

POCKMARK SAMPLING PROJECT

M.V. WHITETHORN

75/WH/21

31 July - 15 August 1975

by

C Graham

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REPORT ON M.V. WHITETHORN CRUISE 75/WH/21

31st July to 15th August 1975

Personnel

D Arduş	CSU II (Senior Scientist)
R Owens	CSU II
C Graham	CSU II
G Peasley	CSU II (Student)
J Lambert	EGU
P Hobbs	EGU

Introduction

The objective of this cruise was to conduct a programme of profile coring across a number of preselected pockmark sites. In addition to sedimentological examination, samples were to be analysed for gas content, using a technique developed by B.P., and subjected to engineering tests. The precision navigation required for the cruise was provided by Hifix, although the original plan had also included the use of I.O.S. transponder ranging equipment which unfortunately was withdrawn at short notice.

During the cruise samples were obtained from five pockmark locations in the Forties area using the I.G.S. double barrelled vibrocorer and a gravity corer.

EQUIPMENT PERFORMANCE

Vibrocorer - After taking two samples the vibrator motor failed and a replacement vibrator housing was obtained and fitted. A double 20' barrel arrangement was used giving good results which were further improved by omitting the barrel pistons. On several occasions part of the core was lost due to the core catchers failing to contain the sample.

Gravity corer - Samples were obtained using both 20' and 10' barrels. On several occasions the core catcher became inverted and part or all of the core was lost. This problem was solved by using two or more catchers the best results being obtained when a stainless steel catcher was used with a beryllium copper one.

Shipek Grab - The water depth exceeded the amount of cable available and therefore no samples were taken.

Atlas Deso echo sounder - This operated throughout the cruise although the frequency "wandered" from the 1.5 KHz calibrated setting.

Ore pinger - Operation satisfactory after a cable fault was repaired. This was caused by the fish being winched aboard before disconnecting the electric cable.

Hifix navigation equipment - The Hifix receivers were reliable throughout the cruise. The trackplotter was faulty, not recording the ship's movement along the X axis. The plotter was monitored and manual corrections made frequently.

Engineering equipment - During the second week the oscilloscope developed a fault resulting in the abandonment of the velocity scanning.

RESULTS

The weather during the trip was calm providing ideal sampling conditions but several problems developed which limited the end results.

The plan to sample preselected sites was abandoned as the Aquastar detail pockmark plan map was in error with regard to the site locations on the dual side scan sonar records (see 75/AQ/07 Report 75/13). Geophysics lines were run across the area to locate pockmarks for sampling.

A major problem was that the ship failed to anchor in the very soft muds of the Witch Ground Beds, resulting in much time being taken in maneouvering both at anchor and while station keeping. This difficulty changed the emphasis from vibrocoring to gravity coring.

Sediment samples for gas analysis were taken from most of the cores collected. In some cases the suggested 5 - 7 minute time period between core acquisition and sampling was exceeded due to time required for deck handling procedures. The gas analyses are being performed by B.P. using a gas chromatograph and results are not yet available.

Vibrocorer samples were obtained from an area south of the Aquastar survey area and a six anchor spread was used because of the bad holding ground.

All samples were cut into 1 metre lengths and preliminary textural and engineering analysis carried out on board. Sub samples were taken for micropalaeontological examination, the results of which are not yet known.

	<u>No of Samples</u>
Vibrocorer	11
Gravity corer	37

M.V. WHITETHORN

CRUISE 75/WH/21

Wednesday 30th July 1975 Arrived Leith 1200 (18 hours ahead of schedule).
CSU I samples despatched to Leeds.

Thursday 31st July 1975 Mobilising equipment and Hifix for pockmark
coring. Decca unable to convert main chain
track plotter as planned. Replacement unit to
be made available in Aberdeen on 2nd August when
aerials will be tuned.

Friday 1st August 1975

1000 Departed Leith. Core storage drums not loaded.
R Owens, C Graham, J Lambert (EGU), P Hobbs
(EGU), G Peasley (student) aboard.

1145 Anchored in Kirkcaldy Bay for equipment testing.
Cable damage located on ORE pinger system. Sus-
pected paper feed fault on Giffit recorder (later
found to be programming and cleared).

1832 Anchors up geophysics equipment test run commenced.

2105 Departed for Aberdeen.

Saturday 2nd August 1975

0800 Docked in Aberdeen. Hifix track plotter fitted.
UDI repaired pinger cable fault (without charge).
Extra scrap material collected for dan buoy
mooring.
D A Ardus aboard.

1630 Departed for Forties.

Sunday 3rd August 1975

0530 Commenced referencing of Hifix at Forties Alpha
N and S danger buoys.
Aquastar detail pockmark plan found to be mis-
plotted.

0930 Proceeding to work area.

1130 Pinger deployed.

1425 Dan buoy launched but bottom weight sand into
mud on sea bed. Recovered and relaunched 1517.
Transit sonar deployed.

1645 Detail survey commenced using Atlas-Deso E/S,
transit sonar and pinger. Continued until 2230.
Returned to Hifix reference buoy at Greythorpe I.

Sunday 3rd August (cont)

During the day the main drill was fitted with a 800 ft. 18 mm. wire for Forties and Brent vibro-coring and new wire fitted to cargo winch for lifting the vibrocore foot.

Existing vibrocore cable is 250 m. on Ferris wheel. New BICC cable has been spliced on accessible end only.

New $\frac{1}{2}$ " wire to be fitted for gravity coring (18 mm. wire removed for the vibrocorer).

Monday 4th August 1975

- 0230 Proceeded to reference buoys at Forties Alpha as Hifix stability not certain and track plotter wandering.
- 0330 Advised by Captain that 1st Officer requires medical attention. Suggested he query availability of transport from Greythorpe I.
- 0530 Rendezvous with 'Highland Moon' and mate transferred.
- 0615 Commenced referencing of Hifix at Forties Alpha S.
- 0715 Reference completed at Forties Alpha S.
- 1130 Reference on dan buoy I (yellow).
- 1230 Dan buoy II (red) deployed. Commenced echo sounder survey and then detail traversing of individual pockmark.
- 1600 Commenced 2 point mooring. Anchors dragged and lifted.
- 1835 Commenced 3 point mooring. Anchors dragged and lifted.
- 2000 Platform put outboard for 20 ft. x 4" gravity coring. 1 x 20 ft. barrel modified to bolt to gravity core chassis in place of NX adaptor plate.
- 2130 Gravity core sample taken.
Proceeded to dan buoy on standby.

Tuesday 5th August 1975

- 0630 Referenced Hifix.
- 0715 Re-referenced ~~after~~ losing lock.
Track plotter continually loses position on pen pattern.
Commenced relocation of pockmark cored p.m. 4th. Not successful. Failure attributed to Hifix instability yesterday.

Tuesday 5th August (cont)

- 1030 Commenced location and cross traversing of suitable pockmark. Ship handling in rising wind made traverses difficult to control.
- ?1400 Commenced sampling with 20 ft. x 4" gravity corer. First sample (2 m. from 6 m. penetration) lost during vertical extrusion. Damaged sample retained c 1 m. in length.
- Unloading procedure modified to cope with this difficulty using winch to draw barrel gently to horizontal position. Several further attempts made to sample: all failed due to one or both of following: ship movement causing corer to fall over; inversion or non closure of catcher and loss of soft core material.
- Station location and keeping in force 5 proved extremely difficult with very poor Hifix repeatability.
- 1700 Proceeded to dan buoy to reference Hifix.
- 1900 Hifix referenced. Commenced pinger/echo sounder traverse southward from Witch Ground Beds (soft material) in attempt to locate pockmarks in Swatchway Beds.

Wednesday 6th August

- 0100 Terminated traverse.
- 0630 Commenced reference at South Forties Alpha, prior to locating pockmark.
- 0700 Traversing with pinger and echo sounder.
- 1730 Commenced gravity coring (20 ft. x 4") in pockmark in area of Witch Ground Beds shown as isolated patch (c 8 nm. north-west of Forties Alpha) on fishing charts. 1st core successful in centre, no recovery on second attempt and third attempt outside resulted in a bent barrel and a short core due to muddy sand at c 1 m. depth. Indication from this of reasonable chance of holding station at anchor.
- 2100 Proceeding to reference Hifix at North Forties Alpha, lane identification confirmed, its stability through day. Track plotter remains unstable, progressively losing position on pen tracking.

Thursday 7th August 1975

- 0630 Hifix re-referenced (36 lanes lost on pattern II through night). Proceeding to anchor at pockmark.
- 0912 New 1st mate aboard via rig boat.

Thursday 7th August (cont)

- 0958 At anchor. Gravity core taken and then vibro-coring commenced. 1st sample satisfactory, 2nd no penetration due to premature closing of gate.
- 2200 Remaining at anchor overnight.

Friday 8th August 1975

- 0700 Hifix checked out.
- 0730 Commenced vibrocoring. Full penetration on first sample but second sample equipment failure. Checking indicated potential jamming of eccentrics on vibrator motor or severe overloading on two phases with possible damage to windings. Vibrocorer transferred to hatch top and pot opened. Severe overheating evident and testing while open with heavier fuses fitted in control box blew umbilical/tail connection. Gravity coring commenced 1400 while investigation of damage and fitting of replacement tail continued.
- 1500 Vibrator motor failure confirmed. Replacement vibrator housing assembly arranged with assistance from BP operations manager via supply vessel ETA. Sunday a.m. out from Peterhead.
- 2140 Operations terminated remaining on anchor spread overnight.

Saturday 9th August 1975

- 0300 Logging and engineering tests completed.
- 0700 Hifix checked.
- 0730 Operations commenced.
- 0900 Commenced lifting anchors after pinger launched.
- 1000 Proceeding to Aquastar detail sampling area via North Forties Alpha reference buoy.
- 1500 One set of trawl floats recovered but both dan buoys stolen.
- 1500 Layed new dan buoy for Hifix reference then stern anchor (maximum fluke area) in attempt to yaw over pockmark. Manoeuvre unsuccessful, but large pockmark located.
- 1900 Anchor raised after trial to see if it would bite failed. Commenced gravity coring of pockmark.
- 2200 Sampling ceased.

Sunday 10th August 1975

Processing completed.

- 0600 Proceeding to rendezvous with "Oil Producer" to collect replacement vibrator housing.
- 1300 Housing aboard commence E/S pinger traverse en route to dan buoy.
- 1730 At dan buoy. Commence location of pockmark located yesterday.
- 2130 Re-referenced at buoy after unsuccessful location exercise. Vibrocorer ready to be returned to davit.

Monday 11th August 1975

- 0630 Reference Hifix on dan buoy. Pinger/echo sounder traverse commenced.
- 0730 Gravity coring commenced on pockmark.
- 1530 Coring terminated.
- 1600 Hifix referenced on dan buoy. Vibrocorer refitted to davit.
- 1730 Dan buoy recovered. Pinger/echo sounder traverse commenced.

Pockmark relocated near to southern boundary of Witch Ground Beds.
- 2100 Dan Buoy laid.
- 2130 At anchor for night.

Tuesday 12th August 1975

- 0130 Processing completed.
- 0730 Anchor up and laying anchor spread across pockmark.
- 1000 Testing vibrocore in mid-water while waiting for ship to settle.
- 1030 Relaying starboard bow anchor.
- 1530 Anchor lifted after repeated attempts to position vessel.
- 1620 Commenced laying of six point mooring. Aft anchors not holding well but adequate for vibro-coring.
- 1900 Commenced vibrocoring.
- 2200 Processing completed.

Wednesday 13th August 1975

- 0730 Vibrocoring commenced.
- 1030 Transfer of Hifix plotter to "Gardline Locator" by ship's boat. Second journey necessary to acquire Hifix/trackplotter wire due to incompatibility of plugs. Dobinson and Roberts transferred to "Whitethorn" to strip out this cabling.
- 2100 Vibrocoring stopped. Comparison of recovery between one barrel fitted with piston and one without showed significantly better performance from latter giving almost as much core as penetration. Last two sample stations cored with no pistons fitted and very good, equal recovery resulted. The unequal recovery at earlier stations may possibly be attributable to piston behaviour.
- 2115 Anchors being lifted.
- 2210 Lying to one tow anchor.

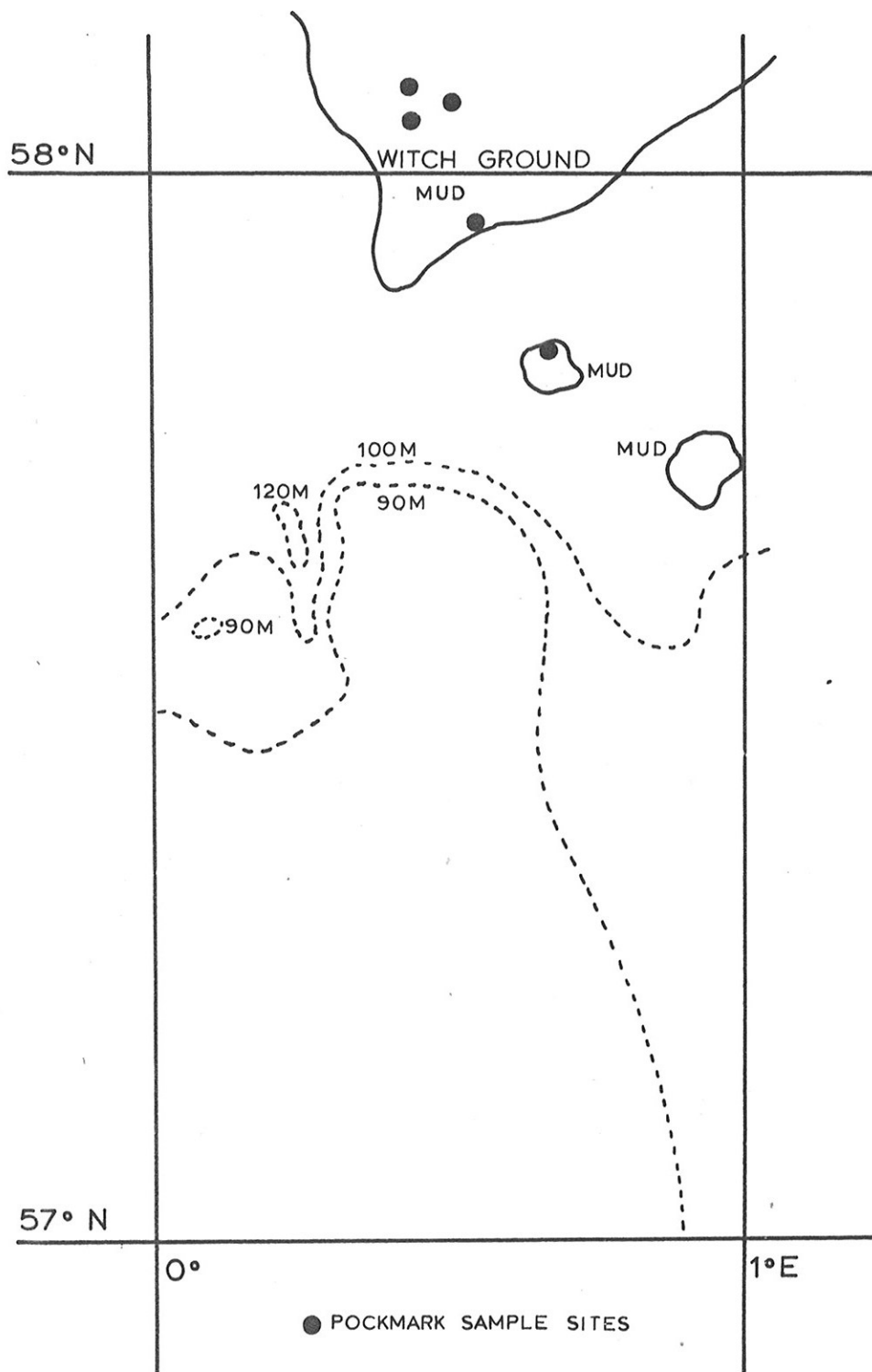
Thursday 14th August 1975

- 0730 Anchor up and Hifix referenced on dan buoy.
- 0850 Proceeding to active pockmark (advised by Aquatronics and confirmed by Locator) to carry out gravity coring. After bending barrels at the first two stations fitted 10 ft. x 4" in place of 20 ft. Pockmark yielded cores of silty mud with strong H₂S.
- 1845 Proceeding to Locator reference buoy to collect track plotter.
- 1920 Drill platform in board.
- 1980 Hifix referenced at buoy.
- 2100 Workboat despatched to Locator.
- 2130 En route for Aberdeen. ETA 0830 15th.
Plan to have sample of Swatchway Beds (south of the Witch Ground Beds in which all cores were taken) collected by Whitethorn en route to Brent after port call.

Friday 15th August 1975

- 1030 Aberdeen harbour.

POCKMARK LOCATION DIAGRAM



WHITETHORN 31 July - 15 Aug.