III 3. EXTRACT OF DAILY ACTIVITIES

APRIL	
10	Pulling anchors. Start towing to new location.
11	Run anchors. Picked up new BHA. Rig rep.
12	Rig rep.Drlg 36" hole to 171m. Pooh. Rih w/30" csg.
13	Cemented 30" csg. Drlg out cmt and shoe.Nippled up pin conn.and riser Drlg 17½" hole to 200m.
14	Drlg 17½" hole to 415m. Run ISF-Sonic-GR.Nippled down and pulled riser.
15	RIH w/new BHA. Reamed 26" hole to 398m. Run 20" csg to 399m and cemented.
16	Cemented 20" csg. Run BOP stack and tested.
17	Tested BOP drlg cmt. and shoe. Leak off 1.43 sp.gr.Drlg. 17½" hole to 644m.
18	Changed slipjoint packing. Drlg 17½" hole to 1076m.
19	Drlg to 1190m. Raised mud wt to 1.17 sp.gr. Pooh logging.
20	Logging. Drlg to 1195m. Pooh. Run 13 3/8" csg.
21	Cemented 13 3/8" csg. Washed in BOP and housing. RIH w/seal assy. Attempted to test. No success. Pooh Rih and recovered seal assy.
22	RIH w/seal assy. and tried to test it. No success. Tested seal assy and csg through chokeline to 140 kg/cm^2 ok.Pooh. RIH w/12 1/4" BHA. Drilled to 1322m, leakoff test 1.68 sp.gr. No leak-off reached.
23	Drlg. to 1533m. POOH. RIH w bit nr. 5 Drlg to 1579m.
24	Drlg to 1781m. Raised mud wt to 1.22 sp.gr. Drlg to 1983m. Est.pore pressure at 1983m eq. to 1.19 sp.gr.
25	POOH RIH w/bit nr. 6 Drlg to 2205m. Est.pore press. at 2205m eq. 1.2 sp.gr.
26	Drlg to 2314m. POOH RIH w/bit nr. 7 Drlg to 2404m.
27	Drlg to 2496m. POOH RIH w/bit nr. 8 Drlg to 2592m.
28	Drlg to 2656m. POOH RIH w/bit nr. 9 Drlg to 2718m.
29	Drlg to 2734m. POOH RIH w/same bit. Drlg 2762m.
30	Drlg to 2813m.
MAY	
1	Drlg to 2819m POOH. Started logging
2	Logging. RIH reamed and circ.
3	Reamed and circ. POOH. Retrieved wearbushing. Run 9 5/8" csg.
4	Run csg. to 2790m. Cemented. Run seal ass. Attempted to test seal assembly.
5	Attempted to test seal assy, neg. POOH w/seal assy. Washed 18 3/4" housing. RIH w/new seal ass. Attempted to test. Neg.
6	Pooh w/seal ass. nr. 2. Washed seal area. Rigged to squeeze cmt in 9 5/8"x 13 3/8" annulus. Tested cmt.Leaking. Pumped more cmt.
7	Attempted to test cmt, leaking. Run and set 9 5/8" seal ass. Nippled down and pulled BOP. Observed wash-out on wellhead side of AX-seal ring. Press. tested BOP. Divers rep. washout in wellhead.
8	Installed resilient seal ring.Ran BOP. Attempted to test seal ass. neg.
9	RIH w/new cuptester. Retrieved seal ass. Tested cmt to 211 kg/cm^2 ok. Washed seal area. RIH w/seal ass. Tested seal ass. ok. RIH w/wear bushing POOH. RIH w/8½" BHA. Tested csg OK.

10 RIH Drlg cmt and shoe .Leak off 1.8 sp.gr.,at 2823m Drlg to 2832m POOH made u
turbine. RIH w/ 8½" bit and junk sub. Drlg to 2834m. Working junk subs.

11 Drlg to 2836m POOH RIH w/turbine. Drlg to 2975m.

12 Drlg to 3131m

13 Drlg to 3234 POOH

14 POOH. Serviced turbo and changed bit. RIH. Drlg to 3357m.

15 Drlg to 3478m.

16 POOH. Retrieved wear bushing. Tested BOP OK. Run wearbushing. Drlg to 3497m. Raised mud weight to 1.35 sp.gr. POOH.

17 POOH. RIH w/core barrel. Cored from 3489 to 3515m. POOH

18 RIH w/core barrel (C.B.) no 2. Cored to 3533m. POOH.Serviced C.B. RIH w C.B. no. 3

19 Cored to 3551m. POOH serviced C.B. and RIH w/new core bit.

20 Cored to 3570m. RIH and cut core no 5 to 3578m.

21 Cut core no 5 to 3588m. POOH.RIH w/bit no. 18. Reamed from 3420m. Circ.POOH

22 Logging. Could not get below 3572m. RIH w/bit no. 18 and reamed. POOH

23 RIH w/C.B. Cut core no. 6 to 3606,3m. POOH RIH w/C.B.

24 Cut core no. 7 to 3624m. POOH. RIH w/C.B. and new bit.

25 Cut core no. 8 to 3642.8m. POOH. RIH w/C.B.

26 Cut core no. 9 to 3661m. POOH RIH w/C.B.

27 Cut core no. 10 to 3669m. POOH. RIH w/new BHA Drlg. to 3674m. circ. POOH to 3284m, swabbing. RIH and washed/reamed to T.D.

28 Circ. POOH RIH w/C.B. Cut core no. 11 to 3692m.

29 POOH. Tested BOP. RIH w/bit no. 21. Drlg. 8½" hole to 3700m.

30 Drlg. to 3708m. Circ. for samples. Drlg to 3735m.

31 Drlg to 3761m.

JUNE

1 Drlg to 3764m. Wiper trip POOH.Logging

2 Logging RIH w/bit. Circ. wiper trip. POOH. Logging.

3 Ran HDT.RIH w/bit. circ. POOH. Ran RFT.

4 Ran RFT. Took 25 sidewall cores

5 Ran CBL on 9 5/8" csg. Made up csg equipment

6 RIH to csg shoe. circ. RIH Circ. and cond. mud.

7 POOH. Logging

8 Logging. RIH, circ POOH Running RFT.

9 Logging RIH w/bit and worked tight spot. circ. POOH.

10 POOH. Logging

11 Logging.Rep.elec.failure on draw work panel.Drifting pipe. Circ. and cond.mud POOH. Rig and run 7" liner.

12 Run 7" liner. Cementing. POOH. TIH w/8½" bit at 2695m.

13 Circ. POOH. RIH cleaned top of 7" liner. POOH

14 POOH Ran CBL. Tested csg. RIH. Set plug no. 1 at 2716m. top of plug at 2640m.

JUNE

15 POOH. Perforate 9 5/8" csg at 1070m. Squeezed.POOH set cement plug at 415m and 280m.

16 Blowed off wellhead at 142m. Recovered 20", 13 3/8" and 9 5/8" csg. Run charge no. 2. Attempted to work 30" csg free. No success.

17 Run charge no. 3 Recovered 30" housing and permanent quide base. Pulled anchors.

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

rilling Fluid & Material Consumption Report

UD SYSTEM GEL SEAWATER

WELL NAME 15/9-2 AREA NORTH SEA
OPERATOR STATOIL RIG. ROSS RIG
ENGINEERS S. ASBJØRNSEN/J. STRAND

ay No.	DATE	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE BULK	BENTONITE BULK	SACK MATERIALS: BENTONITE		MATERIALS ADDED TO CONTROL PROPERTIES: FCL LIGNO.		THINNERS		POLYMERS				OTHERS: CAUSTIC	LIME	SODA ASH	SODIUM BICARB.	L.C.M.				
1	10																								
2	11			1000	6		180										6	4	4						
3	12		1300	300			42										2	4	1		12				
4	13			1200	17	14											8		8						
5	14			500		5	33										6								
6	15	2550		800	14	20											8	2	8		80				
7	16																								
8	17	114	100	2000	31	14	175		26								32		8						
9	18		327	560	2		222		65								54		4						
0	19		161	200	20		20		15								13								
1	20								4																
2	21		795						28								4			7					
3	22			347			50		34								14		2	2					
4	23		240	260	37		130		40								16		2	1					
FORWARD																									
ESTIMATED TOTALS		2664	2923	7167	127	53	852		212								163	10	37	10	92				

REMARKS:

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

MUD SYSTEM: GEL LIGNOSULFONATE

WELL NAME: 15/9-2 AREA: NORTH SEA
OPERATOR: STATOIL RIG: ROSS RIG
ENGINEERS: S. ASBJØRNSEN/J. STRAND

Day No.	DATE	Estimated Daily Mud Volumes: Losses Sub Surface	Losses Surface	Volume Mud Built	Bulk Materials: Barite	Bentonite	Sack Materials: Barite	Bentonite	FCL.	Thinners: Lignite			Polymers: CMC	Soltex				Others: Caustic	Lime	Soda Ash	Sodium Bicarb.	L.C.M.	M.D.	Lubra Seal	Al. Stear.
15	24		180	468	24				81									34		2			2	1	
16	25		120	258	6			20	95									40						1	
17	26		240	345	11			40	46					10				22		1					
18	27		190	355	28			48	43									34							
19	28		280	200	28			85	27									43							
20	29		370	300	10			60	21									17							
21	30		185	200	13			60	23				5					31							13
22	1		150	85	16				61				5					6							3
23	2		312	100	3			50	2									4							
24	3		118	200	17			59	98				1					19	1						
25	4		214					7	2																
26	5				8			28										1							
27	6	70	150					38	13									2							
28	7		70																						
FORWARD		2664	2923	7167	127	53		852	212									163	10	37	10	92			
ESTIMATED TOTALS		2734	5502	9678	291	53		1347	724				11	10				416	11	40	10	92	2	2	16

REMARKS:

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

rilling Fluid & Material Consumption Report

JD SYSTEM: GEL LIGNOSULFONATE

WELL NAME: 15/9-2 AREA: NORTH SEA

OPERATOR: STATOIL RIG: ROSS RIG

ENGINEERS: S. ASBJØRNSEN/J. STRAND

ay lo.	DATE	ESTIMATED DAILY MUD VOLUMES			BULK MATERIALS		SACK MATERIALS		MATERIALS ADDED TO CONTROL PROPERTIES: THINNERS				POLYMERS					OTHERS								
		LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BARITE	BENTONITE	BARITE	BENTONITE	FCL. LIGNO.	LIGNITE			CMC	SOLTEX				CAUSTIC	LIME	SODA ASH	SODIUM BICARB.	L.C.M.	M.D.	LUBRA SEAL	AL. STEAR.	
29	8		140																1			20				
30	9	50		57				25										1								
31	10		30	90	10			56	6											1						
32	11		112		8			64										3								
33	12		22		7			26	34	37			15					19							1	
34	13							28	27	33			11					20							1	
35	14			64					38	16			4					16								
36	15		178	200	25			25	45	18			8					20								
37	16		15	20	36				33	6								11								
38	17		157	200					9	10			9					6								
39	18			33	21			40	8	7			21					9								
40	19		30	26	3				11	12								4								
41	20		20	49	4			32	10	11			2													
42	21		36		3				18	23								2								
FORWARD		2734	5502	9678	291	53		1347	724				11	10				416	11	40	10	92	2	2	16	
ESTIMATED TOTALS		2784	6242	10417	408	53		1643	963	173			81	10				527	12	41	10	112	2	2	18	

REMARKS:

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

MUD SYSTEM: GEL LIGNO LIGNITE

WELL NAME: 15/9-2 AREA: NORTH SEA
OPERATOR: STATOIL RIG: ROSS RIG
ENGINEERS: S. ASBJØRNSEN/J. STRAND

Day No.	DATE	Estimated Daily Mud Volumes: Losses Sub Surface	Estimated Daily Mud Volumes: Losses Surface	Estimated Daily Mud Volumes: Volume Mud Built	Bulk Materials: Barite	Bulk Materials: Bentonite	Sack Materials: Barite	Sack Materials: Bentonite	Thinners: FCL	Thinners: Lignite	Thinners	Thinners	Polymers: CMC	Polymers: Soltex	Polymers	Polymers	Polymers	Others: Caustic	Others: Lime	Others: Soda Ash	Others: Sodium Bicarb.	Others: L.C.M.	Others: M.D.	Others: Lubra Seal	Others: Al. Stear.	
43	22	–	10	122	11			28	20	15				15				8								
44	23	–	13	22				38	37	52								30								
45	24	–	40	10	16			15	26	54								11								
46	25	–						7	13	22																
47	26	–	15		8				13	12								11								
48	27	–	27	100	8				15	21				17				13								
49	28	–		52	3			17	15	16			6					10								
50	29	–	45					8	8	8								7								
51	30	–	20		1			12	23	23								5								
52	31	–	11		2					5																
53	1	–	9		3					11								3								
54	2	–			1				7	7								3								
55	3	–	50	18	4				12	12								2								
56	4	–	20	20				20																		
FORWARD		2784	6242	10417	408	53		1643	963	173			81	10				527	12	41	10	112	2	2	18	
ESTIMATED TOTALS		2784	6502	10761	465	53		1788	1152	431			87	42				630	12	41	10	112	2	2	18	

REMARKS:

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

rilling Fluid & Material Consumption Report

UD SYSTEM GEL LIGNOSULFONATE

WELL NAME 15/9-2 AREA NORTH SEA
OPERATOR STATOIL RIG. ROSS RIG
ENGINEERS S. ASBJØRNSEN/J. STRAND

ay lo.	DATE	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	SACK MATERIALS: BARITE	BENTONITE	THINNERS: FCL	LIGNITE			POLYMERS: CMC	SOLTEX				OTHERS: CAUSTIC SODA	LIME	SODA ASH	SOD. BICARB.	L.C.M.	M.D.	LUBRA SEAL	AL. STEAR.		
7	5																										
8	6		30	28	5			24	12	10								5									
9	7		18																								
0	8		10																								
1	9				8																						
2	10																										
3	11				6			4										9									
4	12	30			3													10									
5	13				11																						
6	14																										
FORWARD		2784	6502	10761	465	53		1788	1152	431			87	42				630	12	41	10	112	2	2	18		
ESTIMATED TOTALS		2814	6560	10789	498	53		1816	1164	441			87	42				654	12	41	10	112	2	2	18		

REMARKS:

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

9

Drilling Mud Properties Record

WELL NAME 15/9-2 AREA NORTH SEA
OPERATOR STATOIL RIG. ROSS RIG
MUD SYSTEM WYOMING BENTONITE/LIGNOSULFONATE
ENGINEERS S. ASBJØRNSEN/J. STRAND

Day No.	DATE	DEPTH (FEET ☐ METERS ☒)	DENSITY PPG ☐ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Cl⁻ ppm	Ca ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
1	10																							Moving rig to new l
2	11			SPUD	MUD	VISC.	130+																	Only one rig pump
3	12	171		SPUD	MUD	VISC.	200+																	Used 1300 bbls. spu
4	13	171		SPUD	MUD	VISC.	120+																	Drilled out 30" cmt shoe P.O.O.H.
5	14	415		SPUD	MUD	VISC.	120+																	Displaced w/mud. Dr 17½ to 415.
6	15	415		SPUD	MUD	VISC.	200+		WT. 9.8															O.H. to 26". Pumped 2550 bbls. m
7	16	415		NO MUD																				Ran 20" Csg. Running BOP + Riser
8	17	530	9.1	46	24	16	17	14/25	10	2		10.5	6500	80	.9	-	5	TR	25					RIH. Drill out cmt. Drill to 530
9	18	928	9.3	50	24	10	22	22/31	11	2		10.5	11000	80	.9	-	7	1/4	20					Drill ahead. Building mud.
10	19	1190	9.3	49	25	10	28	20/29	12	3		10.5	11500	80	.9	-	9	1/4	20					Drilled 17½" to T.D 1190. Logging.
11	20	1195	9.8	50	24	13	22	19/36	14	3		10.5	12400	80	.55	-	10	1/2	25					Running 13-3/8" cas
12	21	1195	9.8	54	22	13	18	12/25	15	3		11	12400	60	2.3	-	10	1/4	20					Run 13-3/8 csg.Cmt.
13	22	1197	9.8	42	19	13	12	15/40	19	3		11	11000	148	2.4	-	11	3/4	20					Drilled float + sho
14	23	1573	10.4	43	24½	16	17	12/28	12	3		11.1	6800	80	1.7	-	11	1/4	25					Drilling clayst.30M

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Mud Properties Record

MUD SYSTEM: WYOMING BENTONITE/LIGNOSULFONATE

WELL NAME: 15/9-2 AREA: NORTH SEA
OPERATOR: STATOIL RIG: ROSS RIG
ENGINEERS: S. ASBJØRNSEN/J. STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☒	MUD PROPERTIES: DENSITY PPG ☐ SG ☐	VISCOSITY: sec/qt	VISCOSITY: A.V. cps	VISCOSITY: P.V. cps	VISCOSITY: Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis: Cl⁻ ppm	Filtrate Analysis: Ca ++ ppm	Filtrate Analysis: Pf	RETORT: % OIL	RETORT: % SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMAR
15	24	1970	10.2	43	21½	15	13	5/25	12	3		11.2		80	1.1	-	9	1/2	25					Drilling claystone 20-30 M/HL
16	25	2199	10.2	43	20	14	12	3/19	9	3		11		40	1.4	-	9	1/4	32½					Drilling shale wit sand str.25-50 M/H
17	26	2395	10.4	42	21	15	12	2/10	9	2		10		80	0.7	-	11	1/4	35					Drilling 100% shal
18	27	2517	10.4	42	16	13	6	3/17	9	2		10.5		80	0.7	-	12	1/4	32.5					Drilling shale with sandstone
19	28	2680	10.4	42	16	12	8	3/17	9.8	2		10.5		80	1.1	-	13	1/4	30					Drilling sandstone Trip.
20	29	2742	10.4	42	16	13	9	3/17	9.6	2		10.5		60	1.1	-	13	TR	30					Drilling sandstone Trip.
21	30	2799	10.4	41	16	12	8	4/20	9.9	2		10.5		60	0.9	-	12	TR	32.5					Drilling ahead. Mixed 200 bbls.
22	31	2819	10.5	41	17	13	9	3/18	8	2		11			1.1	-	13	TR	27.5					Drilling ahead. Circ. wipertrip.
23	32	2819	10.5	40	15	12	6	4/28	8.5	2		11			1.1	-	13	TR	27.5					Logging RIH Circulating.
24	33	2819	10.6	43	19	14	9	4/18	8.4	2		11			1.1	-	13	TR	27.5					Strat running 9-5/8" casing.
25	34	2819	10.6	44	19½	14	11	5/19	8.6	2		11.2			1.3	-	12	TR	27.5					Cemented 9-5/8". Leakin seal ass.
26	5	2819	10.9	46	20½	15	11	5/21	9	2		10.5			.75	-	14	TR	27.5					Working with seal
27	6	2819	10.7	46	19½	14	11	6/25	9	2		10.5			.7	-	13	TR	27.5					Cementing between 13-3/8 - 9-5/8.
28	7	2819	10.5	46	19½	14	11	7/24	9	2		11			.7	-	13	TR	27.5					Pull liser + BOP.

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

WELL NAME 15/9-2 AREA NORTH SEA
OPERATOR STATOIL RIG. ROSS RIG
ENGINEERS S. ASBJØRNSEN/J. STRAND

Drilling Mud Properties Record

MUD SYSTEM WYOMING BENTONITE/LIGNOSULFONATE

Day No.	DATE	DEPTH (FEET ☐ METERS ☒)	DENSITY PPG ☐ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Cl⁻ ppm	Ca ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARK
29	8	2819	10.4	47	20	14	12	7/26	9	2		10.5	150	12000	.7		13	TR	30					Run bop. Testet se negativ.
30	9	2819	10.5	46	20	14	12	6/24	8.7	2		11	150	12500	.9		13	TR	30					Testet seal ok.
31	10	2819	10.5	43	17	13	9	2/10	8	2		11.2	80	11000	1.3		13	TR	30					Drilled 12m new hol leek of 15kg.
32	11	2917	10.5	45	17	14	9	3/11	9.8	2	34	11.2	80	12000	1.3		13	TR	27½					R.i.h. w/junk baske Pooh rih w/turbo.
33	12	3119	10.6	45	17	13	8	3/17	8.5	2	24	11.1	60	12000	1.1		13	-	27½					Drilling ahead 2/tu
34	13	3226	10.6	46	20	15	8	3/17	8.0	2	23	11.0	80	12000	1.1		13	-	27½					Drilling ahead. Wiper trip.
35	14	3318	10.6	47	22	16	11	3/25	8.5	2	23	11	80	13000	1.1		14	-	27½					Drilling ahead. Poo change bit.
36	15	3462	11	49	24	17	13	3/25	7.9	2	19	11	80	13400	1.2		15	-	27½					Drilling ahead. Wipertrip.
37	16	3495	11.2	47	23	18	12	3/24	8.5	2	16.5	11	80	14400	1.2		17	TR	27½					Drilling to 3478.Ch B.H.A., rock bit.
38	17	3506	11.3	48	20	17	11	3/21	7.2	2	14	11	80	13500	1.1		16	TR	27½					RIH with 60' core barrel.
39	18	3533	11.3	48	23	18	11	3/24	6	2	14	11	80	16400	1.3		16	TR	27½					Cut core no. I and 100% recover.
40	19	3551	11.3	50	24½	18	13	2/21	6	2	14	11	70	16600	1.8		14	TR	27½					Cut core no. III 100% recover.
41	20	3578	11.3	50	25	18	14	3/24	6	2	13.8	10.8	90	16200	1.1		14	TR	30					Cut core no. IV 100% rec.
42	21	3588	11.3	50	26	16	12	2/21	6.9	2	13.4	11	80	15900	1.6		14	TR	27½					Cut core no. V.

REMARKS

ANCHOR DRILLING FLUIDS A/S
OSLO — STAVANGER

illing Mud Properties Record

O SYSTEM WYOMING BENTONITE/LIGNOSULFONATE

WELL NAME 15/9-2 AREA NORTH SEA
OPERATOR STATOIL RIG. ROSS RIG
ENGINEERS S. ASBJØRNSEN/J. STRAND

y	DATE	DEPTH FEET ☐ METERS ☒	DENSITY PPG ☐ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Cl⁻ ppm	Ca ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
3	22	3588	11.3	56	22½	17	11	2/21	5.9	2	13.9	10	15900	80	1.2	10	16	TR	25					Fin logging, RIH for reaming.
4	23	3604	11.3	59	26	19	14	2/9	3.5	2	13.6	11.5	11000	80	2.8	9	14	TR	23					Cut core no. VI.
5	24	3624	11.3	61	23½	20	9	2/9	3.5	2	14.8	11	12500	80	2.8	7	13	TR	23					Cut core no. VII.
6	25	3642	11.3	61	24	19	13	2/13	3.9	2	14	11	13000	80	2.7	6	13	TR	22.5					Cut core no. 8.
7	26	3661	11.3	50	22	18	9	3/13	4	2	14	11	13000	80	2.5	6	13	TR	22.5					Cut core no. 9.
8	27	3674	11.3	60	30	23	13	3/15	2.4	2	9	11	13000	80	2.6	10	13	TR	25					Cut core no. 10. Change BHA RIH.
9	28	3684	11.3	59	28	22	12	3/14	3	2	9.5	11	13000	80	2.8	10	14	TR	25					Cut core no. 11.
10	30	3693	11.3	55	29	23	12	3/13	3.4	2	10.4	11.5	13000	60	2.6	10	14	TR	25					Tested BOP.
11	31	3728	11.3	54	26	20	11	2/12	2.4	2	10	11.5	13200	60	2.6	10	14	TR	25					Drilling ahead.
12	1	3755	11.3	57	27	21	12	2/14	2.6	2	10.2	11.5	12800	80	2.2	10	14	TR	25					Drilling ahead in sandstone.
13	2	3764	11.3	56	27	21	12	2/16	2.0	1	10.4	11.5	13200	80	2.0	9	14	TR	25					Drilled to TD 3764m
14	3	3764	11.3	60	26	20	12	2/15	2.7	1	10.6	11.5	13200	80	2.1	9	14	TR	25					Logging run 3 log
15	4	3764	11.3	56	24½	19	11	2/16	2.9	1	10.8	11.5	12900	90	2.2	9	14	TR	25					Run log no. 5. Wiper trip.
16	5	3764	11.3	54	24	19	10	2/15	2.8	1	10.8	11.4	12900	80	2.1	9	14	TR	25					Run log no. 6 - no. No problems.

EMARKS

ANCHOR DRILLING FLUIDS A/S
OSLO — STAVANGER

illing Mud Properties Record

D SYSTEM WYOMING BENTONITE/LIGNOSULFONATE

WELL NAME 15/9-2 AREA NORTH SEA
OPERATOR STATOIL RIG. ROSS RIG
ENGINEERS S. ASBJØRNSEN/J. STRAND

DATE	DEPTH (FEET ☐ METERS ☒)	DENSITY PPG ☐ SG ☐	sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0 / 10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Cl⁻ ppm	Ca. ++ ppm	Pf	% OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
6	3764	11.3	55	24	19	10	2/16	3	1	10.9	11.4	12900	90	2	9	14	TR	25					Fin logging.
7	3764	11.3	59	24	18	12	2/16	2.8	1	10.8	11.5	12800	80	2.2	9	14	TR	25					Made wiper trip.
8	3764	11.3	58	24	18	12	2/16	2.9	1	11	11.4	12200	80	2.1	8	14	TR	25					Start logging. Hole in good cond.
9	3764	11.3	59	25	18	13	2/16	3.0	1	11.1	11.0	12400	80	2.1	8	14	TR	25					Logging. Wiper trip. Logging.
10	3764	11.3	59	26	17	13	3/15	3.2	1	11.6	11	12400	80	2.0	8	14	TR	25					Logging wiper trip.
11	3764	11.3	59	25	19	14	3/16	2.8	1	10.9	11	12400	80	1.9	8	14	TR	25					Logging (RFT)
12	3764	11.3	50	24	18	12	2/14	2.7	1	11.2	11.5		80	1.9	8	14	TR	25					Logging. Conditioning mud.
13	3764	11.3	54	24	20	13	3/14	2.9	1	10.9	11.5		80	1.9	7	14	TR	25					Set 7" liner and cmt.
14	3764																						
15	3764																						

EMARKS

REPORT

REPEAT FORMATION
TESTER (RFT)
WELL 15/9-2

25. oktober, 1978.

REPEAT FORMATION TESTER (RFT), WELL 15/9-2.

Conclusions.

Two separate pressure surveys, with different RFT-tools, were performed, each giving well defined pressure gradients over the pay zone, 0.0312 bar/m (0.138 psi/ft) and 0.0318 bar/m (0.141 psi/ft) respectively, comparing well with the pressure gradient of 15/9-1.

There was no indication of horizontal pressure barriers within the reservoir.

With respect to the actual values of formation pressures, however, conflicting information from the different gauges leaves us with an interval of inaccuracy of at least 5 bars for each depth level.

Although the observed pressures in this well seems to be a little low compared to the pressures in 15/6-3 and 15/9-1 at same levels, pressure communication should not be rejected.

Hydrocarbon fluid analysis shows a CO_2 concentration of 8 - 9 mol percents. Preliminary calculations based on fluid conpositions indicate a GOR of 25 - 31000 SCF/STB, however, the final fluid analysis is not yet available.

The logs and the RFT sampling in this well confirmed a gas water contact between 3652 and 3654.5 m. This gas water contact is at least 25 m deeper than in the Sleipner structure.

Runs and tools.

A Schlumberger Repeat Formation Tester program was performed during the 8½" open hole logging of the well to establish the formation pressure profile and reservoir pressure gradient. The pressure survey and the sampling program were also designed to check fluid contacts.

Two RFT tools were used for a total of 11 runs in the hole, twice for pressures and 9 times for fluid samples, of which one was a misrun.

RFT No. 32494 was used for run no. 1, 2, 3, 4, 5, 6, 9A and 10.
RFT No. 35761 was used on run no. 7, 8 and 9.

Run no. 2 and 7 were pressure surveys. On both runs, 2 amarada gauges were run with the RFT to check the RFT pressures.

Depth reference and RFT-calibration.

All depths given in this report are RKB, referring to the FDC-CNL log run no. 3, June 2, 1978.

RFT pressures have been corrected by the operator according to the calibration certificate, for temperature and pressure effects on tool readings.

Amarada pressure readings are provided by the field operator.

Quality of pressure data.

It is observed (see figure 1 and 2) that both RFT gauges read consistently lower pressures than the amarada gauges. This tends to be a more or less common feature of RFT pressure surveys that is observed in other wells before. However, we have no general conclusion about which type of gauge gives the more accurate estimate of actual formation pressures.

The difference between corresponding pressure readings of the two RFT gauges is approximately 5 bars, far exceeding the nominal accuracy, claimed by Schlumberger, of properly working tools.

Comparison between nominal mud weight gradient and observed hydrostatic pressures does not add significantly to the arguments for choice of best estimate of formation pressures.

We therefore consider that a reasonable interval of confidens for the actual values of formation pressures is represented by the readings of the two gauges, RFT 35761 and RPG-3 no. 41676, the width of this interval is approximately 5 bars. True values of formation pressures lower than those of RFT 35761 are considered improbable.

RFT PRESSURE SURVEY.

RFT run no. 2 and no. 7.

During run no. 2 the tool was set on 45 positions, and 39 pressure readings were recorded. Four pressure points were lost due to seal failure, and two due to very weak pressure build up in tight formation.

Complete record of final build up pressures and hydrostatic pressures for each tool position is presented in Table no. 1.

One of the two amaradas accompanying the RFT was plugged during the entire run and did not supply any useful pressure information.

Pressures obtained from the other Kuster gauge display a well defined mud gradient (see figure 2 and table). However, the formation pressures recorded by this gauge do not agree with a reasonable pressure profile, and these pressures are discarded for the further discussion.

The RFT gives a spurious, very high, formation pressure at 3626 m, the reason being probably a leaking seal. The build up observations at this setting show an extremely long build up time (11 minutes as compared with approximately 1 min. for the rest of the build ups). The pressure observation at 3656 m, the deepest setting in the main section, is probably indicative of a shift from a gas gradient to a water gradient.

At 3739 m the formation is relatively tight and the observed high pressure could be due to seal leakage also. The pressure did not stabilize, but the tool was retracted after 63 min. due to risk of differential sticking.

The validity of the pressure reading at 3711 m is considered doubtful when compared with the reading at 3695.5 m (run no. 7)

The RFT formation pressures obtained within the main reservoir section are plotted versus depth in figure 1, and the mud hydrostatic pressures of the RFT and Kuster gauge are plotted vs. depth in fig. 2.

A formation pressure gradient based on RFT pressures has been calculated using the least square method. In the calculations the points 3626 and 3656 m are excluded. The resulting pressure gradient is 0.0312 bar/m (0.138 psi/ft).

For data quality control the mud hydrostatic gradient is calculated both for the RFT and amarada gauge, giving 0.134 bar/m (11.4 lbs/gal) and 0.0130 bar/m (11.1 lbs/gal) respectively. Actual mudweight in hole was 11.3 lbs/gal.

For run no. 7 a brand new RFT tool was used to check the pressures from run no. 2. The tool was set on 16 positions, and 15 valid pressure reading were obtained.

All the gauges, including the two amaradas, produced well defined formation pressure gradients, and also mud hydrostatic gradients. The mud had been circulated between run no. 2 and no. 7, and the hydrostatic pressures should not be directly compared.

Build up pressures and hydrostatic pressures for run no. 7 are given in Table 2.

Formation pressures have been plotted vs. depth in fig. 1, and hydrostatic pressures vs. depth in fig. 2.

Each of the three gauges originates separate, well defined, straight line formation pressure gradients. The RFT pressures, however, domonstrate the better straight line fit. The RFT gradient is 0.0318 bar/m (0.141 psi/ft), and amarada gradients are 0.0322 bar/m (0.142 psi/ft) and 0.0307 bar/m (0.136 psi/ft).

Mud hydrostatic gradients were:

RFT :	0.136 bar/m (11.6 lbs/gal)
Amaradas:	0.136 bar/m (11.6 lbs/gal) and
	0.134 bar/m (11.4 lbs/gal).

The nominal mudweight applied was the same as in run no. 2, 11.3 lbs/gal.

Fluid sampling and analysis.

A total of 15 samples were obtained during eight sampling runs. The samples from the first seven runs were transferred under atmospheric pressure on the rig. Fluid recoveries and analysis of these samples are presented in Table no. 3. The lighter oil from run no. 4 (sampling depth 3490 m) may indicate some degree of gravity segregation in the reservoir.

The analysis of the gas from these samples is presented in Table no. 5.

A special report on analysis of the sampled water will be issued shortly.

The samples from RFT run no. 10 were transported ashore in the RFT samplers to be transferred under high pressure and temperature. The 1 gallon chamber developed a leak in a seal during transfer attempt, and the transfer was not successful.

14 samplebottles (600 cc) were collected during transfer of the 5 gallon chamber. Six of these were sent to Corelab (Aberdeen) for classification and component analysis. The results of the analysis are presented in Table no. 4.

The high experimental dew point pressure should be observed. There exist several sources of error that can account for this: light ends may have been lost during sampling, heavy ends may have been lost during the process of transfer from the samplers, the experimental procedure of observing dew points may be systematically biased, the formation temperature applied may also be too low and the effect of rising the temperature will be further investigated.

The high dew point leaves us so far with doubt to which extent the sample analysis should be trusted, however, we consider the higher CO_2 percentages to be significant for this well. We have also applied computer calculations for total GOR on the various compositions and obtained a range of 25 - 31000 SCF/BBL, which shows reasonable agreement with the wells 15/6-3 and 15/9-1.

In concordance with the logs, the fluid sampling of run no. 8 and run no. 9A confirmed a gas water contact between the sampling depths 3652 and 3654 m.

TABLE 3

RECOVERIES FROM RFT SAMPLE RUNS

RUN No	DEPTH RKBM	MAX BHT (°C)	CHAMBER (gals)	PRESSURE (BARS)	GAS (m^3)	CONDENSATE (ccs)	WATER (ccs)	GRAVITY (API)
1	3644.0	109.4 110.6 107.2	1	220	0.75	150	450	44.0
3	3641.5	109.4 112.2 112.2	1 5	207 193	0.69 3.48	1200	2400	47.9, 45.6
4	3490.0		1 5	207 220	0.64 3.65	220 1500	120 2230	49.6 50.2, 50.3
5	3601.6		1 5	206 165	0.60 1.32	160 400	830 12000	45.9 47.5, 47.6, 48.2
6	3641.0 3640.4	110.0	1 5	172 172	0.52 2.52	100 1300	800 1300	48.5
8	3654.3	105.6 106.1	1 5	0 0	- -	- -	3600 18000	
9A	3652.0		1 5	193 179	0.63 2.44	200 1000	700 9000	45.5 47.9
10	3535.7		1 5					

TABLE 4

ANALYSIS OF GAS TRANSFERRED FROM 5 gal CHAMBER

RUN No. 10

Bottle No.	20438-32	22478-94	20112-26	20438-43	20438-20	22478-1
H2S	NIL	NIL	NIL	NIL	NIL	NIL
CO2	9.08	9.33	8.50	8.40	9.24	9.14
N2	0.84	0.72	0.69	0.68	0.76	0.67
C1	71.65	73.26	72.50	72.97	72.78	72.18
C2	7.93	8.24	8.34	8.36	8.13	8.05
C3	4.88	3.73	4.30	4.39	4.27	4.37
iC4	0.84	0.51	0.64	0.64	0.66	0.66
NC4	1.47	0.96	1.16	1.13	1.14	1.13
1C5	0.27	0.30	0.38	0.29	0.29	0.49
NC5	0.42	0.42	0.48	0.37	0.36	0.53
C6	0.26	0.23	0.54	0.50	0.43	0.41
C7+	2.36	2.30	2.47	2.27	1.94	2.37
Molecular weight of heptanes plus	131	134	129	132	135	135
Specific gravity heptanes plus	0.792	0.790	0.793	0.792	0.793	0.793
Dew point at 241°F Psig	6579	6645	6638	6667	6655	6653

Samples was taken by the RFT tool in run no. 1, 3, 4, 5, 6, 8, 9 and 10. All but the last sample was flashed on the rig and samples of gas, water and oil was collected. Below follows the results of the gas analysis (in mol %) by Statoil Petroleum Laboratory.

Run no.	1	3	3	4	4	5	5	6	6	9	9
Depth (m)	3644	3641,5	3641,5	3490,0	3490,0	3601,6	3601,6	3641,0	3640,4	3652	3652
Chamber(gal)	1	1	5	1	5	1	5	1	5	1	5
N_2	0,5	0,5	0,3	0,4	0,5	0,4	0,5	0,2	0,5	0,5	0,4
CO_2	7,0	8,7	8,3	7,3	6,8	8,1	5,9	9,9	8,6	8,5	7,3
C_1	78,8	77,1	75,6	79,0	78,6	78,7	79,0	68,6	77,7	77,9	78,8
C_2	8,4	7,9	8,3	8,0	8,8	8,0	9,3	12.9	7,9	8,4	8,2
C_3	3,8	3,8	4,5	3,7	3,8	3,5	3,9	6,3	3,7	3,5	3,7
iC_4	0,46	0,52	0,71	0,47	0,46	0,42	0,44	0,71	0,48	0,40	0,49
nC_4	0,64	0,79	1,3	0,70	0,68	0,62	0,65	1,03	0,73	0,60	0,81
iC_5	0,17	0,24	0,36	0,16	0,16	0,13	0,19	0,18	0,18	0,10	0,16
nC_5	0,14	0,23	0,31	0,14	0,14	0,11	0,10	0,13	0,15	0,09	0,13
C_6	0,07	0,22	0,32	0,11	0,05	0,02	0,02	0,05	0,06	0,01	0,01
Approx.mol% air in sample	3	3	8	5	2	5	6	2	3	1	5

Note: All samples was contaminated with air. This has been corrected for by subtracting the oxygen and an amount of nitrogen equal to $[O_2] \times 3{,}73$ where 3,73 is the ratio $[N_2]/[O_2]$ in normal air.

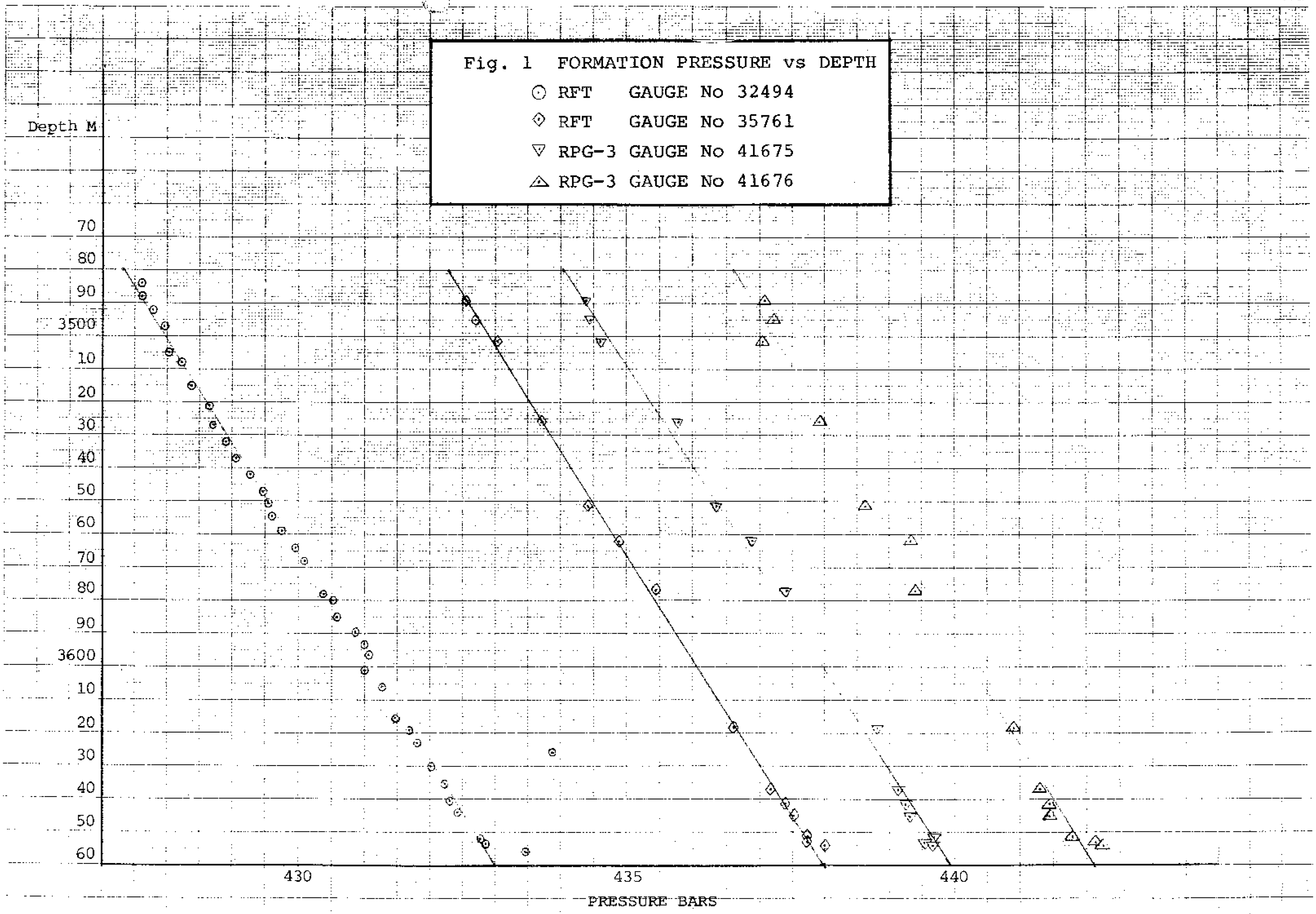

Fig. 1 FORMATION PRESSURE vs DEPTH
RFT GAUGE No 32494
RFT GAUGE No 35761
RPG-3 GAUGE No 41675
RPG-3 GAUGE No 41676
Depth M
70
80
90
3500
10
20
30
40
50
60
70
80
90
3600
10
20
30
40
50
60
430
435
440
PRESSURE BARS

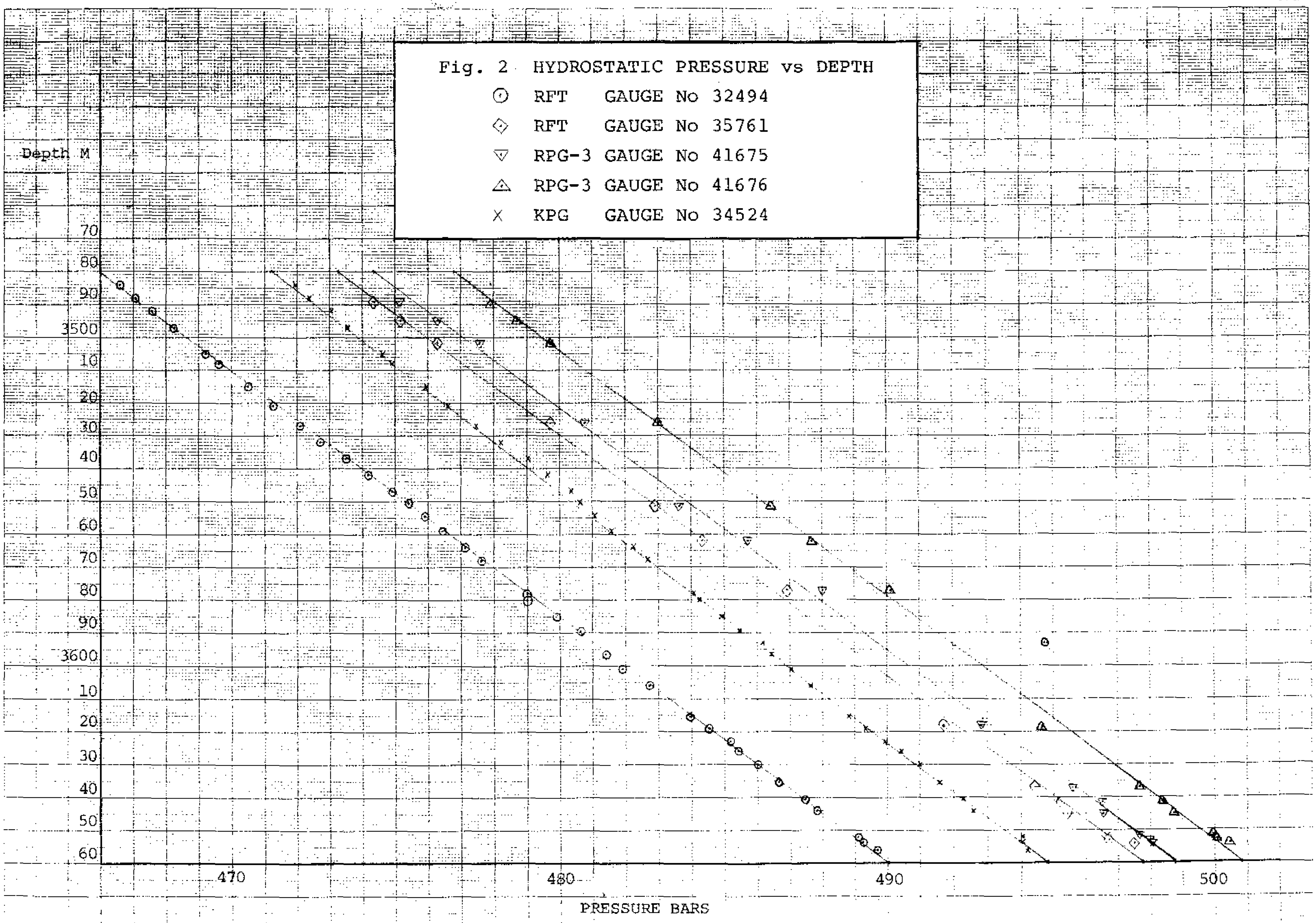

Fig. 2 HYDROSTATIC PRESSURE vs DEPTH
RFT GAUGE No 32494
RFT GAUGE No 35761
RPG-3 GAUGE No 41675
RPG-3 GAUGE No 41676
KPG GAUGE No 34524
Depth M
70
80
90
3500
10
20
30
40
50
60
70
80
90
3600
10
20
30
40
50
60
470
480
490
500
PRESSURE BARS

TABLE 1

RESULTS OF RFT PRESSURE

RUN No 2

		RFT GAUGE No 32494		KPG GAUGE No 34524	
No	DEPTH RKB. M	FORMATION PRESSURE BAR.	HYDROSTATIC PRESSURE BAR.	FORMATION PRESSURE BAR.	HYDROSTATIC PRESSURE BAR.
1A	3745.5	Seal Failure			
1B	3747.3	Seal Failure	501.7		
1C	3747.1	Seal Failure	501.5		
2	3739.0	467.8	500.1		
3	3729.0	Very Slow B.U.	499.0		
4	3717.0	No Seal	497.6		
5	3711.0	445.6	496.8	439.3	501.9
6	3706.0	Very Slow B.U.	496.0		
7	3656.0	433.5	489.7	432.4	494.2
8	3653.5	432.9	489.3	438.6	494.0
9	3652.0	432.8	489.1	438.5	494.0
10	3644.0	432.4	487.8	438.0	492.6
11	3640.5	432.3	487.5	438.0	492.3
12	3635.5	432.2	486.7	438.0	491.6
13	3630.0	432.0	486.0	437.6	491.0
14	3626.0	433.9	485.4	439.3	490.5
15	3623.0	431.8	485.2	437.4	490.0
16	3619.0	431.7	484.5	432.2	489.3
17	3615.5	431.5	484.0	432.2	488.9
18	3606.0	431.3	482.7	436.9	487.7

Table 1 cont....

TABLE 1 Page 2
RESULTS OF RFT PRESSURE RUN No 2

		RFT GAUGE No 32494		KPG GAUGE No 34524	
No	DEPTH RKB. M	FORMATION PRESSURE BAR.	HYDROSTATIC PRESSURE BAR.	FORMATION PRESSURE BAR.	HYDROSTATIC PRESSURE BAR.
19	3601.0	431.0	481.9	437.0	487.0
20	3596.5	431.1	481.4	436.6	486.5
21	3593.0	431.0	494.8	436.6	486.2
22	3589.5	430.9	480.7	436.6	485.5
23	3585.0	430.6	479.9	431.6	484.9
24	3580.0	430.3	479.0	431.9	484.3
25	3578.0	430.4	479.0	431.7	484.1
26	3568.0	430.1	477.6	435.9	482.7
27	3564.0	430.0	477.1	435.9	482.3
28	3559.0	429.8	476.5	435.5	481.6
29	3554.5	429.6	475.9	435.4	481.1
30	3550.5	429.6	475.4	435.4	480.7
31	3547.0	429.5	474.9	431.1	480.4
32	3542.0	429.3	474.2	431.2	479.7
33	3537.0	429.1	473.5	430.8	479.0
34	3532.0	428.9	472.7	430.8	478.2
35	3527.0	428.7	472.1	430.6	477.5
36	3521.0	428.7	471.3	430.6	476.6
37	3515.0	428.4	470.5	430.2	476.0
38	3508.0	428.2	469.6	434.1	475.0
39	3505.0	428.0	469.2	430.2	474.6
40	3497.0	428.0	468.3	429.9	473.6
41	3492.0	427.8	467.6	430.2	473.1
42	3488.0	427.6	467.1	429.9	472.4
43	3484.0	427.6	466.6	430.0	472.0

TABLE 2

RESULTS OF RFT PRESSURE

RUN No 7

		RFT GAUGE No 35761		RPG3 No 41675		RPG3 No 41676	
No	DEPTH RBK. M	FORMATION PRESS.BAR.	HYDROSTATIC PRESS.BAR.	FORMATION PRESS.BAR.	HYDROSTATIC PRESS.BAR.	FORMATION PRESS.BAR.	HYDROSTATIC PRESS.BAR.
1	3730.0	Very slow buildup	507.4				
2	3695.5	456.2	502.8	457.5	503.4	460.0	505.9
3	3654.0	438.0	497.5	439.7	498.1	442.3	500.5
4	3653.0	437.7	496.8	439.5	498.0	442.2	500.1
5	3651.5	437.7	496.6	439.7	497.7	441.8	499.6
6	3645.0	437.5	495.5	439.3	496.6	441.5	498.7
7	3641.5	437.4	495.2	439.3	496.5	441.5	498.4
8	3637.0	437.2	494.4	439.1	495.6	441.3	497.7
9	3618.5	436.6	491.7	438.8	492.8	440.9	494.7
10	3577.0	435.5	486.9	437.4	488.0	439.4	490.1
11	3562.0	434.9	484.4	436.9	485.8	439.3	487.7
12	3551.5	434.4	482.9	436.4	483.7	438.6	486.4
13	3526.0	433.7	479.8	435.8	480.8	437.9	483.0
14	3501.5	433.0	476.3	434.6	477.6	437.1	479.8
15	3495.0	432.7	475.2	434.5	476.3	437.2	478.7
16	3489.0	432.6	474.4	434.4	475.2	437.1	477.9