U - 497

Saga Petroleum a.s.

3

Licence	057
Partners	SAGA/STATOIL/DEMINEX/AMOCO AMERADA/TEXAS EASTERN
Date	AUGUST 1986
Revision no.	
Date of revision	
Word Processing	

FINAL WELL REPORT

34/4-6

Norwegian Continental Shelf

Classification / Distribution

[X] Saga and partners

	Exploration	Petr.Tech.	Drilling	
Authors	Danielsen/Pedersen/ Stenstadvold/ Selbekk/Tibballs	Bang/Jensen/ Nysetvold	Bjørheim/Leraand/ Sirevaag/Sætervik/ Ødegaard	
Reviewed	Gustavsen/Karlsson	Rasmussen	Klavenes/Vaan	
Accepted				
Approved				

Head Office Oslo
Address
Mariea vei 20
P.O.Box 9
1322 Hovik
Norway

Telephone
Nat. (02) 12 66 00
Internat. 47 2 12 66 00

Telex
16652 Saga n
Facsimile
Nat. (02) 53 99 00
Internat. 47 2 53 99 00

Regional Office Stavanger
Address
P.O. Box 117
4033 Forus
Norway

Telephone
Nat. (04) 57 99 55
Internat. 47 4 57 66 55

Telex
33244 sagas n
Facsimile
Nat. (04) 57 02 61
Internat. 47 4 57 02 61

DISTRIBUTION LIST

Copy No.	Company
1	NPD
2	"
3	Statoil
4	"
5	Deminex (Norge) A/S
6	" " "
7	Amoco Norway Oil Company
8	" " " "
9	Amerada Hess (Norway) Ltd.
10	" " " "
11	Texas Eastern Norwegian, Inc.
12	" " " "
13	Saga Petroleum a.s, Høvik
14	" " " "
15	" " " "
16	" " " "
17	" " " "
18	" " " "
19	" " " "
20	" " " "
21	" " " "
22	" " " "
23	" " " "
24	" " " "
25	" " " "
26	" " " "
27	" " " "
29	" " " "
30	" " " "
31	" " " "
32	" " " "
33	" " " "

Copy No.	Company
34	Saga Petroleum a.s., Høvik
35	" " " "
36	Saga Petroleum a.s., Stavanger
37	" " " "
38	" " " "
39	" " " "
40	" " " "
41	" " " "
42	" " " "
43	" " " "
44	" " " "
45	" " " "
46	" " " "
47	" " " "
48	" " " "
49	" " " "
50	" " " "

2. SUMMARY

2.1 Exploration

The objectives of the well 34/4-6 were to test the reservoir quality of the Upper Lunde Formation and to confirm the established oil/water contact observed in the northern part of the Snorre Field. Other purposes were to control the proposed subdivision and reservoir characteristics of the Middle and Lower Lunde Formation.

Apart from the sandy Utsira Formation of Late - Middle Miocene to Pliocene age (1127.5 - 1239 m RKB), and a sandstone unit within the Hordaland Group of Early Oligocene age (1358.5 - 1387 m RKB), the upper section down to the Base Cretaceous Unconformity proved mainly claystones. One core, 11 m, was cut (recovered 3.8 m, 35%) in this section belonging to the Shetland Group and across the stratigraphic border zone into the Cromer Knoll Group. No Jurassic rocks were encountered below the Base Cretaceous Unconformity. The Triassic Hegre Group consists of sandstones with minor shales and siltstones down to T.D. of the well.

The target horizon, the Upper Lunde, Unit E, Formation, was encountered at 2576.5 m RKB, with a gross thickness of 68.5 m and 39.7 m net sand. 5 cores totalling 74.5 m were cut (recovered 54.3 m, 72.9%) in this section. Hydrocarbons were encountered in the uppermost part of this formation.

The well was drilled to 3282 m RKB (driller's depth) into the Teist Formation of Upper Triassic age. It was plugged and abandoned after testing as an oil discovery.

2.2 Operation

The well was drilled by the GVA 4000 semi-submersible rig D/P "Vinni". The rig was taken over by the licence when the first anchor was dropped on location December 28, 1985. The well was spudded on December 31 in a water depth of 373.5 m MSL. T.D. was reached on March 3, 1986, and the rig was released from the licence on March 29.

Before spudding the well all main anchors were deployed with at least one piggy-back anchor due to poor seabed conditions for anchors to hold tension.

The 36" hole was drilled in two steps. A 17 1/2" pilot hole was subsequently opened up to 36". The 30" casing was set at 521 m RKB. Marine riser and pin connector were run before drilling the 17 1/2" pilot hole and opening the hole to 26" using an underreamer. Half way through underreaming of the section, bad weather made it necessary to disconnect the riser from the wellhead. Due to unsuccessful operation when attempting to re-latch the pin connector back onto the wellhead, the remaining part of this section was drilled without return back to the surface using a 26" bit. The 20" casing was set at 904 m RKB on January 19.

The 15.000 psi BOP stack was run before drilling ahead. The 17 1/2" section was drilled down to 1856 m RKB, and the 13 3/8" casing was set at 1841 m RKB on January 29.

The 12 1/4" section was drilled down to 2549 m RKB where coring commenced. 6 cores were cut in the interval from 2549.5 to 2660.5 m RKB. The first 3 cores were attempted oriented without success. The 12 1/4" hole was drilled down to 2770 m RKB, and the 9 5/8" casing was set at 2760 m RKB on February 23.

The 8 1/2" section was drilled down to a total depth of 3282 m RKB. The well was plugged back to 2720 m RKB before testing.

One DST was carried out before the well was permanently plugged.

2.3 Testing and Formation Evaluation

The well 34/4-6 penetrated top reservoir at 2576.5 m RKB. An oil column of 10.5 m was found in the Triassic Upper Lunde Unit E. In the oil-bearing part of Unit E the porosity was found to be 24.6% with a water saturation of 41%. For the total Unit E (2576.5 - 2645 m RKB) the porosity was estimated to 21.5% and the N/G ratio to 0.58.

The Upper Lunde Unit F was found from 2645 to 2841 m RKB. The porosity in this section was estimated to 19.8% and the N/G ratio to 0.52.

The oil-water contact was picked at 2587 m RKB from RFT pressures.

Cores were taken in the interval 2549.5 - 2553.3 m RKB, 2576.0 - 2632.0 m RKB and 2642.0 - 2660.5 m RKB.

One combined production/interference test was carried out in the Upper Lunde Unit E. The well produced from the interval 2577 - 2585 m RKB, with the interval 2592 - 2595 m RKB as an observation interval. The production rate was 1206 Sm^3/D with a wellhead pressure of 153.6 bar. The flowing bottom hole pressure was 359.6 bar at 2546.9 m RKB.

The gas-oil ratio was measured to 91.3 Sm^3/Sm^3 after a four stage separation. The corresponding dead oil density was 824.5 kg/Sm^3.

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 offshore West Norway, approximately 240 km northwest of Bergen (fig. 3.1). The block covers an area of 492.619 km^2, of which about 50% was relinquished in 1985. The area retained consists of 246 km^2.

Group Members	Working Interest	Net Interest
Saga Petroleum a.s. (operator)	15%	15%
Statoil	15%	50%
Deminex	30%	15%
Amoco	20%	10%
Amerada	10%	5%
Texas Eastern	10%	5%

Rig taken over by PL 057:	December 28, 1985.
Spud date:	December 31, 1985.
T.D. date:	March 3, 1986.
Rig released from PL 057:	March 29, 1986.
Completion status:	Plugged and abandoned as an oil discovery.
Final location coordinates:	Latitude 61° 34' 14.09" N Longitude 02° 13' 19.99" E
Seismic position:	SG8420-198, SP 525.
Rig:	"Vinni"
RKB - MSL:	26.0 m
MSL - Seabed (water depth):	373.5 m
RKB - Seabed:	399.5 m
RKB - T.D.	3282.0 m RKB

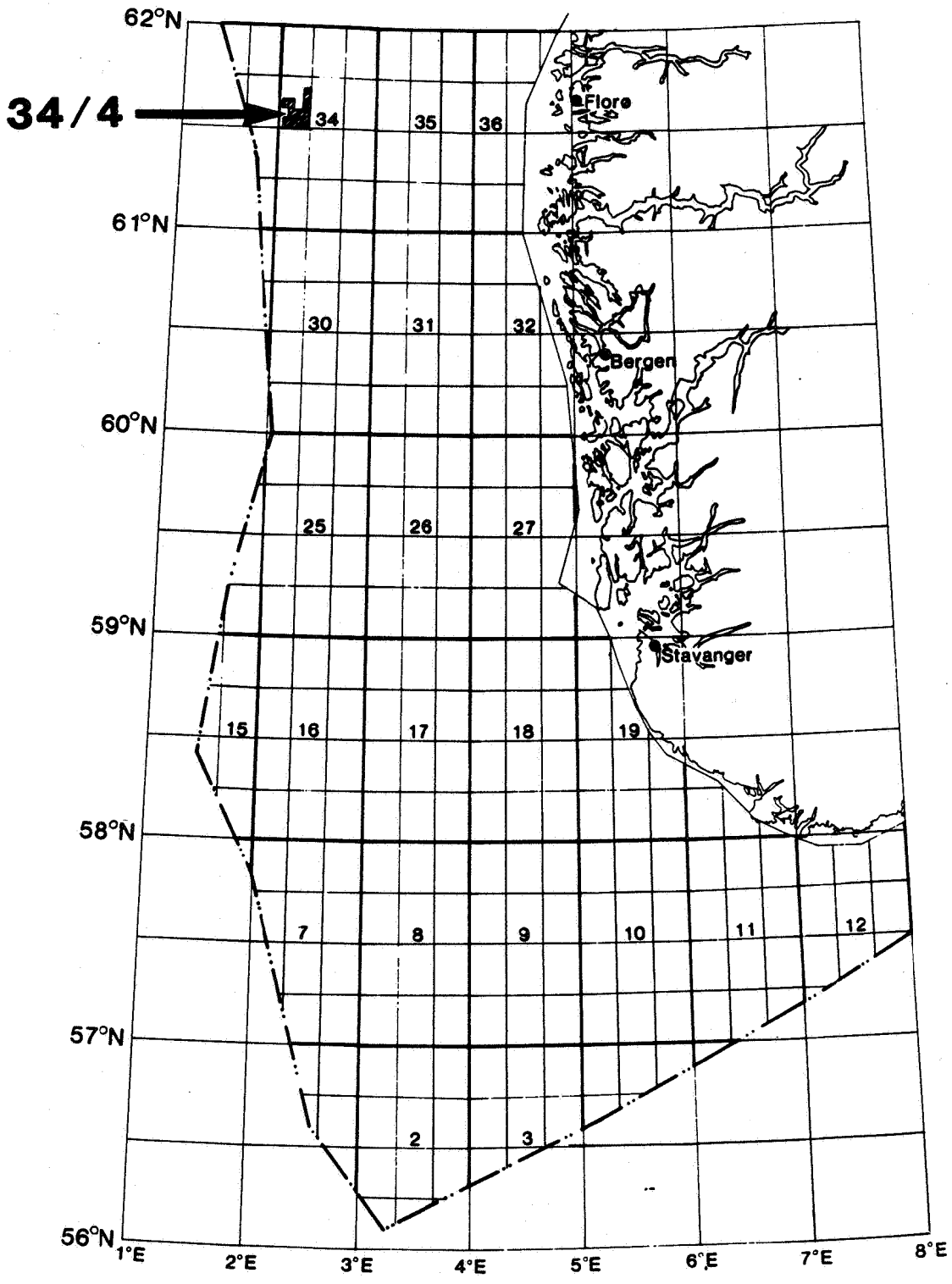


Fig. 3.1 Location map showing the position of block 34/4 approx. 240km NW of Bergen.

Dato JULY86	Forf. UMS	Godkj. BAG
Tegn.av 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
Senior Manager, Engineering:	Paul T. Klavenes
Chief Engineer:	Tor Stein Ølberg
Senior Drilling Engineers:	Svein Bjørheim
	Helge Varhaug
Drilling Engineers:	Frode Leraand
	Hilde Ødegaard
Testing:	
Chief Engineer:	Anders P. Hjellen
Senior Drilling Engineer:	Yngve Andbo
Offshore:	
Drilling Supervisors:	Tom Bjerke
	Kjartan Ladstein
	John Nilsen
	Kjell Randulff
	Per Stø
	Jon Arne Aase
Assistant Drilling Supervisor:	Øivind Holte

3.2.2 Geology

Onshore:	
Exploration Department	
Vice President, Exploration:	Hans Chr. Rønnevik
Senior Manager, Operation Geology:	Bjørn Gustavsen
Operation Geologist:	Terje Solli
Operation Engineer:	Jan Egil Pedersen

Senior Manager, Exploration North Sea:	Werner Karlsson
Licence Geophysicists:	Per Andreassen
	Kari Bøyum
Licence Geologist:	Morten Bergan
Senior Manager, Geophysical Laboratory:	Karl A. Berteussen
Geophysicist:	Vidar Danielsen
Senior Manager, Geological Laboratory:	Arvid Elvsborg
Palynologist:	Frøydis Eide
Sedimentologists:	Ragnar Knarud
Geochemist:	Ellen Sofie Mo
Sample distribution:	Ann Kristin Selbekk
Offshore:	
Well-site Geologists:	Per Bakøy
	Carl W. Carstens
	Kari Chruchow
	Brit Riise Fredheim
	Øystein Jacobsen
	Åge Karlsen
	Bjørn Karlstad
	Mona Kjølseth
	Tormod Lid Larsen
	Øystein Mjelde
	Unni Stenstadvold
	Hanne Øines

3.2.3 Petroleum Technology

Onshore:	
Vice President, Petroleum Technology:	Hugo Sandal
Senior Manager, Formation Evaluation:	Hans Morten Strømmevold
Project Coordinator:	Gabriel Jensen
Petrophysicists:	Jens Bang
	Cathrine Slungaard
	Pål Smestad

Offshore:	
Petrophysicists:	Jens Bang
	Cathrine Slungaard
Well testing:	Bård Beldring
	Sven O. Brandvoll
	Bengt Hultberg
	Gabriel Jensen
	Robert Nygård

3.3 Contractors and Service Companies

Drilling Contractor:	Sverre Ditlev-Simonsen
Mud Logging:	Anadrill Schlumberger
Wireline Services:	Schlumberger Inland Services, Inc.
Mud Engineering:	Promud A/S
Cement and Pumping Services:	Dowell Schlumberger
Casing Services:	Weatherford
Cutting Services:	Deepwater
Coring Services:	North Sea Drilling Services A/S
Underreaming:	Tri-State
Well Head System:	Vetco
Jarring Services:	Eastman Whipstock
Stabilizers:	Norton Christensen
Supply Boats:	"Nordfonn", "Skandi Beta" and "Balder Torungen"
Standby Boat:	"Strilvakt"
Helicopter Service:	Helikopter Service A/S
Catering Service:	Stavanger Catering A/S

4. GEOLOGY AND GEOPHYSICS

4.1 Geographic and Structural Setting

The 34/4-6 well was drilled in the northern part of the Snorre Field (fig. 4.1). The Late Triassic reservoirs of the northern part of the structure are tilted fault blocks gently dipping in a generally north-westerly direction. The structure map is defined at the Base Cretaceous/Top Upper Lunde Formation.

4.2 Purpose of the Well

The main objectives were to test the northern outline of the Snorre Field in block 34/4, as well as confirming the oil/water-contact and reservoir characteristics of the Upper Lunde Formation. The stratigraphy and reservoir characteristics of the Middle and Lower Lunde together with the Lomvi Formations were also objectives taken into account.

SNORRE FIELD
TOP RESERVOIR STRUCTURE MAP

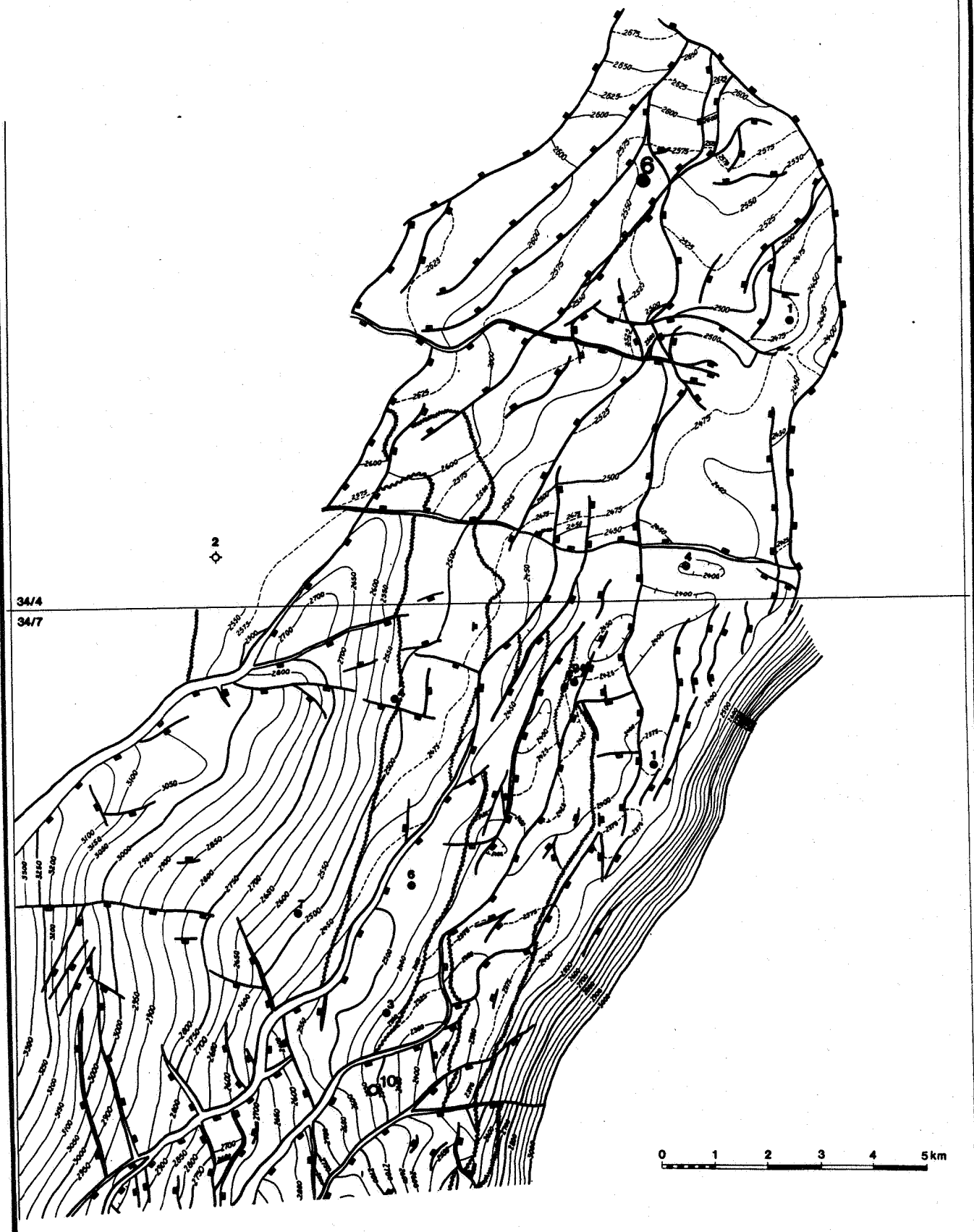


Fig. 4.1

Date	Auth.	Appr.
Sept.86	SV.KB.AE	
Draw.by TG.EOm	Ref.	

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: 399.5 (Seabed) - 540 m RKB
   10 m intervals: 540 - 1855 m RKB
   5 m intervals: 1855 - 2545 m RKB
   3 m intervals: 2545 - 3282 m RKB

c) One set of canned composite wet samples for geochemical analyses.
   10 m intervals: 540 - 2545 m RKB
   9 m intervals: 2545 - 3282 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 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) Sent to Saga, Høvik, for paleontological and mineralogical analysis.

e) Sent to Geco and split into two parts. One half washed and dried and one half untreated. Thereafter they were returned to Saga, Høvik.

f) Washed and divided into 6 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, c/o Frogner Transportbyrå, warehouse, Ringeriksvn. 39, 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 Saga, Høvik, for detailed sedimentological and structural description together with petrographical and paleontological analysis. The A and B cuts will be stored at Saga, Høvik, 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	:	2549.5 - 2560.5 m RKB
	Recovered	:	2549.5 - 2553.3 m RKB
	Recovery	:	3.8 m (35%)
	Correction factor	:	0
	Recovered interval, log	:	2549.5 - 2553.3 m RKB
Core No. 2	Cut	:	2576.0 - 2589.0 m RKB
	Recovered	:	2576.0 - 2583.0 m RKB
	Recovery	:	7 m (54%)
	Correction factor	:	+0.5 m
	Recovered interval, log	:	2576.5 - 2583.5 m RKB
Core No. 3	Cut	:	2589.0 - 2600.0 m RKB
	Recovered	:	2589.0 - 2596.5 m RKB
	Recovery	:	7.5 m (68%)
	Correction factor	:	+2.0 m
	Recovered interval, log	:	2591.0 - 2598.5 m RKB
Core No. 4	Cut	:	2600.0 - 2614.0 m RKB
	Recovered	:	2600.0 - 2612.9 m RKB
	Recovery	:	12.9 m (92%)
	Correction factor	:	+3.0 m
	Recovered interval, log	:	2603.0 - 2615.9 m RKB
Core No. 5	Cut	:	2614.0 - 2632.0 m RKB
	Recovered	:	2614.0 - 2622.4 m RKB
	Recovery	:	8.4 m (47%)
	Correction factor	:	+2 m
	Recovered interval, log	:	2616.0 - 2624.4 m RKB
Core No. 6	Cut	:	2642.0 - 2660.5 m RKB
	Recovered	:	2642.0 - 2660.5 m RKB
	Recovery	:	18.5 m (100%)
	Correction factor	:	+2.25 m
	Recovered interval, log	:	2644.25 - 2662.75 m RKB

Comments:

All core depths (cut) in chapter 4.3.3 correspond to driller's depth. The log depths correspond to the DIFL-LSBHC logs. The wellsite core descriptions are presented in Enclosures III A-C, and the core analyses are given in chapter 5.2.

4.3.4 Sidewall Cores

Two runs were made with coregun, attempting a total of 120 sidewall cores (table 4.1).

102 cores were recovered (85%), 8 were lost and 10 were empty. There were no misfires.

The geological descriptions are given in table 4.2.

Table 4.1: Sidewall Core Sampling, Well 34/4-6

Run: 3A

No.	No. on log	Depth m RKB	Formation	ΔT	Over-pull	Recovery cm	Remarks
1	53	2762.0	sh	90	1130	3.0	
2	52	2755.0	ss	90	421	2.5	
3	51	2751.5	sh	108	3400	3.0	
4	50	2747.0	ss	95	1100	2.0	
5	49	2725.0	sh	100	357	3.5	
6	48	2717.0	ss	90	1053	2.0	
7	47	2709.0	sh	90	2960	2.0	
8		2700.0	ss	90	350	0	Lost
9	46	2694.0	sh	100	1200	2.5	
10	45	2678.0	sh	100	1700	3.0	
11	44	2597.0	sltst	95	1100	2.5	
12	43	2588.0	sltst	95	1475	3.5	
13	42	2587.0	clyst	95	1240	4.0	
14	41	2586.0	ss	95	830	2.0	
15	40	2585.5	ss	100	890	3.5	
16	39	2585.0	ss	115	250	3.5	
17	38	2584.5	ss	108	730	2.0	
18	37	2584.0	ss	90	820	1.5	
19		2583.6	ss	85	220	0	Empty
20		2583.5	mrl	90	180	0	Empty
21	36	2575.0	mrl	95	274	2.5	
22	35	2573.0	mrl	85	300	3.0	
23		2572.0	mrl	90	200	0	Empty
24	34	2569.0	clyst	110	350	4.5	
25	33	2567.0	mrl	102	200	2.5	
26	32	2565.0	clyst	110	1200	2.5	
27	31	2563.0	clyst	115	75	3.0	
28	30	2560.0	clyst	102	340	1.5	
29		2558.0	mrl	105	120	0	Lost
30		2556.5	mrl	130	210	0	Lost

Run: 3A

No.	No. on log	Depth m RKB	Formation	ΔT	Over-pull	Recovery cm	Remarks
31	29	2525.0	clyst	105	1100	2.5	
32	28	2500.0	clyst	105	365	2.0	
33	27	2475.0	clyst	102	2500	2.5	
34		2450.0	clyst	100	2000	0	Lost
35	26	2425.0	clyst	105	1800	3.5	
36	25	2400.0	clyst	110	1000	2.0	
37	24	2374.0	clyst	110	280	3.5	
38	23	2350.0	clyst	112	421	2.0	
39	22	2318.0	clyst	120	290	2.0	
40	21	2300.0	clyst	100	770	3.0	
41	20	2291.0	clyst	110	520	2.5	
42	19	2267.0	clyst	100	640	3.5	
43	18	2250.0	clyst	115	275	1.5	
44	17	2225.0	clyst	112	1100	3.0	
45	16	2202.0	clyst	90	177	1.0	
46	15	2175.0	clyst	115	640	2.0	
47	14	2150.0	clyst	118	300	3.0	
48	13	2130.0	clyst	120	180	3.5	
49	12	2117.5	clyst	85	281	2.0	
50	11	2079.5	clyst	130	300	3.5	
51	10	2068.0	clyst	125	1155	4.5	
52	9	2057.0	ss/sltst	80	266	2.0	
53	8	2025.0	clyst	130	1154	5.0	
54	7	2001.0	clyst	130	680	3.5	
55	6	1975.0	clyst	130	1350	4.0	
56	5	1960.0	clyst	130	1550	4.5	
57	4	1925.0	clyst	125	250	4.0	
58	3	1900.0	clyst	125	300	4.5	
59	2	1875.0	clyst	125	275	3.5	
60	1	1853.0	clyst	145	190	4.5	

Run: 4B

No.	No. on log	Depth m RKB	Formation	ΔT	Over-pull	Recovery cm	Remarks
1	102	3255.0	sh	80	489	1.5	
2	101	3255.0	sh	"	825	1.5	
3	100	3250.5	sh	90	503	2.0	
4	99	3250.5	sh	"	808	1.5	
5		3248.0	sh	80	478	0	Empty
6		3248.0	sh	"	450	0	Empty
7	98	3240.0	sh	75	380	1.0	
8	97	3240.0	sh	"	935	2.0	
9	96	3231.0	sh	75	450	1.2	
10	95	3231.0	sh	"	420	2.0	
11	94	3220.0	ss	85	890	2.5	
12	93	3220.0	ss	"	1300	2.0	
13	92	3205.0	ss	90	1070	2.5	
14		3192.0	ss	80	293	0	Empty
15	91	3180.0	ss	85	1020	2.2	
16		3170.0	ss	85	1338	0	Lost
17	90	3163.0	sh	80	579	1.5	
18		3163.0	sh	"	582	0	Empty
19	89	3158.0	sh	85	1220	2.0	
20	88	3146.0	sh	80	512	2.0	
21	87	3141.0	sh	80	746	1.2	
22	86	3136.0	sh	80	1400	2.5	
23		3129.0	sh	80	540	0	Empty
24	85	3118.0	sh	75	1294	2.2	
25	84	3118.0	sh	"	380	3.0	
26		3112.0	sh	85	390	0	Empty
27	83	3112.0	sh	"	515	1.5	
28	82	3097.0	sh	85	981	1.5	
29	81	3097.0	sh	"	428	2.0	
30	80	3095.0	sh	85	644	2.0	
31	79	3095.0	sh	85	918	2.2	
32	78	3086.0	ss	75	510	1.5	

Run: 4B

No.	No. on log	Depth m RKB	Formation	ΔT	Over-pull	Recovery cm	Remarks
33	77	3079.0	sh	80	1525	2.0	
34	76	3079.0	sh	"	834	2.0	
35		3067.0	sh	75	2058	0	Lost
36	75	3060.0	sh	85	882	2.0	
37	74	3048.0	sh	85	1065	2.0	
38	73	3023.0	sh	80	951	2.0	
39	72	3010.0	ss	80	1069	3.0	
40	71	3000.0	ss	80	1200	3.0	
41	70	2985.0	ss	75	918	2.0	
42	69	2973.0	sh	80	284	2.0	
43		2955.0	ss	75	353	0	Empty
44	68	2942.0	sh	85	1831	2.5	
45	67	2930.0	sh	85	1053	2.5	
46	66	2924.0	sh	90	1454	2.0	
47	65	2908.0	sh	90	432	2.0	
48	64	2899.0	sh	85	289	1.5	
49	63	2895.0	sh	80	340	2.5	
50	62	2883.0	sh	90	316	3.0	
51	61	2864.0	sh	110	277	2.5	
52	60	2853.0	sh	95	1668	3.0	
53	59	2843.0	sh	85	255	1.0	
54	58	2828.0	sh	95	1739	2.5	
55		2823.0	sh	80	1628	0	Lost
56	57	2812.0	ss	85	221	2.5	
57	56	2807.0	sh	90	1027	3.0	
58		2800.0	ss	65	1600	0	Lost
59	55	2798.0	sh	85	1666	3.0	
60	54	2780.0	sh	90	1484	3.0	

Table 4.2: Sidewall Core Description, Well 34/4-6

No. on log	Depth m RKB	Lithology
1	1853.0	Clyst, sl slty, m-dk gy, frm, non calc
2	1875.0	Clyst, as above
3	1900.0	Clyst, sl slty, dk gy, frm, sl mic-mica, sl calc
4	1927.0	Clyst, as above
5	1960.0	Clyst, non calc, else as above
6	1975.0	Clyst, sl slty, m-dk gy, frm, occ sl mica, sl calc
7	2001.0	Clyst, dk gy blk, frm, sl mica, non calc
8	2025.0	Clyst, m-dk gn gy, else as above
9	2057.0	Ss/sltst, sl arg, lt gy, slt-vf, mod srtd, fri, v calc
10	2068.0	Clyst, sl slty, m-dk gy, frm, sl calc
11	2079.5	Clyst, slty, else as above
12	2117.5	Clyst, sl slty, lt gy, frm, v calc
13	2130.0	Clyst, sl slty, m-dk gy, frm, non-sl calc
14	2150.0	Clyst, as above
15	2175.5	Clyst, as above
16	2202.0	Clyst, mly, m-lt gy, /wh spcs of ls, frm-hd
17	2225.0	Clyst, slty, m gy - gn gy, frm, non-sl calc
18	2250.0	Clyst, sl slty, m gy - gn gy, sl stc, sft, non calc
19	2267.0	Clyst, sl slty, m gy, frm, calc, thn lam of ls in clyst
20	2291.0	Clyst, occ sl slty, m gy, frm, sl calc - calc
21	2300.0	Clyst, sl slty, m gy - blk, frm, calc, thn lam of ls in clyst
22	2318.0	Clyst, m gy, sft, sl stc, non-sl calc
23	2350.0	Clyst, m gy, sft-frm, sl calc - calc
24	2374.0	Clyst, as above
25	2400.0	Clyst, m gy, frm, calc
26	2435.0	Clyst, slty, m gy - lt gy, frm, sl mic-mica, sl calc
27	2475.0	Clyst, sl slty, m gy, frm, sl calc - calc
28	2500.0	Clyst, sl calc, else as above
29	2525.0	Clyst, as above
30	2560.0	Clyst, m gy, sft, sl stc, calc

No. on log	Depth m RKB	Lithology
31	2563.0	Clyst, m gy, sft, sl stc, calc
32	2565.0	Clyst, mly, m gy - dk rd brn, frm
33	2567.0	Mrl, sl slty, brn gy, frm, occ frm-hd, sl mic-mica
34	2569.0	Clyst, mly, dk gy - m-dk gy, sft-frm
35	2573.0	Mrl, sl slty, brn rd, frm, sl mic-mica
36	2575.0	Mrl, as above
37	2584.0	Ss, clr-lt brn, f-m, occ c, w srtd, ang-sbang, fri, sl mica, sl calc, g por Shows, g pale brn o stn, 95-100% mod-strong straw yel flor, fast-inst strmg mlky wh-pale yel cut, pale yel res, fr od
38	2484.5	Ss, as above Shows, as above
39	2485.0	Ss, as above Shows, as above
40	2485.5	Ss, f-c, mod srtd, else as above Shows, fr-g pale o stn, sl more dull flor, else as above
41	2586.0	Ss, as above Shows, fr-g pale brn o stn, 90% mod-strong straw yel flor, fast strmg mlky wh-yel cut, pale yel res, fr od
42	2587.0	Clyst, slty, lt gy-gn, frm, sbfis, sl mic-mica, non calc
43	2588.0	Sltst, arg, v lt gy-gn, frm, v mic-mica, non-sl calc
44	2597.0	Sltst, sl arg, v lt gy, frm, sl mic-mica, calc
45	2678.0	Sh, slty, dk rd-brn, frm, mic-mica, sl calc, s nod of ls in sh
46	2694.0	Sh, slty, dk rd-brn, frm, mica - v mica-mica, sl calc
47	2709.0	Sh, v slty, non-sl calc, else as above
48	2717.0	Ss, lt gy - lt gn, vf-f, pred vf, mod-w srtd, sbang-sbrnd, fri, kao cmt, sl mica, non calc
49	2725.0	Sh, slty, dk rd-brn, frm, mic-mica, non calc
50	2747.0	Ss, lt gy - lt olv-gy, vf-f, pred f, occ m, mod srtd, sbrnd, fri, sl mica, sl calc

No. on log	Depth m RKB	Lithology
51	2751.5	Sh, slty, dk rd-brn, frm, v mic-mica, sl calc
52	2755.0	Ss, lt olv-gy, vf-f, w srtd, sbang-sbrnd, fri, calc - v calc
53	2762.0	Ss, vf-f, pred f, else as above
54	2780.0	Ss,, qtz, clr-wh, vf, w srtd, sbrnd, frm-hd, mica, sl calc cmt, chlor Tr, clyst, lt gn, sft, wxy, non calc
55	2798.0	Ss, as above
56	2807.0	Ss, as above, but calc cmt
57	2812.0	Ss, qtz, clr-wh, occ orng, occ gn, vf-f, mod srtd, sbrnd, frm-hd, v calc cmt, tr mica
58	2828.0	Lam clyst/ss Clyst, dk gy-blk, frm, fis, mic-mica, sl calc Ss, qtz, clr-wh, vf, w srtd, v mica, calc cmt
59	2843.0	Ls, aren, lt gy-gy, hd
60	2853.0	Clyst/sltst, dk rd-brn, frm, occ fis, mic-mica, v calc
61	2864.0	Clyst, dk gy-blk, frm-hd, fis, mic-mica, calc
62	2883.0	Ss, qtz, clr-wh, vf, w srtd, sbrnd, v hd, mica, v calc cmt, chlor
63	2895.0	Ss, as above, but frm-hd
64	2899.0	Ss, as above
65	2908.0	Ss, as above
66	2924.0	Lam sltst, ss and mica Sltst, occ sdy, dk rd-brn, frm, mic-mica, v calc Ss, qtz, clr-wh, vf
67	2930.0	Sample, as above
68	2942.0	Sltst, occ sdy, dk rd-brn, frm, mic-mica, v calc
69	2973.0	Ss, qtz, clr-wh, occ orng, vf-f, occ m, mod srtd, sbang, v calc cmt
70	2985.0	Ss, qtz, clr-lt gn, vf, w srtd, sbrnd, v mica, calc cmt, v chlor (40%)
71	3000.0	Ss, qtz, clr-wh, occ yel, vf-f, occ m-c, p srtd, sbrnd, occ rnd, fri, v calc cmt
72	3010.0	Sample, as above

No. on log	Depth m RKB	Lithology
73	3023.0	Ss, qtz, clr-wh, vf-f, occ m, mod srtd, sbang-sbrnd, sl calc cmt, chlor
74	3048.0	Ss/sltst, m gy-brn, frm, mica, calc cmt, chlor, biot Ss, qtz, clr-wh, occ yel-orng, vf, w srtd
75	3060.0	Ss, qtz, clr-wh, occ lt yel, vf, w srtd, sbang-sbrnd, frm-hd, mica, calc cmt, chlor, biot
76	3079.0	Clyst, slty, dk brn, frm-hd, fis, mic-mica, sl calc
77	3079.0	Sample, as above
78	3086.0	Ss, qtz, clr-wh, occ lt yel, vf-f, occ m, mod srtd, ang, frm-hd, mica, calc cmt, chlor
79	3095.0	Lam ss, clyst and mica Ss, lt gy, vf, frm-hd, v calc Clyst, dk brn, fis, frm-hd, v calc
80	3095.0	Sample, as above
81	3097.0	Clyst, slty, dk brn, frm-hd, fis, mic-mica, v calc
82	3097.0	Sample, as above
83	3112.0	Lam sltst and clyst Sltst, dk gy - dk brn-gy, frm-hd, fis, occ v mica, sl calc, mica, lam, lt gy-brn Clyst, dk gy-blk, sbfis, sl calc
84	3118.0	Sltst, sdy, str lt gy - dk gn-gy, vf, hd, occ frm, sbfis, mic-mica, calc
85	3118.0	Sample, as above
86	3136.0	Sh, dk gy-blk, frm, fis, mic-mica, v calc
87	3141.0	Clyst, slty, frm-hd, mica, v calc, chlor
88	3146.0	Ss, qtz, clr-wh, occ lt yel, vf-f, w srtd, sbrnd, frm-hd, mica, calc cmt, chlor
89	3158.0	Clyst, slty, dk brn - dk gy-brn, fis, frm, mic-mica, sl calc
90	3163.0	Ss, str lt gy - m gn-gy, qtz, clr-wh, pred vf, occ f, w srtd, ang-sbang, frm, mica, calc cmt, chlor
91	3180.0	Ss, qtz, dk brn-rd, occ clr, vf-f, w srtd, sbang-sbrnd, frm, v calc

No. on log	Depth m RKB	Lithology
92	3205.0	Ss, qtz, dk brn-rd, occ clr, vf-f, w srtd, sbang-sbrnd, frm, v calc
93	3220.0	Sample, as above, but sl calc
94	3220.0	Sample, as above
95	3231.0	Sltst grdg ss, dk brn, pred vf, occ f, w srtd, ang, frm, mic-mica, v calc
96	3231.0	Sample, as above
97	3240.0	Sample, as above
98	3240.0	Sample, as above
99	3250.5	Sh, slty, dk brn - dk brn-rd, frm-hd, fis, v mic-mica, v calc
100	3250.5	Sample, as above
101	3255.0	Ss grdg sltst, dk brn - rd-brn, vf, w srtd, sbang, frm, mic-mica, v calc
102	3255.0	Sample, as above

4.4 Measurements While Drilling

The MWD was undertaken by Anadrill Schlumberger. 15 runs were carried out from 530 m RKB to T.D. at 3282 m RKB.

In runs 1 - 5 (17 1/2" hole section), the tool was fully operational, and 100% was recovered. A slight problem with the tool occured in run 6 (12 1/4" hole section) resulting in a total of 82.2% recording of GR for this run. The resistivity log was, however, complete. The remaining runs 7 - 11 in the 12 1/4" hole section were a success with 100% recordings. In the 8 1/2" hole section runs 12 - 15 were carried out with 100% resistivity recordings and 92.6% GR recordings. All surveys were successful.

The MWD was of valuable assistance in picking formation tops as well as core point.

4.5 Wireline Logs (open hole)

Casing Record	Hole Size	Logged Interval (m RKB)	Type of Log	Run No.	Date
30" 521 m	36" to 530 m		GR to surface		
20" 904 m	26" (17 1/2") to 920 m	521.0 - 917.5 521.0 - 919.0	MWD ISF-DDBHC-GR LDL-GR	1A 1A	08.01.86 09.01.86
13 3/8" 1841 m	17 1/2" to 1856 m	904.0 - 1853.0 904.0 - 1854.5	MWD ISF-DDBHC-GR LDL-GR	2B 2B	27.01.86 27.01.86
9 5/8" 2760 m	12 1/4" to 2770 m	1841.0 - 2769.0 750.0 - 1841.0 1841.0 - 2769.0 2545.0 - 2766.5 1841.0 - 2770.0 53 SWC rec.	MWD ISF-LSS-GR CBL-VDL-GR LDL-CNL-NGT-GR DLL-MSFL-GR-SP SHDT-GR RFT VSP (Geco) CST RFT RFT	3C 3A 3C 3A 3A 3A-B 3A 3A 3C 3D	17.02.86 17.02.86 18.02.86 18.02.86 18.02.86 19.02.86 20.02.86 20.02.86 20.02.86 21.02.86
T.D. 3282 m	8 1/4" to 3282 m	2761.5 - 3281.0 2780.0 - 3255.0 2761.5 - 3282.0 2761.5 - 3282.0 49 SWC rec.	MWD ISF-LSS-GR CBL-VDL-GR LDL-CNL-GR VSP (Geco) SHDT-GR CST	4D 4B 4D 4B 4B 4B	04.03.86 05.03.86 04.03.86 04.03.86 04.03.86 05.03.86

4.6 Well Velocity Survey

A zero offset VSP was acquired and processed by GWS.

Two Bolt 1500-airguns 286 cu.in. capacity each, a Teledyne hydrophone and a Geosource VSP-tool were used during acquisition.

The gun offset was 64 m at 100 deg.

The spatial sampling rate was 20 m while the time sampling rate was 1 ms. Total recording length was 4 sec. Number of shots at each level varied between 5 and 10.

The VSP started at 2760 m RKB and was then shot every twenty meter up to 1560 m RKB.

The corrected velocity and density data were used in the production of the synthetic seismograms by GWS. Frequency tests were performed using a minimum and a zero phase Ricker wavelet with center frequencies at 15, 20, 25, 30 and 35 Hz. Synthetic seismograms were produced for the frequency of a 20 Hz Ricker wavelet. All synthetic seismograms were displayed in both normal and reverse polarity with both minimum and zero phase Ricker wavelets. The display scales were 10 cm/sec.

Fig. 4.2 shows the lithological column, the VSP, the synthetic seismogram and a selection of the seismic line SG8420-198 around the well location.

A seismic summary is given in table 4.3. The composite well log also shows the travel times to the different geological units and reflectors.

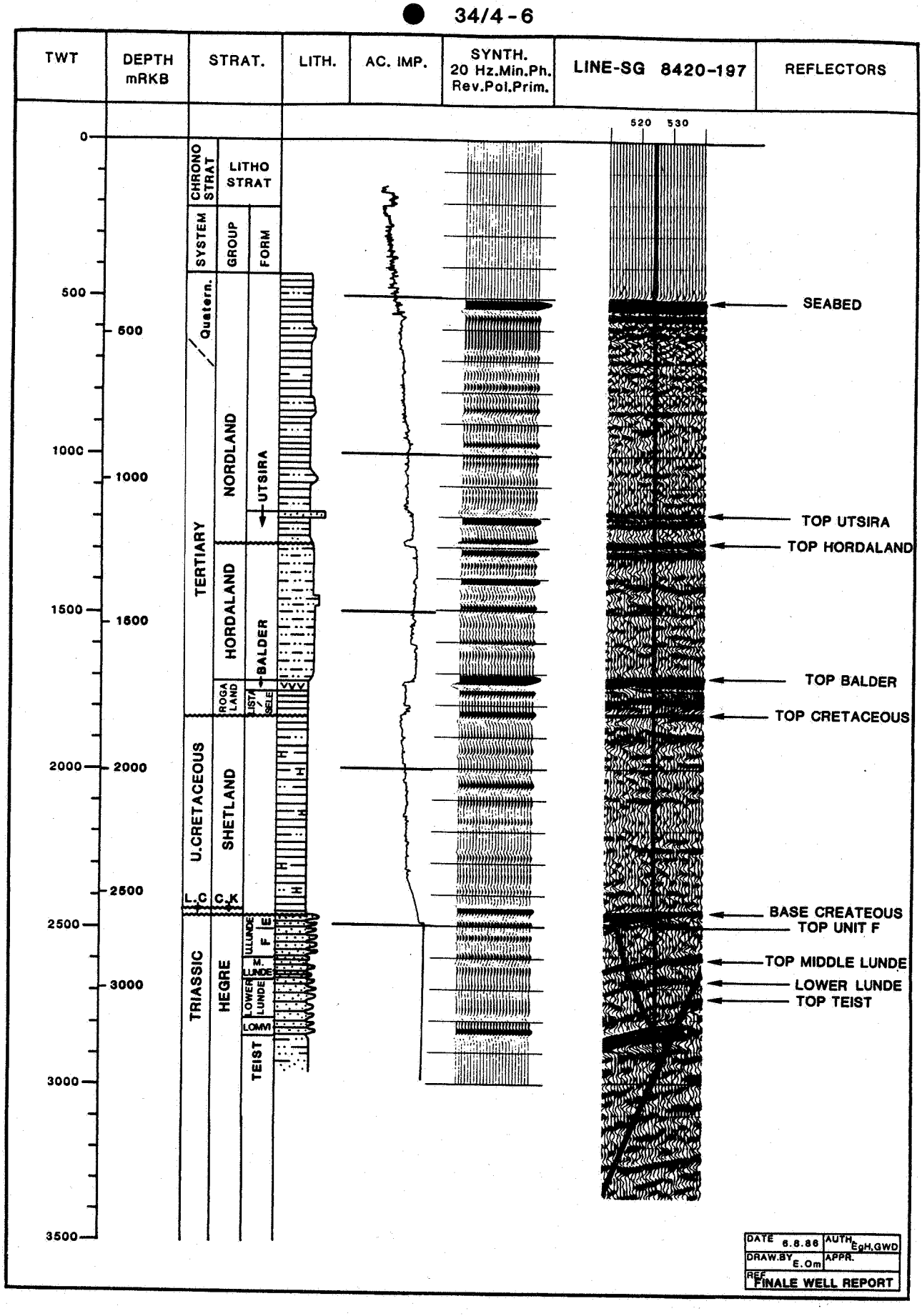


Fig. 4.2 Seismic Summary

Table 4.3: Seismic summary, line SG8420-197, SP 525.

REFLECTOR	FORMATION TOPS	TWT ms	ΔT ms	DEPTH m RKB	DEPTH m MSL	ΔZ m	VINT m/s
Seabed	T. Nordland Gr.	386		399.5	373.5		
						728.0	
	T. Utsira Fm.	1181		1127.5	1101.5		
			97			111.5	2299
T. Hordal.	T. Hordaland Gr.	1278		1239.0	1213.0		
			426			419.0	1967
T. Balder	T. Balder Fm.	1704		1658.0	1632.0		
			23			29.5	2565
	T. Lista/Sele Fm.	1727		1687.5	1661.5		
			83			87.0	2096
T. Cret.	T. Shetland Gr.	1810		1774.5	1748.5		
			621			780.0	2512
	T. Cromer Knoll Gr.	2431		2554.5	2528.5		
			16			22.0	2750
B. Cret.	Unit E	2447		2576.5	2550.5		
			43			68.5	3186
T. Unit F	T. Unit F	2490		2645.0	2619.0		
			117			196.0	3350
	T. M. Lunde Fm.	2607		2841.0	2815.0		
			67			115.5	3478
T. L. Lunde	T. L. Lunde Fm.	2674		2956.5	2930.5		
			105			196.5	3725
	T. Lomvi Fm.	2779		3153.0	3127.0		
			44			77.5	3523
T. Teist	T. Teist Fm.	2823		3230.5	3204.5		

4.7 Formation Temperature

The maximum recorded temperatures (BHT) obtained during logging have been converted to static formation temperatures (Tf) using a Horner plot technique. The recorded BHTs and estimated static formation temperatures are listed in table 4.4. The data used for the calculations are listed in table 4.5.

All the data have been plotted in fig. 4.3.

In addition to the calculated static formation temperatures, one bottom hole temperature was measured during testing:

m RKB	Temp °C
2581	100

Table 4.4: Average bottom hole temperatures (BHT) and static formation temperatures (T_f).

Depth m RKB	No. of BHT readings	Average BHT °C	T_f °C
900	3	34	34
908	3	34	
1836	3	39	60
1841	3	45	
2752	3	68	100
2760	3	78	
2756	3	82	
2763	3	86	
3263.5	3	89	113
3269.5	3	97	

Table 4.5: 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)
ISF-DDBHC-GR	08.01.86	1A	917.5	34	5.3	3.0
LDL-GR	09.01.86	1A	919.0	34	9.5	3.0
ISF-DDBHC-GR	27.01.86	2A	1853.0	39	7.0	2.5
LDL-GR	27.01.86	2A	1854.5	45	11.0	2.5
ISF-LSS-GR	17.02.86	3C	2769.0	68	9.8	5.0
LDL-CNL-NGT-GR	18.02.86	3C	2769.0	78	17.5	4.2
DLL-MSFL-GR-SP	18.02.86	3A	2766.5	82	24.5	4.5
SHDT	18.02.86	3A	2770.0	86	28.6	3.5
ISF-LSS-GR	03.03.86	4D	3282.0	89	9.0	6.0
LDL-CNL-GR	04.03.86	4D	3281.0	97	13.5	5.5

FORMATION TEMPERATURE

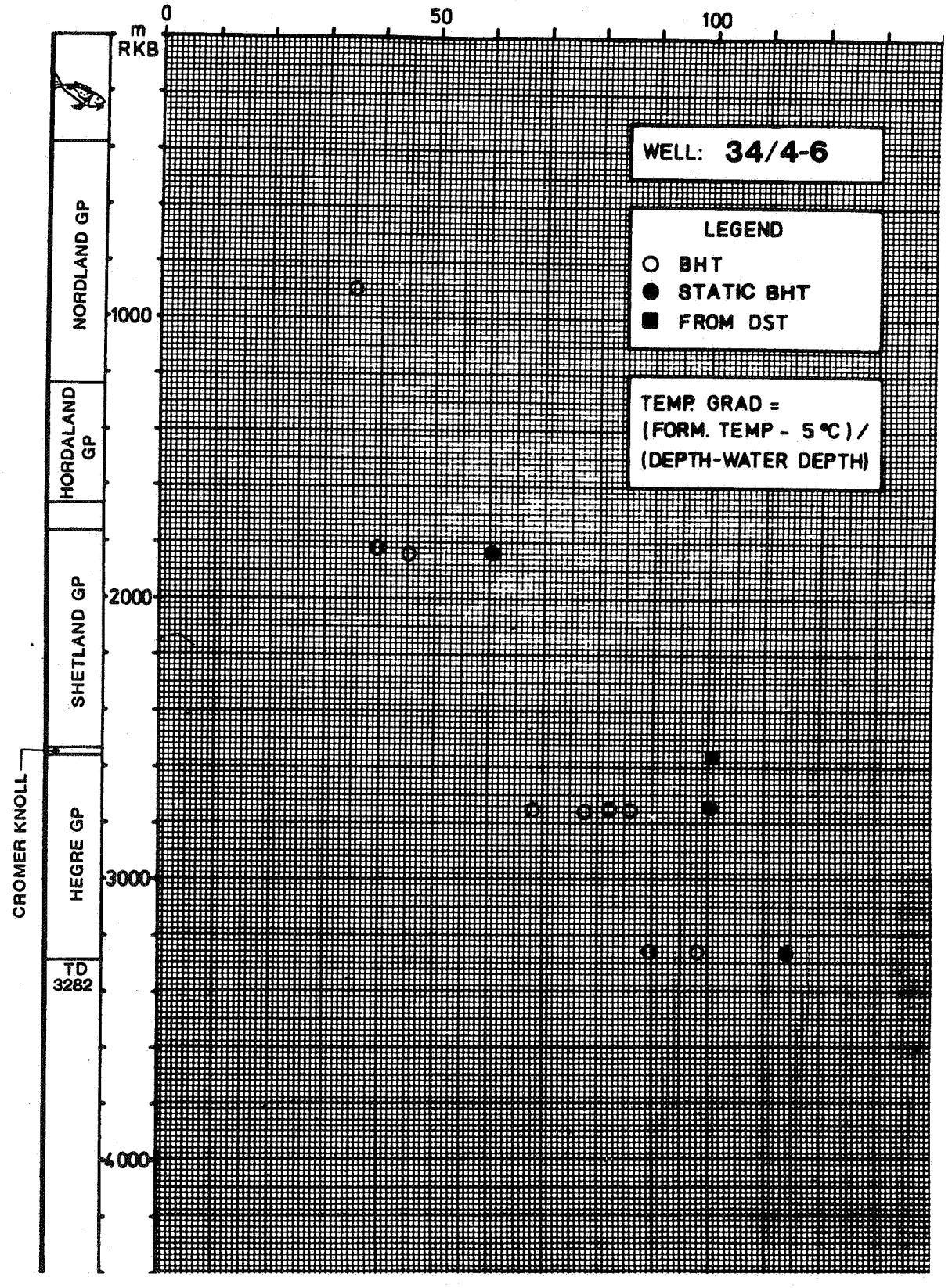


Fig. 4.3

Date July 86	Auth. UMS	Appr. BAG	
Draw by RHK	Ref		

4.8 Formation Pressure

The most relevant pressure parameters are plotted in the Formation Pressure Evaluation Sheet (Enclosure II). An interpreted pressure gradient profile, including mud weight (ECD), stratigraphy, leak-off data and RFTs, is given in fig. 4.4.

The sediments of the Nordland Group show no signs of overpressure. In the uppermost part of the Nordland Group the d_c-exponent curve is very scattered due to soft sediments, and therefore is useless for pressure interpreation. Below 800 m RKB the d_c-exponent plots on a good normal compaction trend. This trend is shifted to the left at approximately 920 and 1125 m RKB because of bit change and changes in the lithology (Utsira Formation). The sonic log plots on a normal compaction trend throughout the Nordland Group, down to approximately 1125 m RKB, where it is shifted to the right due to the Utsira sands. The background gas is very low throughout the whole interval, with a maximum mud weight of 1.13 g/cm^3, which is a strong indication of normally pressured sediments.

The upper part of the Hordaland Group down to approximately 1500 m RKB also seems to be normally pressured. The d_c-exponent is very scattered in this section due to a very sandy/silty lithology. It is therefore difficult to establish any trend lines. The sonic log curve is shifted to the right in the top part of the Hordaland Group and plots on a trend parallel to the one above. No increase in background gas is seen with a constant mud weight of 1.13 g/cm^3.

A build-up in pressure gradient starts around 1500 m RKB. This is indicated by the d_c-exponent which starts to plot on a rather vertical trend in a lithology described as uniform claystone. The sonic log curve deviates towards higher Δts at the same depth, and a slight increase is seen in the background gas, despite a stepwise increase in the mud weight.

At the base of the Hordaland Group (1657 m RKB) the pressure gradient is estimated to be in the range of 1.16 - 1.18 g/cm^3.

FORMATION PRESSURE GRADIENT

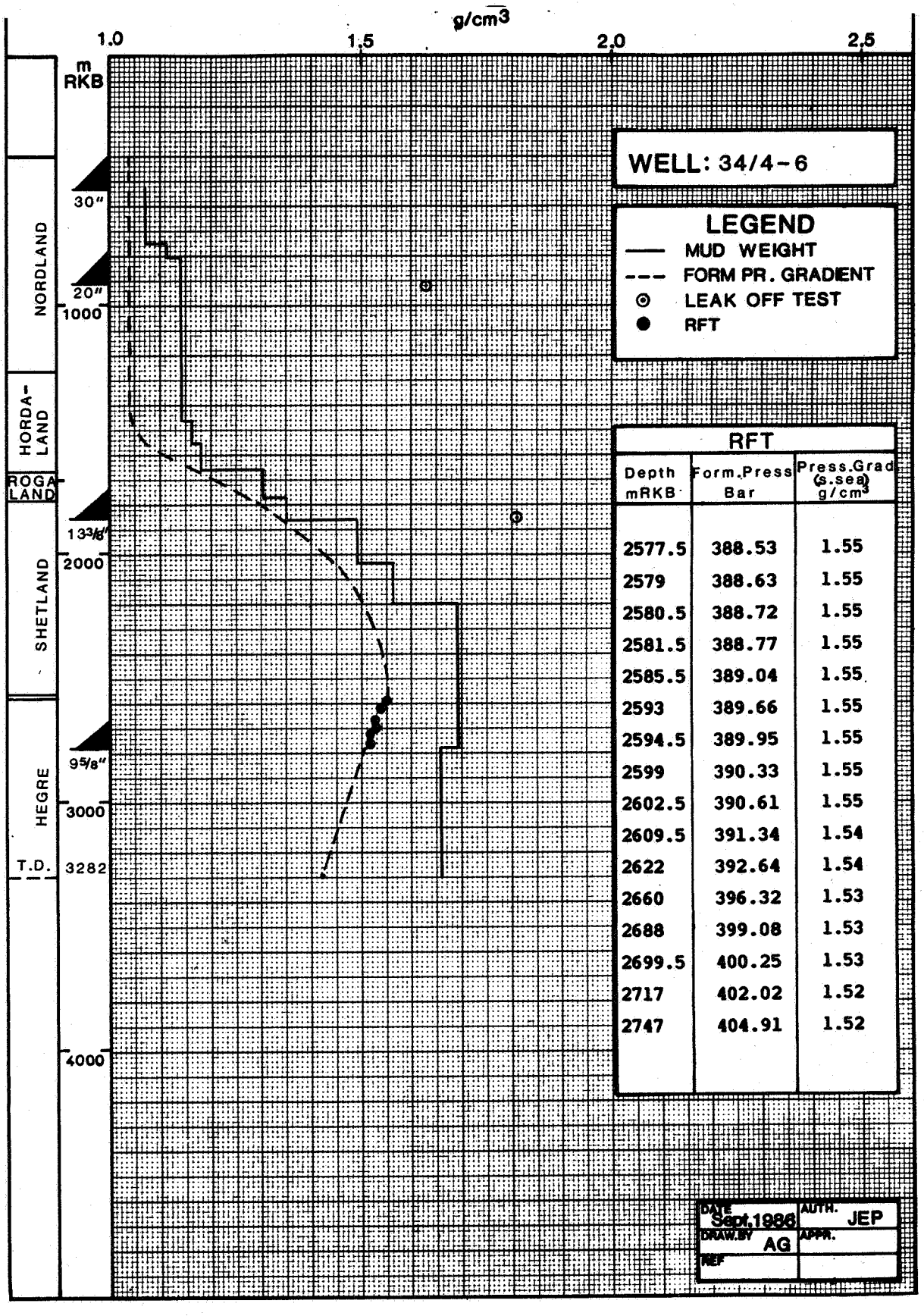


Fig. 4.4

The pressure gradient increases steadily throughout the Rogaland Group and into the Shetland Group. In the top part of the Shetland Group a clear cut back is seen in the d_c-exponent curve. The sonic log plots on a rather vertical or slightly increasing trend which again is indicative of an increasing pressure gradient.

At 1800 m RKB in the Shetland Group a pressure estimation shows that the pressure gradient has increased to approximately 1.30 g/cm^3. Below 2100 m RKB the d_c-exponent starts to plot on an increasing trend towards the reservoir (Hegre Group) at 2576.5 m RKB. This is interpreted as a lithological effect and not as a decrease in pressure gradient. Pressure measurements (RFTs) performed in the reservoir, indicate a steady increase in pressure gradient throughout the lower part of the Shetland Group.

The shallowest pressure reading at 2577.5 m RKB yields a pressure gradient of 1.55 g/cm^3, which is maximum in the well. The pressure gradient decreases throughout the Hegre Group towards T.D. at 3282 m RKB, according to an oil gradient of 0.064 bar/m and a water gradient of 0.099 bar/m (vertical pressure communication). Hence the pressure gradient at the well's T.D. (3282 m RKB) can be estimated to 1.43 g/cm^3.

4.9 Shallow Gas

4.9.1 Well Log Readings

The well site lithology log registers shallow gas at two levels, at 766 m RKB (3% gas reading) and at 862 m RKB (1.3% gas reading).

The upper of the two levels corresponds to a drilling break in the rate of penetration and to a slight increase in resistivity on the MWD-log (Measurement While Drilling).

The lower of the two gas readings does not show up on any other log reading.

The two gas readings have been plotted on the shallow seismic section across the well site

4.9.2 Gas Predictions

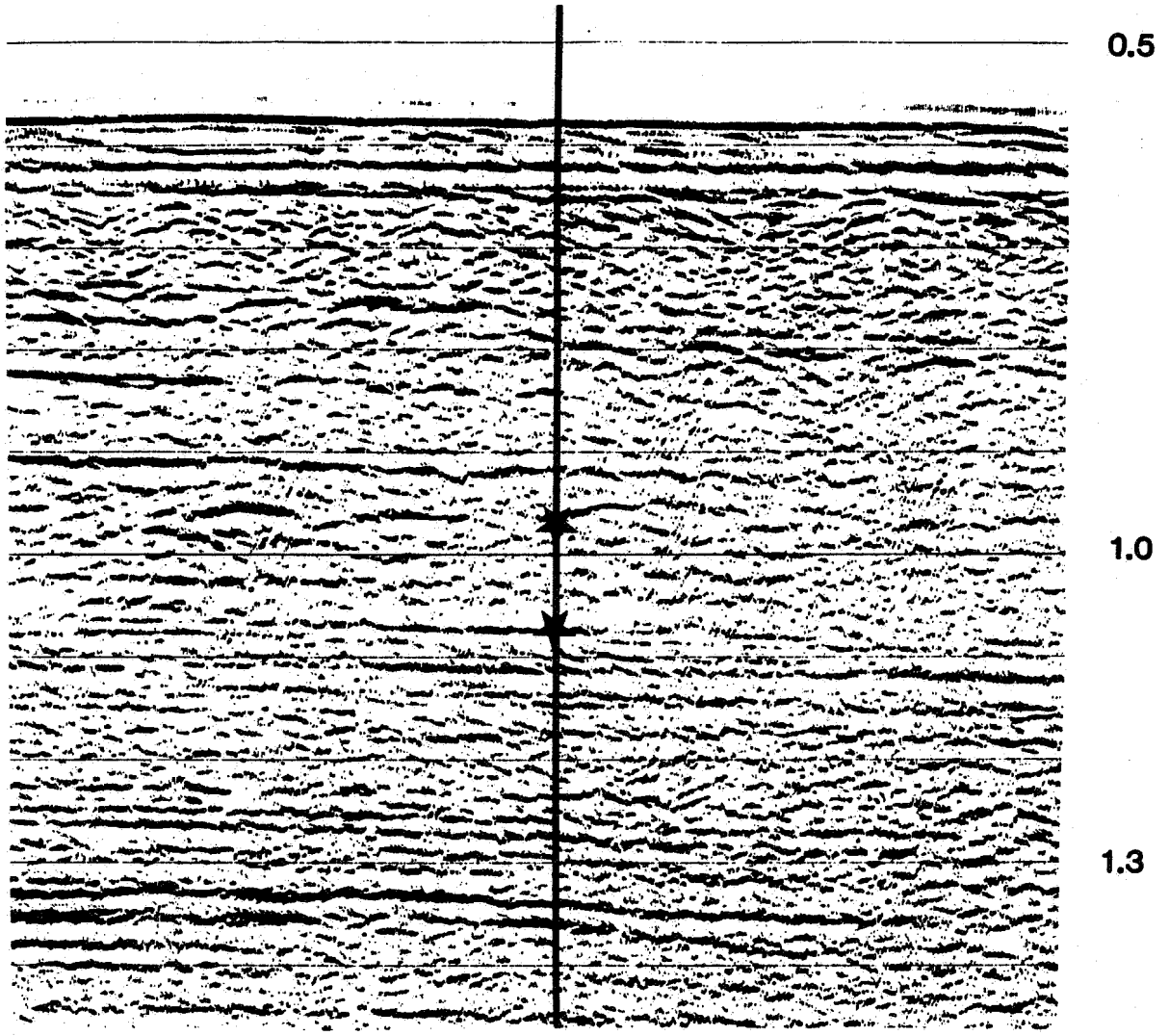
The site survey report for location 34/4-6 states that there is no indications of shallow gas at or near the drilling location.

The well programme states that although no high amplitude events have been seen on the seismic records at the well site, some reflectors display high amplitude events or other gas indications away from the well site. These reflectors have been listed at the following depths: 585, 715, 754 and 813 m RKB.

Increase in sand content at 723 and 752 m RKB corresponds to these reflectors, but no shallow gas was observed there.

The shallow gas observed is not related to any increase in sand content at the corresponding levels.

SEISMIC LINE SG 8520-703



★ Shallow gas readings

NB ! Timeshift of 72ms while recording this line.

Fig. 4.5

Date	Sept.86	Auth.	KBT	Appr.	BUH
Draw by	AG	Ref.			

4.10 Stratigraphy

4.10.1 Lithostratigraphic Summary

The lithostratigraphic subdivision (table 4.6) of well 34/4-6 is based on wireline log responses, conventional cores, sidewall cores and the cutting descriptions, supported by the biostratigraphic breakdown prepared by Robertson Research and Saga.

Table 4.6: Lithostratigraphic Summary, well 34/4-6

Formation Tops	Depths (m RKB)	Thickness m
Nordland Group (Seabed)	399.5	728.0
Utsira Formation	1127.5	111.5
Hordaland Group	1239.0	419.0
Rogaland Group	1658.0	116.5
Balder Formation	1658.0	29.5
Lista/Sele Formation	1687.5	87.0
Shetland Group	1774.5	780.0
Cromer Knoll Group	2554.5	22.0
Hegre Group	2576.5	+705.5
Upper Lunde Formation	2576.5	264.5
Middle Lunde Formation	2841.0	115.5
Lower Lunde Formation	2956.5	196.5
Lomvi Formation	3153.0	77.5
Teist Formation	3230.5	+51.5
T.D.	3282.0 (driller's depth)	

4.10.2 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:	499 ditch cutting, 42 sidewall core and 29 core samples.
Micropaleontology:	210 ditch cutting, 10 sidewall core and 1 core samples.
Palynology:	94 ditch cutting, 42 sidewall core and 8 core samples.

2. Saga:

Micropaleontology:	12 core and 11 sidewall core samples.
Palynology:	22 core and 20 sidewall core samples.

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

Table 4.7: Biostratigraphic Summary, Well 34/4-6

Age	Depth m RKB	Thick-ness m	Remarks
Pleistocene	540	+20	Top not seen
Pliocene	560	580	
Late Miocene - Middle Miocene	1140	110	
UNCONFORMITY			
Late Oligocene	1250	120	
Early Oligocene	1370	40	
Late Eocene	1410	40	
Middle Eocene	1450	180	
Early Eocene	1630	28	
Late Paleocene	1658	116	Log
UNCONFORMITY			
Late Cretaceous	1774	782	Log
Latest Maastrichtian	1774	16	Log
Late Maastrichtian	1790	60	
Early Maastrichtian	1850	25	
Late Campanian	1875	85	SWC
Early Campanian	1960	360	
Santonian	2320	40	
Coniacian	2360	90	
Early Coniacian - Turonian	2450	55	
Turonian	2505	51	
UNCONFORMITY			
Early Cretaceous	2554.5	22	Log
Early Barremian	2554.5	22	
UNCONFORMITY			
Triassic	2576.5	+705.5	Log
Rhaetian	2576.5	333.5	Log
Early Rhaetian - Norian	2910	+372	
T.D.	3282 (driller's depth)		

CAINOZOIC STRATIGRAPHIC HISTORY

PAGE ONE OF TWO

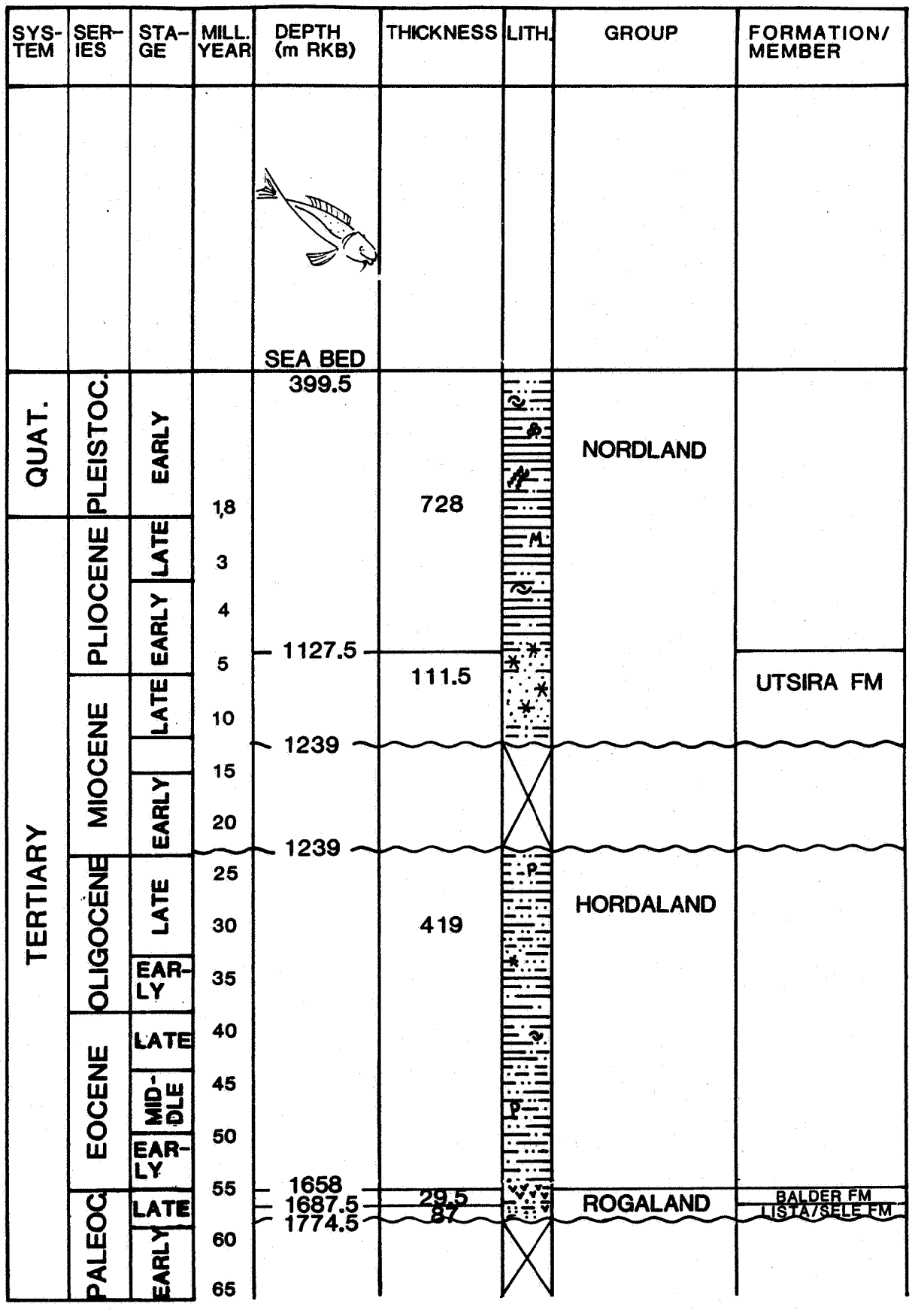


Fig.4.6

Dato SEPT86	Forf. ÖM	Godkj. BAG	
Tegn.av RHK	Ref.		

MESOZOIC STRATIGRAPHIC HISTORY

PAGE TWO OF TWO

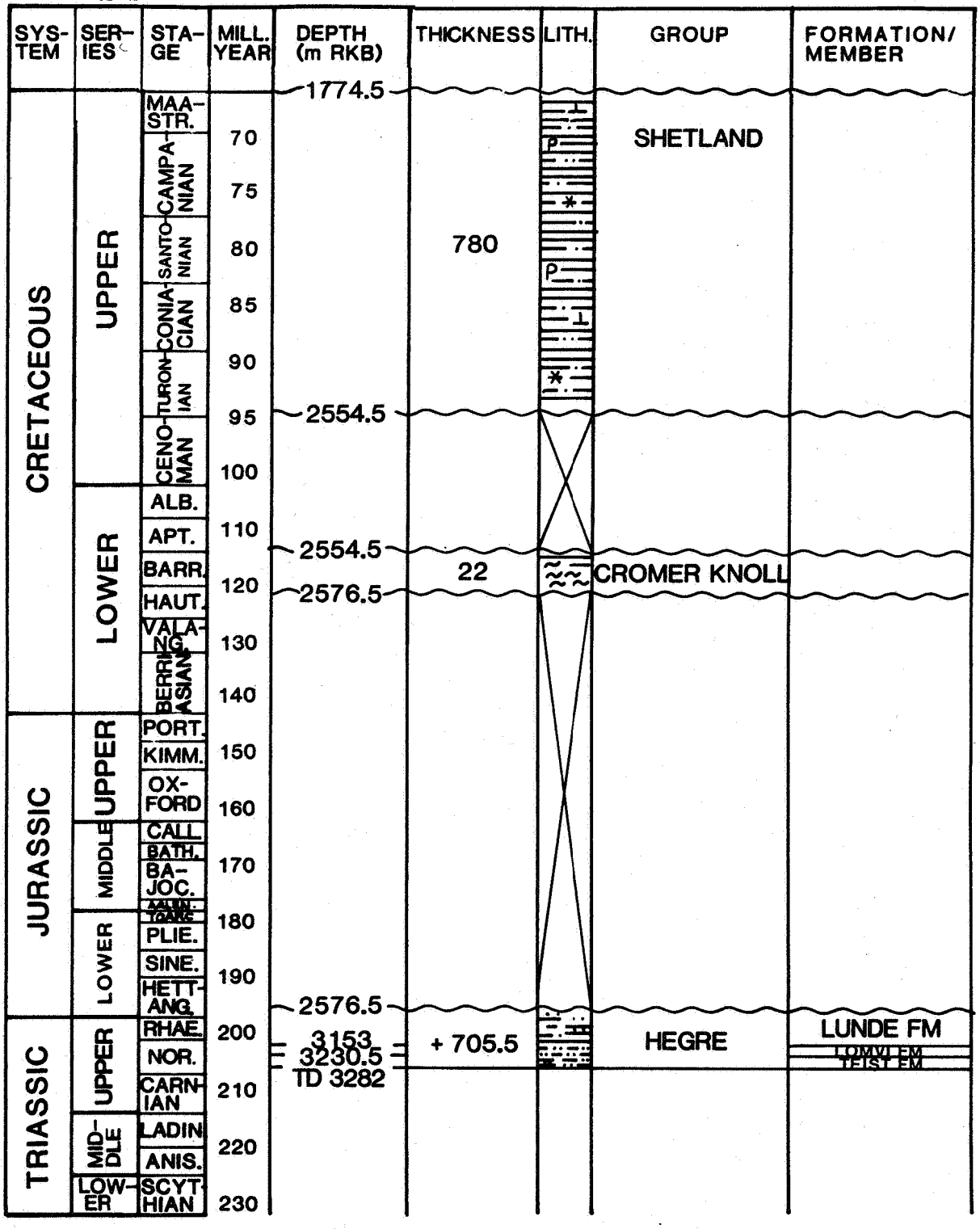


Fig. 4.7

Dato SEPT86	Forf. UMS	Godkj. BAG
Tegn.av RHK	Ref.	

4.10.3 Hegre Group

Teist Formation

Depth interval: 3230.5 - 3282 m RKB (T.D. - driller's depth)
Thickness: Minimum 51.5 m
Age: Early Rhaetian - Norian

The Teist Formation is composed of siltstones with minor shales and sandstones.

The siltstones are arenaceous, reddish brown, occasionally light green grey, friable to firm, micromicaceous and calcareous.

The shales are dark brown to brown red, firm to hard, fissile, very micromicaceous and calcareous.

The sandstones are clear, light brown orange to brown red. The grains are predominantly very fine to fine, occasionally medium, predominantly well sorted, angular to subrounded. They are firm to friable, occasionally hard when calcite cemented. They are micaceous.

Traces of light brown, occasionally light grey, soft to firm limestone appear throughout the sequence.

Upper boundary

The overlying Lomvi Formation is recognized on wireline logs by a decrease in GR and resistivity, accompanied by an increase in sonic travel time, Δt.

Lomvi Formation

Depth interval: 3153 - 3230.5 m RKB
Thickness: 77.5 m
Age: Early Rhaetian - Norian

The Lomvi Formation is composed of sandstones with trace of shales and limestones.

The sandstones are predominantly red orange, occasionally clear to white in colour and fine to medium grained. The sorting is well, and the grains are subangular to subrounded, occasionally rounded. They are loose, occasionally micaceous and non to slightly calcite cemented.

The shale is dark grey to light brown, firm to hard, occasionally subfissile, micromicaceous and slightly calcareous.

The limestones are white to light grey, occasionally light brown and firm.

Traces of pyrite occur throughout the formation.

Upper boundary

The overlying Lunde Formation is apparent from logs by an increase in GR and resistivity.

4.10.3.3 Lunde Formation

Depth interval: 2576.5 - 3153 m RKB
Thickness: 576.5 m
Age: Rhaetian - Early Rhaetian/Norian

The Lunde Formation consists of three differentiable units, the Upper, Middle and Lower Lunde.

The Lower Lunde Formation, 2956.5 - 3153 m RKB, of Lower Rhaetian to Norian age, is composed of sandstones with minor limestones and trace of shales and siltstone.

The sandstones are clear to light brown orange in appearance and predominantly fine to medium grained. They are moderately to well sorted, angular to subangular and predominantly loose except when calcite cemented. A good trace of chlorite appears occasionally.

The limestones are white to light grey, occasionally light brown and firm.

The shales are predominantly dark grey to dark brown, occasionally also green grey in colour and firm to hard in consistency. They are subfissile, micromicaceous and calcareous.

The siltstones are dark grey brown, argillaceous, firm to friable, micromicaceous and calcareous.

Traces of pyrite and chlorite occur throughout.

The overlying Middle Lunde Formation is recognized on logs by a slight increase in GR and sonic travel time, Δt.

The Middle Lunde Formation, 2841 - 2956.5 m RKB, primarily of Rhaetian age, is composed of sandstones with minor shales and limestones.

The sandstones are clear to light grey, occasionally red brown in appearance. They are very fine grained, well sorted, and the grains are subrounded. The sandstones are loose to friable, the latter where calcite cemented. Traces of mica and chlorite occur.

The shales are silty, varicoloured, although, predominantly light grey green. Furthermore, they are firm, micromicaceous and slightly calcareous.

The limestones are dirty, i.e. both argillaceous and arenaceous in

parts. The colour is white to light grey - light brown. The consistency is soft to firm.

Traces of pyrite and mica occur throughout.

The overlying Upper Lunde Formation is recognized on logs by a decrease in both GR and resistivity, accompanied by an increase in Δt.

The Upper Lunde Formation, 2576.5 - 2841 m RKB, of Rhaetian age, consists of sandstones with minor shales and trace limestone.

The sandstones in the lower part of this subdivision are light grey to grey green, occasionally brown in colour and very fine to medium in grain size. The sorting is moderately to well. In the upper part the sandstones appear clear to white and grey to brown. They are predominantly medium to coarse grained, occasionally angular. The sorting is poor to moderate. The angularity of the grains throughout the Upper Lunde Formation is subangular to subrounded. The sandstones are loose to friable, the latter where kaolin and calcite cemented. Mica occurs throughout.

The shales are dark red brown in the lower part becoming medium grey in the upper. They are firm, occasionally subfissile, micromicaceous and non to slightly calcareous.

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

Traces of chlorite, pyrite, calcite nodules and siltstones occur.

Upper boundary

The overlying Cromer Knoll Group is distinguished on logs by an increase in GR and sonic travel time, Δt, accompanied by a decrease in resistivity.

4.10.4 Cromer Knoll Group

Depth interval: 2554.5 - 2576.5 m RKB
Thickness: 22 m
Age: Barremian

The Cromer Knoll Group consists of marl with trace silty claystone.

The marl is predominantly red brown, occasionally white to light grey. The consistency is soft to very soft.

The claystone is silty, brown red to dark red. It is firm of consistency, micromicaceous and slightly calcareous.

Traces of limestone, glauconite and pyrite occur.

Upper boundary

The overlying Shetland Group is recognized on logs by a decrease in GR, resistivity and sonic travel time, Δt.

4.10.5 Shetland Group

Depth interval: 1774.5 - 2554.5 m RKB
Thickness: 780 m
Age: Latest Maastrichtian - Turonian

The Shetland Group consists primarily of claystones occasionally with traces of limestone stringers.

The claystones are slightly silty becoming less arenaceous with depth. They are varicoloured, ranging from light grey green to medium - dark grey. They are predominantly firm, occasionally soft in consistency, also occasionally slightly sticky. Towards the bottom they turn from blocky towards subfissile. In part they are slightly micaceous and non calcareous to calcareous.

The limestones are white to light grey, occasionally light yellow brown, soft to hard.

Traces of light grey, soft and sticky marl, together with light grey to light brown, firm, non calcareous siltstones occur. Also traces of dolomite, pyrite, glauconite, mica and shell fragments occur.

Upper boundary

The overlying Lista/Sele Formation of the Rogaland Group is recognized on logs by a decrease in GR and resistivity, accompanied by an increase in Δt.

4.10.6 Rogaland Group

Lista/Sele Formation

Depth interval: 1687.5 - 1774.5 m RKB
Thickness: 87 m
Age: Late Paleocene

The Lista/Sele Formation consists of claystone.

The claystone is grey to grey green, occasionally red brown in appearance. The consistency is soft to firm, occasionally blocky and non to slightly calcareous.

Traces of tuff, sand grains, limestone, pyrite, dolomite and glauconite occur.

Upper boundary

The overlying Balder Formation is apparent on logs by a decrease in GR and sonic travel time, Δt, accompanied by an increase in resistivity.

Balder Formation

Depth interval: 1658 - 1687.5 m RKB
Thickness: 29.5 m
Age: Late Paleocene

The Balder Formation consists of claystone interbedded with tuff.

The claystone is varicoloured, grey to green grey, red brown to brown. It is soft to firm, occasionally blocky and occasionally waxy. It is furthermore non to slightly calcareous.

The tuff is variegated, light green grey to light grey with specs, soft and sticky in consistency.

Traces of sand, siltstone, limestone, dolomite, pyrite and glauconite occur.

Upper boundary

The overlying Hordaland Group is recognized on logs by an increase in GR and sonic travel time Δt, as well as by a decrease in resistivity.

4.10.7 Hordaland Group

Depth interval: 1239 - 1658 m RKB
Thickness: 419 m
Age: Late Oligocene - Early Eocene

The Hordaland Group consists of siltstones and clays with minor sands.

The siltstones are occasionally arenaceous, medium olive grey to grey brown, loose to firm in consistency and occasionally slightly calcareous.

The clay is predominantly grey to green grey becoming grey to dark grey towards the bottom, soft to firm, sticky to blocky and calcareous to non calcareous.

The sands are clear to white, predominantly fine to medium but also very fine grained. The sorting is moderate to well, and angularity is predominantly subrounded. The sands are loose.

Traces of glauconite, shell fragments, mica, limestone and pyrite occur.

Upper boundary

The overlying Utsira Formation of the Nordland Group is recognized on logs by an increase in GR and resistivity, accompanied by a decrease in Δt, sonic travel time.

4.10.8 Nordland Group

Utsira Formation

Depth interval: 1127.5 - 1239 m RKB
Thickness: 111.5 m
Age: Pliocene to Middle Miocene

The Utsira Formation consists of sand with minor clay at the top, becoming clay with minor sand towards the bottom of the sequence.

The sand is clear to white, translucent, predominantly medium grained, occasionally very fine to coarse. The sorting is moderately, and the grains are rounded to subrounded. The sands are loose and occasionally glauconite rich.

The clay is arenaceous, medium to light grey, soft and sticky and predominantly non calcareous.

Traces of shell fragments, rock fragments, mica and glauconite occur.

Upper boundary

The overlying remainder of the Nordland Group is recognized on logs by an increase in GR and resistivity and a decrease in Δt, sonic travel time.

Nordland Group above Utsira Formation

Depth interval: 399.5 - 1127.5 m RKB
Thickness: 728 m
Age: Recent - Pliocene

The Nordland Group, above the Utsira Formation, consists of clays with minor sands.

The clays are silty and sandy, medium grey to green grey becoming medium to light grey with depth. They are soft and sticky and non to slightly calcareous.

The sands are predominantly clear to translucent white, occasionally light green. Grain size varies from very fine to very coarse with sequences of predominantly very fine to medium, thus the sorting is in part poor to moderate. The angularity ranges from angular to rounded towards the lower part of the interval. All sands are loose.

Traces of rock fragments, shell fragments, mica, forams, wood fragments, glauconite and limestone occur.

4.11 Hydrocarbon Indication

From the 30" casing shoe at 521 m RKB down to the 20" casing point, the mud weight was gradually raised from 1.06 g/cc to 1.13 g/cc (ECD) to control shallow gas occurences. The average background gas was 0.02% to 0.08% with peaks at 627 m RKB (0.13%), 680 m RKB (0.14%), 696 m RKB (0.15%), 770 m RKB (0.34%), 766 m RKB (3%) and 862 m RKB (1.3%). C1 was the only gas component present.

The mud weight drilling out of the 20" casing shoe at 904 m RKB was initially 1.13 (ECD). This was incrementally increased to 1.35 g/cc at 1780 m RKB in response to pore pressure build-up. Gas averages were 0.03% to 0.06% with peaks at 1700 m RKB (0.16%) and 1744 m RKB (0.18%). C1 was the major component in this interval above the 13 3/8" casing point, with C2 appearing briefly at 1744 m RKB.

Below the 13 3/8" casing shoe at 1841 m RKB, the mud weight was increased from 1.49 g/cc to 1.69 g/cc (ECD) in response to pore pressure build-up. Gas averaged 0.03% without any significant peaks to 2006 m RKB where an increase to 0.1% average was observed. Gas peaks were registered at 2066 m RKB (0.25%), 2114 m RKB (0.45%) and 2192 m RKB (0.24%). All components, i.e. C1-C3, appeared from 2057 m RKB. Due to gas chromatograph failure, only C1 was registered from 2200 m RKB to total depth at 3282 m RKB.

The first appearance of shows was seen in the Shetland Group from approx. 2090 m RKB. This was seen in silt lenses where pale yellow fluorescence was accompanied by slow to moderate streaming blue white cut reaction. A slight yellow residue was occasionally observed.

Entering the main reservoir, the Upper Lunde "E" Formation of the Hegre Group at 2576.5 m RKB, the shows were as follows in the interval 2576.5 - 2587 m RKB (OWC): 100% yellow brown oil stain, 100% yellow fluorescence with instant to fast streaming blue white cut, leaving a light yellow brown residue upon evaporation. The odor was good. Below the OWC, shows decreased gradually to become extinct below 2624 m RKB.

Below the 9 5/8" casing shoe at 2760 m RKB, the mud weight averaged 1.66 g/cc. The gas average was 0.02%.

5. FORMATION EVALUATION

5.1 Logging

The logging programme is summarized in chapter 4.5. The target interval Upper Lunde Unit E and F was recorded in run 3. The logs are generally of good quality, apart from the neutron log (CNL) in RUN 3, where readings are generally high by approx. 0-2 pu.

The logs have been analysed using the in house Complex Lithology type Model. The net sand averages have been calculated by using a porosity cut off of 15% and a shale volume cut off of 40% in the Upper Lunde Formation. The oil-water contact has been defined in the Upper Lunde Unit E at 2587 m RKB from pressure measurements (fig. 5.1).

The average log porosity in the oil zone (2576.5 - 2587 m RKB) is 24.6% with an average water saturation of 41% and a N/G ratio of 0.86. The net sand for the separate zones/formations are given in tables 5.1 and 5.2.

5.2 Core Analyses

The cored interval were 2549.5 - 2560.5 m RKB and 2576.0 - 2660.5 m RKB (driller's depth) with a total recovery of 58.1 m. Core No. 1 was cut above the reservoir and not subjected to any analysis.

Cores No. 2 to 6 were cut in the Upper Lunde Formation 2576.0 - 2660.5 m RKB (driller's depth). Porosity, horizontal air permeability, and grain density were measured every 0.25 m. Vertical air permeability, fluid saturation and summation of porosity were measured every meter.

The main result of cores No. 2 to 6 are listed in table 5.3.

Special core analysis will be carried out on six one and a half inch diameter core plugs from the following depths m RKB:
2577.6, 2579.6, 2593.1, 2609.1, 2647.35 and 2658.35 m RKB. The analysis includes the following measurements:

- Permeability to brine.
- Formation factor.
- Capillary pressure by the porous plate method and by mercury injection.
- Resistivity index.
- Unsteady state, water/oil relative permeability at room conditions.
- Cation exchange capacity.

The results of the special core analysis will be reported in November 1986.

5.3 Formation Pressure Measurements

A Schlumberger Repeat Formation Tester (RFT) with HP and Strain gauge was used for the formation pressure measurements in run 3 (table 5.4). A segregated sample was taken for PVT-analysis.

Formation pressures have been plotted versus depth (fig. 5.1) and the oil-water contact was found to be at 2587 m RKB in the Upper Lunde Unit E. The oil gradient found from the FMT plot is 0.064 bar/m and the water gradient 0.099 bar/m. From the PVT analysis the oil gradient was found to be 0.069 bar/m.

5.4 Testing

A standard production test, including a vertical interference test, was carried out in the Upper Lunde Unit E.

The tested intervals were:

2577 - 2585 m RKB (upper zone)
2592 - 2595 m RKB (lower zone)

The test objectives were to:

- Estimate the formation properties of the two sands.
- Investigate the heterogeneities in the two sands.
- Obtain reservoir fluid samples from both zones.
- Measure the productivity in a zone of high residual oil saturation.
- Measure the degree of communication across the 6 metre thick non reservoir section, (2586 - 2592 m RKB), separating the two sands.

The main components in the test string were:

- One permanent Baker packer (separating the two tested zones).
- Three bundle carriers in the upper zone.
- One bundle carrier and two DST-hangers in the lower zone.
- A standard Halliburton DST-string with a down hole tester valve, circulating valves and a retrievable packer.
- 5" VAM tubing.
- Flopetrol subsea test tree, lubricator valve and surface test tree.

The test intervals were perforated by wireline using a 5" Schlumberger TCP gun with 12 shots per foot.

The planned test procedure was as follows:

1. Perforate the two zones.

2. Set a permanent packer between the two zones.

3. Run the test string with seal assembly.

4. Perform a clean-up flow from the lower zone to confirm communication through the perforations.

5. Isolate the lower zone and perform a test in the upper zone with the lower zone as observation interval.

6. Isolate the upper zone and perform a test in the lower zone with the upper zone as observation interval.

This procedure was followed except for part 6, which was abandoned due to technical problems.

Lower zone (2592 - 2595 m RKB):
A short clean up flow (about 4 minutes) was performed to obtain good communication across the perforations for the upcoming interference test. The clean up flow also gave an indication of the initial reservoir pressure. During the production from this zone the upper zone was isolated. The flow data and bottom hole pressure are given in tables 5.5 and 5.6. A plot of pressure vs time is shown in fig. 5.2.

Upper zone (2577 - 2585 m RKB):
During the 10 min's initial flow, 5.15 m^3 cushion water was flowed to the surge tank. The well was then shut in for 3.8 hrs. before the well was reopened for the main flow. After about 13 hrs. into the main flow the well had to be shut in and the subsea test tree unlatched due to bad weather. The bad weather caused the following main build-up to be about 3.8 days. The main flow data are listed in table 5.5. During the entire test bottom hole pressures were recorded in both the production zone and the isolated lower zone. The pressures are listed in tables 5.7 and 5.8. A plot of pressure versus time for both zones are shown in figs. 5.2 and 5.3.

During the main flow both monophasic wellhead samples and samples for recombination from the separator were taken.

Because of the technical problems, the test was terminated without further testing of the lower zone.

5.5 Fluid Analyses

The RFT chambers from this well gave no pressurized fluid samples. The athmospheric RFT sample from 2580 m RKB was analysed and the results are listed in table 5.9. This sample contained both oil and water/mud filtrate.

During the production test, monophasic reservoir fluid samples were taken at the wellhead. The PVT analyses performed on one of the wellhead sample are presented in tables 5.10 and 5.11.

Formation pressures

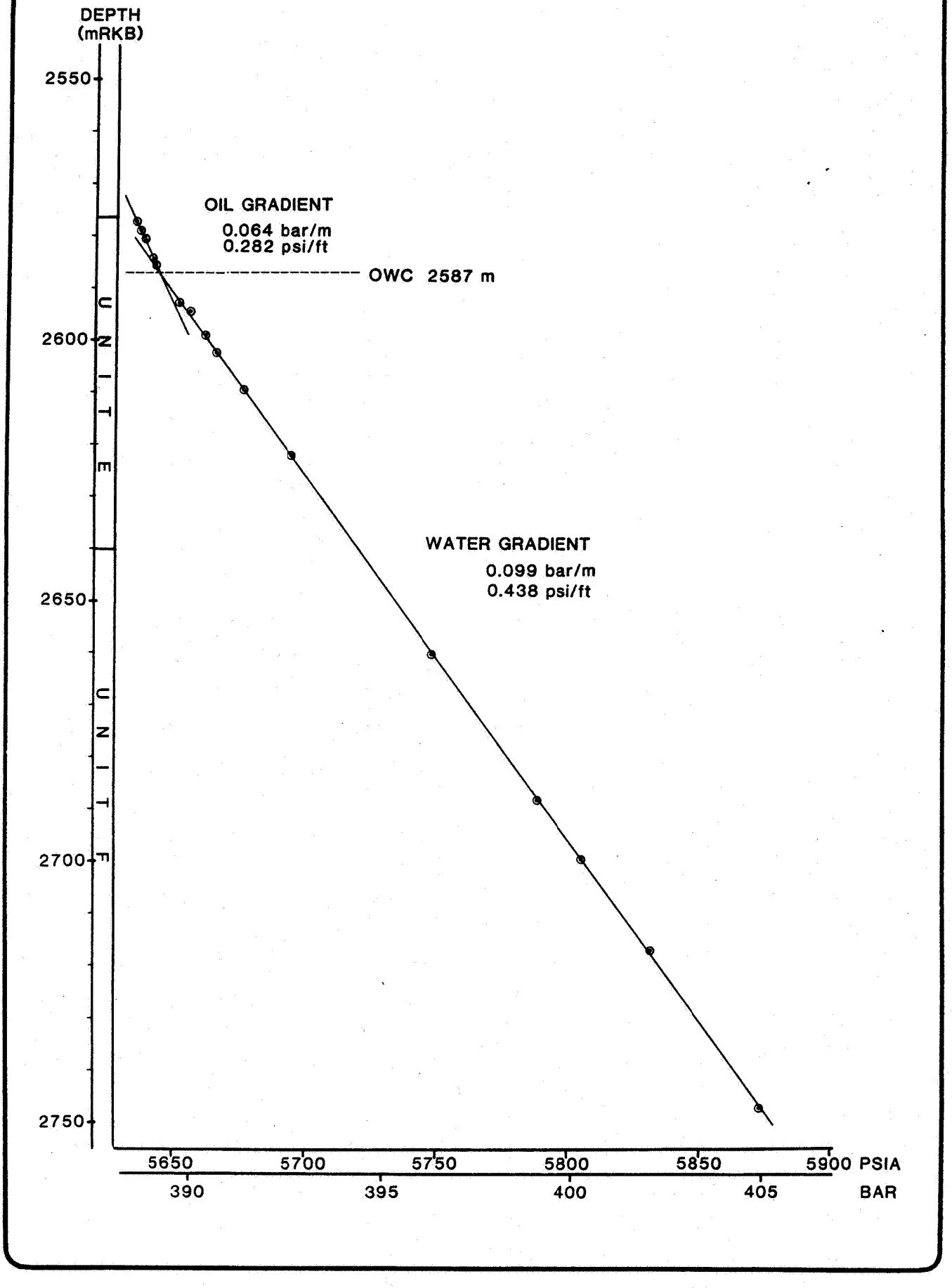


Fig. 5.1, Formation pressures versus depth, 34/4-6

Date 7.86	Auth. JB	Appr. PS
Draw by	Ref.	

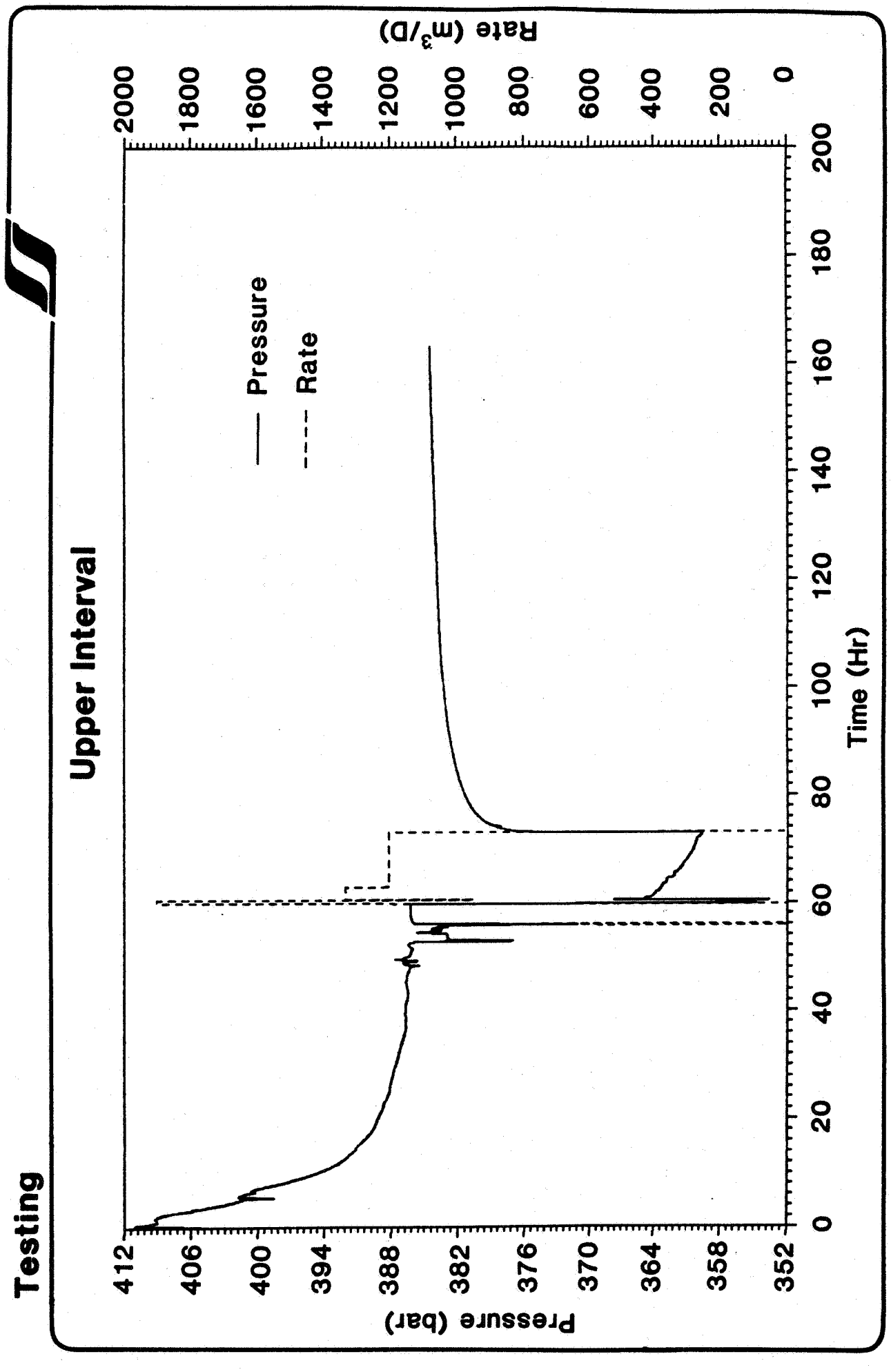


Fig. 5.2 Merged Pressure/Rate/Time Data, Upper Zone 34/4-6

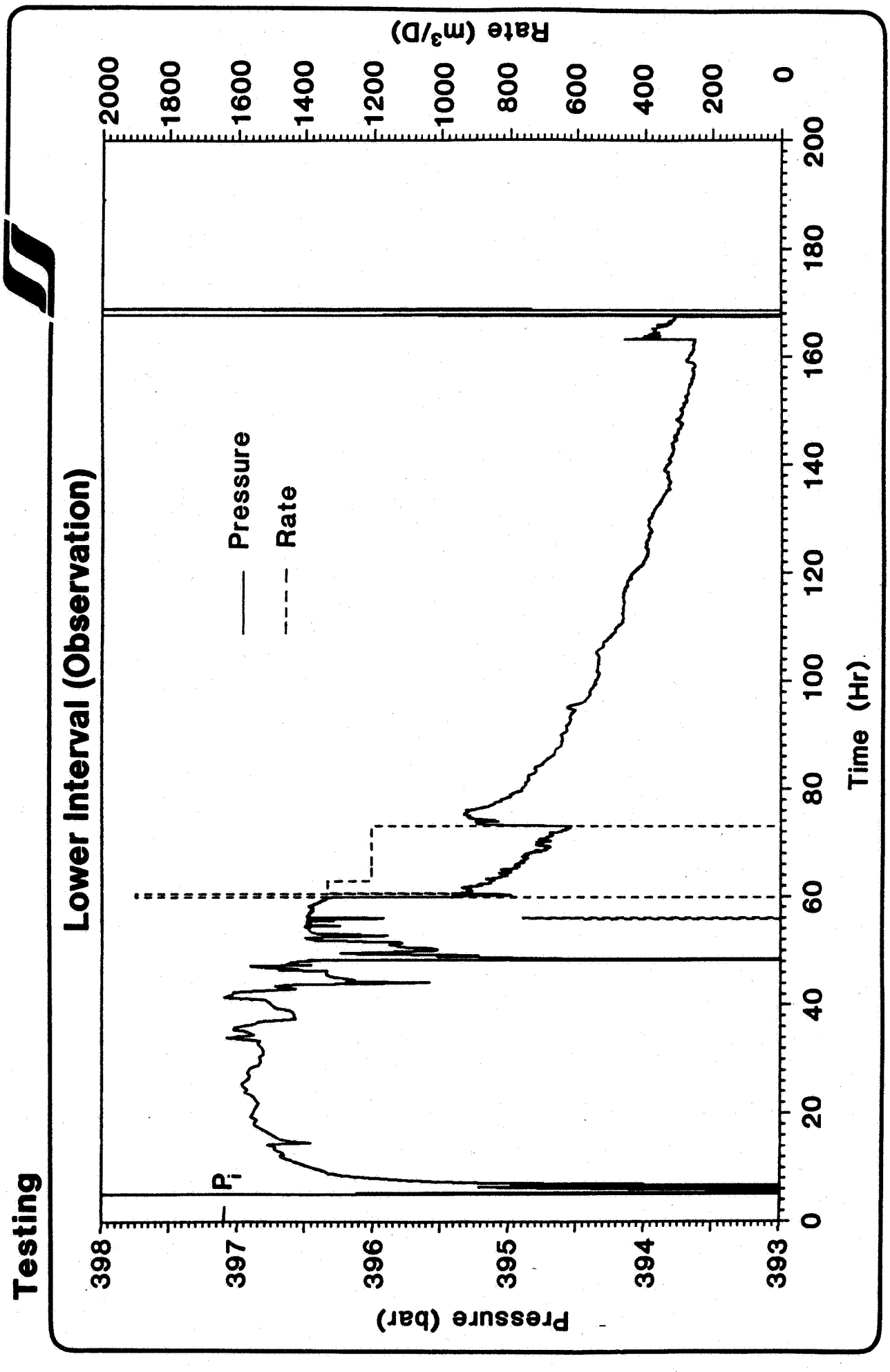


Fig. 5.3 Merged Pressure/Rate/Time Data, Lower Zone 34/4-6

FORMATION UNIT	UNIT E	TOP RESERVOIR TO OWC	UNIT F
TOP M RKB	2576.5	2576.5	2645.0
BOTTOM M RKB	2645.0	2587.0	2841.0
GROSS M	68.5	10.5	196.0
NET SAND M	39.7	9.0	101.9
N/G	0.58	0.86	0.52
ϕ %	21.5	24.6	19.8
SW %	-	41	-
CUTOFFS:			
ϕ %	15	15	15
VSH FRACTION	0.4	0.4	0.4

Table 5.1, Net sand averages 34/4-6

Date 4.86	Author CS/JE	Appr. PS
Draw.by	Ref.	

FORMATION UNIT	MIDDLE LUNDE	LOWER LUNDE	LOMVI FM	TEIST FM
TOP M RKB	2841.0	2956.5	3153.0	3230.5
BOTTOM M RKB	2956.5	3153.0	3230.5	3282.0
GROSS M	115.5	196.5	77.5	51.5
NET SAND M	15.0	72.7	66.0	6.0
N/G	0.13	0.37	0.85	0.12
ϕ %	17.8	18.4	16.9	14.5
SW %	-	-	-	-
CUTOFFS:				
ϕ %	15	15	12	12
VSH FRACTION	0.4	0.4	0.4	0.4

Table 5.2, Net sand averages, 34/4-6

Date 4.86	Auth. CS/JB	Appr. PS
Drawn by	Ref.	

Core analysis

DEPTH (MRKB.D.D)	POROSITY (%)	HORIZONTAL AIR PERMEABILITY (MD)	VERTICAL AIR PERMEABILITY (MD)	GRAIN DENSITY (G/CC)
2576.00	31.6	1480.00	724.00	2.67
2576.25	29.8	2010.00		2.66
2576.50	23.4	607.00		2.67
2576.75	25.5	2389.00		2.67
2577.00	28.2	466.00	316.00	2.67
2577.25	29.9	1940.00		2.66
2577.50	20.6	1759.00		2.66
2577.75	30.2	1373.00		2.66
2578.00	29.5	1070.00	684.00	2.66
2578.25	29.8	1304.00		2.66
2578.50	30.3	2185.00		2.66
2578.75	30.4	1717.00		2.67
2579.00	29.6	1479.00	362.00	2.67
2579.25	25.5	573.00		2.67
2579.50	28.8	4745.00		2.68
2579.75	31.9	9939.00		2.66
2580.00	26.0	2755.00	728.00	2.67
2580.25	27.0	2880.00		2.66
2580.50	25.0	1223.00		2.67
2580.75	23.2	982.00		2.70
2581.00	23.1	300.00	NVPP	2.72
2581.25	22.0	1217.00		2.70
2581.50	27.1	1432.00		2.68
2581.75	28.1	1697.00		2.67
2582.00	NHPP		745.00	
2582.25	24.8	243.00		2.69
2582.50	27.6	955.00		2.67
2589.00	14.9	4.00	NMP	2.66
2589.25	24.9	139.00		2.66
2589.50	26.1	176.00		2.66
2589.75	12.8	0.55		2.72
2590.00	19.5	61.90	0.98	2.65
2590.25	21.3	23.70		2.67
2590.50	26.9	313.00		2.65
2590.75	27.6	278.00		2.65
2591.00	25.4	78.20	35.30	2.67
2591.25	26.4	90.00		2.67
2591.50	26.4	187.00		2.67
2591.75	15.1	3.90		2.68
2592.00	26.8	84.20	59.10	2.67
2592.25	27.0	120.00		2.67
2592.50	27.7	166.00		2.67
2592.75	23.4	61.50		2.68
2593.00	27.0	7.60	3.10	2.69
2593.25	27.6	220.00		2.67
2593.50	27.6	421.00		2.66

Table 5.3 Conventional Core Analyses, 34/4-6

Date 7/86	Auth. IN	Appr. JMH
Draw.by	Ref.	

Core analysis

DEPTH (MRKB-D-D)	POROSITY (%)	HORIZONTAL AIR PERMEABILITY (MD)	VERTICAL AIR PERMEABILITY (MD)	GRAIN DENSITY (G/CC)
2593.75	21.5	62.60		2.67
2594.00	18.6	14.60	3.60	2.68
2594.25	19.5	11.00		2.68
2594.50	NMP	NMP		
2594.75	14.6	0.04		2.81
2595.00	14.6	0.18	0.46	2.75
2595.25	12.5	0.10		2.75
2595.50	15.5	0.13		2.74
2595.75	25.3	330.00		2.66
2596.00	18.0	12.30	16.10	2.67
2600.50	19.6	159.00		2.66
2600.75	23.1	135.00		2.68
2601.00	25.1	525.00	16.10	2.66
2601.25	28.0	904.00		2.66
2601.50	27.6	350.00		2.68
2601.75	25.7	101.00		2.67
2602.00	26.3	68.00	95.80	2.70
2602.25	27.6	372.00		2.66
2602.50	27.8	674.00		2.66
2602.75	27.4	648.00		2.66
2603.00	6.8	0.05	0.04	2.70
2603.25	13.7	9.40		2.70
2603.50	22.6	301.00		2.68
2603.75	24.8	366.00		2.68
2604.00	24.0	231.00	98.00	2.67
2604.25	24.6	101.00		2.66
2604.50	24.7	132.00		2.67
2604.75	23.7	193.00		2.66
2605.00	25.3	284.00	139.00	2.67
2605.25	26.8	514.00		2.66
2605.50	27.1	791.00		2.66
2605.75	25.8	451.00		2.67
2606.00	27.3	505.00	392.00	2.66
2606.25	25.8	252.00		2.66
2606.50	25.3	308.00		2.67
2606.75	27.5	1022.00		2.66
2607.00	21.2	141.00	38.90	2.67
2607.25	25.5	96.60		2.66
2607.50	25.4	102.00		2.66
2607.75	25.2	83.20		2.67
2608.00	25.7	117.00	396.00	2.67
2608.25	25.3	75.50		2.67
2608.50	25.4	90.50		2.67
2608.75	25.7	96.00		2.67
2609.00	25.0	132.00	49.40	2.67
2609.25	25.3	204.00		2.66
2609.50	25.5	171.00		2.66

Table 5.3 Conventional Core Analyses, 34/4-6

Date	Auth.	Appr.
7/86	IN	JMH
Draw.by	Ref.	

Core analysis

DEPTH (MRKB.D.D)	POROSITY (%)	HORIZONTAL AIR PERMEABILITY (MD)	VERTICAL AIR PERMEABILITY (MD)	GRAIN DENSITY (G/CC)
2609.75	25.2	161.00		2.66
2610.00	22.4	120.00	83.20	2.68
2610.25	22.6	82.70		2.71
2610.50	22.6	83.40		2.71
2610.75	19.1	73.60		2.70
2611.00	20.3	42.90	25.00	2.70
2611.25	19.3	11.80		2.72
2611.50	16.4	2.30		2.73
2611.75	18.5	5.00		2.72
2612.00	18.1	32.50	19.20	2.67
2614.50	16.9	0.68		2.68
2618.00	30.6	935.00	1013.00	2.66
2618.25	28.2	212.00		2.67
2618.50	27.7	82.50		2.67
2618.75	28.5	242.00		2.67
2619.00	27.3	137.00	99.10	2.67
2619.25	26.7	142.00		2.67
2619.50				
2619.75	28.2	321.00		2.67
2620.00	13.3	1.10	77.60	2.67
2620.25	14.3	0.20		2.69
2620.50	27.6	3.30		2.68
2620.75	27.7	90.00		2.69
2621.00	28.8	319.00	455.00	2.67
2621.25	17.4	36.70		2.66
2621.50				
2621.75				
2622.00	15.0	107.00	66.30	2.67
2643.00	21.6	28.90	109.00	2.65
2643.25	24.7	178.00		2.64
2643.50	25.4	269.00		2.66
2643.75	22.1	1024.00		2.67
2644.00	22.3	450.00	719.00	2.66
2644.25	22.3	141.00		2.66
2644.50	26.1	77.70		2.67
2644.75	24.7	18.40		2.70
2645.00	24.2	16.90	9.10	2.68
2645.25	24.8	10.70		2.69
2645.50	25.6	136.00		2.66
2645.75	22.8	65.50		2.66
2646.00	22.9	59.40	7.70	2.66
2646.25	24.8	348.00		2.65
2646.50	19.7	135.00		2.66
2646.75	19.1	67.40		2.66
2647.00	21.7	9.00	0.61	2.67
2647.25	23.6	115.00		2.67
2647.50	22.2	54.80		2.67
2647.75	18.9	27.60		2.67

Table 5.3 Conventional Core Analyses, 34/4-6

Date 7/86	Auth. IN	Appr. JMH
Drawn by	Ref.	

Core analysis

DEPTH (MRKB-D-D)	POROSITY (%)	HORIZONTAL AIR PERMEABILITY (MD)	VERTICAL AIR PERMEABILITY (MD)	GRAIN DENSITY (G/CC)
2648.00	17.4	74.60	69.20	2.66
2648.25	18.5	13.30		2.69
2648.50	23.9	7.40		2.72
2648.75	24.8	35.60		2.68
2649.00	24.4	11.50	8.50	2.69
2649.25	24.6	68.40		2.67
2649.50	24.8	48.40		2.68
2649.75	24.4	141.00		2.67
2650.00	24.7	149.00	54.40	2.67
2650.25	21.6	52.30		2.68
2650.50	20.6	99.10		2.67
2650.75	23.8	363.00		2.66
2651.00	20.7	420.00	470.00	2.66
2651.25	24.7	183.00		2.66
2651.50	25.3	211.00		2.66
2651.75	25.7	254.00		2.67
2652.00				
2652.25	16.4	8.20	20.80	2.67
2655.00	15.4	1.60	2.70	2.64
2655.25	21.7	56.30		2.65
2655.50	24.3	555.00		2.65
2655.75	24.3	657.00		2.65
2656.00	26.2	354.00	572.00	2.66
2656.25	26.6	874.00		2.65
2656.50	25.9	379.00		2.65
2656.75	24.5	702.00		2.64
2657.00	25.5	899.00	886.00	2.65
2657.25	26.2	1270.00		2.65
2657.50	26.4	1696.00		2.65
2657.75	27.0	345.00		2.66
2658.00	26.7	1285.00	1358.00	2.65
2658.25	26.4	181.00		2.68
2658.50	27.4	920.00		2.65
2658.75	20.1	88.60		2.66
2659.00	20.4	166.00	206.00	2.66
2659.25				
2659.50	27.0	314.00		2.68
2659.75	27.0	161.00		2.69
2660.00	25.6	77.90	44.10	2.70
2660.25	26.6	270.00		2.68
2660.50	26.5	84.60		2.70

Table 5.3 Conventional Core Analyses, 34/4-6

Date 7/86	Auth. IN	Appr. JMH
Drawn by	Ref.	

Formation Pressures

DEPTH (mRKB)	HYDROSTATIC MUD PRESSURE (psia)	CORRECTED FORMATION PRESSURE (psia)	(bar)
Run 3A (HP-gauge)			
2577.5	6278.9	5635.2	388.53
2579.0	6284.2	5636.6	388.63
2580.5	6287.2	5637.9	388.72
2581.5	6289.0	5638.7	388.77
2584.5	6295.9	5641.6	388.97
2585.5	6297.2	5642.6	389.04
2593.0	6314.4	5651.5	389.66
2594.5	6319.0	5655.8	389.95
2599.0	6329.5	5661.3	390.33
2602.5	6336.7	5665.4	390.61
2609.5	6354.3	5675.9	391.34
2622.0	6385.5	5694.8	392.64
2660.0	6465.4	5748.1	396.32
2688.0	6536.0	5788.2	399.08
2699.5	6559.9	5805.1	400.25
2717.0	6600.6	5830.8	402.02
2747.0	6671.2	5872.8	404.91
RUN 3B (HP-gauge)			
2580.0 Segregated sample for PVT analysis			

Table 5.4, HP gauge Formation pressures, 34/4-6

Date 7.86	Auth. JB	Appr. PS
Draw. TRK	Ref.	

Formation Pressures

DEPTH (mRKB)	HYDROSTATIC MUD PRESSURE (psia)	CORRECTED FORMATION PRESSURE (psia)	(bar)
RUN 3C (HP-gauge)			
2584.5	Unsuccessful sampling due to plugging		
RUN 3D (HP-gauge)			
2583.0	6297.3	5640.9	388.93
2583.5	6299.1	Tight	-
2584.0	6301.1	5641.6	388.97
2585.0	6304.1	5642.7	389.05
2585.5	6305.8	5643.5	389.10
2583.9*	6302.1	5642.0	389.00

* Sample, 2 3/4 gallon chamber flowline plugged,
1 gallon chamber 3 l of oil.

Table 5.4, HP gauge Formation pressures, 34/4-6

Date 7.86	Auth. JB	Appr PS
Draw By HKK	Ref	

Testing

	Lower zone	Upper zone	
Perforations, mRKB	2592 - 2595	2577 - 2585	
Event	Clean up flow	Initial flow	Main flow
Date	11/3	13/3	13/3-14/3
Time, hr:min	10:00-10:03	12:30-12:40	16:27-05:40
Choke, mm	6.4	9.5	12.7
Flow rate, Sm^3/d	110 (cushion)	740 (cushion)	1206 (oil)
Cummulative prod. Sm^3	0.4	5.15	561
Bottom Hole* Pressure, Bar	313.47	371.42	359.62
Wellhead Pressure, Bar	16.3	107.6	153.6
Remarks			

* Depth reference, bottom hole pressure:
- Lower zone 2629.3 mRKB
- Upper zone 2546.9 mRKB

Table 5.5 Flow Data, 34/4-6

Date 7/86	Auth.GAJ	Appr.
Draw by	Ref.	

Testing

Clean Up Flow and Build up, (Production from Lower zone)

Date	Time	Bottom Hole Pressure (Bar)	
1986			
11/3	10:00	392.88	Open well on 6.4 mm Fixed choke
	10:01	318.80	
	10:03	313.47	
	10:04		Shut the well in
	10:04	332.74	
	10:05	363.22	
	10:06	376.26	
	10:07	377.40	
	10:08	384.64	
	10:09	386.39	
	10:10	387.53	
	10:12	389.02	
	10:14	390.03	
	10:20	391.88	
	10:25	392.78	
	10:30	393.43	
	10:45	394.43	
	11:00	395.06	
	12:00	395.47	
	14:00	396.35	
	16:00	396.60	
	18:00	396.73	

(Gauge: Flopetrol # 83875 @ 2629.3 m RKB)

Table 5.6 Bottom Hole Pressure, Lower Zone, 34/4-6

Date 7/86	Auth JMH	Appr. PS
Draw by	Ref	

Testing

Initial Flow and Build Up, (Production from Upper zone)

Date	Time	Bottom Hole Pressure (Bar)	
13/3	12:28	383.55	
	12:30	Well opened on 9.5 mm Fixed choke	
	12:32	371.27	(initial flow)
	12:36	371.42	
	12:40	385.14	Well shut in
	12:44	385.83	
	12:48	385.96	
	12:52	386.04	
	13:00	386.12	
	13:16	386.18	
	13:32	386.22	
	13:44	386.23	
	14:00	386.25	
	14:32	386.28	
	15:00	386.28	
	15:32	386.28	
	16:16	386.27	

Table 5.7 Bottom Hole Pressure, Upper Zone, 34/4-6

Date 7/86	Auth GaJ	Appr
Draw by	Ref	

Main flow and Build up (Production from Upper zone)

Date	Time	Bottom Hole Pressure (Bar)
13/3	16:27	Opened well on 17.5 mm Fix choke
	16:28	356.38 (Main flow)
	16:40	355.71
	17:04	353.64
	17:06	Switched to 12.7 mm Adj. Choke
	17:08	367.82
	17:12	367.76
	17:15	Switched to 12.7 mm Fixed Choke
	17:16	364.86
	18:00	364.08
	20:00	363.22
	22:00	361.63
14/3	00:00	361.38
	03:00	360.30
	05:36	359.62
	05:40	Shut the well in at the LPR-N-valve
	05:40	374.63
	05:44	376.05
	05:48	376.53
	05:52	376.87
	05:56	377.12
	06:00	377.35
	06:08	377.70
	06:20	378.13
	06:40	378.64
	06:44	378.17
	06:48	378.73
	06:52	378.90
	07:00	379.08
	07:08	379.21

Table 5.7 Bottom Hole Pressure, Upper Zone, 34/4-6

Date 7/86	Auth. GaJ	Appr.
Draw by	Ref.	

Main flow and Build up (Production from Upper zone)

Date	Time	Bottom Hole Pressure (Bar)
	07:32	379.55
	08:00	379.86
	09:00	380.36
	10:00	380.71
	12:00	381.23
	18:00	382.16
15/3	00:00	382.92
	12:00	383.37
16/3	00:00	383.70
	12:00	383.93
17/3	00:00	384.09
	12:00	384.21
	21:36	384.28

Gauge: Sperry Sun # 433 at 2546.9 mRKB

Table 5.7 Bottom Hole Pressure, Upper Zone, 34/4-6

Date 7/86	Auth. GaJ	Appr
Draw by	Ref.	

Testing

Main Flow and Build up (Lower zone is observation zone)

Date	Time	Bottom Hole Pressure (Bar)
13/3	16:26	396.37
	16:27	Open well on 44/64 Fixed choke from the Upper zone
	16:28	395.89
	16:30	395.48
	17:00	395.09
	18:00	395.30
	20:00	395.12
	23:00	394.89
14/3	02:00	394.77
	05:40	394.54
	05:40	Shut in the well at the LPR-N-valve
	05:41	394.61
	05:43	394.78
	06:00	395.05
	06:29	395.25
	06:31	395.08
	06:40	395.19
	07:00	395.26
	08:00	395.32
	10:00	395.10
	12:00	394.93
	18:00	394.72
15/3	00:00	394.57
	12:00	394.34
16/3	00:00	394.16
	12:00	393.96
17/3	00:00	393.85
	12:10	393.71
	21:40	393.65

(Gauge: Flopetrol # 83875 @ 2629.3 mRKB)

Table 5.8 Bottom Hole Pressure, Lower Zone, 34/4-6

Date 7/86	Auth. GaJ	Appr
Draw by	Ref.	

Fluid Analyses

SEGREGATED RFT-SAMPLE AT 2580. mRKB

Recovery data:

Opening pressure	:	1 bar
Gas recovered	:	0
Water/mud filtrate	:	2050 cm^3
Oil	:	1580 cm^3

Water (mud filtrate) analysis

Sodium (mg/l)	12620	Chloride (mg/l)	16650
Potassium (mg/l)	410	Sulphate (mg/l)	5160
Calcium (mg/l)	555	Bicarbonate (mg/l)	730
Magnesium (mg/l)	15	Carbonate (mg/l)	NIL
Barium (mg/l)	0.2	Hydroxide (mg/l)	NIL
Strontium (mg/l)	15		
Total iron (mg/l)	6.5		
Dissolved iron (mg/l)	4.2		

Resistivity (OHM-M at 15.6°C)	:	0.234
pH	:	7.7
Specific gravity	:	1.027

Fig. 5.9 Analyses of RFT Sample 34/4-6

Date 7/86	Auth. JMH	Appr.
Draw by	Ref.	

Fluid Analyses

WELLHEAD SAMPLE

Sampling condition	:	153.7 bar and 43.4°C
Producing zone (mRKB)	:	2577.0 - 2585.0
Reservoir temperature (°C)	:	100
Reservoir pressure (bar)	:	388
Bubble point pressure (bar)	:	135.5
Oil formation volume factor (Rm^3/Sm^3)[1]	:	1.32
Gas oil ratio (Sm^3/Sm^3)[1]	:	91.3
Stock tank oil density (kg/m^3)[2]	:	824.5
Reservoir fluid density (kg/m^3)	:	700
Reservoir fluid viscosity (mPa.s)	:	0.656

Subscripts:

1) Corrected for a four stage flash where the separator conditions were:

Stage no.	Sep. pressure (bar)	Sep. temperature (C°)
1	63	66
2	31	60
3	11	54
4	1	15

2) Stock tank oil density after four stage flash

Table 5.10 Analyses of Reservoir oil, 34/4-6

Date 7/86	Auth JMH	Appr
Draw by	Ref.	

Fluid Analyses

WELLHEAD SAMPLE (continued)

Component	Wt %	Mol %
Nitrogen	0.48	1.86
Carbon Dioxide	0.06	0.16
Methane	3.86	26.22
Ethane	2.34	8.48
Propane	3.55	8.77
iso-Butane	0.72	1.34
n-Butane	2.82	5.29
iso-Pentane	1.13	1.71
n-Pentane	1.76	2.66
Hexanes	2.49	3.22
Heptanes	4.36	5.10
Octanes	4.89	5.02
Nonanes	3.35	3.05
Decanes plus	68.19	27.12
	100.00	100.00

Molecular weight C_{10+} : 274.2

Density C_{10+} (kg/m^3) : 871.6

- The composition is mathemetically recombined from gas chromatographic analysis of stock tank oil and gas after single stage flash.

- Molecular weight and density of C_{10+} are measured values from true boiling point destillation of stock tank oil.

Table 5.11 Analyses of Reservoir oil 34/4-6

Date 7/86	Auth. JMH	Appr PS
Draw by	Ref.	

6. DRILLING DATA

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

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 1 of 20 Well no: 34/4-6

Date	Stop	Operational Description
28.12.85	2400	Anchorhandling Anchor no.4 on bottom at 1900 hrs. Anchor no.8 on bottom at 2030 hrs. Anchor no.5 on bottom at 2345 hrs. Removed chaser on anchor no.5.
29.12.85	0830	Anchorhandling. Anchor no.1 on bottom at 0030 hrs, no.3 on bottom at 0255 hrs, no. 7 at 0440 hrs, no.2 at 0500 hrs and no.6 on bottom at 0825 hrs. All anchors deployed with piggy-back anchors except no.4 (drop-anchor).
	1200	Ballasted rig to operation draft, 24.3 m.
	2400	Pretensioned and reset anchors. Added piggy-back to no.4 anchor. Anchor no.2 and no.6 tested to 160 MT,ok. Anchor test failed on no.4,5,7 and 8. Reset anchor no.5. Pretensioned against no.1, no.5 failed.
30.12.85	0400	Reset anchor no. 5,7 and 8. Pennant wire broke behind piggy-back anchor when resetting anchor no. 4, dropped to seabed.
	0830	Waited on anchors to soak into seabed before re-testing.
	1130	Pretensioned anchors to 120 tons, ok. No.2 and 6 tested to 160 tons.
	1400	Running in with TGB and SSTV.
	1530	SSTV failed at 300 m. Pulled out of water, not possible to repair.
	1630	Mob. ROV. Ran in to TGB at 300 m.
	1700	SCR for drawwork failed. Repaired same.
	1730	Landed TGB, 1-1/4 deg. RKB-seabed 400 m. Water-depth 374 m.
	1800	Pulled ROV out of water.
	2030	POOH with TGB running tool. Set back on cellar deck.
	2300	RIH with spud assembly. Damaged threads on last 8" DC and on x/o to 5" HWDP.
	2400	Changed out damaged DC and x/o.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 2 of 20 Well no: 34/4-6

Date	Stop	Operational Description
31.12.85	0230	Changed out damaged 8" DC and x-over. RIH to sea-bed with spud assembly.
	0300	Dropped single shot survey and retrieved same. ROV failed. Pulled to surface. Found hydraulic packer leaking.
	0330	Entered TGB funnel and stabbed in blind.
	0400	Pulled guide frame to surface.
	0500	Worked on SCR failure.
	0530	Worked on rig pump suction. Repaired leak in wash-pipe.
	0730	Spudded in and drilled 17 1/2" pilot hole from 400 to 429 m.
	0800	Dropped and retrieved survey.
	2100	Drilled 17 1/2" pilot hole from 429 to 530 m. High torque due to boulders at 455 m and from 490 to 497 m.
	2130	Dropped and retrieved survey.
	2400	POOH.
01.01.86	0100	Made up 36" bottom hole assembly.
	0330	RIH with 36" BHA to seabed using guide frame.
	0400	Entered TGB funnel. Blind stabbing due to ROV and UTV out off function.
	0430	Retrieved guide frame.
	2400	Opened up 17 1/2" pilot hole to 36" from 400 to 517 m. Guideline no.1 broke at 1845 hrs.
02.01.86	0200	Opened up 17 1/2" pilot hole to 36" from 517 to 530 m.
	0230	Pumped 8 m3 high visc. mud, displaced with sea-water.
	0300	Ran survey, 1/4 deg at 514 m.
	0330	Wiper trip to TGB, no drag - no fill.
	0400	Pumped 105 m3 high vis mud.
	0630	POOH.
	0700	Made up 30" csg. running tool on drillpipe, racked back same.
	0800	Rigged up for casing running.
	1400	Ran 10 joints of 30" csg.
	1600	Rigged up and ran 95 m drillpipe stinger. Install-ed running tool and PGB.
	1830	Ran 30" csg. and landing string. Attempted to stab csg. into TGB blind, no go.
	2400	Waited on spare parts for ROV. Made an attempt to stab csg. in blind at 23:30 hrs, no go.

Date	Stop	Operational Description
03.01.86	1000	Waited on spare parts for ROV.
	1400	Attempted to repair ROV, no success.
	1600	Attempted to stab 30" csg. into TGB blind, OK. Continued RIH with 30" casing and landing string.
	1930	Made up cementing head and landed 30" casing with shoe at 521 m. Ran SSTV with extra camera to bottom. Pan and tilt did not function - not able to see slope indicator.
	2100	Cemented 30" casing and displaced with 12.2 m3 of seawater. Float not holding, kept backpressure.
	2400	Held casing in suspension and waited for cement to set.
04.01.86	0530	Waited for cement to set.
	0700	Unscrewed csg. running tool. POOH with landing string to 30" wellhead housing.
	0800	Picked up kelly and washed wellhead.
	1030	POOH with landing string and L/D same.
	1630	Made up 26" BHA and RIH to 20 m above wellhead.
	1900	Ran ROV to seabed. Positioned rig over wellhead with anchors.
	2000	Stabbed into 30" wellhead and cont. RIH.
	2030	Tagged cement at 510 m. Picked up kelly.
	2100	Kelly spinner clutch stuck. Disconnected same.
	2230	Drilled cement from 510 to 514 m.
	2300	Repaired SCR failure on mud pump no. 1.
	2400	Drilled cement from 514 to 516 m.
05.01.86	0400	Drilled cement from 516 to 521 m. Reamed and washed rathole to 530 m. Pumped hi-vis pill around.
	0430	POOH to wellhead.
	0500	Washed wellhead, observed with ROV.
	0700	POOH. Reset anchor no. 1 with 2 piggy-backs.
	1030	Prepared to run pin connector. Picked up two riser joints. Tensiontested anchors no.4 and no.8, no.4 dragging. Tensiontested anchors, no.1 and no.5, no.1 dragging.
	1600	Anchorhandling. Set third piggy back on anchor no.4. Changed on piggy-backs on anchor no.1. Tested anchor no.4 and no.1 to 130 tons, no.5 and no.8 to 160 tons. Found dogs on pinconnector`s riserconn. turned upside down. Worked on same.
	1730	Repaired pin connector.
	2400	Made up riser to pinconnector. Installed bullseye and started to run riser.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 4 of 20 Well no: 34/4-6

Date	Stop	Operational Description
06.01.86	1030	Ran riser and pin connector.
	1230	Landed pinconn.pulltested same with 15 m/t o.p -ok.installed surface diverter.
	1300	R/d riser running equipm.
	1830	M/u new 17-1/2" bha,rih.
	1900	Function tested diverter system.
	2100	Repaired fault in scr system for mud pump no 1&3.
	2400	Drilled 17-1/2" pilot hole fm 530 m to 582 m.
07.01.86	1030	Drilled 17-1/2" pilot-hole fm 582 m to 782 m
	1100	Repaired oil leak on kelly spinner
	2000	Drilled 17-1/2" pilot hole fm 782 m to 920 m.
	2100	Circ. high-visc. pill.
	2130	Displaced riser to sea water.
	2230	Flowchecked-well static.
	2330	Circ.bttms. up.
	2400	Dropped survey
08.01.86	0400	Pooh. retrieved survey.
	0430	R/u schlm. equipm.
	0930	Attempted to run schlm. logs.isf-sonic-gr 4 times, unable to pass 530 m.
	1000	R/d schlm. equipm.
	1300	Rih with 17-1/2" bit.worked pipe through tight spot at 530 m. cont. rih to 920 m.
	1400	Circ. bttms. up.
	1500	Pooh to 530 m.
	1600	Washed and worked pipe fm 520 m to 540 m.circ
	1830	Cont. pooh.
	1900	R/u schlm. equipm.
	2200	Logging. run no 1: isf-sonic-gr. in at 1910 hrs-out at 2155 hrs.
	2400	Logging. run no 2: ldt-gr. in at 2250 hrs.
09.01.86	0100	Cont. log run no 2. ldt-gr.
	0130	R/d schlm. equipm.
	0830	P/u and function tested 26" u.r. m/u new bha. RIH.
	2030	Underreamed to 26" fm 525 m to 740 m. Terminated underreaming due to big heaves.
	2330	Pooh.
	2400	Serviced u.r. changed cutter arms.
10.01.86	2400	Wow
11.01.86	2400	Wow.
12.01.86	1000	Wow
	1600	Attempted to latch pin connector on 30" wellhead Positioned rig. operation terminated due to bad weather.
	2400	Wow

Date	Stop	Operational Description
13.01.86	0200	W.O.W.
	0400	Attempted to stab 30" latch. Broke off guide arm on no. 4 guide post. Unable to stab with one arm.
	1700	Pulled riser.
	2330	W.O.W. Wind too high to work with cranes. Max gust 70-80 knots.
	2400	Continued to pull riser.
14.01.86	0330	Pulled riser and 30" latch. Set latch back on trolley. Guide wire no.4 broke when pulling riser.
	0600	Pulled no.4 guide wire and recovered broken guide arm.
	1200	Lifted pin connector up on deck and replaced broken 2-arm guide with 4-arm. Repaired hydraulic hoses on latch, function tested latch, OK. Set latch on trolley and connected riser. Function tested, OK.
	1400	Hooked up guide lines. Inspected guide base with ROV. Top of no. 4 guide post clean.
	2400	Ran riser with 30" latch. Guide wire no.2 broke when running riser.
15.01.86	0100	Continued to run riser.
	1230	W.O.W. Wind 50 knots, heave 3-4 m.
	1800	Picked up slip joint and diverter. Attempted to land 30" latch. Broke no.3 guide arm on latch.
	2000	Ran ROV to inspect guide base. Remove end of broken guide wire from guide post no.2.
	2400	W.O.W.
16.01.86	1330	W.O.W.
	2400	Pulled riser and pin connector.
17.01.86	0200	Continued pulling riser and pin connector. Left 2 joints of riser in derrick.
	0400	Landed and serviced pin connector on trolley. Set pin connector on deck.
	1000	Installed and ran measuring frame to check guide post alignment, ok. Recovered broken guide arm from guide post no.3. Re-established guidelines no.2 and 4. All done with ROV support.
	1300	L/D riser and riser equipment.
	1600	Made up new BHA and tested MWD tool while working on guide frame.
	2300	Continued working on guide frame.
	2400	W.O.W. Cranes shut down due to high wind velocity.

Date	Stop	Operational Description
18.01.86	0600	W.O.W. Cranes shut down.
	0730	Picked up guide frame from deck and installed same.
	1600	RIH. Found some bad drillcollar connections. Checked all connections in bottom hole assembly. L/D 3 drillcollars. Tagged bottom of 26" hole at 740 m.
	2400	Opened hole to 26" from 740 to 891 m.
19.01.86	0130	Opened hole to 26" from 891 to 920 m.
	0400	Made wiper trip. Hole - ok.
	0530	Pumped 8 m3 hi-vis pill and displaced with 190 m3 of mud.
	1000	POOH. Strapped pipe.
	1300	Made up cement head and set back. Made up running tool and plug into housing, L/D same.
	2400	Rigged up and ran 20" casing. Landed casing and overpull tested with 10 tons,ok.
20.01.86	0330	Pumped 30 bbls seawater ahead of cement slurry. Sheared plug and displaced. Bumped plug with 69 bar. Floats holding. Good return during cement job.
	0600	Backed out running tool and POOH. L/D running tool cement head and mandrel.
	1200	Picked up riser and made up to BOP. Disconnected LMRP and changed ax-rings on choke- and killines. Changed vx-ring. Installed beacon and slope indicator.
	2400	Ran riser and BOP stack. Tested choke- and killine to 69 bar every 3rd joint. Slow progress due to problems with test-tools, handtools and surface leaks.
21.01.86	1200	Cont.running bop and marine riser,press tested every third joint-ok.
	1230	P/u slip joint and landing joint.
	1530	Positioned rig. Turned riser. Rov in water.
	1900	Installed kill/choke and booster lines. Press.tested kill/choke-lines
	2400	Wow.press. Tested choke manifold-ok.

Date	Stop	Operational Description
22.01.86	0100	Heave down to 1 m. Landed and latched on bop. Overpull tested with 25 m/t-ok.
	0400	Stroked out inner barrel on slip joint.l/d landing joint. Installed diverter housing.
	0600	M/u jet sub one joint below test plug. Rih and washed wellhead area. Landed test plug.
	0930	Press.tested bop to 130 bar-ok.
	1030	Pooh with test plug
	1100	M/u wear bushing on r/t, set same back in derrick
	1200	Press. tested kelly cocks and stab-in valves
	1300	Attempted to close shear rams with accoustic system, riser conn. unlatched accidently. Ran rov. Landed and relatched lmrp. Over pull tested same-ok.
	1500	Rih with test plug. Press.tested riser conn. to 130 bar-ok. Pooh with test plug.
	1630	Installed seat protector.Closed shear rams and press. tested 20" csg. to 130 bar-ok.
	2400	M/u new b.h.a. Function tested mwd-tool-ok. Installed diverter element. Function tested diverter system-ok. RIH.
23.01.86	0130	Rih with 17-1/2" bit. Tagged toc at 888 m.
	0530	Drilled cmt. and csg. shoe to 904 m.
	0600	Cleaned out rathole and displaced hole to gyp/polymer mud.
	0700	Drilled 17-1/2" hole fm 920 m to 925 m.
	0800	Circ.and cond mud. Lined up choke man. and flushed lines.
	0900	Performed leak-off test, equiv. to 1.65 sg m.w.
	2400	Drilled 17-1/2" hole fm 925 m to 1110 m.
24.01.86	1500	Drilled 17-1/2" hole fm 1110 m to 1381 m.
	1600	Circ.bttms. up.
	1730	Pooh to 20" csg.shoe.
	1900	Working on shakerbox. l/d 3 joints of 6 1/2" dc, and 6 joints dp.
	2230	Pooh to change bit while working on shakerbox.
	2400	Function tested mwd-tool-ok. Rih.
25.01.86	0430	Cont. rih. Reamed tight spots at 1233 m. Rih to 1357 m
	0530	Reamed and washed fm 1357 m to 1381 m.
	2400	Drilled 17-1/2" hole fm 1381 m to 1700 m.
26.01.86	1200	Drilled 17-1/2" hole fm 1700 m to 1856 m
	1530	Circ. hole clean
	1730	Pooh to 900 m.
	1800	Slip drlg. line
	2100	Cont. pooh.
	2400	R/u schlm. Rih with isf/lss/gr. Unable to pass 1430 m. Pooh with schlm.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 8 of 20 Well no: 34/4-6

Date	Stop	Operational Description
27.01.86	0100	R/D Schlumberger.
	0300	Picked up cement kelly and made up connections in rotary table. L/D same. Prepared to make up csg. hanger, cranes shut down due to wind picking up.
	0900	Changed BHA and RIH to 1837 m.
	0930	Washed and reamed from 1837 to 1856 m, no fill.
	1200	Circulated and conditioned mud and hole.
	1400	POOH to shoe at 904 m.
	1500	Picked up kelly and worked pipe in old rathole while circulating.
	1830	Continued POOH.
	2400	Rigged up Schlumberger.Signal problems on surface. Ran log no. 1: ISF-LSS-GR. In at 2030 hrs, out at 2325 hrs.
28.01.86	0400	Logging. Ran LDT-GR-CAL. Had to work tool through tight spot at 1430 m. Rigged down Schlumberger.
	0530	RIH to cond. mud and hole.
	0930	Repaired upper racking arm in derrick.
	1200	RIH to bottom.
	1400	Circulated bottoms up.
	1530	Pumped slug and POOH.
	1700	Trip tank not functioning. Checked same. Rigged up csg. fill up line.
	1930	Continued POOH.
	2200	RIH with wearbushing running tool and retrieved wearbushing.
	2400	Made up casing hanger and stood back in derrick. Rigged up to run casing.
29.01.86	0200	Rigged up and started to run 13 3/8" casing.
	0730	WOW. Cranes shut down due to wind speed - 70 kts.
	2130	Ran 13 3/8" casing. Made up cement kelly, broke circulation and landed casing with shoe at 1841 m.
	2300	Circulated casing volume prior to cement job.
	2400	Pumped 20 bbls drillwater spacer. Pressure tested surface lines to 345 bar. Dropped ball, mixed and pumped cement.

Date	Stop	Operational Description
30.01.86	0230	Mixed and pumped cement.Dropped dart and displaced with Dowell to shear top plug. Displaced cement with rig pumps. Bumped plug and pressure tested casing to 310 bar. Bled off pressure and checked floats holding, ok.
	0330	Set packoff with 10.000 ft-lbs. Pressure tested same to 310 bar.
	0500	L/D cement kelly and pulled out with landing string. Accoustic system was tested while pulling out with landing string, ok.
	0630	Made up test plug and wearbushing. Problems to engage wearbushing to testplug.
	0900	RIH with wearbushing and set same.
	1200	Pressure tested BOP stack to 310 bar.
	1400	POOH with test plug.
	1600	Pressure tested kelly cocks and stab-in valves to 310 bar.
	2000	L/D 9 1/2" drillcollars, 17 1/2" stabilizers and MWD-tool.
	2400	Made up 12 1/4" BHA and RIH. Tested MWD tool on surface, ok.
31.01.86	0400	RIH with 12 1/4" BHA. Tagged top plug at 1815 m. Installed diverter element.
	1300	Drilled cement plugs and float collar.
	1630	Drilled cement inside casing and float shoe.
	1700	Reamed and washed from 1841 to 1856 m.
	1800	Drilled 12 1/4" hole from 1856 to 1861 m.
	1830	Circulated and conditioned mud and pulled into shoe.
	1930	Slipped and cut drilline.
	2030	Performed leak-off test. EMW=1.90 s.g. Fractured formation.
	2300	Inspected drilline. Cut off bad line - 798 ft and slipped 138 ft.
	2400	Drilled 12 1/4" hole from 1861 to 1864 m.
01.02.86	0230	Drilled 12 1/4" hole from 1864 to 1892 m.
	0330	Pulled inside 13 3/8" csg. shoe and performed integrity test, EMW=1.80 s.g.
	1500	Drilled 12 1/4" hole from 1892 to 2054 m.
	1530	Circulated prior to wiper trip.
	1700	POOH to shoe, max overpull 20 tons. RIH.
	2230	Drilled to 2127 m, H2S alarm at 2121 m. Flowcheck negative.
	2400	Hole packed off. Worked string. POOH single joints Max overpull on first single 50 tons. L/D 6 joints Worked and circulated pipe free. (Unable to establish circulation before having pulled 6 joints).

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 10 of 20 Well no: 34/4-6

Date	Stop	Operational Description
02.02.86	0300	Circulated at 2058 m while weighing up mud system to 1.60 s.g.
	0330	Shakerbox and flowline plugged, H2S alarm-max 51 ppm. Observed and monitored H2S level closely, dropping. Cleaned shakerbox. Later monitored H2S level with back up equipment-no sign.
	0500	Cont. circulating while weighing up mud to 1.60.
	0600	Washed and reamed from 2058 to 2127 m, no fill.
	2200	Drilled 12 1/4" hole from 2127 to 2273 m.
	2330	Circulated bottoms up.
	2400	Started to POOH. Worked tight hole , max overpull 25-30 tons.
03.02.86	0600	Pooh.changed mwd-tool and bit.
	0700	M/u bit and mwd-tool. Function tested same-ok. Set same back in derrick.
	0800	M/u hang-off tool,set same back in derrick.
	1300	Rih to 2258 m.
	1330	Washed/reamed fm 2258 m to 2273 m.
	2400	Drilled 12-1/4" hole fm 2273 m to 2345 m.
04.02.86	2400	Drilled 12-1/4" hole fm 2345 m to 2441 m.
05.02.86	2400	Drilled 12-1/4" hole fm 2441 m to 2494 m.
06.02.86	0200	Drilled 12-1/4" hole fm 2494 m to 2498 m
	0400	Circ.
	0530	Pooh to 13-3/8" csg. shoe.
	0730	Slip and cut drlg. line
	1200	Cont. pooh. Washed w.h.
	1330	Rih with bop test plug.
	1630	Press. tested bop-ok.
	1800	Pooh with test plug.
	2400	M/u bit and junk sub. Rih.
07.02.86	0100	Cont. rih
	1530	Drilled 12-1/4" hole fm 2498 m to 2549 m
	1730	Circ. for samples
	2400	Pooh.
08.02.86	0130	M/u coring assy.
	0830	Rih with coring assy.
	0930	Washed/reamed fm 2485 m to 2502 m. Rih to td.
	1000	Dropped sperry sun orientation tool.
	2300	Cut core no 1 fm 2549 m to 2560 m,terminated coring after connection.
	2400	Pooh.

Date	Stop	Operational Description
09.02.86	0330	Pooh- found washout on orientation stinger
	0500	Recovered core- 3.8 m- 35% recovery.
	1130	Rih with 12-1/4" bit to 2549 m
	1300	Washed/reamed fm 2549 m to 2560 m. Logged section with mwd-tool.
	1630	Drilled 12-1/4" hole fm 2560 m to 2576 m.
	1830	Circ. for samples.
	2400	Pooh.
10.02.86	0600	Made up coring assembly and RIH.
	0700	Washed from 2558 to 2576 m. Circulated and dropped orientation tool.
	1800	Cut core no. 2 from 2576 to 2589 m.Jammed.
	2400	POOH. Found washout in orientation stinger.
11.02.86	0030	Recovered core no.2, 7 m - 54 % recovery.
	0130	Serviced corebarrel.
	0630	RIH with coring assy.
	0830	Washed and reamed from 2575 to 2589 m.
	0900	Dropped Sperry Sun orientation tool.
	1830	Cut core no. 3 from 2589 to 2600 m.
	2400	POOH. Found washout on orientation stinger.
12.02.86	0030	Recovered core no.3, 7.5 m - 68 % recovery.
	0130	Serviced corebarrel.
	0630	RIH with corebarrel.
	0700	Washed and reamed from 2586 to 2600 m.
	0730	Dropped ball.
	1600	Cut core no.4 from 2600 to 2614 m.
	2000	POOH with core no.4.
	2100	Recovered core no.4, 12.9 m - 92 % recovery.
	2200	Serviced corebarrel.
	2400	RIH with corebarrel.
13.02.86	0300	RIH to shoe with coring assembly.
	0400	Slipped and cut 475 ft of drilline.
	0600	Continued RIH.
	0630	Washed and reamed from 2610 to 2614 m.
	2230	Cut core no.5 from 2614 to 2632 m.
	2400	POOH.
14.02.86	0500	POOH with core no. 5.
	0700	Recovered core no.5 - 8.4 m,47 % recovery.
	0800	RIH with BOP test plug.
	0830	Flushed wellhead and BOP stack.
	1300	Tested BOP stack.
	1400	POOH with test plug.
	1930	RIH with drilling assembly.
	2230	Reamed and washed from 2600 to 2642 m. Logged section with MWD-tool.
	2330	Worked junkbasket and circulated.
	2400	POOH for coring.

Date	Stop	Operational Description
15.02.86	0530	POOH.
	0630	Serviced corebarrel.
	1230	RIH.
	1300	Circulated and dropped ball.
	2300	Cut core no. 6 from 2642 to 2660.5 m. Recovered core - 100 % recovery.
	2400	POOH, strapped pipe.
16.02.86	0430	POOH.
	0500	Recovered core, 100 % recovery.
	0530	L/D corebarrel.
	1300	Made up and RIH with drilling assembly. Tested MWD-tool.
	2400	Drilled 12 1/4" hole from 2660 to 2742 m.
17.02.86	0500	Drilled 12-1/4" hole fm 2742 m to 2770 m.
	0630	Circ.bttms up.
	0730	Wipertrip to 2500 m.
	1030	Circ. hole clean.
	1500	Dropped survey.Pooh, l/d monel and mwd-tool.
	1630	R/u schlm.
	2400	Logging: run no 1: isf-sonic-gr. run no 2: cbl-vdl-gr.
18.02.86	1730	Logging: Run no 2: cbl-vdl-gr run no 3: ldl-cnl-ngs run no 4: dll-msfl-gr run no 5: shdt-gr. r/d schlm
	1830	R/d schlm.
	2300	Rih with 12-1/4" bit
	2400	Circ. to cond. hole
19.02.86	0100	Circ.to cond. hole.
	0530	Pooh.
	2400	Logging: run no 6: hp-rft-gr run no 7: rft- for sample
20.02.86	2300	Logging:Run no 7: rft for sample. R/u to run digital sonic tool -found malfunction in same,l/d tool. Run no 8: vsp Run no 9: swc- 60 shots- 54 rec, 4 bullets lost.
	2400	M/u 9-5/8" csg. hgr. and pack-off to r/t. Set back in derrick.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 13 of 20 Well no: 34/4-6

Date	Stop	Operational Description
21.02.86	0100	M/u csg. hanger and cmt. plugs. Set same back in derrick.
	0830	Rih with 12-1/4" bit
	1000	Reamed/washed fm 2730 m to 2770 m.
	1200	Circ. bttms. up
	1600	Pooh.
	2400	R/u schlm. for logging. Rih with rft-gr for sampling and pressure points. R/d schlm.
22.02.86	0800	Rih with w.b. r/t. Attempted to retrieve w.b., no success. Suspected broken connections.Pooh checking all conn. and r/t - ok. Rih, attempted to retrieve w.b. max overpull 50 m/t,slacked off w/left hand torque and pulled w.b free.pooh w/same
	0900	Slip and cut drlg. line.
	2400	R/u to and ran 176 joints of 9-5/8" csg.
23.02.86	0200	Broke circ. and landed 9 5/8" csg. with shoe at 2760 m. Circulated. Stopped pumping after 3600 strokes due to low return-flow.
	0700	Dowell pumped 4.8 m3 drillwater. Dropped ball, mixed and pumped 60 m3 of 1.90 s.g. tail slurry. Dropped dart and sheared top plug with Dowell. Changed to rig pumps and displaced with mud. Bumped plug and pressure tested casing to 400 bar.
	1300	Set pack-off with 15.000 ft-lbs. Attempted to test same, negative. POOH with running tool. Changed o-rings and RIH. Attempted to pressure test,neg. POOH.
	1900	Made up BOP test plug with jet sub. RIH and washed wellhead area. Attempted to test BOP and pack-off, neg. POOH and changed damaged o-rings on test plug RIH.
	2000	Repaired UTV-camera and ran same down to wellhead.
	2330	Moved rig. Landed test plug in 9 5/8" csg. hanger and attempted to pressure test, neg. POOH.
	2400	Made up and started to run in with RTTS-packer to test BOP and pack-off.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 14 of 20 Well no: 34/4-6

Date	Stop	Operational Description
24.02.86	0430	Made up RTTS packer and RIH. Set packer and attempted to test pack off, neg. POOH and L/D RTTS packer.
	1000	Made up pack off R/R tool and RIH. Checked every connection. Attempted to retrieve pack off. POOH, no pack off on R/R tool. RIH and retrieved pack off. Lower part of pack off left in hole. Picked up kelly and pressured up to release pack off.
	1200	RIH with jet sub and washed wellhead. POOH.
	1400	RIH with emergency pack off and set same with 18.000 ft-lbs.
	1830	Tested BOP and pack off to 400 bar, ok. POOH.
	2130	Made up wearbushing running tool and engaged wear-bushing to same. RIH and set wearbushing. POOH.
	2300	Picked up cement kelly. Broke connections and L/D same.
	2400	Layed out 8" drillcollars.
25.02.86	0300	Continued laying down 8" drillcollars.
	1330	Picked up 6 1/2" drillcollars and made up 8 1/2" BHA. Made up and broke every connection, washed and clean same due to new drillcollars. Tested MWD tool in rotary, ok. Continued RIH. Tagged cement plugs at 2732 m.
	1530	Drilled cement plugs.
	1830	Drilled float collar, cement inside casing, float shoe and cleaned rathole to 2770 m.
	1900	Drilled to 2775 m. Circulated for 10 mins. prior to leak off test.
	2000	Performed leak off test. EMW = 1.99 s.g.
	2400	Drilled 8 1/2" hole from 2775 to 2792 m.
26.02.86	1730	Drilled 8 1/2" hole from 2792 to 2862 m.
	2130	POOH for bit change.
	2400	Made up new bit. Tested MWD tool. RIH.
27.02.86	0430	Continued RIH. Filled pipe and broke circulation. Washed down from 2853 m.
	2400	Drilled 8 1/2" hole from 2862 to 2993 m.
28.02.86	0700	Cont. drilling 8 1/2" hole from 2993 to 3005 m. Bit stopped drilling. Suspected bit-balling. Work-ed bit and drilled to 3007 m.
	1230	POOH to change bit. Found "o"-ring on bit nose.
	1730	Changed out jar. Made up junk sub and new bit. Tested MWD tool. RIH to bottom.
	1800	Made up kelly and worked junk sub.
	2400	Drilled 8 1/2" hole from 3007 to 3040 m.
01.03.86	2400	Drilled 8 1/2" hole from 3040 to 3153 m.

Date	Stop	Operational Description
02.03.86	0230	Drilled 8 1/2" hole from 3153 to 3161 m. Bit stalled.
	0300	Worked junk sub.
	1000	POOH for bit change. Gauged stabilizers. Found O-ring on nearbit stab. L/D nearbit stab., junk sub and MWD tool. Picked up new MWD tool and near-bit stab. Made up new bit and tested MWD tool.
	1500	RIH to 9 5/8" csg. shoe.
	1600	Slipped and cut drilline.
	1700	Cont. rih to 3048 m. Tight hole, max overpull 60 tons.
	1830	Picked up kelly and worked tight spot.
	1930	RIH to 3150 m. Tight hole. Max overpull 85 tons. Picked up kelly and reamed two last singles.
	2400	Drilled 8 1/2" hole from 3161 to 3203 m.
03.03.86	1100	Drilled 8 1/2" hole from 3203 to 3282 m, T.D.
	1300	Circulated and conditioned mud.
	1500	Wiper trip to 9 5/8" csg. shoe. RIH to bottom.
	1700	Circ. and cond. mud.
	2100	POOH. L/D MWD tool.
	2400	Rigged up Schlumberger for logging. Run no.1: ISF-LSS-GR.
04.03.86	2400	Logging:run no 1:isf-lss-gr run no 2:ldl-cnl-gr-cal. run no 3:vsp run no 4:shdtt-gr. run no 5:cbl-vdl-gr-ccl. run no 6: cst.
05.03.86	0300	Logging: cst,out at 0215 hrs-4 bullets missing, 7 bullets empty-r/d schlm.
	0800	Rih with oedp to 3282 m.
	0900	Circ and cond mud.
	1700	PLugged back open hole to 2680 m in 3 steps plug no 1: fm 3270 m to 3090m,pooh to 3080 m,rev circ. plug no 2:fm 3070 m to 2890 m,pooh to 2880 m,rev circ, plug no 3: fm 2870 m to 2680 m,pooh to 2670 m, rev circ.
	2200	Circ. increased mw. to 1.70 sg.
	2400	Pooh. L/d 18 jnts dp.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 16 of 20 Well no: 34/4-6

Date	Stop	Operational Description
06.03.86	0200	Pooh with dp.
	0230	R/u schlm. Press. tested cmt plugs to 400 bar-ok.
	0430	Rih with schlm. perforating gun. Perforated 9-5/8" csg, fm 2592 m to 2593.5 m. Pooh with gun
	0500	R/d schlm. Press. up 9-5/8" csg. to 98 bar to verify open perfs-ok.
	1300	Wow. Installed diverter r/t,displaced riser to seawater.
	1730	Rih with oedp.
	1800	Displaced riser and dp to 1.70 sg. mud
	2200	Press. tested cmt lines to 276 bar-ok. Set balanced cmt. plug fm 2600 m to 2517 m.pooh to 2482 m. Rev, circ. squeezed 560 ltrs of cmt into perfs.max press. 358 bar,using hesit.method. Hold backpress-358 bar dropped to 354 bar in 45 min.
	2300	Bled press. off to 35 bar,-checked for press. Increase-negative.
	2400	Pooh with dp.
07.03.86	0200	Pooh with dp.
	0830	M/u bit,csg, scraper. Rih. Tagged toc at 2547 m.
	1130	Drilled cmt. fm 2547 m to 2601 m.
	1200	Cont. rih . Tagged toc from plugback at 2720 m.
	1230	Worked csg. scraper fm 2660 m to 2720 m.
	1430	Circ. and cond mud.
	2100	Pooh. L/d excess dp,dc,s, bit and csg. scraper.
	2400	Rih with bop test plug. press. tested bop to 400 bar-ok.
08.03.86	0130	Press. tested bop to 400 bar-ok, upper ann. prev. to 240 bar-ok. Function tested bop on yellow pod fm mini panel-ok.
	0230	Pooh with bop test plug.
	0530	R/u schlm. Ran cbl-log out at 0500 hrs. R/d schlm
	1030	Rih with gauge-ring and junk sub to 2626 m
	1200	Circ. bttms up
	1330	Spotted a visc. pill (hec-pill) fm 2626 m to 2526 m.
	1930	Pooh.
	2400	R/u schlm. Rih with tcp perf. gun-12 shots per foot,perforated 9-5/8" csg. fm 2592 m to 2595 m pooh with gun. Rih with baker model F-1 production packer.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 17 of 20 Well no: 34/4-6

Date	Stop	Operational Description
09.03.86	0530	Cont. rih with baker model F-1 production packer, problems passing 2478 m. Set packer at 2589 m, pooh with setting tool.
	1100	R/u schlm. Rih with tcp perforating gun, perforated 9-5/8" csg, fm 2580 m to 2585 m. Rih with a 3 m tcp perf. gun ,perforated 9-5/8" csg. fm 2577 m to 2580.
	1330	Wow.
	1630	M/u flowhead, lubr. valve,sstt on joints of tbg.
	2400	Rih with test-string. Set a plug in x-nipple with wire line.Pressure tested string below safety joint and flop. bundle carrier to 100 bar-ok.Retrieved plug fm x-nipple, cont. rih w/test-string.
10.03.86	1700	Cont. RIH with test string. Pressure tested DST-tools to 300 bar against LPR-N valve, to 400 bar after 86 joints of tubing ran and to 400 bar be-fore picking up fluted hanger. All tests OK. Land-ed test string on fluted hanger for space out.
	2000	Rigged up Schlumberger. Ran CCL-GR for depth correlation.
	2200	Pulled landing string.
	2400	Made up pup joint below fluted hanger. Installed and function tested EZ-tree. Pressure tested string to 400 bar. Continued RIH.
11.03.86	1100	RIH with landing string. Installed lubricator valve, changed bails and made up flowhead. Landed string and set packer. Pressure tested surface eq. Pressured up annulus to 110 bar to open LPR-N valve. Opened well at 1000 hrs. Shut in at 1004 hr
	2400	W.O.W. Too much heave for wireline work.
12.03.86	1300	Wow
	2400	R/u flopetrol wire line equipm. Rih with x-plug and press. gauges. Attempted to set same in x-nipple-no success. Pooh. Checked and redressed setting tool. Rih . Attempted to set x-plug and press. gauges in x-nipple.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 18 of 20 Well no: 34/4-6

Date	Stop	Operational Description
13.03.86	0230	Attempted to set x-plug with press.gauges in x-nipple- no success. pooh.
	0700	M/u shifting tool on wire line. Press.tested lubr/stuffing box-ok. Rih and closed lower sliding side door. Press.tested test string to 138 bar to verify door closed-ok.
	1100	Reset shifting tool. Rih and opened upper sliding side door.
	1230	Cleaned ferfs. for 5 min. Closed well on choke man.
	1630	Opened well for initial flow for 10 min. Closed well on lpr-n valve at 1240 hrs. for initial build up.
	2400	Opened well for main flow. Flowing on 32/64" choke. Flow rate 1160 cum/d. Wellhead press. 154 bar. Gor 61 cum/cum.
14.03.86	0530	Main flow: choke size 32/64".
	1000	Closed well on lpr-n valve due to bad weather. At 0533 hrs. prepared to disconn. stt. Cycled omni-valve in circ. position. Rev. circ. volume of string-gas cut mud, second rev. circ. through p/b degasser. Disconn. sstt.closed shear rams.
	2400	Wow
15.03.86	2400	Wow
16.03.86	2400	Wow
17.03.86	2100	Wow
	2130	Latched sstt on to valve assy. Pick up test ok.
	2400	M/u surface equipm. Press.tested as per program. Displaced tbg. to s.w.
18.03.86	0130	Cycled omni valve into test position,communication between annulus and tbg.during cycling omni-valve into blank position. Press. bled off to formation, indicating apr-m valve sheared circ. ports open.
	0330	Rev. circ. press. build up after 400 strokes, sstt closed due to not being completely open while circ.-opened same. Rev. circ. Observed well while r/d w.l equipm. -ok.
	0430	Unseated rtts packer, bullheaded annulus volume between packer and perfs,observed well-ok.
	0700	R/u to pull test-string,l/d stt and lubr.valve.
	1100	Circ. mud free of gas.
	2400	Pooh with test-string,l/o same.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 19 of 20 Well no: 34/4-6

Date	Stop	Operational Description
19.03.86	0630	Cont. pooh with test-string. l/d test-tools.
	0730	Service break stt
	0900	Rih with tbg. landing string
	1030	Pooh with landing string
	1130	Service break lubr.valve.
	1700	M/u cmt. retainer to mech.setting tool. Rih on dp. Found cmt. in dp when approx 300 m to go.
	1900	Rev. circ to clean dp.
	2300	P/u 26 jnts of dp to reach cmt. retainer setting depth. Drifted same. L/d 34 jnts of dp due to cmt. contamination.
	2400	P/u kelly.Break circ. set cmt. retainer at 2570 m.
20.03.86	0100	Reverse circulated.
	0130	Tested surface eq. to 310 bar. Established injection rate.
	0300	Squeezed 14 bbls of cement into formation and dropped 20 bbls on top of retainer.
	0430	POOH with 4 stands. Attempted to reverse circ. and circ. No success due to hard cement in drillpipe.
	0600	POOH with 21 stds., drifted each stand.
	1800	POOH and L/D drillpipe in singles, drifted drillpipe. Found 219 m of cement inside drillpipe. Operation slow due to bad weather condition.
	2400	W.O.W. Max weather: Wind - 74 m/s, heave - 7 m, roll and pitch - 5 deg., waves - 10-15 m.
21.03.86	0500	Wow
	0630	Rih with oedp,displaced riser to mud.
	1000	R/u schlm. Rih with perf.gun. Perforated 9-5/8" csg. at 430 m.with 34 bar on ann.
	1100	Pooh with dp.
	1400	M/U csg. cutter,rih
	1500	Cut 9-5/8" csg. at 580 m
	1630	Pooh with csg. cutter.
	1830	M/u csg. spear, rih
	2300	Pooh with cut 9-5/8" csg. positioned rig, adjusted rucker lines to enter csg. into innerbarrel on slip joint. L/d csg. Press. tested 9-5/8"-13-3/8" annulus to 50 bar-ok.
	2400	Rih with oedp through bop.

SAGA PETROLEUM A.S. 6.1 DAILY OPERATIONAL DESCRIPTION

Page 20 of 20 Well no: 34/4-6

Date	Stop	Operational Description
22.03.86	0230	R/u schlm. Rih with perf. gun. Perforated 13-3/8" csg. at 430 m, with 34 bar on annulus.
	0300	Pooh with dp.
	0530	M/u csg cutter assy. Rih.
	0600	Cut 13-3/8" csg. at 514 m.
	0830	Pooh with cutting assy.
	0930	M/u spear for 13-3/8" csg. Set same back in derrick.
	1030	Slip and cut drlg. line.
	1900	Wow
	2300	Rih with csg. spear. Retrieved cut 13-3/8" csg. l/d same.
	2400	Rih with oedp.
23.03.86	0100	Rih with oedp to 640 m
	0200	Set a balanced cmt. plug fm 640 m to 440 m
	0230	Pooh to 430 m. rev. circ.
	0400	Cont. pooh.
	2400	Wow to pull bop
24.03.86	2030	W.O.W. to pull riser and BOP stack.
	2400	Disconnected BOP stack and started to pull same.
25.03.86	1200	Pulled riser and BOP stack. Set BOP on carrier. Rigged down running eq.
	1500	Made up jetting tool and RIH with same using guideframe for guiding.
	1700	Jetted TGB with seawater.
	1730	Inspected TGB with ROV.
	1900	Attempted to hook up extra guideline to TGB, no success.
	2000	Pulled jetting tool.
	2230	RIH with 20" and 30" csg. cutting tool.
	2400	Cut 20" and 30" casing.
26.03.86	0400	Cut 20" and 30" csg. at 405 m.
	1000	Pulled csg. free and out of water. Sat PGB on trolley. Attempted to release spear. Pulled 20" & 30" csg. above rotary. Welded on padeyes to 30" and removed PGB. Released spear.
	1230	L/D 20" and 30" csg. wellheads, cutting assembly and 2 joints of 8" drillcollars.
	1900	Made up jetting tool and fishing chain on drill-pipe for TGB and RIH. Mob. ROV in water at 1345. Attached chain to TGB J-slot.
	2000	Fished TGB. Pulled 30 tons on heave compensator and washed TGB free. Pulled TGB to surface.
	2400	Deballasted rig. Sat TGB on trolley.
27.03.86	1050	Anchorhandling. Rig at transit draft at 0100 hrs. Skandi Beta in towing position at 0735 hrs. Last anchor on bolster at 1050 hrs.

SAGA PETROLEUM A.S.

6.1.1 BIT RECORD PART 1
Well no: 34/4-6

No	Size	Make	Type	Ser.no.	Jets 32 inch	Depth out	Drld depth	Hrs	m/HR	WOB tons	RPM	Dull.cond. T	B	G	Other	Bitactivity	Rem
1	17-1/2	SMITH	SDG	XA9382		530.0	130.5	15.0	8.7	2/7	65/65	2	5	I		DRILLING	*
2	26	VAREL	L2JM	18640	24-24-24	530.0	130.5	21.5	6.0	5/7	120/120	2	2	I		U REAMING	*
2 RR	26	VAREL	L2JM	18640	24-24-24	521.0	11.0	5.0	2.2	2/4	55/55	2	5	I		DRLG CMT	
3	17-1/2	HTC	X3A	978XL	24-24-24	920.0	390.0	22.5	17.3	5/15	105/105	3	4	1/8		DRILLING	*
4	26	TRISTA	LWA	TSN3146	6 X 16	740.0	215.0	12.0	17.9	3/5	70/80					U REAMING	*
5	26	VAREL	L3A	10344	24-24-24	920.0	180.0	9.5	18.9	0/10	60/90	2	2	I		U REAMING	*
6	17-1/2	SMITH	SDS	XE3823	24-24-24-18	1381.0	461.0	31.0	14.9	15/25	90/100	5	3	1/4		DRILLING	*
7	17-1/2	HTC	X3A	977XL	24-24-24	1856.0	475.0	30.5	15.6	12/18	80/120	7	4	I	BT	DRILLING	*
7 RR	17-1/2	HTC	X3A	977XL	24-24-24	.0	.0	.0	.0	0/0	0/0					CIRC	
7 RR	17-1/2	HTC	X3A	977XL	24-24-OPEN	.0	.0	.0	.0	0/0	0/0					CIRC	
8	12-1/4	REED	HP11	AAF076	16-16-16	2273.0	417.0	37.5	11.1	18/24	120/120	3	7	1/16		DRILLING	*
9	12-1/4	REED	HP11	AAF075	18-18-16	2498.0	225.0	60.5	3.7	20/23	70/120	4	7	1/8	BT	DRILLING	*
10	12-1/4	SMITH	FDGH	XD8681	18-18-16	2549.0	51.0	14.5	3.5	23/23	100/100	2	7	I		DRILLING	*
11	12-1/4	REED	SHARK	26088		2560.0	11.0	13.0	.8	12/15	80/80				15%	CORING	
12	12-1/4	SMITH	FDGH	XE4321	18-18-16	2576.0	16.0	3.5	4.6	22/22	100/100	2	2	I	BT	DRILLING	
13	12-1/4	REED	SHARK	26066		2589.0	13.0	11.0	1.2	10/10	90/90				10%	CORING	
13RR	12-1/4	REED	SHARK	26066		2600.0	11.0	9.5	1.2	10/10	90/90				30%	CORING	
14	12-1/4	REED	WEAXEN	26002		2614.0	14.0	8.5	1.7	5/5	100/100				30%	CORING	*
13RR	12-1/4	REED	SHARK	26066		2632.0	18.0	16.0	1.1	12/12	90/90				35%	CORING	
12RR	12-1/4	SMITH	FDGH	XE4321	18-16-16	2642.0	10.0	1.0	10.0	0/5	100/100	3	3	I		DRILLING	
15	12-1/4	REED	SHARK	26065		2660.5	18.5	10.0	1.9	7/10	100/100				10%	CORING	
16	12-1/4	SMITH	F2	XD8218	18-18-16	2770.0	109.5	16.0	6.8	22/22	50/70	2	2	I		DRILLING	*
12RR	12-1/4	SMITH	FDGH	XE4321		.0	.0	.0	.0	0/0	0/0					CIRC	
12RR	12-1/4	SMITH	FDGH	XE4321		.0	.0	.0	.0	0/0	0/0					CIRC	*
17	8-1/2	SMITH	FDGH	EU2159	12-13-13	2862.0	92.0	22.0	4.2	13/17	70/90	8	4	1/16		DRILLING	*
18	8-1/2	CHRIST	R482	118793	12-12-13	3007.0	145.0	26.5	5.5	9/12	120/150				100%	DRILLING	*
19	8-1/2	REED	HP51A	YM2046	12-12-12	3161.0	154.0	32.5	4.7	9/14	60/80	2	3	I		DRILLING	*
20	8-1/2	HTC	J22	061HL	12-12-12	3282.0	121.0	15.5	7.8	12/15	60/85	2	3	1/16		DRILLING	
21	8-1/2	SMITH	FDGH	EV2161	16-16-16	.0	.0	.0	.0	0/0	0/0	2	2	I		DRLG CMT	*

6.1.1 BIT RECORD PART 2
Remarks
Well no: 34/4-6

No	Size	Make	Type	Ser.no.	Remarks
1	17-1/2	SMITH	SDG	XA9382	Drilling 17-1/2" pilot hole.
2	26	VAREL	L2JM	18640	26" bit and 36" hole opener.
3	17-1/2	HTC	X3A	978XL	Drilled 17-1/2" pilot hole.
4	26	TRISTATE	LWA	TSN31462	Underreamed with 17-1/2" pilot bit.
5	26	VAREL	L3A	10344	Open 17-1/2" pilot hole to 26" with 26" bit.
6	17-1/2	SMITH	SDS	XE3823	Also drilled 16 m cement in 4 hours.
7	17-1/2	HTC	X3A	977XL	Broken teeth on all inner rows.
8	12-1/4	REED	HP11	AAF076	Also drilled cement and plugs in 12 1/2 hours.
9	12-1/4	REED	HP11	AAF075	10 broken teeth.
10	12-1/4	SMITH	FDGH	XD8681	One cone loose.
14	12-1/4	REED	WEAXEN	26002	Broken inserts.
16	12-1/4	SMITH	F2	XD8218	Drilled to casing point.
12RR	12-1/4	SMITH	FDGH	XE4321	Circ. and cond. hole prior to RFT and 9 5/8" csg.
17	8-1/2	SMITH	FDGH	EU2159	Drilled plugs and cement for 5 hours.
18	8-1/2	CHRIST	R482	118793	Bit was o-ringed
19	8-1/2	REED	HP51A	YM2046	NB stab. o-ringed, bit stalled due to high torque.
21	8-1/2	SMITH	FDGH	EV2161	Drilled cement left from squeeze job, 54m in 3hrs.

Saga Petroleum a.s.

6.1.2. Bottom Hole Assemblies

Well no: 34/4-6

BIT SIZE	DEPTH INTERVAL (m)	DESCRIPTION	COMMENTS
17 1/2"	399.5 - 530.0	17 1/2" bit - nb stab w/float - monel - 17 1/2" stab - 2 x 9 1/2" DC - 17 1/2" stab - 3 x 9 1/2" DC - x/O - 6 x 8" DC - x/O - 15 x 5" HWDP	
26" + 36" HO	399.5 - 530.0	26" bit - 36" hole opener - bit sub - 3 x 9 1/2" DC - X/O - 6 x 8" DC - X/O 15 x HWDP	
26"	510.0 - 521.0	26" bit - bit sub - 3 x 9 1/2" DC - X/O - 9 x 8" DC - X/O - 15 x HWDP	Drilled cmt. in 30" shoe
17 1/2"	530.0 - 920.0	17 1/2" bit - nb stab - X/O - 9" MWD - X/O - 17 1/2" stab - 9 1/2" monel - 1 x 9 1/2" DC - 17 1/2" stab - 4 x 9 1/2" DC - X/O - 9 x 8" DC - 8" jar - 3 x 8" DC - X/O - 15 x HWDP	
17 1/2" + 26" UR	530.0 - 740.0	17 1/2" bit - 26" UR - bit sub - 2 x 9 1/2" DC - X/O - 9 x 8" DC - 8" jar 3 x 8" DC - X/O - 15 x HWDP	
26"	740.0 - 920.0	26" bit - bit sub - X/O - 9" MWD - X/O - 9 1/2" monel - 2 x 9 1/2" DC - X/O - 8 x 8" DC - 8 jar - 3 x 8" DC - X/O - 15 x HWDP	
17 1/2"	888.0 - 1856.0	17 1/2" bit - nb stab - X/O - 9" MWD - X/O - 17 1/2" stab - monel - 9 1/2" DC - stab 17 1/2" - 2 x 9 1/2" DC - X/O - 9 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	
12 1/4"	1856.0 - 2273.0	12 1/4" bit - nb stab - 8" MWD - stab - 8" monel - 8" DC - stab - 15 x 8" DC - 7 3/4" jar - 3 x 8" DC - X/O - 15 x HWDP	
12 1/4"	2273.0 - 2498.0	12 1/4" bit - nb stab - 8" MWD - stab - 8 1/8" monel - 8" DC - stab - 15 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	
12 1/4"	2498.0 - 2549.0	12 1/4" bit - junk sub - nb stab - MWD - stab - monel - 8" DC - stab - 15 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	
12 1/4"	2549.0 - 2560.0	12 1/4" core bit - core bbl - 2 x 8" monel - stab - 13 x 8" DC - jar - 3 x 8" DC -X/O - 15 x HWDP	
12 1/4"	2560.0 - 2576.0	12 1/4" bit - junk sub - nb stab - MWD - stab - monel - 8" DC - stab - 15 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	

Saga Petroleum a.s.

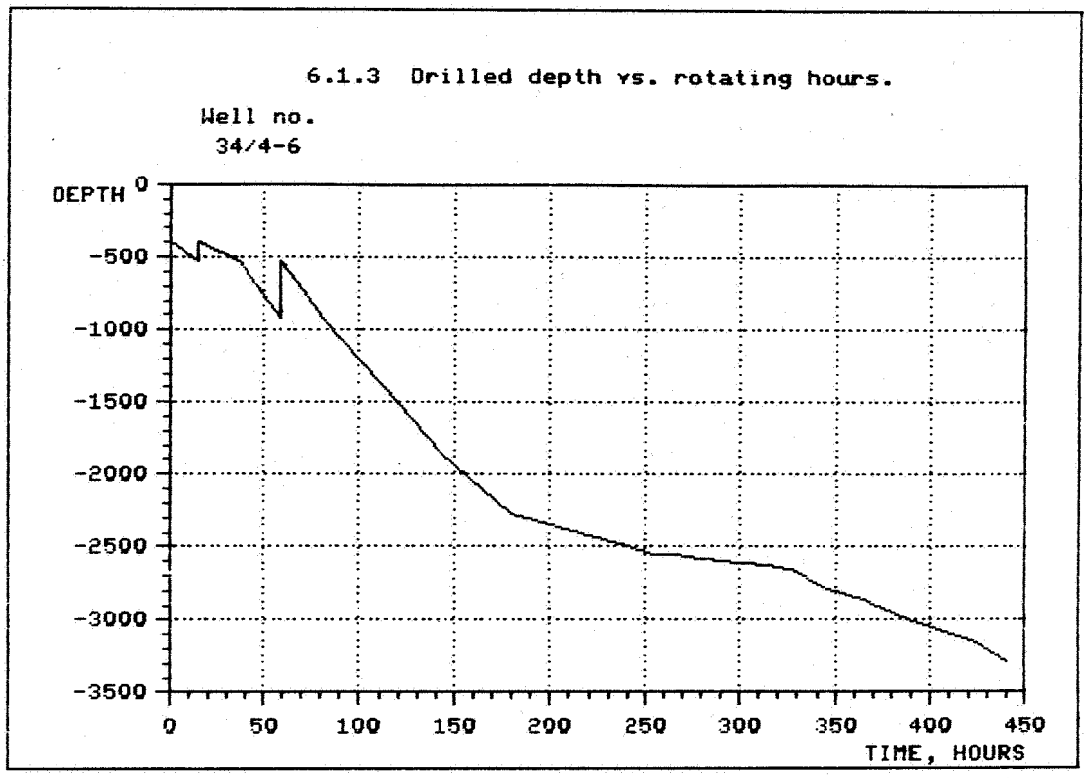
6.1.2. Bottom Hole Assemblies

Well no: 34/4-6

BIT SIZE	DEPTH INTERVAL (m)	DESCRIPTION	COMMENTS
12 1/4"	2576.0 - 2600.0	12 1/4" core bit - core bbl - 2 x 8" monel - stab - 13 x 8" DC - jar - 3 x 8" DC -X/O - 15 x HWDP	
12 1/4"	2600.0 - 2632.0	12 1/4" core bit - core bbl - 2 x 8" DC - stab - 13 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	
12 1/4"	2632.0 - 2642.0	12 1/4" bit - junk sub - nb stab - MWD - 2 x 8" monel - 2 x 8" DC - stab - 14 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	
12 1/4"	2642.0 - 2660.5	12 1/4" core bit - core bbl - 2 x 8" DC - stab - 14 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	
12 1/4"	2660.5 - 2770.0	12 1/4" bit - nb stab - MWD - stab - monel - 8" DC - stab - 15 x 8" DC - jar - 3 x 8" DC - X/O - 15 x HWDP	
8 1/2"	2770.0 - 3007.0	8 1/2" bit - nb stab - 7" MWD - stab - 6 1/2" monel - 6 1/2" DC - stab - 18 x 6 1/2" DC - 6 1/4" jar - 3 x 6 1/2" DC - 15 x HWDP	
8 1/2"	3007.0 - 3161.0	8 1/2" bit - junk sub - nb stab - 7" MWD - stab - 6 1/2" monel - 6 1/2" DC - stab - 18 x 6 1/2" DC - 6 1/4" jar - 3 x 6 1/2" DC - 15 x HWDP	
8 1/2"	3161.0 - 3282.0	8 1/2" bit - nb stab - 7" MWD - stab - 6 1/2" monel - 6 1/2" DC - stab - 18 x 6 1/2" DC - 6 1/4" jar - 3 x 6 1/2" DC - 15 x HWDP	

Saga Petroleum a.s.

6.1.3. Rotating Hours vs Drilled Depth.
Well no: 34/4-6



SAGA PETROLEUM A.S.

6.2.1 MUD PROPERTIES, DAILY REPORT
Well no: 34/4-6

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf / Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
851231	17-1/2	530.0	1.06										SPUD MUD
860101	36	530.0	1.06										SPUD MUD
860102	36	530.0	1.06										SPUD MUD
860103	36	530.0	1.06										SPUD MUD
860104	36	530.0	1.06										SPUD MUD
860105	36	530.0	1.06										SPUD MUD
860106	17-1/2	585.0	1.07	7	34	17/22	10.4						GEL MUD
860107	17-1/2	920.0	1.12	7	29	21/25	9.0	0.1/0.1	180	9000		5.0	GEL MUD
860108	26	920.0	1.12	7	30	22/24	9.0	0.1/0.1	180	9000		5.0	GEL MUD
860109	26	920.0	1.14	6	28	20/25	9.0	0.1/0.2	200	10000		6.0	GEL MUD
860110	26	920.0	1.14	6	26	18/24	9.0	0.1/0.2	200	10000	0.2	6.0	GEL MUD
860111	26	920.0	1.14	5	25	16/21	9.0	0.1/0.2	200	10000	0.2	6.0	GEL MUD
860112	26	920.0	1.14	5	20	15/21	9.0	0.1/0.2	200	10000	0.2	6.0	GEL MUD
860113	26	920.0	1.15	5	21	15/20	9.0	0.1/0.2	200	10000	0.2	6.0	GEL MUD
860114	26	920.0	1.15	5	22	15/20	9.0	0.1/0.2	200	10000	0.2	7.0	GEL MUD
860115	26	920.0	1.15	5	21	15/20	9.0	0.1/0.2	200	10000	0.2	7.0	GEL MUD
860116	26	920.0	1.15	5	21	15/20	9.0	0.1/0.2	200	10000	0.1	7.0	GEL MUD
860117	26	920.0	1.14	6	23	14/22	9.5	0.2/0.2	200	8000	0.1	7.0	GEL MUD
860118	26	920.0	1.14	9	22	11/22	9.5	0.2/0.2	180	3000	0.1	7.0	GEL MUD
860119	26	920.0	1.14	8	24	11/31	9.5	0.2/0.2	160	3000	0.1	7.0	GEL MUD
860120	26	920.0	1.03										GYP/POLYMER MUD
860121	17-1/2	920.0	1.10	12	15	1/2	9.5	0.1/0.2	1400	20000	0.1	4.0	GEL MUD
860122	17-1/2	920.0	1.10	12	15	1/2	9.5	0.1/0.2	1400	20000	0.1	4.0	GYP/POLYMER MUD
860123	17-1/2	1120.0	1.11	19	21	2/3	9.9	0.1/0.3	2600	16000	0.2	5.0	GYP/POLYMER MUD
860124	17-1/2	1381.0	1.13	17	19	2/3	9.6	0.1/0.2	2400	18000	0.3	5.0	GYP/POLYMER MUD
860125	17-1/2	1695.0	1.31	20	22	2/5	9.5	0.1/0.2	2600	17000	0.2	11.0	GYP/POLYMER MUD
860126	17-1/2	1855.0	1.48	25	20	5/14	10.2	0.1/0.2	2700	19000	0.2	17.0	GYP/POLYMER MUD
860127	17-1/2	1855.0	1.48	25	22	7/16	10.5	0.1/0.3	2600	20000	0.2	17.0	GYP/POLYMER MUD
860128	17-1/2	1855.0	1.48	22	18	7/20	9.5	0.1/0.1	2400	20000	0.2	17.0	GYP/POLYMER MUD
860129	17-1/2	1855.0	1.48	24	19	9/21	10.5	0.1/0.1	2400	20000	0.2	17.0	GYP/POLYMER MUD

SAGA PETROLEUM A.S.

6.2.1 MUD PROPERTIES, DAILY REPORT
Well no: 34/4-6

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf / Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
860130	17-1/2	1855.0	1.48	24	19	9/20	10.4	0.1/0.1	2400	19000	0.2	17.0	GYP/POLYMER MUD
860131	12-1/4	1861.0	1.48	17	20	8/22	10.5	0.2/0.3	2800	21000	0.2	18.0	GYP/POLYMER MUD
860201	12-1/4	2127.0	1.55	19	24	14/28	9.8	0.2/0.5	2800	20000	0.2	20.0	GYP/POLYMER MUD
860202	12-1/4	2274.0	1.65	27	25	18/31	10.2	0.2/0.5	1680	19000	0.2	24.0	GYP/POLYMER MUD
860203	12-1/4	2345.0	1.65	21	23	19/31	10.1	0.2/0.8	1680	19000	0.2	24.0	GYP/POLYMER MUD
860204	12-1/4	2443.0	1.68	21	21	18/32	10.2	0.2/0.8	1480	20000	1.0	25.0	GEL MUD
860205	12-1/4	2495.0	1.68	16	18	14/44	10.5	0.2/1.0	1280	20000	1.0	24.0	GEL MUD
860206	12-1/4	2498.0	1.68	18	20	17/38	10.2	0.2/0.8	1280	19000	1.0	24.0	GEL MUD
860207	12-1/4	2549.0	1.70	19	14	5/24	10.4	0.1/0.2	1200	20000	1.0	24.0	GEL MUD
860208	12-1/4	2560.0	1.70	19	13	5/24	10.2	0.2/1.0	720	18000	0.8	24.0	GEL MUD
860209	12-1/4	2576.0	1.70	22	14	4/26	10.4	0.2/0.8	680	19000	1.0	24.0	GEL MUD
860210	12-1/4	2588.0	1.70	22	13	4/24	10.4	0.2/1.1	480	18000	1.0	24.0	GEL MUD
860211	12-1/4	2600.0	1.70	23	14	4/23	10.7	0.3/1.1	480	19000	0.8	24.0	GEL MUD
860212	12-1/4	2614.0	1.70	22	13	3/20	10.8	0.3/0.9	520	19000	1.0	24.0	GEL MUD
860213	12-1/4	2632.0	1.70	22	14	3/23	10.7	0.2/0.8	520	19000	1.0	24.0	GEL MUD
860214	12-1/4	2632.0	1.70	23	15	3/23	10.5	0.2/0.8	560	19000	0.2	24.0	GEL MUD
860215	12-1/4	2650.0	1.70	22	16	3/21	10.6	0.2/0.7	560	19000	0.2	24.0	GEL MUD
860216	12-1/4	2746.0	1.70	20	16	3/21	10.5	0.2/0.7	620	19000	0.5	24.0	GEL MUD
860217	12-1/4	2770.0	1.70	20	16	3/20	10.7	0.2/0.6	600	19000	0.5	24.0	GEL MUD
860218	12-1/4	2770.0	1.70	22	16	3/23	10.7	0.2/0.7	600	19000	0.5	24.0	GEL MUD
860219	12-1/4	2770.0	1.70	22	16	3/23	10.7	0.2/0.7	600	19000	0.3	24.0	GEL MUD
860220	12-1/4	2770.0	1.70	22	16	3/21	10.5	0.2/0.7	600	19000	0.2	24.0	GEL MUD
860221	12-1/4	2770.0	1.70	27	16	3/21	10.7	0.2/0.7	600	19000	0.2	24.0	GEL MUD
860222	12-1/4	2770.0	1.70	27	16	3/28	10.7	0.2/0.7	600	19000	0.2	24.0	GEL MUD
860223	12-1/4	2770.0	1.62	43	17	5/23	9.9	0.1/0.4	600	17000	0.2	21.0	GEL MUD
860224	12-1/4	2770.0	1.62	26	14	3/20	9.9	0.1/0.4	600	17000	0.2	21.0	GEL MUD
860225	8-1/2	2792.0	1.62	19	14	4/31	11.4	0.2/0.8	600	17000	0.2	21.0	GEL MUD
860226	8-1/2	2862.0	1.62	21	15	7/41	11.4	0.2/0.7	450	13000	0.2	21.0	GEL MUD
860227	8-1/2	2993.0	1.62	17	16	9/42	11.2	0.2/0.8	480	13000	0.5	21.0	GEL MUD
860228	8-1/2	3039.0	1.62	18	14	5/35	11.1	0.2/1.0	540	13000	0.3	21.0	GEL MUD

SAGA PETROLEUM A.S.

6.2.1 MUD PROPERTIES, DAILY REPORT
Well no: 34/4-6

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf / Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
860301	8-1/2	3152.0	1.62	17	16	8/45	10.6	0.2/0.7	250	13000	0.3	21.0	GEL MUD
860302	8-1/2	3201.0	1.62	19	16	9/40	10.6	0.1/1.0	200	13000	0.3	22.0	GEL MUD
860303	8-1/2	3282.0	1.62	17	14	8/40	10.6	0.2/0.8	200	12000	0.3	22.0	GEL MUD
860304	8-1/2	3282.0	1.62	17	14	8/39	10.6	0.2/0.9	200	11000	0.3	22.0	GEL MUD
860305	8-1/2	3282.0	1.70	18	15	9/40	11.0	0.2/0.7	230	11000	0.3	22.0	GEL MUD
860306	8-1/2	2700.0	1.70	17	16	10/45	11.6	0.3/0.7	230	11000	0.3	22.0	GEL MUD
860307	8-1/2	2700.0	1.70	18	14	10/40	12.4	0.2/0.7	250	11000	0.3	22.0	GEL MUD
860308	8-1/2	2720.0	1.70	18	14	10/41	12.4	0.2/0.7	250	11000	0.3	22.0	GEL MUD
860309	8-1/2	2720.0	1.70	18	14	10/40	12.4	0.2/0.7	250	11000	0.3	22.0	GEL MUD
860310	8-1/2	2720.0	1.70	18	13	10/40	12.4	0.3/0.7	350	11000	0.3	22.0	GEL MUD
860311	8-1/2	2720.0	1.70	18	13	10/40	12.4	0.3/0.7	350	11000	0.3	22.0	GEL MUD
860312	8-1/2	2720.0	1.70	18	13	10/40	12.4	0.3/0.7	350	11000	0.3	22.0	GEL MUD
860313	8-1/2	2720.0	1.70	18	13	8/41	12.4	0.4/0.7	350	11000	0.3	22.0	GEL MUD
860314	8-1/2	2720.0	1.70	19	14	10/42	12.2	0.4/0.8	350	11000	0.3	22.0	GEL MUD
860315	8-1/2	2720.0	1.70	18	14	11/41	12.2	0.4/0.8	350	11000	0.3	22.0	GEL MUD
860316	8-1/2	2720.0	1.70	17	13	10/40	11.9	0.4/0.8	350	11000	0.3	22.0	GEL MUD
860317	8-1/2	2720.0	1.70	17	13	12/42	11.7	0.4/0.8	350	11000	0.3	22.0	GEL MUD
860318	8-1/2	2720.0	1.70	19	14	14/50	11.4	0.2/0.7	300	10000	0.3	22.0	GEL MUD
860319	8-1/2	2490.0	1.70	19	15	14/50	11.4	0.2/0.7	300	10000	0.3	22.0	GEL MUD
860320	8-1/2	2500.0	1.70	19	15	14/50	11.2	0.2/0.7	300	11000	0.3	22.0	GEL MUD
860321	8-1/2	2500.0	1.70	18	14	12/45	11.2	0.2/0.7	300	11000	0.3	22.0	GEL MUD
860322	8-1/2	2500.0	1.70	18	14	12/45	11.2	0.2/0.7	300	11000	0.3	22.0	GEL MUD
860323		400.0	1.03	18	14	12/45	11.2	0.2/0.7	300	11000	0.3	22.0	GEL MUD

SAGA PETROLEUM A.S.

6.2.2 MUD MATERIALS USED

Well no: 34/4-6

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	213	355	719	241	1528
BICARBONATE	50 KG	3	0	4	0	27	34
PROTHIN	25KG	0	0	16	506	89	611
CAUSTIC SODA	25 KG	24	26	59	177	12	298
DRISPAC REG	50 LB	0	0	132	5	9	146
DRISPAC S/L	50 LB	0	0	0	128	6	134
GYPSUM	50 KG	0	0	520	27	0	547
MILBIO	55 GA	0	0	6	2	0	8
MILPOL 302	25 KG	0	0	132	21	0	153
PERMALOSE	25 KG	0	0	274	46	0	320
PRO-DEFOAMER	25 L	0	0	2	13	5	20
SODA ASH	50 KG	0	1	0	0	2	3
W.0.21	25 KG	0	0	0	0	2	2
BENTONITE	M/T	23	65	0	0	8	96

Saga Petroleum a.s.

6.3. Casing Data

Well no: 34/4-6

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 type	CENTRALIZERS depth m	REMARKS
30"	3.1.86	B	10	124.26	(309)	ST-2	520.76	-	-	-	
20"	19.1.86	X-56	41	508.05	(133)	LS	903.65	888.05	Bow	834 m	Connection torque 25.000 ft lb
										846 m	
										859 m	
										871 m	
										884 m	
										898 m	
									Pos.	408 m	
										519 m	
13 3/8"	30.1.86	N-80	123	1444.28	(72)	Buttress	1841	1816	Bow	1763 m	Connection torque ~10.000 ft. lbs
										1775 m	Pack off torque ~10.000 ft. lbs
										1787 m	
										1799 m	
										1811 m	
										1823 m	
										1838 m	
									Pos.	885 m	
										897 m	
9 5/8"	22.2.86	N-80	176	2363.7	(47)	Buttress	2760	2733	Bow	2542 m	Connection torque ~10.000 ft. lbs
										2556 m	Pack off torque ~ 15.000 ft. lbs
										2569 m	Emergency pack off ~ 18.000 ft. lbs.
										2583 m	Good returns while running most of casing.
										2597 m	Lost ~ 10 bbls during last 20 jts.
										2611 m	
										2617 m	
										2631 m	
										2644 m	
										2657 m	
										2671 m	
										2686 m	
										2698 m	
										2712 m	

Saga Petroleum a.s.

6.3. Casing Data

Well no: 34/4-6

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 type	CENTRALIZERS depth m	REMARKS
9 5/8"	22.2.86	N-80	176	236 .7	(47)	Buttress	2760	2733	Bow Pos.	2725 m 2740 m 2753 m 1819 m 1833 m	

Saga Petroleum a.s.

6.4. Cement Data

Well no: 34/4-6

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
3.1.86	30" csg	520.76	G	Lead: 1.68	59.8	D75:2.22	69.6	-	
				Tail: 1.90	16.8	D77:4.44	42.7	-	
20.1.86	20" csg	903.65	G	Lead: 1.56	120	D75:3.2 D81:0.27	92.3		
				Tail: 1.89	15.6	D77:1.78	44.3		
31.1.86	13 3/8" csg	1841	G	Lead: 1.58	65.7	D75:3.02 D604:1.33 D81:0.98	85.86	-	
				Tail: 1.90	16.4	D604:1.33 D81:0.36	FW:42.47		
23.2.86	9 5/8" csg	2760	G	1.90	62.6	D603:1.78 D604:1.78 D81:0.36	FW:41.20	105*	Lost return after 2800 strokes while circulating before pumping cmt. *Total loss during circulation, pumping and displacement: 105 m^3.
5.3.86	P & A I, II, III		G	1.90	20.2	D604:0.90 D81:0.36	FW:41.19		Cement plug I 3270 - 3090 m II 3070 - 2890 m III 2870 - 2700 m
6.3.86	9 5/8" squeeze before DST		G	1.90	3.34	D603:2.22 D604:2.22	FW:40.31		
20.3.86	Squeeze DST perforations		G	1.89	6.36	D603:2.24 D604.2.24	FW:40.31		
23.3.86	P & A plugs		G	1.89	20.0	D77:4.44	47.1		Cement plugs: 640 - 440 m

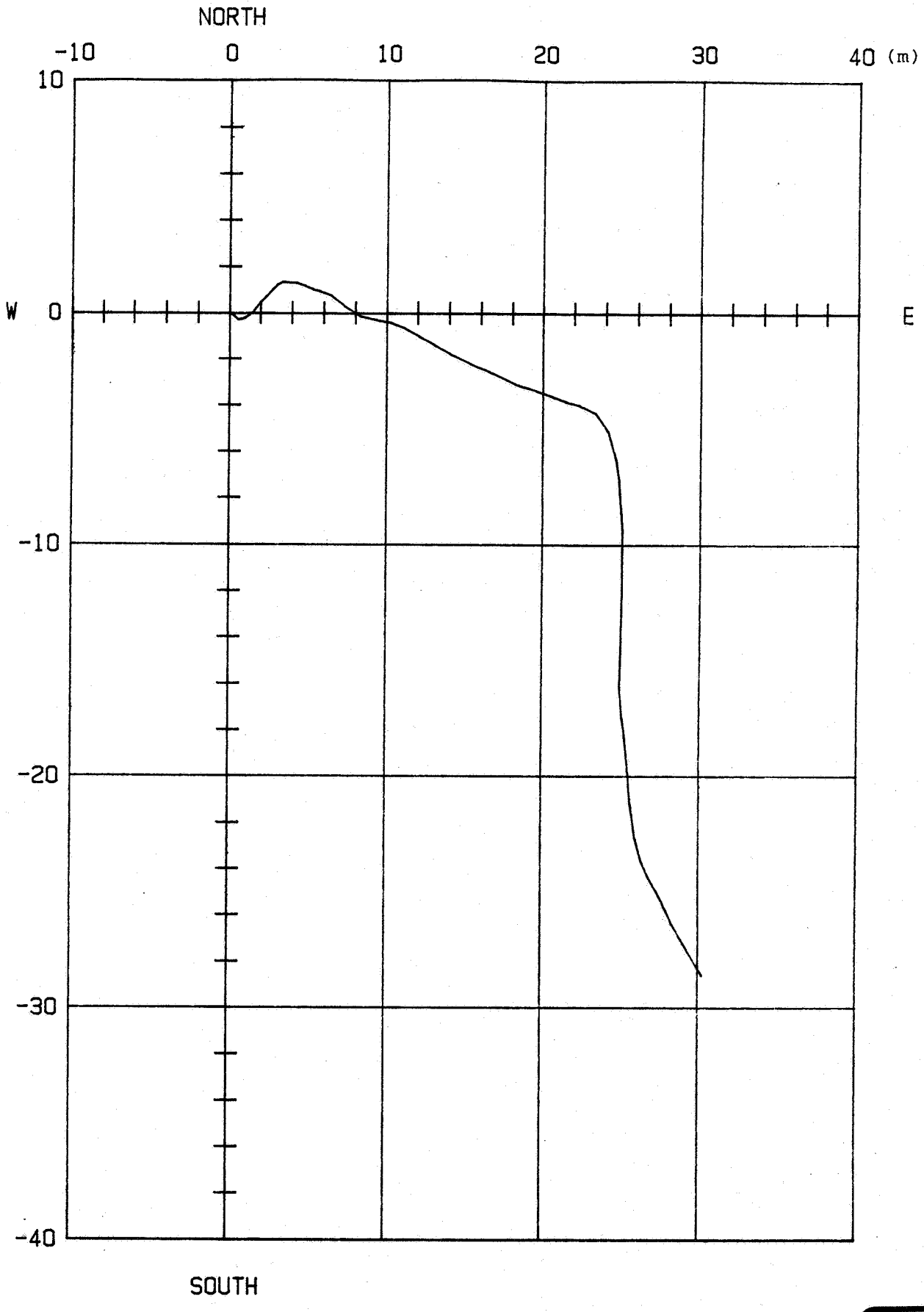
MD meter	TVD meter	INCLIN. deg.	AZIMUT deg.	DOGLEG °/30m	+N,-S meter	+E,-W meter
395.00	395.00	0.00	0.00	0.00	+0.00	+0.00
546.00	546.00	.21	124.00	.04	-.11	+.20
593.00	593.00	.20	124.00	.01	-.20	+.34
641.00	641.00	.30	119.00	.06	-.31	+.52
688.00	688.00	.10	89.00	.14	-.27	+.67
735.00	735.00	.10	89.00	0.00	-.27	+.76
784.00	784.00	.36	59.00	.17	-.22	+.94
831.00	831.00	.40	68.00	.05	-.08	+1.22
887.00	887.00	.40	57.00	.04	+.10	+1.57
911.00	911.00	.40	42.10	.13	+.21	+1.70
953.84	953.83	.58	54.62	.15	+.46	+1.97
998.78	998.77	.47	57.13	.08	+.69	+2.31
1066.01	1066.00	.48	50.47	.03	+1.02	+2.76
1113.14	1113.13	.40	59.55	.07	+1.22	+3.06
1161.95	1161.94	.41	77.95	.08	+1.35	+3.38
1219.36	1219.34	.53	92.64	.09	+1.31	+3.84
1266.39	1266.37	.63	94.90	.07	+1.28	+4.32
1313.68	1313.66	.58	113.09	.13	+1.16	+4.80
1361.20	1361.18	.67	101.70	.10	+1.00	+5.30
1396.69	1396.66	.76	98.25	.08	+.93	+5.73
1446.98	1446.95	.95	112.41	.17	+.73	+6.45
1503.81	1503.77	.98	123.65	.10	+.28	+7.30
1560.35	1560.30	1.20	103.64	.23	-.15	+8.28
1609.00	1608.94	1.28	94.43	.13	-.32	+9.32
1655.67	1655.60	1.11	101.05	.14	-.45	+10.28
1703.26	1703.18	1.09	108.84	.09	-.68	+11.16
1751.00	1750.91	1.22	112.90	.10	-1.03	+12.06
1798.63	1798.53	1.33	111.37	.07	-1.42	+13.04
1845.00	1844.89	1.31	110.49	.02	-1.81	+14.04
1902.88	1902.75	1.31	105.86	.05	-2.22	+15.30
1960.13	1959.99	1.32	105.64	.01	-2.58	+16.56
2030.07	2029.91	1.31	109.30	.04	-3.06	+18.09
2044.35	2044.18	1.27	100.60	.42	-3.14	+18.40
2102.31	2102.13	1.14	102.29	.07	-3.38	+19.60
2160.02	2159.83	.93	105.33	.11	-3.63	+20.61
2211.60	2211.40	.95	102.92	.03	-3.84	+21.43
2263.82	2263.62	.96	98.70	.04	-4.00	+22.28
2326.10	2325.89	1.10	116.90	.17	-4.34	+23.35
2378.00	2377.77	1.40	153.00	.48	-5.13	+24.13
2424.20	2423.96	1.82	162.04	.32	-6.33	+24.63
2454.00	2453.74	1.90	172.23	.34	-7.27	+24.84
2470.00	2469.73	1.95	177.55	.35	-7.80	+24.89
2491.10	2490.82	2.21	168.70	.59	-8.56	+24.98
2511.90	2511.60	2.24	178.57	.55	-9.36	+25.07
2533.88	2533.57	2.13	180.94	.19	-10.20	+25.07
2653.16	2652.77	1.95	181.99	.05	-14.45	+24.96
2700.41	2699.99	2.02	173.90	.18	-16.08	+24.90
2738.34	2737.90	2.23	171.27	.18	-17.48	+25.08
2761.82	2761.36	2.02	165.76	.37	-18.33	+25.26
2804.26	2803.77	2.15	177.56	.32	-19.85	+25.48
2841.36	2840.85	2.03	170.86	.22	-21.20	+25.62
2889.15	2888.61	1.62	165.18	.28	-22.69	+25.93
2936.24	2935.69	.96	150.33	.47	-23.67	+26.33
2984.65	2984.09	1.00	142.75	.08	-24.36	+26.79
3032.73	3032.17	.94	136.51	.08	-24.98	+27.32
3080.83	3080.26	1.06	150.58	.17	-25.65	+27.81
3127.97	3127.39	1.03	143.17	.09	-26.37	+28.28
3186.10	3185.51	1.20	132.61	.14	-27.21	+29.04
3271.60	3270.99	1.26	145.36	.10	-28.59	+30.24

Radius of curvature methode.

Saga Petroleum a.s.

DATE 23.7.86	AUTH. FL
DRAW. BY FL	APPR.
REF. Well 34/4-6	

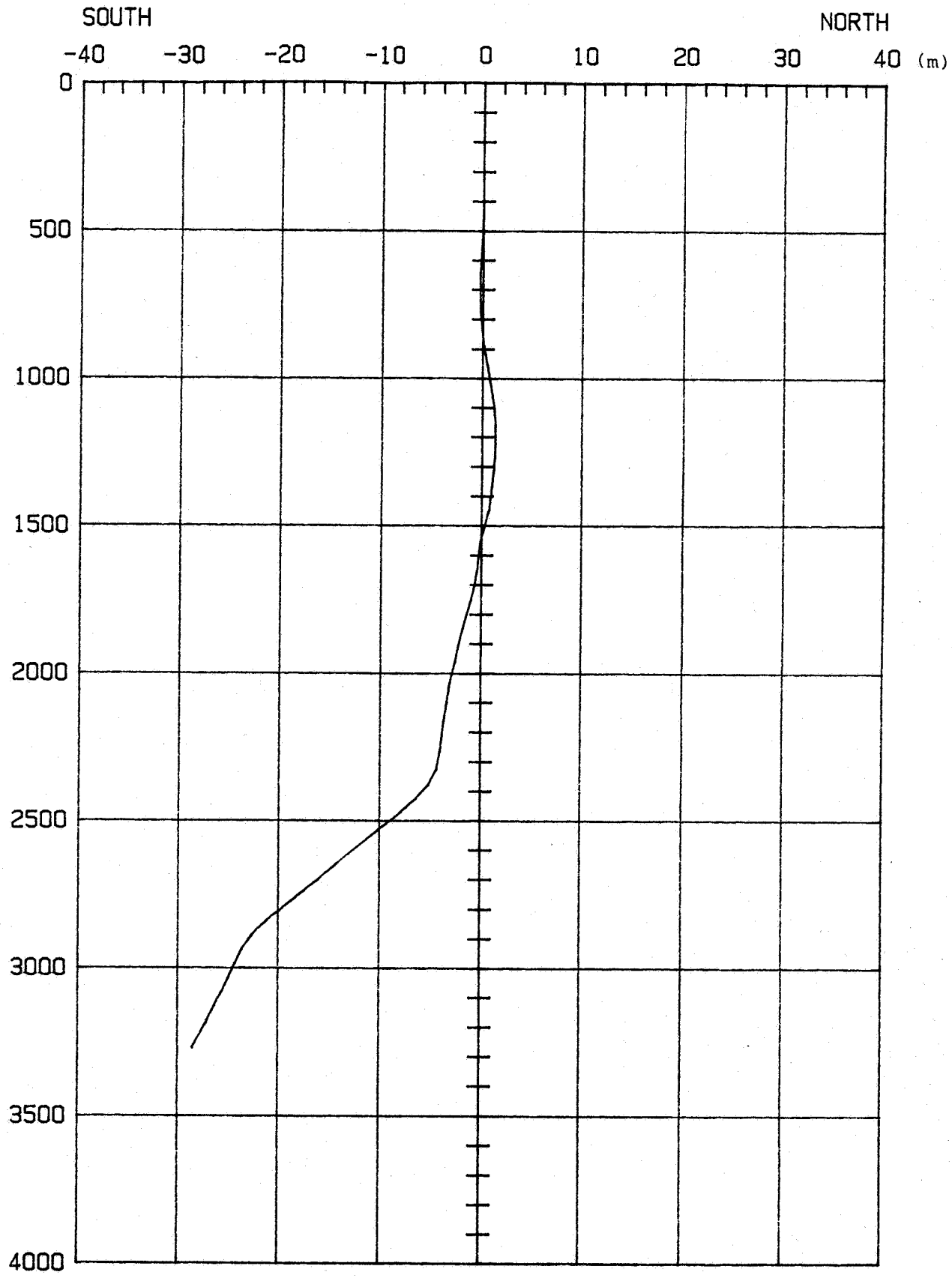
6.5.1 Horizontal projection



Saga Petroleum a.s.

DATE 23.7.86	AUTH. FL
DRAW. BY FL	APPR.
REF. Well 34/4-6	

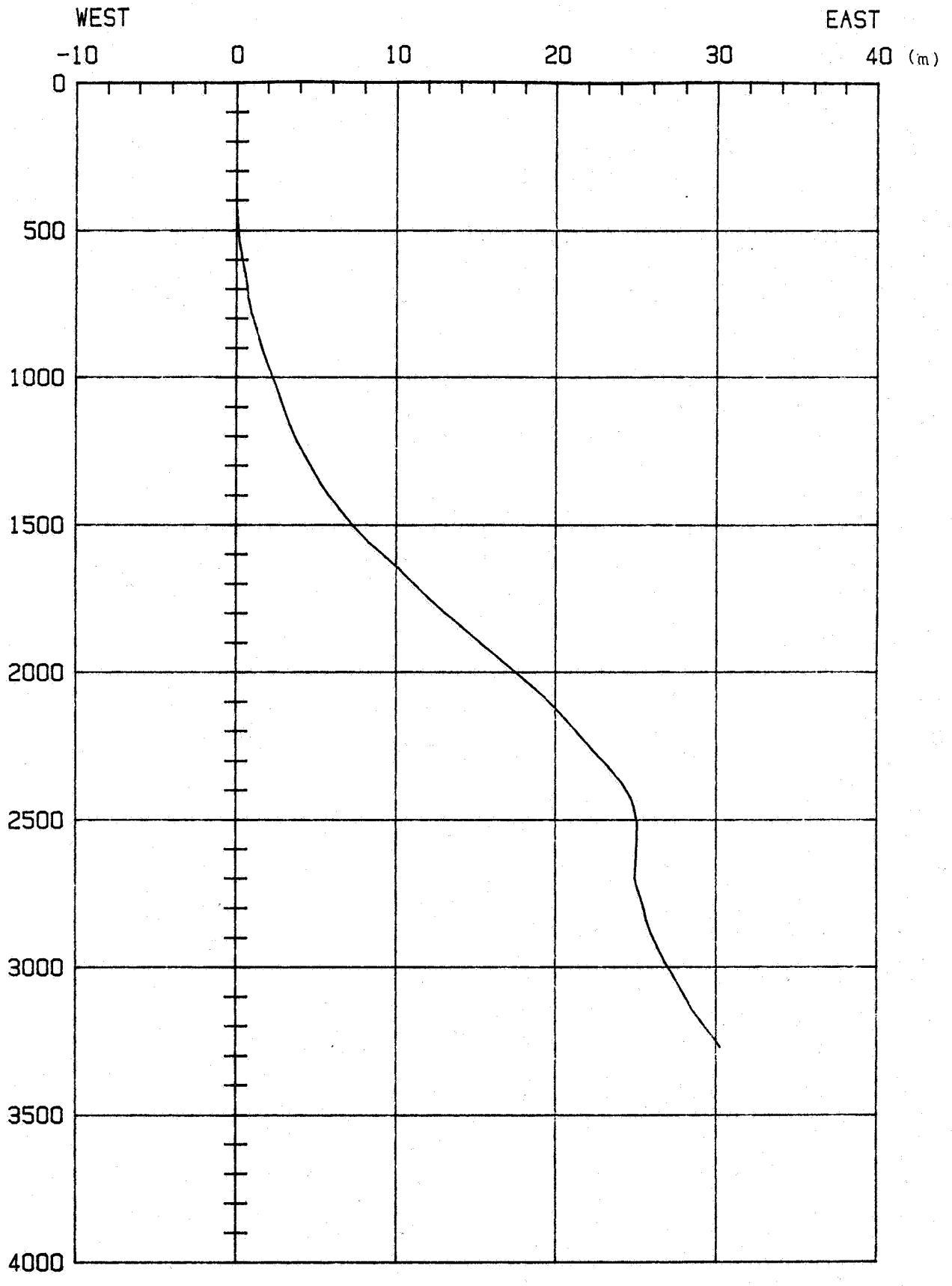
6.5.2 Vertical projection, looking west



Saga Petroleum a.s.

DATE 23.7.86	AUTH. FL
DRAW. BY FL	APPR.
REF. Well 34/4-6	

6.5.2 Vertical projection, looking north



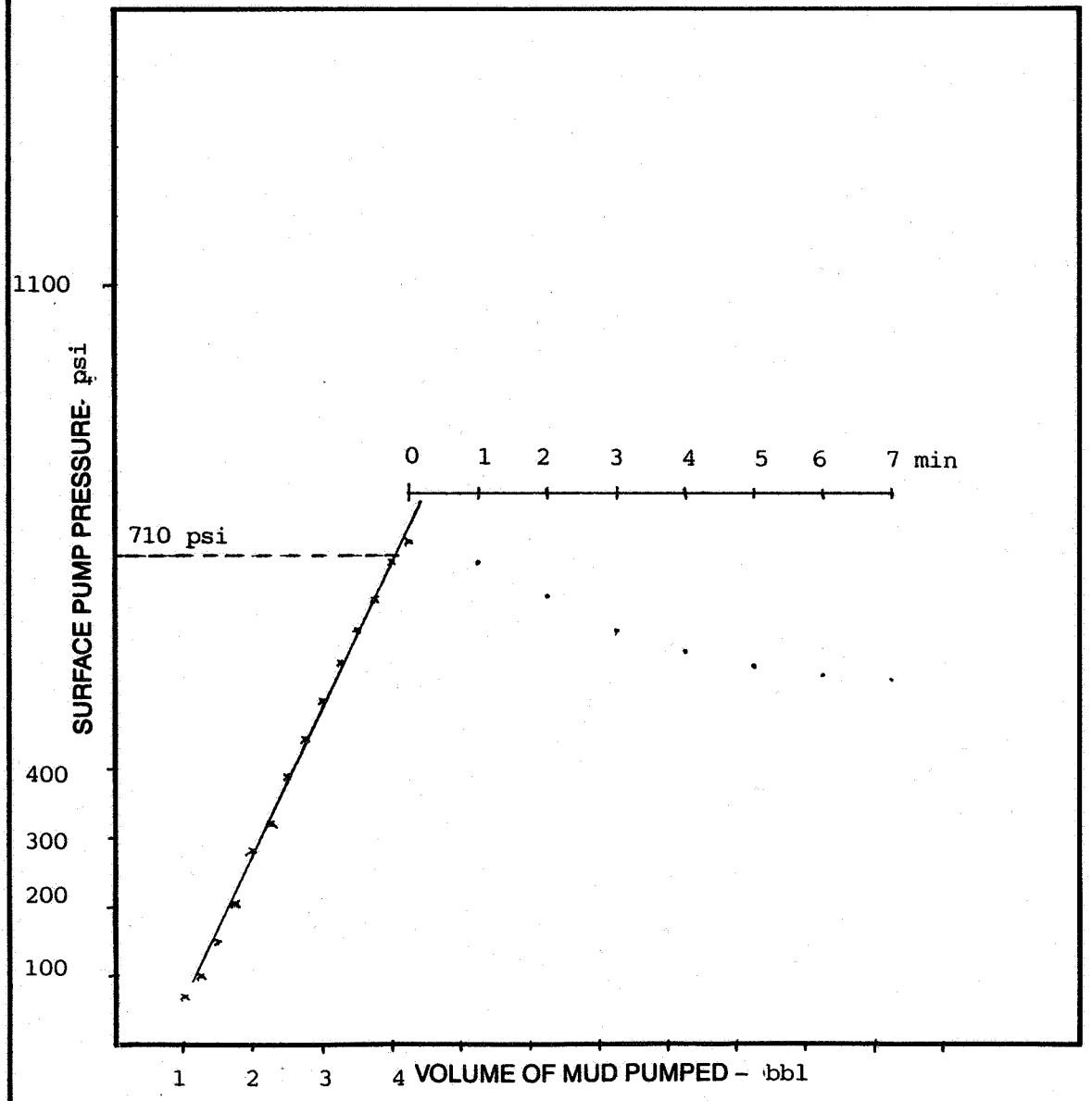
Saga Petroleum a.s.

DATE 23.7.86	AUTH. FL
DRAW. BY FL	APPR.
REF. Well 34/4-6	

Saga Petroleum a.s.

6.6. Formation Leak off Test Data

Well no: 34/4-6



WELL	DATE
34/4-6	23.1.86

CSG. SIZE 20"	VOLUME PUMPED 4.25 bbl
CSG. SHOE DEPTH 904 m	VOLUME RECOVERED 3.85 bbl
WATER DEPTH 373 m	FORMATION TYPE Clay
HOLE SIZE 17 1/2"	LEAK OFF PRESSURE 710 psi
HOLE DEPTH 925 m	SHUT-IN PRESSURE 730 m
MUD WEIGHT 1.10 SG	SHUT-IN TIME 7 min
PUMP RATE 1/4 bbl/min	

EQV. MUD WEIGHT AT CSG. SHOE: 1.65 SG

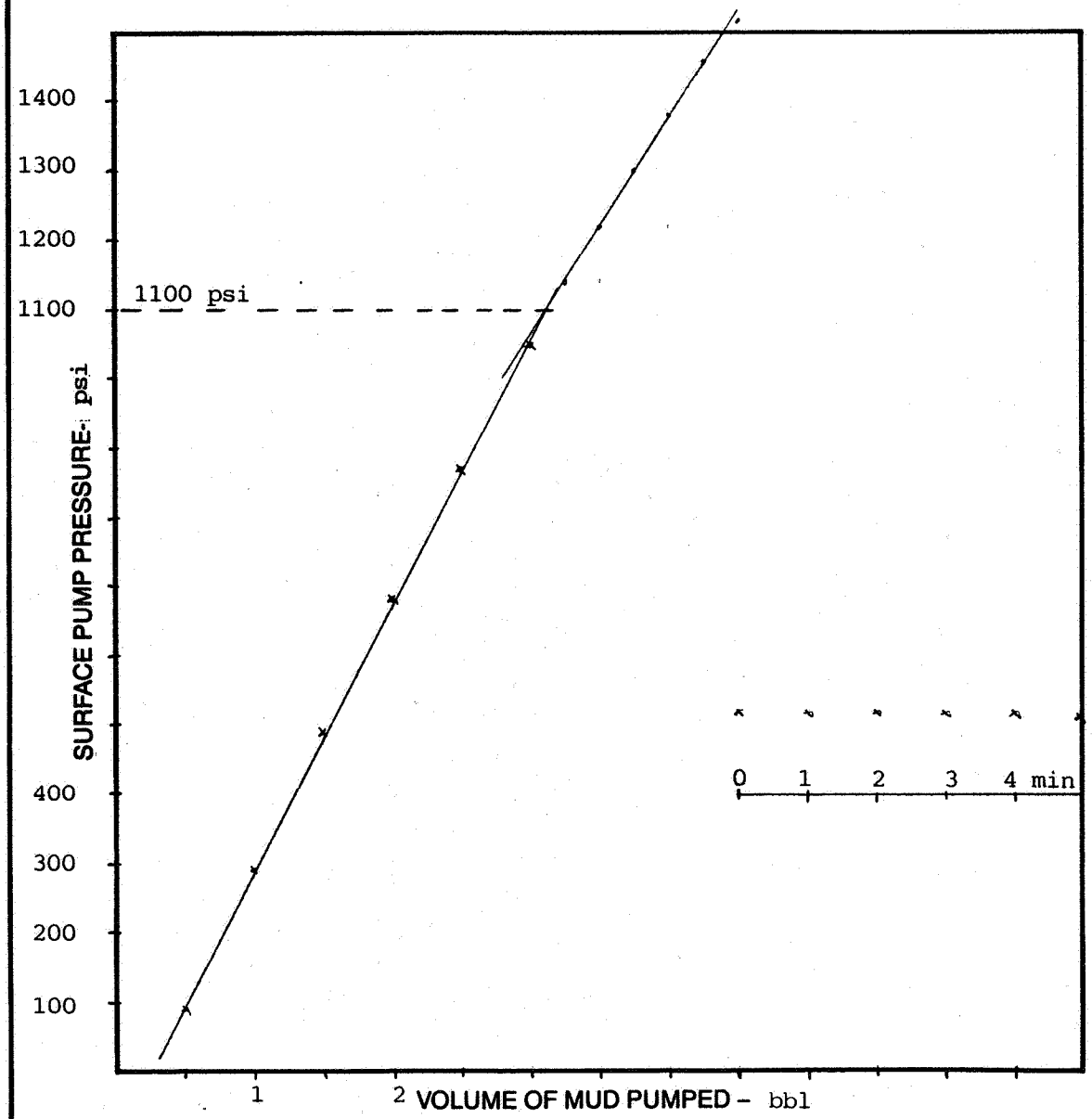
bbl/psi	bbl/psi	min/psi	min/psi
1.00/70	2.75/445	1/700	
1.25/100	3.00/500	2/650	
1.50/150	3.25/555	3/600	
1.75/205	3.50/600	4/570	
2.00/280	3.75/645	5/550	
2.25/320	4.00/700	6/535	
2.50/390	4.25/730	7/530	

Industritrykk 31726

Saga Petroleum a.s.

6.6. Formation Leak off Test Data

Well no: 34/4-6



WELL	DATE
34/4-6	31.1.86

CSG. SIZE	VOLUME PUMPED
13 3/8"	4.6 bbl
CSG. SHOE DEPTH	**VOLUME RECOVERED**
1841 m	3.0 bbl
WATER DEPTH	**FORMATION TYPE**
373 m	Claystone
HOLE SIZE	**LEAK OFF PRESSURE**
12 1/4"	1100 psi
HOLE DEPTH	**SHUT-IN PRESSURE**
1861	520 psi
MUD WEIGHT	**SHUT-IN TIME**
1.48	5 min
PUMP RATE	
1/4 bbl/min	

EQV. MUD WEIGHT AT CSG. SHOE: 1.90 **SG**

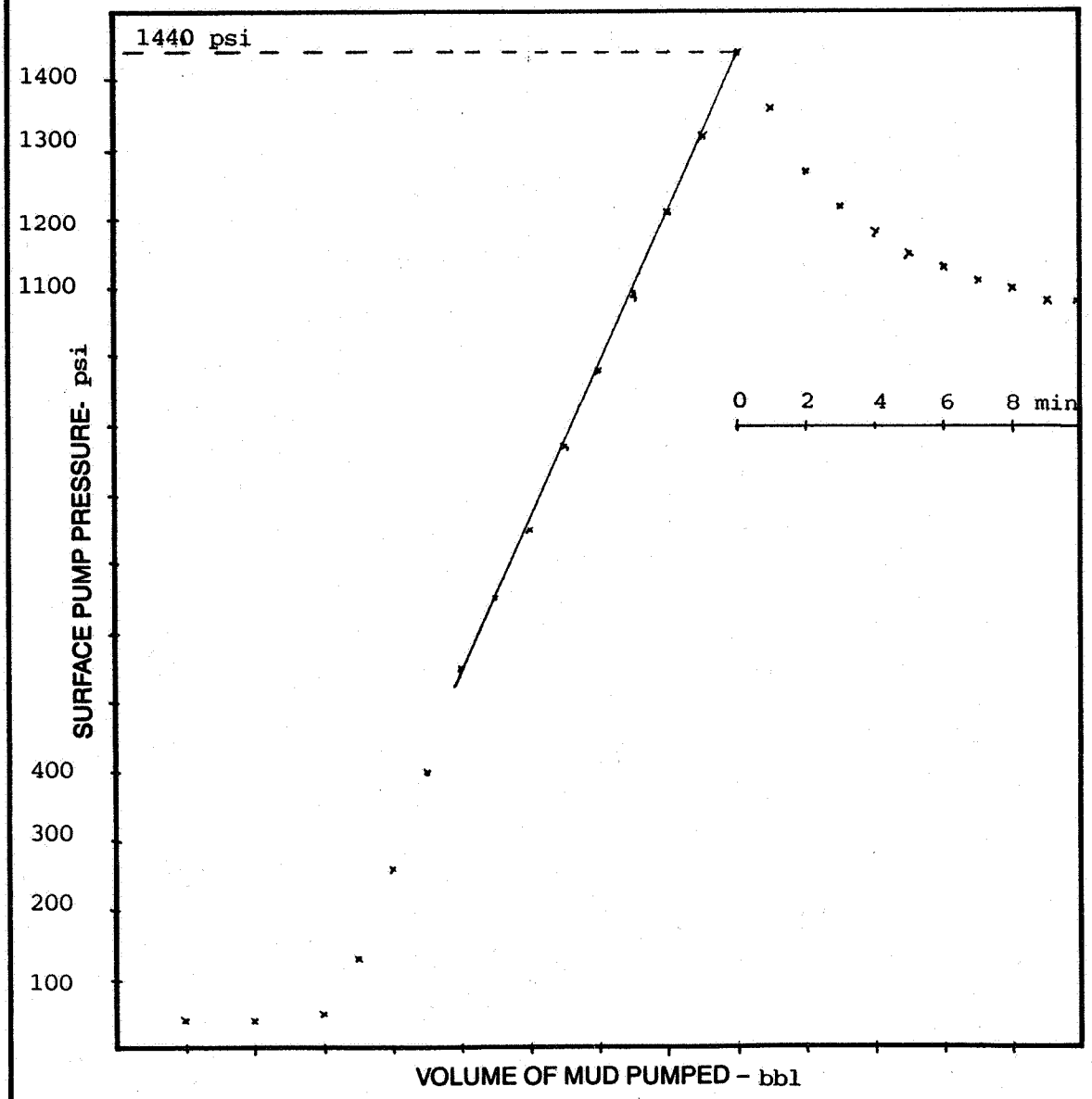
bbl/psi	bbl/psi	min/psi	min/psi
0.50/90	3.50/1220	0/520	
1.00/290	3.75/1300	1/520	
1.50/490	4.00/1380	2/520	
2.00/680	4.25/1460	3/520	
2.50/870	4.50/1520	4/520	
3.00/1050		5/520	
3.25/1140			

Industritrykk 31726

Saga Petroleum a.s.

6.6. Formation Leak off Test Data

Well no: 34/4-6



WELL	DATE
34/4-6	25.2.86

CSG. SIZE	VOLUME PUMPED
9 5/8"	4.5 bbl
CSG. SHOE DEPTH	**VOLUME RECOVERED**
2760 m	2.5 bbl
WATER DEPTH	**FORMATION TYPE**
373	Sandstone, calcareus cemented
HOLE SIZE	**LEAK OFF PRESSURE**
8 1/2"	1440 psi (no leak off)
HOLE DEPTH	**SHUT-IN PRESSURE**
2775	1080 psi
MUD WEIGHT	**SHUT-IN TIME**
1.62	10 min
PUMP RATE	
1/4 bbl/min	

EQV. MUD WEIGHT AT CSG. SHOE: > 1.99 **SG**

bbl/psi	bbl/psi	bbl/psi	min/psi
0.50/40	2.75/650	4.50/1440	4/1180
1.00/40	3.00/750		5/1150
1.50/50	3.25/870	min/psi	6/1130
1.75/130	3.50/980	0/1440	7/1110
2.00/260	3.75/1090	1/1360	8/1100
2.25/400	4.00/1210	2/1270	9/1080
2.50/550	4.25/1330	3/1220	10/1080

Industritrykk 31726

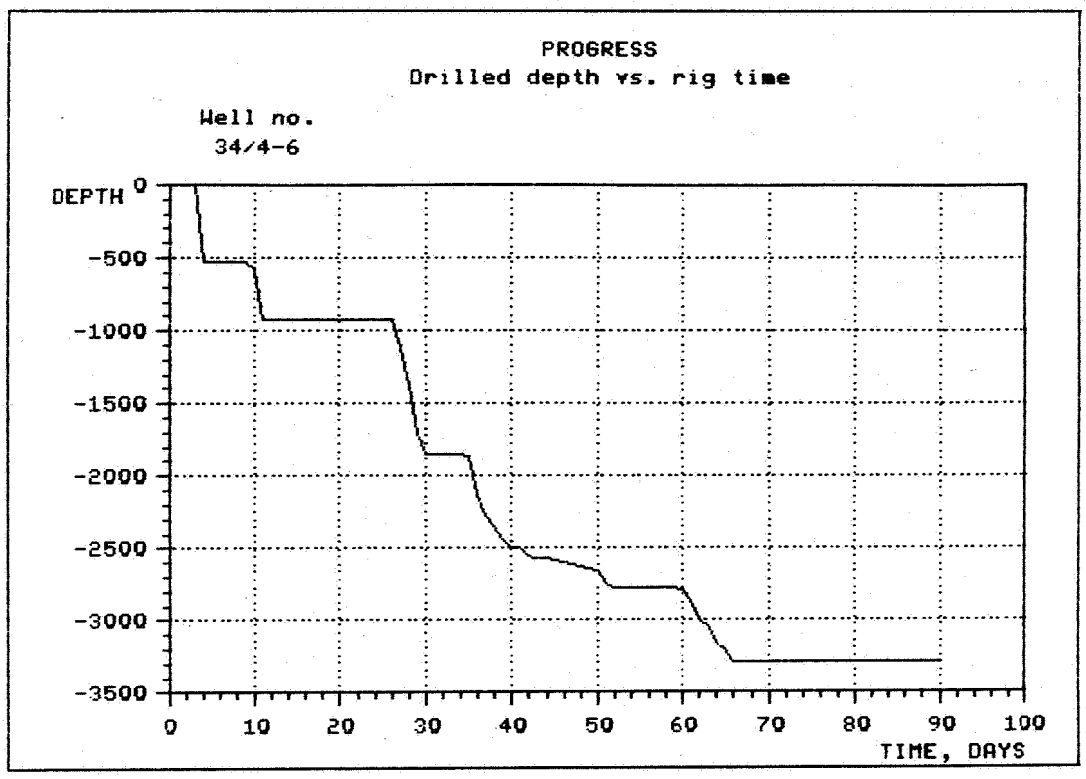
SAGA PETROLEUM A.S. 6.7. RIG TIME DISTRIBUTION

Well no: 34/4-6

Mainoperation	Suboperation	Hours	% of total rig time
MOVING	ANCHOR	60.8	2.9
Sum :		60.8	2.9
DRILLING	BOP ACTIVITIES	16.5	0.8
DRILLING	BOP/WELLHEAD EQ	217.0	10.2
DRILLING	CASING	157.0	7.4
DRILLING	CIRC/COND	52.0	2.4
DRILLING	DRILL	327.5	15.4
DRILLING	HOLE OPEN	31.0	1.5
DRILLING	OTHER	36.0	1.7
DRILLING	PRESS DETECTION	2.0	0.1
DRILLING	REAM	11.0	0.5
DRILLING	SURVEY	2.5	0.1
DRILLING	TRIP	267.5	12.6
DRILLING	UNDERREAM	19.0	0.9
DRILLING	WAIT	8.5	0.4
Sum :		1147.5	53.9
FORMATION EVAL	CIRC/COND	13.0	0.6
FORMATION EVAL	CORE	72.0	3.4
FORMATION EVAL	DST	94.0	4.4
FORMATION EVAL	LOG	131.0	6.2
FORMATION EVAL	OTHER	19.0	0.9
FORMATION EVAL	TRIP	156.0	7.3
Sum :		485.0	22.8
INTERRUPTION	MAINTAIN/REP	45.5	2.1
INTERRUPTION	OTHER	2.5	0.1
INTERRUPTION	WAIT	316.0	14.9
Sum :		364.0	17.1
PLUG & ABANDON	CEMENT PLUG	1.0	0.0
PLUG & ABANDON	CIRC/COND	2.5	0.1
PLUG & ABANDON	CUT	7.0	0.3
PLUG & ABANDON	EQUIP RECOVERY	22.0	1.0
PLUG & ABANDON	MECHANICAL PLUG	1.0	0.0
PLUG & ABANDON	OTHER	5.0	0.2
PLUG & ABANDON	PERFORATE	6.0	0.3
PLUG & ABANDON	TRIP	26.0	1.2
Sum :		70.5	3.3
Total rig time :		2127.8	100.0

Saga Petroleum a.s.

6.7.1. Drilled Depth vs. Rig Time
Well no: 34/4-6



SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 1 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
28.12.85	MOVING	ANCHOR	5.0	
	Sum :			5.0
29.12.85	MOVING	ANCHOR	24.0	
	Sum :			24.0
30.12.85	DRILLING	BOP/WELLHEAD EQ	3.0	
	DRILLING	OTHER	3.0	
	DRILLING	TRIP	5.0	
	INTERRUPTION	MAINTAIN/REP	1.5	
	MOVING	ANCHOR	11.5	
	Sum :			24.0
31.12.85	DRILLING	DRILL	15.0	
	DRILLING	OTHER	0.5	
	DRILLING	SURVEY	1.5	
	DRILLING	TRIP	5.5	
	INTERRUPTION	MAINTAIN/REP	1.5	
	Sum :			24.0
01.01.86	DRILLING	HOLE OPEN	19.5	
	DRILLING	OTHER	0.5	
	DRILLING	TRIP	4.0	
	Sum :			24.0
02.01.86	DRILLING	CASING	12.0	
	DRILLING	CIRC/COND	1.0	
	DRILLING	HOLE OPEN	2.0	
	DRILLING	SURVEY	0.5	
	DRILLING	TRIP	3.0	
	INTERRUPTION	WAIT	5.5	
	Sum :			24.0
03.01.86	DRILLING	CASING	7.0	
	DRILLING	WAIT	3.0	
	INTERRUPTION	MAINTAIN/REP	4.0	
	INTERRUPTION	WAIT	10.0	
	Sum :			24.0
04.01.86	DRILLING	CASING	2.5	
	DRILLING	CIRC/COND	1.0	
	DRILLING	OTHER	2.5	
	DRILLING	TRIP	11.5	
	DRILLING	WAIT	5.5	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
05.01.86	DRILLING	BOP/WELLHEAD EQ	10.0	
	DRILLING	CASING	4.0	
	DRILLING	CIRC/COND	0.5	
	DRILLING	TRIP	2.5	
	INTERRUPTION	MAINTAIN/REP	1.5	
	MOVING	ANCHOR	5.5	
	Sum :			24.0
06.01.86	DRILLING	BOP/WELLHEAD EQ	13.5	
	DRILLING	DRILL	3.0	
	DRILLING	TRIP	5.5	
	INTERRUPTION	MAINTAIN/REP	2.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 2 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
07.01.86	DRILLING	CIRC/COND	2.5	
	DRILLING	DRILL	19.5	
	DRILLING	PRESS DETECTION	1.0	
	DRILLING	SURVEY	0.5	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
08.01.86	DRILLING	TRIP	4.0	
	FORMATION EVAL	CIRC/COND	2.0	
	FORMATION EVAL	LOG	11.5	
	FORMATION EVAL	TRIP	6.5	
	Sum :			24.0
09.01.86	DRILLING	TRIP	3.0	
	DRILLING	UNDERREAM	19.0	
	FORMATION EVAL	LOG	1.5	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
10.01.86	INTERRUPTION	WAIT	24.0	
	Sum :			24.0
11.01.86	INTERRUPTION	WAIT	24.0	
	Sum :			24.0
12.01.86	DRILLING	BOP/WELLHEAD EQ	6.0	
	INTERRUPTION	WAIT	18.0	
	Sum :			24.0
13.01.86	DRILLING	BOP/WELLHEAD EQ	15.5	
	INTERRUPTION	WAIT	8.5	
	Sum :			24.0
14.01.86	DRILLING	BOP/WELLHEAD EQ	16.0	
	INTERRUPTION	MAINTAIN/REP	6.0	
	INTERRUPTION	OTHER	2.0	
	Sum :			24.0
15.01.86	DRILLING	BOP/WELLHEAD EQ	6.5	
	DRILLING	OTHER	2.0	
	INTERRUPTION	WAIT	15.5	
	Sum :			24.0
16.01.86	DRILLING	BOP/WELLHEAD EQ	10.5	
	INTERRUPTION	WAIT	13.5	
	Sum :			24.0
17.01.86	DRILLING	BOP/WELLHEAD EQ	11.0	
	DRILLING	TRIP	3.0	
	INTERRUPTION	MAINTAIN/REP	9.0	
	INTERRUPTION	WAIT	1.0	
	Sum :			24.0
18.01.86	DRILLING	HOLE OPEN	8.0	
	DRILLING	OTHER	1.5	
	DRILLING	TRIP	8.5	
	INTERRUPTION	WAIT	6.0	
	Sum :			24.0
19.01.86	DRILLING	CASING	14.0	
	DRILLING	CIRC/COND	1.5	
	DRILLING	HOLE OPEN	1.5	
	DRILLING	TRIP	7.0	
	Sum :			24.0
20.01.86	DRILLING	BOP/WELLHEAD EQ	18.0	
	DRILLING	CASING	6.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 3 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
21.01.86	DRILLING	BOP/WELLHEAD EQ	19.0	
	INTERRUPTION	WAIT	5.0	
	Sum :			24.0
22.01.86	DRILLING	BOP/WELLHEAD EQ	15.5	
	DRILLING	OTHER	1.0	
	DRILLING	TRIP	7.5	
	Sum :			24.0
23.01.86	DRILLING	CASING	4.5	
	DRILLING	CIRC/COND	1.0	
	DRILLING	DRILL	16.0	
	DRILLING	PRESS DETECTION	1.0	
	DRILLING	TRIP	1.5	
	Sum :			24.0
24.01.86	DRILLING	CIRC/COND	1.0	
	DRILLING	DRILL	15.0	
	DRILLING	TRIP	6.5	
	INTERRUPTION	MAINTAIN/REP	1.5	
	Sum :			24.0
25.01.86	DRILLING	DRILL	18.5	
	DRILLING	REAM	1.0	
	DRILLING	TRIP	4.5	
	Sum :			24.0
26.01.86	DRILLING	CIRC/COND	3.5	
	DRILLING	DRILL	12.0	
	DRILLING	TRIP	5.0	
	FORMATION EVAL	LOG	3.0	
	INTERRUPTION	MAINTAIN/REP	0.5	
	Sum :			24.0
27.01.86	DRILLING	CASING	2.0	
	DRILLING	CIRC/COND	3.5	
	DRILLING	REAM	0.5	
	DRILLING	TRIP	11.5	
	FORMATION EVAL	LOG	6.5	
	Sum :			24.0
28.01.86	DRILLING	BOP/WELLHEAD EQ	2.5	
	DRILLING	CASING	2.0	
	DRILLING	CIRC/COND	2.0	
	DRILLING	TRIP	8.0	
	FORMATION EVAL	LOG	4.0	
	INTERRUPTION	MAINTAIN/REP	5.5	
	Sum :			24.0
29.01.86	DRILLING	CASING	18.5	
	INTERRUPTION	WAIT	5.5	
	Sum :			24.0
30.01.86	DRILLING	BOP ACTIVITIES	5.0	
	DRILLING	BOP/WELLHEAD EQ	4.0	
	DRILLING	CASING	5.0	
	DRILLING	OTHER	6.0	
	DRILLING	TRIP	4.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 4 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
31.01.86	DRILLING	CASING	12.5	
	DRILLING	CIRC/COND	0.5	
	DRILLING	DRILL	2.0	
	DRILLING	OTHER	1.0	
	DRILLING	REAM	0.5	
	DRILLING	TRIP	4.0	
	INTERRUPTION	MAINTAIN/REP	3.5	
	Sum :			24.0
01.02.86	DRILLING	CIRC/COND	2.0	
	DRILLING	DRILL	19.5	
	DRILLING	OTHER	1.0	
	DRILLING	TRIP	1.5	
	Sum :			24.0
02.02.86	DRILLING	CIRC/COND	6.0	
	DRILLING	DRILL	16.0	
	DRILLING	REAM	1.0	
	DRILLING	TRIP	0.5	
	INTERRUPTION	OTHER	0.5	
	Sum :			24.0
03.02.86	DRILLING	DRILL	10.5	
	DRILLING	OTHER	2.0	
	DRILLING	REAM	0.5	
	DRILLING	TRIP	11.0	
	Sum :			24.0
04.02.86	DRILLING	DRILL	24.0	
	Sum :			24.0
05.02.86	DRILLING	DRILL	24.0	
	Sum :			24.0
06.02.86	DRILLING	BOP/WELLHEAD EQ	6.0	
	DRILLING	CIRC/COND	2.0	
	DRILLING	DRILL	2.0	
	DRILLING	TRIP	12.0	
	INTERRUPTION	MAINTAIN/REP	2.0	
	Sum :			24.0
07.02.86	DRILLING	CIRC/COND	2.0	
	DRILLING	DRILL	14.5	
	DRILLING	TRIP	7.5	
	Sum :			24.0
08.02.86	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	15.0	
	FORMATION EVAL	TRIP	8.0	
	Sum :			24.0
09.02.86	DRILLING	CIRC/COND	2.0	
	DRILLING	DRILL	3.5	
	DRILLING	REAM	1.5	
	DRILLING	TRIP	12.0	
	FORMATION EVAL	CORE	1.5	
	FORMATION EVAL	TRIP	3.5	
	Sum :			24.0
10.02.86	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	11.0	
	FORMATION EVAL	TRIP	12.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 5 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
11.02.86	FORMATION EVAL	CIRC/COND	2.5	
	FORMATION EVAL	CORE	10.0	
	FORMATION EVAL	OTHER	1.0	
	FORMATION EVAL	TRIP	10.5	
	Sum :			24.0
12.02.86	FORMATION EVAL	CIRC/COND	1.0	
	FORMATION EVAL	CORE	8.5	
	FORMATION EVAL	OTHER	3.5	
	FORMATION EVAL	TRIP	11.0	
	Sum :			24.0
13.02.86	FORMATION EVAL	CIRC/COND	0.5	
	FORMATION EVAL	CORE	16.0	
	FORMATION EVAL	TRIP	6.5	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
14.02.86	DRILLING	BOP ACTIVITIES	7.0	
	DRILLING	CIRC/COND	1.0	
	DRILLING	REAM	3.0	
	DRILLING	TRIP	6.0	
	FORMATION EVAL	OTHER	2.0	
	FORMATION EVAL	TRIP	5.0	
	Sum :			24.0
15.02.86	DRILLING	TRIP	5.5	
	FORMATION EVAL	CORE	10.0	
	FORMATION EVAL	OTHER	1.0	
	FORMATION EVAL	TRIP	7.5	
	Sum :			24.0
16.02.86	DRILLING	DRILL	11.0	
	DRILLING	TRIP	7.5	
	FORMATION EVAL	OTHER	1.0	
	FORMATION EVAL	TRIP	4.5	
	Sum :			24.0
17.02.86	DRILLING	CIRC/COND	4.5	
	DRILLING	DRILL	5.0	
	DRILLING	TRIP	5.5	
	FORMATION EVAL	LOG	7.5	
	FORMATION EVAL	OTHER	1.5	
	Sum :			24.0
18.02.86	DRILLING	CIRC/COND	1.0	
	DRILLING	TRIP	4.5	
	FORMATION EVAL	LOG	17.5	
	FORMATION EVAL	OTHER	1.0	
	Sum :			24.0
19.02.86	DRILLING	CIRC/COND	1.0	
	DRILLING	TRIP	4.5	
	FORMATION EVAL	LOG	18.5	
	Sum :			24.0
20.02.86	DRILLING	CASING	1.0	
	FORMATION EVAL	LOG	23.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 6 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
21.02.86	DRILLING	CASING	1.0	
	DRILLING	CIRC/COND	2.0	
	DRILLING	REAM	1.5	
	DRILLING	TRIP	11.5	
	FORMATION EVAL	LOG	8.0	
	Sum :			24.0
22.02.86	DRILLING	BOP/WELLHEAD EQ	8.0	
	DRILLING	CASING	15.0	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
23.02.86	DRILLING	BOP/WELLHEAD EQ	16.0	
	DRILLING	CASING	7.0	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
24.02.86	DRILLING	BOP ACTIVITIES	4.5	
	DRILLING	BOP/WELLHEAD EQ	15.0	
	DRILLING	OTHER	2.5	
	DRILLING	TRIP	2.0	
	Sum :			24.0
25.02.86	DRILLING	CASING	5.0	
	DRILLING	DRILL	4.5	
	DRILLING	OTHER	4.0	
	DRILLING	TRIP	10.5	
	Sum :			24.0
26.02.86	DRILLING	DRILL	17.5	
	DRILLING	TRIP	6.5	
	Sum :			24.0
27.02.86	DRILLING	DRILL	19.5	
	DRILLING	TRIP	4.5	
	Sum :			24.0
28.02.86	DRILLING	CIRC/COND	0.5	
	DRILLING	DRILL	13.0	
	DRILLING	TRIP	10.5	
	Sum :			24.0
01.03.86	DRILLING	DRILL	24.0	
	Sum :			24.0
02.03.86	DRILLING	DRILL	7.0	
	DRILLING	OTHER	0.5	
	DRILLING	REAM	1.5	
	DRILLING	TRIP	14.0	
	INTERRUPTION	MAINTAIN/REP	1.0	
	Sum :			24.0
03.03.86	DRILLING	CIRC/COND	4.0	
	DRILLING	DRILL	11.0	
	DRILLING	TRIP	6.0	
	FORMATION EVAL	LOG	3.0	
	Sum :			24.0
04.03.86	FORMATION EVAL	LOG	24.0	
	Sum :			24.0
05.03.86	DRILLING	CIRC/COND	6.0	
	DRILLING	OTHER	8.0	
	DRILLING	TRIP	7.0	
	FORMATION EVAL	LOG	3.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 7 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
06.03.86	DRILLING	CASING	14.0	
	DRILLING	TRIP	2.0	
	INTERRUPTION	WAIT	8.0	
	Sum :			24.0
07.03.86	DRILLING	BOP/WELLHEAD EQ	3.0	
	DRILLING	CASING	21.0	
	Sum :			24.0
08.03.86	DRILLING	BOP/WELLHEAD EQ	2.5	
	DRILLING	CASING	3.0	
	FORMATION EVAL	CIRC/COND	3.0	
	FORMATION EVAL	DST	4.5	
	FORMATION EVAL	TRIP	11.0	
	Sum :			24.0
09.03.86	FORMATION EVAL	DST	11.0	
	FORMATION EVAL	OTHER	3.0	
	FORMATION EVAL	TRIP	7.5	
	INTERRUPTION	WAIT	2.5	
	Sum :			24.0
10.03.86	FORMATION EVAL	DST	7.0	
	FORMATION EVAL	TRIP	17.0	
	Sum :			24.0
11.03.86	FORMATION EVAL	DST	11.0	
	INTERRUPTION	WAIT	13.0	
	Sum :			24.0
12.03.86	FORMATION EVAL	DST	11.0	
	INTERRUPTION	WAIT	13.0	
	Sum :			24.0
13.03.86	FORMATION EVAL	DST	24.0	
	Sum :			24.0
14.03.86	FORMATION EVAL	DST	10.0	
	INTERRUPTION	WAIT	14.0	
	Sum :			24.0
15.03.86	INTERRUPTION	WAIT	24.0	
	Sum :			24.0
16.03.86	INTERRUPTION	WAIT	24.0	
	Sum :			24.0
17.03.86	FORMATION EVAL	OTHER	3.0	
	INTERRUPTION	WAIT	21.0	
	Sum :			24.0
18.03.86	FORMATION EVAL	DST	11.0	
	FORMATION EVAL	TRIP	13.0	
	Sum :			24.0
19.03.86	FORMATION EVAL	CIRC/COND	2.0	
	FORMATION EVAL	OTHER	2.0	
	FORMATION EVAL	TRIP	19.0	
	PLUG & ABANDON	MECHANICAL PLUG	1.0	
	Sum :			24.0
20.03.86	FORMATION EVAL	DST	4.5	
	FORMATION EVAL	TRIP	13.5	
	INTERRUPTION	WAIT	6.0	
	Sum :			24.0

SAGA PETROLEUM A.S. 6.7.2. DAILY RIG TIME DISTRIBUTION

Page 8 of 8 Well no: 34/4-6

Dato	Mainoperation	Suboperation	Hours	
21.03.86	INTERRUPTION	WAIT	5.0	
	PLUG & ABANDON	CUT	1.0	
	PLUG & ABANDON	EQUIP RECOVERY	4.5	
	PLUG & ABANDON	PERFORATE	3.5	
	PLUG & ABANDON	TRIP	10.0	
	Sum :			24.0
22.03.86	INTERRUPTION	MAINTAIN/REP	1.0	
	INTERRUPTION	WAIT	8.5	
	PLUG & ABANDON	CUT	0.5	
	PLUG & ABANDON	EQUIP RECOVERY	4.0	
	PLUG & ABANDON	OTHER	1.0	
	PLUG & ABANDON	PERFORATE	2.5	
	PLUG & ABANDON	TRIP	6.5	
	Sum :			24.0
23.03.86	INTERRUPTION	WAIT	20.0	
	PLUG & ABANDON	CEMENT PLUG	1.0	
	PLUG & ABANDON	TRIP	3.0	
	Sum :			24.0
24.03.86	DRILLING	BOP/WELLHEAD EQ	3.5	
	INTERRUPTION	WAIT	20.5	
	Sum :			24.0
25.03.86	DRILLING	BOP/WELLHEAD EQ	12.0	
	PLUG & ABANDON	CIRC/COND	2.5	
	PLUG & ABANDON	CUT	1.5	
	PLUG & ABANDON	OTHER	1.5	
	PLUG & ABANDON	TRIP	6.5	
	Sum :			24.0
26.03.86	MOVING	ANCHOR	4.0	
	PLUG & ABANDON	CUT	4.0	
	PLUG & ABANDON	EQUIP RECOVERY	13.5	
	PLUG & ABANDON	OTHER	2.5	
	Sum :			24.0
27.03.86	MOVING	ANCHOR	10.8	
	Sum :			10.8

7. OPERATIONAL DATA

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

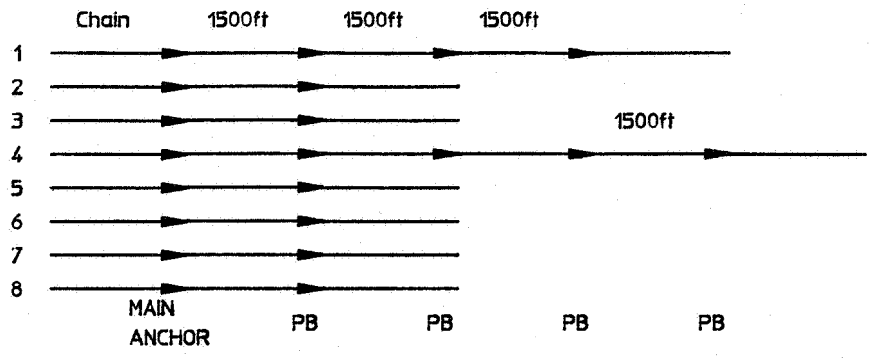
Saga Petroleum a.s.

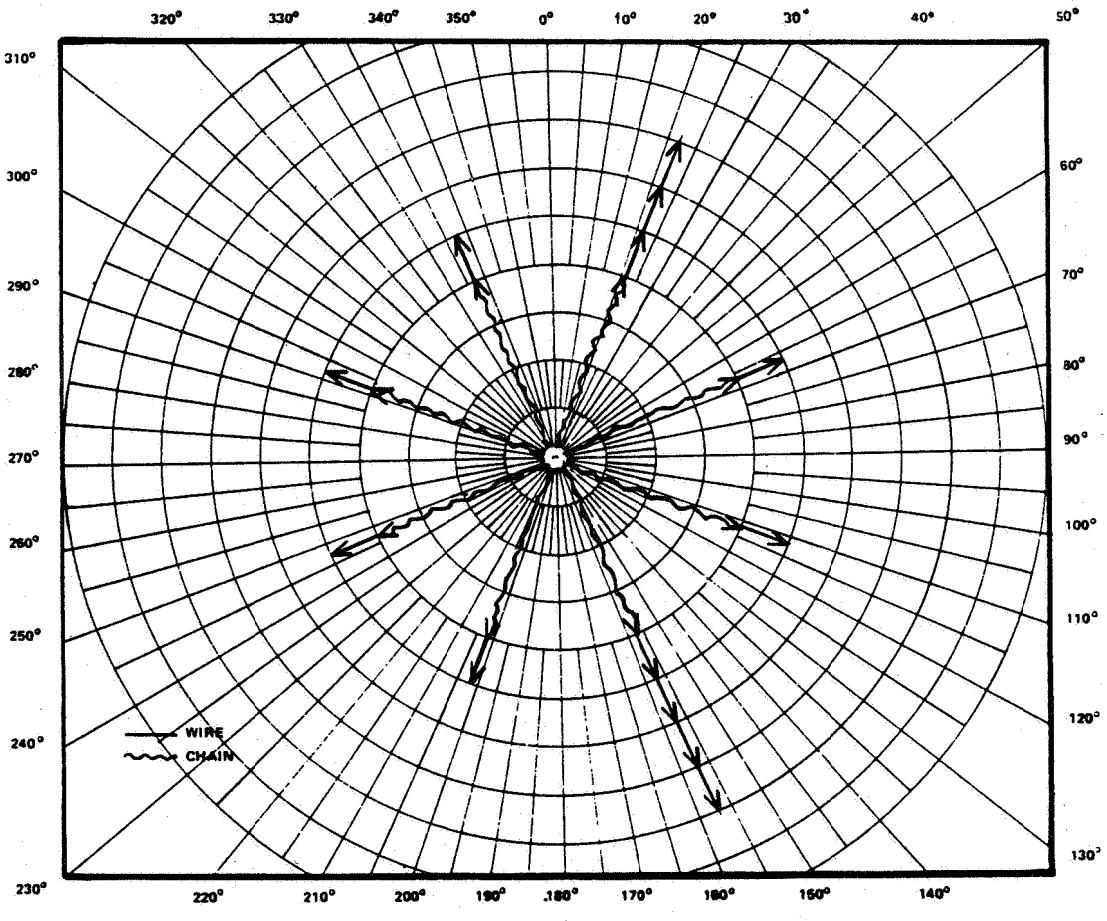
7.1. Anchor Pattern

Well no: 34/4-6

ANCHOR NO	1	2	3	4	5	6	7	8
COMPASS DIRECTION	022	061	112	157	202	247	292	337
LENGTH OF WIRE/CHAIN OUT (FT)	1248	1355	1218	1130	1249	1316	1315	1295
MAX. INITIAL TENSION (KIPS)	160	160	160	160	160	160	160	160

REMARKS:





Saga Petroleum a.s.

7.2. Helicopter and Charter Flights

Well no: 34/4-6

NO OF FLIGHT		FLIGHT ROUTE	PASSENGERS		DESCRIPTION OF CARGO	REMARKS
			OUT	IN		
41	SCHEDULED HELICOPTER FLIGHTS	BGO - VINNI	535	527	Oil Equipment, Mailbags	
-	SCHEDULED CHARTER FLIGHTS		-	-		
20	EXTRA HELICOPTER	BGO - VINNI	63	69	2158 Kgs Oil Equipm.	
17	" "	" "	24	21	232 " " "	"TREASURE SAGA" flight
2	" "	" "	13	6		ACCOUNT OF "GØTAVERKEN"
1	" "	" "	4	8	59 " " "	SPLIT FLIGHT W/NORSK HYDRO
1	" "	" "	2	1		NORSK HYDRO FLIGHT
1	" "	" "	-	3		STATFJORD FLIGHT
1	" "	" "	-	1	105 " " "	"DEEP SEA BERGEN" FLIGHT
3	" "	" "	4	1	40 " " "	MOBILE FLIGHT
1	" "	FORUS - VINNI	1			ACCOUNT OF SUB SEA DOLPHIN

Industritrykk 31725

Saga Petroleum a.s.

7.3.1 Occupational Accidents. Incident/Profession
Arbeidsulykker. Skadehendelse/Yrke

Well no: 34/4-6

Incident / Skadehendelse \ Profession / Yrke	Administration – Administrasjon	Roughneck – Boredektsarbeider	Driller – Borer	Electrician – Elektriker	Catering – Forpleining	Roustabout – Hjelpearbeider	Electronic technician – Instrumentekniker	Crane operator – Kranfører	Derrikman – Tårnmann	Painter Maler Sandblaster worker – Sandblåser	Mechanic/ Mekaniker/Motormann/ Repairer – Reparatør	Operator – Operatør	Plumber – Rørlegger	Service technichan – Serviceteknikker	Scaffolding worker – Stillasbygger	Welder – Sveiser	Unspecified – Uspesifisert	Total – Totalt	%	Year – år
Contact with machinery in motion Kontakt med maskindel 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 kroppsdeler																				
Splinter, spurt Splinter, sprut																				
Electricity Elektrisk strøm																				
Extreme temperatures Ekstreme tempraturer																				
Occupational disease Yrkessykdommer																				
Man overboard Mann overbord																				
Other Annet																				
Total Totalt																		0		

Industritrykk 31725

Saga Petroleum a.s.

7.3.2 Occupational Accidents. Incid./injur. part of the body
Arbeidsulykker. Skadehendelse/skadet legemsdel
Well no: 34/4-6

Injured part of the body / Skadet legemsdel — Incident / Skadehendelse	Eye – Øye	Back – Rygg	Toe/foot – Tå/fot	Hip/leg – Hofte/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													
Bodity overload Overbelastning av kroppsdeler													
Splinter, spurt Splinter, sprut													
Electricity Elektrisk strøm													
Extreme tempratures Ekstreme temperaturer													
Occupational disease Yrkessykdommer													
Man overboard Mann overbord													
Other Annet													
Total Totalt											0		

Industritrykk 31725

Saga Petroleum a.s.

7.3.3. Occupational Accidents. Incid./extern. influence
Arbeidsulykker. Skadehendelse/ytre faktor

Well no: 34/4-6

External influence / Ytre faktor — Incident / Skadehendelse	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. Løs/fast 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 kroppsdeler													
Splinter, spurt Splinter, sprut													
Electricity Elektrisk strøm													
Extreme tempratures Ekstreme temperaturer													
Occupational disease Yrkessykdommer													
Man overboard Mann overbord													
Other Annet													
Total Totalt											0		

Industritrykk 31725

	WIND		SEAS		SWELL			RIG MOVEMENT				ANCHOR		RISER	
Date	speed m/s	dir deg	height m	dir deg	height m	dir deg	periode sec	heave m	roll deg	pitch deg	head deg	min	tons max	max	Remarks
851228	10	315	6.0	315					4.0	4.0	315	0	0	0	
851229	10	338	3.6	360					1.0	1.0	315	0	0	0	
851230	9	270	2.5	270				1.0	1.0	1.0	315	92	134	0	
851231	20	270	3.0	270				1.0	0.5	1.0	315	93	141	0	
860101	15	90	4.0	90				1.0	1.0	1.0	315	90	127	0	
860102	30	30	5.0	30				0.5	2.0	2.0	315	95	128	0	
860103	15	30	.3	30				0.3	1.0	1.0	315	95	128	0	
860104	20	120	1.0	120				0.3	0.5	0.5	315	49	144	0	
860105	20	50	2.0	50				0.3	1.0	1.0	315	88	119	0	
860106	15	60	3.0	60				0.5	1.0	1.0	315	103	134	93	
860107	18	120	1.0	120				0.2	1.0	1.0	315	102	135	93	
860108	23	125	1.0	125				0.3	1.0	1.0	315	102	136	93	
860109	35	175	6.0	175				3.0	2.0	3.0	315	90	138	93	
860110	40	215	11.0	215				5.0	1.0	1.0	315	80	133	0	
860111	20	235	5.0	235				3.5	2.0	2.0	315	77	132	0	
860112	13	345	4.0	345				1.0	1.5	1.5	315	102	118	0	
860113	10	280	5.0	280				1.0	1.0	1.5	315	89	123	0	
860114	23	35	2.0	35				2.0	1.0	1.0	315	95	117	0	
860115	27	330	3.0	330				2.5	1.0	1.0	315	89	121	0	
860116	15	350	3.0	350				1.0	1.0	1.0	315	92	112	0	
860117	30	180	3.0	180				0.5	1.0	1.0	315	82	133	0	
860118	8	280	3.0	280				1.0	1.0	1.0	315	84	119	0	
860119	10	290	2.0	290				0.5	0.5	0.5	315	85	117	0	
860120	23	126	3.0	126				0.5	0.5	0.5	315	84	126	0	
860121	17	7	1.0	7				1.0	0.5	1.0	315	95	128	0	
860122	25	112	5.0	112				2.0	1.0	2.0	315	82	128	151	
860123	23	3	4.0	301				0.4	1.0	0.5	315	100	116	151	
860124	29	360	4.0	61				4.0	1.0	1.0	315	103	118	151	
860125	2	42	3.0	114				1.0	0.6	0.5	315	96	126	151	
860126	28	172	3.0	62				3.0	1.0	1.0	315	95	124	151	

	WIND		SEAS		SWELL			RIG MOVEMENT				ANCHOR		RISER	
Date	speed m/s	dir deg	height m	dir deg	height m	dir deg	periode sec	heave m	roll deg	pitch deg	head deg	min	tons max	max	Remarks
860127	26	171	3.0	74				3.0	1.0	1.0	315	102	133	151	
860128	24	161	4.0	100				1.0	1.0	1.0	315	97	139	151	
860129	33	65	5.0	65				2.0	2.0	1.5	315	96	133	151	
860130	14	90	5.0	90				2.0	1.6	1.3	315	100	125	151	
860131	14	27	3.5	20				2.0	2.3	0.6	315	99	128	151	
860201	19	12	2.0	45				0.5	1.0	1.0	315	100	126	151	
860202	12	35	1.5	90				0.5	0.5	0.5	315	99	127	151	
860203	8	125	1.5	90				0.5	0.5	0.4	315	97	127	151	
860204	28	27	2.0	30				0.5	1.5	0.5	315	97	128	151	
860205	28	27	2.0	30				0.5	1.5	0.5	315	105	135	151	
860206	10	39	3.0	40				0.5	1.5	0.5	315	98	126	151	
860207	26	51	3.0	50				0.5	1.0	1.0	315	102	131	160	
860208	4	70	.5	70				0.2	0.2	0.2	315	106	131	160	
860209	18	239	2.0	240				0.2	0.2	0.2	315	105	137	160	
860210	19	184	3.0	184				0.1	0.5	0.5	315	99	131	160	
860211	22	196	3.0	196				0.4	1.4	0.1	315	102	132	160	
860212	12	193	2.0	193				0.4	1.0	0.5	315	100	128	160	
860213	5	118	1.3	118				0.3	0.3	0.3	315	101	130	160	
860214	7	145	1.9	138				0.3	0.5	0.4	315	100	129	164	
860215	5	46	1.9	46				0.3	0.8	0.4	315	100	131	164	
860216	6	27	1.1	27				0.2	1.2	0.6	315	100	133	164	
860217	10	354	1.2	354				0.3	0.3	0.3	315	100	134	164	
860218	7	112	1.7	112				0.3	0.4	0.4	315	101	137	164	
860219	2	202	3.6	202				0.7	0.7	0.7	315	106	146	164	
860220	13	240	3.8	240				0.7	0.5	1.5	315	99	133	164	
860221	6	1	2.6	1				1.0	0.5	0.5	315	100	130	164	
860222	10	40	3.0	40				1.0	0.5	0.5	315	99	136	164	
860223	15	350	1.6	350				0.2	0.5	0.3	315	92	129	164	
860224	8	142	1.6	142				0.3	0.4	0.3	315	92	130	164	
860225	5	186	1.3	146				0.3	0.3	0.3	315	90	130	160	

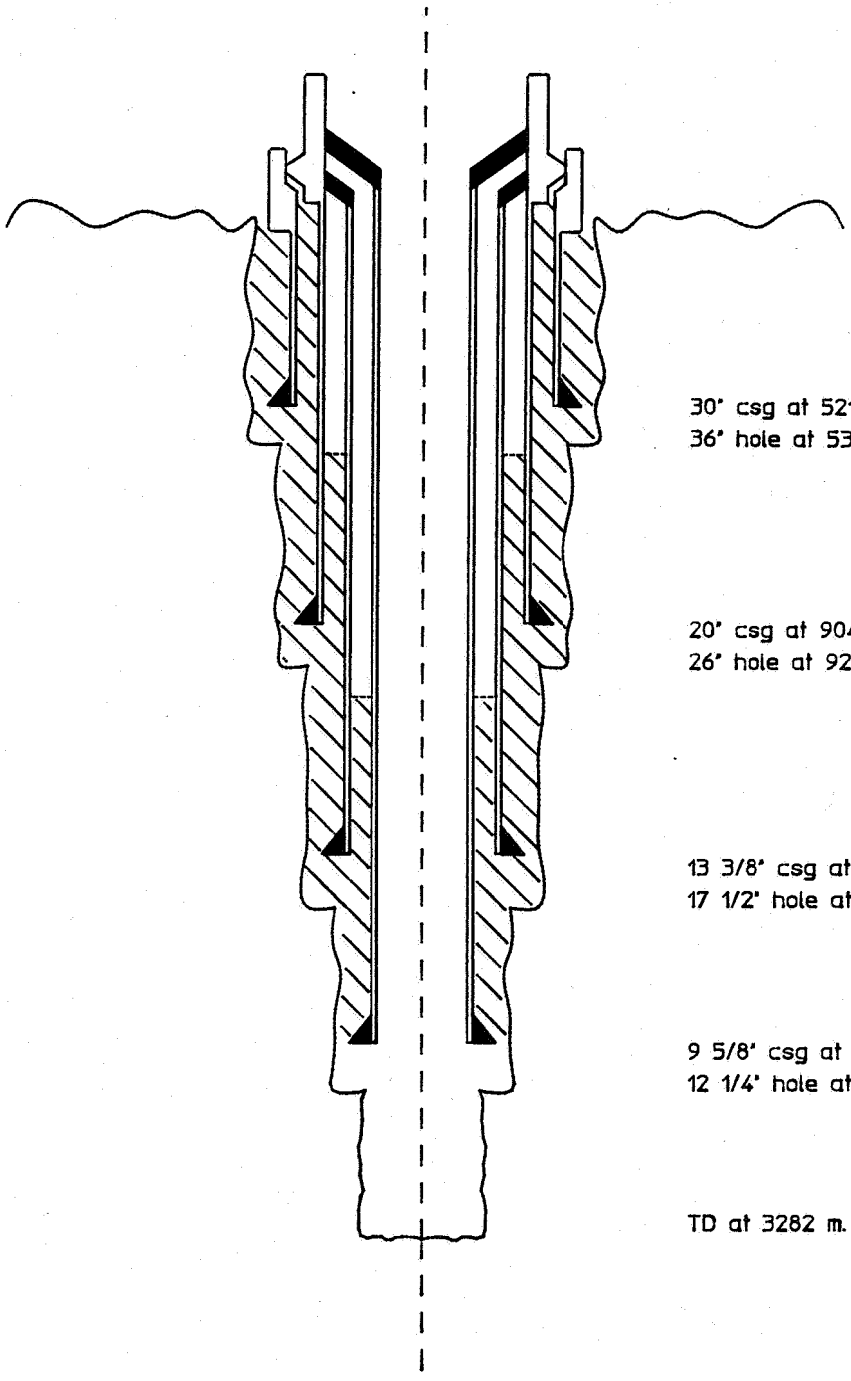
	WIND		SEAS		SWELL			RIG MOVEMENT				ANCHOR		RISER	
Date	speed m/s	dir deg	height m	dir deg	height m	dir deg	periode sec	heave m	roll deg	pitch deg	head deg	min	tons max	max	Remarks
860226	21	235	1.8	309				0.4	0.3	0.3	315	95	126	160	
860227	8	36	2.4	146				0.3	0.6	0.6	315	94	130	160	
860228	19	252	1.7	14				0.3	0.4	0.4	315	96	128	160	
860301	25	233	3.3	164				0.5	1.0	1.0	315	94	128	160	
860302	22	228	1.9	54				0.5	1.0	1.0	315	94	129	160	
860303	27	206	5.2	98				0.5	2.0	1.0	315	97	139	156	
860304	18	217	4.0	200				0.5	1.0	0.5	315	101	137	160	
860305	30	200	4.0	210				1.0	1.5	1.0	315	87	142	160	
860306	36	230	5.2	230				2.0	2.0	1.5	315	88	129	160	
860307	25	225	3.0	225				1.0	2.0	1.0	315	99	132	160	
860308	30	190	3.0	180				1.5	1.5	1.5	315	95	141	160	
860309	25	160	4.7	160				3.0	2.0	2.0	315	88	132	160	
860310	24	160	3.0	160				2.0	3.5	3.5	315	87	132	160	
860311	30	173	6.0	173				3.5	3.0	3.0	315	87	137	160	
860312	31	173	6.0	173				3.0	3.0	3.0	315	92	133	160	
860313	27	158	8.0	158				3.0	3.0	2.0	315	86	139	160	
860314	24	166	8.0	166				3.0	3.0	3.0	315	92	132	160	
860315	27	166	8.0	166				3.0	3.0	2.0	315	92	136	160	
860316	24	164	6.0	164				3.0	3.0	2.0	315	90	139	160	
860317	8	160	3.0	160				0.5	0.5	0.5	315	96	132	160	
860318	22	175	8.0	175				2.0	1.0	1.0	315	90	132	160	
860319	16	187	1.0	187				0.3	1.0	0.5	315	95	128	160	
860320	22	180	12.0	180				7.0	5.0	4.0	315	95	128	160	
860321	25	180	2.0	180				1.0	2.0	2.0	315	88	123	160	
860322	35	215	8.0	215				4.0	2.0	2.0	315	87	130	160	
860323	30	210	5.0	210				3.5	3.0	2.0	315	89	131	160	
860324	30	200	4.0	200				2.0	3.0	4.0	315	97	125	0	
860325	7	215	1.5	215				0.5	1.0	1.5	315	101	125	0	
860326	10	90	2.0	120				1.0	2.0	2.0	315	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. Wellbore Schematic



Seabed at 399.5 m

30" csg at 521 m.
36" hole at 530 m.

20" csg at 904 m.
26" hole at 920 m.

13 3/8" csg at 1841 m.
17 1/2" hole at 1856 m.

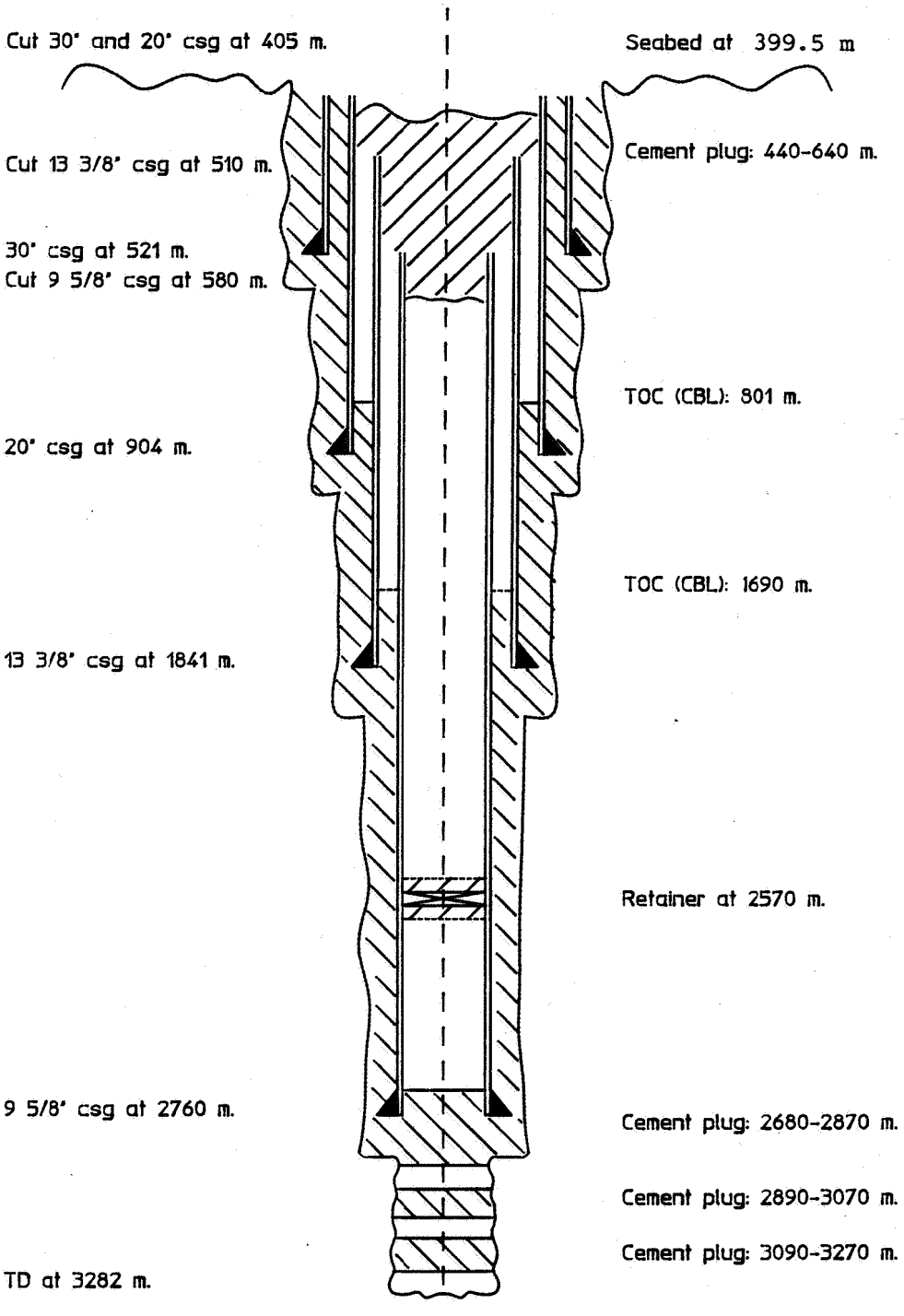
9 5/8" csg at 2760 m.
12 1/4" hole at 2770 m.

TD at 3282 m.

DATE	20.06.86	AUTH.	HØd
DRAW.BY	HØd	APPR.	TSØ
REF.	34/4-6		

Saga Petroleum a.s.

8.2. Abandonment Profile



DATE 20.06.86	AUTH. HØd
DRAW.BY HØd	APPR. TSØ
REF. 34/4-6	

SAGA PETROLEUM

Enclosure III C

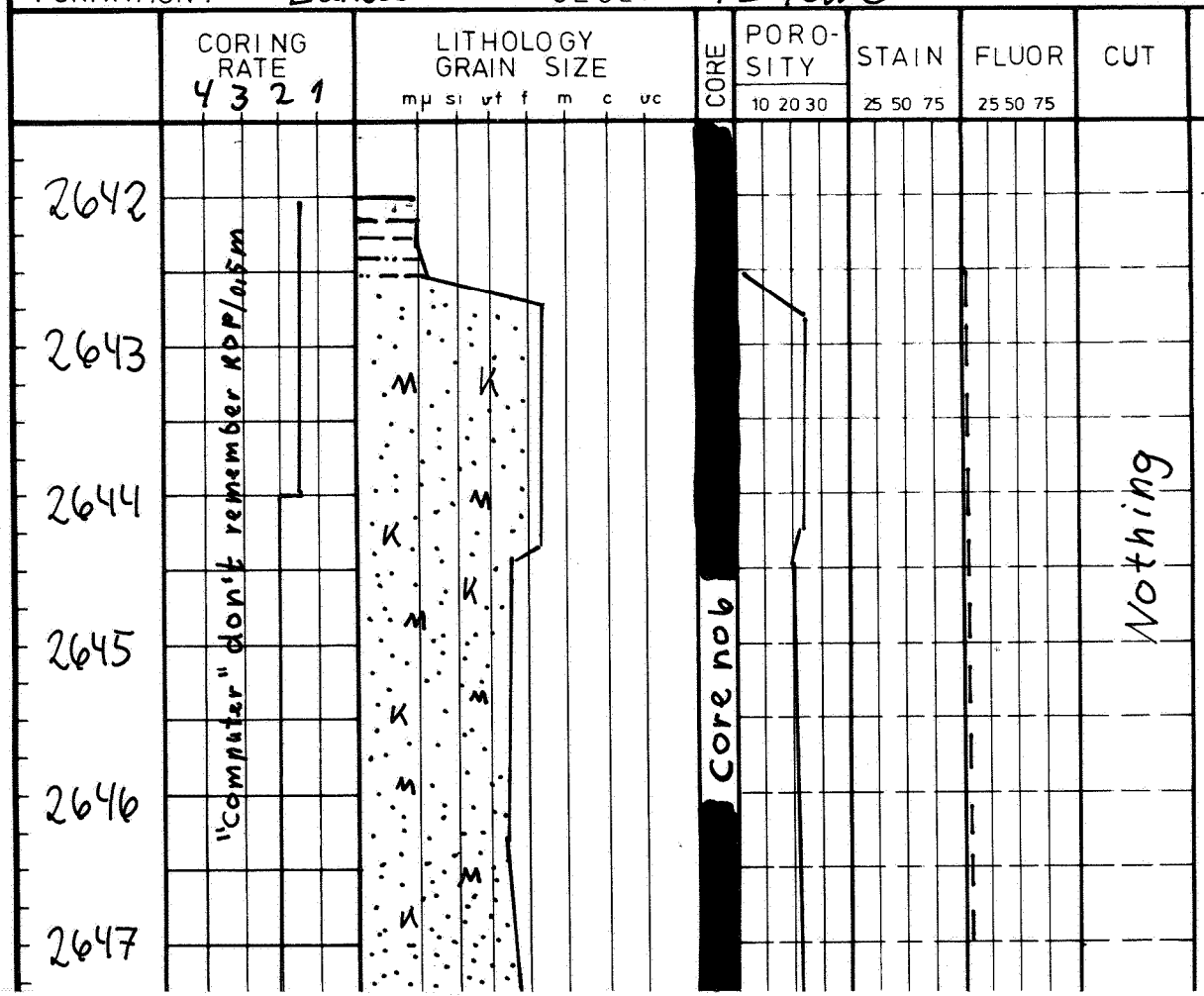
Comment: One pipelength was not taken into account when reaming/fishing for corecatcher chips. -10m new form. drilled

CONVENTIONAL CORE DESCRIPTION

FIELD: SNORRE WELL NO: 34/4-6 CORE NO: 6 PAGE: 1 of 3

FROM: 2642 TO: 2660,5 CORED: 18,5 m REC: 18,5 m 100 %

FORMATION: Lunde GEOL: TLL/CWC DATE: 16/2-86



DESCRIPTION is based on 1m sample-interval - fiberglas-barrel is used.

Top Core no 6 = 2642m

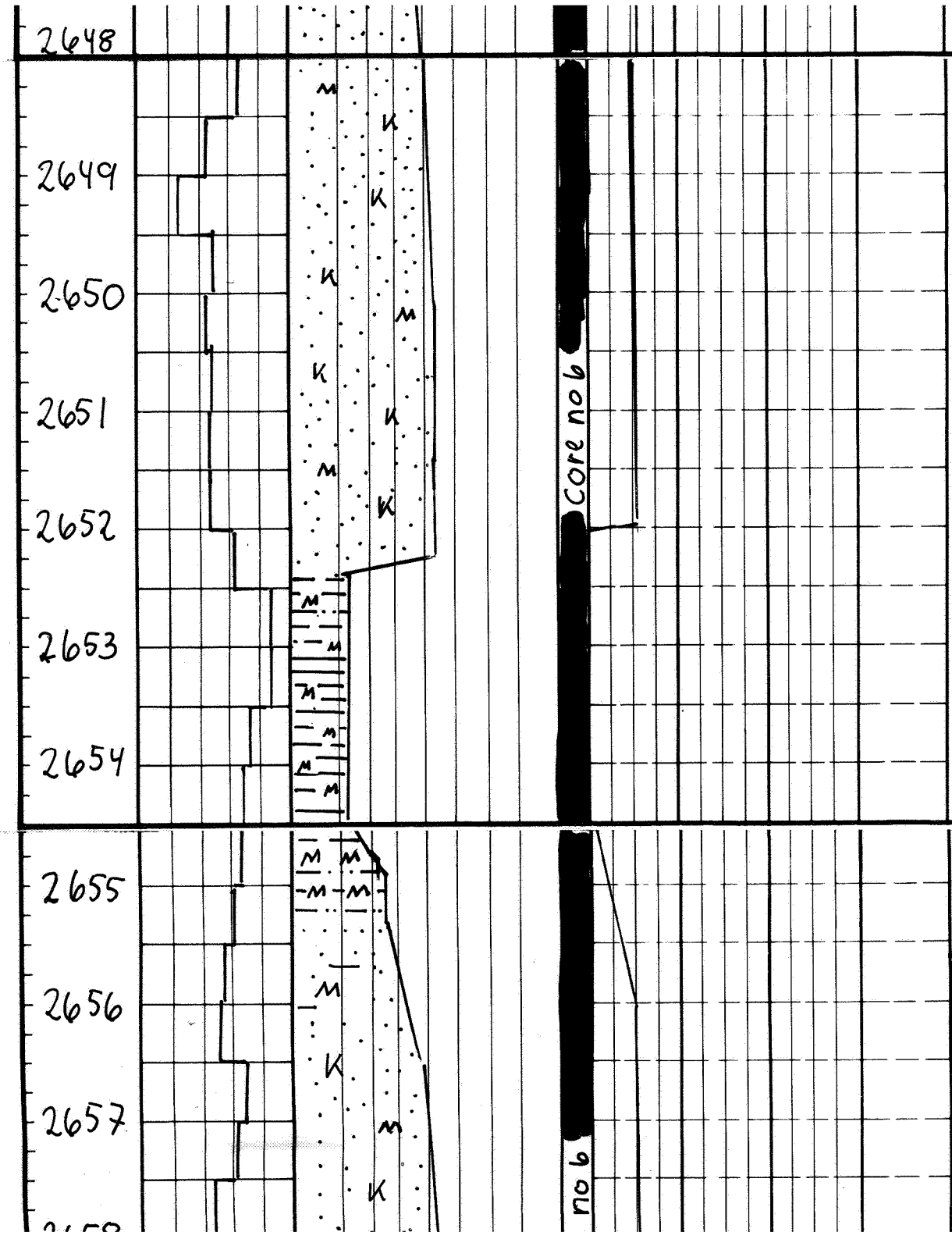
SHALE on top

Sh: dk rd brn, frm, mic mica sl sks, occ sl calc.

2642,5-2652,5m SANDSTONE

Ss: lt gy-gygn occ brn, vf-m pred f (fining upwards to 2646m) mod-W srtd, sbang-sbrnd, fri, Rao cMt, sl mica sl calc. Tr of chlor and hvy min. ~g por.

SHOWS: From 2642,5-2647m: scattered trace of shows.



Sandstone as above.

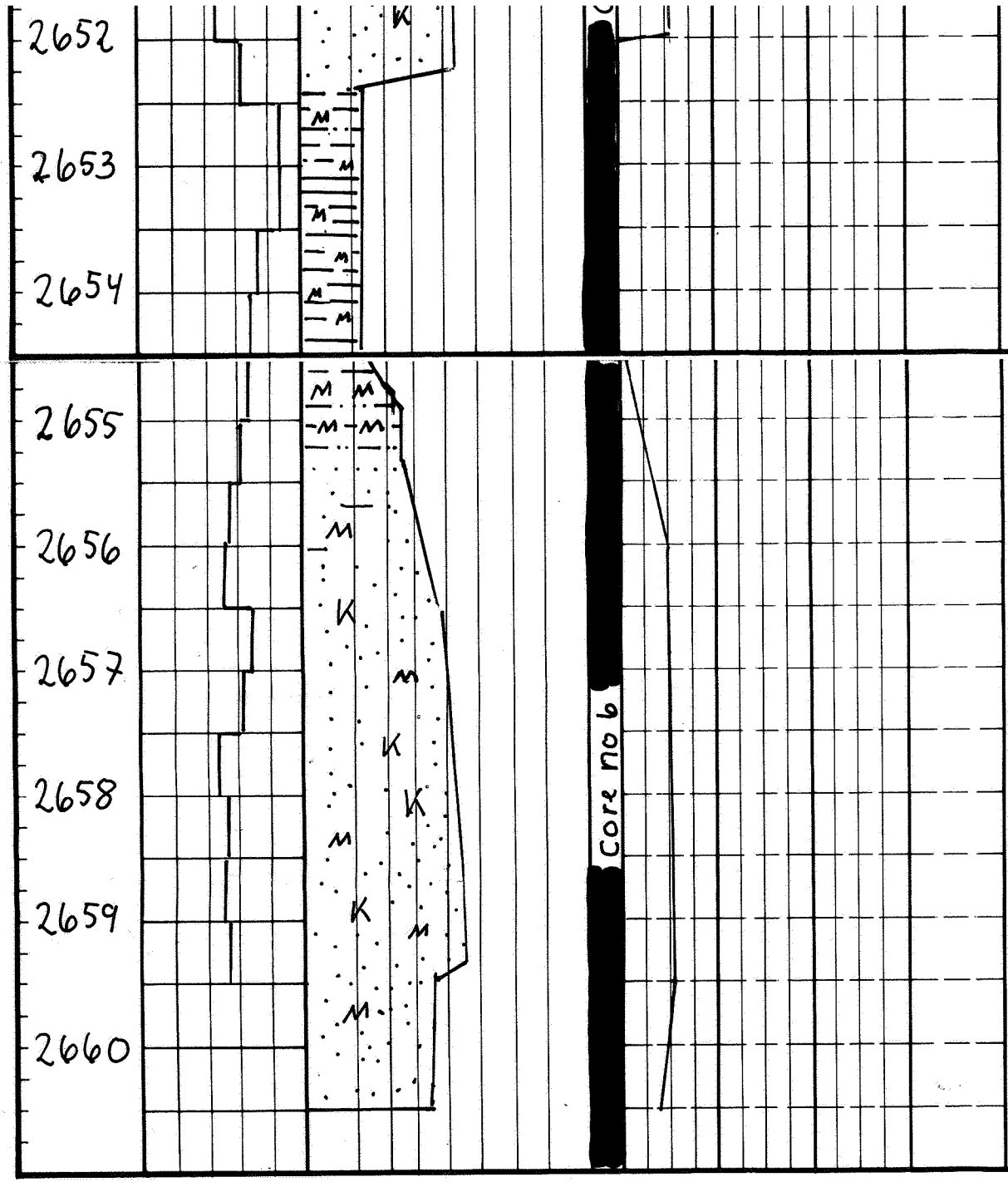
2652,5 - 2654,5m SHALE

Sh: v silty, dkrd-brn, frm, v mic mica, non calc.

2654,5 - 2660,5m SANDSTONE

Ss: (fining upwards from 2659,5) Slt-Vf on top, else as ss above

No shows



2652,5 - 2654,5m SHALE

Sh: v silty, dkrd-brn, frm, v mic mica, non calc.

2654,5 - 2660,5m SANDSTONE

Ss: (fining upwards from 2659,5) Slt-Vf on top, else as ss above

No shows

Bottom core no 6 = 2660,5m

Enclosure III B

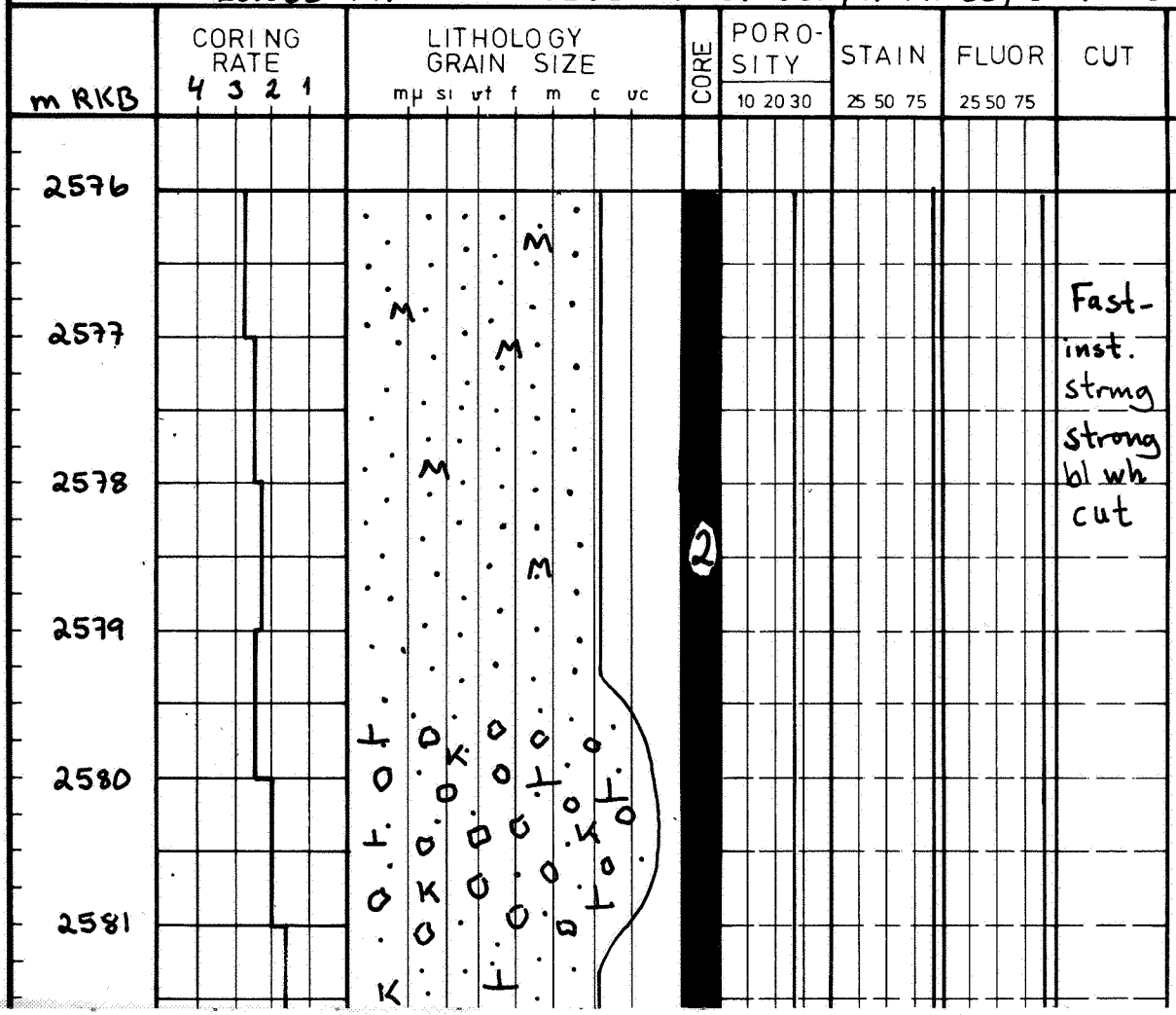
SAGA PETROLEUM

CONVENTIONAL CORE DESCRIPTION

FIELD: SNORRE WELL NO: 34/4-6 CORE NO: 2 PAGE: 1 of 3

FROM: 2576 m RKB TO: 2589 m CORED: 13 m REC: 7 m 54 %

FORMATION: LUNDE FM GEOL: T. L. LARSEN / H. ØINES / U. M. STENSTADVOLD DATE: 10.02.86

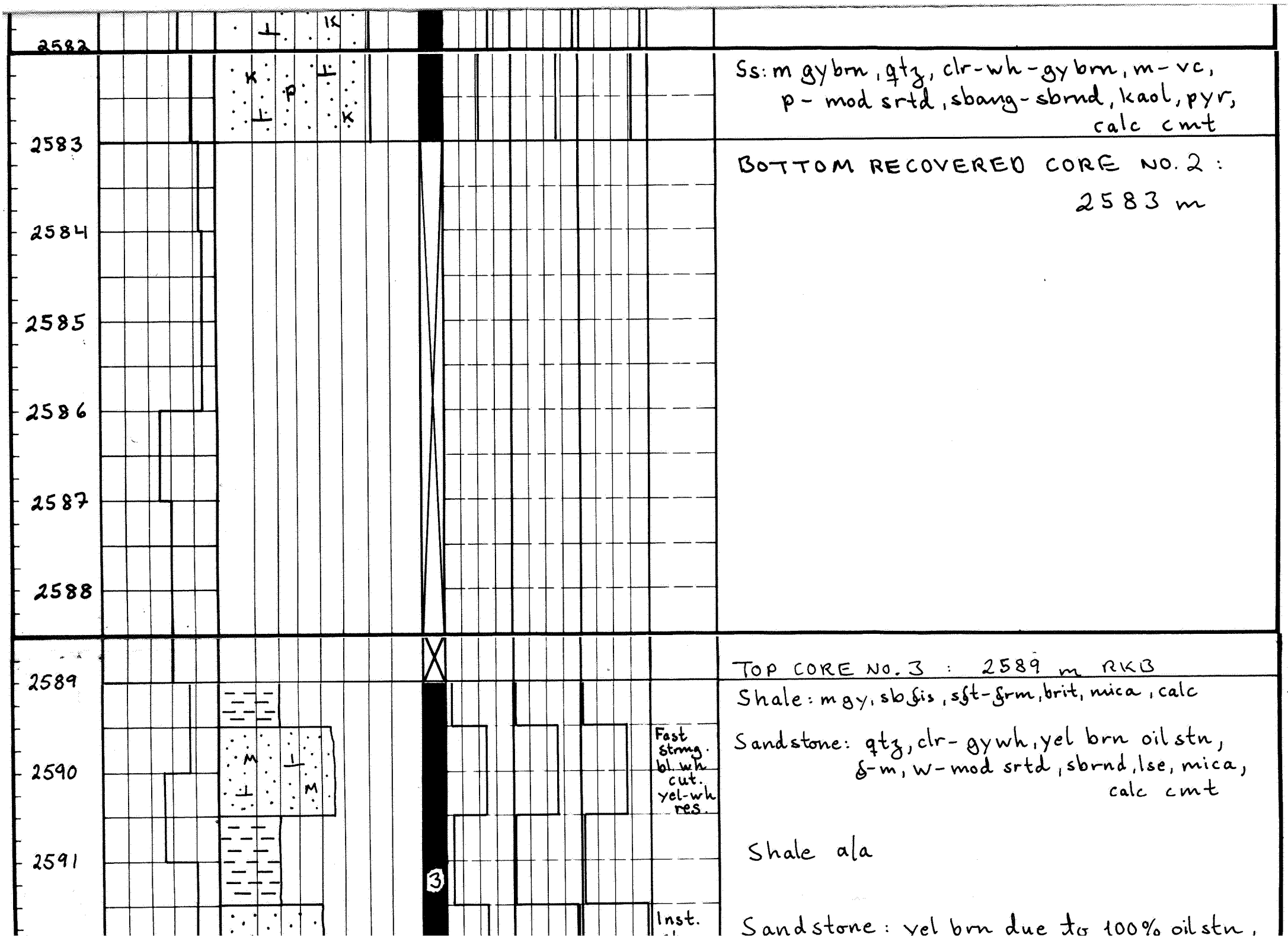


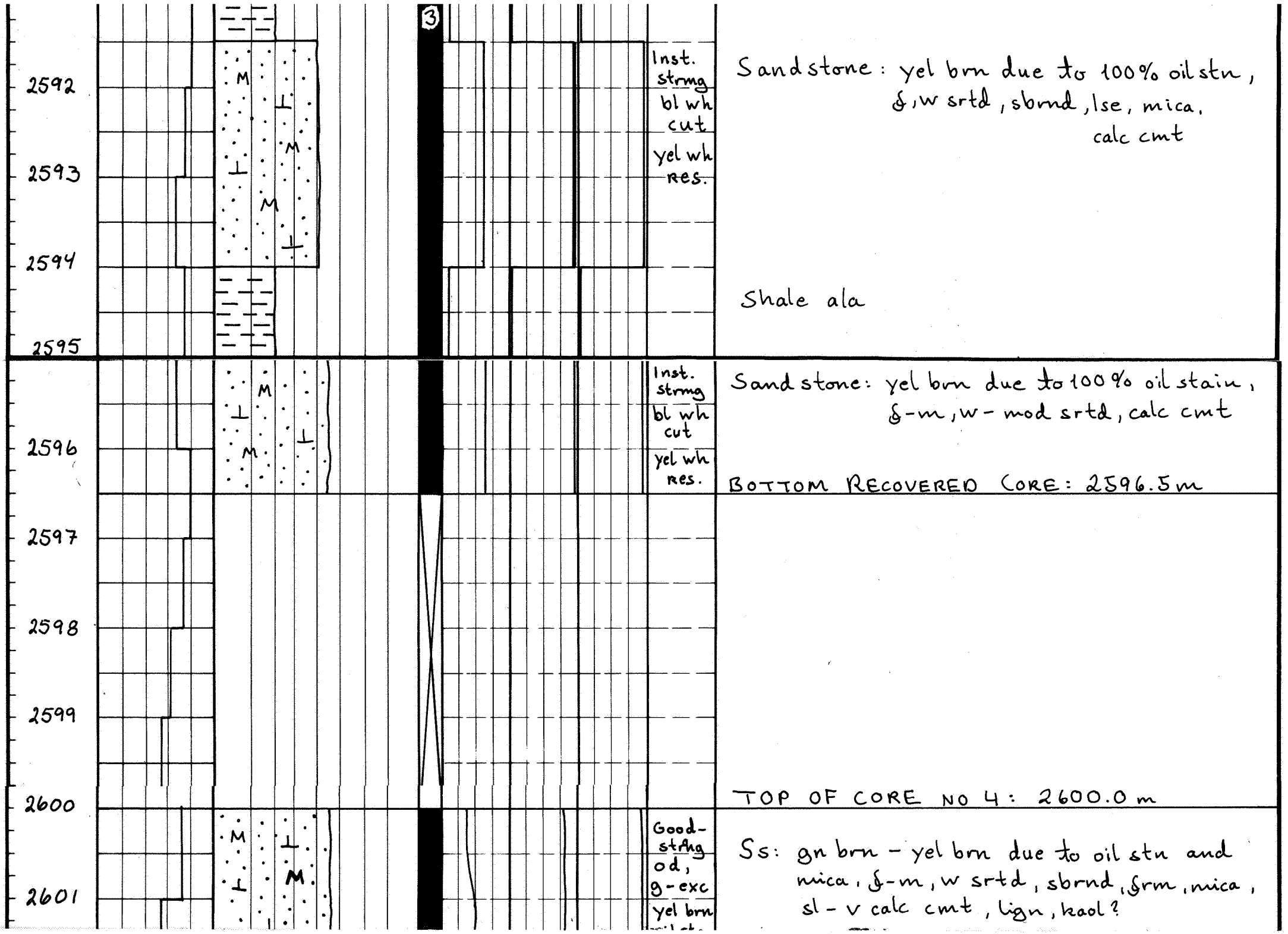
TOP CORE NO. 2 – 2576 m RKB

SANDSTONE

Ss: m gy brn due to oil stain, qtz, clr-gybrn, lse, m-vc, p-mod srtd, sbang-sbrnd, mica

Ss: cgl, qtz, clr-wh-gybrn, p srtd, sbang-sbrnd, kaol, lt bl gn, calc cmt


2582
2583
2584
2585
2586
2587
2588
2589
2590
2591
Ss: m gybrn, qtz, clr-wh-gybrn, m-vc, p-mod srtd, sbang-sbrnd, kaol, pyr, calc cmt
BOTTOM RECOVERED CORE NO. 2 : 2583 m
TOP CORE NO. 3 : 2589 m RKB
Shale: m gy, sb fis, sft-frm, brit, mica, calc
Sandstone: qtz, clr-gywh, yel brn oil stn, f-m, w-mod srtd, sbrnd, lse, mica, calc cmt
Fast strmg. bl. wh cut. yel-wh res.
Shale ala
Inst.
Sandstone: yel brn due to 100% oil stn,
3



Sandstone: yel brn due to 100% oil stn, f, w srtd, sbrnd, lse, mica, calc cmt

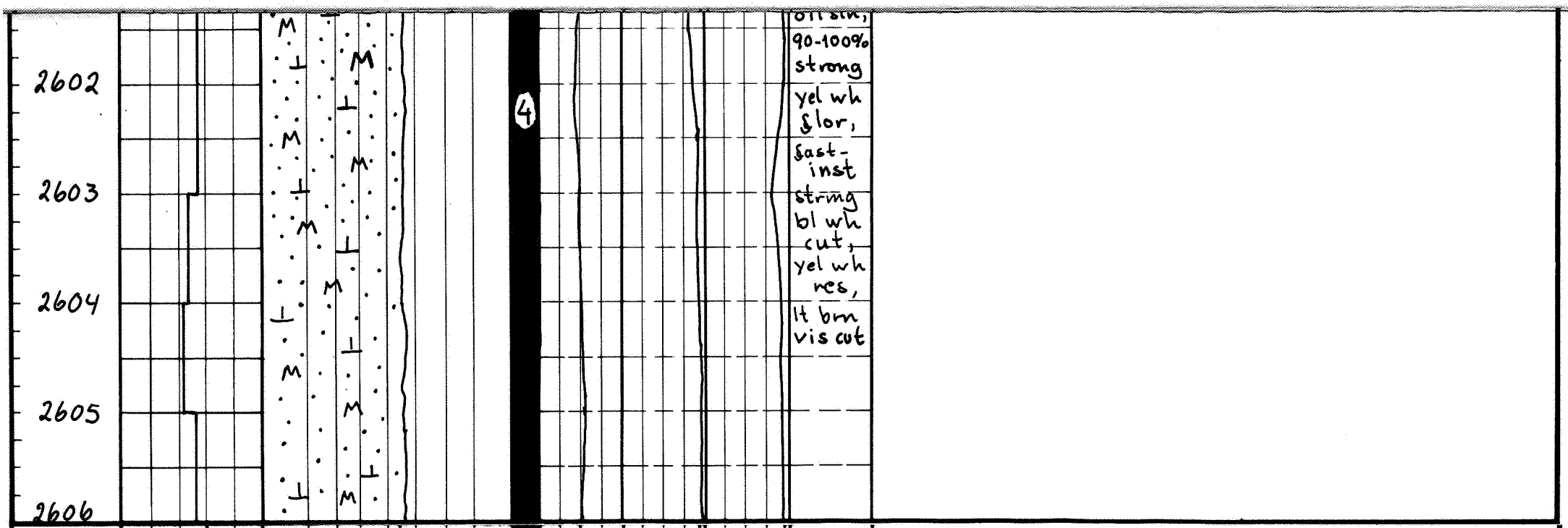
Shale ala

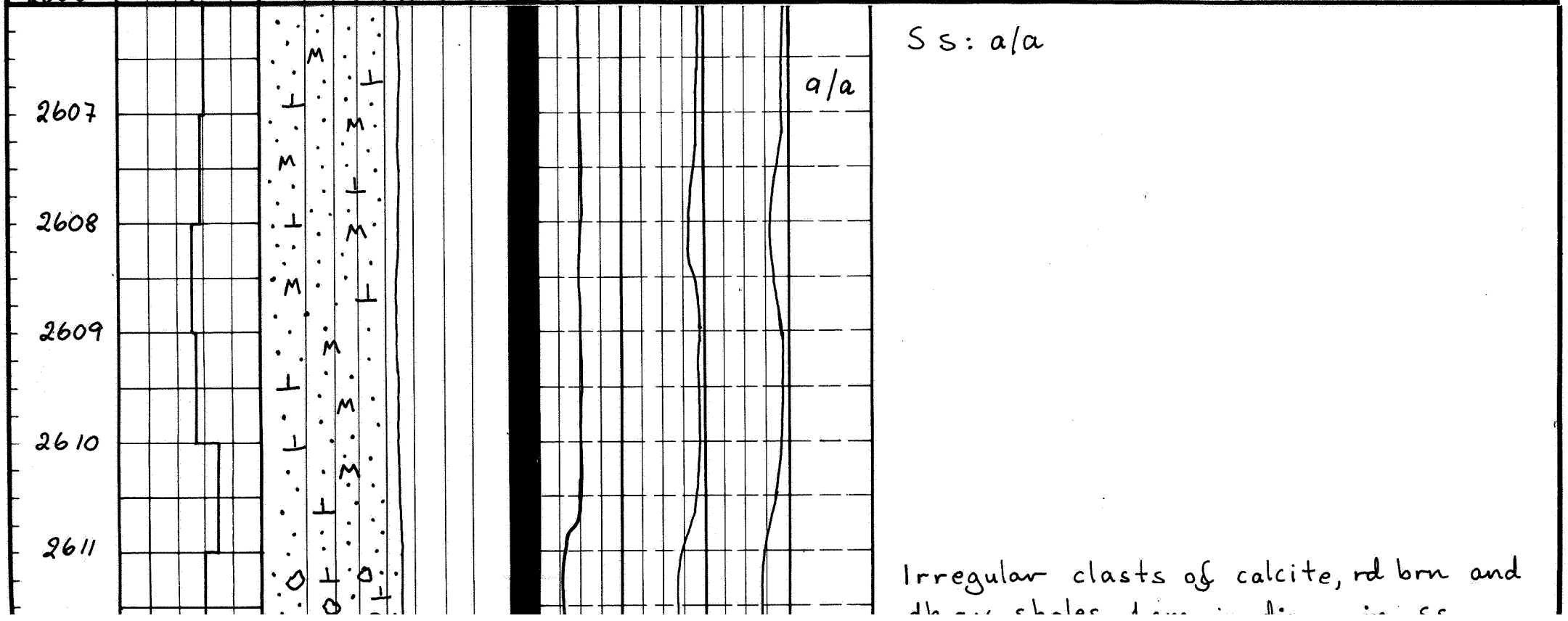
Sandstone: yel brn due to 100% oil stain, f-m, w-mod srtd, calc cmt

BOTTOM RECOVERED CORE: 2596.5m

TOP OF CORE NO 4: 2600.0 m

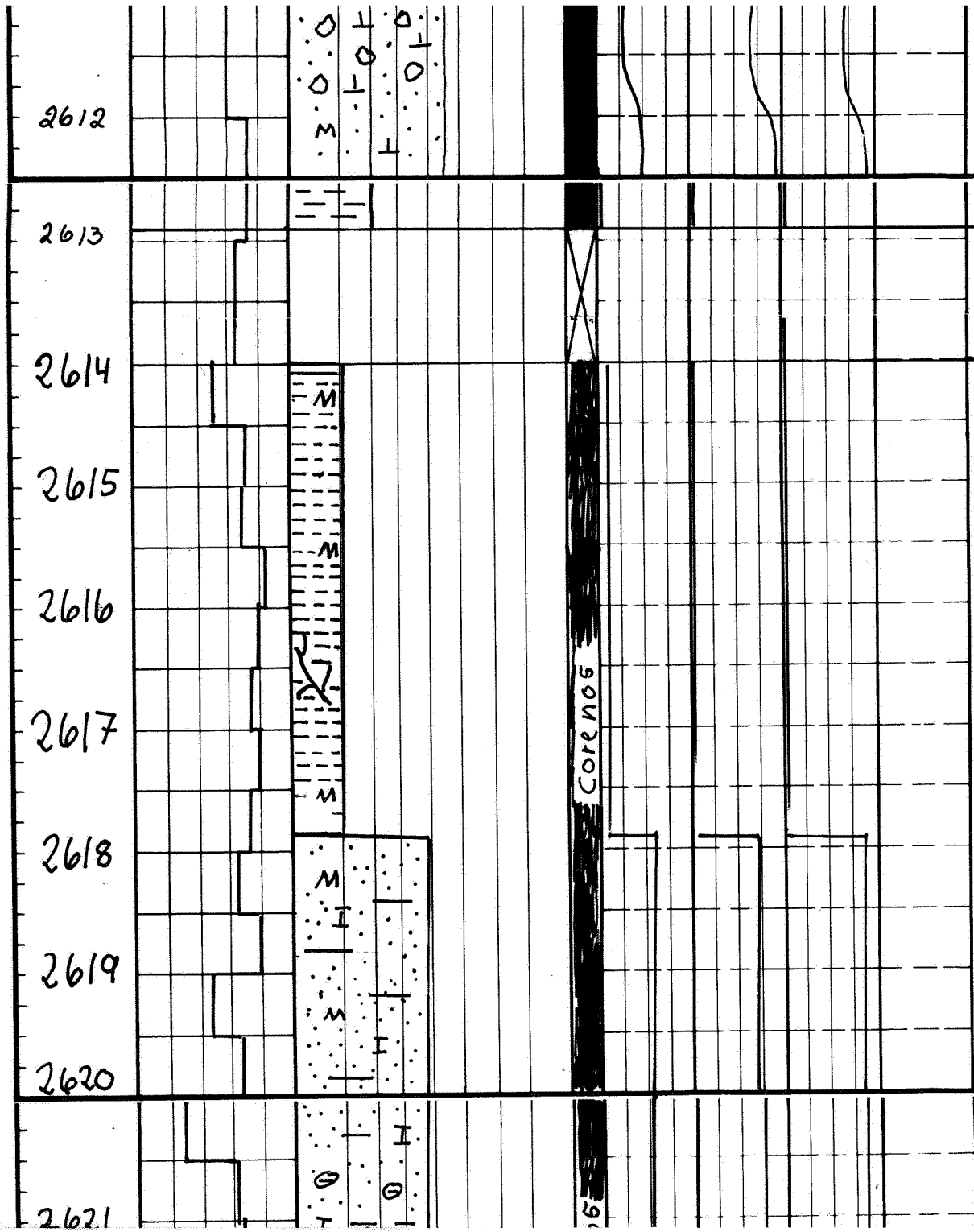
Ss: gn brn - yel brn due to oil stn and mica, f-m, w srtd, sbrnd, frm, mica, sl-v calc cmt, lign, kaol?





Ss: a/a

Irregular clasts of calcite, rd brn and



Irregular clasts of calcite, rd brn and dk gy shales, 1 cm in diam, in ss.

Interbedded rd brn and dk gy shales

Bottom recovered CORE : 2612.9 m
Bottom cored CORE : 2614.0 m

TOP CORE NO 5 : 2614m

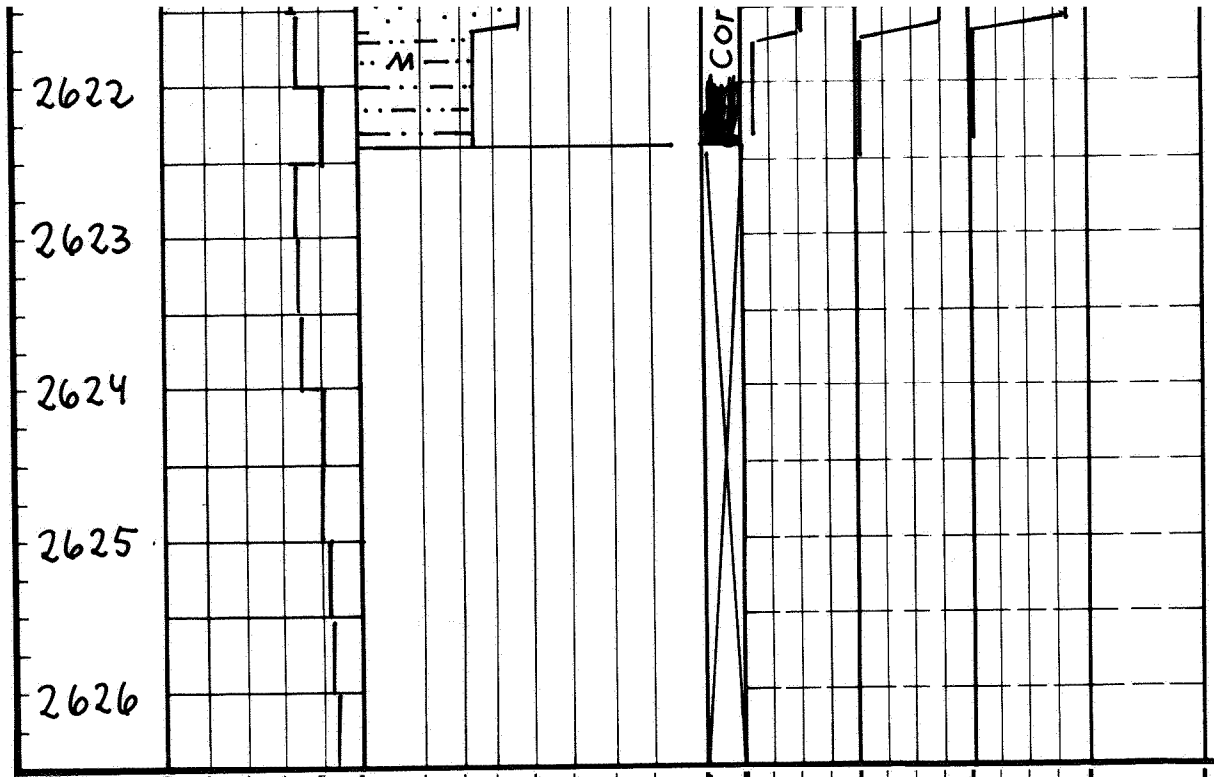
Rd brn shale : sb fis, brit, frm, mic mica calc
Dk gy shale : sb fis, brit, frm, mic mica, non calc

2614-2617,8 m SHALE

Sh: rd brn, lse-frm pred frm, mic mica, occ sks, sl slty, sl calc.

2617,8-2621,7m SANDSTONE WITH TRACES OF CLAYSTONE

SS: clr with lt brn O stn, vf-f pred



frl, calc cmt, mica.

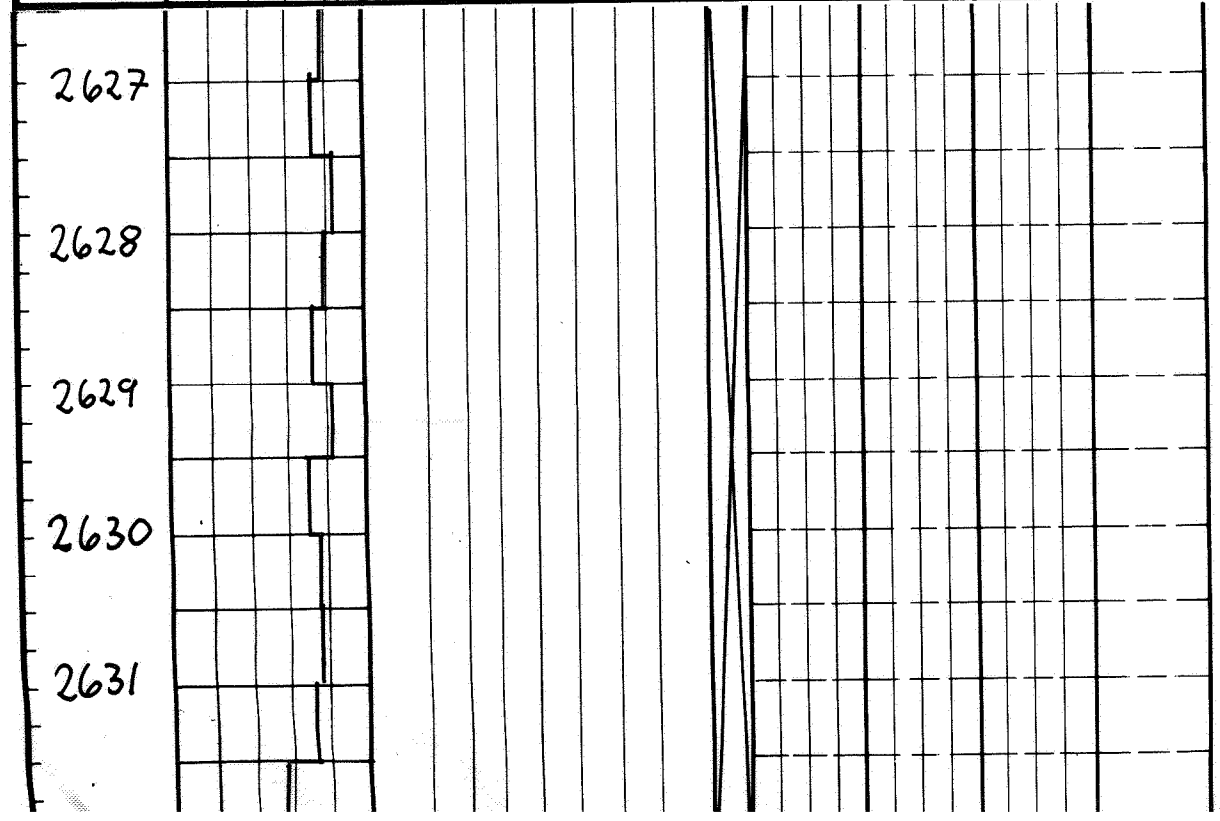
Clyst: gn-gy, frm, mic mica, non calc.

SHOWS: g o stn, 80-100% mod yel lt brn - straw yel flor (sl patchy) fast strmg mlky wh - lt pale yel cut, pale yel res, fr od.

2621.7-2622.4m SILTSTONE

Slts: sdy-arg, gy-gn, frm, mica, v calc.

SHOWS: Nothing.



Please notice. Core catcher probably got damaged when making 1. connections. Upper part of core fell down into outerbarrel when handling it. Some problems were encountered by taking cores controlled from the outerbarrel. Therefore we don't garante 100% corect handling of cores in the boxes.

Bottom core no 5 = 2632m

Enclosure III A

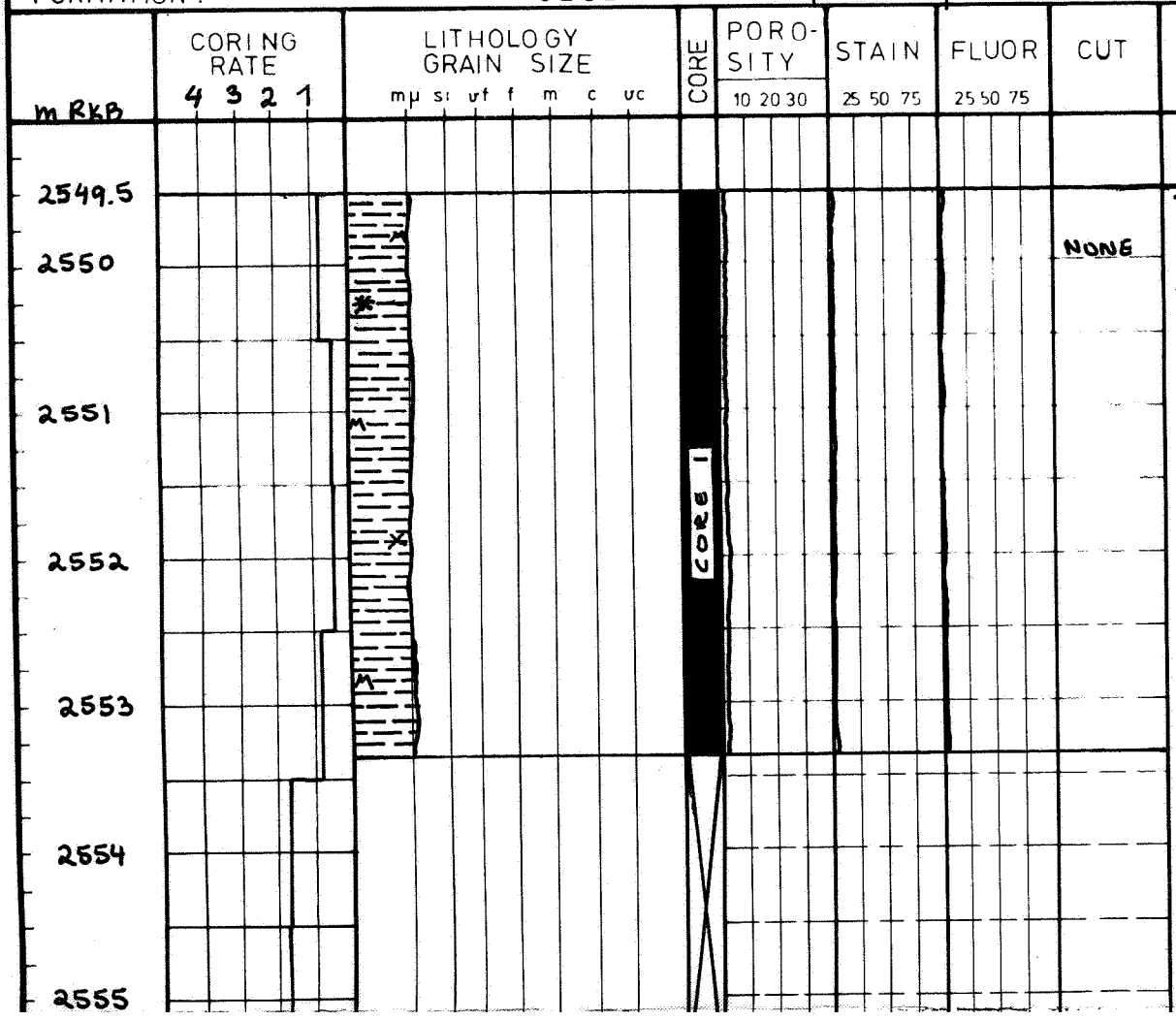
SAGA PETROLEUM

CONVENTIONAL CORE DESCRIPTION

FIELD: SNORRE WELL NO. 34/4-6 CORE NO: 1 PAGE 1 OF 2

FROM: 2549.5 m RKB TO: 2560.5 m RKB CORED: 11 m REC: 3.8 m 35 %

FORMATION: GEOL: T.L. LARSEN | H. ØINES | U.M. STENSTADVOLD DATE: 08.02.86



DESCRIPTION

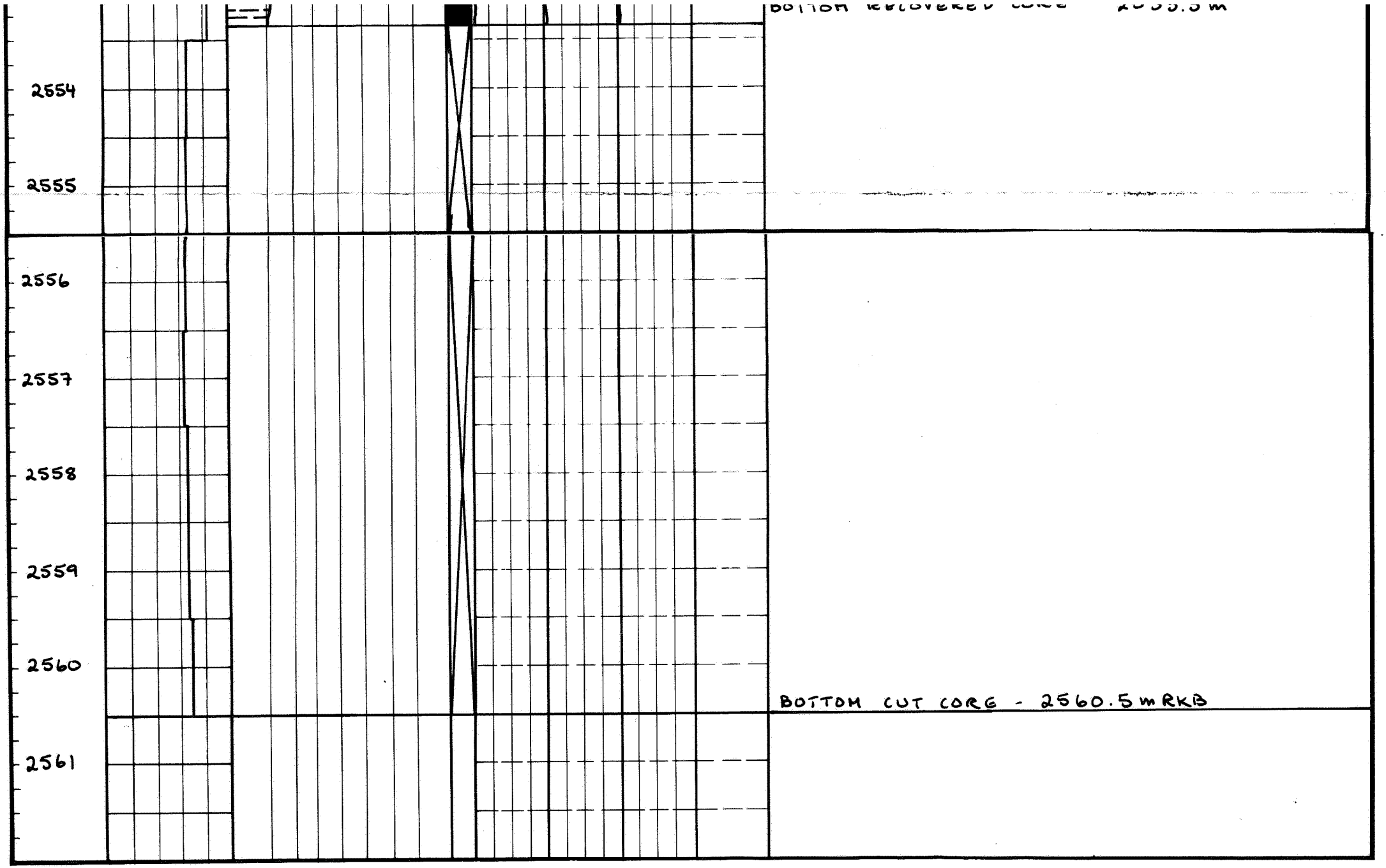
TOP CORE NO. 1 - 2549.5 m

SHALE

Sh: dk gy, m gy thn lam (0.1 mm), frm, sbfis - fis, occ brit, micmica, calc, occ glauc

NO SHOWS

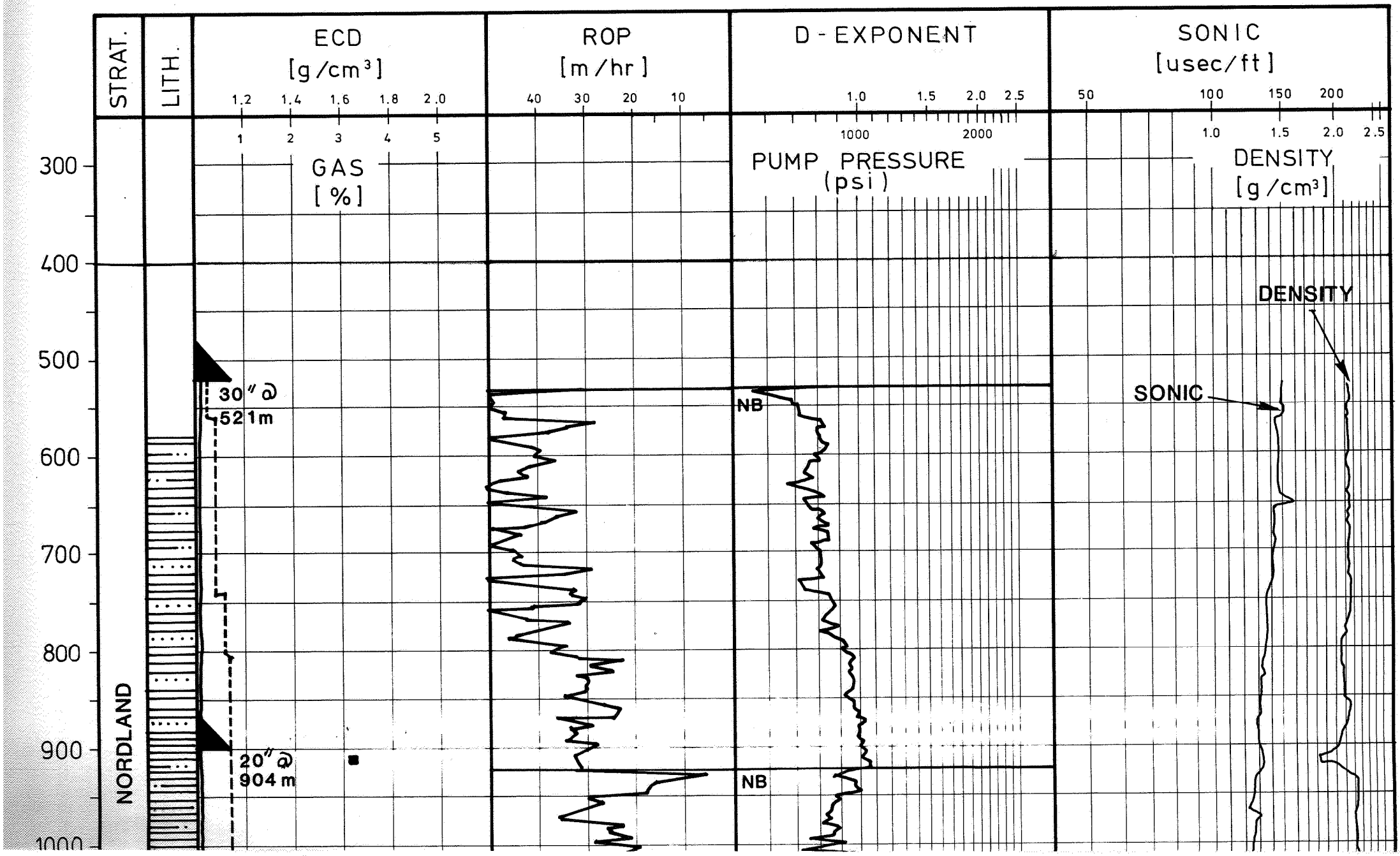
BOTTOM RECOVERED CORE - 2553.3 m

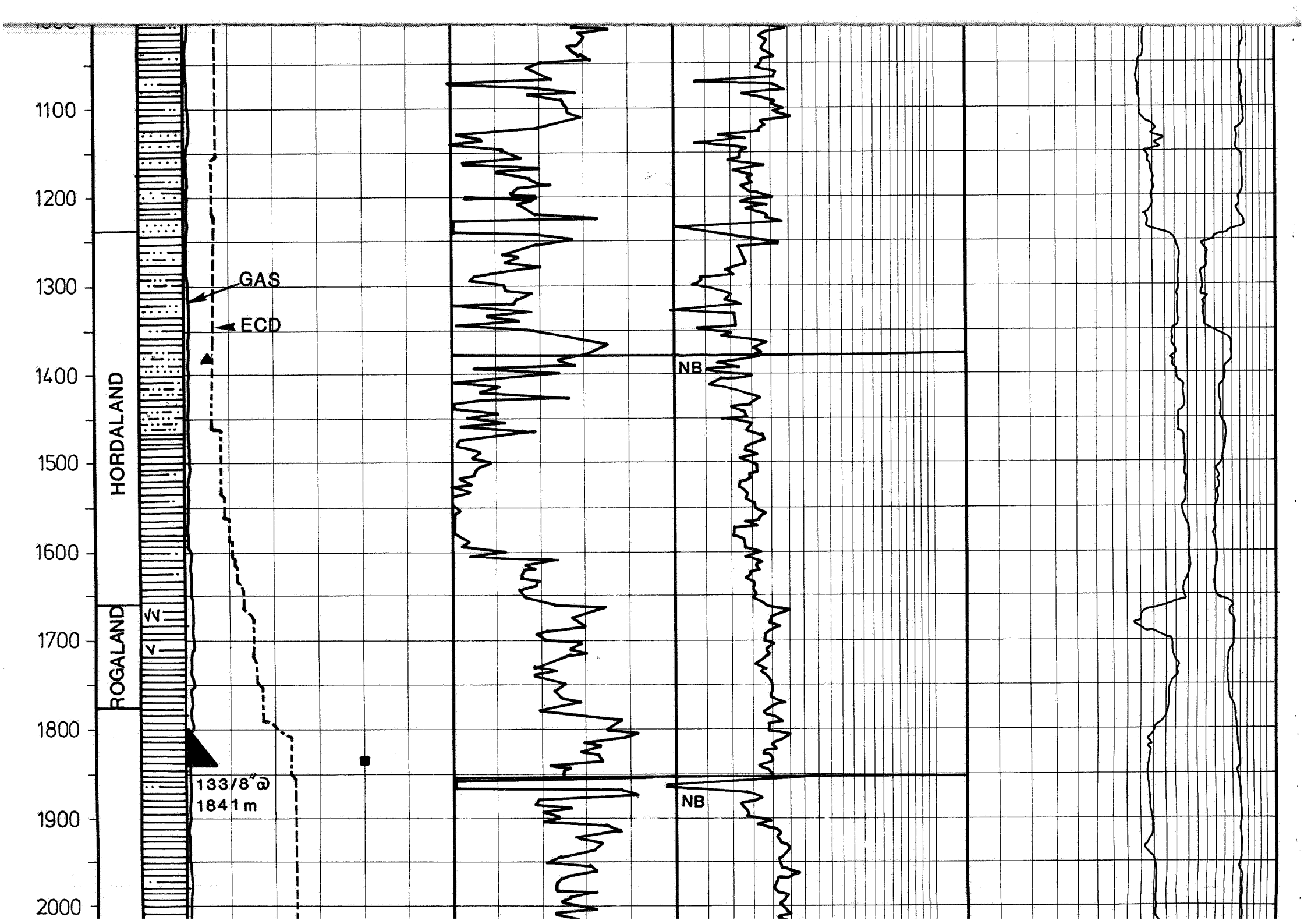

2554
2555
2556
2557
2558
2559
2560
2561
BOTTOM CUT CORE - 2560.5 m RKB

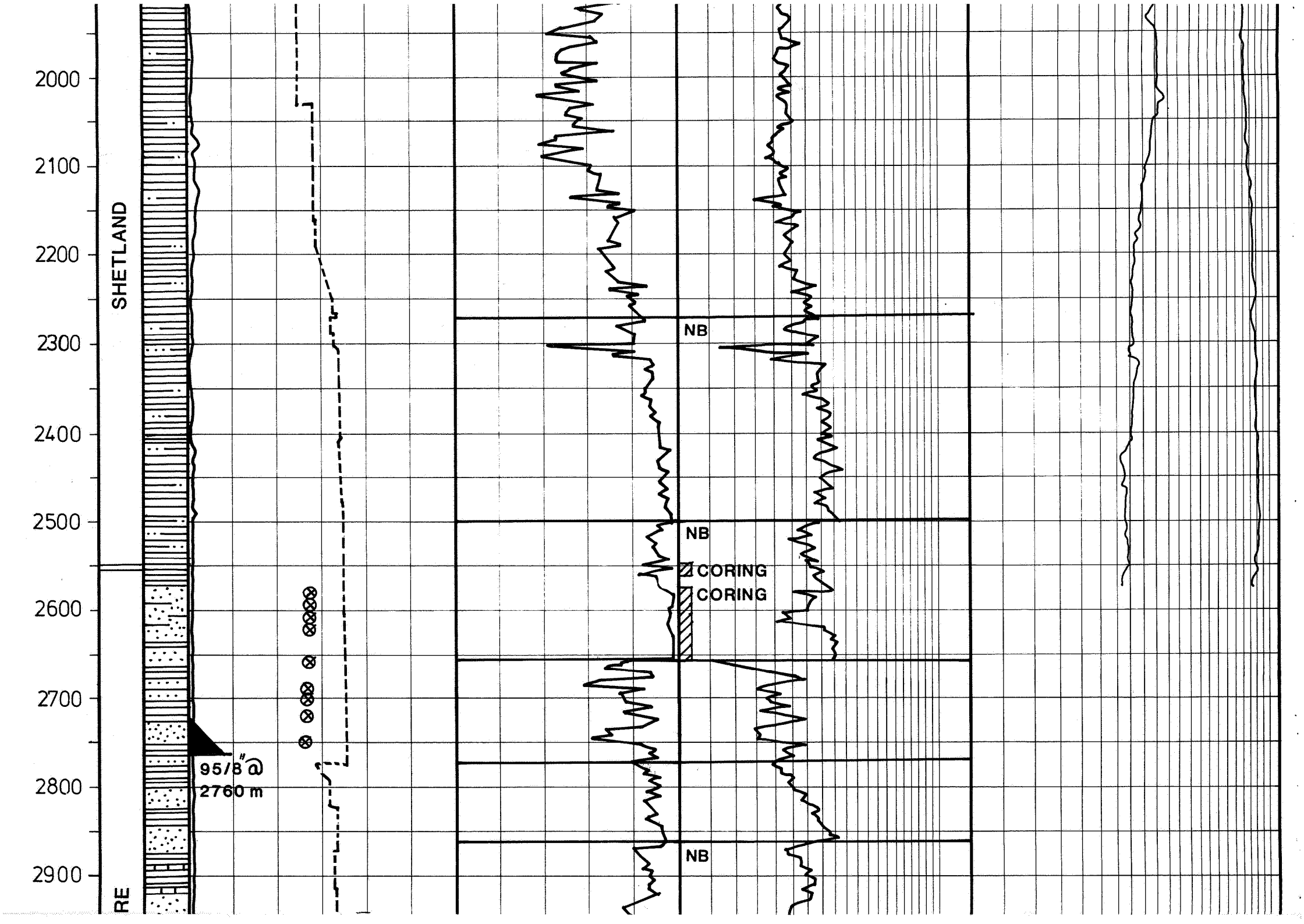
Enclosure II

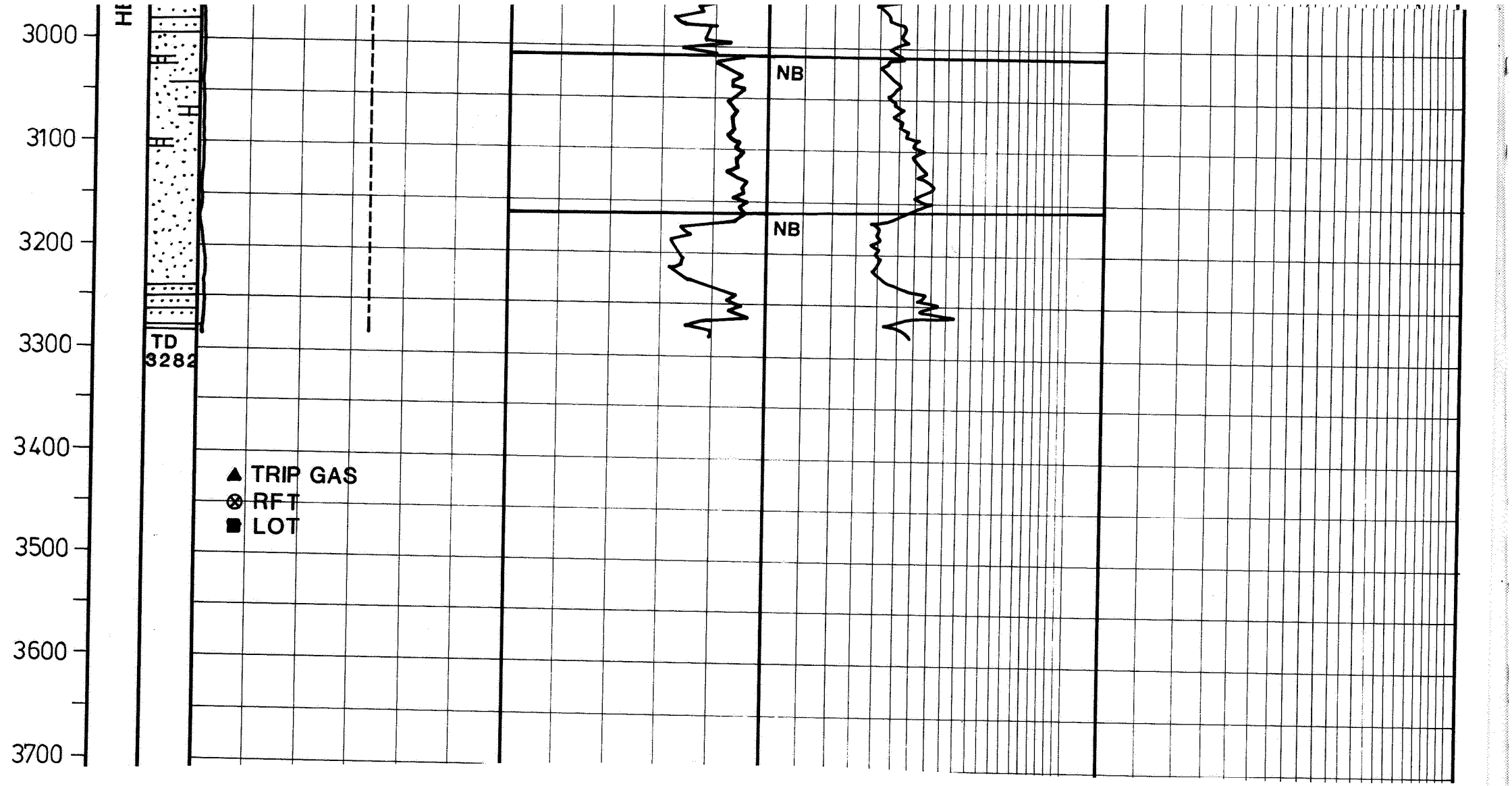
FORMATION PRESSURE EVALUATION SHEET

WELL: 34/4-6




1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
HORDALAND
ROGALAND
GAS
ECD
NB
NB
13 3/8" @
1841 m


2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
SHETLAND
RE
NB
NB
CORING
CORING
NB
95/8" @
2760 m


3000
3100
3200
3300
3400
3500
3600
3700
NB
NB
TD
3282
TRIP GAS
RFT
LOT