INSTITUTE OF GEOLOGICAL SCIENCES
MARINE GEOLOGY UNIT
Internal Report No. 80/12

CRUISE REPORT
MARINER DRILLING
LEG 2
14.10.80 - 22.10.80

by

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CONTENTS

INTRODUCTION

This final leg of the 1980 drilling programme was planned as an open ended cruise with a maximum duration of three weeks. The principal objective was to drill at a number of sites on the Peterhead Sheet and if these were completed then to work on the Bosies Bank sheet (Fig. 1). In the event poor weather conditions and outlook led to the termination of the contract after seven days.

PERSONNEL

N G T Fannin	IGS (MGLU)	Senior Scientist
R Owens	IGS (MGLU)	Geologist
S Brown	IGS (HCU)	Geologist
C Graham	IGS (MGLU)	Geologist
D Long	IGS (EGU)	Engineering Geologist
G Tulloch	IGS (MGLU)	Assistant
M Love	Keele Univ.	Engineering Geologist
J W Wilson	Consultant	

EQUIPMENT

a) Ship's

The ship's layout and equipment are described in MGLU Internal Report No. 80/16. It should be noted however that the ship's laboratory facilities are not regarded as adequate. They are cramped and inconveniently sited requiring access across the drill floor after extracting samples. A bench should be provided for core extraction.

Modifications are required to the slips (rounding of the teeth plates) to provide a better grip on the pipe. A power swivel capable of accepting the drill collars is also required. During this leg the

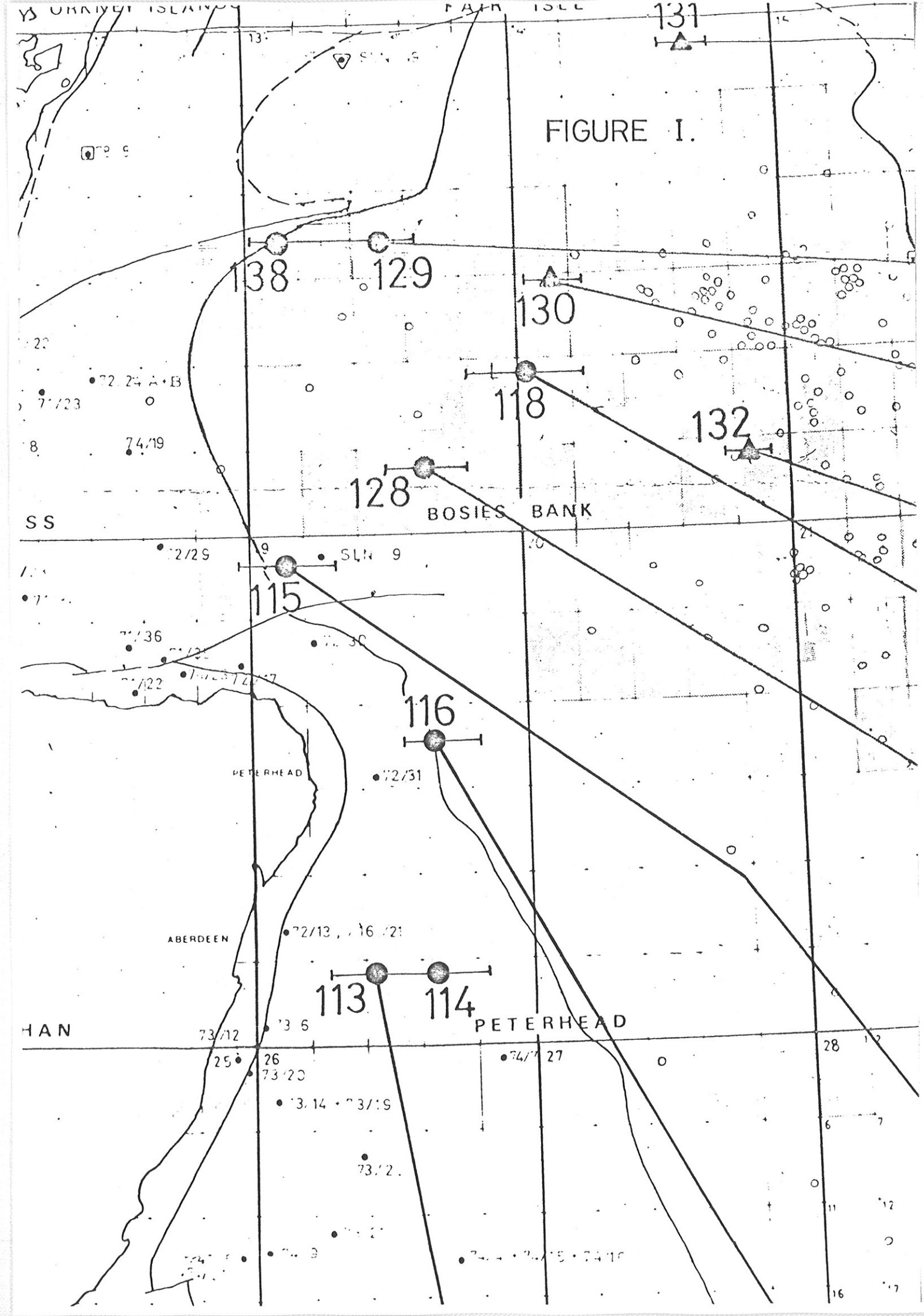


FIGURE I.
131
138
129
130
118
132
128
BOSIES BANK
115
116
PETERHEAD
ABERDEEN
113
114
PETERHEAD

new set of waisted drill collars were used following the twist off problems encountered during the previous leg. These collars proved successful but only six were used in the string assembly. At least one of these collars however was not swabbed after having been drilled out. This resulted in jamming of the inner barrel latches and necessitated the string being pulled at site 80/16 to recover the inner barrel.

b) IGS Equipment

This equipment is also described in MGLU Internal Report 80/16. A number of problems were encountered with new Christensen equipment. In particular the quin latches of the inner barrel required modification as did the bolts on the leaf springs.

SHIP PERFORMANCE

This is dealt with in detail in MGLU Internal Report No. 80/16 and in the report by J.H. W-Wilson. In general the ship behaves well in adverse weather conditions. Pipe handling could be improved as could the layout of the drilling controls and the disposition of pipe handling winches on the pipe handling deck. Particular attention should be paid to the accuracy and use of the Martin Dekker weight gauge and care must be taken at all times that sufficient torque is applied in string assembly. Dope should also be used much more liberally during string assembly.

Anchoring was efficient with the ship using three forward and two stern

anchors. As a safeguard however, a spare wire should be kept already spooled and tensioned on the spare anchor winch. During anchor recovery at site 80/16A the starboard bow sponson was lost with failure of the welds to the hull.

Considerable improvements could be made to the laboratory facilities and for future work the siting of an IGS laboratory forward of the pipe deck should be considered. Client cabin accommodation on the lower deck is also inadequate and these cabins should be provided with running water.

RESULTS

Bad weather affected core recovery and eventually let to the early termination of the cruise. Equipment problems also caused time loss in the available weather window. Despite this however the target was achieved at site 115 (BH 80/16 and 80/16A) where the hole was drilled to a depth of 41.6m into stiff dark grey silty clays with silt lenses. This material is thought to be Tertiary, forming the feather edge of, probably, the early Tertiary in the eastern part of the Moray Firth (Appendix II).

Recovery in the Quaternary section of the hole was poor (of the order of a few percent) in what was probably a dominantly sandy sequence. It is likely however that core recovery could have been improved by push or hammer sampling this section and by rotary drilling with more experimentation with bit speeds, bit weight and mud pressures. In practice the weather window did not allow these techniques to be used and the main target was reached as quickly as possible.

CONCLUSIONS

Despite apalling weather conditions the principal geological target of one site (115: BH 80/16A) is believed to have been achieved. The site cannot however really be regarded as having been wholly successful, a fact which is inevitably a feature of working so late in the season. Other factors dictated the choice of working season but in future careful consideration must be given to the cost effectiveness of drillship operation in exposed waters at this period of the year.

ADDENDUM

Preliminary micropalaeontology results indicate that the sediments are Palaeocene in age, confirming the age interpreted from shallow seismic data.

APPENDIX I

SUMMARY LOG

Tues 14.10.80

1230	Mariner alongside in Peterhead
1800	Drill Collar inspection complete. New collars lifted from hold to deck
2100	Echosounder repairs complete. Paper drive still not operating.

Wed 15.10.80

0000	Cast off from Peterhead
0700	Standing by off site 115
1050	Begin anchoring on site 115 (80/16)
1200	On location 80/16 Prepare to drill
1905	Spud in
1915	Overshot not latching
2030	Pull string to recover inner barrel
2200	Recover barrel and break out inner barrel. Latches jammed with swarf from new collars.
2215	Abandon site in deteriorating weather
2240	Begin raising anchors

Thurs 16.10.80

0100	Complete raising anchors. Standing by, waiting on weather

Fri 17.10.80

1030	Abandon standing by on site and steam to shelter in Firth of Forth.

Sat 18.10.80

0400	Anchor in Largo Bay. Waiting on weather

Sun 19.10.80

1315	Raise anchors and steam towards location (site 115).

Mon 20.10.80

0730	Standing by at site 115
1130	Begin laying anchors at site 115 (80/16A)
1540	Complete laying anchors at 80/16A
1700	Power swivel power pack failure
1800	Power pack repaired - run string to seabed
2300	Power pack fails again
2355	Power pack repaired. Spud in hole

Tues 21.10.80

1230	Slips failure
1300	Slips repaired. Continue drilling
1330	Abandon hole in deteriorating weather
1615	Complete pulling string and template
1800	Complete raising anchors. Starboard bow sponson lost. Steam to lee shore off Troup Head trailing starboard bow anchor.
2145	Anchor of Troup Head, lift starboard bow anchor inboard using crane.
2330	Break open barrel and recover inner barrel

Wed 22.10.80

0900	Raise anchor and steam towards site 116
1200	Abandon cruise and give notice of termination of contract. Steam to Aberdeen.
1500	Standing by off Aberdeen
1630	Alongside in Aberdeen

Thursday 23.10.80

1200	Complete demobilisation of ship
1500	Ship leaves for Rotterdam

Fri 24.10.80

1200	Termination of contract. Ship en route for Rotterdam.

CONTINENTAL SHELF NORTHERN UNIT APPENDIX 2.

PROPOSED BOREHOLE SITE

SITE NUMBER 115

LATITUDE 57° 57'N	LONGITUDE 1° 51'W
APPROXIMATE LOCATION 16 miles NNE of Fraserburgh	
1:250,000 MAP AREA Peterhead NW 1:100,000 SHEET NO. 57.30°N 02°W	LICENCE BLOCK NO. 19/1 OPERATOR Unallocated

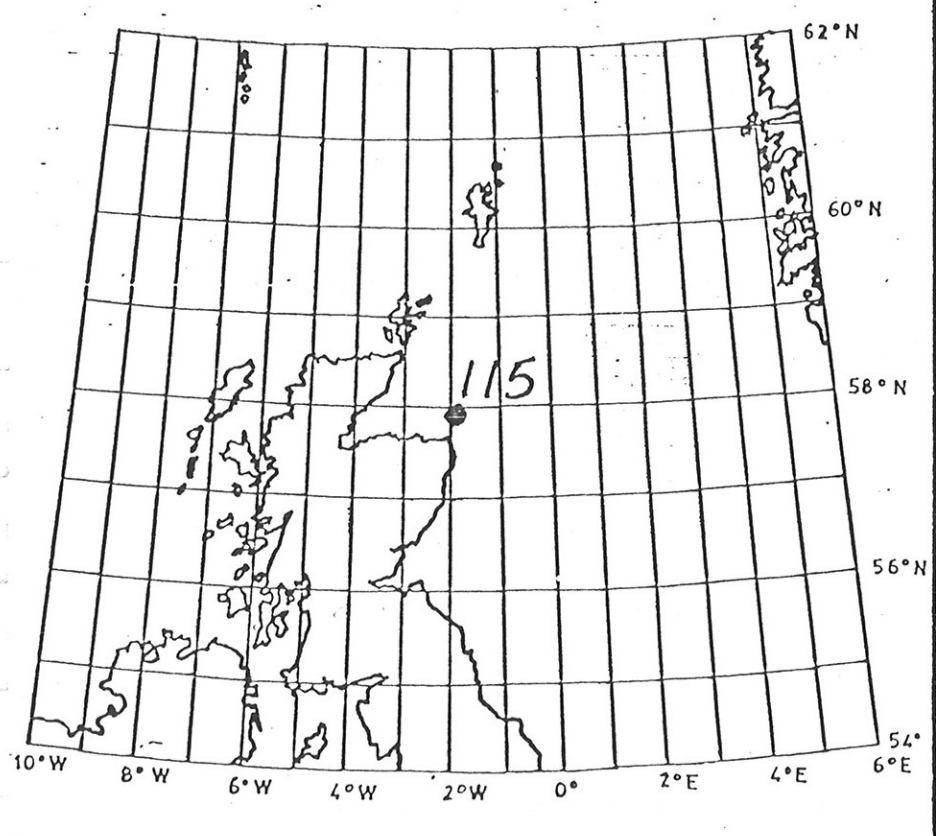
NAVIGATIONAL DATA FOR SITE

DATA ON WHICH SITE IS PLANNED YEAR/CRUISE/LINE/FIX 72/4/55/5.5

CONDITIONS AT SITE

WATER DEPTH	=	60	m	SEABED CONDITIONS-	Sand
DRIFT THICKNESS	=	30	m	PREDICTED AGE -	Quaternary
SOLID TO BE DRILLED	=	80	m(max)	PREDICTED AGE -	Tertiary or U. Cretaceous
TOTAL DRILL STRING	=	170	m		

LOCATION MAP



NOTES

To define position of Tertiary boundary.

SITE APPROVED

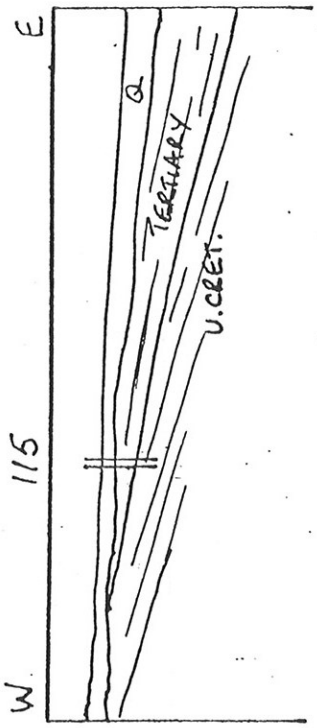
21·1·80 Head of Unit

DATE DRILLED 21·10·80

GEOLOGISTS

BOREHOLE NO. 80/16A

GEOLOGICAL NOTES AND SCHEMATIC SECTION



PREDICTED SUCCESSION
(WITH VELOCITIES USED)

60 WATER DEPTH (m)

SEABED

Quaternary
clay with occasional
pebbles.

30m

50m Tertiary sands and clays

75m

U. Cretaceous chalk and
marls.

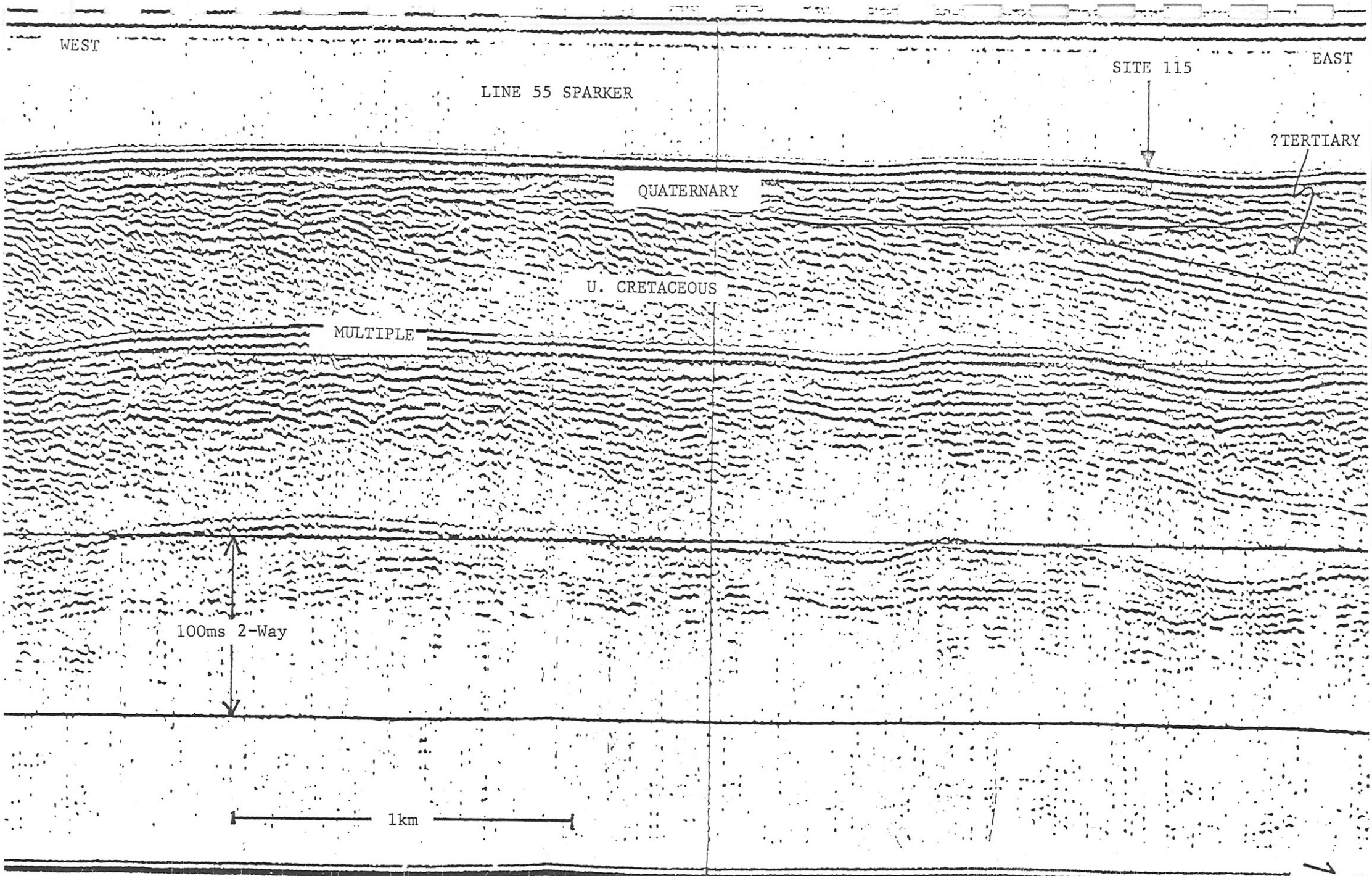
100m

110m T.D.

150m

200m

SAMPLING REQUIRED	LOGGING REQUIRED
Continuous	Gamma


WEST
EAST
LINE 55 SPARKER
SITE 115
?TERTIARY
QUATERNARY
U. CRETACEOUS
MULTIPLE
100ms 2-Way
1km

115

10.