MOBIL EXPLORATION NORWAY INC.
FINAL GEOLOGICAL REPORT
APPRAISAL WELL 33/9-9

FILE NO: 7.70

DEVELOPMENT GEOLOGY
ENGINEERING DEPARTMENT

MARCH, 1978

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Enclosures

NORWAY OFFSHORE
LICENSE 037
WELL 33/9-9

WELL DATA

Well Name:	33/9-9
Location:	61°17'10.1928"N Latitude
	01°54'26.0466"E Longitude
Classification:	Appraisal
Drilling Period:	
Spud Date:	27 July 1977
Drilling Complete:	29 September 1977
Rig Release:	19 November 1977
DF Elevation:	25.0 m
Water Depth:	145.0 m
Rig:	Borgny Dolphin
Status:	Successful Appraisal
Total Depth:	
Planned:	3000 m
Actual:	3100 m
Cost (US $ - MM):	
Planned:	9.0
Actual:	7.3*

* As of February 28, 1978

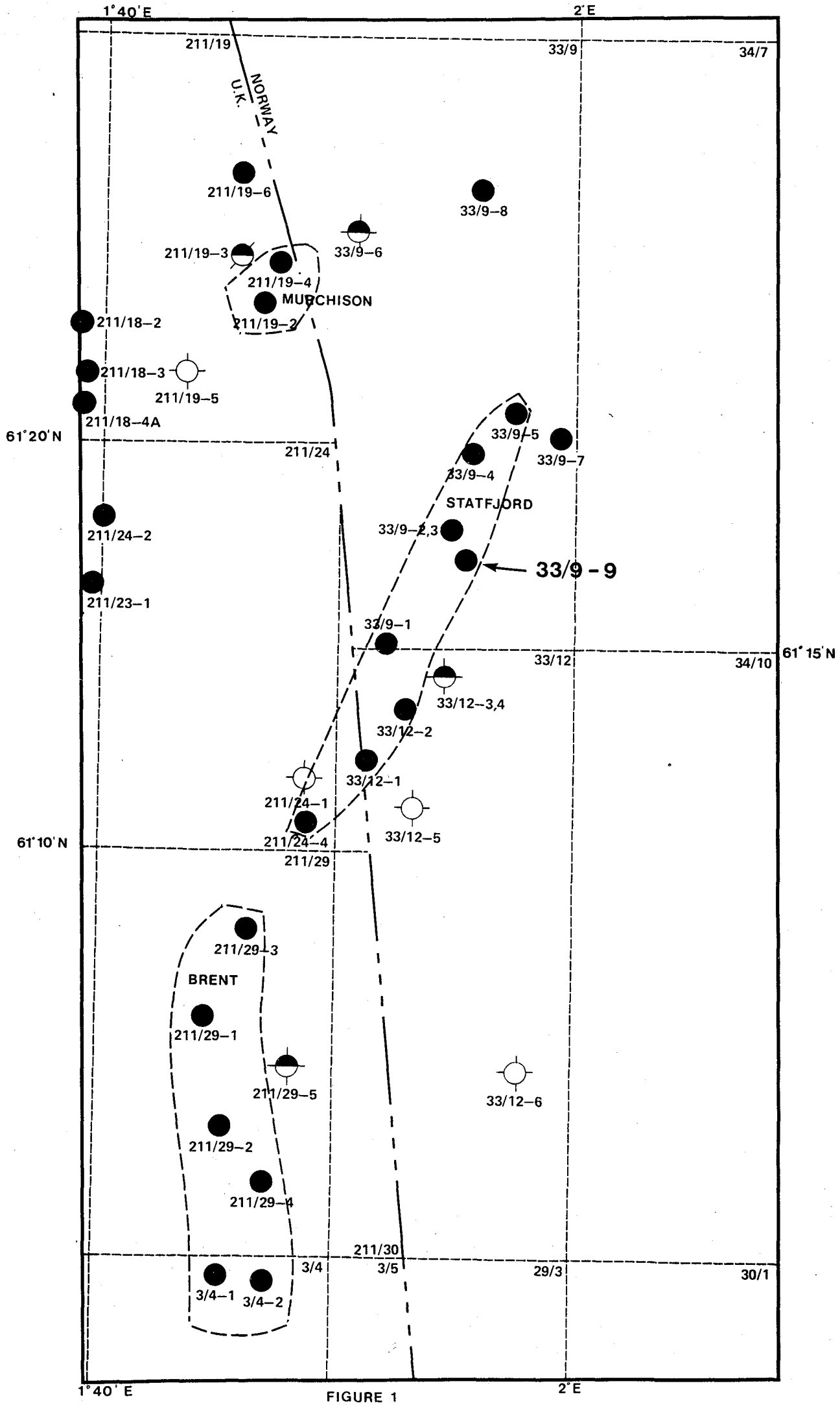
1°40'E
2°E
211/19
33/9
34/7
U.K.
NORWAY
211/19-6
33/9-8
211/19-3
33/9-6
211/19-4
MURCHISON
211/19-2
211/18-2
211/18-3
211/19-5
211/18-4A
61°20'N
211/24
33/9-5
33/9-7
33/9-4
STATFJORD
211/24-2
33/9-2,3
33/9-9
211/23-1
33/9-1
33/12
34/10
61°15'N
33/12-3,4
33/12-2
33/12-1
211/24-1
211/24-4
33/12-5
61°10'N
211/29
211/29-3
BRENT
211/29-1
211/29-5
33/12-6
211/29-2
211/29-4
211/30
3/4
3/5
29/3
30/1
3/4-1
3/4-2
1°40'E
2°E

FIGURE 1

SUMMARY

The 33/9-9 appraisal well is located in the northern portion of the Statfjord field, about 1.6 kilometers southeast of 33/9-3 well on seismic line MNG-22.5 (Figure 1). The objectives of the well were;

A. To provide structural and stratigraphic control on the Brent reservoirs in the northern, crestal portion of the field.

B. To provide stratigraphic control and to establish an oil/water contact for the Statfjord reservoir.

The well was spudded on 27 July 1977 and plugged and abandoned as a successful test on 19 November 1977 at the depth 3100 meters DF, probably in Triassic sediments.

The top of Brent was 77.5 meters lower than prognosed and the Brent reservoir was 44.0 meters thinner than anticipated in comparison to 33/9-3 (Figures 2 & 3). Thinning in the Brent reservoir could be due to normal faulting, stratigraphic thinning, or erosion. Analysis of the dip meter and the conventional core is in progress to try to answer this question.

Eight cores were taken through Brent reservoir and shipped to Mobil's Field Research Laboratory for special core analyses (Enclosure 4).

The Lower Jurassic Dunlin Formation had 23.2 meters (gross) of oil saturated sands between 2528.4-2551.6 meters DF. Fourteen sidewall samples were taken from Dunlin sand interval for porosity, permeability and saturation measurements (See Enclosure 5 and 6). One drillstem test in the upper part of Dunlin sand produced 8314 BOPD, 24.4^{o} API oil on a 1 1/4" choke (Attachment 3). Preliminary stock-tank-oil-in-place calculations based on the assumption that the oil/water contact is at -2584.1 meters subsea, i.e. same as Brent Formation, indicate 28.3 MMB for Dunlin sand.

The Lower Jurassic Statfjord Formation was only 5.0 meters low to prognosis confirming that the Statfjord seismic reflector is a reliable mapping horizon. The anticipated oil/water contact was not found. The oil/shale contact at -2802.7 meters subsea (2827.7 m KB) found in 33/12-2 falls in a zone of interbedded shales and tight sands in the 33/9-9 well. Fifteen cores were taken in the prospective section for special core analysis (Enclosure 4). A depth error of +11.3 meters was found at 2781.7 meters DF and was subsequently corrected (Attachment 4).

The well was plugged and abandoned at 3100.0 m DF in Triassic (?) red beds.

HYDROCARBON SHOWS AND EVALUATION

Middle Jurassic - Brent Formation

Good oil shows were encountered at the top of the Brent Formation and continued throughout the reservoir. The entire Brent Formation section between 2413.0 and 2504.5 meters DF (log) was above the field oil/water contact of -2584.1 meters subsea (2609.1 meters DF). Log calculations show that of the 87.0 meters of gross oil section 84.6 meters is net sand with 27.5% average porosity and 13.1% average water saturation. Two DST's were run, one immediately above middle shaly zone (No. 9) and one immediately below the middle shaly zone (No. 8). DST No. 9, from 2426.0 to 2432.8 meters DF flowed at the rate of 10,500 BOPD through 50/60" choke. DST No. 8, 2458.0 - 2460.7 meters DF, flowed at a rate of 9224 BOPD on a 48/64" choke (Attachment 3).

Lower Jurassic - Dunlin Formation

Oil shows were reported from ditch samples in the Dunlin sand between 2535 and 2575 meters (sample depth). The log interpretation indicated 23.2 meters gross oil column between 2528.4 and 2551.6 meters DF (log) with 17.9 meters net oil sand. The interval has a 20.2% average porosity and 34.6% water saturation.

DST No. 7 (2531.0 - 2537.5 meters DF) flowed 8314 BOPD, 34.4° API oil on a 1 1/4" choke, from the upper part of this interval (Attachment 3). This is the first well to find this unit productive in the field.

Lower Jurassic - Statfjord Formation

Good oil shows were reported from the top at 2715.0 meters down to about 2850.0 meters DF (sample). The lowest potential pay sand indicated on the CPI log occurs between 2847.5 and 2852.5 meters DF. A test in this interval, DST No. 2, produced 1350 BWPD on a 3/4" choke (Attachment 3). The next interval above this (2715.0 meters - 2815.0 meters DF) was sucessfully tested by DST No. 6 which flowed at a rate of 5420 BOPD on a 7/16" choke. DST No. 5 over the same interval was a sand production test flowing at rates of up to 7577 BOPD on a 5/8" choke, with moderate amounts (20 - 40 ptb) sand production. DST No. 3, at 2800.0 - 2803.5 meters DF, flowed at a rate of 9034 BOPD on a 3/4" choke with 90 ptb sand production (Attachment 3). The CPI evaluation for the 100 meter interval from 2715.0 to 2815.0 meters DF (log) showed 78.8 meters net sand with 24.0% average porosity and 27.1% average water saturation (Attachment 1). The lowest-known-oil in the well at 2815.0 meters DF (-2790.0 meters subsea) is 13.1 meters above the lowest-known-oil previously established in the 33/12-2 well and falls within a section of tight sands and shales.

STRATIGRAPHY/STRUCTURE

Tertiary

The Mio-Pliocene section consists of gray colored, soft, sandy, fossiliferous claystones. The underlying Oligocene is mostly gray-brown siltstones with occasional glauconitic sands. These sands become predominant lithology in the basal 50 meters of the section. The upper part of the Eocene is gray-brown firm claystones which become increasingly calcareous, with frequent calcilutite stringers, towards the base. Light colored, tuffaceous claystones and mudstones mark the top of the Paleocene section. Near the base, the Paleocene section contains generally coarse grained sands. An unconformity, based on paleo data, marks the base of Tertiary section in the well.

CROSS–SECTION SHOWING FAULT INTERPRETATION IN 33/9-9 WELL

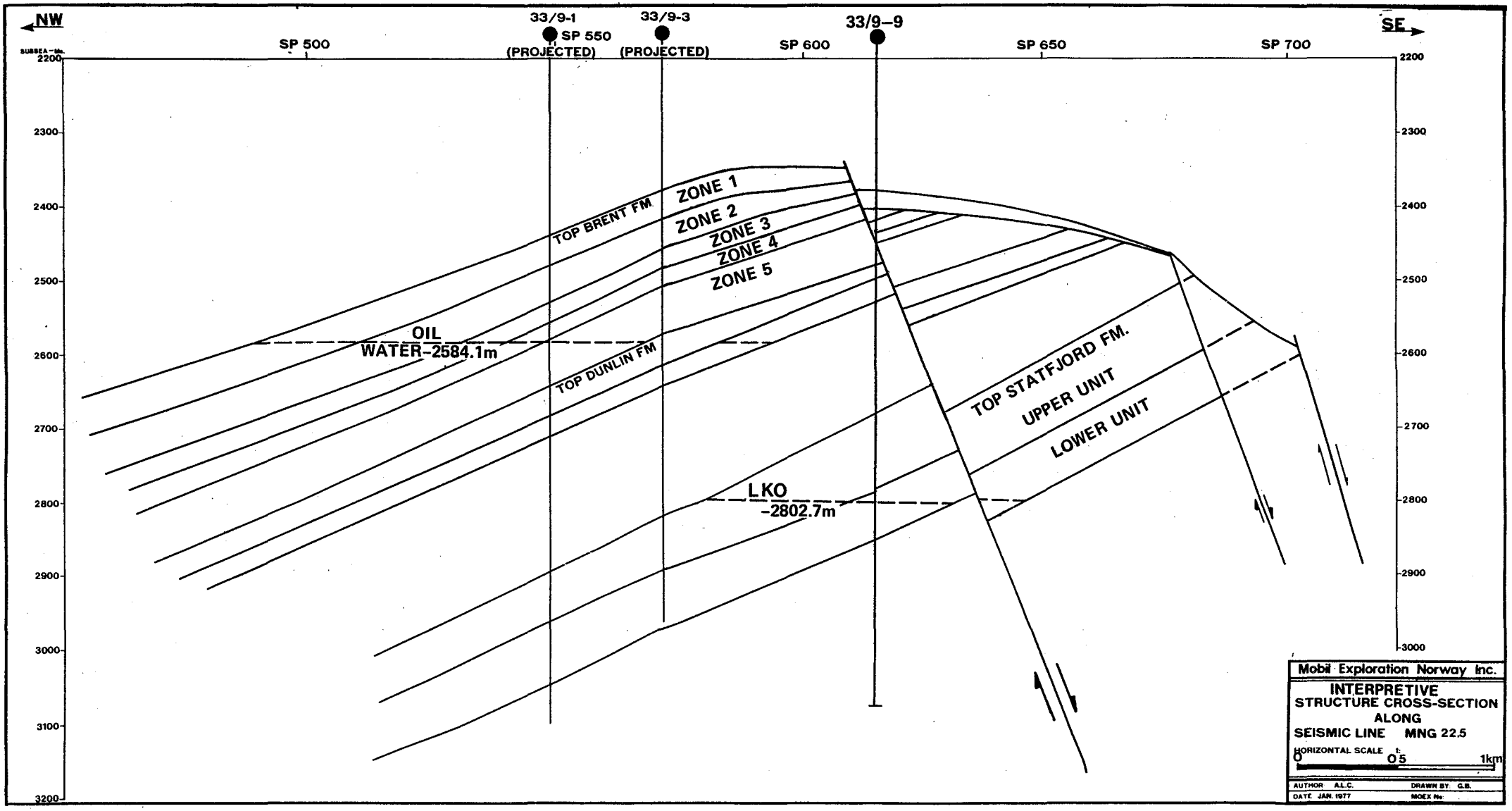

FIGURE 2.

78/176–1805

Cretaceous

The Upper Cretaceous sediments, ranging in age from Late Maastrichtian to Early Campanian, consist of gray claystones with increasing interbeds of fine grained calcareous sandstones, calcilutities and dololutites. Interpretation of dipmeter data indicates a low energy environment of deposition for the Upper Cretaceous section down to 2350 meters DF (log). The dipmeter structural dips for this interval are 2-3^{o} at 94^{o} azimuth. From 2350.0 meters to 2396.3 meters DF (log), the section consists mainly of claystones, and from the dipmeter log, although the dip vectors are scarce and poor in quality, the section appears to be concordant with the section above.

The Lower Cretaceous section consists of gray carbonaceous, glauconitic claystones overlying the white calcilutes of Barremian age . The upper boundary of the Lower Cretaceous section which corresponds to a time gap from top Santonian to probably base Cenomanian, (assuming that the clayey section above Barremian is of Aptian-Albian in age as in wells 33/9-4 and 12-4) is not clearly marked on the dipmeter logs. Dip orientation show concordance with the overlying Upper Cretaceous section. There are however, well developed dip vectors showing gradual decrease in the amount of dip near the top of Barremian Limestone section. A distinct change in the dip vectors from 5^{o} to about 16^{o} at 110^{o} azimuth to 4^{o} at 65^{o} azimuth, occurs around 2400.7 meters DF indicating an unconformity at the top of Barremian Limestone. The paleo evidence (corrected for drilling depth error of +11.3 meters*) also indicates an unconformity at this level, confirming the dipmeter data. Within the Barremian section the amount of dip increases from 4^{o} to 6^{o} near the base, giving a slight indication of the regional Kimmerian Unconformity at the base.

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* Drilling depths were recorded 11.3 m too high starting at about 2200 meters DF. The error was corrected after 2781.7 meters DF. The paleo sample depths are in error in the above interval.

Jurassic

A thin veneer (0.6 meters) of Upper Jurassic Hot Shale Formation is preserved between 2412.5 and 2413.0 meters DF (log) in the 33/9-9 well.

Below this the Brent Formation was encountered at 2413.0 meters DF (log), 77.5 meters low to prognosis. This is due to significantly higher actual seismic velocities than those used for prognosis.

The computer processed log interpretation (CPI) over the interval shows that the oil bearing sands of Brent Formation have an average net/gross ratio of 0.97 and an average porosity of 27.5%. (Attachment 1). Although the section is cored from 2415.0 to the base at 2504.5 meters DF (Cores 1 through 7), no core porosity data is available at the time of this report (Enclosures 1 and 4).

The structural dips on the dipmeter log across the Brent Formation interval between 2504.5 and 2425.0 meters DF (log) are about 2^{o}, with 295^{o} average azimuth. The overlying Upper Brent section between 2425.0 and 2413.0 meters DF (log) however, shows a gradual change from 6^{o} northwest dips at 2424.0 meters to 5^{o} southeast dips at 2414.0 meters DF (log). Such dip vector pattern can be interpreted as the differential compaction of the sediments (See "Fundamentals of Dipmeter Interpretation" 1972, page 100, Pattern Nos: 15 and 16, Schlumberger).

Log correlations and the dipmeter data lend to the interpretation of a possible normal fault at about 2471.0 meters DF, which cut out about 44.0 meters of section in comparison with 33/9-3 well (Figure 2).

The Lower Jurassic Dunlin Formation was topped at 2504.5 meters DF, 44.5 meters low to the prognosis. The section was typical of Dunlin with the exception of a better sand development that in any of the previous Statfjord Field wells, between 2528.4 and 2592.0 meters DF (log). The top 23.2 meters of this same interval had good oil shows. CPI calculations over the oil leg yield 17.9 meters net oil sand and a net-to-gross ratio of 0.77, and average porosity of 20.2% (Attachment 1).

Interpreted structural dips through the Dunlin are low, about 2 - 3° at 330° azimuth. Range of sedimentary dips (2° and 15°) indicate moderately high energy environment of deposition. Three, or possibly five, minor depositional breaks (diastems) can be interpreted within the Dunlin sand interval. Log correlation with 33/9-3 well indicate that the Dunlin Formation is approximately 30 meters thinner in 33/9-9.

Lower Jurassic Statfjord Formation was topped at 2715.0 meters DF (log), only 5.0 meters low to prognosis.

The Statfjord section consists of predominantly medium grained, kaolinitic sandstones interbedded with variegated claystones and mudstones. The frequency and thickness of the sandstone beds decrease sharply below 2815.0 meters DF (log), making this the base of Statfjord Formation, Upper Unit which has higher net-to-gross ratio than that of the Lower Unit. Log analysis over the interval from 2715.0 to 2815.0 meters DF (log) indicated a net-to-gross ratio of 0.75 and an average porosity of 24.0%. The Lower Unit of the Statfjord Formation is wet in this well. A sand count, using 40% clay volume as cut off value indicate 29.1 meters of clean sand, 29.7 meters shale and a sand-shale ratio of 0.98 for the interval from 2815.0 to 2873.8 meters DF (log). The dipmeter log indicates structural dips ranging between 2 - 7° at 295° azimuth (average), over the Statfjord Formation interval.

Triassic

Although the Robertson Research paleo summary shows the top of the Triassic at 2764.0 m DF (Attachment 5), this is based on appearance of red beds only, and not supported either by fossils or by log correlations.

CONCLUSIONS

In terms of stratigraphy, the results of 33/9-9 did not produce significant changes in the Statfjord Field stratigraphy. Structural dips obtained from the well has provided better control over structural configuration of the Brent Formation in the northern crestal area where seismic reflection data is highly questionable. However, the revision of the structure maps in the northern crestal area was not large enough to have signficant impact on the Development Plans of the Statfjord Field.

As for the Statfjord reservoir, results of log and core analyses will provide an additional control point for the reservoir in the northern part of the field.

In summary, well 33/9-9, provided additional structural control and reservoir data for Brent and Statfjord formations in the northern crestal portion of the field, and substantiated the oil potential of Dunlin Formation. It failed to establish an oil/water contact for the Statfjord reservoir.

NTank/ct
7 March 1978

VELL 33/9-9 PROGNOSIS VS ACTUAL DEPTHS

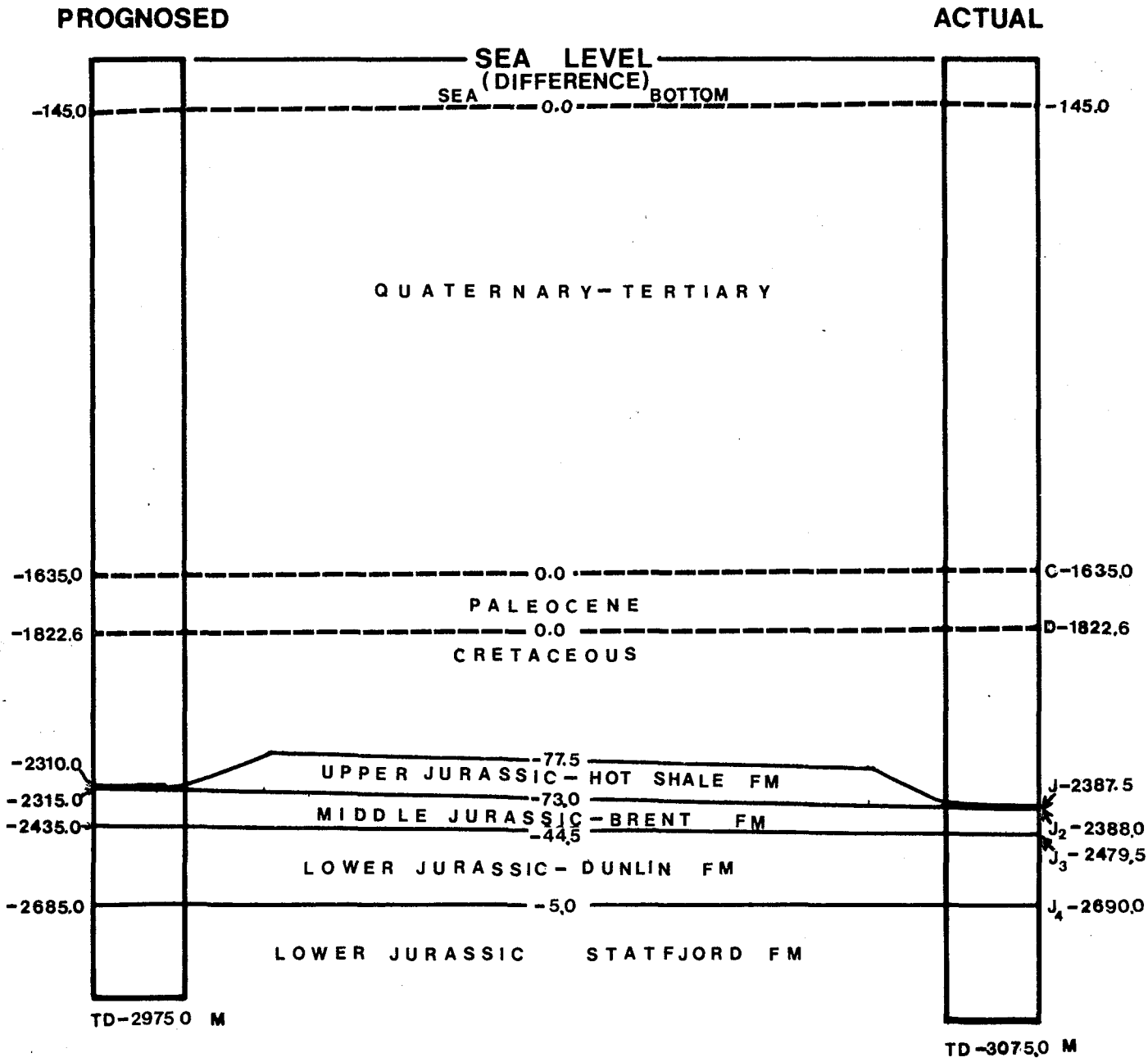


FIGURE 3

ALL DEPTHS ARE IN METERS
SUBSEA
VERTICAL SCALE 1:20,000

ATTACHMENT 1

WELL 33/9-9
LOG INTERPRETATION SUMMARY
(BASED ON CPI RESULTS)

	BRENT FORMATION	DUNLIN FORMATION (DUNLIN SAND)	STATFJORD FORMATION
Top	- 2388.7(SS)	-2503.4 m (SS)	- 2690.0m (SS)
Bottom	-2479.5 (SS)	-2567.0 m (SS)	- 2790.0m (SS)
KB	25.3 m	25.3 m	25.3 m
Ave Ø	27.5%	20.2%	24.0%
Ave Sw	13.1%	34.6%	27.1%
Net	84.6 m	17.9 m	74.8 m
Gross	87 m	23.2 m	100 m
N/G	.97	.77	.75
ALC/ct			

Attachment-2

Mobil Exploration Norway Inc.

WELL RECORD SHEET — **WELL NAME** 33/9-9

COMPANY: Mobil Exploration Norway Inc.	STATUS: Successful Appraisal
AREA / BLOCK: Norway 33/9	RIG & PICK UP DATE: Borgny Dolphin 22 July 77
LATITUDE: 61^o 17' 10.1928" N	SPUDDED: 27 July 77 — REACHED T. D.: 29 Sept 77
LONGITUDE: 01^o 54' 26.0466" E	RIG RELEASE DATE: 19 November 1977
CLASSIFICATION: Appraisal	RIG MONTHS: 3.7 — TRADE DATA:
K. B.: 25.3m D.F.: 25.0m — G. L.	WATER DEPTH: 145m
T. D.: 3100m	CASING: 30" at 244m, 20" at 475m, 13 3/8" at 1984m, 9 5/8" at 3067.5m

LOGS: ISF/SONIC 245.5-3100m, FDC/CNL 475.5-3100m, DLL 2350-3100m, HDT 2300-3100m
GR Spectroscopy 2350-3100, Long Space Sonic 1990-3098.5, 12CheckShots (355-2955m)
RFT 15 zones in Jurassic

STRATIGRAPHIC TOPS

UNIT	DEPTH	SUBSEA	THICKNESS / REMARKS
Paleocene	1660.0 m	-1635.0m	187.6 m
U. Cretaceous	1847.6 m	-1822.6m	548.7 m
L. Cretaceous	2396.3 m	-2371.3m	16.2 m
Barremian Limestone	2407.0 m	-2382.0m	5.5 m
Jurassic Hot Shale	2412.5 m	-2387.5m	0.5 m
M. Jurassic Brent Fm.	2413.0 m	-2388.0m	91.5 m
Base zone 1 Brent Fm.	2432.6 m	-2407.6m	19.5 m
Top zone 2/3 Brent Fm	2432.6 m	-2407.6m	24.4 m
Top zone 3 (Est)	2443.5 m	-2418.5m	
Top zone 4 Brent Fm.	2457.0 m	-2332.0m	14 m
Top zone 5	2471.0	-2446.0m	33.5 m (Fault at 2471m, + 44m measured against 33/9-3).
L. Jurassic Dunlin Fm.	2504.5 m	-2479.5m	210.5 m
Top Dunlin Sand	2528.4 m	-2503.4m	63.6 m
Base Dunlin Sand	2592.0 m	-2567.0m	
L. Jurassic Statfjord Fm.	2715.0 m	-2690.0m	100 m
Base Upper Unit Stat. Fm.	2815.0 m	-2790.0m	
T.D.	3100.0 m	-3075.0m	

ADDITIONAL INFORMATION: Depths for cores 1 through 16 are 11.3m too high.

Core 1	2402.7-2421 m	100% rec.	Core 9	2707 - 2711 m	63% rec.	DEPTH CORRECT:			
" 2	2421 -2433 m	97%	" " 10	2711 - 2721 m	80%	" Core 17	2793 -2807.5m	47%
" 3	2433 -2435 m	25%	" " 11	2721 - 2729 m	81%	" " 18	2807.5-2818.4m	80%
" 4	2435 -2444 m	100%	" " 12	2729 - 2743.5 m	90%	" " 19	2814.4-2826.2m	100%
" 5	2444 -2457 m	85%	" " 13	2743.5 - 2757.3 m	90%	" " 20	2826.2-2837.5m	88%
" 6	2457 -2471 m	93%	" " 14	2757.3 - 2763 m	9%	" " 21	2837.5-2853.5m	94%
" 7	2471 -2489.3m	100%	" " 15	2763 - 2775.3 m	97%	" " 22	2853.5-2866 m	96%
" 8	2489.3-2506.5m	95%	" " 16	2775.3 - 2781.7 m	100%	" " 23	2866 -2876.5m	100%

NOTE: ALL LOG TOPS PICKED ON/OR CORRELATED TO THE IES OR ISF/SONIC LOG UNLESS OTHERWISE NOTED.
Two runs for sidewall cores resulted in 51 of 60 possible SWC in the Jurassic.

Paleontology / Palynology

Interval Meters-KB	Thickness-M	Stage/Substage	System/Subsystem
254-506	± 252		Tertiary-Pliocene
512-548	± 36		Tertiary-Upper Miocene
554-905	± 351		Tertiary-Middle Miocene
914-977	± 63		Tertiary-Lower Miocene
986-1352	± 366		Tertiary-Oligocene
1358-1388	± 30		Tertiary-Upper Eocene
1394-1406	± 12		Tertiary-Middle Eocene
1412-1628	± 216		Tertiary-Lower Eocene-Paleocene
1634-1844	± 210		Tertiary-Paleocene
Unconformity	-		
1850-1856	± 6	Late Maastrichtian	Upper Cretaceous
1862-1922	± 60	Maastrichtian	Upper Cretaceous
1928-2078	± 50	Early Maastricht Late Campanian	Upper Cretaceous
2081-2393	± 312	Early Campanian - ? Santonian	Upper Cretaceous
Unconformity			
2396	± 3	Barremian	Lower Cretaceous
Unconformity			
2399.0-2417.7	± 18.7	?Bathonian (? t/V1)	Middle Jurassic
2422.2-2431.0	± 8.8	Earliest Bathonian - Bajocian (V1)	Middle Jurassic
2435.5-2492.0	± 56.5	Early Bajocian (V2)	Middle Jurassic
2492.5-2519.0	± 26.5	Late Toarcian (W)	Lower Jurassic
2522.0-2555.0	± 33	Early Toarcian (X1)	Lower Jurassic
2558.0-2597.0	± 39	Domerian (X2)	Lower Jurassic
2600.0-2693.0	± 93	Carixian-Late Sinemurian (Y)	Lower Jurassic
2696.0-2762.0	± 66	?Early Sinemurian-Hettangian (Z)	Lower Jurassic
2764.0-3100.0	± 33	Indeterminate Red Beds	?Triassic

Note: The summary is based on telex report by Robertson Research, dated 18 January, 1978.

TEST DATA (INDICATE IF DST, PT, OR FIT) (TIMES IN MINUTES, PRESSURE IN P.S.I.)

NO	INTERVAL	TOTAL FLOW PERIOD	RECOVERY AND REMARKS	MAX. PRESSURE FFP	FSIP	HH
DST 2	2847.5-2852.5m Statfjord Fm	7:19	1350 BWPD on 3/4" choke 14200 ppm Chlorides 30 WHP	4057	5960	7027
DST 3	2800 - 2803.5m Statfjord Fm	14:40	9034 BOPD on 3/4" choke 1500 WHP GOR 412,37.8° API	4387	5912	6890
DST 5	2742 - 2745m Statfjord Fm	21:47	7577 BOPD on 5/8" choke 2158 WHP GOR 545, 38.0° API	4982	5852	6731
DST 7	2531 - 2537.5m Dunlin Sand	25:54	8314 BOPD on 1 1/4" choke 1130 WHP GOR 569,34.4° API	3538	5295	6240
DST 8	2458 - 2460.7m Brent Fm	35:15	9224 BOPD on 3/4" choke 2300 WHP GOR 1058,37.6° API	5041	5539	6014
DST 9	2426 - 2432.8m Brent Fm	24:28	10500 BOPD on 50/64" choke 2300 WHP GOR 1058,37.6° API	5249	5488	5974

ABBREVIATIONS:

NP	NOT PRESENT	ER	ERODED	SL	SONIC LOG
NL	NOT LOGGED	F	FAULTED	DL	DENSITY LOG
NR	NOT REACHED	GR	GAMMA RAY LOG	NL	NEUTRON LOG
		PT	PALEO TOP	ST	SAMPLE TOP
				SD	SCOUT DATA

BY: N. Tank

DATE: 27 January, 1978 REVISED: PAGE ..... OF .....

Form. MOEX N 75/H-1-76

STATFJORD WELL 33/9-9 TEST RESULTS

FIRST TEST INTERVAL (STATFJORD SAND): 2847.5-2852.5 m (66 perfs.)

DST No. 1

Misrun: Could not open downhole (APR) test valve.

DST No. 2

Choke (in.)	Rate (BWPD)	WHP (psig)	Oil (%)	Chlorides (ppm)	BHT (°F)	FBHP (psig)	Flow Period
3/4	1350	30	trace	14,200	196	4057	7:19

Initial Hydrostatic Pressure	6970 psig
Initial Buildup Pressure	-
Final Buildup Pressure	5960 psig
Final Hydrostatic Pressure	7027 psig

Remarks: Produced sand throughout test, declining from 0.2% to 0.05% (1200 to 300 ptb).

SECOND TEST INTERVAL (STATFJORD SAND): 2800-2803.5 m (46 perfs.)

DST No. 3

Choke (in.)	Rate (BOPD)	WHP (psig)	Sep. Press (psig)	GOR (SCF/ bbl)	BS&W (%)	Grav. (°API)	FBHP (psig)	BHT (°F)	Flow Period
3/4	9034	1500	675	412	0.0	37.8	4387	-	4:26
5/8	4929	1243	660	528	0.0	38.8	5177	-	2:42
1/2	4435	1760	610	507	0.0	38.8	5258	-	2:19
1/4	1595	2750	585	458	0.0	39.0	5678	187	5:18

Initial Hydrostatic Pressure	7113 psig	
Initial Buildup Pressure	-	
Final Buildup Pressure	5912 psig	
Final Hydrostatic Pressure	6890 psig	(Field reading - difficult to read due to gauge vibration).

Remarks: Sand was produced over initial flow period, declining from 90 ptb to about 1-4 ptb just before the flow period ended. No further sand production was noted in succeeding tests.

THIRD TEST INTERVAL (STATFJORD SAND): 2742-2745 m (40 perfs.)

DST No. 4

Misrun: Could not open downhole (APR) test valve.

DST No. 5

Choke (in.)	Rate (BOPD)	WHP (psig)	Sep. Press. (psig)	GOR (SCF/ bbl)	BS&W (%)	Gravity (°API)	FBHP (psig)	BHT (°F)	Flow Period
1/4	2906	2849	430	606	0.0	32.4	5603	-	6:25
3/8	3316	2780	435	671	0.0	38.8	5535	-	3:07
1/2	6218	2300	775	526	0.0	38.5	5106	-	3:10
5/8	7577	2158	795	545	trace	38.0	4982	-	4:20
5/16	3225	2920	460	522	trace	38.7	5637	193	4:45

Initial Hydrostatic Pressure	6877 psig
Initial Buildup Pressure	-
Final Buildup Pressure	5852 psig
Final Hydrostatic Pressure	6731 psig

Remarks: Sand produced after each rate change (20 ptb), but cleaned up rapidly. Sand began producing more or less continuously, in bursts, on 5/8" choke (40 ptb) indicating formation was breaking down.

DST No. 6

Choke (in.)	Rate (BOPD)	WHP (psig)	Sep. Press (psig	GOR (SCF/ bbl)	BS&W (%)	Grav. (°API)	FBHP (psig)	BHT (°F)	Flow Period
7/16	5420	2760	465	618	trace	-	5569	-	1:30
1/4	1883	3040	435	722	trace	38.6	5759	193	3:15

Initial Hydrostatic Pressure	6736 psig
Initial Buildup Pressure	5885 psig
Final Buildup Pressure	5857 psig
Final Hydrostatic Pressure	6753 psig

Remarks: Same zone tested as in DST No. 5 in an unsuccessful effort to obtain bottom hole samples. Maximum rate was designed to avoid sand production, and no sand was observed other than a few grains upon initial clean up on 7/16" choke.

FOURTH TEST INTERVAL (DUNLIN SAND): 2531-2537.5 m (85 perfs.)

DST No. 7

Choke (in.)	Rate (BOPD)	WHP (psig)	Sep. Press (psig)	GOR (SCF/ bbl)	BS&W (%)	Gravity (°API)	FBHP (psig)	BHT (°F)	Flow Period
1/4	4027	1940	405	688	0.0	-	4457	-	8:20
1/2	4613	1817	420	695	0.0	-	4302	-	4:12
9/16	4887	1760	405	683	0.0	-	4219	-	2:13
3/4	7514	1370	705	509	0.0	-	3780	-	4:07
7/8	8120	1260	705	531	0.0	-	3653	-	1:56
1 1/4	8314	1130	705	569	trace	-	3538	-	1:26
23/64	2777	2105	360	656	0.0	34.4	4729	181	3:40

Initial Hydrostatic Pressure	6328 psig
Initial Buildup Pressure	-
Final Buildup Pressure	5295 psig
Final Hydrostatic Pressure	6240 psig

Remarks: Sand production of 1-6 ptb after each choke size change. On 1 1/4" choke sand production observed on continuous basis at about 120 ptb.

FIFTH TEST INTERVAL (BRENT SAND): 2458-2460.7 m (36 perfs.)

DST No. 8.

Choke (in.)	Rate (BOPD)	WHP (psig)	Sep. Press. (psig)	GOR (SCF/ bbl)	BS&W (%)	Grav. (°API)	FBHP (psig)	BHT (°F)	Flow Period
20/64	2279	2920	300	849	trace	37.6	5349	-	8:02
26/64	4099	2790	395	821	"	-	5221	-	3:34
30/64	5008	2750	475	788	"	-	5201	-	2:43
40/64	7311	2535	720	763	"	-	5102	-	3:00
var.	5194	2440	705	756	0.0	-	5278	-	1:30
22/64	2758	3010	430	876	0.0	-	5405	-	1:39
var.	7493	2430	410	1213	0.0	-	5083	-	2:32
48/64	9224	2300	735	1058	0.0	-	5041	-	3:32
21/64	1757	3045	400	868	0.0	-	5443	-	2:43
24/64	3300	2995	450	806	0.0	-	5417	177	6:00

Initial Hydrostatic Pressure	6109 psig
Initial Buildup Pressure	-
Final Buildup Pressure	5539 psig
Final Hydrostatic Pressure	6014 psig

Remarks: There were five unscheduled shut ins during test due to leaking chicksans and changing burners. No sand was produced other than a small amount during initial cleanup and a few grains after each increase in test rate. Bottomhole samplers were left in the lubricator at end of test.

SIXTH TEST INTERVAL (BRENT SAND): 2426-2432.8 m (90 perfs.)

DST NO. 9

Choke (in.)	Rate (BOPD)	WHP psig	Sep. Press. (psig)	GOR (SCF/ bbl)	BS&W (%)	Grav. (°API)	FBHP (psig)	BHT (°F)**	Flow Period
22/64	2868	3030	440	837	0.1 to 0.6	38.5	5430	-	6:02
28/64	4643	2910	530	841	0.15	38.4	5371	-	2:48
34/64	5673	2825	615	824	0.1	-	5324	-	2:39
40/64	8313	2570	690	884	0.1 to 0.4	38.4	5264	-	3:35
46/64	9250	2500	720	856	0.0	36.8	5257	-	2:19
50/64*	10500	2370	765	900	0.0	37.4	5249	-	2:21
22/64	2615	3085	465	955	0.0	-	5439	-	4:27

* Adjustable choke

** Temperature gauge failed to work

Initial Hydrostatic Pressure	6102 psig
Initial Buildup Pressure	-
Final Buildup Pressure	5488 psig
Final Hydrostatic Pressure	5974 psig

Remarks: Five liter samples and sand detector showed small amounts down to traces of sand throughout the test. At the highest rate there were no measurable amounts.

JWG/TCMc/

CORE RECORD

WELL: 33/9-9

NO.	DRILLERS' DEPTH INTERVAL	DRILLERS' DEPTH RECOVERY FT/M - (%)	CORRECTED DEPTH INTERVAL	CORRECTED DEPTH RECOVERY FT/M - (%)	REMARKS
1*	2402.7-2421.0	18.3 -(100)	2415.0-2433.3	18.3 -(100)	-
2*	2421.0-2433.0	11.65-(97)	2433.3-2445.8	11.65 -(93)	2444.95 - 2445.8 (LCD) NR
3*	2433.0-2435.0	0.50-(25)	2445.8-2446.3	0.5 -(100)	-
4*	2435.0-2444.0	9.0 -(100)	2446.3-2456.7	9.0 -(75)	2453.3 - 2454.7 (LCD) NR
5*	2444.0-2457.0	11.0 -(85)	2458.7-2471.0	11.0 -(89)	2469.7 - 2471.0 (LCD) NR
6*	2457.0-2471.0	13.0 -(93)	2471.0-2484.0	13.0 -(100)	-
7*	2471.0-2489.3	18.3 -(100)	2486.4-2505.5	18.3 -(96)	2497.5 - 2498.3 (LCD) NR
8*	2489.3-2506.5	16.3 -(95)	2507.8-2524.8	16.3 -(96)	2524.1 - 2524.8 (LCD) NR
9*	2707.7-2711.0	2.4 -(73)	2719.0-2721.4	2.4 -(100)	-
10*	2711.0-2721.0	8.0 -(80)	2721.4-2731.4	8.0 -(80)	2729.4 - 2731.4 (LCD) NR
11*	2721.0-2729.0	6.5 -(81)	2732.9-2740.4	6.5 -(87)	2739.4 - 2740.4 (LCD) NR
12*	2729.0-2743.5	13.0 -(90)	2740.4-2754.8	13.0 -(90)	2750.2 - 2751.6 (LCD) NR
13*	2743.5-2757.3	12.4 -(90)	2754.8-2769.0	12.4 -(87)	2767.2 - 2769.0 (LCD) NR
14*	2757.3-2763.0	0.5 -(9)	2769.0-2773.2	0.6 -(11)	2769.6 - 2773.2 (LCD) NR
15*	2763.0-2775.3	12.0 -(98)	2773.2-2786.5	12.3 -(92)	2781.9 - 2782.9 (LCD) NR
16*	2775.3-2781.7	6.4 -(100)	2786.5-2792.9	6.4 -(100)	-
17	2793.0-2807.5	6.9 -(47)	2795.0-2809.1	6.8 -(48)	2799.2-2800.5;2803.1-2809.1(LCD) NR
18	2807.5-2818.4	8.7 -(80)	2809.1-2818.0	8.7 -(98)	2817.8 - 2818.0 (LCD) NR
19	2818.4-2826.2	7.8 -(100)	2818.0-2826.0	7.8 -(98)	2825.8 - 2826.0 (LCD) NR
20	2826.2-2837.5	10.0 -(88)	2826.0-2836.0	10.0 -(100)	-

LCD = Log Corrected Depth
NR = No Recovery
*NOTE: Core Nos. 1 through 16 were recorded 11.3 meters to high.

CORE RECORD

WELL: 33/9-9

NO.	DRILLERS' DEPTH INTERVAL	DRILLERS' DEPTH RECOVERY FT/M - (%)	CORRECTED DEPTH INTERVAL	CORRECTED DEPTH RECOVERY FT/M - (%)	REMARKS
21	2837.5-2853.5	15.0 -(94)	2836.0-2853.2	15.0 -(86)	2842.5-2843.5;2844.7-2845.0; 2848.0-2848.9 (LCD) NR
22	2853.5-2866.0	12.0 -(96)	2853.2-2866.0	12.0 -(94)	2865.2 - 2866.0 (LCD) NR
23	2866.0-2876.5	10.5 -(100)	2866.0-2876.5	10.5 -(100)	-

WELL 33/9-9
PALEONTOLOGICAL SUMMARY

Interval Meters-KB	Thickness-M	Stage/Substage	System/Subsystem
254-506	± 252		Tertiary-Pliocene
512-548	± 36		Tertiary-Upper Miocene
554-905	± 351		Tertiary-Middle Miocene
914-977	± 63		Tertiary-Lower Miocene
986-1352	± 366		Tertiary-Oligocene
1358-1388	± 30		Tertiary-Upper Eocene
1394-1406	± 12		Tertiary-Middle Eocene
1412-1628	± 216		Tertiary-Lower Eocene-Paleocene
1634-1844	± 210		Tertiary-Paleocene
Unconformity	-		
1850-1856	± 6	Late Maastrichtian	Upper Cretaceous
1862-1922	± 60	Maastrichtian	Upper Cretaceous
1928-2078	± 50	Early Maastricht Late Campanian	Upper Cretaceous
2081-2393	± 312	Early Campanian - ? Santonian	Upper Cretaceous
Unconformity			
2396	± 3	Barremian	Lower Cretaceous
Unconformity			
2399.0-2417.7	± 18.7	?Bathonian (? t/V1)	Middle Jurassic
2422.2-2431.0	± 8.8	Earliest Bathonian - Bajocian (V1)	Middle Jurassic
2435.5-2492.0	± 56.5	Early Bajocian (V2)	Middle Jurassic
2492.5-2519.0	± 26.5	Late Toarcian (W)	Lower Jurassic
2522.0-2555.0	± 33	Early Toarcian (X1)	Lower Jurassic
2558.0-2597.0	± 39	Domerian (X2)	Lower Jurassic
2600.0-2693.0	± 93	Carixian-Late Sinemurian (Y)	Lower Jurassic
2696.0-2762.0	± 66	?Early Sinemurian-Hettangian (Z)	Lower Jurassic
2764.0-3100.0	± 33	Indeterminate Red Beds	?Triassic

Note: The summary is based on telex report by Robertson Research, dated 18 January, 1978.

NT/ct

ENCLOSURE 4

CORE DESCRIPTIONS

CORE # 1–23

FOR DEPTH CORRECTIONS SEE ATTACHMENT 4

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

PAGE 1 OF 1

COMPANY MOBIL WELL 33/9-9 FIELD APP. ST-FJ.

CORE NO. 1 FROM 2402,7 M TO 2421 M RECOVERED 18,3 M 100 %

FORMATION BRENT SANDSTONE DATE 25.8-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 1½ 24 48

OIL & GAS SHOWS · PERMEABILITY · POROSITY Type · POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: N.B. HOLLANDER

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
2403		X				
		X			2403,3	SST: DK GY, FRIA, M GRN, WELL
2404		X			RUBBLE	SRTD, SUBRND, WEAKLY CMTD, GOOD
		X				INTERPART POR. GOOD SHOW: 50 %
2405		X			ZONE	LT BRN STN, 50 % lt yel fluor,
		X				FLUSH CUT W LT BLWH TO YELWH FLUOR.
		X			2406,0	TR GLAUC. AND MUSC.
		X				GRN-SIZE FROM M-CSE, MOD SRTD, BECOM
2407		X				CSE AND W SRTD
		X				
2408		X				SOME ARG CMT, MOD CMTD TO 2412 M.
		X				
2409		X				
		X				
2410		X				F-M GRN OCC CSE, MOD TO POORLY SRTD
		X				MOD HD, F GRN MUSC.
2411		X				
		X				
2412		X				
		X				
2413		X				RANGING F-CSE, MOD SRTD, WEEKLY
		X				CMTD
2414		X				
		X				
2415		X				
		X				
2416		X				
		X				
2417		X				
		X				
2418		X				SST: LT GY BRN, FRIA, PRED M GRN
		X				W M-CSE RANGE, POORLY SRTD, SUBRND,
2419		X				MICAG. GOOD INTERPART POR. GOOD
		X				SHOW: 100% LT BRN STN, 100% lt yel
2420		X				FLUOR, INST BL WH FLUSH CUT TURNS
		X				CLOUDY.
		X				

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG

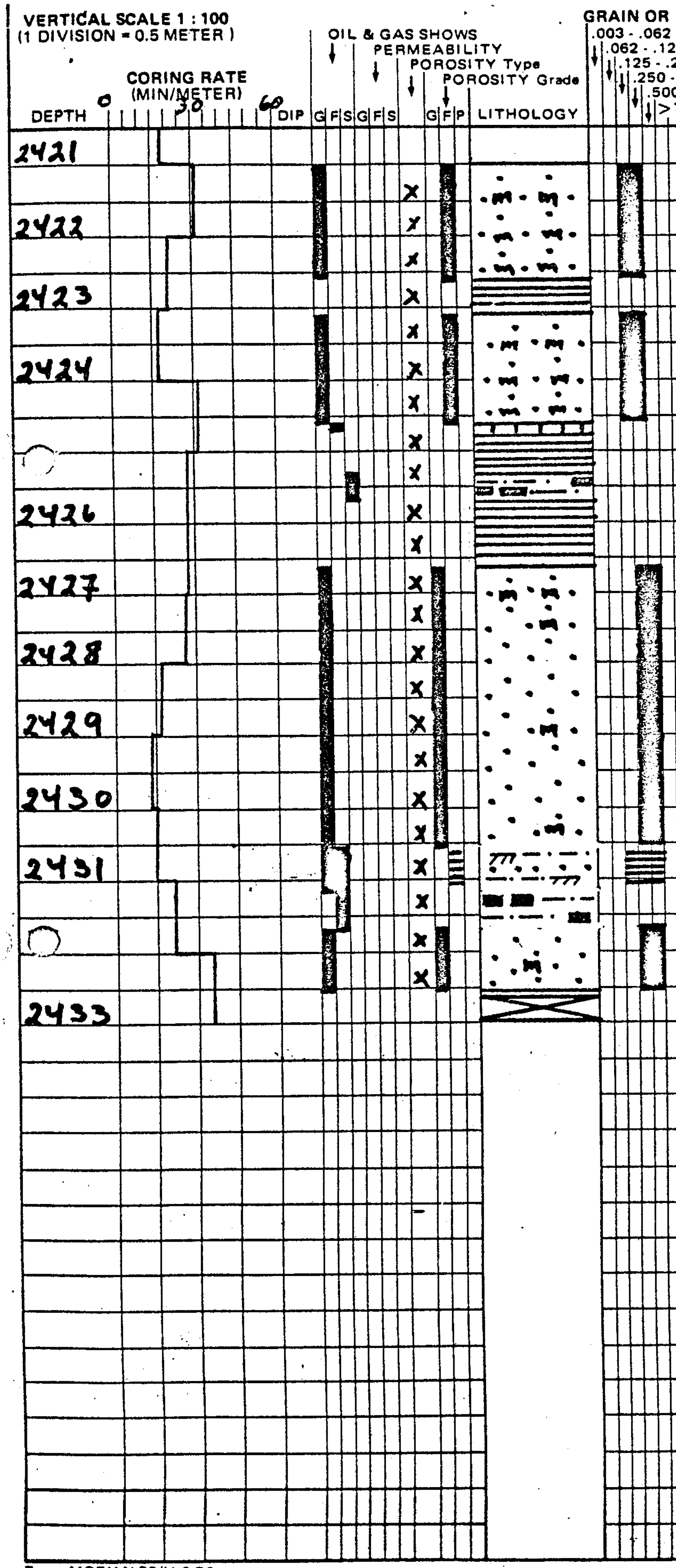
COMPANY: MOBIL WELL: 33/9-9. FIELD: APR. STATFJORD

CORE NO.: 2 FROM: 2421- M TO: 2433 M RECOVERED: 11,65 M 97 %

FORMATION: BRENT DATE: 26/8-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

DESCRIBED BY: S.I / N.B.H.



REMARKS

SS: (arg) gy-lt brn, m, fn-m, M, SA-SR, v mic, carb frags, fr por
GOOD OIL SHOW: 100% lt brn ~~[illegible]~~ stn, bl wh flash cut occ fast streamer cut
Shale: dk gy bl, mic, occ coal frags, firm (sulfides) NO SHOW

Sandstone a.a. SHOW a.a.
Limestone: gy brn, hd, slty, FAIR OIL SHOW: 60% yel flor, slow ~~[illegible]~~ bl wh streamers
Shale: slty, brn, mic, md hd NO SHOW
Siltstone: dk brn-blk, mic, pyr lenses, coal la[…]
POOR OIL SHOW: min lt yel flor in ss lenses

RUBBLE ZONE

Sandstone: lt brn, m, m-c, SA-SR, carb frags, mic, fri, gd por
GOOD OIL SHOW: 100% lt yel flor, lt bl wh flash occ fast streamer cut

Siltstone: arg, lt gy, mic, pyr, v int bdd FAIR OIL SHOW
Sandstone: lt brn, fn, fn-c, M, mic, coal, pyr
GOOD OIL SHOW
Siltstone a.a. carb

RUBBLE ZONE

Sandstone: lt brn, m, m-c, SA-SR, carb frags, mic, fri, gd por GOOD OIL SHOW. 100% lt yel flor, lt bl wh flash occ fast streamer cut.
Shale a.a. NO SHOW

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE 1 OF 1

COMPANY MOBIL WELL 33/9-9 FIELD SOFI

CORE NO. 3 FROM 2433 M TO 2435 M RECOVERED 0,5 M 25 %

FORMATION BRENT DATE 26.8-77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 30 60

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: H.B. HALLANGER

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
2433						Intbd sst and sh/cl:
2434						sst: lt brn, fri to mod hd, cse grn, m-cse, mod srtd, subang-subrnd, wkl cmtd, tr musc, glauc. Good show: 80% tan and lt yel flor, gd flash cut turn cldy w lt bl flor.
2435						Sh: drk gy-bl, frm, subf, musc, carb debris. Poor show: 10% yel flor, weak v slow strm cut w bl wh flor.
						Cuttings indicate that lower part of cored interval (below 2433 m) is rich in coal debris.

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

COMPANY MOBIL WELL 33/9-9 FIELD ST FJ ARR

CORE NO. 4 FROM 2435 M TO 2444 M RECOVERED 9 M 100 %

FORMATION BRENT DATE 27.8-77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 30 60

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: H.B. HOLLANDER

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
2435						
	30°			X		Sh w lam of sst.
2436				X		Sst: lt gy brn, fri to frm, v f grn,
					Rubble	vf-f, well srtd, SR, sl cmtd, v musc,
2437						gd intrap. prr., th incl coal, dr glauc.
				X		Sh: lt gy, frm, slty, v musc, carb debr, py.
2438				X		Show: 100% lt brn tan, 100% lt yel Flor,
				X		gd amt lt yel wh Flor fast strm cut in sst.
39				X		
	0°			X		Sst a.a. w. sh-lam.: sh a.a.
2440				X		Show in sst a.a. No show in sh.
				X		
2441	10°			X		
				X		
2442	10°			X		Indbd sst and sltst. Sst a.a.
				X		sltst: lt gy, frm, musc, carb debris.
2443	10°			X		Gd show in sst a.a. Poor show in
				X		sltst: no tan, v weak lt yel Flor,
2444	15°			X		v slow strm cut w lt yel wh Flor

Mobil Exploration Norway Inc. GRAPHIC CORE LOG

PAGE 1 OF 1

COMPANY MOBIL WELL 33/9-7 FIELD APR. STATFJORD

CORE NO. 5 FROM 2444 M TO 2457 M RECOVERED 11 M 85 %

FORMATION BRENT DATE 28/8-77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 30 60

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: J.I.

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
2444						Intbdd Clyst / Sltst / SS
2445						Clyst / Sltst: dk brn-gy, mic, m hd; Poor oil SHOW: 10% yel flor, weak slow lt wh cloudy cut, Intbdd Sandstone: arg, lt brn, fn, W, SA, coal lam and frags, fr-pr por ~~Fair oil SHOW: lt brn stn~~, 90% yel flor, weak lt wh flash cut, turns cloudy
2446						
2447						Sandstone: lt brn, fn, W, SA-SR, tr mic, tr coal, tr pyr, fri, gd por Very good oil SHOW: lt brn stn, 90-100% bri lt wh - wh yel flor, inst lt wh flash cut, lt brn resd
2448						
2449						Intbdd Clyst / Sltst / SS a. a.
2450						
2451						Sandstone a. a. last 1m m grd oil SHOW a. a.
2452						Remarks: Sandstone lam dips 10-20°
2453						
2454						
2455						
2456						
2457						

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE 1 OF 1

COMPANY MOBIL WELL 33/9-9 FIELD SF. FJ. APR.

CORE NO. 6 FROM 2457 M TO 2471 M RECOVERED 13 M 93 %

FORMATION BRENT FORM. DATE 28.8-77.

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 30 60

OIL & GAS SHOWS | PERMEABILITY | POROSITY Type | POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: H.B. HOLLANDER

DEPTH	DIP	G F S G F S	G F P	LITHOLOGY	REMARKS
2457					
	0°	X		M	Sst: lt brn, fri, f, f-m, mod w srtd, SR, tr vcse, well rnd, qtz grns, coal, tr musc w bands of musc and biot (both <sc grn) at 2459m) becoming vf, vf-m., gd interp. por., tr glauc.
2458		X		M·M·M·	
		X			
2459	0°	X		M·M·M	
		X		M·M·M·M	
2460	0°	X		M	
		X			Show: gd oil show; brt yel flor 100%, v gd flash cut w lt yel flor, brn tan 100%
2461		X		M	
		X		M	
2462		X			
		X		M	
2463		X			
		X		M	
2464		X			
		X			
2465		X		M	
		X			Sst: a.a. but lt gy.
2466		X			
		X			Gas readings:
2467	5	X		M	2459-2462 ave tot 1400 max 1650 w max C_1 1508 ppm, C_2 92 ppm, C_3 50 ppm, tr C_4.
		X		M	
68		X			
		X			
2469		X			
		X			
2470		X			2465-2468 ave tot 950 ppm, max C_1 960 ppm, C_2 30 ppm, C_3 10 ppm and tr C_4.
2471					
2472					
2473					

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE 1 OF 1

COMPANY MOBIL WELL 33/9-9 FIELD STF7. APR.

CORE NO. 7 FROM 2471 M TO 2489,3 M RECOVERED 18,3 M 100 %

FORMATION BRENT SAND DATE 29.8-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER) | CORING RATE (MIN/METER) 0 30 60 | DIP | OIL & GAS SHOWS | PERMEABILITY | POROSITY Type | POROSITY Grade G F S G F S G F P | LITHOLOGY | GRAIN OR CRYSTAL SIZE .003 - .062 MM MICRO .062 - .125 MM Vy FN .125 - .250 MM FINE .250 - .500 MM MED .500 - 1.00 MM CRSE >1.00 MM Vy CRSE | DESCRIBED BY: J.I. | REMARKS

DEPTH	REMARKS
2471	
2472	SANDSTONE: LT BRN, FN, VFN-FN, W, SA-SR, MIC, OCC MIC BANDS, TR PYR,
2473	TR COAL, TR GLAUC, FRI, GD x POR
2474	GOOD OIL SHOW: 100% BRN STN, 100% BRI YEL FLOR, INST BL W/h - LT YEL FLASH CUT, LT BRN RESD
2475	
2476	
2477	SANDSTONE W/ INTBDD SHALE/SLTST
2478	SANDSTONE: ARG, LT BRN GY, FN, V FN-FN, W, SA-SR, MIC, OCC MIC BANDS, TR PYR, TR COAL, FRI, GD-FR x POR
2479	SHALE/SLTST: DK GY-BRN, V MIC, FIRM
2480	GOOD OIL SHOW IN SANDSTONE: LT BRN STN, 70-100% YEL FLOR, INST BL W/H - LT YEL FLASH CUT, LT BRN RESD
2481	NO SHOW IN SHALE/SLTST LAM
2482	
2483	
2484	
2485	
2486	SANDSTONE: CLR, FN, W, SA-SR, CA CMT, VHD, NO POR
2487	SANDSTONE AS INT 2471-2475,5m
2488	SANDSTONE W/ INTBDD SHALE/SLTST
2489	SANDSTONE: V ARG, LT BRN-GY BRN, FN, V FN-FN, W, SA-SR, V MIC, MIC BANDS, TR PYR, FRI-FIRM, PR x PO
	FAIR OIL SHOW: 30% YEL FLOR, LT YEL CLOUDY CUT
	SHALE/SLTST: DK GY-BRN, V MIC, FIRM

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

PAGE 1 OF 1

COMPANY Mobil WELL 33/9-9 FIELD ST. FJ APR.

CORE NO. 8 FROM 2489.3 m M TO 2506.3 m M RECOVERED 16.3 M 95 %

FORMATION BRENT - DUNLIN DATE 8/30/77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 30 60

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: R.B. HISELER

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
2489						
			X		M	Ss w/ intbdd sh/slt st ss: v arg, brn-gy brn, v fn, grdg slt, sa, v mic, fri-firm, pr X por. sh/slt st: dk gy-brn, v mic, firm
2490					M	
2491					M	Sh w/ interlam slt st; generally coarsening upwards Sh: dk gy, sl slty, mic, carb(?) firm slt st: lt gy, mic, lam, fri, weak crush cut at base to flash/streaming cut at top of sequence
2492			X		M	Ss brn-buff, m, w, a-sa, no cmt, mic, fri, gd X por, bri yel flor, flash-streaming cut, gd show
			X		M	Ss gr-brn, c, v fn-vc, u, sa-st, ca-pyr cmt, fri, fr X por, bri yel flor, flash-streaming cut
2493					M	
					o	
					p	
2494					M	
					M	
2495					p	
					M	
2496					M	
2497					o	Sh dk gry-blk, sl slty, mic, carb(?), occ calc, occ pyr, occ ca nod, occ slicken sides, hd, no shows
					p M	
2498					M	
2499					M	
					p	
2500					M	
2501					M	
2502					M	
					p	
2503					M	
					o	
2504					M	
					M	
2505					p	
					M	
2506						
2507						

Tot gas in cored interval ave 600 ppm, max 800 ppm w/ C-1 680, C-2 70, C-3 50 ppm, tr C-4

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE ..... OF .....

COMPANY MENI WELL 33/9-9 FIELD STATFJORD

CORE NO. 9&10 FROM 2707.7 M TO 2721 M RECOVERED 10.4 M 78 %

FORMATION STATFJORD DATE 9 SEPTEMBER-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 20 40 60 80

OIL & GAS SHOWS: PERMEABILITY, POROSITY Type, POROSITY Grade

GRAIN OR CRYSTAL SIZE: .003 - .062 MM MICRO; .062 - .125 MM Vy FN; .125 - .250 MM FINE; .250 - .500 MM MED; .500 - 1.00 MM CRSE; >1.00 MM Vy CRSE

DESCRIBED BY: A. L.

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
2707.7						Sandstone, cong, lt brn, m, range v fn - v crse, pebbles > 15 mm, fr - p srtd, SR-SA, kaol, pyr, occ sil cmtd, hd, fair-g por, okl odor, lt brn stn, bri yl fluor, flash bl wh cut, lt tan res colour, oil bleeding from core
2708					P. O. kao	
2709						
2710	160 min/m					
2711						Claystone, sdy, bl gy, occ mic intbdd Sandstone a.a.
2712					Kaa	Claystone, sdy, brn, hd
2713						Sandstone, lt brn, m, rang, v fn - v crse, SA, fr - p srtd, kaol, carb, tr, fair por, oil odor, lt brn stn, bri yl fluor, good cut and res colour.
2714						Calcareous zones, v hd, p por, p. show
2716					kao	
2716						claystone, sdy, gy brn, carb, plant foss, occ wxy, firm, inbdd Sandstone p. por, p. show, Coal, blk, firm, plant foss, pyr
2717						Sandstone, very carb
2718						Sandstone, cong, lt brn, wh, v fn - v crse, pebbles > 6 mm p. srtd, SA - SR, kaol, tr mic fri, fair - good por, oil odor bri yl fluor, inst. bl wh cut, lt tan res colour
2719					kao	
2720						
2721						

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE ..... OF .....

COMPANY MENI WELL 33/9-9 FIELD STATFJORD

CORE NO. 11 FROM 2721 M TO 2729 M RECOVERED 6.5 M 81 %

FORMATION STATFJORD FM DATE 10 SEPTEMBER-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 | 20 | 40 | 60 | 80 DIP

OIL & GAS SHOWS | PERMEABILITY | POROSITY Type | POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: A.L

DEPTH	G F S	G F S	G F P	LITHOLOGY	REMARKS
2721					5cm Sandstone fair por, good show.
2722					Claystone, occ sdy, grn gy, oky lt brn, rd, dk gy, v dk, mic, wxy surf, occ with lineations, firm-hd, sandy sections yl brn fluor, no dst.
2723					
2724					
2725					
2726					
2727					
2728					
2729					

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE 1 OF 1

COMPANY MENI WELL 33/9-9 FIELD STATFJORD

CORE NO. 12 FROM 2729 M TO 2743.5 M RECOVERED 13.0 M 90 %

FORMATION DATE SEPT 10, 1977

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 20 40 60 80

DEPTH | DIP | OIL & GAS SHOWS | PERMEABILITY | POROSITY Type | POROSITY Grade | G F S G F S | G F P | LITHOLOGY

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: T. HØISÆTER

REMARKS

2729 — SANDSTONE, lt gy, fg, fg-vfg, slty, v. argill w/ c. mic, p srtd, well ind, NO SHOW

2730 — SANDSTONE, tan - lt gy, mod, md-fg, subang argill, sm. amts of c. mic, mod hd,

2731 — GOOD OIL SHOW; odor, lt brn stn, bright

2732 — yel fluor, flash wh-yel cut, res stn

37

2734

2735 — SANDSTONE, tan, crse, crse-cgl, pebbles up to 1cm, sub rnd, p srtd, mod sd, friab, tan argil matrix [kaolinite?] GOOD OIL SHOW a.a

2736

2737

2738 — SST aa, ibd w/ clst, dk gy, firm, slty mic, carb tr. plant rmn, COAL,

2739 — blk, brittle conc frac, 2 cm thick seam at 2737.80m.

2740 — SHALE, dk gy sdy, slty, ibd w/ sst, lt gy-tan fg, fg-vfg argill, mic, p-srtd, p-prr, p-perm

2741 — hd, spotty yel fluor, slow dull cut, bleeding OSG

2742 — SST, tan, fg, fg-vfg, friab GOOD OIL SHOW a.a

SHALE, dk gy mod hd subfiss, mic

2743

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

PAGE 1 OF 1

COMPANY MOBIL WELL 3/19-9 FIELD STATFJORD

CORE NO. 13 FROM 2743.5 M TO 2757.3 M RECOVERED 12.4 M 90 %

FORMATION STATFJORD DATE 11/9 - 77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER)
DEPTH 0 | 20 | 40 | 60 | 80 BIP

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade
G F S G F S G F P LITHOLOGY

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: J. I.

REMARKS

2743.5
2744 — SHALE: slty, dk gy, mic, ~~calc~~ fiss, mod hd. NO SHOW
SANDSTONE: lt brn-tan, m, Vfn-m, M, SA-SR, kao mtx, tr mic, tr coal, fri, gd-fr por
2745 — GOOD OIL SHOW: lt brn stn, 100% gel flor, weak lt wh flash cut turning cloudy, lt brn res'd
2746 — Clasts of coal and Claystone
2747
2748 — SANDSTONE: Cgl, arg, lt brn/gy, C, VC-fn, frequently R pbl up to 20mm, SR, kao mtx, tr mic, fri, gd-fr por
2749 — GOOD OIL SHOW: lt brn stn, 100% gel flor, inst lt wh flash cut, lt brn res'd
2750
2751
2752
2753 — CLAYSTONE/SILTSTONE: lt gy, v mic, s/ft, NO SHOW w/ 40mm clay clasts; lt-m gy, mic, s/ft
2754 — SANDSTONE a.a. SHOW a.a.
2755 — CLAYSTONE/SILTSTONE a.a. NO SHOW
2756 — SANDSTONE a.a. SHOW a.a.
2757

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

PAGE .... OF ....

COMPANY: MENI WELL: 33/9-9 FIELD: STATFJORD

CORE NO.: 14 & 15 FROM: 2757.3 M TO: 2775.3 M RECOVERED: 12.3 M 68 %

FORMATION: STATFJORD DATE: 12-13 SEPT.-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

DESCRIBED BY: AL

Column headings: DEPTH | CORING RATE (MIN/METER) 0 20 40 60 80 | DIP | OIL & GAS SHOWS G F S | PERMEABILITY G F S | POROSITY Type | POROSITY Grade G F P | LITHOLOGY | GRAIN OR CRYSTAL SIZE (.003 - .062 MM MICRO; .062 - .125 MM Vy FN; .125 - .250 MM FINE; .250 - .500 MM MED; .500 - 1.00 MM CRSE; >1.00 MM Vy CRSE) | REMARKS

DEPTH	REMARKS
2757,3 m	Claystone, brn gy, mic, firm-hd (coring rate 118 min/m)
2758	
2759	
2760	
2761	
2762	
2763	Claystone, occ slty, brn, rd brn, grn gy, vgt, mic firm (coring rate 103 min/m)
2764	
2765	
2766	Claystone, grn gy, mic, hd
2767	
2768	Sandstone, wh, Lt gy, m, A, fr srtd v calc cmtd, mic, v hd, v p por, no show
2769	
2770	Sandstone Lt tan, m, vfn-v crse SA, fr srtd, kaol, tr mic, fri g por, oil odor, Lt tn stn, bri yl fluor, inst bl wh cut, turns strmy, Lt tan res colour
2771	
2772	
2773	
2774	
2775	Claystone, grn gy, hd
2775.3	

Lithology column labels: m; m; kao; kao; kao; kao

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE ..... OF .....

COMPANY MENI WELL 33/9-9 FIELD STATFJORD

CORE NO. 16 FROM 2775.3 M TO 2781.7 M RECOVERED 6.4 M 100 %

FORMATION STATFJORD DATE 13SEPT-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER)

OIL & GAS SHOWS

PERMEABILITY

POROSITY Type

POROSITY Grade

GRAIN OR CRYSTAL SIZE

.003 - .062 MM MICRO

.062 - .125 MM Vy FN

.125 - .250 MM FINE

.250 - .500 MM MED

.500 - 1.00 MM CRSE

>1.00 MM Vy CRSE

DESCRIBED BY: A.L.

DEPTH	CORING RATE (MIN/METER) 0 | 20 | 40 | 60 | 80 DIP	OIL & GAS SHOWS G F S	PERMEABILITY G F S	POROSITY Type G	POROSITY Grade F P	LITHOLOGY	REMARKS
2775.3							
2776						Kao	Sandstone lt brn, m, v crse - fn, SA, m srtd, tr mic, kaol mtx, hd, oil bleeding from core, bri yl fluor, mod. fast streaming cut, lt tan res. colour
2777	105 min/m					m	Claystone grn gy, mic. firm
2778							Claystone, occ sdy, vgt cd, mic, sks, firm,
2779							
2780							
2781							Sandstone, arg, lt grn gy, lt beige, crse, crse-fn, SA, fr srtd, kaol bri, fr ppr, oil bleeding from core, spotty bri yl fluor (due to arg. lumps) m fast streaming bl wh cut, v weak lt tan res colour.
2781.7						Kao: Kao	

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

PAGE 1 OF 1

COMPANY ..... WELL 33/9-9 FIELD STATFJORD

CORE NO. 17 FROM 2793.0 M TO 2807.5 M RECOVERED 6.8 M 47 %

FORMATION STATFJORD DATE 18.9.77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 15 30 45 60 75

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: R.B. HISELER

DEPTH	DIP	G	F	S	G	F	S	G	F	P	LITHOLOGY	REMARKS
2793							X				M	SA Ss: lt buff, c, f-vc, occ granular, U, felds, mic tr rock frag (?), Tr kao (?), minor clay mtx fri, fr X por, good show, lt brn stain, 100% bri yel flor, bri yel-wh str cut, rare mdst clast
2794							X				M	
							X					
2795												Ss: grn gy-blugy, c-vc, vf-pbl, conglomeratic, A-SA, U, felds, abd cly mtx, fir-tri, no shows except weak crush cut at core edge @ 2796.9 thought to be contamination.
2796												Increase in grn color and cly mtx upwards. cly mtx = altered felds (?) Lower contact gradational ?
2797							X					Ss: wh-lt gy, M-C, f-vc, occ conglomeratic A-SA M, felds, tr rock frag (?), tr pnk tourmaline (?), ca cmt, cly mtx, hd, pr-fr X por, fr show @ base grdg to gd show at top lt brn stain 25-80% bri yel flor, weak-med cloudy cut, weak-bri yel crush cut.
2798							X					
							X					
2799							X				M	Clyst: gy, slty, occ sdy, micro mic, sfr, sl fiss, sd in irreg. pods, rare pbls @ base.
							X					Ss: wh-lt buff, m-c, occ vc, I/B w/ F-M, A-SA M, felds, tr kao (?), sft-fri, ca cmt @ base, gd X por, gd show, lt brn stain, 80-100% bri yel flor, flash-streaming cut, faint hor bdg, occ erosional contacts, pbls, fr show @ base, w/ poor por, 20-30% bri yel flor, flash cut.
2800							X					
2801												
2802												
2803												
2804												
2805												
2806												
2807												
2808												

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

PAGE 1 OF 1

COMPANY MOBIL WELL 33/9-9 FIELD STATFJORD

CORE NO. 18 FROM 2807.5 M TO 2818.4 M RECOVERED 8.7 M 80 %

FORMATION STATFJORD DATE 19.9.77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER)

DEPTH 0 | 15 | 30 | 45 | 60 DIP

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade

G F S G F S G F P LITHOLOGY

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: L J R

REMARKS

2807

2808 — Sdst, WH, GY, m, f-c, cong, V. argil, calc cmt, Brn stained matrix

Sdst, gy, SA, W, V. Argil, non-calc, mod hd, TT, NOSCOF

2809 — Sdst, LT GY, SA, M, abundant wh cly matrix, non-calc, patchy brn stain, fr milky-wh flash cut, patchy yel fluor

2810

2811 — Sdst, brn, congl. wh cly matrix, fri, uniform brn stain, bright yel fluor, Gd milky-wh flash cut

Sdst, wh, M, SA, wh cly mtx, calc cmt V. hd, NOSCOF.

2812

2813 — Sdst, grading from brn → gy → wh downwards, M, SA, Non calc, wh cly mtx. Gd show

2814 — SH, DRK GY, GY-GRN, Sdy in part (f-m), non-calc, mod. hd.

2815

2816

2817

2818

2819

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG

COMPANY MOBIL WELL 33/9-9 FIELD STATFJORD

CORE NO. 19 FROM 2818·4 M TO 2826·2 M RECOVERED 7·8 M 100 %

FORMATION STATFJORD DATE 20/9/77

VERTICAL SCALE 1 : 100
(1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER)
DEPTH 0 20 40 60 80 100 120 DIP

OIL & GAS SHOWS
PERMEABILITY
POROSITY Type
POROSITY Grade
G F S G F S G F P LITHOLOGY

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: G. I. BARROW.

REMARKS

2818

2819 Shl, red/brn, non-calc, mic, mod hd, sandy in part.

Sstn, lt gy, slightly shy, mostly qtz, mic, calc matrix, coarsening and becoming less calc downwards.

2820 NOSCOF

2821

Shl, dk gy, non-calc, fairly soft, sandy in part

2822 Sstn, lt gy, qtz, mic, slightly calc cement, Sl oil show, -Dead oil following mic lamination.

2823 Mudstn, red/gy, mod hd, non calc, SR qtz frags

2824 Mudstn, red, calc, ca filling fissures

2825

Mudstn, mot pink/grey, calc, becoming harder, more marly downwards.

2826

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE 1 OF 1

COMPANY MOBIL WELL 33/9-9 FIELD STATFJORD

CORE NO. 20 FROM 2826.2 M TO 2837.5 (?) M RECOVERED 10/11.3 88(?) %

FORMATION STATFJORD DATE 21.9.77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER) 0 30 60 90 120

DEPTH | DIP | OIL & GAS SHOWS G F S | PERMEABILITY G F S | POROSITY Type G F P | POROSITY Grade | LITHOLOGY

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: R. B. HISELER

REMARKS

~~2826.0~~

~~2827.0~~ Mdst irregularly interfingered w/ clayst, calcilutite and siltst.

~~2828~~ Mdst: rd brn, gy, slty occ sdy, occ mic, calc in part, sft-fir.

Clayst: rd brn, slty, sft

~~2829~~ Calcilutite: lt gy, cream, pnk, occ v. argil, hd, mottled

Siltst: rd brn, cly mtx(?), iron oxide(?) cmt, in part calc

~~2830~~

~~2831~~ Calcilutite: gy, hd, occ v argil, grdg downward to mdst, and siltst a/a

~~2832~~

~~2833~~ Siltst: gy grn, sdy, mic, fir to hd grdg downward to Sdst: lt gy, m, dcc f-c, M-Wsrt, SA, calc cmt, fri-hd, fair-gd por, no shows, no cut

~~2834~~ Mdst irregularly interfingering w/ clyst, siltst, and rarely calcilutite a/a

~~2835~~ Ss: grn gy, f, slty-m, U-M, mic, fir, pr-fr por, no show, no cut.

~~2836~~ Mdst, clyst, siltst a/a

Ss: grn gy, vf-m, slty, mic, fir, poor por.

~~2837~~

N 82/H-3-7

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE ..... OF .....

COMPANY MENI WELL 33/9-9 FIELD STATFJORD

CORE NO. 21 FROM 2837.5 M TO 2853.5 M RECOVERED 15 M 94 %

FORMATION STATFJORD FM DATE 22/9/77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER) DESCRIBED BY: A.L.

CORING RATE (MIN/METER) DEPTH 0 30 60 90 120 BIP

OIL & GAS SHOWS G F S G F S

PERMEABILITY

POROSITY Type

POROSITY Grade G F P

LITHOLOGY

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

REMARKS

2837.5
2838
2839
2840
2841
2842
2843
2844
2845
2846
2847
2848
2849
2850
2851
2852
2853
2853.5

Claystone, slty, rd, gy, mic, hd

Sandstone, lt gy, fn, SA, fr srtd fr coal, v calc cmtd, hd, p por, no show,
Sandstone, arg, bl grn, v fn grdg silt, SR, fr srtd, v mic, carb, hd, p por, no show
Claystone sdy, grn, brn, rd brn, occ wxy surf, mic, firm

Sandstone lt gy, m, crse-vfn, SA, fr srtd, v calc cmtd, mic(bio) hd, p por, no shows
Claystone, brn, rd brn, mic, sks, hd

Sandstone lt brn, m, v crse-v fn, SA, fr srtd, kaol mtx, fri, fr-g por, lt brn stn, oil bleeding from core, 100% bri yl fluor, fast cloudy-strmy cut, lt brn res colour

Claystone, dk gy, wxy surf, sl mic hd.

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc. GRAPHIC CORE LOG PAGE 1 OF 1

COMPANY MENI WELL 3319-9 FIELD STATFJORD

CORE NO. 22 FROM 2853,5 M TO 2866 M RECOVERED 12 M 96 %

FORMATION STATFJORD DATE 23/9 -77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER)

OIL & GAS SHOWS

PERMEABILITY

POROSITY Type

POROSITY Grade

GRAIN OR CRYSTAL SIZE

.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: J. I.

DEPTH	LITHOLOGY	REMARKS
2853.5		CLAYSTONE: sdy, gy, subfiss, firm
2854		SANDSTONE: v arg, clr-lt gy grn, fn, v fn-m, M, SA, v mic, firm, RR pr por, NO SHOW
2855		
2856		SANDSTONE: clr, occ tan-rd brn, c, m-v c, M, SA-SR, mic, ca cmt, tr kao mtx, v hd, no por, no show
2857		CLAYSTONE: slty, gy, subfiss, sft-firm, occ grn spots
2858		SANDSTONE: arg, clr, occ tan-rd brn, m, fn-m, M, SA, mic, poor mtx, pr-hd, fr-pr por, no show, Lower part ca cmt
2859		
2860		CLAYSTONE: rd brn, mic, firm, w/grn reduction spots
2861		SANDSTONE: v arg, slty, lt gy-grn, v fn, v fn-m, M, SA, mic, firm-hd, pr por, no show
		~~SANDSTONE: a.a. m grn, v fn-m, no show~~
		CLAYSTONE: slty, rd brn, mic, firm
2862		
2863		SANDSTONE: arg, clr-lt grn gy, occ tan, m, v fn-m, M, SA, v mic, kao mtx, pr-hd, fr por, NO SHOW
2864		CLAYSTONE: rd brn, mic, subfiss, hd, w/grn reduction spots
		~~CLAYSTONE: slty, grn, subfiss, hd~~
2865		SANDSTONE: arg, clr, occ tan, C, fn-c, M, SA-SR, fr mic, kao mtx, occ ca cmt, pr-hd, fr por, NO SHOW
2866		

Form MOEX N 82/H-3-76

Mobil Exploration Norway Inc.

GRAPHIC CORE LOG

COMPANY MENI WELL 3319-9 FIELD STATFJORD

CORE NO. 23 FROM 2866 M TO 2876.5 M RECOVERED 10.15 M 100 %

FORMATION STATFJORD DATE 24/9-77

VERTICAL SCALE 1 : 100 (1 DIVISION = 0.5 METER)

CORING RATE (MIN/METER)

OIL & GAS SHOWS

PERMEABILITY

POROSITY Type

POROSITY Grade

GRAIN OR CRYSTAL SIZE
.003 - .062 MM MICRO
.062 - .125 MM Vy FN
.125 - .250 MM FINE
.250 - .500 MM MED
.500 - 1.00 MM CRSE
>1.00 MM Vy CRSE

DESCRIBED BY: T. I.

DEPTH	DIP	G F S	G F S	G F P	LITHOLOGY	REMARKS
2866			X			SANDSTONE: V arg, slty, gm-gy, occ tan, m, v/m-m, M, SA-SR, mic, occ mtx, hd, pr por, NO SHOW
2867			X			CLAYSTONE: slty, dk gy, mic, sl ca, hd
2868			X			SANDSTONE: arg, dk-ltgy, occ gm-gy, tan, c, m-VC, M, SA-SR, tr mic, occ mtx, ca cmt, m-hd, pr-no por, no show
2869			X			CLAYSTONE: sdy, slty, gm-gy, hd
2870			X			SANDSTONE: arg, gm-gy, occ tan, m, v/m-VC, M, SA-SR, mic, occ mtx, ca cmt, m-hd, pr por, no show
2871			X			
2872			X			
2873			X			SANDSTONE: arg, dk-ltgy, occ tan, m, v/m-C, M, SA-SR, mic, occ mtx, ca cmt, hd, pr por, no show
2874			X			SANDSTONE: V arg, ltgy, occ tan-ltbrn, c, m-VC, w/tan-ltbrn 2-3mm pbl, SR, tr mic, sl ca cmt, occ mtx, fr, pr por, no show
2875						CLAYSTONE: rd brn, occ mic sdy, sft
2876			X			SANDSTONE: arg, ltgy, occ tan, m, v/m-VC, M, SA-SR, mic, occ mtx, ca cmt, m-hd, pr por, no show

Form MOEX N 82/H-3-76

OPERATOR: Mobil Exploration Norway Inc. WELL: 33/9-9 NO.

DATE October 7, 1977 RUN NO. 1-2 FIELD: Statfjord

GEOLOGIST: N. Tank CO. OR PH. STATE: Norway

SIDE-WALL CORE DESCRIPTIONS

No.	DEPTH	REC. cm	DESCRIPTION	ODOR	CUT	FLUOR.	FLUOR. ON CUT	
60	2412.5	3.0	Mrl, dirty wh, w/occ dk gy spots chky, spintery	pet mod	pale tan	brite lt yel	very slow strmg yel-bl	mnrl fluor
58	2433.5	3.5	Ss, dk brnshgy, mica, vf grnd, w srtd, sbang, modcalc, firm, fri, gø, dk brn stn, abnt blk tar (?), tr pk hvy mnrls, mica clr & brn, lrg flakes.	strong pet	dk straw	brite wh-yel	flash, cloudy blshwh	tar 10-15% coating lrg grns.
56	2467	3.5-4.0	Ss, lt brn-buff, mgrnd, sbang - sbrdd, wstrd, v fri, excellent Ø, tr mica + hvy mnrls. Oil stnd v thin arg-carbonaceous laminae.	strog pet	dk straw	100% brite yell	flash-cldy blshwht	
55	2468	4.2	Ss, a/a, f grnd, mod mica, firm, fri, vg Ø, oil stn.	a/a	a/a	a/a	fast cldy/ strmg blshwh	
54	2482	3.0	Ss, gy, vf-f grnd, sbang, mica, wsrtd, firm, fri, g Ø.	a/a	lt straw	a/a	a/a	
51	2529	5.0	Sh, dk gy, firm, sdy, mica, sli pyric, abnt chamosite oolites.	sli pet	clear	rr spotty	slow strmg	chamosite marker
49	2531	5.0	Ss, buff, vf grnd, ang, w srtd, mica, firm, fri, vg Ø, oil stn, intbdd w/dk gy, v arg Ss & dk gy, sft, laminated Sh, bands 3-4 mm wide.	pet	straw	banded brite yel-dull-yel 70%	fast cloudy strmg bl-wh.	
48	2532	4.5	Ss, gy, vf-slty, v mica, arg, firm, vfri, fr Ø, intlam w/Sh, brn gy, fiss, v mica (10-15%, 1-2 mm bands) oil stn ?	pet	pale straw	dull blsh yel 60%	mod fast strmg pale blsh	
47	2533	3.0	Calcarenite, lt gy-gy, sdy - arg, hd, dns.	No	No	No	No	

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OPERATOR: Mobil Exploration Norway Inc. WELL: 33/9-9 NO.

DATE October 7, 1977 RUN NO. 1-2 FIELD: Statfjord

GEOLOGIST: N. Tank CO. OR PH. STATE: Norway

SIDE-WALL CORE DESCRIPTIONS

	DEPTH	REC. cm	DESCRIPTION	ODOR	CUT	FLUOR.	FLUOR. ON CUT
46	2535	3.5	Ss, brn-gy brn, mod mica, arg patches, f-grnd, wsrtd, firm, fria, f-g Ø, oil stn, intlam w/Sh, gy, subfiss, firm mica, 4-5 mm thk.	pet	pale straw	banded brite yel, spotty brite- dull yel	mod fast- slow halo- strmg
45	2536	4.5	Sh, dkgy-blsh gy, sft-firm, sdy, mica, sbfiss, intlam w/Ss (40 %), gy-brnsh gy, vf-f, fr sorted, mica, arg. dirty, frm, fri, frØ, poor stn	faint pet	pale straw	brit yell banded	fast cloudy blshwh
44	2537	4.5	Ss, brnsh gy, f-vf, ang, mica, w srtd, g Ø, oil stn, intlam w/Sh (25%)	mod pet	ala	lamina- ted mod brite yel	fast strmg blsh
43	2538	4.0	Ss, brnsh gy, rr mica, f-vf, ang, wsrtd, g ø, stn, firm, fri, intlam w/ dk gy, mica, fiss sh	ala	very pale	patch- lam, mod brite yell	mod fast strmg blsh wh fsh
42	2539.5	2.0	Calcarenite, lt gy, f sdy, dense, hd.	no	no	no	no
41	2540	4.5	Ss, brnsh gy, slicalc, mica, vf-v grnd, ang-sbang, fr srt, firm, fri, frØ, oil stn, intlam w/Sh, gy, mica, mod hd, sbfiss (20%).	faint pet	pale strow	brit yell banded	mod fast cloudy strmg blsh
40	2541	4.0	a/a	mod petr	very pale straw	pepper & salt brite, yell & band- ed	mod fast strmg blshwh
39	2542	3,5	a/a Sh 40%	a/a	a/a	banded brite yel	a/a
38	2544	4.0	a/a Sh 50%	a/a	a/a	a/a	a/a
37	2545	3.0	a/a Sh 60%	faint petr	a/a	banded & salt &pepper brite yel	mod fast cloudy & strmg yel. bl

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OPERATOR: Mobil Exploration Norway Inc. WELL: 33/9-9 NO.

DATE October 7, 1977 RUN NO. 1-2 FIELD: Statfjord

GEOLOGIST: N. Tank CO. OR PH. STATE: Norway

SIDE-WALL CORE DESCRIPTIONS

	DEPTH	REC.	DESCRIPTION	ODOR	CUT	FLUOR.	FLUOR. ON CUT	
35	2548	1.5	Sh, gy, arg, firm, sbfiss, intlam w/	very	no	v dull	no	
			Ss (20-30%) dk gy, blk, arg, mica, vf	faint		yell		
			grnd, slty, firm, fri, fr-p ø, no stn.	petr		patch		
						5-10%		
33	2555	3.5	Sh, dk gy, intlam w/Ss, ltgy, vf grnd,	mod	no	brite	v slow	
			w srtd, mica, firm, frø.(50/50).	pet		yel	strmg.	
						banded	wh-bl	
30	2715	3.0	Ss, lt gy, vf-m, com float pbls, ang-	mod	no-	brite	slow	crush
			rrd, p srtd, fr-pø, n stn. Large	pet	vy	pepper	strmg	cut
			pyritic lump.		pale	& salt	yel-bl	slow
29	2716	2.5	Ss, dirty wh, vf-c, rrpbl, ang, psrtd,	faint	no-	brite	slow	crush
			mod firm, fri, gø, stain(?), tr kaol.		pale	yell	blsh wh	cut
			tr kaolin				halo	
28	2717	1.5	Ss, a/a vf-m, Kaolinitic firm, fria,	faint	no	yel	u slow	none-
				mod		mod	weak	crush
						brite	strmg	cut
27	2718	3.5	Ss, lt gy-tan, m-c grnd, fr srtd,	faint	v pale	brite	v slow	crush
			kaol (?).		straw	yel	slow	cut
							strmg	mod
							milky	
26	2719	3.5	Ss, a/a.	mod	pale	brite	slow-	
				pet	straw	yel	mod fast	mod
							strmg	crush
							blshwh	
25	2722	2.5	Ss, gy, f-vf grnd, ang-sbang, mod w	mod	a/a	dull-	mod	
			srtd, sli mica, firm, fria, fr-g ø,	pet		brite	fast	
			no stn.			yell	strmg	
						patchy	cldy	
						60/40	blshwh	
24	2731	3	Ss, beige, f-c, occ v c-pbly sbrdd, p	mod	pale	brite	fast	
			srtd, dissem kaol mtx (?), firm, fria,	pet		dull	strmg	
			g-fr ø, no vis stn.			yel	blsh wh	
						patch	cut	
						90/10		
23	2732	1.5	Ss, a/a, looks wet (flushed) mostly	mod	no	brite	slow	
			filtrate. POOR SAMPLE	pet		yell	strmg	

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OPERATOR: Mobil Exploration Norway Inc. WELL: 33/9-9 NO.

DATE October 7, 1977 RUN NO. 1-2 FIELD: Statfjord

GEOLOGIST: N. Tank CO. OR PH. STATE: Norway

SIDE-WALL CORE DESCRIPTIONS

	DEPTH	REC.	DESCRIPTION	ODOR	CUT	FLUOR.	FLUOR. ON CUT	
22	2739.5	1.5	Ss, gy, vf-f, sbang, mica, arg W srtd, firm, fria, p ø, no vis stn. SAMPLE PROBABLY FLUSHED VERY SMALL	faint pet	none	none-v dull	none	?
21	2754	4.0	Sltst, dk gy, v mica, carb, firm.	v faint	none	none	none	-
20	2756	4.0	Ss, beige, m-c sbang, mod w srtd, mica, firm, v fri, g ø, no stn, tr kaol.	mod pet	medium straw	mod brite yell	fast strmg-eldy milky	-
19	2757	3.0	Ss, lf gy, f-vf occ m grnd		med. straw	dull yell	mod fast-slow cloudy-strmg, blsh wh	crush
18	2768	poor	Clayst, gy, slty, firm. & ss (?) tan, pbly.	?	none	brite yel	v slow strmg	poor spl
17	2770	3.5	Ss, beige, m-v c, occ pbly, p strd, kaolinitic, firm, fri, frØ, no vis stn.	strong pet	med straw	brite yel	fast strmg	crush
16	2771	3.5	Ss/a/a, v pbly, v kaol.	a/a	a/a	a/a	fast cloudy	
15	2772	3.5	Ss, beige, f-m, ang-sbang, w srtd, kaol, p-fr ø, firm, fri.	a/a	pale straw	brite yel	slow strmg mod cloudy	crush cut blsh
14	2773	2.0	Poor spl, looks wet. Ss, beige, m-vc, p srtd, p Ø.	?	no	patchy (50%) brite yell	no	Flushed
13	2774	5.0	Clayst, gn, slty, gummy.	mod pet	no	no	no	-
12	2786.5	2.0	Ss, beige, vf-m, occ c grnd, p strd, sbang-ang clear qtz, rr mica, kaolinitic, firm v fri, f-g ø.	strong pet	pale tan	brite yell	mod fast-slow strmg blshwh	

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OPERATOR: Mobil Exploration Norway Inc WELL: 33/9-9 NO. _____

DATE October 7, 1977 RUN NO. 1-2 FIELD: Statfjord

GEOLOGIST: N. Tank CO. OR PH. _____ STATE: Norway

SIDE-WALL CORE DESCRIPTIONS

	DEPTH	REC.	DESCRIPTION	ODOR	CUT	FLUOR.	FLUOR. ON CUT	
11	2800.	1.5	Ss, a/a m-vc. Sample flushed (wet),	?	a/a	a/a	weak strmg- cldu bsh	poor spl crush cut
10	2801.	1.0	s/a/a	mod pet	a/a	a/a	mod strmg cloudy	crush cut
9	2803.	2.0	Ss a/a, m-c.	a/a	mod tan	a/a	slow strmg	-
8	2804.5	3.0	Ss, a/a m-c, sli mica.	a/a	mod straw	a/a	mod fast strmg	-
7	2806.	2.0	Ss, a/a m-c occ vc.	mod pet	med straw	brite yel	fast strmg cldy blshwh	-
6	2807.5	1.5	Ss, wh, f-m, extremely kaolinitic, p ø.	a/a	pale straw	brite yel spotted (40%) dull yell	v slow strmg brsh	crush cut
5	2817.	5.0	Sh, dk gy, firm, sbfiss, rr floating c sd grns.	no	no	no	no	-
4	2818.	5.0	Clystn, varigated, hd, compact.	no	no	no	no	-
3	2837.	3.0	Sltst gn, slty, v mica, firm, slicalc, arg.	?	no	no	no	-
2	2853.	5.0	Clyst, dk by arg, mod mica, firm, chunky.	sli pet	no	no	no	sh? swollen & frac- tured?
1	2866.	2.0	Ss, gnsh gy, f-m, rr c grn float, sbang-sbrdd, w srtd, firm fri, tr mica, tr rd chert, sli calc	sli pet	no	v dull yel (1%)	no	-