

INSTITUTE OF GEOLOGICAL SCIENCES  
MARINE GEOLOGY UNIT  
Internal Report No. 81/6

CRUISE REPORT MV WHITETHORN

5<sup>TH</sup> ~~3RD~~ LEG

28 May - 10 June, 1981

by

J A Chesher

## 1. Introduction

The purpose of this cruise was to complete the sampling programme of the Bosies Bank Sheet. The equipment used consisted of shipek grab, 4" gravity corer, and vibrocorer.

The weather and sea state was good throughout the cruise, and resulted in no time loss. The cruise proved highly successful, the Bosies Bank Sheet sampling programme being completed by the end of this leg.

## 2. Personnel

J Chesher	IGS	MGLU	Chief scientist
R Sutherland	IGS	HCU	
M Dean	IGS	HCU	
D Hall	IGS	HCU	
A Thompson	IGS	HCU	
W Lonie	IGS	MGLU	
A Bell	IGS	MGLU	
P Sanden	IGS	GCU	
G Tulloch	IGS	MGLU	

## 3. Equipment and Performance

A shipek grab, 4" gravity corer, and 6 metre electric vibrocorer comprised the sampling equipment used. No major problems or time losses were encountered with the equipment apart from the occasional earth trip on the power cable due to water in the terminations.

Trials on the water flushing introduced at the end of the previous leg showed that in thixotropic sands penetration was improved from 3 metres to 6 metres when the flushing was switched on. However no core recovery

was achieved with the flushing which was fluidising the sand and washing it away on penetration. Placing the water jet holes higher up the barrel may resolve this problem. In soft clays no obvious difference was noted with the flushing but in tough sandy clays a better penetration was achieved, three times as fast as without flushing but core recovery was poor, less than one half that without flushing due to washing away of the core.

#### 4. Results

An average of 6 vibrocores were achieved each day with 5 - 10 miles steaming between stations. Full 6 metre recovery was attained in 95% of the cores resulting in over 350 metres of core recovery in total excluding 100 metres recovered by sediment corer. The number of stations occupied are tabulated below.

	Shipek Grab	Vibrocorer	Sediment Corer
No of Stations	135	67	94

#### 5. Geological Summary

The entire area of the Bosies Bank 1:250,000 is covered by a fine olive green sand varying from 0.1 to 1.0 metre in thickness. At the base of this surface sand a shell 'hash' or gravel some 0.10 metre thick is generally developed comprised of entire gastropods and bivalves together with broken shell debris in a fine muddy sand matrix. The surface sediments are variably underlain by different types of Quaternary deposits which the following facies have been recognised in a general stratigraphical succession from the top tabulated below:

- i) An olive green slightly muddy sand rich in  $H_2S$  and up to 6 metres in thickness identical to the surface sand.

- ii) A pinkish brown soft buttery mud similar to the Errol Clay
- iii) A grey soft buttery mud sometimes interlaminated with the above pinkish brown clay.
- iv) A firm grey silty clay often with abundant pebbles, mainly consisting of chalk in the west of the area. The clay gets tougher towards the base and very compact. Interspersed throughout the clay are sand lenses, of clean, well sorted, grey sand, and occasional distinct red sand.
- v) A clean well sorted, well rounded tixotropic sand that is present directly beneath the surface sediments.

#### 6. Acknowledgements

Acknowledgements are due to the ships officers and crew for all the help and assistance rendered, and to the IGS team on this leg.

## 7. Ship's Log

### Thurs 28 May

0000-1700 In port Aberdeen, routine port call  
1700-2400 Steaming en route to Bosies Bank Sheet

### Fri 29 May

0000-0700 Steaming en route to Bosies Bank  
0700-2300 Vibrocoreing Bosies Bank NE Sheet  
2300-2400 Routine sampling Bosies Bank NE Sheet

### Sat 30 May

0000-0700 Routine sampling Bosies Bank NE  
0700-2400 Vibrocoreing Bosies Bank NE

### Sun 31 May

0000-0700 Routine sampling Bosies Bank NE  
0700-2400 Vibrocoreing Bosies Bank NE

### Mon 1 June

0000-0700 Routine sampling Bosies Bank SE  
0700-2400 Vibrocoreing Bosies Bank SE

### Tues 2 June

0000-0030 Vibrocoreing continued  
0030-0700 Routine sampling Bosies Bank SE  
0700-2300 Vibrocoreing Bosies Bank SE  
2300-2400 Routine sampling Bosies Bank SE

### Wed 3 June

0000-0700 Routine sampling Bosies Bank SE  
0700-2230 Vibrocoreing Bosies Bank SE  
2230-2400 Routine sampling Bosies Bank SE

Thurs 4 June

0000-0700 Routine sampling Bosies Bank SW  
0700-2230 Vibrocoring Bosies Bank SW  
2230-2400 Routine sampling Bosies Bank SW

Fri 5 June

0000-0700 Routine sampling Bosies Bank SW  
0700-2300 Vibrocoring Bosies Bank SW  
2300-2400 Routine sampling Bosies Bank SW

Sat 6 June

0000-0700 Routine sampling Bosies Bank SW  
0700-2300 Vibrocoring Bosies Bank SW  
2300-2400 Routine sampling Bosies Bank NW

Sun 7 June

0000-0800 Routine sampling Bosies Bank NW  
0800-1000 Transferring samples from container to hold  
1000-2300 Vibrocoring Bosies Bank NW  
2300-2400 Routine sampling Bosies Bank NW

Mon 8 June

0000-0700 Routine sampling Bosies Bank NW  
0700-2230 Vibrocoring Bosies Bank NW  
2230-2400 Routine sampling Bosies Bank NW

Tues 9 June

0000-0700 Routine sampling Bosies Bank NW  
0700-2000 Vibrocoring Bosies Bank NW  
2000-2400 Steaming en route for Aberdeen

Wed 10 June

0000- Steaming en route for Aberdeen  
-2400 In port Aberdeen routine port call.