





OPERATOR B.P. Norway

WELL NO. 7/12 - 6

# MATERIAL CONSUMPTION & COST ANALYSIS

17½" HOLE DRILLED TO 1696 Meters Feet CASING SET AT 1684 Meters Feet

ACTUAL AMOUNT OF HOLE DRILLED 1231 Meters Feet DAYS ON INTERVAL 9

DRILLING FLUID SYSTEM Gyp Lignosulphonate

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
Barite	MT	320	303	- 7	34190.52
Bentonite	MT	15	34	+ 19	9352.72
Lignosulphonate	25 Kg	370	264	-106	3812.16
LF-5	25 Kg	-	74	+ 74	2961.48
CMC L.V.	25 Kg	185	242	+ 57	11799.92
Staflo Regular	25 Kg	35	61	+ 26	7923.90
Aluminum Stearate	25 Kg	1	5	+ 4	289.80
Caustic Soda	25 Kg	93	148	+ 55	1694.60
Soda Ash	50 Kg	3	63	+ 60	1014.30
Sodium Bicarbonate	50 Kg	-	23	+ 23	1382.30
Gypsum	40 Kg	185	599	+414	5456.89
Drilling Detergent	200 Litre	4	-	- 4	-

COST/DAY \$8875.40 TOTAL COST FOR INTERVAL \$79878.59

COST/MT or Ft. \$ 64.89 PROG. COST FOR INTERVAL \$69005.85

ENGR. COST COST VARIANCE FOR INTERVAL + \$10872.74

OPERATOR B.P. Norway

WELL NO. 7/12 - 6

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# MATERIAL CONSUMPTION & COST ANALYSIS

HOLE DRILLED TO  Meters Feet  CASING SET AT  Meters Feet

ACTUAL AMOUNT OF HOLE DRILLED  Meters Feet DAYS ON INTERVAL

DRILLING FLUID SYSTEM

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
Barite	MT	560	762	+ 202	85984.08
Barite	50 Kg	-	200	+ 200	1030.00
Bentonite	MT	50	14	- 36	3851.12
Bentonite	50 Kg	-	100	+ 100	1279.00
Lignosulphonate	25 Kg	523	706	+ 183	10194.64
LF-5	25 Kg	-	57	+ 57	2281.14
CMC L.V.	25 Kg	261	142	- 119	6923.92
Staflo Regular	25 Kg	-	108	+ 108	14029.20
Staflo Exlo	25 Kg	40	-	- 40	-
Caustic Soda	25 Kg	104	469	+ 365	5370.05
Soda Ash	50 Kg	-	20	+ 20	322.00
Gypsum	50 Kg	261	116	- 145	1056.76
Drilling Detergent	200 litre	25	15	- 10	4071.00
Al. Stearate	25 Kg	-	1	+ 1	57.96
Lignite	25 Kg	-	10	+ 10	209.80

COST/DAY  TOTAL COST FOR INTERVAL   
 COST/MT of Ft.  PROG. COST FOR INTERVAL   
 ENGR. COST  COST VARIANCE FOR INTERVAL

OPERATOR B.P. Norway

WELL NO. 7/12 - 6

# MATERIAL CONSUMPTION & COST ANALYSIS

8½" HOLE DRILLED TO 3700 Meters Feet 7" CASING SET AT 3688 Meters Feet

ACTUAL AMOUNT OF HOLE DRILLED 350 Meters Feet DAYS ON INTERVAL 25

DRILLING FLUID SYSTEM Lignosulphonate/KCL

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
Barite	MT	143	176	+ 33	19859.84
Bentonite	MT	-	2	+ 2	550.16
Bentonite	50 Kg	200	53	- 147	677.87
Lignosulphonate	25 Kg	130	61	- 69	880.84
Lignite	25 Kg	70	84	+ 14	1762.32
LF-5	25 Kg	-	33	+ 33	1320.66
CMC LV	25 Kg	40	30	- 10	1462.80
Staflor Regular	25 Kg	-	49	+ 49	6365.10
Staflor Exlo	25 Kg	-	38	+ 38	4789.52
EML Lubricant	200 litre	-	6	+ 6	3444.48
Caustic Soda	25 Kg	20	40	+ 20	458.00
Sodium Bicarbonate	50 Kg	-	12	+ 12	721.20
Potassium Chloride	40 Kg	-	340	+ 340	3685.60
Aluminum Stearate	25 Kg	1	-	- 1	-
* This section originally programmed without use of KCL. Cost of					
incorporating KCL in system not included in programme cost.					

COST/DAY \$1839.14 TOTAL COST FOR INTERVAL \$45978.39

COST/MF or Ft. \$ 131.37 PROG. COST FOR INTERVAL \* \$26581.00

ENGR. COST COST VARIANCE FOR INTERVAL + \$19397.39



WELL NO. 7/12 - 6

# TOTAL CONSUMPTION & COST ANALYSIS

TOTAL DEPTH  Meters  
Feet

TOTAL HOLE DRILLED  Meters  
Feet

TOTAL DAYS

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
Barite	MT	1113	1387	+ 274	156509.08
Barite	50 kg	-	200	+ 200	1030.00
Bentonite	MT	124.3	129	+ 4.7	35485.32
Bentonite	50 kg	200	213	+ 13	2724.27
Lignosulphonate	25 kg	1023	1205	+ 182	17400.20
Lignite	25 kg	70	135	+ 65	2832.30
LF-5	25 kg	70	208	+ 138	8324.16
CMC LV	25 kg	486	435	- 51	21210.60
Staflor Regular	25 kg	35	269	+ 234	34943.10
Staflor Exlo	25 kg	40	50	+ 10	6302.00
Eml Lubricant	200 litre	-	6	+ 6	3444.48
Drilling Detergent	200 litre	29	15	- 14	4071.00
Al. Stearate	25 kg	2	6	+ 4	347.76
Caustic Soda	25 kg	286	788	+ 502	9022.60
Soda Ash	50 kg	15	114	+ 99	1835.40
Sodium Bicarbonate	50 kg	-	35	+ 35	2103.50
Gypsum	40 kg	446	715	+ 269	6513.65
Potassium Chloride	40 kg	-	340	+ 340	3685.60

COST/DAY

TOTAL COST FOR INTERVAL

COST/Mt. or Ft.

PROG. COST FOR INTERVAL

ENGR. COST

COST VARIANCE FOR INTERVAL



# ANCHOR DRILLING FLUIDS AS

OSLO - STAVANGER

WELL NAME 7/12 - 6 AREA Offshore Norway

OPERATOR B.P. Norway RIG Sedco 707

## Drilling Mud Properties Record

MUD SYSTEM Spud Mud /Gel/Seawater

ENGINEERS Chris Atkinson

Day No.	DATE	DEPTH FEET METERS	MUD PROPERTIES																		OPERATION REMARKS		
			DENSITY PPG SG	VISCOSITY				GELS 0	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis			RETORT		BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL		"N"	"K"
				sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.						x 1000 Cl ppm	x 1000 Ca ++ ppm	Pf/11*	% OIL	% SOLIDS						
1	6																						Prepare to spud
2	7		1.06	100																			Makeup spud mud, wait on permission to spud
3	8		1.06	100																			" " "
4	9		1.06	100																			" " "
5	10	133	1.06	100																			Spud in- Drill 36" Hole
6	11	172	1.06	100																			Drill to 172m - run 30" conductor
7	12	172	1.07	100																			Cement casing - W.O.C.
8	13	172	1.07	90																			Rig to run stack&Riser repairs to Pods.
9	14	172	1.07	90																			Work on stack.
10	15	172	1.07	90																			" "
11	16	172	1.07	90																			" "
12	17	172	1.07	80																			" "
13	18	480	1.11	110	32.5	22	21	11 48	7.5	1	-	10.9	12.	0.08	.2	0	6	1.5	20				Drill to 18 3/4 csg. Pt.
14	19	480	1.26	74	33	21	23	18 48	8.0	1	-	11	11.5	.18	.45 .15 .35	0	10	1.75	20				Disp. riser to seawater Disp. hole w/1.26 mud

REMARKS





# ANCHOR DRILLING FLUIDS AS

OSLO — STAVANGER

WELL NAME 7/12 - 6 AREA Offshore Norway  
 OPERATOR B.P. Norway RIG. Sedco 707  
 ENGINEERS W. Shepherd/D. Geddes

## Drilling Mud Properties Record

MUD SYSTEM Gyp Ligno

Day No.	DATE	DEPTH FEET METERS	MUD PROPERTIES																				OPERATION REMARKS
			DENSITY PPG SG	VISCOSITY				GELS 0	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	PH	Filtrate Analysis			RETORT		BENTONITE #/BBL	Excess Gypsum				
				sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq. ft.						x 1000 Cl ppm	x 1000 Ca ++ ppm	PI	% OIL	% SOLIDS					% SAND	
15	20/4	480	1.23	63	27.5	18	17	12	8.7	1	-	10.2	11.5	.4	.15	0	8	1.5	20			Run & Cmt. csg. Drill out shoe.	
16	21/4	483	1.14	44	21.5	13	17	13	12.8	2	-	11.6	16.	1.0	1.2	0	7	1.5	11	4.7		Leak-off test.	
17	22/4	752	1.17	45	26	18	15	15	8	1	-	10.8	14.	1.2	.5	0	8	Tr	15	3.8		Drill 17½" hole	
18	23/4	1108	1.14	42	16	11	10	12	8	1	-	10.8	15.	2.2	.28	0	6	Tr	16	3.2		Drill gumbo problems.	
19	24/4	1180	1.17	49	24.5	19	11	3	9.9	1	-	11.5	13.	1.64	.5	0	8	.75	22	3.5		Repair rotary Drill.	
20	25/4	1433	1.30	55	32.5	24	17	5	7.3	1	-	11.2	13.	1.4	.35	0	10	.75	27.5	5		Drill. Increase Wt. to 1.3	
21	26/4	1696	1.41	56	29.5	22	15	7	9.1	1	-	11.3	11.5	1.1	.4	0	8	.5	30	4.75		Drill. Wt. up to 1.4	
22	27/4	1696	1.42	60	36	28	16	9	8.5	1	-	11.0	10.5	1.04	.35	0	10	.75	32.5	3.5		Try to log R.I.H. to clean out hole.	
23	28/4	1696	1.42	54	35	37	16	7	7.5	1	-	11.1	11.5	1.28	.35	0	10	.75	27.5	3.5		Log. Run 13¾" csg.	
24	29/4	1696	1.42	57	39	30	18	9	7.1	1	-	10.5	11.5	1.22	.22	0	11	1.25	30	3.0		Run & cmt.csg.	
25	30/4	1696	1.42	56	38	30	16	8	7.3	1	-	10.6	11.5	1.22	.24	0	12	1.25	30			Repair Bop	
26	1/5	1696	1.42	57	37	30	15	9	7.8	1	-	10.5	12.	1.	.1	0	12	1.25	30	2.75		W.O.W.	
27	2/5	1696	1.43	59	37	29	16	8	7.9	1	-	10	11.5	1.04	.25	0	13	1	30	2		W.O.W.	
28	3/5	1696	1.40	52	31.5	24	15	5	7.3	1	-	10	12.	1.4	.15	0	12	1.5	27.5	2		Work on Bop	

REMARKS



# ANCHOR DRILLING FLUIDS AS

OSLO — STAVANGER

WELL NAME 7/12 - 6 AREA Offshore Norway

OPERATOR B.P. Norway RIG. Sedco 707

ENGINEERS Dennis Geddes/Chris Meyjes

## Drilling Mud Properties Record

Gyp Ligno

MUD SYSTEM \_\_\_\_\_

Day No.	DATE	DEPTH FEET METERS	MUD PROPERTIES																			OPERATION REMARKS
			DENSITY PPG SG	VISCOSITY				GELS 0	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	PH	Filtrate Analysis			RETORT		BENTONITE #/BBL	Excess GYP-sum			
				sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.						Ca. ++ ppm	PI	% OIL	% SOLIDS	% SAND					
29	4/5	1696	1.42	58	38.5	33	12	3/25	10.0	1	10	11.5	1040	.1	12	1	27.5	2.2			Run & test Bop's Drill out.	
30	5/5	1810	1.45	45	32.5	25	15	2/7	9.2	2	10.8	1.6	1200	.7	13	3/4	25	3.2			Drill	
31	6/5	2028	1.44	47	37.5	30	15	4/20	7.2	2	10.8	1.6	1600	.4	12	3/4	27.5	3.0			Drill	
32	7/5	2176	1.44	54	40	32	16	5/34	8.0	2	10.5	1.6	1520	.3	13	3/4	27.5	3.2			Drill	
33	8/5	2363	1.44	54	35	25	20	4/32	7.0	2	10.5	1.7	1600	.4	15	3/4	30				Drill	
34	9/5	2537	1.44	55	32.5	25	20	4/30	6.6	2	10.5	1.8	1600	.3	16	3/4	32.5	3.3			Drill	
35	10/5	2631	1.44	54	36	26	20	4/31	6.4	2	10.5	1.8	1600	.4	16	3/4	32.5	3.0			Drill	
36	11/5	2631	1.48	55	35	25	20	4/31	6.8	2	10.5	1.8	1600	.4	18	3/4	32.5	3.0			RIH & ream stuck @ 2101 Free mud wt. to 1.48	
37	12/5	2679	1.50	55	35	25	20	4/30	7.4	2	10.0	1.8	1200	.3	18	3/4	32.5	3.2			Ream to btm. Drill Raise wt. to 1.50	
38	13/5	2761	1.50	53	35	25	20	4/32	6.8	2	10.5	2.0	1000	.3	18	1/2	32.5	3.5			Turbo drill	
39	14/5	2779	1.50	53	35	25	20	4/31	6.6	2	10.5	2.0	1000	.3	18	1/2	32.5	3.3			Drill POH RIH. stuck @ 2000 P.O.O.H.	
40	15/5	2779	1.50	58	39.5	28	23	7/35	7.0	2	10.0	2.1	1080	.2	18	1/2	32.5	3.0			RIH ream. Hole packing off. Ream 1712-2349	
41	16/5	2791	1.50	50	33	24	18	4/26	7.3	2	10.2	2.1	.84	.3	18	1/4	27.5	2.8			Ream to btm. Drill	
42	17/5	2830	1.50	50	33.5	25	17	5/23	7.2	2	10.2	2.1	.80	.4	18	1/2	27.5	2.9			Drill	

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REMARKS



# ANCHOR DRILLING FLUIDS AS

OSLO - STAVANGER

WELL NAME 7/12 - 6

AREA Offshore Norway

## Drilling Mud Properties Record

OPERATOR B.P. Norway

RIG. Sedco 707

MUD SYSTEM Gyp Ligno

ENGINEERS Chris Meyjes

Day No.	DATE	DEPTH FEET <input type="checkbox"/> METERS <input type="checkbox"/>	MUD PROPERTIES																				OPERATION REMARKS	
			DENSITY PPG <input type="checkbox"/> SG <input type="checkbox"/>	VISCOSITY				GELS 0	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	PH	Filtrate Analysis			RETORT			BENTONITE #/BBL	Excess Gypsum	"N"	"K"		
				sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.						Ca. ++ ppm	PT	% OIL	% SOLIDS	% SAND							
43	18/5	2861	1.50	49	33.5	25	17	4/20	7.0	2		10.2	2.1	800	.3		18	Tr	27.5		2.8			Drill
44	19/5	2979	1.50	51	35.5	26	19	5/22	7.1	2		10.1	2.15	660	.3		19	Tr	27.5		2.4			Drill
45	20/5	3075	1.50	51	35	25	20	6/28	7.1	2		10.2	2.2	480	.3		19	Tr	27.5		1.7			Drill
46	21/5	3142	1.50	55	38.5	27	23	10/32	8.0	2		10.0	2.2	320	.3		20	1/4	30		1.0			Drill
47	22/5	3212	1.50	53	38	27	22	7/29	7.8	2		10.5	2.2	220	.4		20	Tr	30		0.4			Drill
48	23/5	3277	1.54	58	41.5	30	23	6/29	8.0	2		10.5	2.2	180	.4		21	Tr	30		-			Drill. Raise wt to 1.54
49	24/5	3335	1.54	54	38	26	24	7/31	8.2	2		10.0	2.2	160	.3		21	Tr	27.5		-			Drill
50	25/5	3350	1.54	58	38.5	27	23	7/28	8.0	2		10.5	2.25	160	.4		21	Tr	30		-			Drill. Wiper Trip
51	26/5	3350	1.54	63	42	30	24	7/30	8.2	2		10.0	2.25	200	.3		21	1/4	30		-			Log
52	27/5	3350	1.54	64	43	31	24	7/29	8.4	2		10.0	2.25	220	.3		21	1/4	30		-			Run 9 5/8" casing
53	28/5	3350																						Cmt.up 9 5/8" casing
54	29/5	3350																						Drill out cmt.
55	30/5	3350																						Drill out cmt.
56	31/5	3350	1.50	55	42.5	30	25	4/21	6.6	2		9.8	2.2	800	.2		19	Tr	22.5					Drill cmt, Displace to mud.

REMARKS



# ANCHOR DRILLING FLUIDS AS

OSLO - STAVANGER

WELL NAME 7/12 - 6 AREA Offshore Norway

OPERATOR B.P. Norway RIG. Sedco 707

## Drilling Mud Properties Record

Gyp/Ligno

ENGINEERS Dennis Geddes/Jim Hepburn

MUD SYSTEM \_\_\_\_\_

Day No.	DATE	DEPTH FEET <input type="checkbox"/> METERS <input type="checkbox"/>	MUD PROPERTIES																			OPERATION REMARKS		
			DENSITY PPG <input type="checkbox"/> SG <input type="checkbox"/>	VISCOSITY				GELS 0	FLUID LOSS 30 Min cc's	CAKE 32 rds	H.T.H.P. cc's	PH	Filtrate Analysis			RETORT		% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL		"N"	"K"
				sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.						10	Cl <sup>-</sup> ppm	Ca. ++ ppm	Pl	% OIL							
57	1/6	3353	1.50	58	35	25	20	4/20	6.6	2		10.5	2.25	240	.5		19	Tr	22.5					Drill hole & new Formation.
58	2/6	3353	1.50	50	29.5	22	15	4/15	6.8	2		10.5	2.2	200	.4		19	Tr	22.5					Cmt. 9 3/8"
59	3/6	3353	1.50	50	30	22	16	4/15	6.8	2		10.5	2.2	240	.4		20	Tr	22.5					Work on rotary table
60	4/6	3353	1.50	53	32.5	25	15	4/19	8.2	2	26	10.5	4.2	360	15		19	Tr	22.5					Work on rotary table
61	5/6	3355	1.50	50	29	21	16	2/10	9.4	2	28	10.5	5.0	360	1.4		18	Tr	22.5					BIH wash & ream Drill retainer, cmt. & new formation
62	6/6	3381	1.50	54	30.5	23	15	2/11	6.8	2	20	10.8	4.45	400	1.4		18	1/2	20.0					Drill ahead
63	7/6	3406	1.50	50	29	22	14	2/10	6.4	2	18	10.8	4.45	400	1.2		18	1/2	22.5					Drill ahead
64	8/6	3434	1.50	50	26.5	24	15	2/11	5.6	2	15	10.6	4.45	400	1.2		19	1/2	25.0					Core #1
65	9/6	3467	1.50	51	32.5	25	15	2/10	5.8	2	14	10.5	4.45	400	1.2		19	1/2	22.5					Cut core #2
66	10/6	3503	1.50	51	32.5	25	15	2/12	5.4	2	12	10.5	4.45	400	.8		19	1/2	22.5					Cut core #3
67	11/6	3543	1.50	51	32.5	25	15	2/13	5.6	2	15	10.5	4.0	520	.8		19	1/2	22.5					Cut core #3 Cut core #4
68	12/6	3560	1.50	55	30	22	16	2/12	5.3	2	15	10.5	40K	520	.7		19	1/2	22.5					Cut core #5 Cut core #6
69	13/6	3560	1.50	53	30	22	16	3/14	5.3	2	15	10.5	43K	190	.7		19	Tr	24					Cut core #7 Cut core #8
70	14/6	3643	1.50	48	30	22	16	3/14	5.0	2	15	10.5	43K	180	.5		19	Tr	24					Cut core #9 test Bop & stack
REMARKS																								



# ANCHOR DRILLING FLUIDS AS

OSLO — STAVANGER

WELL NAME 7/12 - 6 AREA Offshore Norway

OPERATOR B.P. Norway RIG. Sedco 707

## Drilling Mud Properties Record

MUD SYSTEM Ligno /KCL

ENGINEERS Jim Hepburn/Chris Atkinson

Day No.	DATE	DEPTH FEET METERS	MUD PROPERTIES																		OPERATION REMARKS					
			DENSITY PPG SG	VISCOSITY				GELS 0	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	PH	Filtrate Analysis			RETORT		BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL		"N"	"K"			
				sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.						10	Cl ppm	Ca. ++ ppm	Pl	% OIL							% SOLIDS	% SAND	
71	15/6	3647	1.50	51	31	22	16	3/13	5.0	2	15	10.5	44K	190	0.4	1	19	Tr	25	17.75	1			RIH & drop survey Raise Cl to 44K		
72	16/6	3700	1.50	50	30	22	16	3/14	5.0	2	15	10.5	44K	190	0.4	1	19	Tr	25	17.75	1				Logging hole	
73	17/6	3700	1.50	50	31	22	16	3/15	5.0	2	15	10.5	44K	180	0.6	1	19	Tr	25	17.75	1				Logging	
74	18/6	3700	1.50	48	30	22	16	3/13	5.0	2	15	10.5	44K	180	0.5	1	19	Tr	25	17.75	1				Logging	
75	19/6	3700	1.50	49	30	22	16	3/12	5.0	2	15	10.5	44K	180	0.4	1	19	Tr	25	17.75	1				Check trip & cont Logging	
76	20/6	3700	1.50	53	31.5	23	17	3/14	5.0	2	15	10.5	42K	180	0.5	1	19	Tr	25	17.5	1				Logging	
77	21/6	3700	1.50	53	30	22	16	3/13	5.0	2	15	10.5	42K	100	0.4	1	19	Tr	25	17.0	1				Tree liner	
78	22/6	3700	1.50	53	30	22	16	3/12	5.0	2	15	10.5	42K	100	0.4	1	19	Tr	25	17.0	1				Awaiting hanger replacement	
79	23/6	-	1.50	50	30	22	16	3/13	5.1	2	15	10.5	42K	100	0.5	1	19	Tr	25	17.0	1				RIH 7" liner	
80	24/6	2476	1.50	50	32	23	17	3/12	5.0	2	15	10.5	40K	100	0.4	1	19	Tr	25	16.0	1				Cmt. liner. Wash down @ 2442 - 2476	
81	25/6	3133	1.51	47	31	24	14	2/10	5.4	2	15	10.5	39K	190	.95	-	19	Tr	20		1				Drill cmt to top of liner	
82	26/6	3632	1.51 <sup>+</sup>	48	32	25	14	2/9	5.5	2	-	10.5	40K	390	.3 1.10	-	19	Tr	20		1					Drill cmt to 3632 w/ 5 7/8" bit & run CBL
83	27/6	3632	1.51 <sup>+</sup>	48	32	25	14	2/10	5.5	2	-	10.5	40K	380	.3 1.10	-	19	Tr	20		1					RIH w/packer & run dry Test - POOH
84	28/6	3632	1.51 <sup>+</sup>	47	30.5	24	13	2/9	5.4	2	15.4	10.6	39K	360	.35 1.15	-	19	Tr	20		1					Test Bop's - run per guns - unable to get into liner - run bit & wash through - cmt contam. mud
REMARKS																										



# ANCHOR DRILLING FLUIDS AS

OSLO - STAVANGER

## Drilling Mud Properties Record

Ligno/KCL

MUD SYSTEM \_\_\_\_\_

WELL NAME 7/12 - 6 AREA Offshore Norway  
 OPERATOR B.P. Norway RIG. Sedco 707  
 ENGINEERS Chris Atkinson/Chris Meyjes

Day No.	DATE	DEPTH FEET □ METERS □	MUD PROPERTIES																	OPERATION REMARKS				
			DENSITY PPG □ SG □	VISCOSITY				GELS 0	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	PH	Filtrate Analysis			RETORT		BENTONITE #/BBL	POTASH #/BBL		POLYMER #/BBL	"N"	"K"	
				Sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.						Ca. ++ ppm	PL/TM	% OIL	% SOLIDS	% SAND							
85	29/6	3632	1.51 <sup>†</sup>	47	30.5	24	13	2 9	5.4	2	15.4	10.6	39K	360	.35 1.15	-	19	Tr	20					Test overlap-perfora start run DST tools.
86	30/6	3632	1.51 <sup>†</sup>	46	30.5	24	13	2 9	5.4	2	15.4	10.6	39K	360	.35 1.15	-	19	Tr	20					Run DST tools after leak found.
87	1/7	3632	1.52	46	30.5	24	13	2 8	5.6	2	15.6	10.5	38K	370	.25 .5	-	19½	Tr	19					rev circ valve opened well flowed-circ& cond
88	2/7	3632	1.51 <sup>†</sup>	51	32	24	16	2 10	5.6	2	15.4	10.5	38K	370	.3 1.0	Tr	20	Tr	20.5					POH w/DST tools, RIH w/bit + scraper - circ POH w/bit + scraper
89	3/7	3632	1.51 <sup>†</sup>	51	32	24	16	2 10	5.6	2	15.4	10.5	38K	370	.3 1.0	Tr	20	Tr	20.5					RIH w/DST tools.
90	4/7	3632	1.51	51	34	26	16	2 12	5.5	2	15.4	10.6	37K	380	.25 .95	Tr	20	¼	21					well flowed again- Rev out circ&cond. POH. 1
91	5/7	3632	1.51	51	34	26	16	2 12	5.5	2	15.4	10.6	37K	380	.25 .95	Tr	20	¼	21					RIH w/DST tools - 60 valve opened.
92	6/7	3632	1.51	53	34	26	16	2 13	5.6	2	15.6	10.6	36.5K	380	.2 .9	Tr	20	¼	21					Rev. out water-circ & cond-POH w/tools Test Bc
93	7/7	3632	1.51	54	34.5	26	17	2 14	5.6	2	15.6	10.6	36K	370	.25 .9	Tr	20	¼	21					RIH w/bit + scraper - circ&cond-makeuptest & P
94	8/7	3632	1.51	54	34.5	26	17	2 14	5.6	2	15.6	10.6	36K	370	.25 .9	Tr	20	¼	21					RIH w/test string.
95	9/7	3632	1.51	52	34	26	16	2 12	5.8	2	16.0	10.6	36K	360	.3 .9	Tr	20	¼	21					Test as per programme.
96	10/7	3632	1.51	52	34	26	16	2 12	5.8	2	16.0	10.6	36K	360	.3 .9	Tr	20	Tr	21					Test as per programme.
97	11/7	3632	1.52	50	34.5	27	15	3 14	5.8	2	16.0	10.5	35K	360	.3 .9	1	21	¼	22.5					Shut in reverse out oi & gas circulate hole.
98	12/7	3632	1.52	51	35	27	16	3 14	6.0	2	16.0	10.5	35K	360	.3 .9	1	21	¼	22.5					Set cmt plug. Clean hole & POOH.

REMARKS \_\_\_\_\_



# ANCHOR DRILLING FLUIDS AS

OSLO — STAVANGER

WELL NAME 7/12 - 6 AREA Offshore Norway

OPERATOR B.P. Norway RIG. Sedco 707

Drilling Mud Properties Record  
Ligno/KCL

ENGINEERS Chris Meyjes

MUD SYSTEM \_\_\_\_\_

Day No.	DATE	DEPTH	MUD PROPERTIES																		OPERATION REMARKS						
			DENSITY PPG □ SG □		VISCOSITY				GELS	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	PH	Filtrate Analysis			RETORT		BENTONITE #/BBL	POTASH #/BBL		POLYMER #/BBL	"N"	"K"			
			FEET □ METERS □	sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	0	10					Ca. ++ ppm	PI	% OIL	% SOLIDS	% SAND									
			1981																								
99	13/7	3525	1.52	50	34	26	16	3	14	6.0	2	16.0	10.5	3.5	360	.3	.9	1	21	1/4	22.5						Drill cmt to 3525 circ hole clean & POOH.
100	14/7	3525	1.52	50	34	26	16	3	14	6.0	2	16.0	10.5	3.5	360	.3	.9	1	21	1/4	22.5						Perforate run test string.
101	15/7	3525	1.52	50	34	26	16	3	14	6.0	2	16.0	10.5	3.5	360	.3	.9	1	21	Tr	22.5						Run test string. Set Packer Test well
102	16/7	3525	1.52	50	34	26	16	3	14	6.0	2	16.0	10.5	3.5	360	.3	.9	1	21	Tr	22.5						Test well
103	17/7	3525	1.52	50	34	26	16	3	14	6.0	2	16.0	10.5	3.5	360	.3	.9	1	21	Tr	22.5						Test well
104	18/7	3525	1.52	50	34	26	16	3	14	6.0	2	16.0	10.5	3.5	360	.3	.9	1	21	Tr	22.5						Test well
105	19/7	3525	1.52	48	33	26	14	2	12	6.8	2															P.O.O.H. with test string	
106	20/7	3404	1.52	48										11.0		.5											Cmt plug across perms.
107	21/7	1630	1.52	48										11.0													Cmt plug. Lay dn Ds
108	22/7	140	1																								Cmt plug. Cut 9 5/8" Wg dump mud
109	23/7																										
110	24/7																										
111	25/7																										
112	26/7																										

REMARKS

Table 3.4: Well 7/12-6 Triassic Interval Evaluation

		Total Interval	DST 1 Tested Interval
Top	mBRT	3521	3544.0
Base	mBRT	3695	3613.4
Gross Thickness	m	174	69.3
Net Pay	m	60.9	25.3
Net/Gross		0.350	0.365
Average Porosity		0.181	0.187
Average Water Saturation		0.272	0.243



Table 4.1: Formations Pressure Measurements

RFT Run No. 5A

RFT = 24m

PRETEST No.	DEPTH mBRT	FORMATION PRESSURE (Temp. corr.) psig		COMMENT
1 1	3416	3392	7027 ✓ 7042	Segregated sample, 2 x 2 <sup>3</sup> / <sub>4</sub> gal  6 gal sample attempted - chamber leaked
2 3	3428	3404	7038 7053	
3 5	3437	3413	7046 7061	
4 2	3417.5	3393.5	7030 ✓ 7045	
5 4	3428	3404	7039 7054	
6 6	3437	3413	7046 7061	
7 7	3448	3424	7056 7071	
8 8	3460	3436	7070 7085	
9	3469	3445	7078 7093	
10	3483.5	3459.5	7094 7109	
11	3499.5	3475.5	7108 7123	
12	3510	3486	7120 7135	
13	3533.5	3509.5	7150	Sample taken - 2 <sup>3</sup> / <sub>4</sub> gal
14	3549	3525	7201	Tight
15	3589.5	3565.5	7212	
16	3599.5	3575.5	7225	
17 17	3611	3587	7241	
18 19	3623		0	
19 18	3622	3598	7283	
20 20	3660		0	
21	3661		0	
22	3670.5		0	
23	3670.5		0	

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TRAC

Table 4.2: Formation Pressure Measurements

RFT Run No. 6B

PRETEST No.	DEPTH mBRT	FORMATION PRESSURE (Temp corr.) psig		COMMENT	
1	3417	3393	7028	7043	Segregated sample, 2 x 2 <sup>3</sup> / <sub>4</sub> inches chambers
2	3436.5	3412.5	7042	7057	
3	3459.5	3435.5	7069	7084	
4	3482.5	3458.5	7094	7109	
5	3506.5	3482.5	7118	7133	
6	3530.5	3506.5	7152	7167	
7	3533	3509	7154	7169	
8	3545.5	3521.5	7174	7189	
9	3523.5	3499.5	7180	7195	
10	3526.5	3502.5	7175	7190	
11	3589	3565	7210		
12	3599	3575	7228		
13	3611	3587	7244		
14	3570.8	3546.5	7203		

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Table 4.3: DST 1 Perforated Intervals

Perforated Intervals* mBRT	Height m
3544 - 3550	6
3570.5 - 3575	4.5
3588 - 3591	3
3592 - 3595	3
3597 - 3606	9
3609.5 - 3612.5	3
	<hr/>
	28.5 m
	<hr/>

\* all depths are quoted with respect to the finalised  
FDC/CNL log run 5A.

Table 4.4: DST 1 Test Evaluation Parameters

Parameter	Value	Comment
Porosity	0.187	} see Table 3.4
Thickness of tested interval	25.3 m (83 ft)	
Viscosity	0.448 cP	300°F and 7000 psig
FVF	1.32 RB/STB	300°F and 7000 psig. (The 4 stage separator data considered best fit for wellsite testing conditions)
Compressibility	$13.92 \times 10^{-6} \text{ psi}^{-1}$	Assuming $C_w$ and $C_f$ are the same as U1a
Core data:		
$k_{arith}$	18.5 md	} See Table 2.3. Only overburden correction has been applied
$k_{geom}$	8.1 md	
$k_{harm}$	4.0 md	

Table 4.5: DST 1 Summary of PBU Interpretation

Gauge No	Gauge Depth mBRT	Slope m	Transmissivity kh - md. ft	Permeability md	Skin s	Comment
36405	3523.26	128.2	742.2	8.9	+2.0	Figure 8
41677	3523.26	137.4	692.5	8.3	+1.5	Figure 9
37968	3529.03	174.3	545.9	6.6	+1.7	Figure 10
32493	3527.21	-	-	-	-	Poor PBU data - not presented
7776	3533.49	-	-	-	-	Poor PBU data - not presented

Table 4.6: DST 2 Perforated Intervals

Perforated Intervals* mBRT	Height m
3434.5 - 3444.2	9.7
3446.5 - 3452.8	6.3
3458.5 - 3468.2	9.7
3474.8 - 3483.5	9.7
3487.5 - 3497.2	9.7
3501.8 - 3511.5	9.7
	<hr/>
	54.8 m
	<hr/> <hr/>

\* all depth quoted with respect to the finalised  
FDC/CNL log run 5A

Table 4.7: DST 2 Test Evaluation Parameters

Parameter	Value	Comment
Porosity	0.194	} See Table 3.3
Thickness of tested interval	107.6 m (353 ft)	
Viscosity	0.365 cP	290°F and 7000 psig
FVF (oil production)	1.37	Four stage separation data, considered closest fit of wellsite testing conditions. 290°F and 700 psig
FVF (water injection)	1.00	-
Compressibility	$15.2 \times 10^{-6}$	$C_w$ and $C_f$ taken from previous Ula studies (ref. 1)
Core data*		
$k_{arith}$	267 md	} averaged for entire Ula Formation
$k_{geom}$	86 md	
$k_{harm}$	10 md	

\* All core permeability data has been taken from Table 2.2, where it is quoted as overburden-corrected data, and further liquid permeability and relative permeability corrections applied (0.93 and 0.80 respectively).

Table 4.8: DST 2 Summary of PBU and PFO Interpretation

Gauge No	Gauge Depth mBRT	Slope psi/cycle	Transmissivity md - ft	Permeability md	Skin	Comment
41678	3425.06	14.12	46230	131	+4.1	PBU data - Figure 12
"	"	12.27	39530	112	+55.0	PFO data - Figure 16
7776	3423.30	12.67	51530	146	+8.7	PBU data - Figure 13
"	"	11.58	41890	119	+57.3	PFO data - Figure 17
37968	3439.79	9.57	68170	193	+10.8	PBU data - Figure 14
SS0147	3430.61	9.00	72470	205	+5.3	PBU data - Figure 11
"	"	11.75	41290	117	+54.9	PFO data - Figure 15



Table 4.9: DST 2 Summary of Pressure Data

Gauge No.	Gauge Depth mBRT	Initial PBU		Main PBU		Main PFO	
		Final pressure psig	Final pressure resolved to mid point of perfs*	Extrapolated pressure p* psig	p* resolved to mid point of perfs*	Extrapolated pressure p* psig	p* resolved to mid point of perfs*
41678	3425.06	7029	7073.0	7023 <sup>7038</sup>	7067	7066	7110.0
7776	3423.30	7031	7076.7	7029 <sup>7044</sup>	7074.7	7086	7131.7
37968	3439.79	7067	7096.6	7061 <sup>7076</sup>	7090.6	-	-
SS0147	3430.61	7074.5	7113.1	7064.3 <sup>7079</sup>	7102.9	7101.2	7139.8

\* mid point of perfs: 3470 mBRT. Pressures corrected using a pressure gradient of 0.979 psi/m.

Table 5.1: DST 2 Ula Crude Oil,  
Single Phase Reservoir Oil Composition

COMPONENT	FRACTIONAL DESTILLATION	SINGLE STAGE FLASH
	mol %	mol %
H <sub>2</sub> S	nil	nil
CO <sub>2</sub>	1.16	1.22
N <sub>2</sub>	1.92	1.82
Methane	29.03	30.23
Ethane	7.24	7.55
Propane	6.92	7.28
i - Butane	1.30	1.37
n - Butane	4.79	4.74
i - Pentane	1.88	1.74
n - Pentane	3.30	3.07
Hexanes	3.52	3.26
Heptanes	4.45	4.08
Octanes	5.13	4.74
Nonanes	3.60	3.54
Decanes plus	25.70	25.36

Table 5.2: PVT Separator Tests, DST 2 Ula Crude Oil

Separator Tests	Separator Conditions		GOR SCF/STB		FVF		Final Stock Tank Oil Gravity °API
	Pressure psig	Temperature °F	Per Stage	Total	Saturation*	Reservoir**	
Single Stage	0	60	672	672	1.513	1.41	38.8
Three Stage	520	255	476	615	1.441	1.34	40.5
	125	160	86				
	0	60	53				
Four Stage	520	255	475	641	1.469	1.37	39.6
	140	215	102				
	30	195	57				
	0	60	7				

\* FVF (sat) = BBL at saturation conditions (2334 psig and 290°F) per STB.

\*\* FVF (res) = BBL at reservoir conditions (7000 psig and 290°F) per STB.

Table 5.3: Analysis of Separator Gas Samples: DST 2

Bottle No.	A4508	A7343	A4867	A4275
Component	% mol	% mol	% mol	% mol
CO <sub>2</sub>	2.70	2.67	2.69	2.75
N <sub>2</sub>	4.56	5.13	6.83	4.61
C <sub>1</sub>	66.63	67.05	65.36	67.20
C <sub>2</sub>	13.21	13.25	13.04	13.32
C <sub>3</sub>	7.25	7.36	7.32	7.50
iC <sub>4</sub>	0.97	0.91	0.91	0.92
nC <sub>4</sub>	2.38	2.16	2.17	2.17
iC <sub>5</sub>	0.52	0.43	0.43	0.42
nC <sub>5</sub>	0.55	0.46	0.45	0.43
iC <sub>6</sub>	0.31	0.19	0.24	0.22
nC <sub>6</sub>	0.14	0.10	0.13	0.11
C <sub>7</sub>	0.25	0.13	0.19	0.14
C <sub>8</sub>	0.11	0.06	0.09	0.07
C <sub>9</sub>	0.06	0.04	0.06	0.04
C <sub>10</sub>	0.03	0.02	0.03	0.02
Benzene	0.03	0.02	0.04	0.06
Toluene	0.03	0.02	0.02	0.02
Total Sulphur ppm (wt)	5	1.9/1.2	1.2	<1.0
Calculated Density kg/m <sup>3</sup>	1.020	0.994	1.010	0.998

Table 5.4: DST 1 Triassic Oil, Single Phase Reservoir Oil Composition

Component	Fractional Distillation mol %	Single Stage Flash mol %
H <sub>2</sub> S	nil	nil
CO <sub>2</sub>	1.75	1.74
N <sub>2</sub>	1.76	1.66
Methane	20.41	20.73
Ethane	7.25	7.43
Propane	8.72	8.89
i-Butane	2.12	2.12
n-Butane	6.07	6.06
i-Pentane	2.03	2.02
n-Pentane	3.07	3.13
Hexanes	3.30	3.48
Heptanes	5.20	5.36
Octanes	5.80	5.74
Nonanes	4.17	4.09
Decanes	3.16	3.11
Undecanes	2.53	2.40
Dodecanes	2.02	1.89
Tridecanes	2.22	2.10
Tetradecanes	1.98	1.90
Pentadecanes	1.67	1.60
Hexadecanes	1.44	1.47
Heptadecanes	1.92	1.78
Octadecanes	0.81	0.88
Nonadecanes	1.11	1.04
Eicosane plus	9.49	9.38

-Clot 27.55

Table 5.5: PVT Separator Tests, DST 1 Triassic Crude Oil

Separator Tests	Separator Conditions		GOR SCF/STB		FVF		Final Stock Tank Oil Gravity °API
	Pressure psig	Temperature °F	Per Stage	Total	Saturation*	Reservoir**	
Single Stage	0	60	487	487	1.448	1.34	41.5
Three Stage	520	255	297	437	1.408	1.30	42.9
	125	160	80				
	0	60	60				
Four Stage	520	255	295	463	1.431	1.32	42.0
	140	215	105				
	30	195	61				
	0	60	2				

\* FVF (sat) = BBL at saturation conditions (1602 psig and 300°F) per STB.

\*\* FVF (res) = BBL at reservoir conditions (7000 psig and 300°F) per STB.

Table 5.6: Comparison of Crude Oil Inspection Data Well 7/12-6

	Ula Crude Oil DST 2	Triassic Oil DST 1
°API	36.9	39.2
SP. Gr. at 60/60°F	0.8405	0.829
Wax wt %	9.5	13.5
Melting Pt. wax °C	54	58
Pour Point °C	3	12
Asphaltenes % wt	0.25	0.6
Nitrogen ppm	683	316
Sulphur % wt	0.12	0.075
Nickel ppm	<1	<1
Vanadium ppm	<1	<1
Ni/Vn ratio	~1	~1
Kinematic Viscosity cSt at 20°C	8.34	13.7
Total acidity mg KOH/gm	0.05	0.15
Asphaltenes:		
Saturates Content % wt	70.6	75.7
Aromatics % wt	23.2	19.6
Residue (NSO) % wt	6.1	4.7
Carbon Isotope Ratio	-28.95	-28.86
N-alkane CPI	1.02	1.04
Pristane/Phytane ratio	1.44	1.44

Table 6.1: Formation Temperature Measurements Well 7/12-6

DEPTH mBRT	Formation Temperature °F	Log Run No/ DST No	Comment
477	70	1A	ISF/Sonic
1692	106	2B	ISF/Sonic
3351.5	206	3C	ISF/Sonic
3703	280	5A	HDT - max. measured temp - not fully built up
3580	300	DST 1	Max temperature - taken at mid-point of perf'd interval
3470	290	DST 2	Max temperature - taken at mid-point of perf'd interval