FINAL WELL REPORT 2/11-10 S (T2)

SECTION 11 - DRILLING DATA SUMMARY

11.1 DRILLING FLUIDS SUMMARY

DRILLING FLUIDS SUMMARY

Mud Type Summary	
30" Conductor Cleanout	Seawater / Bentonite Sweeps
9-7/8" x 26" Interval	Spud Mud
16" Interval	Novadril
12-1/4" Interval	Novadril
8-1/2" Interval	Novadril

30" CONDUCTOR CLEANOUT SUMMARY (119 - 201 M)

MUD TYPE - SEAWATER/BENTONITE SWEEPS

Section Length Drilled: 81 m
Formation Volume Drilled: 202 bbl

Materials Consumption					
Material	**Unit Size**	**Units Used**	**Unit Cost**	**Cost**	**USD/ BBL**
Barite	MT	17	84.79	1,441.43	0.66
Bentonite	MT	32	250.41	8,013.12	3.68
Lime	AP kg	333	0.20	66.60	0.03
Soda Ash	AP kg	125	0.31	38.75	0.02
Interval Material Cost:				**9,559.90 USD**	

Volumes Breakdown			
Description	**BBL**	**Cost**	**USD/BBL**
New Mud Built	2175	9,559.90	4.40
Volume Transferred Out to 26"	1905	-8,382.00	-4.40
Total Cost		**1,177.90**	

Cost per meter drilled: **14.54 USD**
Cost per barrel formation drilled: **5.83 USD**

26" INTERVAL SUMMARY (201 - 382 M)

MUD TYPE - SPUD MUD

PROPERTIES	
Mud Weight:	9.0 - 9.3 ppg
Plastic Viscosity:	6 - 11 cps
Yield Point:	23 - 45 lbs/100 ft2
pH:	9.3 - 10.5
API Fluid Loss:	7.0 - 9.5 cc

Section Length Drilled: 185 m
Formation Volume Drilled: 399 bbl

Materials Consumption					
Material	**Unit Size**	**Units Used**	**Unit Cost**	**Cost**	**USD/ BBL**
Barite	MT	2	84.79	169.58	0.10
Bentonite	MT	27	250.41	6,761.07	3.85
Lime	AP kg	467	0.20	93.40	0.05
Lime	20 kg	5	4.06	20.30	0.01
Soda Ash	AP kg	165	0.31	51.15	0.03
Polysal	25 kg	93	21.24	1,975.32	1.13
Interval Material Cost:				**9,070.82 USD**	

Volumes Breakdown			
Description	**BBL**	**Cost**	**USD/BBL**
New Mud Built	1754	9,070.82	5.17
Volume Transferred In	1905	8,382.00	4.40
Total Cost		**17,452.82**	

Cost per meter drilled: **94.34 USD**
Cost per barrel formation drilled: **43.80 USD**

16" INTERVAL SUMMARY (385 - 1587 M)

MUD TYPE - NOVADRIL

PROPERTIES	
Mud Weight:	10.1 - 11.6 ppg
Plastic Viscosity:	20 - 31 cps
Yield Point:	16 - 28 lb/100 ft2
Gels 10sec/10min:	10 - 18 / 16 - 28
6/3 RPM Values:	10 -17 / 9 - 16
HTHP Fluid Loss:	3.0 - 5.8 ml
Electrical Stability:	700 - 980
Chlorides:	144 - 152 k mg/l
Pom:	0.9 - 2.4 ml H2SO4
PAO/Water Ratio:	70/30 - 75/25

Section Length Drilled: 1342 m
Formation Volume Drilled: 1095 bbl

Materials Consumption					
Material	Unit Size	Units Used	Unit Cost	Cost	USD/ BBL
Barite	MT	212	84.79	17,975.48	8.51
Novasol	BBL	1540	307.46	473,488.40	224.08
Novamul	197 kg	35	758.22	26,537.70	12.56
Novamod	187 kg	11	816.34	8,979.74	4.25
SWA	218 kg	5	827.38	4,136.90	1.96
VG 69	50 lb	45	44.43	1,999.35	0.95
CaCl2 Brine	BBL	122	29.85	3,641.70	1.72
CaCl2	AP kg	2600	0.30	780.00	0.37
Lime	AP kg	4300	0.20	860.00	0.41
Lime	20 kg	2	4.06	8.12	0.00
XCD - Polymer	25 kg	19	51.24	973.56	0.46
Bentonite	25 kg	72	3.19	229.90	0.11
Interval Material Cost:				**539,610.85 USD**	

Volumes Breakdown			
Description	**BBL**	**Cost**	**USD/BBL**
New Mud Built	2113	539,610.85	255.38
Volume Transferred In	957	227,344.92	237.56
Volume Transferred Out to 12.25"	2212	-551,739.16	-249.43
Total Cost		**215,216.61**	

Cost per meter drilled: **160.3701 USD**
Cost per barrel formation drilled: **196.5269 USD**

12-1/4" INTERVAL SUMMARY (1587 - 3911 M)

MUD TYPE - NOVADRIL

PROPERTIES	
Mud Weight:	13.0 - 14.65 ppg
Plastic Viscosity:	31 - 40 cps
Yield Point:	16 - 31 lb/100 ft2
Gels 10sec/10min:	12 19 / 21 - 35
6/3 RPM Values:	10 - 17 / 9 - 15
HTHP Fluid Loss:	2.6 - 5.4 ml
Electrical Stability:	460 - 1800
Chlorides:	141 - 185 k mg/l
Pom:	0.6 - 3.0 ml H2SO4
PAO/Water Ratio:	73/27 - 80/20

Section Length Drilled: 2324 m
Formation Volume Drilled: 1111 bbl

Materials Consumption					
Material	**Unit Size**	**Units Used**	**Unit Cost**	**Cost**	**USD/ BBL**
Barite	MT	612	84.79	51,891.48	22.55
Novasol	BBL	1226	307.46	376,945.96	163.82
Novamul	197 kg	39	758.22	29,570.58	12.85
Novamod	187 kg	10	816.34	8,163.40	3.55
SWA	218 kg	2	827.38	1,654.76	0.72
VG 69	50 lb	6	44.43	266.58	0.12
CaCl2 Brine	BBL	230	29.85	6,865.50	2.98
Mica Fine	25 kg	12	11.41	136.92	0.06
Borrewell C	25 kg	6	11.55	69.30	0.03
Lime	AP kg	5600	0.20	1,120.00	0.49
Lime	20 kg	162	4.06	657.72	0.29
XCD - Polymer	25 kg	3	243.39	730.17	0.32
Geltone II	kg	1700	4.09	6,953.00	3.02
Interval Material Cost:				**485,025.37 USD**	

Volumes Breakdown			
Description	**BBL**	**Cost**	**USD/BBL**
Gunk Pill	50	6,976.10	139.52
Sacrificial Spacer	41	913.29	22.28
New Mud Built	2301	477,205.28	207.39
Volume Transferred In	2212	551,739.16	249.43
Volume Transferred Out to 8.5"	3499	-797,772.00	-228.00
Total Cost		**239,061.83**	

Cost per meter drilled: **102.87 USD**
Cost per barrel formation drilled: **215.22 USD**

8-1/2" INTERVAL SUMMARY (3911 - 4090 M)

MUD TYPE - NOVADRIL

PROPERTIES	
Mud Weight:	14.75 - 14.0 ppg
Plastic Viscosity:	37 - 49 cps
Yield Point:	12 - 28 lb /100 ft2
Gels 10sec/10min:	11 - 28 / 24 - 42
6/3 RPM Values:	8 - 20 / 7 - 18
HTHP Fluid Loss:	2.8 - 4.8 ml
Electrical Stability:	880 - 2000
Chlorides:	139 - 174 k mg/l
Pom:	0.8 - 3.8 ml H2SO4
PAO/Water Ratio:	75/25 - 80/20

Section Length Drilled: 179 m
Formation Volume Drilled: 40.8 bbl

Materials Consumption					
Material	**Unit Size**	**Units Used**	**Unit Cost**	**Cost**	**USD/ BBL**
Barite	MT	142	84.79	12,040.18	20.00
Novasol	BBL	293	307.46	90,085.78	149.64
Novamul	197 kg	30	758.22	22,746.60	37.79
Novamod	187 kg	18	816.34	14,694.12	24.41
SWA	218 kg	5	827.38	4,136.90	6.87
VG 69	50 lb	39	44.43	1,732.77	2.88
VG 69	25 kg	51	45.56	2,323.56	3.86
CaCl2	AFOS kg	1650	0.30	495.00	0.82
Borrewell C	25 kg	2	11.55	23.10	0.04
Lime	20 kg	240	4.06	974.40	1.62
XCD - Polymer	25 kg	24	243.39	5,841.36	9.70
A302	208 ltr	1	1,991.10	1,991.10	3.31
A307T	208 ltr	10	1,201.50	12,015.00	19.96
A130	208 ltr	1	1,097.56	1,097.56	1.82
Interval Material Cost:				**170,197.43 USD**	

Volumes Breakdown			
Description	**BBL**	**Cost**	**USD/BBL**
New Mud Built	602	149,252.41	247.93
Volume Transferred In	3499	797,772.00	228.00
Volume Transferred Out to A-7	3685	-850,977.05	-230.93
Total Cost		**96,047.36**	

Cost per meter drilled: **536.58 USD**
Cost per barrel formation drilled: **2354.10 USD**

4.3.1 FMT RESULTS

Test No	Depth MDBRT	Depth TVDSS	Hydrostatic Pressure psig	Formation Pressure psig	Remarks
1	3915.9	2784.6	6858.6	-	Tight, abandoned
3	3920.8	2783	6858.7	6666.6	Good
4	3925	2785.3	6863.6	6670.8	Good
5	3937	2796.4	6886.4	6689.3	Good
6	3948	2802.6	6899.7	6703.9	Good
7	3955.9	2807	6909.6	6740.3	Good
8	3966.9	2813.2	6924	6767.2	Good
10	3983.9	2822.4	6945.4	-	Tight
12	3999	2830.4	6962.4	-	Tight
15	3983	2821.8	6928.2	-	Abandoned
17	3953.9	2805.9	6872.8	6718.5	Good
18	3919.9	2782.4	6847.2	6667.2	Good
18	3919.9	2782.4			10 litre tank(mud/oil)
19	3953.9	2805.9			4 litre tank (oil)

Formation Water Analysis

	2/11-10 S	2/11A-6ST1	Seawater
Sodium (mg/l)	27,300	26,900	-
Potassium (mg/l)	173	158	-
Calcium (mg/l)	3,473	1,970	400-700
Magnesium (mg/l)	278	394	1100-1300
Strontium (mg/l)	272	284	-
Barium (mg/l)	425	409	<10
Iron (mg/l)	12.5	<0.1	-
Chloride (mg/l)	40,500	45,500	20,000
Sulphate (mg/l)	5	18	1900-2600

The analysis shows that the water produced from 2/11-10 S is definitely formation water and not water from the fracture treatment or seawater overflush. It also shows a similar composition to the formation water being produced from the Hod East Field.

12.5 Production Logging

A production log was run on 25th June 1994. The aims of this log were to identify the source of the water production and establish the production profile. The following table shows a summary of the flow distribution indicated from the log.

Flow Distribution

Interval mRKB	Oil Rate stb/d	Water Rate stb/d	Watercut %	Total Flow stb/d	Total Flow %
3915-3915.3	0	0	0	0	0
3925-3925.3	181	218	55	399	60
3933-3933.3	29	55	65	84	12
3940-3940.3	97	87	47	184	28
Total	307	360	54	667	100

All producing intervals appear to be producing oil and water. No flow was detected to be coming from the uppermost perforation cluster. the majority of production (60%) is from the second from top perforation cluster. This cluster is in the best quality part of the formation and so the flow distribution from the log interpretaion appears to be consistent with the open hole logs.

It should be noted however that the interpretation assumes that the fluid density tool is measuring a representative sample of the fluid being produced through the perforations. If segregated flow is occuring in the wellbore, this may not be the case. The results do however, indicate that the source of the water in the well is from the lower formations and not the overlying Ekofisk Formation.

The flow distribution from the well is also complicated by the possibility of flow behind casing. Poor cement jobs of the 5" and 7" liners are suspected. The temperature log does not indicate significant flow behind casing or indicate that the source of the water is from deeper formations.