SAMPLE STATION DATA

INSTITUTE OF GEOLOGICAL SCIENCES – MARINE GEOLOGY UNIT

SAMPLE NO. F (1) +61 (± lat) −01 (± long) 8 (no.) (11)

CRUISE NO. 84 FE 09 (year : ship : no 18)

DATE 06 01 (mnth : day 22)

TIME (local) (hrs : mins 26)

WATER DEPTH 160 (metres 30)

POSITION FIXING METHOD H

COMMENT (32)

NAVIGATIONAL READINGS (tick lanes with best intersection)

CHAIN

RED (41)

GREEN (48)

PURPLE (55)

POSITION

LATITUDE +61 11.54 (± degs : mins (decimal) 63)

LONGITUDE −00 32.35 (± degs : mins (decimal) 71)

ADDITIONAL INFORMATION :

BGS BH 84/5

EQUIPMENT TYPE: 1 = sample recovered; 2 = no sample (geological reasons); 3 = no sample (equipment failure); 4 = no sample (undifferentiated)

G (1) dup cols 2–11

GS | VE | CS | CR | DM | DR | BH | SD | RD | SU | PS | DI | BS | OC | OG (12 … 22 … 32)

T.D. metres 85.00 (50 … 55)

SUMMARY SAMPLE DESCRIPTION : (Free text – max. 69 characters)

H (1) dup cols 2–11

17m QUATERNARY SANDS ON TERTIARY (12 … 20 … 30 … 40)

SANDS AND GRAVELS ON POSSIBLE CRET (50 … 60 … 70 … 80)

GEOTECHNICAL DATA :

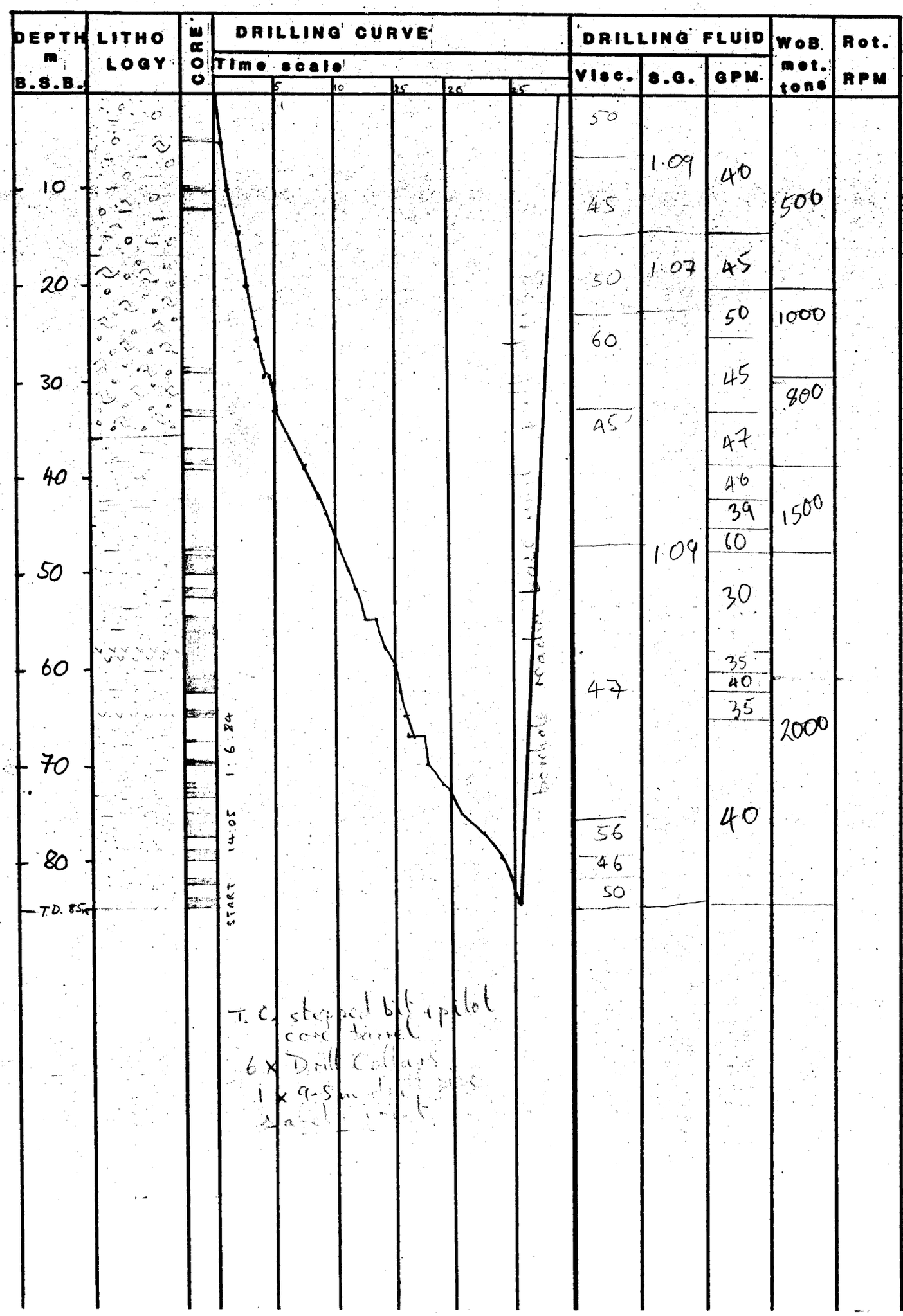
RAW DATA

PENETROMETER Head	PENETROMETER Readings					HAND VANE Head	HAND VANE Readings			

AVERAGED DATA

	DEPTH	PENETROMETER (KPa)	HAND VANE (KPa)
I (1) dup cols 2–11	(14)	(18)	(22)
	(25)	(29)	(33)
	(36)	(40)	(44)
	(47)	(51)	(55)
	(58)	(62)	(66)
	(69)	(73)	(77)
I (1) dup cols 2–11	(14)	(18)	(22)
	(25)	(29)	(33)
	(36)	(40)	(44)
	(47)	(51)	(55)
	(58)	(62)	(66)
	(69)	(73)	(77)

D.S. FERDER	BGS MGLU	B.H.	LATITUDE	LONGITUDE	WATER DEPTH
1984 PROGRAMME		84/5	61° 11·505'N	0° 32·468'	162 m



M/S FERDER

BH84/5

DRILLER'S LOG

NB!! Husk Bolt i Bitgaiden!!

Date	Client	Location	Borehole No
01.06.84.		Loc. 262	
Depth deck to mudline		Waterdepth	

Time	Pipe No.	Length single pipe	Length total pipe	Plus/ minus pipe	Pipe below mudline	Bit load	Total weight	Mud press	REMARKS
~0700	B.T	5,9							
	6 dc.		32,9						
x	1	9,55	42,49						930 brg i hyppe mud
x	2	9,50							1214 Seacalf på bunn
x	3/16"	0,9							
x	3	9,5							1320 i bunn.
x	4	9,55	71,5						
x	5	9,05							
x	6	9,35							
x	7	9,55							
x	8	9,50							
x	9	9,50							
x	10	9,35	129,8						
x	11	9,50							
x	12	9,20							
x	13	9,50	156						
x	14	9,50	165,5	0					
1607	IX	5	170,5	8	5	500		2	
1/1455		5	175	0	10			40	
1/1550	15	9,45	179,45	0	14,45			45	
1/1620		5	184,45	0	19,45			45	
15/1735	16	9,45	188,90	0	23,90	1000		50	CORE CORE // 3 HAMMER
15/1800		5	193,90	0	28,90	"		50	
0/1905	17	9,45	198,35	0	33,35	"		45	
30/2120		5	203,35	0	38,35	4/1000		47	2015-2035 Mix mud.
15/2235	18	9,20	207,55	0	42,55				2015-2035 Mix mud.
30/2330		5	212,55		47,55	"		60	Mud mixing
45/		5	217,55	-2,5	50,05	2000		50	Mud mixing
47/42	2	5	222,55	0	52,55	"		30	
7/0130	Rev	5	222,55						
00/30	3	5	222,55	-2,5	55,05	"		35	Circ mud. Mixing mud / mixing mud
20/0112				0	57,55	"		35	
31/06	4	5	227,55	-2,5	60,05	"		40	
515				0	62,55	"		40	
30/	5	5	232,55	-2,5	65,05	"			

M/S FERDER

DRILLER'S LOG

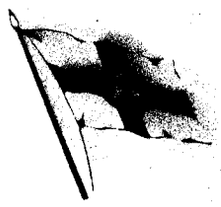
NB! Husk Bolt i Bitgaiden

Date	Client	Location	Borehole No
01.06.84.		Loc. 262	

Depth deck to mudline | Waterdepth

Time	Pipe No.	Length single pipe	Length total pipe	Plus/ minus pipe	Pipe below mudline	Bit load	Total weight	Mud press	REMARKS
Svbt	BIT	5,9							
	6 dc.		32,9						
x	1	9,55	42,44						930 Arg + trykk m
x	2	9,30							1214 Seacalf på bunn
x	Sub	0,9							
x	3	9,3							1320 i bunn.
x	4	9,55	71,5						
x	5	9,05							
x	6	9,35							
x	7	9,55							
x	8	9,50							
x	9	9,50							
x	10	9,35	129,8						
x	11	9,50							
x	12	9,20							
x	13	9,50	156						
x	14	9,50	165,5	0					
1407	Ex	5	170,5	0	5	500		2	
1 1424/1435		5	175	0	10			40	
2 1516/1550	15	9,45	179,45	0	14,45			40	
3 1605/1620		5	184,45	0	19,45			45	CORE / 3 HAMMER
4 1725/1735	16	9,45	188,90	0	23,90				
5 1755/1805		5	193,90	0	28,90	1000		50	
6 1850/1905	17	9,45	198,35	0	33,35	800		45	
7 1930/2020		5	203,35	0	38,35	1/1000		45	
8 2445/2235	18	9,20	207,55	0	42,55	1500		47	2015-2035 Mix mu
9 2300/2330		5	212,55	-2,5	45,05	"		46	
10 2345/				0	47,55	"		39	
11 0027/42	2	5	217,55	-2,5	50,05	2000		30	
12 057/0130				0	52,55	"		30	
13	3	5	222,55	-2,5	55,05	"		30	
14				0	57,55	"		35	
15	4	5	227,55	-2,5	60,05	"		40	
16				0	62,55	"		40	
17	5	5	232,55	-2,5	65,05	"			

CICERO GRAFISK A/S Tønsberg



M/S FERDER

DRILLER'S LOG

237.55
72.55
164.00

Date	Client	Location	Borehole No

Depth deck to mudline | Waterdepth 164 mtrs

Time	Pipe No.	Length single pipe	Length total pipe	Plus/ minus pipe	Pipe below mudline	Bit load	Total weight	Mud press	REMARKS
18 ~~0530~~/~~0550~~	5	5	232.55	-2.5	65.05	2000		46	
19 ~~0630~~/0636				0	67.55	"		35	Hammer seen.
20 0730/~~0749~~	6	5	237.55	-2.5	70.05	"		40	
21 0832/~~0858~~				0	72.55	"		40	— " —
	~~7~~	~~5~~	~~242.55~~	~~-2.5~~	~~75.05~~	~~"~~			
22 ~~1003~~/1010	7	5	242.55	÷ 4	73.55	2000		40	Hammer seen
23 1023/1035				÷ 3	74.55	2000		40	— " —
24 1105/~~1119~~				÷ 2	75.55	"		42	— " —
25 ~~1139~~/1149				÷ 1	76.55	"		44	
26 1204/1215				0	77.55	"		40	
27 1235/1315	8	5	247.55	-2.5	80.05	"		40	
~~1340~~/				~~-2.5~~	~~82.05~~	~~"~~		~~44~~	
28 1340/1415				0	82.55	"		44	
29 1440/1455	9	5	252.55	-2.5	85.05			46	1510 - 1800 Trippet o 1805 Seacat oppe.

TIME	DATE & LOCATION	ACTIVITY
0000	1/6/84 Loc 262	
0100	Steaming	
0200	to	
0300	Loc 1,	
0400		
0500		
0600		
0700	Commence Anchoring.	
0800	~~Anchoring~~ complete. Prepare core barrel	
0900	run pipe; template	
1000	after welding, slips	retainers.
1100		
1200	Break bit, guide nose. re-run template run pipe.	pull template
1300	~~run~~ hand in. 1315 - Bit on sea bed.	
1400	1355 start drilling	
1500	Run to 5m 1425 ~~Run to 10m 1450~~	
1600	Run to 14.5m 1550 Run to 19.5m 1620	
1700	BIT APPARENTLY BLOCKED	Hammer to clear bit?
1800	START'D DRILLING AGAIN 1715 RUN TO 24.0m 1730 RUN TO 29.0 1800	Fine grained sand/clay ring no recovery.
1900	RUN TO ~~33.0~~ 28.9 1835 (REPEAT!!) RUN TO 33.35 1905	← could not recover barrel first time
2000	2015 Mixing Mud 2035 Drilling again	
2100	2130 38.55m	
2200	2240 42.5m	
2300	1130 45.0m	
2400		

TIME	DATE & LOCATION	ACTIVITY
0000	2/6/84 Loc 262	
0100	0030 47.55 ~~0100 50.05~~	
0200	0145 52.55 0230 55.05	
0300	~~Hammer clear~~ - little core. drill another 5m	
0400	0415 57.55	
0500	0450 60.05	
0600	62.55 ~~65.05~~	
0700	0645 67.55m ~~HAMMER TOOLBOX MAINT. LOG ACQUIRED~~	
0800	0730 DRILLING AGAIN. ~~70.05m 8:00~~	
0900	72.55m 8.55am Hammer to be lost 9.55am Drilling again	
1000	~~73.55~~ M 10.15am 74.55m 10.35am	
1100	11 TO HAMMER TO CLEAR BIT 75.55m 11.20am 76.55m 11.50am	
1200	77.55 12.30	
1300	1315 80.00	
1400	1415 82.5	
1500	1505 85.0 1515 PULL UP STRING	
1600		
1700		
1800	1735 Bit on deck 1805 Template up 1815 Pull anchors	
1900		
2000		
2100	2030 Anchors up steaming to Loc 261	
2200		
2300		
2400		

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 0.0 m to 5.0 m Recovery 0.55 m (11 %)

Depth	Sub Samples	Lith-ology	Description
0			
1.0			
2.0			
3.0			
4.0			
4.45			Clayey v.fine-fine sand, well consolidated, with large shell fragments of various bivalves and pebbles up to 4cm across at top. Dark grey 5Y4/1: Sand comprises angular quartz and rock fragments. Very slight reaction with HCl
4.70			
5.0			Muddy sandy gravel 5Y4/1 dk grey: pebbles up to 60mm across of varying metamorphic rock-types and granite. Sand v.fine to coarse grade quartz and rock fragments - very slight reaction with HCl Pebbles mod. well rounded.
5.00			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 5.0 m to 10.0 m Recovery 0.35 m (7 %)

Depth	Sub Samples	Lith-ology	Description
5.0			
6.0			
7.0			
8.0			
9.0			
9.65m			Muddy gravelly sand – dark grey 5Y 4/1 shelly at top with Scallops – also pebbles of metamorphic origin. Broken shell fragments throughout up to gravel grade Sand very fine to medium grained predominantly quartz subrnd – subang. with subordinate rock fragments. Moderate reaction with HCl
10.0			At base pebble of ?porphyry, broken 80mm across
10.0m			

All core recovered measured from base of run.

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gravel/conglomerate
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Metamorphic
pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 10.0 m to 14.5 m Recovery 0.1 m (2 %)

Depth	Sub Samples	Lith-ology	Description
10.0			
11.0			
12.0			
13.0			
14.0			
14.5			

STORED IN 1LB JAR

Clayey sandy gravel / gravelly sand, dk grey 5Y4/1, sand v fine - fine, quartzose with rock fragments - pebbles up to 30mm across varying origin ?basalt, ?mylonite - consolidated sediment small shell fragments throughout. weak reaction with HCl

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 14.5 m to 19.5 m Recovery 0 m (0 %)

Depth	Sub Samples	Lith-ology	Description
15.0			14.5 - 19.5 NO RECOVERY ~~? Bit blocked~~ see next sheet
16.0			HAMMER SAMPLES :- JARS
17.0			(Muddy sandy) Shelly gravel — predominantly lithic fragments but also well-worn thick bivalve fragments. Apparently more shell frags in first sample. Rock frags of mixed metamorphic / igneous affinity.
18.0			Appears to be "winnowed" gravel from the beds drilled above or alternatively 'good' gravel ~~with~~ which is washed away while drilling (see next sheet)
19.0			
20.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mág - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 5 of 29

Run 19.5 m to 24.0 m Recovery SCRAPING = (0 %)

Depth	Sub Samples	Lith-ology	Description
19.0			SCRAPING FROM BOTTOM OF BARREL
			Muddy sandy shelly gravel. No small pebbles as in hammer samples above but much shell material including Dentalid fragments.
20.0			
21.0			
22.0			Suspect that this and previous run represents shelly stoney gravel with little sand and mud fraction.
23.0			Most sediment is washed away by circulating mud while drilling. Hammer samples are probably most true representation of the sediment.
24.0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 24·0 m to 28·9 m Recovery 0·5 m (10 %)

Depth	Sub Samples	Lith-ology	Description
24·0			FIRST RUN – CORE BARREL NOT RECOVERED
25·0			
26·0			
27·0			
28·0			SECOND RUN
28·4			Shelly stoney gravel, few pebbles coarser than 10mm. Comprising ca 60% shell frags 40% lithic. Shell frags – mostly thick-walled bivalves, mostly well worn, some blackened. Rock frags mixed origin mostly rounded, low sphericity. Sediment well sorted.
28·9	28·9		
29·0			

All core recovered measured from base of run.

Sub Sample Code

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P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 28·9 m to 33·35 m Recovery 0·3 m (7 %)

Depth	Sub Samples	Lith-ology	Description
28·0			
28·9m			
29·0			
30·0			
31·0			
32·0			
33·0			
33·05			Gravel comprising shell frags and pebbles as above
33·35			
34·0			

NB. Drill slowed down ca 0·3m before pulling core ? Test. rockhead

All core recovered measured from base of run.

Sub Sample Code

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P.S.A. - grain size
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Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 33·35 m to 38·35 m Recovery 1·35 m (27 %)

Depth	Sub Samples	Lith-ology	Description
33·0			
33·35			Action of drill suggests boulders
34·0			
35·0			
36·0			NB. In previous run, drill slowed down ca 0·3m before pulling core.
37·0			37·0 Slightly muddy sand, greenish grey 5GY5/1 Quartz veg fine-fine grained - angular, mica, chlorite?, glauconite? flakes upto 1mm across darker patches, richer in green minerals. Shell fragp - NB 37·6m. Compacted. Structureless apart from dk patches and
38·0			
38·35	MPAL		38·35 clay-bed artifacts. Mod strong reaction with HCl, moderate sorting ca 75% quartz, 15% mica/glauc, 10% rock frags
39·0			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 38·35 m to 42·5 m Recovery 3·5 m (85 %)

Depth	Sub Samples	Lith-ology	Description
38·0			
38·35			
39·0			39·0
39·0	MPAL		Greenish grey glauconitic micaceous sandstone, moderate clay fraction
39·5	MPAL	m	v. fine - fine sand, angular grains, quartz, rock frags as above
40·0			
40·5	MPAL	m	below 40·5m Some "bright green" sand bands impoverished in clay but with green clay clasts
41·0			
		m	41·3
41·5	MPAL	m	sand as above but with brown silty clay bands, micaceous no reaction with HCl
42·0			
42·5	MPAL		dk greenish grey clay at base
43·0			

sediment as a whole has little reaction with HCl.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 42.5 m to 45.0 m Recovery 2.4 m (96 %)

Depth	Sub Samples	Lith-ology	Description
42.0			
42.5			42.5
42.6m	MICROPAL		42.6 → Laminated, hard, blue green clay/claystone
43.0			→ Variably colored olive grey, greenish, grey brown, fine-very fine, firm muddy sands. with isolated coal fragment at c. 44.7m.
44.0	MICROPAL		
45.0	MICROPAL		

All core recovered measured from base of run.

Sub Sample Code

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P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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SHIP: FERDER

B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

Run 45 m to 47.55 m Recovery 2.95 m (+100 %) 115%

Depth	Sub Samples	Lith-ology	Description
44			
45			Fine - very fine, variably coloured (a/a) thd dominantly dk. olive grey (5Y 3/2), firm [redacted], argillaceous, micaceous sand. Strong reaction to dil. HCl. Occasional blue-grey clay / claystone bands with laminations.
45.5	MICROPAL		
46			
46.6	MICROPAL		
47			
47.55	MICROPAL		
48			

All core recovered measured from base of run.

Sub Sample Code

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M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

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Run 47·55 m to 50·05 m Recovery 2·05 m (82 %)

Depth	Sub Samples	Lith-ology	Description
47·0			
47·55			
48·0			Dk olive grey (5Y 3/2), firm [redacted], fine-v. fine, moderately sorted, calcareous, micaceous, argillaceous massive sand.
49·0			
	49·05 M'PAL		
50·0			
50·05	50·05 M'PAL		

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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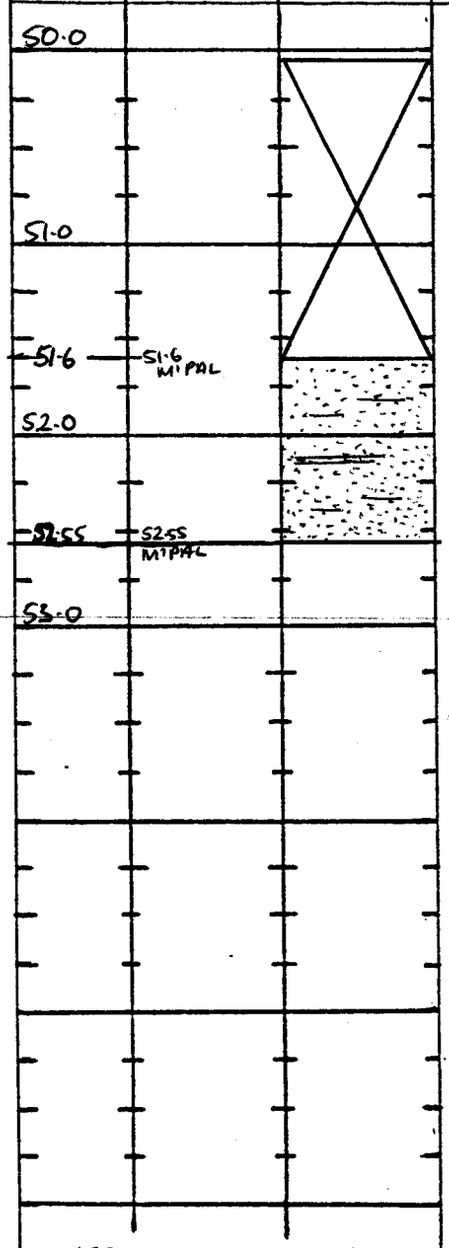
1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

Run 50·05 m to 52·55 m Recovery 0·95 m (30·8%)



Description

Olive, fine[illegible], fine-very fine, moderately sorted, mostly structureless, calcareous, argillaceous, micaceous sand. Occasional bluish green - dk olive grey ?glauconite rich bands indicate occasional well marked stratification, although sequence as a whole is mostly structureless.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 52.55 m to 55.05 m Recovery 0.25 m (10 %)

Depth	Sub Samples	Lith-ology	Description
52.0			
52.55			
53.0			
54.0			
54.8	M'PAL.		Olive-grey (5Y 4/2), soft, glauconitic, calcareous, argillaceous, fine-v.fine, moderate-poorly sorted, sand. Laminae in sand may be due to disturbance during drilling as 'bit' became blocked and penetration at this level was v.slow, hence probable remoulding of sediment may have occurred.
55.0			
55.05			[Hammer sample at 55.05m. a/a.]

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

Page No: 15 of 29

Run 55·05 m to 57·55 m Recovery 3·25 m (130%)

Depth	Sub Samples	Lith-ology	Description
54			Top 0·25m in bottle sample.
54·25			locally highly glauconitic Firm to indurated, calcareous, colour banded - lt grey, yellow-green, lt red-brown, - argillaceous micaceous sands / sandstones. Possible localised rip-up clasts or flecks/streaks of different coloured sandy material.
55			
	55·46 M'PAL		
56			While quartz is the dominant mineral species there is an abundance of both biotite + muscovite mica and red, yellow + black heavy minerals, i.e. a definite mixed mineral assemblage.
	56·48 M'PAL		
57			
57·55	57·5 M'PAL		
58			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
c organic
p Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT

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SHIP: FERDER

B.H. NO: 84/5

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 57·55 m to 60·05 m Recovery 2·37 m (90·4%)

Depth	Sub Samples	Lith-ology	Description
57			Firm - indurated, brown, brown-grey, grey, olive-green-yellow, blue grey banded, argillaceous, micaceous, calcareous, silty/siltstone to fine-v. fine sand/sandstone. Becoming very argillaceous + distinctly red-brown in colour towards base.
57·55			
57·68			
SG			
	Petrology 58·1 △		58·10 Possible ash-bands occur at 58·1 and 58·75 m with localized streaks in between. These are streaky in appearance, and dark greenish grey 5G 4/1 to 5BG 4/1. Very fine grained and appear "crystalline" under the microscope.
	*		
	*		
	△		58·75
59	*		(Base Eocene / top Palaeocene ?).
	*		
	*		* Recommend closely spaced M'pal subsamples at a later stage in an attempt to fix the Pal/Eocene boundary.
	59·57 M'PAL		
60			
60·05	M'PAL		△ Also subsample suspected ash bands. further for more material.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 60·05 m to 62·55 m Recovery 2·73 m (109 %)

Depth	Sub Samples	Lith-ology	Description
59			
59·82			
60			Firm to indurated, variably coloured, argillaceous, micaceous sands a/a.
	60·78 M'PAL		
61			
	61·70 M'PAL		
62			
62·55	MPAL.		

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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SHIP: FERDER — B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 18 of 29

MATHS ERROR.

Run 62·55 m to 65·05 m Recovery 0·85 m (74 %)

Depth	Sub Samples	Lith-ology	Description
62			
62·55			
63			
64			
64·2	M'PAL		→ Firm to indurated, yellow brown to light grey, calcareous, micaceous, argillaceous sand/sst. with conspicuous shell frags. Red to dk green, non to poorly calcareous ~~band~~
65	?		→ V fine shaley band at c 64.95 may be ash fall horizon.
65·05	M'PAL		→ Indurated light grey sandstone at base.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

Run 65·05 m to 67·55 m Recovery 0·25 m (10 %)

Depth	Sub Samples	Lith-ology	Description
65			
65·05			
66			
67			
67·30			Olive (5Y4/3-4/4), soft, micaceous sand
67·55			Hammer Sample
68			a/a Olive, fine-vfine micaceous, argillaceous sand with abundant heavies + detritals.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

Page No: 20 of 29

Run 67.55 m to 70.05 m Recovery 0.4 m (16 %)

Depth	Sub Samples	Lith-ology	Description
67			
67.55			
68			
69			
69.65			
70	69.85 M'Pal		Olive grey (5Y 4/2) ▲, fine to v.fine, mod. calcareous, medium sorted sand with qtz dominant plus abundant mica + detritals
70.05			Hammer Sample a/a.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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SHIP: FERDER — B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 21 of 29

Run 70·05 m to 72·55 m Recovery 0·65 m (26 %)

Depth	Sub Samples	Lith-ology	Description
70			
70·05			
71			
72 71·9	MPAL		a/a. Olive, fine-v fine, micaceous, argillaceous sand. Core consists mostly of cavings.
72·55			Hammer sample a/a.

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

I.G.S. MARINE GEOLOGY UNIT

1984 PROGRAMME

SHIP: FERDER

B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

Run 72·55 m to 73·55 m Recovery 0·45 m (45 %)

Depth	Sub Samples	Lith-ology	Description
72			
72·55			Red-brown, hard silty to very fine sandy mud/mudstone, overlying fine to v. fine dk. olive grey (5Y 3/2), moderate to poorly sorted, micaceous, argillaceous sand [redacted] Both facies weak to non-calcareous.
73			
73·10			
73·55	M'PAL.		
74			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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SHIP: FERDER — B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 23 of 29

Run 73·55 m to 74·55 m Recovery 0·0 m (0 %)

Depth	Sub Samples	Lith-ology	Description
73			
			No recovery
74			
			← Hammer sample
			Medium-v.fine, olive grey (5Y 4/2), moderate to poorly sorted, calcareous, soft micaceous, argillaceous sand.
75			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic

pebbles
shells
organic
Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 74·55 m to 75·55 m Recovery 0·4 m (40 %)

Depth	Sub Samples	Lith-ology	Description
74			
75	75·30 M'PAL		75·45 Fine-v.fine, moderate to poorly sorted, dark grey (5Y3/1), glauconitic, shelly, micaceous, argillaceous sand. Rare coal/lignite fragments. Possibly less mica than above. [redacted]
76			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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SHIP: FERDER — B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 25 of 29

Run 75·55 m to 76·55 m Recovery 1·0 m (100 %)

Depth	Sub Samples	Lith-ology	Description
75·0			
			75·55 Sand, dk greyish green, mod-well sorted, slight reaction with HCl. Quartz, ?feldspar, mica and abundant green mineral — ?glauconite : mica green and brown.
76·0		m e	
76·25	MPAL	m e	76·55 Quartz v.fine to fine grained, clean angular to subangular. Several shell fragments seen throughout core including prism shaped microscopic fragments - ?echinoid spines.
77·0			

UPPER PART IS PARTLY REMOULDED

Could this be Cret. Greensand?

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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SHIP: FERDER — B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 26 of 29

Run 76.55 m to 77.55 m Recovery 1.3 m (130 %)

Depth	Sub Samples	Lith-ology	Description
76.0			
			76.25 Sandstone, dark greenish grey, indurated, very fine to fine grained, mainly quartz (90%) with rock frags, mica (green and brown) and ?glauconite. Some shell material including some large corroded fragments of ?bivalves. Sand v. clean, subang–ang.
77.0		m	
77.45	MPAL	c	77.55
78.0			NB. Drilling artifacts in the form of brown clay laminae make up for part of extra core. Remoulding at top for remainder.
			Almost certainly Cret. greensand!

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
c organic
p Plant Fragments
Si, Fe, minerals

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SHIP: FERDER — B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN — Page No: 27 of 29

Run 77.55 m to 80.00 m Recovery 1.0 m (40%)

Depth	Sub Samples	Lith-ology	Description
77.0			
77.55			
78.0			
79.0			
79.0			Sandstone, dk greenish grey, indurated v. fine to fine, quartz, rock frags, abundant brown, green and white mica, ?glauconite, some polycrystalline quartz grains. Apparently structureless apart from vertical tube-like fabric, ?burrow at 79.75 m. No reaction with dilute HCl.
79.75	MPAL		
80.0			
80.0			

How do I know Cret. Greensand when I see it anyway?

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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B.H. NO: 84/5

GEOLOGICAL LOG COVERING ONE CORE RUN

Run 80.0 m to 82.5 m Recovery 0.5 m (20 %)

Depth	Sub Samples	Lith-ology	Description
80.0			
81.0			
82.0			
82.2	M'Pal		82.0 Sand similar to above but considerably more friable and with less mica.
82.5			82.5 Sand is apparently better rounded than in previous core.
83.0			Drilling artifacts are closes spaced

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
vvv Extrusive
xxx Intrusive
Metamorphic

pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

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GEOLOGICAL LOG COVERING ONE CORE RUN

Run 82.5 m to 85.0 m Recovery 1.0 m (40%)

Depth	Sub Samples	Lith-ology	Description
82.0			
82.5			
83.0			
84.0			84.0-84.05 Sandstone - quartzose micaceous sand similar to above but well indurated
			84.0 84.05-84.07 Grey shale band - not examined on board ship ? fossil shell
	84.9m MPAL (?IN CORE) (?LOST) !	M	84.07-85.0 Sand, dk greenish grey, friable, little reaction with HCl.
85.0			85.0 mod.-well sorted, micaceous, quartz v. fine to fine grained, subangular to angular, some rock fragments.
TD			

All core recovered measured from base of run.

Sub Sample Code

EGU - Engineering
P.S.A. - grain size
M'Pal - Micropalaeontology
Macro - Macropalaeontology
P'Mag - Palaeomagnetic
M - Moisture Content

Lithology Code

Clay/shale/mudstone
silt/siltstone
sand/sandstone
gravel/conglomerate
Carbonate
Extrusive
Intrusive
Metamorphic
pebbles
shells
C organic
P Plant Fragments
Si, Fe, minerals

INSTITUTE OF GEOLOGICAL SCIENCES

Continental Shelf Unit

COMPOSITE LOG

Borehole No 84/5 (61/-01/8)

Location: 23 miles NE of Muckle Flugga

Actual position: **Latitude:** 61° 11·541' N
Longitude: 0° 32·350' W

Dates of drilling: 1st - 2nd June 1984
Total depth: 85·0 m
Water depth: 160 m

Navigation: SATNAV / DECCA
Positioning: SATNAV
Contractor: ANTON VON DER LIPPE
Vessel: FERDER

Sea Area. MILLER
Planned IGS No 262
Licence Block 218/23
Operator unallocated

1 100 000 Sheet No 61 N 01 W (MILLER SE)
Geologists AF, MS, DL, ACS

COMPOSITE LOG COMPILED BY A FYFE FROM LOG SHEETS COMPLETED BY A FYFE AND M STOKER

IGS Borehole No 84/5

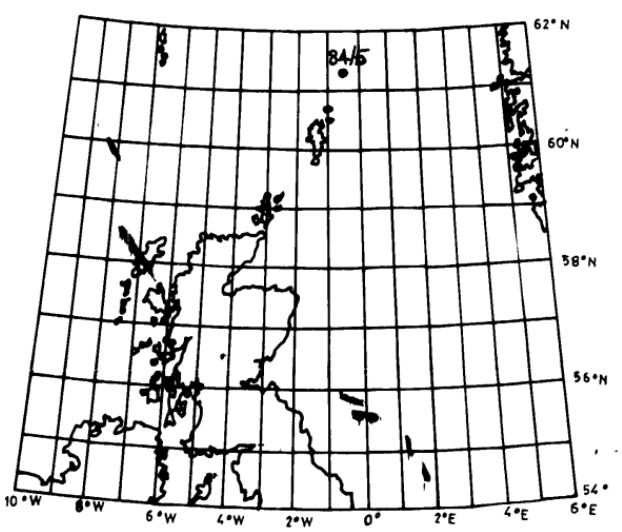
Purpose

The borehole was intended to penetrate into acoustically structureless Mesozoic strata underlying thin (65m) Quaternary / Tertiary cover. It was expected to sample the youngest Mesozoic strata present, cf site 261.

Comments

Borehole penetrated 17m of Quaternary ? Ferdes Formation and then 19m of well sorted shelly stoney gravel which may be Tertiary. The underlying strata comprised dark greenish grey sands and sandstones of Tertiary and/or Cretaceous age. Ash horizons at 58-59 m suggest these sediments to be Tertiary (Palaeocene/Eocene marker). More indurated and less argillaceous sandstone below 76m may mark the top of the Mesozoic (Cretaceous) strata. In addition there is a change in clay coloration from brown (above) to grey.

No Tertiary present (MS)



LITHOLOGICAL KEY

CLAY/SHALE, MUDSTONE	EVAPORITES	
SILT/SILTSTONE	EXTRUSIVE IGNEOUS (ASH)	
SAND/SANDSTONE	INTRUSIVE IGNEOUS	
GRAVEL/CONGLOMERATE	BASEMENT	
LIMESTONE	WHOLE SHELLS/SHELL FRAGMENTS	
CHALK	C P CARBONACEOUS/PLANT FRAGMENTS	
DOLOMITE	FE IRON PYRITES / FERRUGINOUS	
COAL/LIGNITE	CALCAREOUS	

AGE	~~NATURAL GAMMA RAY LOG~~ (Counts/s) 0 50 100	LITHOLOGY: INTERPRETATION	LITHOLOGY: CORE RECOVERED	DESCRIPTION	SUB-SAMPLES	COMMENTS
	DRILLING RATE metres / hour; Depth (m below sealevel)		37% CORE RECOVERED	Seabed		
QUATERNARY	FERDER FORMATION			Muddy gravelly sand, dark grey, well consolidated. Sand comprises quartz and rock fragments, very fine to coarse grade in places but dominantly fine-grained, subrounded to angular, variable argillaceous content. Pebbles of mixed metamorphic / igneous affinity moderately well rounded up to 80mm max. diameter. Shell fragments of various bivalves including Pectenids generally angular and not worn or abraided up to 20mm across but generally of lesser dimensions		
			5.0			
			10.0	porphyritic rock pebbles (? Norwegian) Pectenid shell fragments		
			14.5	basaltic / mylonite pebbles small shell fragments		
						17m boundary insubstantive

Scale 10 20 30 40 50 (depth scale)

TERTIARY (PLIOCENE?)

TERTIARY (EOCENE and younger)

LOWER CRETACEOUS

see Dorset reports

"BACK UP"

20 — 19.5

Shelly stoney gravel, variable nos of abraided shell material and small pebbles – overall carbonate ca 50%. Sediment is generally well sorted. Shell material includes well-worn thick-walled bivalve fragments, some blackened, ? Dentalium, gastropods, some almost intact. Pebbles are well rounded to rounded, of mixed origin, mainly igneous/metamorphic up to 15mm max di.

← 3 HAMMER SAMPLES

24.0

25

Subordinate v.fine sand and clay matrix in some samples.

28.9

30

33m boundary based on observation – see log sheets.

33.35

35

36m boundary based on drilling curve (could be 33m)

38.35

Slightly muddy sand, greenish grey, moderately sorted, very fine to fine grained, subangular to angular, predominantly quartz, some rock fragments and heavy minerals and abundant mica – muscovite and biotite and green mica and amorphous mineral ?glauconite. Some shell fragments generally corroded but probably of bivalves. Rare plant fragments

40

42.5

45

45.0

Mostly structureless apart from darker clay-rich bands and "brighter" green bands, richer in ?glauconite. Some bands are well-compacted clay (stone)

(variable reaction with HCl – from strong in parts to very weak) – apparently becoming more calcareous with depth)

47.55

Some clay bands reddish brown in colour, this colouration becoming more consistent with depth.

50

50.05

52.55

55

55.05

57.55

Ash-bands, dark greenish grey, very fine grained, crystalline micro-appearance

60

60.05

38.35 MPAL	
39.0 MPAL	
39.5 MPAL	
40.5 MPAL	
41.5 MPAL	
42.5 MPAL	
42.6 MPAL	
44.0 MPAL	
45.0 MPAL	
45.5 MPAL	
46.6 MPAL	
47.55 MPAL	
49.05 MPAL	
50.05 MPAL	
51.6 MPAL	
52.55 MPAL	
55.0 MPAL	
55.46 MPAL	
56.48 MPAL	
57.5 MPAL	
58.1 PETROLOGY	MS RECOMMENDS CLOSE SUBSAMPLING HERE
59.7 MPAL	
60.05 MPAL	
60.78 MPAL	
61.7 MPAL	

TERTIARY (?PALAEOCENE)

? CRETACEOUS

"GREENSAND"

Depth	Description	MPAL	Notes
62.55		62.55 MPAL	
		64.2 MPAL	
65	Possible ash band		
65.05		65.05 MPAL	
67.55			
70		69.85 MPAL	
70.05			
		71.9 MPAL	
72.55			
	reddish brown clay band		
73.55		73.55 MPAL	
74.65			
75		75.3 MPAL	
75.55			76m boundary arbitrary
76.55		76.25 MPAL	
77.55		77.45 MPAL	
	Sandstone, greenish grey, similar to beds above but with significantly less clay and harder and more indurated, especially at top of unit. Towards the base of core, becomes more friable. Some shell fragments and possible bioturbation. Difference in colour of clay material. Variable proportions of mica, generally being less in the indurated material		
80		79.75 MPAL	5 MPAL SAMPLES TAKEN BY I J ANDREWS 6/7/84
80.0			
82.5		82.2 MPAL	
	dark grey clay band		
85		84.4 MPAL	
85.0 TD			

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

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