

# ALSF East Coast Regional Environmental Characterisation Cruise CEND 09/09 / BGS 2009/04

Marine Geosciences Internal Report IR/00/00



#### BRITISH GEOLOGICAL SURVEY

MARINE GEOSCIENCES INTERNAL REPORT IR/00/00

# ALSF East Coast Regional Environmental Characterisation Cruise CEND 09/09 / BGS 2009/04

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Edinburgh British Geological Survey 2009

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#### Front cover

Seabed image from site T1\_56

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### Foreword

This report provides information on the BGS 2009/04 / CEND 09/09 survey aboard the *R/V CEFAS Endeavour* which took place from the 18<sup>th</sup> May to the 14<sup>th</sup> June 2009 in an area located to the east of East Anglia. The cruise has been carried out under contract for the Aggregate Levy Sustainability Fund comprising the acquisition of ground-truthing data including vibrocore samples, clamshell grab samples,  $0.1m^2$  Hamon grab samples, 2m Jennings beam trawls and various camera techniques; and geophysical data including high-resolution multibeam echosounder and sidescan sonar data, as part of a Regional Environmental Characterisation. The sample sites were chosen based on data acquired on the BGS 2008/04 / CEND 18/08 geophysical survey which took place from the 27<sup>th</sup> September to the 30<sup>th</sup> October 2008. The survey was undertaken in joint collaboration between the British Geological Survey (BGS), the Centre for Ecology, Fisheries and Aquaculture Science (CEFAS) and Wessex Archaeology.

### Acknowledgements

The scientists and surveyors would like to express their gratitude to the crew and officers of the *R/V CEFAS Endeavour*.

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### 1 Introduction

The aims of the *R/V CEFAS Endeavour* 09/09 / BGS 2009/04 cruise were to acquire groundtruthing data; vibrocore, clamshell grab and  $0.1\text{m}^2$  Hamon grab samples, 2m Jennings beam trawls and various camera techniques; and acoustic data; multibeam echo-sounder and dual frequency/single range sidescan sonar, in the East Coast Regional Environmental Characterisation area. This is the second phase of data acquisition following on from the geophysical survey carried out on board the *R/V CEFAS Endeavour* in September and October of 2008 (Cefas 2009). The cruise was carried out under contract for the Aggregate Levy Sustainability Fund.

The East Coast Regional Environmental Characterisation (EC REC) area is approximately 3300km<sup>2</sup> and extends approximately 44km east of Ness Point. An acquisition programme of geophysical survey lines was undertaken in 2008 on board the *RV CEFAS Endeavour*. A total of 2514.9 line kilometres of sidescan sonar, multibeam echo-sounder, magnetometer and AGDS (acoustic ground discrimination system) data were acquired of which 2365.2 line kilometres included surface tow boomer data.

The *R/V CEFAS Endeavour* 09/09 / BGS 2009/04 ground-truthing cruise acquired a total of 225 seabed samples and cores, photographic stills of the seabed from 81 sample sites, and processed 125 2m-beam trawls on board the vessel. A total of 1194.27 line kilometres of high-resolution acoustic data were acquired. The survey was split into two legs. Leg A took place from the 18<sup>th</sup> to 24<sup>th</sup> May and primarily concentrated on geological and archaeological ground-truthing which involved the use of the BGS 6m Vibroocorer and Clamshell Grab. Leg B, which took place between the 24<sup>th</sup> May to 14<sup>th</sup> June, largely focused on biological ground-truthing, involving the use of the 0.1m<sup>2</sup> Hamon grab, 2m-beam trawl and various camera techniques. Both legs were very successful.

The geophysical and ground-truthing data were acquired to compliment existing data held by project partners and other organisations in order to map sea-bed morphology, fine-scale sediment structure, broader scale habitats and palaeo-landscapes. The combination of fine- and broad-scale mapping is necessary for integrating the relationship between geophysical, archaeological and morphological features and the context in which they are found.

### 2 Cruise Narrative

#### 2.1 MOBILISATION

### Monday 18<sup>th</sup> & Tuesday 19<sup>th</sup> May 2009

#### Alongside in Lowestoft

Equipment was transported from BGS Marine Operations, Loanhead to Lowestoft on two 40 feet articulated Lorries on the 17<sup>th</sup> May. BGS personnel joined the vessel on the evening of the 17<sup>th</sup> May in order to unload the equipment on the 18<sup>th</sup> May. The Lorries arrived dockside at 07.30 GMT and all equipment was unloaded and onboard the *R/V CEFAS Endeavour* by 15.00 GMT on the 18<sup>th</sup> May. The Safety briefing was undertaken at 07.00 GMT on the 18<sup>th</sup> May for BGS personnel and at 16.00 GMT on the 19<sup>th</sup> May for all other personnel. A toolbox talk for the vibrocorer and clamshell grab was undertaken 09.30 GMT on the 19<sup>th</sup> May, during which a wet test of the vibrocorer was undertaken in the harbour whilst alongside. Cefas equipment required for the second leg of the survey was also mobilised at this time. All personnel were onboard by 15.00 GMT, and the vessel left Lowestoft at 16.30 GMT on the 19<sup>th</sup> May.

#### 2.2 SURVEY

### Tuesday 19<sup>th</sup> – Saturday 23<sup>rd</sup> May

The vessel sailed at 16.30 GMT and proceeded directly to the first site, GEO28, arriving at 17.00 GMT. The clamshell grab was deployed successfully, followed by the first vibrocore. The vibrocore echo-sounder was giving erratic readings for penetration, so was re-targeted once back on deck. This sorted the problem, and data acquisition continued without further disruption for the remainder of the cruise leg.

All 30 of the top priority vibrocore and the 9 top priority clamshell grab sites were completed by 18.00 GMT on the  $22^{nd}$  May. The decision was taken to continue operations for a further 24 hour period during which time, the remaining second priority vibrocore and grab sample sites were completed.

#### Sunday 24th May

The pilot was booked for 07.30 GMT on the 24<sup>th</sup> May, and the vessel was tied up alongside by 08.30 GMT. BGS equipment was demobilised as much as possible while in transit. All BGS equipment was demobbed and loaded onto the lorries for transport north by 12.30 GMT. All vibrocore data was backed up.

N Campbell, M Wilson, D Baxter, L Baines and M Mowat departed the vessel at 16.15 GMT. J Crummy stayed on the vessel for the second leg of the survey.

The remainder of the equipment required for the second leg of the cruise was mobilised, and all personnel were on board by 19.00 GMT. A safety briefing was undertaken at 19.00 GMT for all personnel joining the ship. The vessel sailed at 20.00 GMT and proceeded directly to the first sample site, T1\_51 where a grab and a trawl were carried out.

#### Monday 25<sup>th</sup> May

#### **Data Acquisition / Downtime**

The second sample site, T1\_13, required the Camera Sledge,  $0.1m^2$  Hamon grab and the 2mbeam trawl. The Camera Sledge was deployed at 01:52 GMT. Visibility was very poor and it was decided to try another camera technique. The vessel was equipped with the Curtain Camera, the SPI-camera and the Ham-Cam. All 3 were deployed, and good quality images were acquired using the Curtain Camera, therefore the Curtain Camera was favoured for all sites requiring a camera tow.

Once all activities were completed it was discovered there was no Formaldehyde on board the vessel for the preservation of biological samples/specimens. At 10.00 GMT the vessel docked in Lowestoft to collect the Formaldehyde, and immediately sailed again, reaching the third sample site by 14.00 GMT. Data acquisition continued without further disruption.

### Tuesday 26<sup>th</sup> – Thursday 28<sup>th</sup> May

Data acquisition using a mixture of the 0.1m<sup>2</sup> Hamon grab, 2m Jennings beam trawl and the Curtain Camera continued. Visibility on the seabed cleared so a decision was made to try the Camera Sledge to acquire continuous video footage along the seabed. At 10.00 GMT on Thursday 28<sup>th</sup> May, the Curtain Camera and Camera Sledge were swapped over, and the Camera Sledge was deployed at site T1\_5 at 10.45 GMT. Visibility was good, with features on the seabed clearly visible. In light of this, the planned route was altered in order to acquire good video footage at all the sites furthest offshore where the probability of better visibility is highest.

### Friday 29<sup>th</sup> May

During the night of Thursday  $28^{th}$  the wind increased, causing visibility on the seabed to deteriorate. The Cameral Sledge was run at site T1\_70\_f, where visibility was very poor. This was in part due to the increased sea swell, and the location of the site being further inshore in shallower waters. During the tow, at 05.00 GMT, the Scientist-In-Charge made the decision to swap back over to the Curtain Camera for the remainder of the sites.

#### **Data Acquisition**

#### Data Acquisition

**Downtime/Data Acquisition** 

#### Alongside in Lowestoft

To compensate for the time needed to swap camera equipment, the vessel proceeded to site  $T1_{26}$ , where a grab and trawl were carried out. The vessel then continued on to  $T1_{77}$ , where the Curtain Camera was deployed at 07.15 GMT. During deployment it was noticed the cable had slackened and twisted around the winch drum, potentially damaging the cable. The Camera was recovered and the cable was unwound from the drum. No serious damage was caused to the cable, and it was wound back on the drum and operations continued at 11.30 GMT.

### Saturday 30<sup>th</sup> & Sunday 31<sup>st</sup> May

Data acquisition continued without further problems, and the Tranche 1 samples sites were completed by 16.00 GMT on Sunday  $31^{st}$  May. Testing of the Costerus Grab was then carried out in a selected area; 10 Costerous grab samples and 10  $0.1m^2$  Hamon grab samples were collected for comparison.

Once these were completed, the vessel steamed to the beginning of the Tranche 2 survey, which kicked off with a high resolution acoustic survey (HIRES\_1) in the south of the area.

#### Monday 1<sup>st</sup> June

The high resolution acoustic survey (HIRES\_1) started at 23.55 on Sunday  $31^{st}$  May and continued through Monday  $1^{st}$  June, finishing at 11.00 GMT. 10 lines of high resolution multibeam echo-sounder data were collected. On the first 2 lines, the sidescan sonar was deployed to check the fish and acquisition software.

At 11.47 GMT, the vessel arrived at the first sample site of Tranche 2, T2\_30, where samples were collected using the  $0.1m^2$  Hamon grab and the 2m-beam trawl. Ground-truthing data acquisition continued through the rest of the day.

#### Tuesday 2<sup>nd</sup> June

By 09.00 GMT, 15 of the Tranche 2 samples sites had been completed. The vessel transited to the start of the second high resolution acoustic survey areas, HIRES\_2, in the centre of the EC REC survey area. The first line was started at 09.54 GMT. By 18:00 GMT, all 11 survey lines were completed, and ground-truthing data acquisition continued on the Tranche 2 sample sites.

#### Wednesday 3<sup>rd</sup> to Saturday 8<sup>th</sup> June

The third high resolution acoustic survey, HIRES\_3, in the Northeast of the area, was started at 07.00 GMT on Wednesday 3<sup>rd</sup> June. Good quality data was acquired on all 8 survey lines. The survey was completed at 17.39 GMT, and the vessel transited to the start of the fourth high resolution acoustic survey area, HIRES\_4. The first line of the survey was started at 18.40 GMT, and continued through the night, finishing at 07.45 GMT on Thursday 4<sup>th</sup> June.

The vessel transited to site T2\_34, where the 2m-beam trawl was deployed to confirm the presence of a sustained Sabellaria reef. Once this was completed, the ship proceeded to the start of the fifth high resolution acoustic survey area, HIRES\_5. The survey commenced at 11.55 GMT and continued through the night into Friday 5<sup>th</sup> June, finishing 14.30 GMT. Good data was collected on all 26 survey lines.

Activities then continued on the Tranche 2 sample sites. Grab samples and trawl samples were collected at T2\_18, T2\_17 and T2\_32. This brought the ship to the start of the sixth high resolution acoustic survey, HIRES\_6. The survey started at 19.37 GMT on Friday 5<sup>th</sup> June. Good quality multibeam echo-sounder and sidescan sonar data was collected through the night on all 26 lines, and the survey was completed at 12.43 GMT on Saturday 6<sup>th</sup> June. Two more sites from Tranche 2, T2\_33 and T2\_19, were completed before commencing acoustic data acquisition on the last high resolution survey area of Tranche 2, HIRES\_7 at 19.58 GMT.

### Sunday 7th JuneData Acquisition/Acoustic/Archaeology Sampling

The HIRES\_7 acoustic survey was completed at 05.20 GMT on Sunday 7<sup>th</sup> June and the remaining 5 Tranche 2 samples sites were completed by 14.20 GMT.

## Data Acquisition/Acoustic

**Data Acquisition/Costerus Test** 

#### **Data Acquisition/Acoustic**

**Data Acquisition/Acoustic** 

From 15.27 GMT to 21.15 GMT, 30 grab samples were collected for Archaeological artefacts using the Costerus Grab. No artefacts were found, so 1 sample was targeted using the Scallop Dredge.

Once this was completed, the vessel proceeded to the first of the Tranche 3 sites, T3\_47, where a grab sample and trawl sample were collected. The vessel then proceeded to the start of the first of the Tranche 3 high resolution acoustic surveys, GRAV\_1.

### Monday 8<sup>th</sup> & Tuesday 9<sup>th</sup> June

The GRAV\_1 survey commenced at 00.05 GMT. Good quality sidecan sonar and multibeam echo-sounder data was collected along every other line giving complete sidescan sonar data coverage. This gave the option of returning to infill with the multibeam echo-sounder if time would allow. The survey was completed at 08.04 GMT, and data acquisition continued on the Tranche 3 sample sites.

### Wednesday 10<sup>th</sup> – Sunday 14<sup>th</sup> June

Data acquisition continued until 08.30 GMT when the vessel steamed to Yarmouth to meet the Pilot boat in order for Matt Curtis and Marta Perez-Fernandez to depart the vessel at 10.30 GMT.

Sampling continued at 10.43 GMT on the near-shore sample sites. At 13.34 GMT acoustic data acquisition started on the second of the Tranche 3 high resolution acoustic survey areas, GRAV\_2. 3 lines of data were acquired, finishing at 15.06 GMT. Data acquisition then continued on the sample sites.

By 12:11 GMT on Thursday 11<sup>th</sup> June, 63 of the Tranche 3 sample sites were completed, and the vessel proceeded to the start of the third high resolution acoustic survey, GRAV\_3. Good quality sidescan sonar and multibeam echo-sounder data were acquired on 28 lines, and the survey was finished at 09.45 GMT on Friday 12<sup>th</sup> June.

Activities continued on the remaining Tranche 3 sample sites. The GRAV\_4 high resolution acoustic survey lines were reached at 02.00 GMT on Saturday  $13^{th}$  June. The 3 survey lines were completed by 09.00 GMT, and the remaining 11 Tranche 3 sample sites were completed by 21.16 GMT. The vessel transited to the GRAV\_1 high resolution acoustic survey area to fill in the remaining lines with the multibeam echo-sounder. 4 extra lines were added to the acoustic survey, and were completed at 05.58 GMT on Sunday  $14^{th}$  June marking the end of this survey.

#### 2.3 **DEMOBILISATION**

#### Sunday 14<sup>th</sup> June

#### Transiting to Lowestoft/Alongside in Lowestoft

The survey was completed at 05.58 GMT, and the vessel proceeded to Lowestoft to meet the Pilot boat at 13.00 GMT. During the transit, as much equipment as possible was demobilised, and the labs and deck were cleaned thoroughly ready for the next cruise. All data was backed up on to the hard drive.

The vessel tied up alongside in Lowestoft at 12.30 GMT and all samples were unloaded by 15.00 GMT. Much of the equipment stayed on board for the next survey. All scientific personnel departed the vessel by 17.00 GMT.

### 3 Navigation

Navigation data was logged using the Tower CEMap navigation software which is linked directly into the ships positioning system; the Fugro Seastar Network positioning system. All data acquisition systems received time stamps from this navigation signal ensuring seamless positioning of all data types acquired during this cruise. The Fugro Seastar Network system

#### Acoustic/Data Acquisition

**Data Acquisition/Acoustic** 

calculates a virtual base station for the vessel location and does not use differential corrections from actual base stations. The GPS mask angle was  $5^{\circ}$ . All steering nodes (offsets, Table 1) were defined for the vessels central reference point (details of all offsets are in Appendix 6). The coordinate system used was WGS84 Zone 31N.

A gyro calibration was carried out on the 24<sup>th</sup> May 2006, the results of which can be found as Appendix 1 (page 48) in the CEND 07 08 Dogger Bank cruise report (Limpenny, 2008) which can be found on the BGS network (cruise folder: *NONBGS2008\_CEFAS\_CEND\_7\_08*).

Equipment	Steering Node
BGS 6m Vibrocorer	Stern gantry. Correction applied in real-time by Tower
BGS Clamshell Grab	Side gantry. Correction applied in real-time by Tower
Mini-Hamon Grab	Side gantry. Correction applied in real-time by Tower
2m-beam trawl	Stern gantry. Cable counter on winch. Correction applied in real- time by Tower
Camera	Stern gantry. Cable counter on winch. Correction applied in real- time by Tower
Sidescan Sonar	Stern gantry. Cable counter on winch. Automatically updated in Isis software.
Multibeam Echosounder	Drop keel reference point. Correction applied in real-time by acquisition software.

Table 1, List of equipment utilised during the cruise and which steering node each item utilised, for offsets from the steering node that need to be applied please see Appendix 6

#### 3.1 TOWER CEMAP NAVIGATION SOFTWARE

The Tower CEMap navigation software receives the navigation string from the ships positioning system. All offsets are calculated in Tower. This software was used to record fixes for all ground-truthing samples. At the start of the survey, the fix numbers were zeroed. In order to link the navigation data with the sampling activities, an incremental station number was recorded along with the fix number in Tower, and on the logs.

For the vibrocorer and grab samples, once the equipment was on the seabed a manual fix was taken in Tower and the latitude and longitude, water depth, date and time were recorded on log sheets. For the 2m-beam trawl, Tower was set up to automatically take a fix at a set distance or time. Initially it was set to fix every 100m, however this did not give the required number of fixes, so it was changed to fix every 300 seconds. The latitude, longitude, date and time was recorded for the start and end of line on log sheets. When the camera sledge was deployed, a manual fix was taken every 60 seconds, when a still photo was taken. For the curtain camera, a manual fix was taken every 25m. The fix number and time of each fix was recorded on a log sheet.

Every 3 or 4 days the Tower navigation file was downloaded and backed-up on the vessel's server.

## 4 Ground-truthing Survey Equipment

#### 4.1 BGS 6M VIBROCORER

The BGS 6m Vibrocorer is a steel open frame structure with electro-hydraulic winch retraction, seabed penetration monitoring unit and vibrator motor. The vibrocorer is 7.7m high with 5.5m span at the extremities of its feet, and weighs 4 tonnes. The vibrocorer is mobilised along with an 8' x 6'6'' x 6'6'' control cabin, and 7m x 1.2m x 1m core bench. The control cabin is connected to the vessel's power supply, and contains a 3phase electro-hydraulic power pack and PC which runs the vibrocoring software.

The Vibrocorer is deployed over the stern of the vessel. Once it is on the seabed, the vibrator motor is started and the core barrel penetrates the seabed. An echo-sounder monitors seabed penetration which is displayed in a time-depth graph on a monitor in the control cabin. Once either 6m depth has been reached, or the penetration curve levels off with time, the vibrator motor is stopped and the core barrel is retracted. The vibrocorer is then recovered on deck and the core barrel removed and carried to the core bench.



Figure 1, Recovering the vibrocorer



Figure 2, Removing the core liner from the core barrel

The core barrel is fitted with polycarbonate core liner with a diameter of 83mm. The core liner is removed from the core barrel and cut into 1m sections, measured from the top of the core. The ends are capped, taped with black electrical tape, and dipped in wax to seal. Different colour end caps are used; yellow for the top of the core and black for the base. The individual cores are labelled with the sample number and the number of sections.

The cores will be cut horizontally and processed at the Wessex Archaeology laboratory postcruise.

#### 4.2 CLAMSHELL GRAB

The BGS Clamshell grab is a hydraulically operated industrial 'hopper type' grab with a 340 litre capacity. The system uses a combination of high voltage electricity (415Volts) and high pressure hydraulics (200bar). The grab system requires a handling device ('A' frame, Gantry, Davit, Hiab or similar) with a minimum safe working load of 1000kgs at whatever reach is required to operate from the vessel. The grab is hydraulically powered from its own 3phase electro-hydraulic power pack.

The clamshell grab was deployed off the starboard side. Once on the seabed, the grab is closed hydraulically, penetrating the seabed sediments. The grab is then recovered on deck.



Figure 3, Recovering the Clamshell Grab

The sample was emptied out into a 2m x 1m stainless steel tray where it was mixed and subsampled; one 20 litre sample for Wessex Archaeology, one 20 litre sample for ALSF, one 10 litre sample for CEFAS for particle size analysis, and BGS collected a 1lb jar sample for archive.

Once the sub-samples had been collected, the remainder of the sample was sieved by the watch Archaeologist for any artefacts, which may be present.



Figure 4, Clamshell grab sample

#### 4.3 0.1M<sup>2</sup> HAMON GRAB

During Leg B of the survey, seabed samples were collected using the Cefas  $0.1m^2$  Hamon grab. The  $0.1m^2$  Hamon grab is an effective sampler of coarse sediments for the analysis of benthic macrofauna and particle size distribution.

The grab consists of a rectangular frame forming a stable support for a sampling bucket attached to a pivoted arm. On reaching the seabed, tension in the wire is released which activates the grab. Tension in the wire during in-hauling then moves the pivoted arm through 90 degreees, driving the bucket through the sediment. The bucket stops against an inclined rubber-covered steel plate, which completely seals it, preventing any washout of sample material. The grab samples an area of  $0.1m^2$  and penetrates up to 0.15m into the seabed. The maximum sample volume is 12 litres.

Once on deck the sample was collected in a 70 litre container and carried over to the processing area. Here, the sample was photographed and the volume measured. A representative 0.5 litre sub-sample was collected for particle size analysis, and the remaining sample was sieved in 5mm and 1mm square mesh. The retained fauna and residual sediment was collected in a suitable container and preserved in a 10% formaldehyde solution.

#### 4.4 2-METRE JENNINGS BEAM TRAWL

Epibenthic megafauna samples were collected using a 2m-beam trawl, and the samples used in conjunction with the  $0.1m^2$  Hamon grab to assess marine benthos. The gear comprises a heavyduty steel beam, a chain mat to prevent the collection of large boulders, and chafers to limit net damage. A 4mm knotless mesh liner is used in the cod-end to retain smaller organisms.

The Cefas 2m-beam trawl is deployed from the vessel's stern with the amount of warp paid out being roughly three times the water depth. Tow distance was 500m for all trawls and vessel speed was kept between 1 and 1.5 knots.

Figure 5, Recovering the 2m-beam trawl

Once on deck, the net was emptied into 70 litre containers and carried over to the processing area of the vessel. Here, the catch was photographed, the volume measured, and sorted to obtain abundance data for each taxa in the catch. In some instances where there were highly numerous

species in a catch, sub-sampling of the catch was carried out. This was done by fully sorting one or more sub-samples of known volume until the cumulative numbers of individuals exceeded 100. The total abundance of the species in question was then accurately estimated by dividing the cumulative number by the sub-sample volume, then multiplying that number by the total volume of the catch. Once the highly numerous species was sub-sampled, the remainder of the catch was sorted for all other species.



Figure 6, Sorting the catch from the 2mbeam trawl

#### 4.5 COSTERUS GRAB

The Costerus grab is a pneumatically operated twin grab. It is operated using a 12 litre SCUBA cylinder pressurised to 50 Bar, fixed to the inside of the grab. The Costerus grabs design is based on the Hamon grab; however it has 2 sample buckets with a maximum sample volume of 12 litres for each bucket.

The grab consists of a square frame forming a stable support for 2 sampling buckets attached to pistons. Once on the seabed the tension in the winch wire is released, which releases the compressed air firing the pistons. This drives the buckets through the sediment. The buckets stop against an inclined rubber-covered steel plate which completely seals them, preventing any washout of sample material.

Once on deck the samples were collected in 70 litre containers and carried over to the processing area. Here, the sample was photographed and the volume measured. A representative 0.5 litre sub-sample was collected for particle size analysis from one of the samples, and the other sample was sieved in 5mm and 1mm square mesh. The retained fauna and residual sediment was collected in a suitable container and preserved in a 10% formaldehyde solution for biological analysis post-cruise.

#### 4.6 CAMERA EQUIPMENT

High quality video and stills images were required to interpret benthic habitats, including identifying epifauna and sediments. The EC REC area has potentially high tidal rates and difficult visibility therefore the principal gear used was the water curtain camera set up as drop camera which was transited in a series of dropdown locations. Where possible the camera sledge

was towed to identify the putative borders of acoustic areas. Further options included the Video grab (Ham-Cam) and Sediment Profile Imager (SPI). All equipment are depth rated to at least 100 metres, however normal operation depths were between 20 and 55 metres.

#### 4.6.1 Curtain Camera

The Curtain Camera consists of a high resolution digital video/stills camera, Kongsberg OE14-208, mounted vertically in a square steel frame. A  $1m^3$  fresh-water tank with a Perspex base is mounted in the frame which sits on 4 legs approximately 0.3m off the bottom. The camera looks vertically downwards through the tank, giving a clear image of the seabed. A dual LED (Seatronics SeaLED) lighting set up provides even 'white natural' lighting over the camera scene. Still shots are taken from the surface control unit. There is a remote focus and zoom facility on the video camera.



Figure 7, Curtain Camera

Positional data is fed into the Cefas developed video overlay. The vessel's position is logged to a separate data file at set intervals or by manual fix using the Tower CEMap system. The internal camera clock is synchronised with the GPS clock on the video overlay, so that the time-stamp on still images reflect the time-stamp on the video.

The Curtain Camera was deployed from the stern gantry. Video was taken of the seabed, and once the Curtain Camera was on the seabed, a still image was taken. Once the image was taken the Curtain Camera was lifted clear of the seabed, and the vessel moved 25m along a 250m tow line, where another image was taken. In areas where specific features were being targeted the spacing was adjusted according to conditions but typically between 5 and 10 metres.

#### 4.6.2 Camera Sledge

The sledge is an alloy frame, 2.5m x 1.5m x 1.5m, which is configured with an oblique, forwardfacing high resolution digital video/stills camera; Kongsberg OE14-208. A four LED (Seatronics SeaLED) lighting set up provides even 'white natural' lighting over the camera scene. The camera is operated remotely as described above, however the sledge camera obtains continuous video footage. The camera is fitted with a laser spot scaling system.

The Sledge Camera was deployed from the stern gantry, and once on the seabed, video data was recorded. The vessel moved along a 250m line at approximately 0.5 knotts, and still images were taken every 60 seconds.

#### 4.6.3 Ham-Cam

The Cefas Ham-Cam consists of a miniature video camera (Bowtech), mounted in the Hamon grab frame so it looks vertically downwards. A single LED (Seatronics SeaLED) lighting set up provides even 'white natural' lighting over the camera scene. The same system is shared with the Curtain Camera but the Ham-Cam has no stills capability.

The Ham-Cam was deployed from the side gantry, and as with the Curtain Camera, video footage was recorded of the seabed every 25m along a 250m line. In areas where specific features were being targeted the spacing was adjusted according to conditions but typically between 5 and 10 metres.

#### 4.6.4 SPI Camera

The Sediment Profile Imager (SPI) is operated in a similar way to the Curtain camera in a series of dropdown transects. The camera sits in a frame which is lowered over the side gantry to the seabed. Once on the seabed, a switch is activated which allows the camera to slide down the frame and penetrate the sediments. A still image is taken of the profile of the sediments, which is downloaded from the camera when it is recovered back on deck.





## 5 Geophysical Survey Equipment

#### 5.1 MULTIBEAM ECHO-SOUNDER

The *R/V CEFAS Endeavour* is fitted was a Kongsberg EM3002D swathe bathymetry system with data acquisition using the Kongsberg SIS multibeam acquisition software. The operating frequency for the system is 300kHz. QC of data were carried out during and following acquisition. All real-time data were monitored closely by surveyors.

The multibeam echo-sounder heads and sound velocity meter were mounted on a retractable blade which reduces noise caused by bubble blowdown and wave blanking around the hulls immediate interface with the water. The blades place the heads approximately 3.2m below the vessel hull. Sound velocity at the heads was measured using a Reson sound velocity meter. Measurements are filtered over a 60 second period and applied in real-time in the Kongsberg SIS multibeam acquisition software. Real-time sound velocity measurements ensure appropriate corrections are applied for beam-forming at the multibeam echo-sounder heads. The blade is lowered to 2m as surveyed, and fixed at calibration check time during voyage.

Vessel draft is measured by Druck PTX 1830 Depth/Level sensor (SN2069034) located in the blade space. The sensor which resolves draft to millimetres is connected via a 4-20mA current loop to the shipboard logging system and is logged with the navigation and parametric data in the general log file. It is also displayed in real-time on the logging displays as waterline level (distance between MRU and waterline as defined by Kongsberg SIS multibeam acquisition package). Readings are made when the vessel is stationary in the water to eliminate any offsets introduced through water suck down within the blade space whilst underway. The vessel draft is applied in the Kongsberg SIS software at the start of survey, where appropriate the change in vessel draft over time is applied as a "delta draft" during multibeam post processing in CARIS.

The multibeam echo-sounder data acquired during this cruise will be processed by BGS staff post-cruise and supplied to all partners once the processing is completed. Good quality data were obtained.

#### 5.2 BENTHOS SIS1624 DUAL-FREQUENCY SIDESCAN SONAR

The sidescan sonar data were collected using a Benthos 1624 dual-frequency system and the TEI ISIS software package. The two frequencies acquired were 100 and 400 kHz. Data displayed in realtime ISIS where it was monitored by shipboard engineers and scientists. All data were stored electronically in .xtf format.

QC and post processing of data were carried out during and post acquisition. Sidescan sonar data were reviewed at frequent intervals with respect to quality, resolution and spatial coverage to ensure that the acquisition programme would provide adequate data to meet the objectives of the survey. QC of the data will be carried out by Cefas staff post-cruise and supplied to all partners once the processing is completed. Good quality data were obtained.

### 6 Ground-truthing Survey Leg A

Leg A of the survey was carried out between Monday 18<sup>th</sup> May and Sunday 24<sup>th</sup> May. This leg concentrated on geological and archaeological ground-truthing in the East Coast Regional Environmental Characterisation area.

During this leg, 38 vibrocores and 19 grab samples were collected. Figure 9 in Appendix 1 shows the location of all sample sites from Leg A, while Table 2 shows the location and description of the vibrocores, as well as the targeted depth and feature, and Table 3 shows the same information for the clamshell grab samples.

At each sample site, 2 vibrocores were collected; 1 with clear core liner and 1 with black core liner. Cores were collected with black core liner for Optical Spectrum Luminescence in order to date the sediments.

The vibrocores will be sent to Wessex Archaeology where they will be cut horizontally and logged. Carol Cotterill (BGS) will be working with Wessex Archaeology on this.

The sub-samples collected from the Clamshell grab samples will be sent to Wessex Archaeology for processing and archiving, and to Cefas for particle size analysis.

#### 6.1 SURVEYING METHOD

At sample sites where both Clamshell grab samples and vibrocores were collected, the Clamshell grab was deployed first. On all vibrocore sites, a core was taken with the clear core liner first, and then the black core liner. This enabled us to gauge recovery to aid in cutting the black core liner into 1m length, or less, sections.

If no sample was recovered, the equipment was re-deployed for a second attempt.

Geological descriptions were recorded for all the Clamshell grab samples and the vibrocores. Only the vibrocores collected in the clear liner were logged. A smear was taken from the top of each metre length section, which were looked at under a microscope and described. The clear core liner enabled geologists to look for any sediment boundaries or structure along the core. Digital geological logs were produced in Strater (Appendix 3).

#### 6.2 SAMPLE SITE SELECTION

Sample sites were selected based on data acquired on the 2008 Geophysical survey. The BGS selected a total of 53 potential sample sites through analysis of all the seismic reflection Boomer data collected. The sites were chosen based on:

- Geological / Geomorphological interest;
- Geographical spread across the survey area to enable accurate ground-truthing of a range of sites;
- Potential penetration depths based on sediment type;
- Uniqueness of sub-surface features within the survey area.

Once chosen, the sites were ranked according to priority -15 low, 13 medium and 25 high - based on:

- Depth of target and possible penetration expected;
- Sediment and bedform distribution (e.g. proximity to large sandwaves may prevent coring of the feature of the vibrocore accidentally hits a sandwave crestline);
- Quality of the feature (a number of similar features were chosen, such as formation boundaries near sea bed, and the best example was ranked the highest).

Wessex Archaeology selected 30 vibrocore sample sites and 9 clamshell grab sample sites based on the seismic reflection Boomer data, high resolution multibeam echo-sounder data, sidescan sonar data and the magnetometer data collected. Formations and features targeted for archaeological interest were:

- Channels and associated fills;
- Edges of channels;
- Evidence of peat;
- Ravinement surfaces;
- Submerged channels.

Again these were ranked according to priority based on depth of the target and the quality of the feature.

Once both parties had selected their sites, a list of 30 sample sites and 10 reserve sites were chosen for the survey (Table 2, Appendix 1). The sample site locations were checked against the locations of underwater cables and pipelines. A 250m buffer around the cables and pipelines was required for sampling activities. Three sample sites had to be moved a short distance to outside the buffer zone, and two sites were discarded and replaced by the first two sample sites from the reserve list.

A total of 19 Clamshell grab sample sites were chosen based on their geological value in assessing the seabed sediment type, and the above formations and features targeted for archaeological interest (Table 3, Appendix 1).

#### 6.3 SAMPLE NUMBERING SCHEME

Planned sample sites were numbered incrementally with a prefix of 'VC' for vibrocore sites, 'VCR' for vibrocore reserve sites and 'CG' for Clamshell grab sites. During the survey, sample sites were numbered incrementally with a prefix of 'GEO' (Tables 2 & 3, Appendix 1)). Each sampling activity was logged with a Station Number; an incremental number used throughout both legs of the survey. This linked the activity to the fix location in the Tower navigation software.

At all vibrocore sites, where 2 cores were collected, the cores were labelled with the 'GEO' number and the 'VC' number followed by 'C' for clear, and 'B' for black.

BGS used their own unique numbering scheme to enter the sample metadata into the BGS database. The BGS numbering scheme uses the degree square of the latitude and longitude the sample site lies within which is defined by the co-ordinates for the south-west corner, and an incremental number for that degree square, i.e. +52+02/12. For this survey, all samples were in the +52+01 and +52+02 degree squares. This numbering scheme was used for BGS use only.

## 7 Ground-truthing Survey Leg B

The second leg of the survey took place between Sunday 24<sup>th</sup> May and Sunday 14<sup>th</sup> June 2009. This part of the survey concentrated on biological ground-truthing which involved the acquisition of seabed grab samples using the 0.1m<sup>2</sup> Hamon grab, epibenthic megafauna using the 2m-beam trawl, and photographic still and video data using various camera equipment.

During this leg, a total of 168 grab samples were acquired, 125 trawls were processed on board, and photographic stills were collected from 81 sites.

In order to guarantee geographic spatial coverage in the event of downtime, the survey was divided into three tranches. Tranche 1 consisted of 79 sample sites which included; 61 grab samples, 61 trawls and 52 camera tows (Table 4, Appendix 2). Tranche 1 was completed on Sunday 31<sup>st</sup> May. Figure 10 (Appendix 2) shows the location of the Tranche 1 sample sites.

Tranche 2 consisted of 34 sites, and 7 high resolution acoustic survey areas. Of the 34 sample sites, 1 was a grab, trawl and camera tow site, 1 was a trawl only site, and the remaining 32 were grab and trawl sites. Tranche 2 was completed on Sunday  $6^{th}$  June. Figure 11 (Appendix 2) shows the location of the Tranche 2 sample sites and survey areas.

Tranche 3 consisted of 112 sample sites from which 64 Hamon grab samples and 30 Costerus grab samples were collected, 33 trawls were processed, and photograph and video images were collected from 28 sites. Multibeam echo-sounder and sidescan sonar data were collected from 4 high-resolution acoustic survey areas. Figure 12 (Appendix 2) shows the location of the Tranche 3 sample sites and survey areas.

Grab samples were collected using the  $0.1m^2$  Hamon grab, and were sub-sampled for particle size analysis and faunal abundance. The 2m-beam trawls were processed on board the vessel. Species were counted and the abundances recorded in an excel spreadsheet. The 2m-beam trawl samples were used in conjunction with the Hamon grab samples to assess marine benthos.

Photographic and video data were acquired using both the Camera Sledge and the Curtain Camera. The Camera Sledge generally gave poor results as visibility on the seabed was poor; therefore the Curtain Camera was used for the majority of sites.

#### 7.1 SURVEYING METHOD

At the beginning of each Tranche, all the sample sites were entered into the Tower navigation software.

At sample sites where grab, trawl and camera data were required, the Camera equipment was deployed first. The procedure followed MESH guidelines. Data was collected from camera tows of 250m. Photographic stills were taken every 60 seconds when using the Camera Sledge and every 25m when using the Curtain Camera and Ham-Cam. In areas where specific features were being targeted the spacing was adjusted according to conditions but typically between 5 and 10 metres. Once recovered on deck, a grab sample was collected using the Hamon grab. The sample was collected within 50m of the specified sample station. Once a sample had been successfully recovered, the 2m-beam trawl was deployed over a distance of 500m.

At sample sites where grab and trawl data were required, the grab was generally deployed first.

If no sample or a poor sample was recovered (<5 litres), an additional 2 drops were carried out. Where none of the 3 samples achieved a volume of 5 litres, the largest sample was processed in order to characterise the site.

On all the high resolution acoustic surveys, the lines requiring sidescan sonar data acquisition were run first. The sidescan sonar data coverage was approximately 400m and the multibeam echo-sounder data coverage was approximately 200m, therefore sidescan sonar data was generally acquired on alternate lines. Once the sidescan sonar data had been collected, the fish was recovered on deck, and the remaining survey lines were completed with the multibeam echo-sounder.

#### 7.2 SAMPLE SITE SELECTION

In order to characterise the EC REC area a set of regional maps were produced by Envision and Cefas. The Envision map was based on singlebeam bathymetry and segmented the region into a set of morphological strata. The Cefas map was based on sidescan sonar data and classified the area based on acoustic properties. By combining the two maps a set of 56 samples, which was representative of the combined strata were initially chosen. The frequency of samples were weighted based on the areal extent of the strata with larger and less homogenous strata having more samples than smaller and more homogenous strata. There were a further five sites chosen from inspection of the multibeam echo-sounder data and sidescan sonar data and represent sites that would appear to be unusual in terms of fine scale topography and texture, possibly indicating biogenic activity. These 61 sample sites were ranked priority 1 and made up the first Tranche of this leg of the survey.

Further second and third priority sites were selected partly to reinforce the primary sites with additional samples. However, an emphasis was placed on areas of backscatter heterogeneity. These sample sites made up Tranche 2 and 3 of the survey.

#### 7.3 SAMPLE NUMBERING SCHEME

All sample sites were labelled with the numbering scheme adopted in the planning stages of the survey. Sample sites from Tranche 1 were labelled with an incremental number and pre-fixed with 'T1'. Sample site numbers from Tranche 2 were pre-fixed with 'T2', and sample site numbers from Tranche 3 were pre-fixed with 'T3'.

Individual sampling activities were assigned an incremental Station Number, which linked the activity to the fix location in the Tower navigation software.

#### 7.4 LINE NUMBERING SCHEME

The Tranche 2 high resolution acoustic surveys were labelled HIRES\_1 to HIRES\_7. Lines were numbered sequentially, pre-fixed with the survey name, i.e. HIRES1\_1.

The Tranche 3 surveys were labelled GRAV\_1 to GRAV\_4, and the lines were numbered sequentially pre-fixed with the survey name.

### 8 High Resolution Acoustic Survey

During Tranche 2 and Tranche 3, 11 high resolution acoustic surveys were carried out, totalling 1194.27 line kilometres of which 698.45 line kilometres included sidescan sonar data. Multibeam echo-sounder data was acquired on all survey lines. The survey areas were selected based on ground-truthing data from Tranche 1 and acoustic data collected during the 2008 EC REC Geophysical survey.

On all survey lines, good quality multibeam echo-sounder data was acquired. A CTD cast was carried out at the beginning of each survey in order to apply an accurate sound velocity profile to the data. The multibeam echo-sounder data will be processed by the BGS and circulated to all partners in due course.

Good quality sidescan sonar data was collected on each of the survey areas. Sidescan sonar data was processed by CEFAS on board. QC of the data will be carried out by Cefas staff post-cruise and supplied to all partners once the processing is completed.

### 9 Costerus Grab Trial

The design of the Costerus Twin Grab was funded by ALSF, and is based on the Hamon grab. It has previously been tested in soft sediments; however no comparison with the Hamon grab had been carried out. This survey presented an ideal opportunity to test the Costerus grab against the Hamon grab. A total of 20 sample sites; 10 Costerus and 10 Hamon grab sites, were randomly selected in a 200m x 200m area of gravel.

A sub-sample was collected for particle size analysis from the Hamon grab sample and the rest was sieved and the retained fauna and residual sediment was collected for biological analysis. A sub-sample was collected from one of the samples from the Costerus grab for particle size analysis, and the other sample was sieved and the retained fauna and residual sediment was collected for biological analysis.

Adequate samples were collected from each grab site. A comparison will be carried out on the particle size and biological analyses.

### 10 Archaeological Sampling

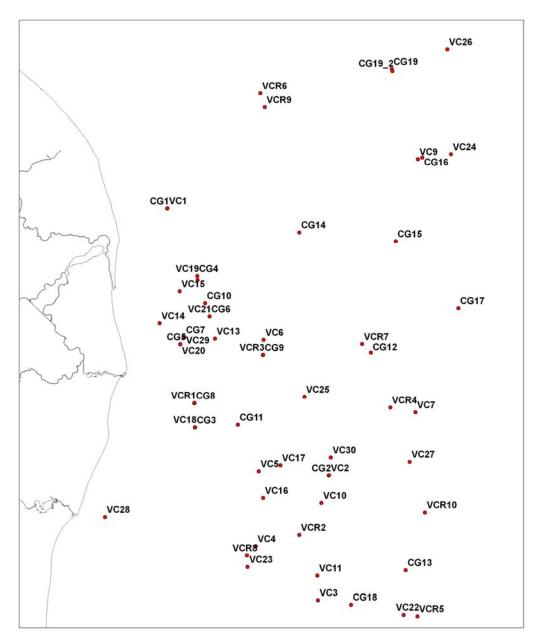
During Leg A of the survey, a piece of worked flint was discovered in a Clamshell grab sample, GEO18 (Figure 12, ARCH 01 area). Based on this, 30 grab samples were collected using the Costerus Twin grab in an area of 550m x 1250m, around the GEO18 sample site. The samples were sieved in the 5mm square mesh. No archaeological artefacts were found.

## 11 Health & Safety

The health and safety guidance for this cruise was written and approved by BGS prior to operations being undertaken (Campbell, 2009). All BGS personnel read the H&S document and signed the confirmation sheet. There was no separate CEFAS health and safety document that BGS personnel were asked to read.

All BGS personnel attended a safety briefing on Monday 18<sup>th</sup> May 2009. CEFAS personnel who had not sailed on the *R/V CEFAS Endeavour* within the last 6 months and Wessex Archaeology personnel attended a safety briefing on Tuesday 19<sup>th</sup> May prior to sailing. Following the crew change on Sunday 24<sup>th</sup> May, a safety briefing was carried out for all new members of survey. A muster was carried out at 16.00 GMT on Friday 29<sup>th</sup> May for all personnel. Personnel were required to gather at the muster station and don lifejackets. A second muster was carried out on Tuesday 9<sup>th</sup> June at 16.00 GMT. All personnel were required to gather at the muster station and a fire drill and casualty evacuation drill were carried out.

All staff recovering and deploying equipment at the stern of the vessel were required to wear lifejackets, as per the vessel regulations.



Appendix 1 Leg A Groundtruthing

Figure 9, Map showing Leg A sample site locations

GEO number	VC number	Latitude	Longitude	Target Depth	Target	Cored Depth	Description
GEO1	VC1	52 39.770 N	1 49.935 E	4.5m	Cross Sands Anomaly - possible Swarte Bank Formation	1.6	Gravelly muddy sand, orangey brown in colour which gradually changes to grey coarse sand. Contains pebbles and shell fragments. From 0.3m, medium grey sand with shell fragments (~5%) becoming finer towards base of core
GEO2	VC2	52 21.809 N	2 08.290 E	5m	Causeway Anomalies. Target area just off one of the anomalies - MBES suggests causeway may have outcropping rock	1.64	Medium-coarse sand, lightish brown, no shell fragments. Distinct boundary at 0.88m into coarser gravelly sand. More greyish brown in colour. Contains shell fragments (~7%). At base of core, fine-medium sand with shells to 40mm. Orangey brown colour.
GEO3	VC3	52 13.344 N	2 7.214 E	4.5m	Discrete sediment lens following the topography of the present day seafloor. Unusual seismic signature compared to the surrounding sediments.	3.95	Fairly homogenous dark grey sand mud. Very fine grained/silty. Some silt horizons interbedded with sandier mud. Bioturbation. Well sorted. Very dry.
GEO4	VC4	52 16.912 N	2 00.298 E	5.0m	Edge of a broad channel feature. Onlap of channel fill onto older sediments.	3.61	Fairly homogeneous grey/green sandy mud. Very well sorted. Sandier horizons throughout. Anoxic lenses at about 3.2m. Gravel up to 15mm at seabed.
GEO5	VC5	52 22.016 N	2 00.506 E	5.0m	Sub-surface erosional surface with onlap of younger sediments - formation boundary?	1.67	Grey/brown medium grained muddy sand, moderately sorted, no shell material.
GEO6	VC6	52 30.942 N	2 00.848 E	4.5m	Inclined reflector coming ro near surface with near horizontal onlapping reflectors beneath.	2.43	Fairly homogeneous sandy mud, dark grey colour. Shoe - Very dry dark grey sandy mud as rest of core but contains shell fragments (~3%).
GEO7	VC7	52 26.132 N	2 17.756 E	4.5m	Topographic high showing internal structure.	2.09	Gravelly muddy sand, orangey brown colour, coarse grains, moderately sorted with shell fragments up to 20mm. Becomes finer grained and very well sorted at ~1m, before becoming coarser again at the base of the core.
GEO8	VC9	52 43.313 N	2 17.750 E	5.0m	Internal dipping reflectors within sandwave - best example of internal geometry	5.2	Fine grained slightly muddy sand down to 1.5m then gradual change into dark grey muddy sand which becomes very dark, almost black towards base of core. Metallic smell to very black sediment at base of core.
GEO9	VC11	52 14.988N	2 7.129E	4.5m	Large channel - like feature containing present day topographic high. Possible formation boundary coming to near surface. Evidence of a secondary erosional surface	2.82	Coarse gravelly sand with abundant shell fragments and complete shells, down to 0.2m. Grey medium grained sand, very well sorted. No obvious structure. Becoming darker grey finer grained sand towards base.
GEO10	VC13	52 30.983 N	1 55.450 E	5m	Discrete sediment lens at the base of a channel- like feature, mirrored by present day topography	2.62	Medium-coarse grained sand, reddish brown colour, shell fragments, ~1%, maximum 10mm in size. At 0.3m changes to medium grained muddy sand, grey in colour with darker patches. Stiff to touch - clay matrix

Table 2, Vibrocore sample sites and core descriptions

GEO11	VC14	52 31.972 N	1 49.286 E	5m	Strong sub-surface horizon within a topographic bank feature. Evidence of multiple internal reflectors - only example of this kind	2.46	Fine grained grey/brown sand. Well sorted. Contains small % shell fragments. Colour variations through core - layers grey and bown sand.
GEO12	VC15	51 34.160 N	1 51.457 E	5m	Inclined horizons coming to near surface with overlying near horizontal reflectors - laterally variable in extent	0.78	Grey muddy sand, fine grained, watery. Well sorted. Top 0.12m is slightly gravelly coarse sand, poorly sorted, contains shell fragments up to 3mm.
GEO13	VC16	52 20.204 N	2 01.033 E	5.0m	Sub-surface mound-like feature with a different acoustic signature beneath it	1.46	Muddy sand, grey in colour, fine grained. Poorly sorted with up to 40% shell material. Shell material disappears towards base of core.
GEO14	VC17	52 22.451 N	2 02.886 E	5-6m	Sub-surface topographic high with moat like features on either side. Higher internal reflectors	2.48	Coarse sandy gravelly mud, very poorly sorted. Contains shell fragments (low percentage). Gradually changes at ~1m to dark grey sandy mud, very fine to fine grained. Very watery.
GEO15	VC18	52 24.939 N	1 53.405 E	4.5m	Cut into Westkappelle Ground Formation. Yarmouth Roads or Brown Bank fill? Within southern extent of possible remnant channel	2.25	Sandy mud, very fine grained, poorly sorted becoming coarser downhole. Gravelly sand with shell and clasts up to 4mm at base.
GEO16	VC19	52 35.213 N	1 53.390 E	3m	Small channel cut into bank feature - fine grained sediment unit?	3.13	At seabed, gravel clasts up to 20mm, angular and shell fragments up to 35mm. Dark grey sandy mud, soft to touch, very fine grained, well sorted. Becomes lighter grey and coarser downhole, with increasing % shell material. At base, coarse gravelly sand with ~5% shell material. Clasts up to 10mm.
GEO17	VC20	52 30.547 N	1 51.602 E	5.0m	Holocene overlying fill. Fill possibly associated with submerged channel	1.03	Gradual change from ~0.3m from reddish brown coarse sand with ~3% shell fragments to a brown/grey very coarse sand with abundant shell fragments (~20%) and gravel clasts up to ~1cm. Very dark patch about 5cm wide at 0.35m.
GEO18	VC21	52 32.489 N	1 54.821 E	4.5m	Minor cut within Area 240. Unknown fill.	0.64	Coarse gravelly sand, light brown. Moderately sorted. No shell fragments. From ~0.3m gets more gravelly with clasts up to 1cm.
GEO19	VC22	52 12.436 N	2 16.669 E	4.5m	V-shaped cut and fill. Fill acoustically transparent. Possible fine-grained sediments	1.56	Very coarse sand, moderately-poorly sorted. Shell fragments to 12mm, clasts up to 2mm. Around a 0.1m wide horizon rich in shell material (~50%) at 0.25m depth.
GEO20	VC23	52 15.507 N	1 59.420 E	4.5m	Sediment unit (?Brown Bank) cutting into 2 earlier units.	2.61	Brownish grey gravelly muddy sand, coarse grained with gravel clasts up to 2cm. Very poorly sorted. Contains shell fragments (~5%). From ~1m, fairly homogenous dark grey clay with rare shell fragments, well compacted, well sorted. At base of core, coarse muddy sand, poorly sorted with ~5% shell fragments.
GEO21	VC24	52 43.675 N	2 21.444 E	5.0m	Complex sediment unit. Layers of sands and gravels?	3.35	Coarse grained sand. Very dark grey/black down to 0.80m, then quite sharp change to grey/brown colour.
GEO22	VC25	52 27.098 N	2 05.453 E	4.0m	Dipping reflectors beneath surficial sediments. Evidence of at least two sediment layers	1.77	Coarse sand (poorly sorted) suspended in very fine grained matrix, very watery. Top 30cm very gravelly with abundant shell fragments. Relatively sharp change at 0.7m into medium sand, dark grey in colour with patches of very black sand.

GEO23	VC26	52 50.798 N	2 20.924 E		Small sub-surface topographic high - possible formation boundary	3.4	Very fine sand, lightish grey becoming darker towards base of core. Well rounded grains, predominantly quartz with abundant larger black grains (haematite?). At 2.3m, very gradual change into sandy mud, very stiff to touch. Very dark grey/black.
GEO24	VC27	52 22.785 N	2 17.180 E	4.0m	Edge of cut feature. Layerd fill unit.	5.95	Grey sandy mud (fine/silt) containing shell fragments up to 30mm. Well sorted. At ~1m unit becomes much darker in colour, and becomes finer downhole to ~5.5m where it becomes sandy. The base of the core is sandy gravel containing shells and clasts to 30mm. Very poorly sorted.
GEO25	VC28	52 18.742 N	1 43.602 E	4.0m	Nature of coarse grained sediments - remains of onshore gravels?	1.74	Very dark grey sandy mud, fine grained. Very poorly sorted. Contains shell fragments (~10%). Gradual change at 1.1m into medium grained sandy gravel. Contains shell fragments. Very poorly sorted.
GEO26	VC29	52 31.063 N	1 52.053 E	3m	Bank feature. Nature of bank is unknown. Bank is on the edge of possible remnant submerged channel	3.36	Top 0.30m coarse sand, moderatley well sorted, occasional shell fragments (1%). Gradual change at ~0.30m to fairly homogenous dark grey medium muddy sand. Very well sorted. Stiff to touch - clayey.
GEO27	VC30	52 23.021 N	2 08.457 E	5m	Two strong horizons coming to near surface - possibly formation boundaries and/or different periods of infill.	3.42	Gravelly muddy sand, brownish grey. Gravel clasts up to 30mm. Contains shell fragments. Very poorly sorted. Banding observed from 0.6m. From 1m, core is dark grey sandy mud, very well sorted with same banding.
GEO28	VCR1	52 26.585 N	1 53.289 E	4.5m	Sub-surface erosional surface with laterally localised down-dipping reflectors	1.15	Coarse muddy sand with shell fragments, becoming coarser downhole. At base, very coarse grained sandy gravel with <1% shell fragments.
GEO29	VCR2	52 17.729 N	2 5.071 E	4.0m	Shallow cut close to seabed	2.18	Very coarse grained shelly sand up to 40% shell material. Fragments up to 2mm. No obvious structure through core. Poorly sorted.
GEO30	VCR3	52 29.927 N	2 00.807 E	3.0m	Edge of bank. Similar bank structure that is known to contain peat further north	1.13	Gravelly sand with abundant worm casts (Sabellaria) at seabed. Medium grained sand, reddy brown colour, well sorted. No obvious structure through core.
GEO31	VCR4	52 26.445 N	2 14.970 E	4.0m	Holocene over ?Yarmouth Roads.	2.49	At seabed, coarse slightly gravelly sand with ~10% shell material, brown in colour. Disinct change at 0.25m into grey coarse sand with shell fragments to 2mm (~8%). Becomes progressively darker downhole. From ~0.8m sediment is medium grained sand with up to 4% shell material, becoming finer towards the based of the core.
GEO32	VCR5	52 12.340 N	2 18.202 E	3.6m	Small cut and fill. Nature of the fill?	2.82	Fairly homogenous medium-coarse grained sand. First 20cm is light brown in colour, gradually becoming greyer down core. No obvious structure through core. Shell fragments at base of core (~15%).
GEO33	VCR6	52 47.675 N	2 00.111 E		Sub-surface erosional horizon with small topographic high on top of it	2.34	Coarse sand, light brown colour. Shell fragments ~3%. Gradual change at about 0.5m into a finer dark grey sand with clay matrix - stiff to touch.
GEO34	VCR7	52 20.743 N	2 11.777 E	4.5m	Fill marked by undulating reflector extending into bank feature	2.78	Coarse (slightly muddy) sand, moderately sorted with ~5% (up to 10% at seabed) shell material. Becomes finer grained downhole and has variations in colour from brown/grey to dark grey.

GEO35	VCR8	52 16.277 N	1 59.318 E	4m	Inclined formation boundary coing to near surface	3.35	Medium grained shelly sand (up to 25% shell material), which becomes finer grained with depth. Sharp boundary at 2.4m into stiff grey mud/clay, very well sorted.
GEO36	VCR9	52 46.729 N	2 00.620 E	5m	Inclined horizon coming to near surface to form a topographic high - younger onlapping horizons	1.27	Fairly homogeneous coarse grained sand. Greeny grey in colour, darker towards base. Rare shell fragments. No structure through core.
GEO37	VCR10	52 19.347 N	2 18.916 E	4.5m	Modern day sandwave feature with sub-surface reflectors coming up to form a mound - past deposition guiding present day formations?	2.77	Medium-coarse grained muddy sand (very slightly gravelly), greyish/brown in colour. Shell fragments (~5%). Poorly sorted. At ~2.3m sediment becomes more fine grained, muddy sand with no shell fragments - gradual change.
GEO48	VC10	52 19.921 N	2 07.476 E	4.5m	Sub-surface topographic high with indications of a complex internal sediment stratigraphy. Onlap to either side. Present day seafloor guided by this sub-surface high	1.75	Fairly homogeneous grey medium sand (slightly muddy) with rare shell fragments up to 1mm in size. Whole shells at seabed. No visible structure throughout.

### Table 3, Clamshell grab sample sites and descriptions

GEO number	CG number	Latitude	Longitude	Target	Cored Depth	Description
GEO1	CG1	52 39.751 N	1 49.926 E	Cross Sands Anomaly - possible Swarte Bank Formation	25cm	Gravelly coarse muddy sand containing pebbles/cobbles, shells and shell fragments. Brown and grey sand very poorly sorted.
GEO2	CG2	52 21.794 N	2 08.247 E	Causeway Anomalies. Target area just off one of the anomalies - MBES suggests causeway may have outcropping rock	30 cm	Clean gravelly medium/coarse sand. Small amount of complete and broken shell. About 50/50 sand/gravel mixture - very poorly sorted.
GEO15	CG3	52 24.922 N	1 53.388 E	Cut into Westkappelle Ground Formation. Yarmouth Roads or Brown Bank fill? Within southern extent of possible remnant channel	34cm	Very fine grain slightly sandy mud. This sandy horizons. Lamination throughout.
GEO16	CG4	52 35.206 N	1 53.390 E	Small channel cut into bank feature - fine grained sediment unit?	0.2cm	Handful of pebbles and grey wet sand. Dark grey sandy mud. Well sorted.
GEO16	CG4-2	52 34.945 N	1 53.406 E		12cm	Coarse gravelly sand containing pebbles and cobbles up to ~60mm. Very poorly sorted. Contains shell fragments (~3%).
GEO17	CG5	52 30.565 N	1 51.617 E	Holocene overlying fill. Fill possibly associated with submerged channel	24 cm	Coarse sandy gravel. Gravel clasts to 50mm plus shell fragments (5%).
GEO18	CG6	52 32.490 N	1 54.819 E	Minor cut within Area 240. Unknown fill.	25cm	Clean gravelly sand with occasional flint/quartz cobbles/pebbles on top. Mostly well rounded and sub-angular flint. Max 17cm. Contains shell fragments. Very poorly sorted.
GEO26	CG7	52 31.042 N	1 52.043 E	Bank feature. Nature of bank is unknown. Bank is on the edge of poaaible remnant submerged channel	31cm	Very coarse grained shelly gravelly sand. Angular gravel clasts to 12mm, rare large cobbles. Up to 20% shell material.
GEO28	CG8	52 26.566 N	1 53.276 E	Sub-surface erosional surface with laterally localised down-dipping reflectors	~30cm	Top 10 cm dark sandy mud underlain by coarse/medium shelly sand. At 20cm 2cm of very dark anoxic material. Possibly peat. Below that coarse shelly sand. Occassional cobbles.

GEO30	CG9	52 29.913 N	2 00.785 E	Edge of bank. Similar bank structure that is known to contain peat further north	33 cm	Medium grained sand. First 20cm very well sorted. Underlain by coarse gravelly sand with abundant shell material (20%), clasts up to 5cm+. Layers of very black anoxic (peat?) sediment - very fine grained/silty. Sabellaria worm casts on seabed.
GEO38	CG10	52 33.384	1 54.293	Sediment boundary confirmation	44cm	Very coarse sand with shell fragments of up to 2mm (~10%). Some coarse layers with up to 25% shell material. Moderately sorted.
GEO39	CG11	52 25.148 N	1 58.130 E	Sediment boundary confirmation	20cm	Seabed covered in pebbles and cobbles up to 15cm, mostly subrounded. Also worm casts. Only about 10cm of gravelly sand, sharp boundary into fine-medium grained sand, grey in colour with patches of very dark grey/ black. Very well sorted.
GEO40	CG12	52 30.163 N	2 12.762 E	Sediment boundary confirmation	40cm	Gravelly sand, orangey brown. Very poorly sorted. Coarse sand. Shell fragments (10%).
GEO41	CG13	52 15.413 N	2 16.857 E	Sediment boundary confirmation	35cm	Coarse grained shelly sand becoming gravelly at base of sample.
GEO42	CG14	52 38.259 N	2 04.656 E	Sediment boundary confirmation	25cm	Gravelly sand. Clasts up to 15mm. Coarse to very coarse sand. Shell fragments (1%).
GEO43	CG15	52 37.733 N	2 15.381 E	Sediment boundary confirmation	23cm	Gravelly sand on top 5cm overlying coarse sand. Shell fragments and whole shells (1%).
GEO44	CG16	52 43.418 N	2 18.241 E	Sediment boundary confirmation	27cm	Very dark grey/black very fine mud (slightly sandy). First 20cm very silty becoming sandier at base of sample. Very well sorted, rare shell fragments.
GEO45	CG17	52 33.248 N	2 22.420 E	Sediment boundary confirmation	40cm	Slightly gravelly sand. Brown, coarse to very coarse. Not much gravel. Some brown shell fragments ~2%.
GEO46	CG18	52 13.068 N	2 10.868 E	Sediment boundary confirmation	32cm	Coarse grained sand, moderately sorted. Contains shell fragments (~3%).
GEO47	CG19	52 49.430 N	2 14.739 E	Sediment boundary confirmation	NIL	No sample
GEO47	CG19_2	52 49.300 N	2 14.813 E		33cm	Dark grey sandy mud with layers of very dark/black silt, anoxic. Becomes sandier at base of sample.

## Appendix 2 Leg B Groundtruthing

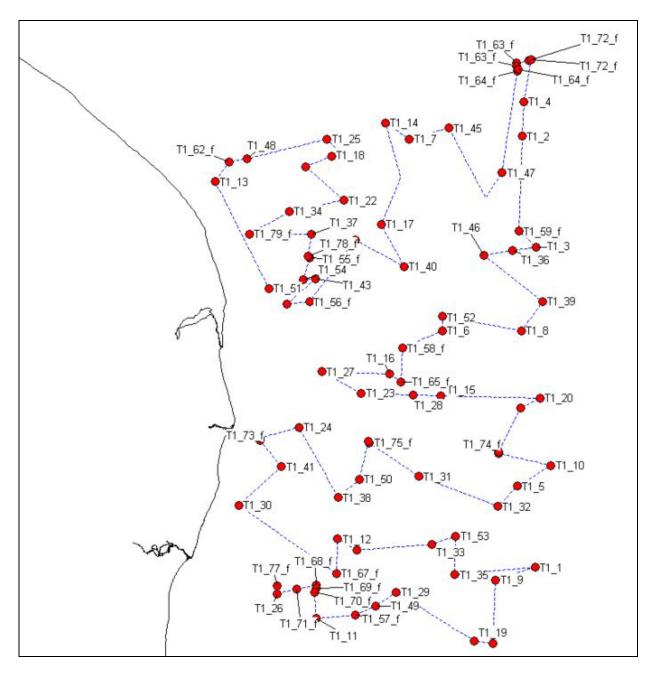


Figure 10, Map showing Tranche 1 sample site locations

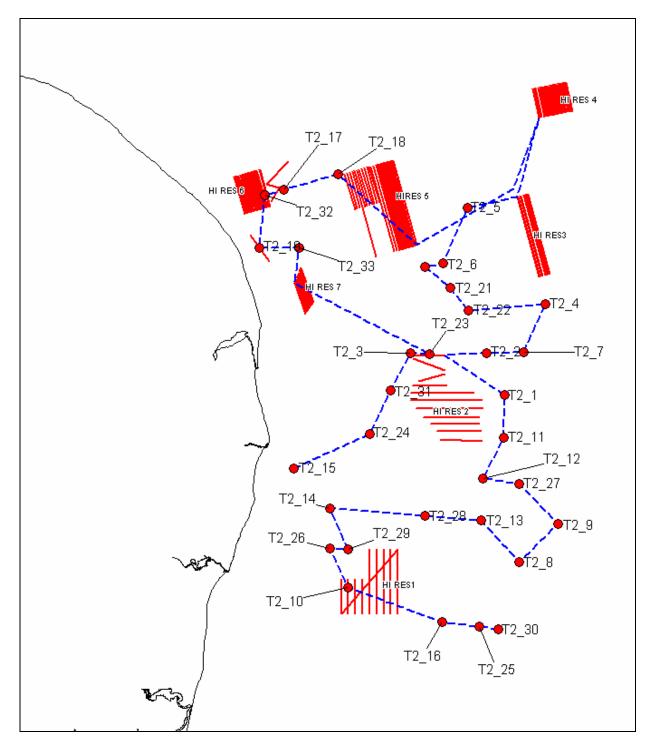


Figure 11, Map showing Tranche 2 sample site and high resolution acoustic survey locations

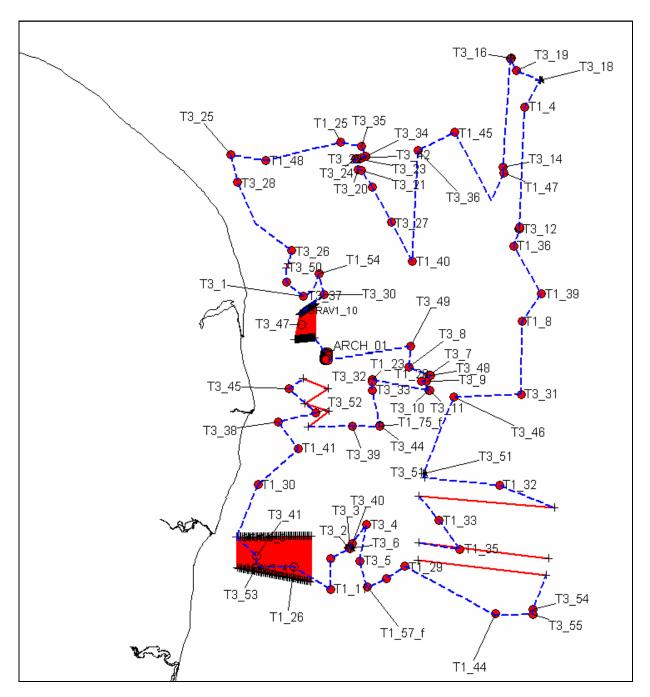


Figure 12, Map showing Tranche 3 sample site and high resolution acoustic survey locations

Tranche	No. of stations	0.1 m² Hamon grabs	2m beam trawl	Camera	Costerus Twin grab	Scallop dredge	Multibeam (km)	Sidescan (km)
1	79	61	61	52	10	0	0	0
2	34	33	34	1	0	0	858.42	491.51
3	112	64	33	28	30	1	492.96	206.94
TOTAL	225	158	128	81	40	1	1351.38	698.45

Table 4, Summary table of Leg B ground-truthing

# Appendix 3 Geological Log

BGS2009/4 +52+002 / 3212 VE 1 British Geological Survey Natural Environmental Research Council										
Latitude	: 2	.12023	Equipn	nent: Vibrocorer	Water Depth:	47 m	Vessel:	Cefas Endevour		
Longitu	de: 52	2.2224	Total D	epth: 3.95 m	Geneal Area:	E of East Anglia	Geologist:	J Crummy		
EPSG c	ode: W	/GS84/U	JTM zone 31	IN	Date(mm/dd/yy):	05/20/09 11:58:00	BGS Plan #:	GE03/VC3-C		
Recovered Core Image Not to Scale	Depth (m)	Drilled Length (m)	Recovery	Lithology, Structu (Clay 10% to Bo - 은 옧 응 육 유 윤	ulder 100%)		Description			
	0	A/4				Coarse sandy gravel fragmer y sorted. Subrounde	nts up to 10mr	n.		
	- - 2- - - - 3-	B/4 C/4			interb	Homogenous Very fine grained / s edded with sandier r high sphericity. SHC	dark grey sanc ilt. Some very nud. Well sort Biouturbated. DE SAMPLE	ly mud. silty horizons ed, rounded grains, Very dry.		
	4	D/4								

## Appendix 4 Daily Log

The daily logs were completed by the Senior Scientist. For a daily narrative of onboard operations please see Chapter 2 of this report.

### 18<sup>th</sup> May 2009

Cefas Endeavo	ur				Ce	efas		
Mini-M Phone Mini-M Fax	00 8717639 N/A	00 871763998027 N/A				07799773456 <u>cefas.endeavour@gtships.</u>		<u>m</u>
Addressee OrganisationAttentionMEPFEuan McNei			11	Telefax		e-mail e.mcneill@wessexarch.co.u		
Client Project Report No Period	MEPF East Coast Re 1 18 <sup>th</sup> May 200	-	mental Characte	erisation Sur	vey	Cefas Email		C3340
1. Ship's Position	on & Status 18 <sup>th</sup> May 2009			Latitude		0.000 N		
	GMT	24:00 Alongside in I	Lowestoft	Longitude		8.388 N 4.625 E		
2. Summary of	Events							
From To	MT D Durati 1:00 24:00	on Code Mob	Activity Mobilising vi	brocorer and	clamshell gr	ab		
<b>3. Time Analys</b> <b>Activity</b> Operational Standby at sea ( <sup>1</sup>					<b>Code</b> Ops StbyW	Today	Previous	Present
Stand-down alor Mob / Demob Contractors Tim Contractor's Tir	e (Vessel)				StbyO Mob CtV Ct	24:00	0	24:00
					Total:	24:00	0	24:00
4. Production S Data gathe Clamshell y Vibrocores Hamon gra Camera sta Beam traw High resolu	ered grabs bs tions	m)	<b>Today</b> 0 0 0 0 0 0 0	Previous	Total	Remaining	Planned 10 30 60 30 20 N/A	% Complete
04:00 A 08:00	<b>bs Wind</b> longside in Lov	vestoft	Obs Sea State		Rema	rks		
12:00 16:00 20:00 24:00 <b>Outlook Inshe</b>	ore shipping fo	recast & Navt	ex:					
6. Safety & Env Safety incidents Cetacean watch:	:	None None						
<b>7. Personnel</b> Marine Crew Master 1 <sup>st</sup> Mate 2 <sup>nd</sup> Mate		A Reading G Ritchie R Hitcham		Survey	<i>Crew</i> scientist engineer engineer	Nigel	Limpenny Lyman Campbell	

3 <sup>rd</sup> Mate Chief Engineer + 12 additional	crew		akham weedie		Survey er Survey er Survey er Geologist Geologist Archaeolo Archaeolo	ngineer ngineer ogist ogist	Mich David Julia Mary Steph	Baines ael Wilson I Baxter Crummy Mowatt anie Arnott a Perez-Fernan	dez
Total crew		17			Total sur	vey	10		
Others									
Client represent MEPF Student	ative		n Coppock o Gausser						
Total		2							
Total persons of	onboard	29							
8. Next 24 Hou									
Plan to sail on F	PM tide on	19 <sup>th</sup> May.							
9. Key Dates					ation		Date		
Last Port call	~~			Low	estoft		18 <sup>th</sup> Ma	У	
Next crew chan Expected compl		cauisition					TBA 15 <sup>th</sup> Jun	e 2009	
Next Port call		quisition		Low	estoft		15 Juli	2007	
Last safety mus				N/A					
Next safety mus	ster			20 <sup>th</sup>	May				
10. Vessel Stat	us								
Fuel Remaining			Lub	Oil Remaining			Wat	er Remaining	
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Mob / Demob Contractors Time (Vessel)	,			Mob CtV	17:00 0	24:00 0	41:00 0
Contractor's Time (Operatio	ns)			Ct Total:	0 24:00	0	0 <b>48:00</b>
4. Production Summary		Teder	Duandana	Tatal	Domoining	Diamad	0/ Complete
Data gathered Clamshell grabs		Today 2	Previous 0	Total 2	Remaining 8	10	% Complete 20
Vibrocores		2	0	$\frac{2}{2}$	28	30	6.6
Hamon grabs		0	0	_	20	60	010
Camera stations		0	0			30	
Beam trawls		0	0			20	
High resolution surveys	(km)	0	0			N/A	
5. Weather		Oha Gaa Stata		D	J		
Fime Obs Wind 04:00 Alongside in I	owestoft	Obs Sea State		Remai	'KS		
08:00 Alongside in I							
12:00 Alongside in I							
16:00 Alongside in I							
20:00 SW 18kn	loweston	1-2m					
24:00 SW 19kn		2m					
<b>Dutlook</b> Inshore shipping f	orecast & Navtex	: S to SW 4-5.					
5. Safety & Environmental							
Safety incidents: Cetacean watch:	None None						
	None						
7. Personnel			a	~			
Marine Crew				y Crew	D	· ·	
Master	A Reading			r scientist		Limpenny	
l <sup>st</sup> Mate 2 <sup>nd</sup> Mate	G Ritchie			y engineer		Lyman	
B <sup>rd</sup> Mate	R Hitcham			y engineer		Campbell	
Chief Engineer	A Oakham S Tweedie			y engineer y engineer	Lee B	el Wilson	
+ 12 additional crew	5 Tweedle			y engineer		Baxter	
+ 12 additional crew			Geolo			Crummy	
			Geolo			Mowatt	
				eologist		anie Arnott	
				eologist		Perez-Fern	andez
Total crew	17			survey	10	1 0102 1 011	unuez
Others				-			
Client representative MEPF Student	John Coppock Theo Gaussen						
Total	2						
Total persons onboard	29						
8. Next 24 Hours							
Continue clamshell grabs and	d vibrocores						
). Key Dates			ation		Date		
Last Port call		Low	vestoft		18 <sup>th</sup> May	/	
Next crew change					TBA		
Expected completion of acqu	isition				15 <sup>th</sup> June	e 2009	
Next Port call			vestoft				
Last safety muster Next safety muster		N/A 20 <sup>th</sup>	May				
10. Vessel Status			-				
Fuel Remaining	Lub	Oil Remaining			Wate	er Remainir	g
<b>11. Party Chief Comments</b> Mobbing completed success	fully Sailed at 15	30hrs Samplin	o oning well	1			
	any. Sance at 15.	Somo, Sampini	5 50mg well	•			
12. Report submitted by:	npenny Clier	nt Representativ		ock	Master	А	

Cefas Endeavou	r				Ce	efas		
Mini-M Phone Mini-M Fax	00 8717639 N/A	98027		<b>Mobile</b> E-mail		799773456 fas.endeavou	ar@gtships.co	om
Addressee Orga	nisation	Attention		Telefax	ζ		e-mail	
MEPF		Euan McNei	11				e.mcneill@w	vessexarch.co.u
	MEPF East Coast Re 3 20 <sup>th</sup> May 2009	-	mental Characte	erisation Sur	vey	Cefas Emai		C3340
1. Ship's Position	n & Status			<b>T</b>				
	0 <sup>th</sup> May 2009			Latitude		9.9 N		
Time G Present Activity	ЪМТ	24:00 Vibrocore/Cla	amshell grabs	Longitud	e 02.0	7.5 E		
<b>2. Summary of E</b> Time zone GM								
From To 00:00 24:	Durati	on Code Ops	Activity Collecting vil	brocore samj	ples			
3. Time Analysis	5				<u> </u>	<i>т</i> , т		
Activity Operational					Code Ops	<b>Today</b> 24:00	<b>Previous</b> 07:00	<b>Present</b> 31:00
Standby at sea (w	veather)				StbyW	0	0	0
Stand-down along					StbyO	0	0	0
Mob / Demob					Mob	0	41:00	41:00
Contractors Time					CtV	0	0	0
Contractor's Tim	e (Operations)				Ct Total:	0 24:00	0	0 72:00
4. Production Su	ımmarv							
Data gathere			Today	Previous	Total	Remaining	g Planned	% Complete
Clamshell g	rabs		0	2	2	8	10	20
Vibrocores			9	2	11	19	30	36.6
Hamon grab			0	0			60	
Camera stati			0	0			30 20	
Beam trawls High resolut	ion surveys (k	m)	0 0	0 0			20 N/A	
5. Weather								
	s Wind		Obs Sea State		Remar	ks		
04:00 15	kn SW		0.5					
	kn SW		0.5					
	kn SW		0.5					
	n SW		0.5					
	n SE		0.5					
24:00 14 Outlook Inshore	cn S e shipping fore	ecast & Navtex	0.5 : SW 4-5.					
6. Safety & Envi	ronmental							
Safety incidents: Cetacean watch:		None None						
7. Personnel				~	<i>c</i>			
Marine Crew		A Deading			v Crew	D	Limnor	
Master 1 <sup>st</sup> Mate		A Reading G Ritchie			scientist y engineer		e Limpenny l Lyman	
$2^{nd}$ Mate		R Hitcham			y engineer		Campbell	
3 <sup>rd</sup> Mate		A Oakham			y engineer		Baines	
Chief Engineer		S Tweedie			y engineer		ael Wilson	
+ 12 additional ci	rew				y engineer		d Baxter	
				Geolo	gist		Crummy	
				Geolo	gist	Mary	/ Mowatt	

Total crew	17	Archaeologist Archaeologist <b>Total survey</b>	Stephanie / Marta Pere 10	Arnott ez-Fernandez
Others				
Client representative MEPF Student	John Coppock Theo Gaussen			
Total	2			
Total persons onboard	29			
8. Next 24 Hours Continue clamshell grabs and	vibrocores			
9. Key Dates		Location	Date	
Last Port call		Lowestoft	18 <sup>th</sup> May TBA	
Next crew change Expected completion of acqui	sition		15 <sup>th</sup> June 200	)9
Next Port call		Lowestoft		
Last safety muster		N/A		
Next safety muster		21 <sup>st</sup> May		
<b>10. Vessel Status</b> Fuel Remaining	Lub Oil Remai	ning	Water Re	maining
<b>11. Party Chief Comments</b> Sampling going well. No prol	blems encountered.			
12. Report submitted by:		ntative J Coppock	Master	A Reading
Party Chief Dave Lim	penny Client Represe			
Party Chief     Dave Lim       21 <sup>st</sup> May 2009       Cefas Endeavour       Mini-M Phone     00 871763       Mini-M Fax     N/A		Mobile	Cefas 07799773456 <u>cefas.endeavour@gt</u>	ships.com
21 <sup>st</sup> May 2009 Cefas Endeavour Mini-M Phone 00 871763		Mobile	07799773456	
21 <sup>st</sup> May 2009 Cefas Endeavour Mini-M Phone 00 871763 Mini-M Fax N/A	3998027	<b>Mobile</b> E-mail	07799773456 cefas.endeavour@gt e-ma	il
21 <sup>st</sup> May 2009 Cefas Endeavour Mini-M Phone 00 871763 Mini-M Fax N/A Addressee Organisation MEPF Client MEPF	3998027 Attention Euan McNeill Regional Environmental Cl	Mobile E-mail Telefax	07799773456 cefas.endeavour@gt e-ma	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 20         1. Ship's Position & Status	3998027 Attention Euan McNeill Regional Environmental Cl	Mobile E-mail Telefax naracterisation Survey	07799773456 cefas.endeavour@gt e-ma e.mcr Cefas Ref	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status         Date       21st May 200	3998027 Attention Euan McNeill Regional Environmental Ch 09	Mobile E-mail Telefax haracterisation Survey Latitude 52	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> <u>Cefas Ref</u> <u>Email Ref:</u> 2 31.0 N	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status         Date       21st May 200         Time       GMT	3998027 Attention Euan McNeill Regional Environmental Cl	Mobile E-mail Telefax haracterisation Survey Latitude 52 Longitude 0	07799773456 cefas.endeavour@gt e-ma e.mcr Cefas Ref Email Ref:	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status         Date       21st May 200         Time       GMT         Present Activity         2. Summary of Events	3998027 Attention Euan McNeill Regional Environmental Cl 09 9 24:00	Mobile E-mail Telefax haracterisation Survey Latitude 52 Longitude 0	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> <u>Cefas Ref</u> <u>Email Ref:</u> 2 31.0 N	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status         Date       21st May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT	Attention Euan McNeill Regional Environmental Cl 09 9 24:00 Vibrocore/Clamshell gr	Mobile E-mail Telefax naracterisation Survey Latitude 52 Longitude 0. abs	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> <u>Cefas Ref</u> <u>Email Ref:</u> 2 31.0 N	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status       Date         Date       21st May 200         Time       GMT         Present Activity       2.         2. Summary of Events       Time zone         Time zone       GMT         From       To	3998027         Attention         Euan McNeill         Regional Environmental Cl         09         9         24:00         Vibrocore/Clamshell gr         ution       Code         Activity	Mobile E-mail Telefax naracterisation Survey Latitude 52 Longitude 0. abs	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> Cefas Ref Email Ref: 2 31.0 N 1 52.0 E	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status       Date         Date       21st May 200         Time       GMT         Present Activity       2.         2. Summary of Events       Time zone         Time zone       GMT         From       To         00:00       24:00         3. Time Analysis	3998027         Attention         Euan McNeill         Regional Environmental Cl         09         9         24:00         Vibrocore/Clamshell gr         ution       Code         Activity	Mobile E-mail Telefax naracterisation Survey Latitude 5/ Longitude 0. abs	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> Cefas Ref Email Ref: 2 31.0 N 1 52.0 E clamshell samples	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status       Date         Date       21st May 200         Time       GMT         Present Activity       2.         Summary of Events       Time zone         Time zone       GMT         From       To         00:00       24:00       24:0         3. Time Analysis         Activity	3998027         Attention         Euan McNeill         Regional Environmental Cl         09         9         24:00         Vibrocore/Clamshell gr         ution       Code         Activity	Mobile E-mail Telefax naracterisation Survey Latitude 52 Longitude 0 abs	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> Cefas Ref Email Ref: 2 31.0 N 1 52.0 E clamshell samples e Today P	il neill@wessexarch.co.uk C3340
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status         Date       21st May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         00:00       24:00         3. Time Analysis         Activity         Operational         Standby at sea (weather)	3998027         Attention         Euan McNeill         Regional Environmental Cl         09         9         24:00         Vibrocore/Clamshell gr         ution       Code         Activity	Mobile E-mail Telefax naracterisation Survey Latitude 5/ Longitude 0. abs	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> Cefas Ref Email Ref: 2 31.0 N 1 52.0 E clamshell samples e <b>Today P</b> 24:00 3 W 0 0 0	il neill@wessexarch.co.uk C3340 C3340 revious Present 1:00 55:00 0
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status         Date       21st May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         00:00       24:00         3. Time Analysis         Activity         Operational         Standby at sea (weather)         Stand-down alongside	3998027         Attention         Euan McNeill         Regional Environmental Cl         09         9         24:00         Vibrocore/Clamshell gr         ution       Code         Activity	Mobile E-mail Telefax haracterisation Survey Latitude 52 Longitude 0 abs // ing Priority 1 vibrocore and c Ops StbyV StbyV	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> Cefas Ref Email Ref: 2 31.0 N 1 52.0 E clamshell samples e Today P 24:00 3 W 0 0 0 0 0	il neill@wessexarch.co.uk C3340 C3340 revious Present 1:00 55:00 0 0
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status       Date         Date       21st May 200         Time       GMT         Present Activity       2         2. Summary of Events       Time zone         Time zone       GMT         From       To         00:00       24:00         3. Time Analysis         Activity         Operational         Standby at sea (weather)         Stand-down alongside         Mob / Demob	3998027         Attention         Euan McNeill         Regional Environmental Cl         09         9         24:00         Vibrocore/Clamshell gr         ution       Code         Activity	Mobile E-mail Telefax haracterisation Survey Latitude 52 Longitude 0 abs ( (ing Priority 1 vibrocore and c Ops StbyV StbyO Mob	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> Cefas Ref Email Ref: 2 31.0 N 1 52.0 E clamshell samples e Today P 24:00 3 W 0 0 0 0 0 00:00 4	il neill@wessexarch.co.uk C3340 revious Present 1:00 55:00 0 0 1:00 41:00
21 <sup>st</sup> May 2009         Cefas Endeavour         Mini-M Phone       00 871763         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast I         Report No       4         Period       21 <sup>st</sup> May 200         1. Ship's Position & Status         Date       21st May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         00:00       24:00         3. Time Analysis         Activity         Operational         Standby at sea (weather)         Stand-down alongside	3998027         Attention         Euan McNeill         Regional Environmental Cl         09         9         24:00         Vibrocore/Clamshell gr         ttion       Code         Activity         0       Ops         Collection	Mobile E-mail Telefax haracterisation Survey Latitude 52 Longitude 0 abs // ing Priority 1 vibrocore and c Ops StbyV StbyV	07799773456 <u>cefas.endeavour@gt</u> <u>e-ma</u> <u>e.mcr</u> Cefas Ref Email Ref: 2 31.0 N 1 52.0 E clamshell samples e Today P 24:00 3 W 0 0 0 0 0	il neill@wessexarch.co.uk C3340 revious Present 1:00 55:00 0 1:00 41:00 0

4. Production Summary

Today	Previous	Total	Remain	ing Planned	% Complete
4	2	6	2	10	60
11	11	22	8	30	73.3
0	0			60	
0	0			30	
0	0			20	
0	0			N/A	
		$\begin{array}{cccc} 4 & 2 \\ 11 & 11 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \end{array}$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

5. Weath	er			
Time	Obs Wind	Obs Sea State	Remarks	
04:00	10kn S	0		
08:00	6kn SW	0		
12:00	11kn SW	0		
16:00	6kn SW	0		
20:00	7kn E	0		
24:00	Light airs	0		
Outlook	Inshore shipping for	ecast & Navtex: W to SW 3-4		

#### 6. Safety & Environmental

6. Safety & Environmental			
Safety incidents:	None		
Cetacean watch:	None		
7. Personnel			
Marine Crew		Survey Crew	
Master	A Reading	Senior scientist	Dave Limpenny
1 <sup>st</sup> Mate	G Ritchie	Survey engineer	Nigel Lyman
2 <sup>nd</sup> Mate	R Hitcham	Survey engineer	Neil Campbell
3 <sup>rd</sup> Mate	A Oakham	Survey engineer	Lee Baines
Chief Engineer	S Tweedie	Survey engineer	Michael Wilson
+ 12 additional crew		Survey engineer	David Baxter
		Geologist	Julia Crummy
		Geologist	Mary Mowatt
		Archaeologist	Stephanie Arnott
		Archaeologist	Marta Perez-Fernandez
Total crew		Total survey	10
Others			
Client representative	John Coppock		
MEPF Student	Theo Gaussen		
	•		
Total	2		

#### 8. Next 24 Hours

Total persons onboard

Complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.

29

9. Key Dates	Location	Date
Last Port call	Lowestoft	18 <sup>th</sup> May
Next crew change	Lowestoft	24 <sup>th</sup> May
Expected completion of acquisition		15 <sup>th</sup> June 2009
Next Port call	Lowestoft	
Last safety muster	N/A	
Next safety muster	22 <sup>nd</sup> May	
10. Vessel Status		
Fuel Remaining	Lub Oil Remaining	Water Remaining
11. Party Chief Comments		

Sampling going well. No problems encountered. Plan to dock on morning tide of Sunday 24<sup>th</sup> May. Logistics are being arranged.

12. Report subn	nitted by:				
Party Chief	Dave Limpenny	Client Representative	J Coppock	Master	A Reading

# 22<sup>nd</sup> May 2009

#### **Cefas Endeavour**

**Mini-M Phone** 00 871763998027

07799773456

Cefas

Mobile

Mini-M Fax	N/A				E-mail	<u>ce</u>	fas.endeavou	ur@gtships.co	<u>m</u>
Addressee Org MEPF	anisation		<b>tention</b> an McNeil	11	Telefax	ζ.		<b>e-mail</b> <u>e.mcneill@w</u>	essexarch.co.uk
Client Project Report No Period	5	ast Region ay 2009	al Environ	mental Characte	erisation Sur	vey	Cefas Emai		C3340
1. Ship's Positie	on & Sta 22nd Ma				Latitude	52 /	-7.60 N		
	GMT	24:		umshell grabs	Longitud		0.00 E		
From To	MT o	Duration 24:00	Code Ops	Activity Complete co collection of l					amples. Initiate
3. Time Analys Activity Operational Standby at sea ( Stand-down alor Mob / Demob Contractors Tim Contractor's Tim	weather) ngside ne (Vesse					Code Ops StbyW StbyO Mob CtV Ct Total:	<b>Today</b> 24:00 0 0 0 00:00 0 0 <b>24:00</b>	Previous 55:00 0 0 41:00 0 0 96:00	Present 79:00 0 0 41:00 0 0 120:00
4. Production S Data gather Clamshell Vibrocores Hamon gra Camera sta Beam traw High resolu	red grabs lbs ltions ls			<b>Today</b> 5 10 0 0 0 0	Previous 6 22 0 0 0 0 0 0	<b>Total</b> 11 32	<b>Remaining</b> 0 0	g Planned 10 30 60 30 20 N/A	% Complete 110 106
04:00         Li           08:00         10           12:00         12           16:00         51           20:00         71	bs Wind ight Airs Dkn SW 4kn SW 4kn SW 4kn SW 5W 5W ight Airs g forecast	& Navtex:	SW 4-5. I	Obs Sea State 0 0 0 0 0 0 0 0 Decreasing 3-4 1	ater.	Remar	ks		
6. Safety & Env Safety incidents Cetacean watch:	:	ntal	None None						
7. Personnel Marine Crew Master 1 <sup>st</sup> Mate 2 <sup>nd</sup> Mate 3 <sup>rd</sup> Mate Chief Engineer + 12 additional	crew	G R R H A C	eading itchie itcham akham weedie		Senior Surve Surve Surve Surve Geolo Geolo Archa	gist eologist	Nige Neil Lee I Mich Davi Julia Mary Stepl	Limpenny I Lyman Campbell Baines ael Wilson d Baxter Crummy Mowatt manie Arnott	ndaz
Total crew		16				eologist survey	Mart <b>10</b>	a Perez-Ferna	ndez
Others									

Client representative	John Coppock
MEPF Student	Theo Gaussen
Total	2

29

#### Total persons onboard

#### 8. Next 24 Hours

Complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.

9. Key Dates	Location	Date
Last Port call	Lowestoft	18 <sup>th</sup> May
Next crew change	Lowestoft	24 <sup>th</sup> May
Expected completion of acquisition		15 <sup>th</sup> June 2009
Next Port call	Lowestoft	
Last safety muster	N/A	
Next safety muster	22 <sup>nd</sup> May	

10. Vessel Status Fuel Remaining

Lub Oil Remaining

#### **11. Party Chief Comments**

Sampling going well. Started on Priority 2 samples during evening. Plan to complete all Priority 2 samples before docking. Pilot booked for 08:30hrs on 24th May. All logistics in place to demobilise and re-mobilise on a 12hr turnaround.

Water Remaining

12. Report subm	itted by:				
Party Chief	Dave Limpenny	Client Representative	J Coppock	Master	A Reading

## 23<sup>rd</sup> May 2009

Cefas Endeavour		Cefas
Mini-M Phone         00 871763998027           Mini-M Fax         N/A	Mobile E-mail	07799773456 <u>cefas.endeavour@gtships.com</u>
Addressee Organisation Attention	Telefax	e-mail

MEPF		Et	uan McNe	111		<u>e.mcneill@y</u>	wessexarch.co.uk
Client Project Report No Period	6		nal Enviro	nmental Characte	erisation Survey	Cefas Ref Email Ref:	C3340
<b>1. Ship's Pe</b> Date Time Present Act	23nd I GMT	May 2009 24	:00 brocore/Cl	lamshell grabs	Latitude Longitude	52 33.84 N 01 54.13 E	
<b>2. Summar</b> Time zone From 00:00	y of Even GMT To 24:00	ts Duration 24:00	Code Ops	Activity Complete col	lection of Priority	2 vibrocore and clamshell sample	les.

3. Time Analysis				
Activity	Code	Today	Previous	Present
Operational	Ops	24:00	79:00	103:00
Standby at sea (weather)	StbyW	0	0	0
Stand-down alongside	StbyO	0	0	0
Mob / Demob	Mob	00:00	41:00	41:00
Contractors Time (Vessel)	CtV	0	0	0
Contractor's Time (Operations)	Ct	0	0	0
	Total:	24:00	120:00	144:00

4. Production Summary						
Data gathered	Today	Previous	Total	Remain	ing Planned	% Complete
Clamshell grabs	8	11	19	0	10	190
Vibrocores	6	32	38	0	30	126
Hamon grabs	0	0			60	

High resolution surveys (km)       0       0       N/A         Weather       Obs Sea State       Remarks         ime       Obs Sea State       Remarks         4:00       Light Airs       0         8:00       7kn S       0         0:00       6kn S       0         0:00       8kn S       0         0:000       8kn S       0         shore shipping forecast & Navtex: S 4-5.       Survey         Safety & Environmental afety incidents:       None         etacean watch:       None         Haster       A Reading       Survey Crew         faster       A Reading       Survey Crew         faster       A Reading       Survey engineer <sup>ad</sup> Mate       G Ritchie       Survey engineer       Neil Campbell <sup>ad</sup> Mate       A Oakham       Survey engineer       Lie Baines <tr< th=""><th></th><th>ra stations</th><th></th><th>0</th><th>0</th><th>30</th></tr<>		ra stations		0	0	30
Weather       Obs Sea State       Remarks         4:00       Light Airs       0         8:00       7kn S       0         2:00       6kn S       0         0:00       8kn S       0         vittook       0       0         ushore shipping forecast & Navtex: S 4-5.       Safety & Environmental         afety incidents:       None         Personnel       Iterine Crew         faster       A Reading         * Mate       G Ritchie         * Mate       A Gakham         Survey engineer       Neil Campbell         * Mate       A Oakham       Survey engineer         * Mate       A Oakham       Survey engineer         * 12 additional crew       Iter Provedie       Survey engineer         * Geologist       Matry Mowatt         Archaeologist       Matry Mowatt         Archaeologist       Matra Perez-Fernandez         otal crew       16       Total survey			- (l)	0	0	20 N/A
ime Obs Sea State Remarks 0 4:00 Light Airs 0 5:00 7kn S 0 2:00 6kn S 0 0:00 8kn S 0 4:00 Light Airs 0 butlook ishore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None etacean watch: None teacean watch: None stree G Ritchie Survey Crew faster A Reading Senior scientist Dave Limpenny * Mate G Ritchie Survey engineer Nigel Lyman * Mate R Hitcham Survey engineer Nigel Lyman * Mate R Hitcham Survey engineer Nigel Lyman * Mate A Oakham Survey engineer Michael Wilson 12 additional crew I Survey engineer Michael Wilson 12 additional crew I 6 12 additional crew I 6 theres I 7 then representative I 0 theres I 6 theres I 7 the I coppock I 7 there I 7 the I coppock I 1 the I coppoce I 1 the	High	resolution survey:	s (km)	0	0	N/A
4:00 Light Airs 0 8:00 7kn S 0 2:00 6kn S 0 0:00 8kn S 0 4:00 Light Airs 0 0:00 8kn S 0 0:00 8kn S 0 4:00 Light Airs 0 0:00 8kn S 0 0:00 8kn	5. Weathe	r				
8:00 7kn S 0 2:00 6kn S 0 6:00 6kn S 0 0:00 8kn S 0 4:00 Light Airs 0 butlook Isshore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None etacean watch: None Personnel Mate A Reading Senior scientist Dave Limpenny <sup>41</sup> Mate G Ritchie Survey engineer Nigel Lyman <sup>44</sup> Mate R Hitcham Survey engineer Niel Lyman <sup>44</sup> Mate A Oakham Survey engineer Niel Lyman <sup>44</sup> Mate A Oakham Survey engineer Lee Baines hief Engineer S Tweedie Survey engineer David Baxter 12 additional crew I6 Total survey I0 thers <sup>45</sup> Hers <sup>46</sup> John Coppock	Time				Remark	S
2:00 6kn S 0 6:00 6kn S 0 0:00 8kn S 0 4:00 Light Airs 0 butlook shore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None etacean watch: None Personnel Marine Crew A Reading Senior scientist Dave Limpenny <sup>4</sup> Mate G Ritchie Survey engineer Nigel Lyman <sup>44</sup> Mate R Hitcham Survey engineer Nigel Lyman <sup>44</sup> Mate A Oakham Survey engineer Nigel Lyman <sup>44</sup> Mate A Oakham Survey engineer Lee Baines hief Engineer S Tweedie Survey engineer Michael Wilson 12 additional crew I 6 <i>but Crew I 16</i> Total survey I 0 thers <sup>45</sup> Hers I for Coppock						
6:00 6kn S 0 0:00 8kn S 0 4:00 Light Airs 0 buttook Isshore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None etacean watch: None Personnel Marine Crew A Reading Senior scientist Dave Limpenny <sup>14</sup> Mate G Ritchie Survey engineer Nigel Lyman <sup>14</sup> Mate R Hitcham Survey engineer Neil Campbell <sup>14</sup> Mate A Oakham Survey engineer Lee Baines hief Engineer S Tweedie Survey engineer Michael Wilson 12 additional crew I Campbell Survey engineer David Baxter Geologist Julia Crummy Geologist Julia Crummy Geologist Marta Perez-Fernandez <i>Iotal crew I</i> 6 <i>Total survey 10</i> thers lient representative John Coppock	08:00					
0:00 & Skn S 0 4:00 Light Airs 0 butlook ashore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None etacean watch: None Personnel Marine Crew faster A Reading Senior scientist Dave Limpenny <sup>4</sup> Mate G Ritchie Survey engineer Nigel Lyman <sup>4</sup> Mate G Ritchie Survey engineer Neil Campbell <sup>4</sup> Mate A Oakham Survey engineer Lee Baines hief Engineer S Tweedie Survey engineer Michael Wilson 12 additional crew <i>12</i> additional crew <i>16 Total survey 10</i> thers <sup>11</sup> Hon Coppock	12:00					
4:00 Light Airs 0 butlook ishore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None etacean watch: None Arresonnel Mate A Reading Senior scientist Dave Limpenny <sup>44</sup> Mate G Ritchie Survey engineer Nigel Lyman <sup>44</sup> Mate R Hitcham Survey engineer Neil Campbell <sup>44</sup> Mate A Oakham Survey engineer Michael Wilson <sup>14</sup> Mate A Oakham Survey engineer Michael Wilson <sup>12</sup> additional crew Survey engineer David Baxter Geologist Julia Crummy Geologist Marta Perez-Fernandez <i>Jotal crew I6</i> Total survey 10	16:00					
hutlook ishore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None etacean watch: None Personnel larine Crew Survey Crew faster A Reading Senior scientist Dave Limpenny <sup>ad</sup> Mate G Ritchie Survey engineer Nigel Lyman <sup>ad</sup> Mate R Hitcham Survey engineer Neil Campbell <sup>ad</sup> Mate A Oakham Survey engineer Lee Baines hief Engineer S Tweedie Survey engineer David Baxter Geologist Julia Crummy Geologist Mary Mowatt Archaeologist Mary Mowatt Archaeologist Mara Perez-Fernandez total crew 16 Total survey 10						
nshore shipping forecast & Navtex: S 4-5. Safety & Environmental afety incidents: None letacean watch: None Personnel Marine Crew A Reading Senior scientist Dave Limpenny af Mate G Ritchie Survey engineer Nigel Lyman af Mate R Hitcham Survey engineer Neil Campbell date A Oakham Survey engineer Lee Baines hief Engineer S Tweedie Survey engineer Lee Baines hief Engineer S Tweedie Survey engineer David Baxter Geologist Julia Crummy Geologist Marty Mowatt Archaeologist Marta Perez-Fernandez total crew 16 Total survey 10 thers lient representative John Coppock		Light Airs		0		
Safety & Environmental afety incidents:       None         afety incidents:       None         Personnel       None         Marine Crew       Senior scientist       Dave Limpenny         Mate       A Reading       Senior scientist       Dave Limpenny         Mate       G Ritchie       Survey engineer       Neil Campbell         Mate       R Hitcham       Survey engineer       Neil Campbell         Mate       A Oakham       Survey engineer       Lee Baines         hief Engineer       S Tweedie       Survey engineer       David Baxter         12 additional crew       Geologist       Julia Crummy       Geologist         Kotal crew       16       Total survey       10         whers       John Coppock       Item representative       John Coppock		nning forecast &	Navtex: S 4-5			
afety incidents: None etacean watch: None Marine Crew faster A Reading Senior scientist Dave Limpenny af Mate G Ritchie Survey engineer Nigel Lyman ad Mate R Hitcham Survey engineer Lee Baines ad Mate A Oakham Survey engineer Michael Wilson 12 additional crew Mate IC A Oakham Survey engineer David Baxter Geologist Julia Crummy Geologist Mary Mowatt Archaeologist Mary Mowatt Archaeologist Marta Perez-Fernandez Marta Perez-Fernandez	misnore sm	ipping torecast &	INAVIEX. 5 4-5.			
Personnel       Survey Crew         Marine Crew       Senior scientist       Dave Limpenny         faster       A Reading       Senior scientist       Dave Limpenny         at Mate       G Ritchie       Survey engineer       Nigel Lyman         Mate       R Hitcham       Survey engineer       Neil Campbell         Mate       A Oakham       Survey engineer       Lee Baines         hief Engineer       S Tweedie       Survey engineer       David Baxter         12 additional crew       Geologist       Julia Crummy         Geologist       Julia Crummy       Geologist       Mary Mowatt         Archaeologist       Stephanie Arnott       Archaeologist       Matta Perez-Fernandez         Iotal crew       I6       Total survey       I0						
Personnel       Survey Crew         Master       A Reading       Senior scientist       Dave Limpenny <sup>st</sup> Mate       G Ritchie       Survey engineer       Nigel Lyman <sup>nd</sup> Mate       R Hitcham       Survey engineer       Neil Campbell <sup>nd</sup> Mate       A Oakham       Survey engineer       Lee Baines         hief Engineer       S Tweedie       Survey engineer       Michael Wilson         12 additional crew       S Tweedie       Survey engineer       David Baxter         Geologist       Julia Crummy       Geologist       Julia Crummy         Geologist       Mary Mowatt       Archaeologist       Marta Perez-Fernandez         Iotal crew       I6       Total survey       I0						
Marine CrewSurvey CrewMasterA ReadingSenior scientistDave Limpennyat MateG RitchieSurvey engineerNigel Lymanad MateR HitchamSurvey engineerNeil Campbellad MateA OakhamSurvey engineerLee Bainesad MateA OakhamSurvey engineerMichael Wilsonad MateS TweedieSurvey engineerDavid Baxteradditional crewS TweedieSurvey engineerDavid Baxter12 additional crewGeologistJulia CrummyGeologistMary MowattArchaeologistStephanie ArnottArchaeologistMarta Perez-FernandezVotal crew16Total survey10	Cetacean w	vatch:	None			
fasterA ReadingSenior scientistDave Limpennyst MateG RitchieSurvey engineerNigel Lymanad MateR HitchamSurvey engineerNeil Campbellad MateA OakhamSurvey engineerLee Bainesad MateA OakhamSurvey engineerLee Baineshief EngineerS TweedieSurvey engineerDavid Baxter12 additional crewS TweedieSurvey engineerDavid BaxterGeologistJulia CrummyGeologistMary MowattArchaeologistMary MowattArchaeologistMarta Perez-FernandezKotal crew16Total survey10						
<ul> <li><sup>st</sup> Mate</li> <li><sup>st</sup> Mate</li> <li><sup>nd</sup> Mate</li> <li>R Hitcham</li> <li>Survey engineer</li> <li>Neil Campbell</li> <li>Mate</li> <li>A Oakham</li> <li>Survey engineer</li> <li>Lee Baines</li> <li>Michael Wilson</li> <li>Survey engineer</li> <li>Michael Wilson</li> <li>Survey engineer</li> <li>David Baxter</li> <li>Geologist</li> <li>Julia Crummy</li> <li>Geologist</li> <li>Mary Mowatt</li> <li>Archaeologist</li> <li>Marta Perez-Fernandez</li> <li>Iters</li> <li>Iters</li> <li>John Coppock</li> </ul>	Marine Cr	ew				
and Mate       R Hitcham       Survey engineer       Neil Campbell         and Mate       A Oakham       Survey engineer       Lee Baines         bief Engineer       S Tweedie       Survey engineer       Michael Wilson         12 additional crew       S Tweedie       Survey engineer       David Baxter         Geologist       Julia Crummy         Geologist       Mary Mowatt         Archaeologist       Stephanie Arnott         Archaeologist       Marta Perez-Fernandez         Fotal crew       16       Total survey       10         Wheres       John Coppock       John Coppock       John Coppock	Master					
rd Mate       A Oakham       Survey engineer       Lee Baines         hief Engineer       S Tweedie       Survey engineer       Michael Wilson         12 additional crew       Survey engineer       David Baxter         Geologist       Julia Crummy         Geologist       Mary Mowatt         Archaeologist       Stephanie Arnott         Archaeologist       Marta Perez-Fernandez         Iotal crew       16         Total survey       10						
hief EngineerS TweedieSurvey engineerMichael Wilson12 additional crewS TweedieSurvey engineerDavid Baxter12 additional crewGeologistJulia CrummyGeologistMary MowattArchaeologistStephanie ArnottArchaeologistMarta Perez-FernandezItersIo						-
12 additional crew       Survey engineer       David Baxter         Geologist       Julia Crummy         Geologist       Mary Mowatt         Archaeologist       Stephanie Arnott         Archaeologist       Marta Perez-Fernandez         Iotal crew       16         Total survey       10         Where       John Coppock						
Geologist     Julia Crummy       Geologist     Mary Mowatt       Archaeologist     Stephanie Arnott       Archaeologist     Marta Perez-Fernandez       Jotal crew     16       Total survey     10			STweedle			
Geologist     Mary Mowatt       Archaeologist     Stephanie Arnott       Archaeologist     Marta Perez-Fernandez       Jotal crew     16       Total survey     10	+ 12 additi	onal crew				
Archaeologist     Stephanie Arnott       Archaeologist     Marta Perez-Fernandez       Archaeologist     Marta Perez-Fernandez       Identers     Identers						
Archaeologist     Marta Perez-Fernandez       Iotal crew     I6     Total survey     I0       others     John Coppock     John Coppock						
Initial crew     I6     Total survey     I0       withers     John Coppock     John Coppock						
lient representative John Coppock	Total crew		16		-	
	Others					
	Client repr	econtative	John Connocl	~		
otal 2	Total		2			
otal persons onboard 29	Total pers	ons onboard	29			
	MEPF Stud Total	dent	Theo Gausser			
			·			
			ell grabs and vibro	cores Start Prior	rity 2 clamshells and vibro	cores
Next 24 Hours	-	-	6		-	
Next 24 Hours omplete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.						Date
Next 24 Hours         complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         Key Dates       Location						18 May
• Next 24 Hours         complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         • Key Dates       Location         ast Port call       Lowestoft			visition	Low	estoft	$24^{\text{m}}$ May $15^{\text{th}}$ Lype 2000
Next 24 Hours         Jomplete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         • Key Dates       Location         ast Port call       Lowestoft         18 <sup>th</sup> May         Jext crew change       Lowestoft         24 <sup>th</sup> May	Expected c	ompletion of acq	uisition	Ŧ		15 <sup></sup> June 2009
Next 24 Hours         omplete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         • Key Dates       Location         ast Port call       Lowestoft         18 <sup>th</sup> May         jext crew change       Lowestoft         xpected completion of acquisition       15 <sup>th</sup> June 2009					estoft	
Next 24 Hours         Image: Complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         Key Dates       Location       Date         ast Port call       Lowestoft       18 <sup>th</sup> May         lext crew change       Lowestoft       24 <sup>th</sup> May         xpected completion of acquisition       15 <sup>th</sup> June 2009         lext Port call       Lowestoft					M	
Next 24 Hours         complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         • Key Dates       Location         ast Port call       Lowestoft       18 <sup>th</sup> May         lext crew change       Lowestoft       24 <sup>th</sup> May         xpected completion of acquisition       15 <sup>th</sup> June 2009         lext Port call       Lowestoft         ast safety muster       N/A	Next safety	muster		25 <sup>th</sup> .	May	
Next 24 Hours         Image: Complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         Key Dates       Location       Date         ast Port call       Lowestoft       18 <sup>th</sup> May         lext crew change       Lowestoft       24 <sup>th</sup> May         xpected completion of acquisition       15 <sup>th</sup> June 2009         lext Port call       Lowestoft	10. Vessel	Status				
Next 24 Hours         complete Priority 1 clamshell grabs and vibrocores. Start Priority 2 clamshells and vibrocores.         • Key Dates       Location         ast Port call       Lowestoft       18 <sup>th</sup> May         lext crew change       Lowestoft       24 <sup>th</sup> May         xpected completion of acquisition       15 <sup>th</sup> June 2009         lext Port call       Lowestoft         ast safety muster       N/A	Eucl Dama					Water Demoining

Fuel Remaining

ining

Water Remaining

Lub Oil Remaining

**11. Party Chief Comments** Sampling continued to go well with no incidents or hold-ups. All planned samples completed.

12. Report sub	mitted by:				
Party Chief	Dave Limpenny	Client Representative	J Coppock	Master	A Reading

## 24<sup>th</sup> May 2009

Cefas Endeavou	r		Cefas
Mini-M Phone Mini-M Fax	00 871763998027 N/A	<b>Mobile</b> E-mail	07799773456 cefas.endeavour@gtships.com
Addressee Orga	nisation Attention	Telefax	e-mail
		44	

MEPF		Eua	an McNei	11				e.mcneill@w	essexarch.co.
Client Project Report No	MEPI East C 7		l Enviror	nmental Characte	erisation Sur	vey	Cefas Emai		C3340
Period		May 2009							
1. Ship's Po	osition & St	tatus							
Date	24 <sup>th</sup> Ma	ay 2009			Latitude	52 3	8.6 N		
Time	GMT	24:0	0		Longitud	e 014	9.9 E		
Present Acti	vity	0.1n	n <sup>2</sup> Hamor	n grabbing/2m be	eam trawling	g/camera			
<b>2. Summary</b> Time zone	y of Events GMT	6							
From	То	Duration	Code	Activity					
00:00	24:00	24:00	Ops	Exchanging g	gear and staf	f at Lowestoft	, sail at 20:0	0.	
3. Time Ana	alysis								
Activity						Code	Today	Previous	Present
Operational						Ops	24:00	103:00	127:00
Standby at s		r)				StbyW	0	0	0
Stand-down						StbyO	0	0	0
Mob / Demo						Mob	0	41:00	41:00
Contractors						CtV	0	0	0
Contractor's	Time (Ope	erations)				Ct	0	0	0
						Total:	24:00	144:00	168:00
4. Productio Data g	on Summa athered	ry		Today	Previous	Total	Remaining	Planned	% Complet
	nell grabs			0	0	19	0	10	190
Vibroc				0 0	0 0	38	0	30	126
Hamon				1	0	1	59	60	120
	a stations			0	Ő	0	30	30	
Beam t				1	0	1	19	20	
	esolution su	rveys (km)		0	0	NA	NA	N/A	
5. Weather									
Time	Obs Wine	d		Obs Sea State		Remar	ks		
04:00	In port			In port					
08:00	In port			In port					
12:00	In port			In port					
16:00	In port			In port					
20:00	Light airs			Slight					
24:00 Outlook S'	Light airs	s SW for a time		Slight					
6. Safety & Safety incide		ental	None						
Cetacean wa	atch:		None						
7. Personne Marine Cre					C	. Cress			
Marine Cre Master	rv .	A D	eading			y Crew r scientist	Kaith	Cooper	
1 <sup>st</sup> Mate			itchie			y engineer		/Leadows	
3 <sup>rd</sup> Mate			akham			y engineer	Ken l		
Chief Engin	eer		veedie			y engineer		n Pearson	
+ 12 addition		510	, could			ic ecologist		Barrio	
12 additi0						ic ecologist		Curtis	
						ic ecologist		nne Ware	
						ic ecologist		ny Pearce	
						ic ecologist		Grubb	
					Geolo			tean Wilson	
					Geolo			Crummy	
					Archa	eologist		a Perez-Fernar	ndez
Total crew		16				survey	12		
		10							
Others									
Client repres	sentative	Johr	Coppocl	k					

MEPF Student	Rauhan V	Van Hussin					
Total	2						
Total persons onboard	30						
<b>8. Next 24 Hours</b> Continue 0.1m <sup>2</sup> Hamon gra	abbing/2m bear	n trawling/camera (T	Tranche 1)				
9. Key Dates		Loca			Date		
Last Port call			estoft		18 <sup>th</sup> Ma	у	
Next crew change Expected completion of acc	auisition	TBA	1		TBA 15 <sup>th</sup> Jun	e 2009	
Next Port call	1		estoft		10 0 0		
Last safety muster Next safety muster		N/A ASK	TONY				
10. Vessel Status							
Fuel Remaining		Lub Oil Remaining			Wat	er Remaining	
<b>11. Party Chief Comment</b> Mob straightforward. Tool		osterus grab at 13:00	whilst along	side.			
<b>12. Report submitted by:</b> Party Chief Keith C	Cooper	Client Representative	e J Coppo	ck	Master	AI	Reading
	*	*	**				
25 <sup>th</sup> May 2009							
Cefas Endeavour				Ce	efas		
Mini-M Phone 00 8717 Mini-M Fax N/A	763998027		Mobile E-mail		799773456 fas.endeavou	r@gtships.co	<u>m</u>
Addressee Organisation	Attentio		Telefax	ζ		e-mail	
MEPF	Euan M	cNeill				e.mcneill@w	essexarch.co.uk
ClientMEPFProjectEast CoastReport No8Period25 <sup>th</sup> May	-	vironmental Characte	erisation Sur	vey	Cefas Email		C3340
1. Ship's Position & Statu	18						
Date 25 <sup>th</sup> May 2	009		Latitude		47.51' N		
Time GMT Present Activity	24:00 0.1m <sup>2</sup> Ha	mon grabbing/2m be	Longitud am trawling		54.10' E		
2. Summary of Events							
Time zone GMT							
	uration Cod 7:24 Ops	2					
	41 Ct		ort for missi	ng Formaldeh	iyde		
13:05 24:00 10	0:55 Ops						
3. Time Analysis							_
Activity Operational				Code Ops	<b>Today</b> 18:15	<b>Previous</b> 127:00	<b>Present</b> 145:15
Standby at sea (weather)				StbyW	0	0	0
Stand-down alongside				StbyO	0	0	0
Mob / Demob				Mob	0	41:00	41:00
Contractors Time (Vessel) Contractor's Time (Operati	ions)			CtV Ct	5:45 0	0 0	5:45 0
Contractor 5 Time (Operati				Total:	24:00	168:00	192:00
4. Production Summary							
Data gathered		Today	Previous	Total	Remaining		% Complete
Clamshell grabs Vibrocores		0 0	0 0	19 38	0 0	10 30	190 126
Hamon grabs		6	1	7	73	80	120
Camera stations		4	0	4	26	30	13

	n trawls resolution survey	ys (km)	6 0		1 0	7 NA	23 NA	30 N/A	35 N/A
5. Weath	er								
Time	Obs Wind		Obs Sea S	tate		Remar	ks		
04:00	120° 14		Slight						
08:00	145° 05		Slight						
12:00	070° 24		070° <1m						
16:00	070° 24 070° 15		070° 1m						
20:00	100° 15		090° 1.2m						
	220° 08		090° 1.211	1					
24:00	220* 08		090° 1m						
Dutlook E-NE 3-4,	, later veering sou	ıtheast							
	& Environmenta								
Safety inc Cetacean			None None						
7. Person	nel								
Marine C					Survey C				
Master		A Read	ing		Senior so	cientist	Kei	th Cooper	
1 <sup>st</sup> Mate		G Ritch	ie		Survey e	ngineer	Bill	Meadows	
3 <sup>rd</sup> Mate		A Oakh	am		Survey e		Ken	n May	
Chief Eng	ineer	S Twee	die		Survey e		Sim	on Pearson	
	ional crew				Benthic e		Chr	is Barrio	
					Benthic e		Mat	t Curtis	
					Benthic e		Suz	anne Ware	
					Benthic e	0		ony Pearce	
					Benthic e			Grubb	
					Geologis			istean Wilso	n
					Geologis			a Crummy	511
					Archaeol			rta Perez-Fe	manuez
Total crew	v	16			Total sur	vey	12		
Others									
Client ren	resentative	John Co	nnock						
MEPF Stu			Wan Hussin						
Total		2							
Total pers	ons onboard	30							
8. Next 24		hhina/2m ha	am trawling/came		aba 1)				
		idding/2111 dei							
. Key Da				Locatio			Date	r.	
Last Port				Lowest	oft		$18^{\text{th}} \text{ M}$	iay	
Next crew				TBA			TBA		
	completion of acc	quisition					15 <sup>տ</sup> Jւ	ine 2009	
Next Port				Lowest	oft				
Last safety				N/A					
Next safet	y muster			TBA					
10. Vessel								_	
Fuel Rema	aining		Lub Oil Remain	ıng			Wa	ater Remain	ing
11. Partv	Chief Comment	S							
Ship retur empty).	rned to Lowestof	t to pick-up	chemicals (chem	icals cra	ate had bee	n craned a	board on 1	18 <sup>th</sup> May bu	it was found to
12. Repor	t submitted by:								
Party Chie	ef Keith C	looper	Client Represen	tative	J Coppock		Master		A Reading
26 <sup>th</sup> Ma	ay 2009								
Cefas End						Ce	efas		
		762000007			Makl				
Mini-M P	101e 00 8/1/	763998027			Mobile	07	799773456		

Mini-M Fax	x N/A			E-mail	<u>ce</u> :	fas.endeavou	ur@gtships.co	<u>em</u>
Addressee ( MEPF	Organisation	Attention Euan Mc		Telefa	x		e-mail e.mcneill@w	vessexarch.co.uk
Client Project Report No Period	MEPF East Co 9 26 <sup>th</sup> Ma	-	ironmental Charac	terisation Su	rvey	Cefas Emai	s Ref l Ref:	C3340
1. Ship's Po Date	sition & Stat 26 <sup>th</sup> May			Latitude	52	49.300 ' N		
Time Present Activ	GMT	24:00	non grabbing/2m ł	Longitud	le 02 (	04.500' N		
		0.1111 1141			B) culliola			
<b>2. Summary</b> Time zone	of Events GMT							
From		Duration Code		n grabbing/2	m hoom trouv	ing/aamara		
00:00	24:00 2	24:00 Ops	0.1m Hamo	on grabbing/2	m beam trawl	ing/camera		
	ea (weather) alongside				Code Ops StbyW StbyO Mob CtV Ct Total:	<b>Today</b> 24:00 0 0 0 0 0 0 24:00 24:00	Previous 145:15 0 0 41:00 5:45 0 <b>192:00</b>	Present 169:15 0 0 41:00 5:45 0 <b>206:00</b>
1 Droductio	on Summary							
Data ga Clamsh Vibrocc Hamon Camera Beam ti	athered ell grabs ores grabs stations rawls	(1)	<b>Today</b> 0 10 9 10	<b>Previous</b> 0 7 4 7 0	<b>Total</b> 19 38 17 13 17	<b>Remaining</b> 0 63 17 13	10 30 80 30 30	% Complete 190 126 21 43 57
Ũ	solution surv	• • •	0		NA	NA	N/A	N/A
NB Planned	number of H	amon, camera and	d beam trawls take	en from tende	r			
5. Weather Time 04:00 08:00 12:00 16:00 20:00 24:00 Outlook .SW 6-7	Obs Wind 220° 05 310° 17 270° 11 270° 20 270° 11 260° 08		Obs Sea State 090° 1.0 m 270° 1.2 m 270° 1.2 m 270° 2.0 m 270° 1.2 m 270° 1.0 m	2	Remar	ks		
	Environmen	tal						
Safety incide Cetacean wa	ents:	No: No:						
7. Personne Marine Crev Master 1 <sup>st</sup> Mate 3 <sup>rd</sup> Mate Chief Engine + 12 addition	v	A Reading G Ritchie A Oakham S Tweedie	1	Senio Surve Surve Surve Benth Benth	y Crew r scientist y engineer y engineer y engineer tic ecologist tic ecologist tic ecologist	Bill M Ken Simo Chris Matt	n Cooper Meadows May on Pearson 3 Barrio Curtis nne Ware	

		Benthic e Benthic e Geologist Geologist Archaeolo <b>Total sur</b>	cologist ogist	Lisa C Christ Julia	ny Pearce Grubb tean Wilson Crummy 1 Perez-Fernand	lez
Total crew	16	10tal sul	vey	12		
Others						
Client representative MEPF Student	John Coppock Rauhan Wan H	ussin				
Total	2					
Total persons onboard	30					
8. Next 24 Hours Continue 0.1m <sup>2</sup> Hamon grab	bing/2m beam traw	ling/camera (Tranche 1)				
9. Key Dates		Location		Date		
Last Port call Next crew change		Lowestoft TBA		18 <sup>th</sup> Ma TBA	У	
Expected completion of acqu	isition			15 <sup>th</sup> Jun	e 2009	
Next Port call		Lowestoft				
Last safety muster Next safety muster		N/A ASK TONY				
<b>10. Vessel Status</b> Fuel Remaining	Lub O	il Remaining		Wate	er Remaining	
<b>11. Party Chief Comments</b> Work progressing to plan. No	o problems to repor	t				
12. Report submitted by:						
Party Chief Keith Co	oper Client	Representative J Coppock	Ν	/laster	A Re	ading
27 <sup>th</sup> May 2009						
27 <sup>th</sup> May 2009 Cefas Endeavour			Cefa	s		
•	3998027	<b>Mobile</b> E-mail	0779	9773456	r@gtships.com	
Cefas Endeavour Mini-M Phone 00 87176	Attention		0779	9773456 s.endeavou	e-mail	
Cefas Endeavour Mini-M Phone 00 87176 Mini-M Fax N/A		E-mail	0779	9773456 s.endeavou	•	
Cefas Endeavour Mini-M Phone 00 87176 Mini-M Fax N/A Addressee Organisation MEPF Client MEPF	Attention Euan McNeill Regional Environm	E-mail	0779 <u>cefa</u>	9773456 s.endeavou	e-mail e.mcneill@wes Ref	
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 20         1. Ship's Position & Status	Attention Euan McNeill Regional Environm	E-mail Telefax nental Characterisation Survey	0779 <u>cefa</u>	9773456 s.endeavou G Cefas Email	e-mail e.mcneill@wes Ref	sexarch.co.uk
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 20	Attention Euan McNeill Regional Environm 009 24:00	E-mail <b>Telefax</b>	0779 <u>cefa</u> 52 41 02 18	9773456 s.endeavour	e-mail e.mcneill@wes Ref	sexarch.co.uk
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 20         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT	Attention Euan McNeill Regional Environm 009 24:00	E-mail Telefax nental Characterisation Survey Latitude Longitude	0779 <u>cefa</u> 52 41 02 18	9773456 s.endeavou G Cefas Email	e-mail e.mcneill@wes Ref	sexarch.co.uk
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 200         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT	Attention Euan McNeill Regional Environm 009 24:00 0.1m <sup>2</sup> Hamon g	E-mail Telefax nental Characterisation Survey Latitude Longitude rabbing/2m beam trawling/ca	0779 <u>cefa</u> 52 41 02 18	9773456 s.endeavou G Cefas Email	e-mail e.mcneill@wes Ref	sexarch.co.uk
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 200         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT	Attention Euan McNeill Regional Environm 009 24:00 0.1m <sup>2</sup> Hamon g ation Code	E-mail Telefax nental Characterisation Survey Latitude Longitude	0779 <u>cefas</u> 52 41 02 18 mera	9773456 <u>s.endeavou</u> Cefas Email 500 ' N 900' E	e-mail e.mcneill@wes Ref	sexarch.co.uk
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 200         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         Dur       00:00       24:00	Attention Euan McNeill Regional Environm 009 24:00 0.1m <sup>2</sup> Hamon g ation Code	E-mail Telefax nental Characterisation Survey Latitude Longitude rabbing/2m beam trawling/ca	0779 <u>cefas</u> 52 41 02 18 mera	9773456 <u>s.endeavou</u> Cefas Email 500 ' N 900' E	e-mail e.mcneill@wes Ref	sexarch.co.uk
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 200         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         Dur       0200         3. Time Analysis         Activity	Attention Euan McNeill Regional Environm 009 24:00 0.1m <sup>2</sup> Hamon g ation Code	E-mail Telefax nental Characterisation Survey Latitude Longitude rabbing/2m beam trawling/ca	0779 cefas 52 41 02 18 mera eam trawlin Code	9773456 s.endeavou Cefas Email 500 ' N 900' E g/camera Today	e-mail e.mcneill@wes Ref Ref: Previous	sexarch.co.uk C3340 Present
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 200         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         Dur       02:00       24:00         3. Time Analysis         Activity	Attention Euan McNeill Regional Environm 009 24:00 0.1m <sup>2</sup> Hamon g ation Code	E-mail Telefax nental Characterisation Survey Latitude Longitude rabbing/2m beam trawling/ca	0779 cefas 52 41 02 18 mera eam trawlin Code Ops	9773456 <u>s.endeavou</u> <u>Cefas</u> <b>Email</b> 500 ' N 900' E g/camera <u>Today</u> 24:00	e-mail e.mcneill@wes Ref Ref: Previous 169:15	sexarch.co.uk C3340 Present 193:15
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 200         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         Dur       00:00       24:00         3. Time Analysis         Activity         Operational       Standby at sea (weather)	Attention Euan McNeill Regional Environm 009 24:00 0.1m <sup>2</sup> Hamon g ation Code	E-mail Telefax nental Characterisation Survey Latitude Longitude rabbing/2m beam trawling/ca	0779 cefas 52 41 02 18 mera eam trawlin Code Ops StbyW	9773456 s.endeavou Cefas Email 500 ' N 900' E g/camera Today	e-mail e.mcneill@wes Ref Ref: Previous	sexarch.co.uk C3340 Present
Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF         Project       East Coast         Report No       10         Period       27 <sup>th</sup> May 200         1. Ship's Position & Status         Date       27 <sup>th</sup> May 200         Time       GMT         Present Activity         2. Summary of Events         Time zone       GMT         From       To         Dur       024:00       24:00         3. Time Analysis         Activity	Attention Euan McNeill Regional Environm 009 24:00 0.1m <sup>2</sup> Hamon g ation Code	E-mail Telefax nental Characterisation Survey Latitude Longitude rabbing/2m beam trawling/ca	0779 cefas 52 41 02 18 mera eam trawlin Code Ops	9773456 <u>s.endeavou</u> Cefas Email 500 ' N 900' E g/camera Today 24:00 0	e-mail e.mcneill@wes Ref Ref: Previous 169:15 0	sexarch.co.uk C3340 Present 193:15 0

Contractor's Time (Operatio	ons)			Ct Total:	0 24:00	0 <b>216:00</b>	0 240:00
4. Production Summary							
Data gathered	Т	oday	Previous	Total	Remaining	g Planned	% Complet
Clamshell grabs		0	0	19	0	10	190
Vibrocores		0	0	38	0	30	126
Hamon grabs		9	17	26	54	80	33
Camera stations		7	13	20	10	30	67
Beam trawls		, 9	17	26	4	30	87
		0	0	20 NA	4 NA	JU N/A	N/A
High resolution survey	s (kiii)	0	0	NA	NA	IN/A	IN/A
NB Planned number of Ham	non, camera and beam traw	ls take	n from tende	r			
5. Weather							
Time Obs Wind	Obs Se	ea State	;	Rema	rks		
04:00 260° 20	270° 2	.0 m					
08:00 260° 21	270° 2						
12:00 240° 24	270° 2						
	270°2 220° 3⁄2						
16:00 220° 30							
20:00 230° 15	220° 2						
24:00 245° 16	220° 2	.0 m					
Outlook W/NW 4-5 decreasing N/NV	W 1-3						
6. Safety & Environmental Safety incidents:	l None						
Cetacean watch:	None						
7. Personnel							
Marine Crew			Surve	y Crew			
Master	A Reading			r scientist	Keith	Cooper	
1 <sup>st</sup> Mate	G Ritchie			y engineer		Aeadows	
3 <sup>rd</sup> Mate	A Oakham			y engineer	Ken M		
	S Tweedie					n Pearson	
Chief Engineer	5 i weedle			y engineer			
+ 12 additional crew				ic ecologist		Barrio	
				ic ecologist		Curtis	
				ic ecologist		nne Ware	
				ic ecologist	Bryoi	ny Pearce	
			Benth	ic ecologist	Lisa (	Grubb	
			Geolo	ogist	Chris	tean Wilson	
			Geolo			Crummy	
				eologist		a Perez-Fern	andez
				survey	12		
Total crew	16						
Others							
Client representative	John Coppock						
MEPF Student	Rauhan Wan Hussin						
Total	2						
Total persons onboard	30						
<i>Total</i> Total persons onboard	2						
<b>8. Next 24 Hours</b> Continue 0.1m <sup>2</sup> Hamon grat	obing/2m beam trawling/ca	amera (	Tranche 1)				
9. Key Dates	- 0		cation		Date		
Last Port call			westoft		18 <sup>th</sup> Ma	У	
Next crew change		TB.	A		TBA		
Expected completion of acq	uisition				15 <sup>th</sup> Jun	e 2009	
Next Port call		Lov	westoft				
Last safety muster		N/A	A				
Next safety muster			K TONY				
10. Vessel Status							
Fuel Remaining	Lub Oil Rem	aining			Wate	er Remainin	g
							0

11. Party Chief Comments

<b>28<sup>th</sup> May 2009</b> Cefas Endeavour Mini-M Phone 00 8717639980 Mini-M Fax N/A							
C <mark>efas Endeavour</mark> Mini-M Phone 00 8717639980							
				C	Cefas		
	27		M.1.9.	0	7700772456		
	21		<b>Mobile</b> E-mail		7799773456 <u>efas.endeavour</u>	<u>e@gtships.co</u>	<u>m</u>
	<b>ttention</b> uan McNeil	1	Telefax			e <b>-mail</b> e.mcneill@w	essexarch.co.u
ClientMEPFProjectEast Coast RegionReport No11Period28 <sup>th</sup> May 2009	nal Environ	mental Characte	risation Surv	rey	Cefas Email		C3340
1. Ship's Position & Status							
Date 28 <sup>th</sup> May 2009			Latitude		30.700 ' N		
	$m^2$ Hamon	grabbing/2m be	Longitude eam trawling/		10.400' E		
2. Summary of Events Time zone GMT							
From To Duration	Code	Activity					
00:00 24:00 24:00	Ops	0.1m <sup>2</sup> Hamon	grabbing/2m	n beam trav	vling/camera		
3. Time Analysis							
Activity				Code	Today	Previous	Present
Operational				Ops	24:00	193:15	217:15
Standby at sea (weather)				StbyW		0	0
Stand-down alongside				StbyO	0	0	0
Mob / Demob				Mob	0	41:00	41:00
Contractors Time (Vessel) Contractor's Time (Operations)				CtV Ct	0 0	5:45 0	5:45 0
Contractor's Time (Operations)				Total:	24:00	240:00	264:00
4. Production Summary							
Data gathered		Today	Previous	Total	Remaining	Planned	% Complete
Clamshell grabs		0	0	19	0	10	190
Vibrocores		0	0	38	0	30	126
Hamon grabs		11	26	37	43	80	46
Camera stations		8	20	28	2	30	93
Beam trawls		11	26	37	0	30	123
High resolution surveys (km)		0	0	NA	NA	N/A	N/A
NB Planned number of Hamon, car	nera and be	am trawls taken	from tender				
5. Weather							
Time Obs Wind		Obs Sea State		Rema	arks		
04:00 245° 20		220° 2.0 m					
08:00 270° 10		220° 1.2 m					
12:00 330° 14		220° 1.0 m					
16:00 Light Airs		Slight					
20:00Light Airs24:00Light Airs		Slight Slight					
Outlook E/NE 2-3 increasing 3-4 later		~1511					
6. Safety & Environmental							
Safety incidents:	None						
Cetacean watch:	None						
7. Personnel							
7. Personnel Marine Crew			Survey				
7. Personnel Marine Crew	Reading			<i>Crew</i> scientist	Keith	Cooper	

1 <sup>st</sup> Mate 3 <sup>rd</sup> Mate Chief Engineer + 12 additional crew	G Ritchie A Oakham S Tweedie	Survey engineer Survey engineer Survey engineer Benthic ecologist Benthic ecologist Benthic ecologist Benthic ecologist Benthic ecologist Geologist Geologist Archaeologist <i>Total survey</i>	Bill Meadows Ken May Simon Pearson Chris Barrio Matt Curtis Suzanne Ware Bryony Pearce Lisa Grubb Christean Wilson Julia Crummy Marta Perez-Fernandez 12
Total crew	16	i olul sul vey	12
Others			
Client representative MEPF Student	John Coppock Rauhan Wan Hussin		
Total	2		
Total persons onboard	30		

#### 8. Next 24 Hours

Continue 0.1m<sup>2</sup> Hamon grabbing/2m beam trawling/camera (Tranche 1).

Following a period of calm conditions over the past 48 hours, we will reassess the camera sledge for collecting underwater stills and video at station T1\_5 (offshore). If successful we will continue with this gear, targeting the offshore stations in the  $1^{st}$  instance.

In addition, we will begin the process of assessing the data collected thus far (e.g. curtain camera and grab/trawl sample images, beam trawl data, acoustics from previous geophysical survey) to identify a suitable sites for the trial of the Costerus twin grab and for the high resolution acoustic surveys.

9. Key Dates			Locat		Date	
Last Port call			Lowe	stoft	18 <sup>th</sup> May	
Next crew cha			TBA		TBA	
Expected com		uisition			15 <sup>th</sup> June 20	09
Next Port call			Lowe	stoft		
Last safety mu			N/A			
Next safety m	uster		16:00	29/05/2009		
10. Vessel Sta	atus					
Fuel Remainin	ng		Lub Oil Remaining		Water Re	emaining
11. Party Chi Work progres			to report			
12. Report su						
Party Chief	Keith Co	ooper	Client Representative	J Coppock	Master	A Reading
29 <sup>th</sup> May 2	2009					
29 <sup>th</sup> May 2 Cefas Endeav	2009 vour	-	-		Cefas	
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor	<b>2009</b> vour ne 00 8717	63998027		Mobile	07799773456	
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor	2009 vour	-	-	<b>Mobile</b> E-mail		tships.com
29 <sup>th</sup> May 2	2009 vour ne 00 8717 N/A	63998027 Atten			07799773456	
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor Mini-M Fax Addressee Or	2009 vour ne 00 8717 N/A	63998027 Atten	tion McNeill	E-mail	07799773456 <u>cefas.endeavour@g</u> e-ma	
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor Mini-M Fax Addressee Or MEPF Client	2009 vour ne 00 8717 N/A rganisation MEPF	63998027 Atten Euan	McNeill	E-mail <b>Telefax</b>	07799773456 cefas.endeavour@g e-ma e.mc Cefas Ref	ail eneill@wessexarch.co.u C3340
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor Mini-M Fax Addressee On MEPF Client Project	2009 vour ne 00 8717 N/A rganisation MEPF East Coas	63998027 Atten Euan		E-mail <b>Telefax</b>	07799773456 cefas.endeavour@g e-ma e.mc	ail eneill@wessexarch.co.u C3340
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor Mini-M Fax Addressee Or MEPF Client Project Report No	2009 vour ne 00 8717 N/A rganisation MEPF East Coas 12	63998027 Atten Euan I t Regional E	McNeill	E-mail <b>Telefax</b>	07799773456 cefas.endeavour@g e-ma e.mc Cefas Ref	ail eneill@wessexarch.co.u C3340
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor Mini-M Fax Addressee On MEPF Client Project Report No	2009 vour ne 00 8717 N/A rganisation MEPF East Coas	63998027 Atten Euan I t Regional E	McNeill	E-mail <b>Telefax</b>	07799773456 cefas.endeavour@g e-ma e.mc Cefas Ref	ail eneill@wessexarch.co.u C3340
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor Mini-M Fax Addressee Or MEPF Client Project Report No Period 1. Ship's Posi	2009 vour ne 00 8717 N/A rganisation MEPF East Coas 12 29 <sup>th</sup> May 2	63998027 Atten Euan 1 t Regional E 2009	McNeill	E-mail Telefax	07799773456 cefas.endeavour@g e-ma e.mc Cefas Ref	ail eneill@wessexarch.co.u C3340
29 <sup>th</sup> May 2 Cefas Endeav Mini-M Phor Mini-M Fax Addressee On MEPF Client Project Report No Period	2009 vour ne 00 8717 N/A rganisation MEPF East Coas 12 29 <sup>th</sup> May 2	63998027 Atten Euan 1 t Regional E 2009	McNeill	E-mail <b>Telefax</b>	07799773456 cefas.endeavour@g e-ma e.mc Cefas Ref	ail eneill@wessexarch.co.u C3340

Present Activity

<b>2. Summary of Events</b> Time zone GMT							
	ation Code 00 Ops	Activity 0.1m <sup>2</sup> Hamor	n grabbing/21	m beam trawl	ling/camera		
3. Time Analysis							
Activity				Code	Today	Previous	
Operational Standby at sea (weather)				Ops StbyW	24:00 0	217:15 0	241:15 0
Stand-down alongside				StbyW	0	0	0
Mob / Demob				Mob	0	41:00	41:00
Contractors Time (Vessel)				CtV	0	5:45	5:45
Contractor's Time (Operation	ns)			Ct	0	0	0
				Total:	24:00	264:00	288:00
4. Production Summary							
Data gathered		Today	Previous	Total	Remaining		% Complete
Clamshell grabs Vibrocores		0 0	0 0	19 38	0 0	10 30	190 126
Hamon grabs		12	0 37	38 49	0 31	30 80	61
Camera stations		8	28	36	0	30	120
Beam trawls		12	28 37	30 49	0	30	160
High resolution surveys	(km)	0	0	NA	NA	N/A	N/A
NB Planned number of Ham							
	m, camera and t						
<b>5. Weather</b> Time Obs Wind		Obs Sea State		Remar	`ks		
04:00 Light Airs		Slight		Roma			
08:00 090° 08		Slight					
12:00 090° 10		Slight					
16:00 090° 10		Slight					
20:00 070° 15		090° 1.2 m					
24:00 070° 19		090° 1.2 m					
Outlook							
E/NE 4-5, decreasing NE 3-	4 later						
6. Safety & Environmental							
Safety incidents: Cetacean watch:	None						
Cetacean watch:	None						
7. Personnel			G	G			
Marine Crew				y Crew	17 .11	C	
Master 1 <sup>st</sup> Mate	A Reading			scientist		Cooper	
3 <sup>rd</sup> Mate	G Ritchie A Oakham			y engineer		leadows	
	A Oaknam S Tweedie			y engineer y engineer	Ken N Simor	ay Pearson	
Chief Engineer + 12 additional crew	5 I weedle			ic ecologist		Barrio	
				ic ecologist	Matt (		
				ic ecologist		ne Ware	
				ic ecologist		y Pearce	
				ic ecologist	Lisa C		
			Geolo			ean Wilson	
			Geolo			Crummy	
				eologist		Perez-Ferna	ndez
Total crew	16			survey	12		-
	10						
Others							
		1					
Client representative MEPF Student	John Coppoo Rauhan War						

8. Next 24 Hours

Continue 0.1m<sup>2</sup> Hamon grabbing/2m beam trawling/camera (Tranche 1).

Whilst we have successfully deployed the camera sledge at 4 offshore stations in the past 24 hours, we may have to switch back to the curtain camera for the inshore stations (visibility here has been very poor).

We remain on target to complete all work within the first of 3 survey tranches by the end of Sunday 1st June

9. Key Dates		Locatio	on	Date	
Last Port call		Lowest	toft	18 <sup>th</sup> May	
Next crew change		TBA		TBA	
Expected completion of ac	quisition			15 <sup>th</sup> June 2	2009
Next Port call	-	Lowest	toft		
Last safety muster		16:00 2	29/05/2009		
Next safety muster		N/A			
10. Vessel Status					
Fuel Remaining	Lub	Oil Remaining		Water	Remaining
11. Party Chief Commen	ts				
Work progressing to plan.	No problems to rep	ort			
12. Report submitted by:					
Party Chief Keith C	Cooper Clier	nt Representative	J Coppock	Master	A Reading

## 30<sup>th</sup> May 2009

Celas Elluc	eavour				Cefas	
Mini-M Ph Mini-M Fa		8717639980 A	27	<b>Mobile</b> E-mail	07799773456 cefas.endeavour@gts	hips.com
Addressee MEPF	Organisati		<b>ttention</b> uan McNei	Telefax	e-mail	l eill@wessexarch.co.ul
Client Project Report No Period	13	-	nal Enviror	mental Characterisation Survey	Cefas Ref Email Ref:	C3340
1. Ship's Po Date	osition & S 30 <sup>th</sup> M	Status ay 2009		Latitude	52 18.000 ' N	
Time Present Act	GMT ivity		:00 m <sup>2</sup> Hamor	Longitude grabbing/2m beam trawling/came	02 06.700' E ra	
Time zone From	<b>y of Event</b> GMT To 08:20	s Duration 08:20	Code Ops	Activity 0.1m <sup>2</sup> Hamon grabbing/2m bear	n trawling/camera	
<b>2. Summar</b> Time zone From 00:00 08:20	GMT To	Duration			-	n successfully rectified

3. Time Analysis				
Activity	Code	Today	Previous	Present
Operational	Ops	19:00	241:15	260:15
Standby at sea (weather)	StbyW	0	0	0
Stand-down alongside	StbyO	0	0	0
Mob / Demob	Mob	0	41:00	41:00
Contractors Time (Vessel)	CtV	5	0	5:00
Contractor's Time (Operations)	Ct	0	5:45	5:45
	Total:	24:00	288:00	312:00

NB/ In previous reports the Contractors downtime, up to 24:00, 29/05/2009, should have been assigned to Ct and not CtV. All times now corrected.

4. Production Summary							
Data gathered		Today	Previous	Total	Remainin	g Planned	% Complete
Clamshell grabs		0	0	19	0	10	190
Vibrocores		0	0	38	0	30	126
Hamon grabs		5	49	54	26	80	67
Camera stations		9	36	45	0	30	150
Beam trawls		6	49	55	0	30	183
High resolution surv	eys (km)	0	0	NA	NA	N/A	N/A
NB Planned number of H	amon, camera and be	eam trawls taken	from tender	r			
5. Weather							
Time Obs Wind		Obs Sea State		Rem	arks		
04:00 070° 15		090° 1 - 2 m					
08:00 070° 14		090° 1 - 2 m					
12:00 080° 14		090° 1 m					
16:00 080° 15		090° 1 m					
20:00 070° 16		090° 1 m					
24:00 060° 14		090° 1 m					
Outlook							
NE 4-6							
5. Safety & Environmen	tal						
Safety incidents:	None						
Cetacean watch:	None						
7. Personnel Marine Crew			G	C			
Marine Crew	A Deading			y Crew r scientist	Vait	Coomen	
1 <sup>st</sup> Mate	A Reading G Ritchie					n Cooper	
3 <sup>rd</sup> Mate	A Oakham			y engineer y engineer	Ken	Meadows	
	S Tweedie			y engineer		n Pearson	
Chief Engineer + 12 additional crew	5 Tweedle					s Barrio	
+ 12 additional crew				ic ecologist ic ecologist		Curtis	
				ic ecologist		nne Ware	
				ic ecologist			
				ic ecologist		ny Pearce Grubb	
			Geolo			stean Wilson	
			Geolo			Crummy	
				eologist		a Perez-Ferr	andaz
				survey	Mari 12	a reiez-rem	lanuez
Total crew	16		1 out	survey	12		
Others							
Client representative	John Coppoch Rauhan Wan						
Others Client representative MEPF Student <b>Total</b>							

#### 8. Next 24 Hours

Over the next 24 hours we expect to complete the first tranche of survey work ( $61 \times 0.1m^2$  Hamon grabbing;  $61 \times 2m$  beam trawls;  $38 \times 2m$  camera tows). We will then undertake the planned comparison of the  $0.1m^2$  Hamon and Corteus Twin grabs. This work will be undertaken at a previously sampled station from tranche 1 that was characterised by sandy gravel sediments.

On completion of the grab comparison we will start work on the second tranche of survey work. Tranche 2 comprises  $33 \times 0.1 \text{m}^2$  Hamon grab samples, 1 x camera tow and 4 days of high resolution acoustic surveys. Where conditions allow, we will also collect additional 2m beam trawl samples to augment the data collected to date.

9. Key Dates	Location	Date
Last Port call	Lowestoft	18 <sup>th</sup> May
Next crew change	TBA	TBA
Expected completion of acquisition		15 <sup>th</sup> June 2009
Next Port call	Lowestoft	
Last safety muster	16:00 29/05/2009	
Next safety muster	N/A	
-		

10. Vessel Status

#### **11. Party Chief Comments**

Poor underwater visibility in the inshore half of the survey area necessitated a switch back to the curtain camera. However, the camera sledge was successfully employed at 5 stations in the south-west of the survey area (offshore, relatively deep water).

Camera winch problems were successfully resolved without affecting the schedule (see above).

12. Report submitted by:						
Party Chief	Keith Cooper	Client Representative	J Coppock	Master	A Reading	

## 31<sup>st</sup> May 2009

31 <sup>st</sup> May 20	09								
Cefas Endeavour					C	efas			
Mini-M Phone Mini-M Fax	00 87 N/A	7176399802	27		<b>Mobile</b> E-mail		799773456 fas.endeavou	ur@gtships.co	<u>m</u>
Addressee Orga MEPF	nisatio		t <b>tention</b> 1an McNe	ill	Telefax	X		e-mail e.mcneill@w	essexarch.co.u
Client Project Report No Period	14		al Enviro	nmental Charact	erisation Sur	vey	Cefas Emai	s Ref il Ref:	C3340
1. Ship's Positio	on & Sta 31 <sup>th</sup> May	atus y 2009			Latitude	52	14.700 ' N		
	GMT	24:		on acoustic surv	Longitud ey		0.200' E		
From         To           00:00         17           17:00         23           23:00         24	:00 :00 :00	Duration 17:00 06:00 01:00	Code Ops Ops Ops	Activity 0.1m <sup>2</sup> Hamo 0.1m <sup>2</sup> Hamo High resoluti	n/Corteus Tw	vin grab com		(Tranche 1)	
3. Time Analysi Activity Operational Standby at sea (v Stand-down alor Mob / Demob Contractors Time Contractor's Time	weather) Igside e (Vesse	el)				Code Ops StbyW StbyO Mob CtV Ct Ct Total:	<b>Today</b> 24:00 0 0 0 0 0 24:00 24:00	Previous 260:15 0 0 41:00 5 5:45 312:00	Present 284:15 0 0 41:00 5:00 5:45 <b>336:00</b>
NB/ In previous times now correct	-	the Contrac	ctors down	ntime, up to 24:	00, 29/05/20	09, should ha	ave been ass	igned to Ct ar	nd not CtV. A
4. Production S Data gathe Clamshell g Vibrocores Hamon gral	<b>red</b> grabs	у		<b>Today</b> 0 0 8	<b>Previous</b> 0 0 54	<b>Total</b> 19 38 62	<b>Remainin</b> 0 18	<b>g Planned</b> 10 30 80	% Complete 190 126 78

NB Planned number of Hamon, camera and beam trawls taken from tender

8

0

10

10

55

0

0

0

 5. Weather
 Obs Wind
 Obs Sea State

 04:00
 060° 12
 090° 1 m

 08:00
 050° 14
 070° 1 - 2 m

Costerus Twin grabs (grab comparison)

Beam trawls

High resolution surveys (km)

Hamon grabs (grab comparison)

Remarks

0

0

0

NA

30

N/A

10

10

210

N/A

100

100

63

NA

10

10

12:00	060° 16	070° 1 m
16:00	060° 18	070° 1 m
20:00	025° 17	$050^{\circ} 1 - 2 m$
24:00	045° 16	090° 1 - 2 m
Outlook		
NE 4-5		

## 6. Safety & Environmental

Client Project MEPF

Safety incidents: Cetacean watch:		None None				
7. Personnel						
Marine Crew				Survey Crew		
Master	,	A Reading		Senior scientist	Kei	th Cooper
1 <sup>st</sup> Mate		G Ritchie		Survey engineer		Meadows
3 <sup>rd</sup> Mate		A Oakham		Survey engineer		n May
Chief Engineer		S Tweedie		Survey engineer		ion Pearson
+ 12 additional cre				Benthic ecologi		is Barrio
1 12 udditional ere				Benthic ecologi		tt Curtis
				Benthic ecologi		anne Ware
				Benthic ecologi		
						ony Pearce
				Benthic ecologi		a Grubb
				Geologist		istean Wilson
				Geologist		a Crummy
				Archaeologist		rta Perez-Fernandez
				Total survey	12	
Total crew		16				
Others						
Client representati		John Coppock				
MEPF Student	]	Rauhan Wan Hussin				
Total		2				
Total persons onl	oard	30				
8. Next 24 Hours		ustic data from the 1 <sup>st</sup>	targeted s	urvey area, followe	d by Tranche 2	ground-truthing stations.
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change	resolution aco		targeted s Location Lowes TBA	on	Date 18 <sup>th</sup> M TBA	ſay
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi	resolution aco		Locatio Lowes TBA	on toft	Date 18 <sup>th</sup> M TBA	
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call	resolution aco on of acquisiti		Location Lowes TBA Lowes	on toft	Date 18 <sup>th</sup> M TBA	ſay
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster	resolution aco on of acquisiti		Location Lowes TBA Lowes 16:00	on toft	Date 18 <sup>th</sup> M TBA	ſay
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster	resolution aco on of acquisiti		Location Lowes TBA Lowes	on toft	Date 18 <sup>th</sup> M TBA	ſay
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster 10. Vessel Status	resolution aco on of acquisiti	on	Locati Lowes TBA Lowes 16:00 2 N/A	on toft	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	lay une 2009
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster 10. Vessel Status	resolution aco on of acquisiti		Locati Lowes TBA Lowes 16:00 2 N/A	on toft	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	ſay
<ul> <li>8. Next 24 Hours Collection of high</li> <li>9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster</li> <li>10. Vessel Status Fuel Remaining</li> <li>11. Party Chief C</li> </ul>	resolution aco on of acquisiti	on Lub Oil Rema	Locati Lowes TBA Lowes 16:00 2 N/A	on toft	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	lay une 2009
<ul> <li>8. Next 24 Hours Collection of high</li> <li>9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster</li> <li>10. Vessel Status Fuel Remaining</li> <li>11. Party Chief C Work progressing</li> </ul>	resolution aco on of acquisiti r omments to plan. No pro	on Lub Oil Rema	Locati Lowes TBA Lowes 16:00 2 N/A	on toft	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	lay une 2009
8. Next 24 Hours	resolution aco on of acquisiti r omments to plan. No pro	on Lub Oil Rema oblems to report	Locati Lowes TBA Lowes 16:00 2 N/A	on toft	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	lay une 2009
<ul> <li>8. Next 24 Hours Collection of high</li> <li>9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster</li> <li>10. Vessel Status Fuel Remaining</li> <li>11. Party Chief C Work progressing</li> <li>12. Report submi</li> </ul>	resolution aco on of acquisiti r omments to plan. No pro	on Lub Oil Rema oblems to report	Locati Lowes TBA Lowes 16:00 2 N/A	on toft 29/05/2009	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	Iay     Ine 2009     ater Remaining
<ul> <li>8. Next 24 Hours Collection of high</li> <li>9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster</li> <li>10. Vessel Status Fuel Remaining</li> <li>11. Party Chief C Work progressing</li> <li>12. Report submi Party Chief</li> </ul>	resolution aco on of acquisiti r omments to plan. No pro tted by: Keith Cooper	on Lub Oil Rema oblems to report	Locati Lowes TBA Lowes 16:00 2 N/A	on toft 29/05/2009	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	fay ane 2009 ater Remaining
<ul> <li>8. Next 24 Hours Collection of high</li> <li>9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster</li> <li>10. Vessel Status Fuel Remaining</li> <li>11. Party Chief C Work progressing</li> <li>12. Report submi</li> </ul>	resolution aco on of acquisiti r omments to plan. No pro tted by: Keith Cooper	on Lub Oil Rema oblems to report	Locati Lowes TBA Lowes 16:00 2 N/A	on toft 29/05/2009	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju	Iay     Ine 2009     ater Remaining
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster 10. Vessel Status Fuel Remaining 11. Party Chief C Work progressing 12. Report submi Party Chief 1 <sup>st</sup> June 2009 Cefas Endeavour	resolution aco on of acquisiti r omments to plan. No pro tted by: Keith Cooper	on Lub Oil Rema oblems to report Client Repres	Locati Lowes TBA Lowes 16:00 2 N/A	on toft 29/05/2009 J Coppock	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju W Master Cefas	Iay       Ine 2009       ater Remaining       A Reading
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster 10. Vessel Status Fuel Remaining 11. Party Chief C Work progressing 12. Report submi Party Chief 1 <sup>st</sup> June 2009 Cefas Endeavour Mini-M Phone	resolution aco on of acquisiti r omments to plan. No pro tted by: Keith Cooper	on Lub Oil Rema oblems to report Client Repres	Locati Lowes TBA Lowes 16:00 2 N/A	on toft 29/05/2009	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju W W Master Cefas 07799773456	Iay       Ine 2009       ater Remaining       A Reading
8. Next 24 Hours Collection of high 9. Key Dates Last Port call Next crew change Expected completi Next Port call Last safety muster Next safety muster 10. Vessel Status Fuel Remaining 11. Party Chief C Work progressing 12. Report submi Party Chief	resolution aco on of acquisiti r omments to plan. No pro tted by: Keith Cooper 00 87176399 N/A	on Lub Oil Rema oblems to report Client Repres	Locati Lowes TBA Lowes 16:00 2 N/A	on toft 29/05/2009 J Coppock Mobile	Date 18 <sup>th</sup> M TBA 15 <sup>th</sup> Ju W W Master Cefas 07799773456	ater Remaining A Reading

East Coast Regional Environmental Characterisation Survey

Cefas Ref

Email Ref:

C3340

Report No15Period1st June 2009

1. Ship's Posi	ition & Status			
Date	1 <sup>st</sup> June 2009		Latitude	52 22.600 ' N
Time	GMT	24:00	Longitude	02 09.300 ' E
Present Activi	ty	High resolution acoustic survey	4	

#### 2. Summary of Events

Time zone From 00:00	GMT To 11:45	Duration 11:45	Code Ops	Activity High resolution acoustic survey
11:45	24:00	12:15	Ops	0.1m <sup>2</sup> Hamon grabbing/2m beam trawling (Tranche 2)

3. Time Analysis				
Activity	Code	Today	Previous	Present
Operational	Ops	24:00	284:15	284:15
Standby at sea (weather)	StbyW	0	0	0
Stand-down alongside	StbyO	0	0	0
Mob / Demob	Mob	0	41:00	41:00
Contractors Time (Vessel)	CtV	0	5	5:00
Contractor's Time (Operations)	Ct	0	5:45	5:45
	Total:	24:00	336:00	360:00

NB/In previous reports the Contractors downtime, up to 24:00, 29/05/2009, should have been assigned to Ct and not CtV. All times now corrected.

4. Production Summary						
Data gathered	Today	Previous	Total	Remaini	ng Planned	% Complete
Clamshell grabs	0	0	19	0	10	190
Vibrocores	0	0	38	0	30	126
Hamon grabs	10	62	72	8	80	90
Camera stations	0	49	49	0	30	163
Beam trawls	9	63	72	0	30	240
High resolution surveys (km)	77	0	77	NA	N/A	12
Hamon grabs (grab comparison)	0	10	10	0	10	100
Costerus Twin grabs (grab comparison)	0	10	10	0	10	100

NB Planned number of Hamon, camera and beam trawls taken from tender

S Tweedie

5. Weather	r				
Time	Obs Wind		Obs Sea State	Remarks	
04:00	045° 18		040° 2 m	Kemarke	5
04:00	010° 16		040°2 m		
12:00	030° 16		030° 1 m		
16:00	030° 20		030° 1 m		
20:00	020° 18		020° 1 m		
24:00	010° 14		020° 1 m		
Outlook					
NE 4-5, po	ssibly 6				
6. Safety 8	<b>k</b> Environmental				
Safety inci		None			
Cetacean w	atch:	None			
7. Personn	el				
Marine Cr	ew			Survey Crew	
Master		A Reading		Senior scientist	Keith Cooper
1 <sup>st</sup> Mate		G Ritchie		Survey engineer	Bill Meadows
3 <sup>rd</sup> Mate		A Oakham		Survey engineer	Ken May

Chief Engineer

+ 12 additional crew

Survey engineer Survey engineer Benthic ecologist Benthic ecologist Benthic ecologist Benthic ecologist Benthic ecologist Geologist Geologist Keith Cooper Bill Meadows Ken May Simon Pearson Chris Barrio Matt Curtis Suzanne Ware Bryony Pearce Lisa Grubb Christean Wilson Julia Crummy

Total crew	16	Archaeologist <i>Total survey</i>	Marta Perez-Fernandez 12
Others			
Client representative MEPF Student	John Coppock Rauhan Wan Hussin		
Total	2		
Total persons onboard	30		

**8.** Next 24 Hours Tranche 2 ground-truthing stations, followed by collection of high resolution acoustic data from the 2<sup>nd</sup> targeted survey area.

	es			Locati		Date		
Last Port ca			stoft	18 <sup>th</sup> May				
Next crew				TBA		TBA		
Expected c	ompletion of	of acquisition				15 <sup>th</sup> June	2009	
Next Port c	all			Lowes	stoft			
Last safety	muster			16:00	29/05/2009			
Next safety				N/A				
10. Vessel	Status							
Fuel Rema	ining		Lub	Oil Remaining		Water	Remaining	
11. Party (	Chief Com	ments						
Work prog	ressing to p	lan. No probl	ems to rep	oort				
	submitted							
Party Chief	f Ke	eith Cooper	Clie	nt Representative	J Coppock	Master	A Rea	ading
2 <sup>nd</sup> June	e 2009							
Cefas End	eavour					Cefas		
M:: M DI		9717620090	27		Mahila	07700772456		
Mini-M Pl		8717639980	27		Mobile	07799773456	0.11	
Mini-M Fa	ax N/	A			E-mail	cefas.endeavour@	@gtships.com	
	Organisat		ttention	.11	Telefax	-	mail	
MEPF		E	uan McNe	111		<u>e.</u>	mcneill@wess	sexarch.co.ul
Client	MEI					Cefas R		C3340
Project		Coast Region	nal Enviro	nmental Characteri	isation Survey	Email F	Ref:	
Report No Period	16 2 <sup>nd</sup> J	une 2009						
-	Position & S	Status						
Date	$2^{nu}$ Ju	ne 2009			Latitude	52 38.900 ' N		
Time	GMT	24	:00		Longitude	02 20.400 ' E		
Present Ac	tivity	0.1	m <sup>2</sup> Hamo	n grabbing/2m bea	m trawling (Tra	anche 2)		
	ry of Event	ts						
Time zone	GMT							
From	То	Duration	Code	Activity				
00:00	08:45	08:45	Ops	0.1m <sup>2</sup> Hamon g	grabbing/2m bea	am trawling (Tranche 2	2)	
08:45	19:15	10:30	Ops	High resolution	acoustic surve	у		
19:15	24:00	04:45	Ops	0.1m <sup>2</sup> Hamon g	grabbing/2m bea	am trawling (Tranche 2	2)	

Activity	Code	Today	Previous	Present
Operational	Ops	24:00	308:15	332:15
Standby at sea (weather)	StbyW	0	0	0
Stand-down alongside	StbyO	0	0	0
Mob / Demob	Mob	0	41:00	41:00
Contractors Time (Vessel)	CtV	0	5	5:00

Ct	0	5:45	5:45
Total:	24:00	360:00	384:00

NB/ In previous reports the Contractors downtime, up to 24:00, 29/05/2009, should have been assigned to Ct and not CtV. All times now corrected.

Production Summary						
Data gathered	Today	Previous	Total	Remaini	ng Planned	% Complete
Clamshell grabs	0	0	19	0	10	190
Vibrocores	0	0	38	0	30	126
Hamon grabs	9	72	81	0	80	101
Camera stations	0	49	49	0	30	163
Beam trawls	9	72	81	0	30	270
High resolution surveys (km)	73.24	77	150.24	NA	N/A	24
Hamon grabs (grab comparison)	0	10	10	0	10	100
Costerus Twin grabs (grab comparison)	0	10	10	0	10	100

NB Planned number of Hamon, camera and beam trawls taken from tender

5. Weather			
Time	Obs Wind	Obs Sea State	Remarks
04:00	010° 17	020° 1-2 m	
08:00	020° 19	020° 1-2 m	
12:00	350° 17	020° 1-2 m	
16:00	350° 12	020° 2 m	
20:00	350° 9	020° 1-2 m	
24:00	350° 9	020° 1-2 m	
Outlook			
NW 4-5			

#### 6. Safety & Environmental

Safety incidents:	None
Cetacean watch:	None

7. Personnel			
Marine Crew		Survey Crew	
Master	A Reading	Senior scientist	Keith Cooper
1 <sup>st</sup> Mate	G Ritchie	Survey engineer	Bill Meadows
3 <sup>rd</sup> Mate	A Oakham	Survey engineer	Ken May
Chief Engineer	S Tweedie	Survey engineer	Simon Pearson
+ 12 additional crew		Benthic ecologist	Chris Barrio
		Benthic ecologist	Matt Curtis
		Benthic ecologist	Suzanne Ware
		Benthic ecologist	Bryony Pearce
		Benthic ecologist	Lisa Grubb
		Geologist	Christean Wilson
		Geologist	Julia Crummy
		Archaeologist	Marta Perez-Fernandez
		Total survey	12
Total crew	16		
Others			
Client representative MEPF Student	John Coppock Rauhan Wan Hussin		
Total	2		
Total persons onboard	30		

#### 8. Next 24 Hours

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Tranche 2 ground-truthing stations, followed by collection of high resolution acoustic data from the 3<sup>rd</sup> and 4<sup>th</sup> targeted survey areas.

9. Key Dates	Location	Date
Last Port call	Lowestoft	18 <sup>th</sup> May
Next crew change	TBA	TBA
Expected completion of acquisition		15 <sup>th</sup> June 2009
Next Port call	Lowestoft	
Last safety muster	16:00 29/05/2009	
Next safety muster	N/A	

<b>10. Vessel S</b> Fuel Remai			Lub O	il Remaining		Water Remaining			
<b>11. Party C</b> Work progr			lems to repor	rt					
<b>12. Report</b> Party Chief		<b>by:</b> ith Cooper	Client	Representative	J Coppock		Master	۸D	eading
Faity Chief	Ke	tui Coopei	Client	Representative	ј Сорроск		Waster	A K	aunig
3 <sup>rd</sup> June	2009								
Cefas Ende	eavour					Ce	efas		
Mini-M Ph Mini-M Fa		8717639980 A	27		<b>Mobile</b> E-mail		799773456 fas.endeavou	ar@gtships.com	L
Addressee MEPF	Organisati		<b>ttention</b> uan McNeill		Telefax			e-mail e.mcneill@wes	ssexarch.co.u
Client Project Report No Period	17	-	nal Environn	nental Characteri	sation Survey	7	Cefas Emai		C3340
<b>I. Ship's Po</b> Date Fime Present Act	GMT	ne 2009 24	:00 1m <sup>2</sup> High res	olution acoustic	Latitude Longitude survey (HI RI	02.2	53.800 ' N 21.900 ' E		
2. Summar	v of Event	s							
Time zone From 00:00	GMT To 07:00	Duration 07:00	Code Ops	Activity 0.1m <sup>2</sup> Hamon g	rabbing/2m b	aam trawl	ing (Tranch	2)	
07:00	24:00	17:00	Ops	High resolution	-		-		
3. Time An Activity Operational Standby at s Stand-down Mob / Demo Contractors	sea (weathe a alongside ob Time (Ves	sel)				Code Ops StbyW StbyO Mob CtV	<b>Today</b> 24:00 0 0 0	<b>Previous</b> 332:15 0 0 41:00 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	<b>Present</b> 356:15 0 0 41:00 5:00
Contractor's	s Time (Op	erations)				Ct Total:	0 24:00	5:45 384:00	5:45 <b>408:00</b>
NB/ In prev times now c 4. Producti		ts the Contra	actors downti	me, up to 24:00	, 29/05/2009,	should ha	ve been assi	igned to Ct and	not CtV. A

Data gathered	Today	Previous	Total	Remaini	ng Planned	% Complete
Clamshell grabs	0	0	19	0	10	190
Vibrocores	0	0	38	0	30	126
Hamon grabs	5	81	86	0	80	107
Camera stations	0	49	49	0	30	163
Beam trawls	5	81	86	0	30	286
High resolution surveys (km)	106.76	150.24	257	NA	N/A	41
Hamon grabs (grab comparison)	0	10	10	0	10	100
Costerus Twin grabs (grab comparison)	0	10	10	0	10	100

NB Planned number of Hamon, camera and beam trawls taken from tender

# 5. Weather

5. Weather			
Time	Obs Wind	Obs Sea State	Remarks
04:00	360° 18	020° 2 m	
08:00	010° 15	020° 2-3 m	

12:00	010° 20	020° 2-3 m
16:00	340° 20	000° 3 m
20:00	010° 19	000° 3 m
24:00	360° 20	000° 3 m
Outlook		
NW 4-5		

## 6. Safety & Environmental

Addressee Organ	usation	Attention Euan McNeill		Telefax	e-n	ail cneill@wessexarch.co.ul
Mini-M Phone Mini-M Fax	00 8717639 N/A			Mobile E-mail	07799773456 cefas.endeavour@	
Cefas Endeavour					Cefas	
4 <sup>th</sup> June 2009	)					
<b>12. Report subm</b> Party Chief	itted by: Keith Coop	er Client Repr	resentative	J Coppock	Master	A Reading
<b>11. Party Chief C</b> Work progressing		problems to report				
<b>10. Vessel Status</b> Fuel Remaining		Lub Oil Re	maining		Water F	Remaining
Next Port call Last safety muster Next safety muste			Lowest 16:00 2 N/A	toft 29/05/2009		
Next crew change Expected complet		ition	TBA	C.	TBA 15 <sup>th</sup> June 2	009
8. Next 24 Hours High resolution ac 9. Key Dates Last Port call	coustic data fr	rom the 4 <sup>th</sup> and 5th tar	geted survey Locatio Lowest	on	Date 18 <sup>th</sup> May	
Total persons on		30				
Total		2				
Client representat MEPF Student	ive	John Coppock Rauhan Wan Hussin				
Others						
Total crew		16		Benthic ecologis Benthic ecologis Geologist Geologist Archaeologist <i>Total survey</i>	t Bryony I t Lisa Gru Christean Julia Cru	Pearce bb 1 Wilson
Marine Crew Master 1 <sup>st</sup> Mate 3 <sup>rd</sup> Mate Chief Engineer + 12 additional cre	ew	A Reading G Ritchie A Oakham S Tweedie		Survey Crew Senior scientist Survey engineer Survey engineer Benthic ecologis Benthic ecologis Benthic ecologis	Ken May Simon Pe t Chris Ba t Matt Cur	dows earson rrio tis
7. Personnel						

Report No18Period4th June 2009

Latitude 52 46.100 ' N Longitude 02 00.100 ' E ligh resolution acoustic survey (HI RES 5)
de Activity
High resolution acoustic survey (HI RES 4)
High resolution acoustic survey (HI RES 5). 1 x 2m beam trawling taken p to HI RES5 (in order to determine % coverage)
)

5. Thile Analysis				
Activity	Code	Today	Previous	Present
Operational	Ops	24:00	356:15	380:15
Standby at sea (weather)	StbyW	0	0	0
Stand-down alongside	StbyO	0	0	0
Mob / Demob	Mob	0	41:00	41:00
Contractors Time (Vessel)	CtV	0	5	5:00
Contractor's Time (Operations)	Ct	0	5:45	5:45
	Total:	24:00	408:00	432:00

Production Summary						
Data gathered	Today	Previous	Total	Remaini	ng Planned	% Complete
Clamshell grabs	0	0	19	0	10	190
Vibrocores	0	0	38	0	30	126
Hamon grabs	0	86	86	0	80	107
Camera stations	0	49	49	0	30	163
Beam trawls	1	86	87	0	30	290
High resolution surveys (km)	150	257	407	NA	N/A	55
Hamon grabs (grab comparison)	0	10	10	0	10	100
Costerus Twin grabs (grab comparison)	0	10	10	0	10	100

NB Planned number of Hamon, camera and beam trawls taken from tender

5. Weath	er			
Time	Obs Wind	Obs Sea State	Remarks	
04:00	350° 20	350° 3 m		
08:00	350° 18	350° 3 m		
12:00	330° 18	350° 2-3 m		
16:00	330° 20	350° 2-3 m		
20:00	340° 18	350° 3 m		
24:00	330° 16	350° 2-3 m		
Outlook				
NW 4-5				

## 6. Safety & Environmental

None		
None		
	Survey Crew	
A Reading	Senior scientist	Keith Cooper
G Ritchie	Survey engineer	Bill Meadows
A Oakham	Survey engineer	Ken May
S Tweedie	Survey engineer	Simon Pearson
	Benthic ecologist	Chris Barrio
	Benthic ecologist	Matt Curtis
	Benthic ecologist	Suzanne Ware
	Benthic ecologist	Bryony Pearce
	Benthic ecologist	Lisa Grubb
	Geologist	Christean Wilson
	Geologist	Julia Crummy
	Archaeologist	Marta Perez-Fernandez
	Total survey	12
16	2	
-	None A Reading G Ritchie A Oakham S Tweedie	None          Survey Crew         A Reading       Senior scientist         G Ritchie       Survey engineer         A Oakham       Survey engineer         S Tweedie       Survey engineer         Benthic ecologist       Benthic ecologist         Benthic ecologist       Benthic ecologist         Benthic ecologist       Geologist         Geologist       Geologist         Archaeologist       Archaeologist         Benthic survey       Burthic

Others

Client representative	John Coppock
MEPF Student	Rauhan Wan Hussin
Total	2

30

#### Total persons onboard

#### 8. Next 24 Hours

High resolution acoustic data from the 5<sup>th</sup> and 6th targeted survey areas. Continue with Tranche 2 ground-truth stations (0.1m2 Hamon grabs and 2m beam trawl).

<b>9. Key Dates</b> Last Port call				Locati			Date 18 <sup>th</sup> Ma				
	ast Port call ext crew change				Lowestoft TBA			TBA			
		of acquisition		IDA			15 <sup>th</sup> Jun	a 2000			
Next Port cal		acquisition		Lowe	stoft		15 Juli	2009			
Last safety m					29/05/2009						
Next safety n				N/A	29/03/2009						
10. Vessel St	atus										
Fuel Remain	ing		Lub	Oil Remaining			Wate	er Remaining			
11. Party Ch		<b>nents</b> lan. No probl	ame to rar	ort							
		-	ems to rep	on							
12. Report s Party Chief		by: ith Cooper	Clie	nt Representative	J Coppock		Master	A Re	ading		
_th											
5 <sup>th</sup> June 2 Cefas Endea						Ce	fas				
Mini-M Pho Mini-M Fax		8717639980 A	27		Mobile E-mail		799773456 as.endeavou	<u>e@gtships.com</u>	L		
Addressee O	)roanicat	ion A	ttention		Telefax			e-mail			
MEPF	n gamsati		uan McNe	ill	Тентал			e.mcneill@wes	ssexarch.co.		
Client Project Report No Period	19		nal Enviro	nmental Character	isation Survey	y	Cefas Email		C3340		
L. Ship's Pos	sition & S	Status									
Date	5 <sup>m</sup> Jui	ne 2009			Latitude	52 4	9.100 ' N				
Fime Present Activ	GMT vitv		:00 m <sup>2</sup> High r	esolution acoustic	Longitude survey (HI R		4.000 ' E				
2. Summary	-					_~ ~ )					
Fime zone	GMT										
From	To	Duration	Code	Activity							
00:00	14:30	14:30	Ops	High resolution				a and 2 h	• teored - )		
14:30	19:37	05:07	Ops	Tranche 2 grou				s and 2m beam	i trawls)		
19:37	24:00	04:23	Ops	High resolutior	acoustic surv	vey (HI KE	S 0)				
3. Time Ana Activity	lysis					Code	Today	Previous	Present		
Operational						Ops	24:00	380:15	404:15		
Standby at se	a (weathe	er)				StbyW	0	0	0		
Stand-down a						StbyO	0	0	0		
Mob / Demo	b					Mob	0	41:00	41:00		
Contractors 7						CtV	0	5	5:00		
	Time (Op	perations)				Ct	0	5:45	5:45		
Contractor's						Total:	24:00	432:00	456:00		
Contractor's						10000		102100	-50.00		
Contractor's 4. Productio Data ga		ary		Today	Previous 7	fotal	Remaining		430.00 % Complete		

Clamshell grabs	0	0	19	0	10	190
Vibrocores	0	0	38	0	30	126
	0	0		0		
Hamon grabs	3	86	89	0	80	111
Camera stations	0	49	49	0	30	163
Beam trawls	3	87	90	0	30	300
High resolution surveys (km)	150	407	557	NA	N/A	75
Hamon grabs (grab comparison)	0	10	10	0	10	100
Costerus Twin grabs (grab comparison)	0	10	10	0	10	100

NB Planned number of Hamon, camera and beam trawls taken from tender

5. Weather				
Time	Obs Wind	Obs Sea St		
04:00	330° 18	350° 2-3 m	l	
08:00	340° 09	350° 2 m		
12:00	000° 04	350° 1-2 m		
16:00	000° 05	350° 1-2 m		
20:00	135° 12	350° 1-2 m		
24:00	120° 12	350° 1-2 m	L	
Outlook NW 4-5				
	Environmental			
Safety incide		None		
Cetacean wa	itch:	None		
7. Personne	-		с. <u>с</u>	
Marine Crev Master	W	A Booding	Survey Crew Senior scientist	Kaith Cooper
1 <sup>st</sup> Mate		A Reading G Ritchie		Keith Cooper Bill Meadows
3 <sup>rd</sup> Mate		A Oakham	Survey engineer Survey engineer	Ken May
Chief Engin	eer	S Tweedie	Survey engineer	Simon Pearson
+ 12 addition		5 Tweedle	Benthic ecologist	Chris Barrio
+ 12 additio	nai ciew		Benthic ecologist	Matt Curtis
			Benthic ecologist	Suzanne Ware
			Benthic ecologist	Bryony Pearce
			Benthic ecologist	Lisa Grubb
			Geologist	Christean Wilson
			Geologist	Julia Crummy
			Archaeologist	Marta Perez-Fernandez
			Total survey	12
Total crew		16	•	
Others				
Client repres MEPF Stude		John Coppock Rauhan Wan Hussin		
Total		2		

#### 8. Next 24 Hours

High resolution acoustic data from the  $6^{th}$  and 7th targeted survey areas. Continue with Tranche 2 ground-truth stations (0.1m2 Hamon grabs and 2m beam trawl).

9. Key Dates	Location	Date
Last Port call	Lowestoft	18 <sup>th</sup> May
Next crew change	TBA	TBA
Expected completion of acquisition		15 <sup>th</sup> June 2009
Next Port call	Lowestoft	
Last safety muster	16:00 29/05/2009	
Next safety muster	N/A	
10. Vessel Status		
Fuel Remaining	Lub Oil Remaining	Water Remaining
11. Party Chief Comments		
Work progressing to plan. No problems	to report	
	-	

12. Report submitted by:

Party Chief	Keit	h Cooper	Clier	nt Representativ	ve J Cop	pock		Master	AF	Reading
6 <sup>th</sup> June 200	09									
Cefas Ende	avour	ſ					(	Cefas		
Mini-M Phone Mini-M Fax	00 8 N/A	37176399802	.7		Mobi E-m			7799773456 efas.endeavo	our@gtships.com	<u>n</u>
Addressee Org	anisatio		tention	11	Tele	fax			e-mail	
MEPF			an McNei	11						essexarch.co.ul
Client Project Report No Period	20		al Enviror	nmental Charact	terisation	Survey			s Ref il Ref:	C3340
1. Ship's Positi	on & St 6 <sup>th</sup> June	atus			Ŧ .*.	1				
Date Time Present Activity	GMT	24:		on acoustic surv	Latitu Longi vev (HI RI	tude		41.200 ' N 49.700 ' E		
2. Summary of					., (	~ ~/				
Time zone         G           From         To           00:00         0           00:43         1	MT	Duration 00:43 07:15 04:02	Code Ops Ops Ops	Activity High resoluti Tranche 2 gr High resoluti	ound-truth	n statior	ns (0.1m	2 Hamon gra	abs, 2m beam tr	rawls, camera)
3. Time Analys Activity Operational Standby at sea ( Stand-down aloo Mob / Demob Contractors Tim Contractor's Tim	weather ngside ne (Vess	el)				-	Code Ops StbyW StbyO Mob CtV Ct Total:	<b>Today</b> 24:00 0 0 0 0 0 24:00 <b>24:00</b> 24:00	Previous 404:15 0 0 41:00 5 5:45 <b>456:00</b>	Present 428:15 0 41:00 5:00 5:45 <b>480:00</b>
4. Production S	Summar	ry								%
Data gathe	red			Today	Previo	usTot	tal	Remainii	ngPlanned	Complete
Clamshell g	grabs			0	0	19	)	0	10	190
Vibrocores				0	0	38	;	0	30	126
Hamon gral	os			2	89	91		0	80	113
Camera stat	tions			1	49	50	)	0	30	166
Beam trawl	S			2	90	92		0	30	307
High resolu	tion sur	veys (km)		37	557	59	4	NA	N/A	81
Hamon gral	os (grab	comparison	)	0	10	10	)	0	10	100
Costerus Ty	vin grab	os (grab com	parison)	0	10	10	)	0	10	100
NB Planned numb	er of Ha	mon, camera a	and beam tr	awls taken from t	ender					
5. Weather							-			
	bs Wind	1		Obs Sea State			Rema	irks		
	20° 15 90° 21			350° 1 m 070° 2-3 m						
	0° 21			070° 2-5 m 080° 2 m						
	50° 18			080° 2 m						
	50° 18			080° 2 m						
	70° 24			080° 2 m						
Outlook NW 4-5										

**6. Safety & Environmental** Safety incidents:

None

Cetacean watch:	None		
7. Personnel			
Marine Crew		Survey Crew	
Master	A Reading	Senior scientist	Keith Cooper
1 <sup>st</sup> Mate	G Ritchie	Survey engineer	Bill Meadows
3 <sup>rd</sup> Mate	A Oakham	Survey engineer	Ken May
Chief Engineer	S Tweedie	Survey engineer	Simon Pearson
+ 12 additional crew		Benthic ecologist	Chris Barrio
		Benthic ecologist	Matt Curtis
		Benthic ecologist	Suzanne Ware
		Benthic ecologist	Bryony Pearce
		Benthic ecologist	Lisa Grubb
		Geologist	Christean Wilson
		Geologist	Julia Crummy
		Archaeologist	Marta Perez-Fernandez
		Total survey	12
Total crew	16		
Others			
Client representative	John Coppock		
MEPF Student	Rauhan Wan Hussin		
Total	2		
Total persons onboard	30		

#### 8. Next 24 Hours

High resolution acoustic data collection from the 7th targeted survey area. Complete Tranche 2 ground-truth stations (0.1m2 Hamon grabs and 2m beam trawl, camera). Begin work on Tranche 3, beginning with archaeological work.

9. Key Dates			Locat	ion	Date	
Last Port call	Lowe			stoft	18 <sup>th</sup> May	
Next crew chang					TBA	
Expected comple	etion of acquisi	tion			15 <sup>th</sup> June 200	09
Next Port call			Lowes			
Last safety must				29/05/2009		
Next safety mus	ter		N/A			
10. Vessel Statu	IS					
Fuel Remaining		Lub (	Oil Remaining		Water Re	emaining
	ng to plan. No p	roblems to repo	ort. Tranche 3 pla	n finalised, wor	k due to begin Sunday pr	1.
12. Report subr Party Chief	nitted by: Keith Coope	er Clien	t Representative	J Coppock	Master	A Reading
	-				Cefas	
Cefas Endeavoi	ur	98027		Mohile		
Cefas Endeavou Mini-M Phone	-	98027		<b>Mobile</b> E-mail	<b>Cefas</b> 07799773456 <u>cefas.endeavour@gt</u>	<u>ships.com</u>
Cefas Endeavou Mini-M Phone Mini-M Fax	ur 00 8717639 N/A	98027 Attention			07799773456	
Cefas Endeavou Mini-M Phone Mini-M Fax Addressee Orga	ur 00 8717639 N/A		1	E-mail	07799773456 <u>cefas.endeavour@gt</u> e-ma	il
Cefas Endeavou Mini-M Phone Mini-M Fax Addressee Orga MEPF	ur 00 8717639 N/A	Attention	1	E-mail	07799773456 <u>cefas.endeavour@gt</u> e-ma	il
Cefas Endeavor Mini-M Phone Mini-M Fax Addressee Orga MEPF Client	00 8717639 N/A anisation MEPF	<b>Attention</b> Euan McNeil	l mental Character	E-mail Telefax	07799773456 cefas.endeavour@gt e-ma e.mct	il neill@wessexarch.co.u C3340
Cefas Endeavou Mini-M Phone Mini-M Fax Addressee Orga MEPF Client Project	00 8717639 N/A anisation MEPF East Coast Re 21	<b>Attention</b> Euan McNeil		E-mail Telefax	07799773456 cefas.endeavour@gt e-ma e.mct Cefas Ref	il neill@wessexarch.co.u C3340
Cefas Endeavou Mini-M Phone Mini-M Fax Addressee Orga MEPF Client Project Report No	00 8717639 N/A anisation MEPF East Coast Re	<b>Attention</b> Euan McNeil		E-mail Telefax	07799773456 cefas.endeavour@gt e-ma e.mct Cefas Ref	il neill@wessexarch.co.u C3340
Cefas Endeavou Mini-M Phone Mini-M Fax Addressee Orga MEPF Client Project Report No Period	00 8717639 N/A anisation MEPF East Coast Re 21 <sup>7th</sup> June 2009	<b>Attention</b> Euan McNeil		E-mail Telefax	07799773456 cefas.endeavour@gt e-ma e.mct Cefas Ref	il neill@wessexarch.co.u C3340
Cefas Endeavou Mini-M Phone Mini-M Fax Addressee Orga MEPF Client Project Report No Period 1. Ship's Positic	00 8717639 N/A anisation MEPF East Coast Re 21 <sup>7th</sup> June 2009	<b>Attention</b> Euan McNeil		E-mail Telefax	07799773456 cefas.endeavour@gt e-ma e.mct Cefas Ref	il neill@wessexarch.co.u C3340
	00 8717639 N/A anisation MEPF East Coast Re 21 <sup>7th</sup> June 2009 on & Status	<b>Attention</b> Euan McNeil		E-mail Telefax isation Survey	07799773456 cefas.endeavour@gt e-ma e.mcr Cefas Ref Email Ref:	il neill@wessexarch.co.u C3340

2. Summary of Events

Time zone	GMT			
From	То	Duration	Code	Activity
00:00	05:20	05:20	Ops	High resolution acoustic survey (HI RES 7)
05:20	15:27	10:07	Ops	Tranche 3 ground-truth stations (0.1m2 Hamon grabs, 2m beam trawls)
15:27	21:57	06:30	Ops	Archaeology
21:57	24:00	02:03	Ops	Tranche 3 ground-truth stations (0.1m2 Hamon grabs, 2m beam trawls)

3. Time Analysis				
Activity	Code	Today	Previous	Present
Operational	Ops	24:00	428:15	452:15
Standby at sea (weather)	StbyW	0	0	0
Stand-down alongside	StbyO	0	0	0
Mob / Demob	Mob	0	41:00	41:00
Contractors Time (Vessel)	CtV	0	5	5:00
Contractor's Time (Operations)	Ct	0	5:45	5:45
	Total:	24:00	480:00	504:00

Data gathered	Today	Previous	Total	Remaini	ng Planned	% Complete
Clamshell grabs	0	0	19	0	10	190
Vibrocores	0	0	38	0	30	126
Hamon grabs	6	91	97	0	80	121
Camera stations	0	50	50	0	30	166
Beam trawls	6	92	98	0	30	326
High resolution surveys (km)	42	594	636	NA	N/A	100
Costerus Twin grab (Archaeology)	30	0	30	0	30	100
Hamon grabs (grab comparison)	0	10	10	0	10	100
Costerus Twin grab (grab comparison)	0	10	10	0	10	100

NB Planned number of Hamon, camera and beam trawls taken from tender

None

None

5. Weather	r			
Time	Obs Wind	Obs Sea State	Remarks	
04:00	070° 18	080° 2 m		
08:00	070° 16	080° 1 m		
12:00	120° 18	090° 2 m		
16:00	080° 20	090° 2 m		
20:00	080° 10	090° 1-2 m		
24:00	050° 16	090° 1 m		
Outlook				
NW 4-5				

# **6. Safety & Environmental** Safety incidents:

Cetacean watch:

7. Personnel			
Marine Crew		Survey Crew	
Master	A Reading	Senior scientist	Keith Cooper
1 <sup>st</sup> Mate	G Ritchie	Survey engineer	Bill Meadows
3 <sup>rd</sup> Mate	A Oakham	Survey engineer	Ken May
Chief Engineer	S Tweedie	Survey engineer	Simon Pearson
+ 12 additional crew		Benthic ecologist	Chris Barrio
		Benthic ecologist	Matt Curtis
		Benthic ecologist	Suzanne Ware
		Benthic ecologist	Bryony Pearce
		Benthic ecologist	Lisa Grubb
		Geologist	Christean Wilson
		Geologist	Julia Crummy
		Archaeologist	Marta Perez-Fernandez
		Total survey	12
Total crew	16		
Others			
Client representative	John Coppock		
MEPF Student	Rauhan Wan Hussin		
Total	2		
Total persons onboard	30		

#### 8. Next 24 Hours

Continue work on Tranche 3, beginning with archaeological task.

9. Key Date				Loca			Date		
Last Port cal					estoft		18 <sup>th</sup> Ma	ıy	
Next crew cl				10 <sup>m</sup> J	June (Pilot bo	oat)	TBA		
		f acquisition		_			15 <sup>th</sup> Jur	ne 2009	
Next Port ca				Lowe					
Last safety r					0 29/05/2009	)			
Next safety	muster			N/A					
10. Vessel S Fuel Remair			Lub	Oil Remaining			Wat	er Remaining	
11. Party C	0			6				6	
	essing to p		Perez-Fern	andez and Matt (	Curtis are du	ie to leave t	he ship, via	the Lowestof	t Pilot boat,
<b>12. Report</b> s Party Chief		<b>by:</b> th Cooper	Clie	nt Representative	J Coppoc	k	Master	A I	Reading
8 <sup>th</sup> June	2009								
Cefas Ende						C	efas		
Mini-M Pho Mini-M Fay		87176399802 A	27		<b>Mobile</b> E-mail		799773456 <u>fas.endeavou</u>	ur@gtships.co	<u>m</u>
Adducence	0		ttention		Telefax			e-mail	
Addressee ( MEPF	Organisati		an McNe	ill	Telefax			e-mail e.mcneill@w	essexarch.co.
Client Project Report No	23		nal Enviro	nmental Characte	risation Surv	vey	Cefas Emai		C3340
reriod	9 <sup>th</sup> Ju	ine 2009							
Period 1. Ship's Po	osition & S	ine 2009							
		tatus			Latitude	52 4	44.800 ' N		
<ol> <li>Ship's Po</li> <li>Date</li> </ol>	osition & S	tatus e 2009	:00				44.800 ' N 19.900 ' E		
1. Ship's Po	osition & S 9 <sup>th</sup> June GMT	<b>tatus</b> e 2009 24:		ound-truth station	Longitude	01	19.900 ' E	wls)	
1. Ship's Po Date Time Present Acti 2. Summary	osition & S 9 <sup>th</sup> June GMT ivity y of Events	<b>itatus</b> e 2009 24: Tra		ound-truth station	Longitude	01	19.900 ' E	wls)	
<b>1. Ship's Po</b> Date Fime Present Acti <b>2. Summary</b> Fime zone	osition & S 9 <sup>th</sup> June GMT ivity y of Events GMT	tatus e 2009 24: Tra	anche 3 gr		Longitude	01	19.900 ' E	wls)	
<b>1. Ship's Po</b> Date Fime Present Acti <b>2. Summary</b> Fime zone From	osition & S 9 <sup>th</sup> Juna GMT ivity y of Events GMT To	tatus e 2009 24: Tra s Duration	Code	Activity	Longitude as (0.1m2 Ha	mon grabs, 2	19.900 ' E 2m beam trav		
<b>1. Ship's Po</b> Date Fime Present Acti <b>2. Summary</b> Fime zone From 00:00	osition & S 9 <sup>th</sup> Juna GMT ivity y of Events GMT To 18:13	<b>itatus</b> e 2009 24: Tra s Duration 18:13	Code Ops	Activity Acoustic surve	Longitude as (0.1m2 Ha	mon grabs, 2	19.900 ' E 2m beam trav	option 3).	
<b>1. Ship's Po</b> Date Fime Present Acti <b>2. Summary</b> Fime zone From 00:00 [8:13	osition & S 9 <sup>th</sup> Juna GMT ivity y of Events GMT To 18:13 18:45	<b>Example 2009</b> 24: Tra <b>S</b> Duration 18:13 00:32	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area	19.900 ' E 2m beam trav a (Tranche 3, h brake prob	option 3). lem.	roule)
<b>1. Ship's Po</b> Date Fime Present Acti <b>2. Summary</b> Fime zone From 00:00 [8:13	osition & S 9 <sup>th</sup> Juna GMT ivity y of Events GMT To 18:13	<b>itatus</b> e 2009 24: Tra s Duration 18:13	Code Ops	Activity Acoustic surve	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area	19.900 ' E 2m beam trav a (Tranche 3, h brake prob	option 3). lem.	rawls)
L. Ship's Po Date Fime Present Acti 2. Summary Fime zone From 00:00 8:13 8:45 3. Time Ana	osition & S 9 <sup>th</sup> Juna GMT ivity y of Events GMT To 18:13 18:45 24:00	<b>Example 2009</b> 24: Tra <b>S</b> Duration 18:13 00:32	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon gral	option 3). Iem. bs, 2m beam t	
L. Ship's Po Date Fime Present Acti C. Summary Fime zone From 00:00 8:13 8:45 3. Time Ana Activity	osition & S 9 <sup>th</sup> Juna GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis	<b>Example 2009</b> 24: Tra <b>S</b> Duration 18:13 00:32	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2 Code	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon gral Today	option 3). dem. bs, 2m beam t <b>Previous</b>	Present
<ul> <li><b>1. Ship's Po</b></li> <li>Date</li> <li>Present Acti</li> <li><b>2. Summary</b></li> <li>From</li> <li>00:00</li> <li>18:13</li> <li>18:45</li> <li><b>3. Time Ana</b></li> <li>Activity</li> <li>Operational</li> </ul>	osition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis	<b>S</b> <b>Duration</b> 18:13 00:32 5:15	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2 Code Ops	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grad Today 24:00	option 3). dem. bs, 2m beam t <b>Previous</b> 452:15	<b>Present</b> 476:15
<ul> <li><b>1. Ship's Po</b></li> <li>Date</li> <li>Present Acti</li> <li><b>2. Summary</b></li> <li><b>7</b> From</li> <li><b>10</b>:00</li> <li><b>18</b>:13</li> <li><b>18</b>:45</li> <li><b>3. Time Ana</b></li> <li><b>Activity</b></li> <li>Operational</li> <li>Standby at s</li> </ul>	osition & S 9 <sup>th</sup> Juna GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis	<b>S</b> <b>Duration</b> 18:13 00:32 5:15	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2 Code Ops StbyW	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grat Today 24:00 0	option 3). dem. bs, 2m beam t <b>Previous</b> 452:15 0	<b>Present</b> 476:15 0
<ol> <li>Ship's Po Date</li> <li>Time</li> <li>Present Acti</li> <li>Summary</li> <li>Time zone</li> <li>From</li> <li>00:00</li> <li>18:13</li> <li>18:45</li> <li>Time Ana</li> <li>Activity</li> <li>Operational</li> <li>Standby at session-down</li> </ol>	osition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis	<b>S</b> <b>Duration</b> 18:13 00:32 5:15	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grat Today 24:00 0 0	option 3). dem. bs, 2m beam t <b>Previous</b> 452:15 0 0	<b>Present</b> 476:15 0 0
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<ol> <li>Ship's Po Date</li> <li>Time</li> <li>Present Acti</li> <li>Summary</li> <li>Time zone</li> <li>From</li> <li>D0:00</li> <li>18:13</li> <li>18:45</li> <li>Time Ana</li> <li>Activity</li> <li>Operational</li> <li>Standby at se</li> <li>Stand-down</li> <li>Mob / Demo</li> <li>Contractors</li> </ol>	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grat Today 24:00 0 0	option 3). dem. bs, 2m beam t <b>Previous</b> 452:15 0 0	<b>Present</b> 476:15 0 0
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<ol> <li>Ship's Po Date</li> <li>Fime</li> <li>Present Acti</li> <li>Summary</li> <li>From</li> <li>O:00</li> <li>13</li> <li>18:45</li> <li>Time Ana</li> <li>Activity</li> <li>Operational</li> <li>Standby at sistand-down</li> <li>Mob / Demo</li> <li>Contractors's</li> </ol>	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves s Time (Op	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon gral <b>Today</b> 24:00 0 0 0 0 0 0	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 0 41:00 5 5:45	<b>Present</b> 476:15 0 0 41:00 5:00 5:45
<ol> <li>Ship's Po Date</li> <li>Time</li> <li>Present Acti</li> <li>Summary</li> <li>Time zone</li> <li>From</li> <li>00:00</li> <li>18:13</li> <li>18:45</li> <li>Time Ana</li> <li>Activity</li> <li>Operational</li> <li>Stand-down</li> <li>Mob / Demo</li> <li>Contractors'</li> <li>Contractor's</li> <li>4. Production</li> </ol>	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves 5 Time (Op	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV	Activity Acoustic surve Down-time to	Longitude as (0.1m2 Ha ey of exposed resolve side	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grad Today 24:00 0 0 0 0 0 0 24:00	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 41:00 5 5:45 <b>504:00</b>	<b>Present</b> 476:15 0 41:00 5:00 5:45 <b>528:00</b>
Ship's Po Date     Time     Present Acti     Z. Summary     Time zone     From     D0:00     18:13     18:45     Stand-down     Mob / Demo     Contractors     Contractor's     Contractor's	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves s Time (Op	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV	Activity Acoustic surve Down-time to Tranche 3 grou	Longitude as (0.1m2 Ha ey of expose resolve side und-truth sta	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct Total:	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon gral <b>Today</b> 24:00 0 0 0 0 0 0	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 41:00 5 5:45 <b>504:00</b>	<b>Present</b> 476:15 0 41:00 5:00 5:45 <b>528:00</b>
Ship's Po Date     Time     Present Acti     Z. Summary     Time zone     From     D0:00     18:13     18:45     Stand-down     Mob / Demo     Contractors     Contractor's     Contractor's	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves 5 Time (Op on Summa athered nell grabs	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV	Activity Acoustic surve Down-time to Tranche 3 grou	Longitude as (0.1m2 Ha ey of exposed resolve side und-truth sta Previous	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct Total: Total	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grad <b>Today</b> 24:00 0 0 0 0 0 0 24:00 <b>Remaining</b>	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 41:00 5 5:45 <b>504:00</b> g <b>Planned</b>	Present 476:15 0 41:00 5:00 5:45 528:00
<ul> <li><b>1. Ship's Po</b></li> <li>Date</li> <li>Cime</li> <li>Present Acti</li> <li><b>2. Summary</b></li> <li>Cime zone</li> <li>From</li> <li>O000</li> <li>18:13</li> <li>18:45</li> <li><b>3. Time Ana</b></li> <li><b>Activity</b></li> <li>Dperational</li> <li>Stand-down</li> <li>Mob / Demo</li> <li>Contractors's</li> <li>Contractor's</li> <li><b>4. Production</b></li> <li>Data gate</li> <li>Clamsh</li> </ul>	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves 5 Time (Op on Summa athered hell grabs ores	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV	Activity Acoustic surve Down-time to Tranche 3 grou	Longitude as (0.1m2 Ha ey of exposed resolve side und-truth sta <b>Previous</b> 0 0 97	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 111	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grad Today 24:00 0 0 0 0 0 0 24:00 Remaining 0	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 41:00 5 5:45 <b>504:00</b> <b>g Planned</b> 10 30 80	Present 476:15 0 0 41:00 5:00 5:45 528:00 % Complete 190 126 138
Ship's Po Date     Time     Present Acti     Z. Summary     Time zone     From     D0:00     18:13     18:45     S. Time Ana     Activity     Dperational     Stand-down     Mob / Demo     Contractors     Contractor's     Contractor's     Stand-duction     Data ga     Clamsh     Vibroco     Hamon     Camera	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves 5 Time (Op on Summa athered nell grabs a stations	Atatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15         r)         sel)         erations)	Code Ops CtV	Activity Acoustic surve Down-time to Tranche 3 grou Tranche 3 grou	Longitude as (0.1m2 Ha ey of exposed resolve side und-truth sta <b>Previous</b> 0 0 97 50	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 111 56	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grad Today 24:00 0 0 0 0 0 0 24:00 <b>Remaining</b> 0 0 0 0 0	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 0 41:00 5 5:45 <b>504:00</b> <b>g Planned</b> 10 30 80 30	Present 476:15 0 41:00 5:00 5:45 <b>528:00</b> % Complet 190 126 138 187
Ship's Po Date     Time     Present Acti     Z. Summary     Time zone     From     D0:00     18:13     18:45     S. Time Ana     Activity     Derational     Stand-down     Mob / Demo     Contractors     Contractor's     Contractor's     Stand-down     Mob / Demo     Contractor s     Contractor s	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves 5 Time (Op on Summa athered nell grabs a stations rawls	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV	Activity Acoustic surve Down-time to Tranche 3 grou Tranche 3 grou	Longitude as (0.1m2 Ha ey of exposed resolve side und-truth sta <b>Previous</b> 0 0 97 50 98	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 111 56 101	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grai <b>Today</b> 24:00 0 0 0 0 0 0 0 <b>24:00</b> <b>Remaining</b> 0 0 0 0 0 0 0 0	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 0 41:00 5 5:45 <b>504:00</b> <b>g Planned</b> 10 30 80 30 30	Present 476:15 0 0 41:00 5:00 5:45 <b>528:00</b> % Complete 190 126 138 187 337
<ol> <li>Ship's Po Date</li> <li>Fime</li> <li>Present Acti</li> <li>Summary</li> <li>Time zone</li> <li>From</li> <li>00:00</li> <li>18:13</li> <li>18:45</li> <li>Time Ana</li> <li>Activity</li> <li>Dperational</li> <li>Stand-down</li> <li>Mob / Demo</li> <li>Contractors</li> <li>Contractor's</li> <li>Froductic</li> <li>Data ga Clamsh</li> <li>Vibroco</li> <li>Hamon</li> <li>Camera</li> <li>Beam t</li> <li>High re</li> </ol>	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves 5 Time (Op on Summa athered nell grabs a stations rawls esolution su	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15         r)         sel)         erations)	Code Ops CtV Ops	Activity Acoustic surve Down-time to Tranche 3 grou Tranche 3 grou Tata 4 grou 0 0 14 6 3 42	Longitude as (0.1m2 Ha resolve side und-truth sta <b>Previous</b> 0 0 97 50 98 594	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 111 56 101 636	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grad <b>Today</b> 24:00 0 0 0 0 0 0 0 <b>24:00</b> <b>Remaining</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 0 41:00 5 5:45 <b>504:00</b> <b>g Planned</b> 10 30 80 30 30 N/A	<b>Present</b> 476:15 0 0 41:00 5:00 5:45 <b>528:00</b> <b>% Complet</b> 190 126 138 187 337 100
<ol> <li>Ship's Po Date</li> <li>Time</li> <li>Present Acti</li> <li>Summary</li> <li>Time zone</li> <li>From</li> <li>00:00</li> <li>18:13</li> <li>18:45</li> <li>Time Ana</li> <li>Activity</li> <li>Operational</li> <li>Stand-down</li> <li>Mob / Demo</li> <li>Contractors's</li> <li>Contractor's</li> <li>Productice</li> <li>Data ga Clamsh Vibroco Hamon</li> <li>Camera Beam t</li> <li>High re Costeru</li> </ol>	sition & S 9 <sup>th</sup> Jund GMT ivity y of Events GMT To 18:13 18:45 24:00 alysis ea (weathe alongside ob Time (Ves 5 Time (Op on Summa athered nell grabs a stations rawls esolution su	Itatus         e 2009         24:         Tra         s         Duration         18:13         00:32         5:15	Code Ops CtV Ops	Activity Acoustic surve Down-time to Tranche 3 grou Tranche 3 grou	Longitude as (0.1m2 Ha ey of exposed resolve side und-truth sta <b>Previous</b> 0 0 97 50 98	d gravel area gantry winc tions (0.1m2 Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 111 56 101	19.900 ' E 2m beam trav a (Tranche 3, h brake prob 2 Hamon grai <b>Today</b> 24:00 0 0 0 0 0 0 0 <b>24:00</b> <b>Remaining</b> 0 0 0 0 0 0 0 0	option 3). lem. bs, 2m beam t <b>Previous</b> 452:15 0 0 41:00 5 5:45 <b>504:00</b> <b>g Planned</b> 10 30 80 30 30	Present 476:15 0 0 41:00 5:00 5:45 <b>528:00</b> % Complete 190 126 138 187 337

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NB Planned number of Hamon, camera and beam trawls taken from tender

5. Weather				
Time	Obs Wind	Obs Sea		KS
04:00	030° 15	090° 1 1		
08:00	030° 09	060° 1 1		
12:00	060° 11	060° 1 1		
16:00	060° 10 060° 13	060° 1 1 060° 1 1		
20:00 24:00	060° 13 060° 14	060° 1 1		
Outlook	000 14	000 11	11	
	increasing E/N	F 4-5		
variable 2-3,		L <del>-</del> -5		
6. Safety & I	Environmental			
Safety incide		None		
Cetacean wat		None		
7. Personnel				
Marine Crew	v		Survey Crew	
Master		A Reading	Senior scientist	Keith Cooper
1 <sup>st</sup> Mate		G Ritchie	Survey engineer	Bill Meadows
3 <sup>rd</sup> Mate		A Oakham	Survey engineer	Ken May
Chief Engine		S Tweedie	Survey engineer	Simon Pearson
+ 12 addition	al crew		Benthic ecologist	Chris Barrio
			Benthic ecologist	Matt Curtis
			Benthic ecologist	Suzanne Ware
			Benthic ecologist	Bryony Pearce
			Benthic ecologist	Lisa Grubb Christean Wilson
			Geologist	
			Geologist Archaeologist	Julia Crummy Marta Perez-Fernandez
			Total survey	<i>12</i>
Total crew		16	10iui survey	12
101410100		10		
Others				
Client repres		John Coppock		
MEPF Stude	nt	Rauhan Wan Hussin		
Total		2		
10000		-		
Total person	ns onboard	30		
8. Next 24 H	ours			
		, beginning with archaeolo	gical task.	
		, , , , , , , , , , , , , , , , , , , ,		
9. Key Dates	5		Location	Date
Last Port call	l		Lowestoft	18 <sup>th</sup> May
Next crew ch			10 <sup>th</sup> June (Pilot boat)	TBA
	npletion of acqu	isition	. ,	15 <sup>th</sup> June 2009
Next Port cal	1		Lowestoft	
Last safety m	nuster		16:00 29/05/2009	
Next safety n	nuster		N/A	

#### 11. Party Chief Comments

**10. Vessel Status** Fuel Remaining

Work progressing to plan, no problems to report. We expect to complete all work by the morning of Sunday 14<sup>th</sup> June, and to dock in Lowestoft around 14:00 on the same day.

Lub Oil Remaining

12. Report submitted by:							
Party Chief	Keith Cooper	Client Representative	J Coppock	Master	A Reading		

## 9<sup>th</sup> June 2009

**Cefas Endeavour** 

Water Remaining

MEPF	Organisati		<b>ttention</b> uan McNei	11	Telefax	ζ.		e-mail e.mcneill@w	vessexarch.co.
Client Project Report No Period	23		nal Environ	imental Charact	terisation Sur	vey	Cefas Email		C3340
1. Ship's Po	sition & S 9 <sup>th</sup> Jun	Status			I atituda				
Date					Latitude		44.800 ' N		
Time	GMT		:00		Longitud		19.900 ' E	<b>.</b> .	
Present Acti	vity	Tra	anche 3 gro	ound-truth static	ons (0.1m2 H	amon grabs, 2	2m beam traw	vls)	
2. Summary	v of Event	s							
Time zone	GMT	~							
From	То	Duration	Code	Activity					
00:00	18:13	18:13	Ops		vey of expose	ed gravel area	(Tranche 3.	option 3).	
18:13	18:45	00:32	CtV			e gantry winc			
18:45	24:00	5:15	Ops						······
		5.15	Ops	Tranche 5 gr	ound-truth st	ations (0.1m2	l Hamon grab	os, 2m beam t	irawis)
3. Time Ana Activity Operational Standby at so Stand-down Mob / Demo Contractors ' Contractor's	alysis ea (weathe alongside ob Time (Ves Time (Op	er) ssel) erations)	Ops		ound-truth st	Code Ops StbyW StbyO Mob CtV Ct Total:	<b>Today</b> 23:30 0 0 00:30 0 <b>24:00</b>	Previous 476:15 0 41:00 5 5:45 528:00	
3. Time Ana Activity Operational Standby at so Stand-down Mob / Demo Contractors Contractor's 4. Productio	alysis ea (weathe alongside ob Time (Ves Time (Op on Summa	er) ssel) erations)	Ops			Code Ops StbyW StbyO Mob CtV Ct Total:	Today           23:30         0           0         0           0         0           00:30         0           24:00         0	<b>Previous</b> 476:15 0 0 41:00 5 5:45 <b>528:00</b>	Present           499:45           0           41:00           5:30           5:45           552:00
3. Time Ana Activity Operational Standby at so Stand-down Mob / Demo Contractors ' Contractor's 4. Productio Data gat	alysis ea (weathe alongside ob Time (Ves Time (Op on Summa thered	er) ssel) erations)		Today	Previous	Code Ops StbyW StbyO Mob CtV Ct Total: Total	<b>Today</b> 23:30 0 0 0 0 0 0 24:00 <b>Remaining</b>	Previous 476:15 0 41:00 5 5:45 528:00	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete
3. Time Ana Activity Operational Standby at so Stand-down Mob / Demo Contractors ' Contractor's Contractor's 4. Production Data gat Clamsh	alysis ea (weathe alongside ob Time (Ves Time (Op on Summa thered aell grabs	er) ssel) erations)		Today 0	Previous 0	Code Ops StbyW StbyO Mob CtV Ct Total: 19	<b>Today</b> 23:30 0 0 0 0 0 0 24:00 <b>Remaining</b> 0	Previous 476:15 0 41:00 5 5:45 528:00 41:00 5 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete 190
3. Time Ana Activity Operational Standby at so Stand-down Mob / Demo Contractors ' Contractor's 4. Production Data gat Clamsh Vibroco	alysis ea (weathe alongside ob Time (Ves Time (Op on Summa thered tell grabs ores	er) ssel) erations)		<b>Today</b> 0 0	Previous 0 0	Code Ops StbyW StbyO Mob CtV Ct Total: 19 38	<b>Today</b> 23:30 0 0 0 0 0 0 24:00 <b>Remaining</b> 0 0 0	<b>Previous</b> 476:15 0 41:00 5 5:45 <b>528:00</b> <b>; Planned</b> 10 30	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete 190 126
3. Time Ana Activity Operational Standby at so Stand-down Mob / Demo Contractors ' Contractor's 4. Production Data gat Clamsh Vibroco Hamon	alysis ea (weathe alongside ob Time (Ves Time (Op on Summa thered tell grabs ores grabs	er) ssel) erations)	Ops	<b>Today</b> 0 0 16	<b>Previous</b> 0 0 111	Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 127	<b>Today</b> 23:30 0 0 0 0 0 0 24:00 <b>Remaining</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Previous 476:15 0 41:00 5 5:45 528:00 ; Planned 10 30 80	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete 190 126 158
3. Time Ana Activity Operational Standby at so Stand-down Mob / Demo Contractors ' Contractor's 4. Production Data gat Clamsh Vibroco Hamon	alysis ea (weathe alongside ob Time (Ves Time (Op Din Summa thered thered tell grabs ores grabs a stations	er) ssel) erations)	Ops	<b>Today</b> 0 0	Previous 0 0	Code Ops StbyW StbyO Mob CtV Ct Total: 19 38	<b>Today</b> 23:30 0 0 0 0 0 0 24:00 <b>Remaining</b> 0 0 0	<b>Previous</b> 476:15 0 41:00 5 5:45 <b>528:00</b> <b>; Planned</b> 10 30	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete 190 126
3. Time Ana Activity Operational Standby at se Stand-down Mob / Demo Contractors ' Contractor's Contractor's 4. Production Data gat Clamsh Vibroco Hamon Camera Beam to	alysis ea (weathe alongside ob Time (Ves Time (Op on Summa thered thered tell grabs ores grabs a stations rawls	er) ssel) berations) <b>ary</b>	Ops	<b>Today</b> 0 0 16 6	<b>Previous</b> 0 0 111 56	Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 127 62 110	<b>Today</b> 23:30 0 0 0 0 0 0 24:00 <b>Remaining</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Previous 476:15 0 41:00 5 5:45 528:00 ; Planned 10 30 80 30 30	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete 190 126 158 206 366
3. Time Ana Activity Operational Standby at s Stand-down Mob / Demo Contractors Contractor's Contractor's 4. Productio Data gat Clamsh Vibrocc Hamon Camera Beam tu	alysis ea (weathe alongside bb Time (Ves Time (Op Dn Summa thered thered tell grabs ores grabs a stations rawls esolution su	er) ssel) berations) <b>ary</b> urveys (km)		<b>Today</b> 0 16 6 9	<b>Previous</b> 0 0 111 56 101	Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 127 62	<b>Today</b> 23:30 0 0 0 0 0 24:00 <b>Remaining</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<b>Previous</b> 476:15 0 41:00 5 5:45 <b>528:00</b> ; <b>Planned</b> 10 30 80 30	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete 190 126 158 206
3. Time Ana Activity Operational Standby at se Stand-down Mob / Demo Contractors ' Contractor's Contractor's 4. Production Data gat Clamsh Vibroco Hamon Camera Beam th High re Costeru	alysis ea (weathe alongside bb Time (Ves Time (Op on Summa thered tell grabs a stations rawls esolution su as Twin gra	er) ssel) berations) <b>ary</b>	ogy)	<b>Today</b> 0 16 6 9 0	<b>Previous</b> 0 0 111 56 101 0	Code Ops StbyW StbyO Mob CtV Ct Total: 19 38 127 62 110 636	<b>Today</b> 23:30 0 0 0 0 0 24:00 <b>Remaining</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Previous 476:15 0 41:00 5 5:45 528:00 30 80 30 30 N/A	Present 499:45 0 41:00 5:30 5:45 552:00 % Complete 190 126 158 206 366 100

5. Weath	er					
Time	Obs Wind		Obs Sea State	Remarks	3	
04:00	060° 15		060° 2 m			
08:00	040° 16		060° 2 m			
12:00	330° 25		000° 1 m			
16:00	000° 15		000° 2 m			
20:00	350° 20		000° 3 m			
24:00	330° 14		340° 2-3 m			
Outlook						
W/NW 4-	5, decreasing varia	able 2-4				
•	& Environmenta	l				
Safety inc	eidents:	None				
Cetacean	watch:	None				
7. Person						
Marine C	rew			Survey Crew		
Master		A Reading		Senior scientist	Keith Cooper	
1 <sup>st</sup> Mate		G Ritchie		Survey engineer	Bill Meadows	
3 <sup>rd</sup> Mate		A Oakham		Survey engineer	Ken May	
Chief Eng	gineer	S Tweedie		Survey engineer	Simon Pearson	
+ 12 addit	tional crew			Benthic ecologist	Chris Barrio	

		Benthic ecologist	Matt Curtis
		Benthic ecologist	Suzanne Ware
		Benthic ecologist	Bryony Pearce
		Benthic ecologist	Lisa Grubb
		Geologist	Christean Wilson
		Geologist	Julia Crummy
		Archaeologist	Marta Perez-Fernandez
		Total survey	12
Total crew	16		
Others			
Client representative	John Coppock		
MEPF Student	Rauhan Wan Hussin		
T-4-1	2		
Total	2		
Total persons onboard	30		

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**8. Next 24 Hours** Continue work on Tranche 3, beginning with archaeological task.

9. Key Dates Last Port call	Location Lowestoft	Date 18 <sup>th</sup> May
Next crew change Expected completion of acquisition Next Port call	10 <sup>th</sup> June (Pilot boat) Lowestoft	TBA 15 <sup>th</sup> June 2009 14 <sup>th</sup> June 2009 (~14:00)
Last safety muster Next safety muster	16:00 09/06/2009 N/A	11 Julie 2005 (11100)
10. Vessel Status Fuel Remaining	Lub Oil Remaining	Water Remaining

**11. Party Chief Comments** Work progressing to plan, no problems to report. Marta Perez-Fernandez and Matt Curtis left the ship at 11:15 this morning and were taken ashore by the Lowestoft Pilot boat.

12. Report submitted by:					
Party Chief	Keith Cooper	Client Representative	J Coppock	Master	A Reading

## 10<sup>th</sup> June 2009

Cefas Endeavour	•		Cefas
Mini-M Phone	00 871763998027	Mobile	07799773456
Mini-M Fax	N/A	E-mail	<u>cefas.endeavour@gtships.com</u>

Addressee Organisation		Attention	Telefax	e-mail	e-mail	
MEPF		Euan McNeill		e.mcneill@y	wessexarch.co.uk	
Client	MEPF			Cefas Ref	C3340	
Project	East Coast l	Regional Environmental Ch	aracterisation Survey	Email Ref:		
Report No	23	-	-			
Period	10 <sup>th</sup> June 20	009				
1. Ship's Pos	ition & Status					
Date	10 <sup>th</sup> June 200	9	Latitude	52 30.900 ' N		
Time	GMT	24:00	Longitude	02 00.900 ' E		
Present Activ	ity	Tranche 3 ground-truth	stations (0.1m2 Hamon	grabs, 2m beam trawls)		
2. Summary	of Events					
Time zone	GMT					

Time zone	GMT			
From	То	Duration	Code	Activity
00:00	13:34	13:34	Ops	Tranche 3 ground-truth stations (0.1m2 Hamon grabs, 2m beam trawls)
13:34	15:06	01:32	Ops	Acoustic survey of exposed gravel area (Tranche 3, option 3).
15:06	24:00	8:54	Ops	Tranche 3 ground-truth stations (0.1m2 Hamon grabs, 2m beam trawls)

3. Time Analysis

Activity	Code	Today	Previous	Present
Operational	Ops	24:00	499:45	523:45
Standby at sea (weather)	StbyW	0	0	0
Stand-down alongside	StbyO	0	0	0
Mob / Demob	Mob	0	41:00	41:00
Contractors Time (Vessel)	CtV	0	5:30	5:30
Contractor's Time (Operations)	Ct	0	5:45	5:45
	Total:	24:00	552:00	576:00

4. Production Summary						
Data gathered	Today	Previous	Total	Remaini	ng Planned	% Complete
Clamshell grabs	0	0	19	0	10	190
Vibrocores	0	0	38	0	30	126
Hamon grabs	20	127	147	0	80	184
Camera stations	7	62	69	0	30	230
Beam trawls	7	110	117	0	30	390
High resolution surveys (km)	15	636	651	NA	N/A	100
Costerus Twin grab (Archaeology)	0	0	30	0	30	100
Hamon grabs (grab comparison)	0	0	10	0	10	100
Costerus Twin grab (grab comparison)	0	0	10	0	10	100

NB Planned number of Hamon, camera and beam trawls taken from tender

#### 5. Weather Time Obs Wind Obs Sea State Remarks 04:00 330° 10 340° 1-3 m Light airs 340° 1-2 m 08:00 Light airs 030° 0.5 m 12:00 100° 10 090° 10 080° 13 030° 0.5 m 030° 1 m 060° 1-2 m 060° 1-2 m 16:00 20:00 24:00 Outlook N/NW 3-4, possibly 5, backing N/NW

#### 6. Safety & Environmental

30		
2		
John Coppock Rauhan Wan Hussin		
16		
	Geologist Archaeologist <b>Total survey</b>	Julia Crummy Marta Perez-Fernandez 12
	6	Lisa Grubb Christean Wilson
	Benthic ecologist	Bryony Pearce
		Matt Curtis Suzanne Ware
	Benthic ecologist	Chris Barrio
S Tweedie	Survey engineer	Simon Pearson
A Oakham		Ken May
e		Keith Cooper Bill Meadows
	Survey Crew	Kith Comm
INOILE		
	S Tweedie 16 John Coppock Rauhan Wan Hussin 2	NoneA Reading G Ritchie A Oakham S TweedieSurvey Crew Senior scientist Survey engineer Survey engineer Benthic ecologist Benthic ecologist 

9. Key Dates Last Port call Next crew change Expected completion of acquisition Next Port call **Location** Lowestoft 10<sup>th</sup> June (Pilot boat)

Lowestoft

18<sup>th</sup> May TBA 15<sup>th</sup> June 2009 14<sup>th</sup> June 2009 (~14:00)

Next safety must	er er			16:00 N/A	09/06/2009				
<b>10. Vessel Status</b> Fuel Remaining	S		Lub Oil I	Remaining			Wa	ter Remaining	g
<b>11. Party Chief</b> Work progressing		oblems (	to report.						
<b>12. Report subm</b> Party Chief	nitted by: Keith Coope	r	Client Re	presentative	J Coppoc	k	Master	Δ	Reading
	iiiiiii coope	-			e coppor				Treatening
11 <sup>th</sup> June 20	09								
Cefas Endeavou	r					Ce	efas		
Mini-M Phone Mini-M Fax	00 87176399 N/A	98027			<b>Mobile</b> E-mail		799773456 fas.endeavoi	ur@gtships.co	om
Addressee Orga MEPF	nisation	Attent Euan M	t <b>ion</b> McNeill		Telefax			e-mail e.mcneill@v	vessexarch.co.u
Client Project Report No Period	MEPF East Coast Reg 24 11 <sup>h</sup> June 2009	gional E	nvironmer	ital Characte	risation Surv	ey	Cefas Emai	s Ref il Ref:	C3340
1. Ship's Position	<b>n &amp; Status</b> 1 <sup>h</sup> June 2009				I atituda				
		• • • • •			Latitude		6.900 ' N		
Time C Present Activity	GMT	24:00 Tranche	e 3 ground	-truth statior	Longitude is (0.1m2 Ha		48.600 ' E 2m beam tra	wls)	
-			U		,	6, 2		,	
-									
Time zone GM	ΔT		ada A	ativity					
Time zone GM From To	AT Duratio			ctivity	und truth sto	tions (0, 1m)	Hamon are	ha Jan haam	trouve)
Time zoneGNFromTo00:0012:	MT Duratio :32 12:32	Oj	ps T	ranche 3 gro				bs, 2m beam	trawls)
Time zone         GM           From         To           00:00         12:           12:32         24:	AT Duratio :32 12:32 :00 11:28		ps T	ranche 3 gro	und-truth sta ey of exposed				trawls)
Time zone         GM           From         To           00:00         12:           12:32         24:           3. Time Analysis	AT Duratio :32 12:32 :00 11:28	Oj	ps T	ranche 3 gro		l gravel area	(Tranche 3	, option 3).	
Time zone         GN           From         To           00:00         12:           12:32         24:           3. Time Analysis           Activity	AT Duratio :32 12:32 :00 11:28	Oj	ps T	ranche 3 gro		l gravel area	(Tranche 3 Today	, option 3). Previous	s Present
Time zoneGMFromTo00:0012:12:3224:3. Time AnalysisActivityOperational	AT Duratic 32 12:32 300 11:28	Oj	ps T	ranche 3 gro		d gravel area Code Ops	Today 24:00	, option 3). <b>Previous</b> 523:45	<b>s Present</b> 547:45
Time zoneGMFromTo00:0012:12:3224: <b>3. Time Analysis</b> ActivityOperationalStandby at sea (w	AT Duratic :32 12:32 :00 11:28 s	Oj	ps T	ranche 3 gro		l gravel area Code Ops StbyW	<b>Today</b> 24:00 0	, option 3). <b>Previous</b> 523:45 0	<b>s Present</b> 547:45 0
Time zoneGNFromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStand-down along	AT Duratic :32 12:32 :00 11:28 s	Oj	ps T	ranche 3 gro		l gravel area Code Ops StbyW StbyO	<b>Today</b> 24:00 0 0	, option 3). <b>Previous</b> 523:45 0 0	s Present 547:45 0 0
Time zoneGMFromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStand-down alongMob / Demob	AT Duratio 32 12:32 300 11:28 s veather) gside	Oj	ps T	ranche 3 gro		d gravel area Code Ops StbyW StbyO Mob	<b>Today</b> 24:00 0	Previous 523:45 0 41:00	s Present 547:45 0 0 41:00
Time zoneGMFromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStand-down alongMob / DemobContractors Time	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel)	Oj	ps T	ranche 3 gro		l gravel area Code Ops StbyW StbyO	<b>Today</b> 24:00 0 0 0	, option 3). <b>Previous</b> 523:45 0 0	s Present 547:45 0 0
Time zoneGMFromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStand-down alongMob / DemobContractors Time	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel)	Oj	ps T	ranche 3 gro		d gravel area Code Ops StbyW StbyO Mob CtV	<b>Today</b> 24:00 0 0 0 0	Previous 523:45 0 41:00 5:30	s Present 547:45 0 0 41:00 5:30
Time zoneGMFromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStandby at sea (wStand-down alongMob / DemobContractors TimeContractor's Time	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) e (Operations)	Oj	ps T	ranche 3 gro		Code Ops StbyW StbyO Mob CtV Ct	<b>Today</b> 24:00 0 0 0 0 0 0	, option 3). Previous 523:45 0 41:00 5:30 5:45	s Present 547:45 0 41:00 5:30 5:45
Time zoneGMFromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStand-down alongMob / DemobContractors TimeContractor's Time4. Production St	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) e (Operations)	Oj	ps T	ranche 3 gro		Code Ops StbyW StbyO Mob CtV Ct	<b>Today</b> 24:00 0 0 0 0 0 24:00	, option 3). Previous 523:45 0 41:00 5:30 5:45	s Present 547:45 0 41:00 5:30 5:45 600:00
Time zoneGMFromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStandby at sea (wStand-down alongMob / DemobContractors TimeContractor's Time	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) ummary red	Oj	ps T	ranche 3 gro coustic surv	ey of exposed	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19	<b>Today</b> 24:00 0 0 0 0 0 24:00	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00	s Present 547:45 0 41:00 5:30 5:45 600:00
Time zone GM From To 00:00 12: 12:32 24: <b>3. Time Analysis</b> Activity Operational Standby at sea (w Stand-down alon Mob / Demob Contractors Time Contractor's Time <b>4. Production Su</b> Data gather Clamshell g Vibrocores	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) mmary red rabs	Oj	ps T	Today 0 0	Previous 0 0	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38	Today 24:00 0 0 0 0 24:00 Remainin	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00 g Planned 10 30	s Present 547:45 0 41:00 5:30 5:45 600:00 % Complete 190 126
Time zone GM From To 00:00 12: 12:32 24: <b>3. Time Analysis</b> Activity Operational Standby at sea (w Stand-down alon Mob / Demob Contractors Time Contractor's Time <b>4. Production Su</b> Data gather Clamshell gr Vibrocores Hamon grab	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) ummary red rabs	Oj	ps T	Today 0 5	Previous 0 147	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38 152	<b>Today</b> 24:00 0 0 0 0 2 <b>4:00</b> <b>Remainin</b> 0 0 0	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00 g Planned 10 30 80	s Present 547:45 0 41:00 5:30 5:45 600:00 % Complete 190 126 184
Time zone GM From To 00:00 12: 12:32 24: <b>3. Time Analysis</b> Activity Operational Standby at sea (w Stand-down alon Mob / Demob Contractors Time Contractor's Time <b>4. Production Su</b> Data gather Clamshell gr Vibrocores Hamon grab Camera stati	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) ummary red rabs os ions	Oj	ps T	Today 0 5 4	Previous 0 147 69	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38 152 73	<b>Today</b> 24:00 0 0 0 0 2 <b>4:00</b> <b>Remainin</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00 g Planned 10 30 80 30	s Present 547:45 0 41:00 5:30 5:45 600:00 % Complete 190 126 184 243
Time zone GM From To 00:00 12: 12:32 24: <b>3. Time Analysis</b> Activity Operational Standby at sea (w Stand-down alone Mob / Demob Contractors Time Contractor's Time <b>4. Production Su</b> Data gather Clamshell g Vibrocores Hamon grab Camera stati Beam trawls	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) mmary red rabs os ions s		ps T	Today 0 5	Previous 0 147 69 117	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38 152	<b>Today</b> 24:00 0 0 0 0 2 <b>4:00</b> <b>Remainin</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00 g Planned 10 30 80	s Present 547:45 0 41:00 5:30 5:45 600:00 % Complete 190 126 184
Time zone GM From To 00:00 12: 12:32 24: <b>3. Time Analysis</b> Activity Operational Standby at sea (w Stand-down alone Mob / Demob Contractors Time Contractor's Time <b>4. Production Su</b> Data gather Clamshell g Vibrocores Hamon grab Camera stati Beam trawls	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) ummary red rabs os ions		ps T	Today 0 5 4 7	Previous 0 147 69 117 See note	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38 152 73 124	<b>Today</b> 24:00 0 0 0 0 2 <b>4:00</b> <b>Remainin</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	, option 3). Previous 523:45 0 0 41:00 5:30 5:45 576:00 g Planned 10 30 80 30 30	s Present 547:45 0 41:00 5:30 5:45 600:00 % Complete 190 126 184 243 413
Time zone GM From To 00:00 12: 12:32 24: <b>3. Time Analysis</b> Activity Operational Standby at sea (w Stand-down alone Mob / Demob Contractors Time Contractor's Time <b>4. Production Su</b> Data gather Clamshell g Vibrocores Hamon grab Camera stati Beam trawls High resolut	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) mmary red rabs os ions s tion surveys (kr	Ol Ol N)	ps T ps A	Today 0 5 4 7 139km	Previous 0 147 69 117 See note 2	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38 152 73 124 1066 km	Today 24:00 0 0 0 0 24:00 <b>Remainin</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00 g Planned 10 30 80 30 30 N/A	s         Present           547:45         0           0         41:00           5:30         5:45           600:00         %           %         Complete           190         126           184         243           413         100
FromTo00:0012:12:3224:3. Time AnalysisActivityOperationalStandby at sea (wStand-down alongMob / DemobContractors TimeContractor's Time4. Production SuData gatherClamshell giVibrocoresHamon grabCamera statiBeam trawlsHigh resolutCosterus Tw	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) ummary red rabs os ions s tion surveys (kr vin grab (Archa	n)	ps T ps A	Today 0 0 5 4 7 139km 0	Previous 0 147 69 117 See note 2 0	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38 152 73 124 1066 km 30	Today 24:00 0 0 0 24:00 24:00 8 Remainin 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00 g Planned 10 30 80 30 30 N/A 30	s         Present           547:45         0           0         41:00           5:30         5:45           600:00         %           %         Complete           190         126           184         243           413         100           100         100
Time zone GM From To 00:00 12: 12:32 24: <b>3. Time Analysis</b> Activity Operational Standby at sea (w Stand-down along Mob / Demob Contractors Time Contractor's Time <b>4. Production Su</b> Data gather Clamshell g Vibrocores Hamon grab Camera stati Beam trawls High resolut Costerus Tw Hamon grab	AT Duratio 32 12:32 300 11:28 s veather) gside e (Vessel) te (Operations) mmary red rabs os ions s tion surveys (kr	n) eology) ison)	ps T ps A	Today 0 5 4 7 139km	Previous 0 147 69 117 See note 2	Code Ops StbyW StbyO Mob CtV Ct Total: Total 19 38 152 73 124 1066 km	Today 24:00 0 0 0 0 24:00 <b>Remainin</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	, option 3). Previous 523:45 0 41:00 5:30 5:45 576:00 g Planned 10 30 80 30 30 N/A	s         Present           547:45         0           0         41:00           5:30         5:45           600:00         %           %         Complete           190         126           184         243           413         100

Planned number of Hamon, camera and beam trawls taken from tender
 Previous acoustic survey distances were reported in nautical miles. Total distance now corrected to km. Also, previous distances were estimated and included turns. Total distance now includes only run lines.

5. Weather

Time	Obs Wind	Obs Sea State
04:00	080° 05	060° 1 m
08:00	350° 09	040° 1 m

Remarks

12:00	350° 08	040° 1 m
16:00	350° 10	020° 1 m
20:00	110° 08	020° 1 m
24:00	340° 11	020° 1 m
Outlook		
W 2-4		

6.	S	af	ety	8	z	Environmental
0	c					

	None			
7. Personnel				
Marine Crew		Survey Crew		
Master	A Reading	Senior scientist	Keith Coo	oper
1 <sup>st</sup> Mate	G Ritchie	Survey engineer	Bill Mead	
3 <sup>rd</sup> Mate	A Oakham	Survey engineer	Ken May	
Chief Engineer	S Tweedie	Survey engineer	Simon Pe	arson
+ 12 additional crew		Benthic ecologist	Chris Bar	rio
		Benthic ecologist		is
		Benthic ecologist		Ware
		Benthic ecologist		earce
		Benthic ecologist		
		Geologist	Christean	
		Geologist	Julia Crur	nmv
		Archaeologist		ez-Fernandez
		Total survey	12	
Total crew	16			
Others				
Client representative	John Coppock			
MEPF Student	Rauhan Wan Hussin			
Total	2			
Total persons onboard	30			
8. Next 24 Hours Continue work on Tranche 3	3			
9. Key Dates	Lo	ocation	Date	
<b>9. Key Dates</b> Last Port call	Lo Lo	owestoft	18 <sup>th</sup> May	
9. Key Dates Last Port call Next crew change	Lc Lc 10		18 <sup>th</sup> May TBA	00
<b>9. Key Dates</b> Last Port call Next crew change Expected completion of acq	Lo Lo 10 uisition	westoft <sup>th</sup> June (Pilot boat)	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20	
<b>9. Key Dates</b> Last Port call Next crew change Expected completion of acq Next Port call	Lo Lo 10 uisition Lo	westoft <sup>th</sup> June (Pilot boat) westoft	18 <sup>th</sup> May TBA	
<b>9. Key Dates</b> Last Port call Next crew change Expected completion of acq Next Port call Last safety muster	Lc Lc 10 uisition Lc 16	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20	
<b>9. Key Dates</b> Last Port call Next crew change Expected completion of acq Next Port call	Lo Lo 10 uisition Lo	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20	
9. Key Dates Last Port call Next crew change Expected completion of acq Next Port call Last safety muster Next safety muster 10. Vessel Status	Lc Lc uisition Lc 16 N/	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20	09 (~14:00)
<b>9. Key Dates</b> Last Port call Next crew change Expected completion of acq Next Port call Last safety muster Next safety muster <b>10. Vessel Status</b> Fuel Remaining	Lo Lo 10 Lo 16 N/ Lub Oil Remaining	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20	09 (~14:00)
9. Key Dates Last Port call Next crew change Expected completion of acq Next Port call Last safety muster Next safety muster 10. Vessel Status	Lc Lc 10 Lc 16 N/ Lub Oil Remaining	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20	09 (~14:00)
<ul> <li>9. Key Dates <ul> <li>Last Port call</li> <li>Next crew change</li> <li>Expected completion of acq</li> <li>Next Port call</li> <li>Last safety muster</li> </ul> </li> <li>10. Vessel Status <ul> <li>Fuel Remaining</li> </ul> </li> <li>11. Party Chief Comments <ul> <li>Work progressing to plan, n</li> </ul> </li> <li>12. Report submitted by:</li> </ul>	Lo Lo lo lo lo Lub Oil Remaining o problems to report.	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20	09 (~14:00)
<ul> <li>9. Key Dates Last Port call Next crew change Expected completion of acq Next Port call  Last safety muster  Next safety muster  </li> <li>10. Vessel Status Fuel Remaining  11. Party Chief Comments Work progressing to plan, n</li></ul>	Lo Lo lo lo lo Lub Oil Remaining o problems to report.	westoft June (Pilot boat) westoft :00 09/06/2009 A	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20	09 (~14:00)
9. Key Dates         Last Port call         Next crew change         Expected completion of acq         Next Port call         Last safety muster         Next safety muster         10. Vessel Status         Fuel Remaining         11. Party Chief Comments         Work progressing to plan, n         12. Report submitted by:         Party Chief	Lo Lo lo lo lo Lub Oil Remaining o problems to report.	westoft June (Pilot boat) westoft :00 09/06/2009 A	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Re	09 (~14:00) emaining
<ul> <li>9. Key Dates <ul> <li>Last Port call</li> <li>Next crew change</li> <li>Expected completion of acq</li> <li>Next Port call</li> <li>Last safety muster</li> </ul> </li> <li>10. Vessel Status <ul> <li>Fuel Remaining</li> </ul> </li> <li>11. Party Chief Comments <ul> <li>Work progressing to plan, n</li> </ul> </li> <li>12. Report submitted by:</li> </ul>	Lo Lo lo lo lo Lub Oil Remaining o problems to report.	westoft June (Pilot boat) westoft :00 09/06/2009 A	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Re	09 (~14:00) emaining
9. Key Dates         Last Port call         Next crew change         Expected completion of acq         Next Port call         Last safety muster         Next safety muster         10. Vessel Status         Fuel Remaining         11. Party Chief Comments         Work progressing to plan, n         12. Report submitted by:         Party Chief	Lo Lo lo lo lo Lub Oil Remaining o problems to report.	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A g	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Re	09 (~14:00) emaining
<ul> <li>9. Key Dates <ul> <li>Last Port call</li> <li>Next crew change</li> <li>Expected completion of acq</li> <li>Next Port call</li> <li>Last safety muster</li> </ul> </li> <li>10. Vessel Status <ul> <li>Fuel Remaining</li> </ul> </li> <li>11. Party Chief Comments <ul> <li>Work progressing to plan, n</li> </ul> </li> <li>12. Report submitted by: <ul> <li>Party Chief Keith Comments</li> </ul> </li> <li>12<sup>th</sup> June 2009</li> <li>Cefas Endeavour</li> </ul>	Lub Oil Remaining o problems to report.	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A g ive J Coppock	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Ro Master	09 (~14:00) emaining
9. Key Dates         Last Port call         Next crew change         Expected completion of acq         Next Port call         Last safety muster         Next safety muster         10. Vessel Status         Fuel Remaining         11. Party Chief Comments         Work progressing to plan, n         12. Report submitted by:         Party Chief         Keith Comments         Cefas Endeavour	Lo Lo lo lo lo Lub Oil Remaining o problems to report.	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A g ive J Coppock Mobile (	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Ro Master	09 (~14:00) emaining <u>A Reading</u>
9. Key Dates         Last Port call         Next crew change         Expected completion of acq         Next Port call         Last safety muster         Next safety muster         Next safety muster         10. Vessel Status         Fuel Remaining         11. Party Chief Comments         Work progressing to plan, n         12. Report submitted by:         Party Chief         Keith Comments         Cefas Endeavour         Mini-M Phone       00 87176	Lub Oil Remaining o problems to report.	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A g ive J Coppock Mobile (	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Ro Master Cefas 07799773456	09 (~14:00) emaining <u>A Reading</u> tships.com
9. Key Dates         Last Port call         Next crew change         Expected completion of acq         Next Port call         Last safety muster         Next safety muster         10. Vessel Status         Fuel Remaining         11. Party Chief Comments         Work progressing to plan, n         12. Report submitted by:         Party Chief         Keith Co         12 <sup>th</sup> June 2009         Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A	Lub Oil Remaining o problems to report.	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A g ive J Coppock Mobile ( E-mail g	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Ro Master Cefas 07799773456 cefas.endeavour@g e-ma	09 (~14:00) emaining <u>A Reading</u> tships.com
9. Key Dates         Last Port call         Next crew change         Expected completion of acq         Next Port call         Last safety muster         Next safety muster         10. Vessel Status         Fuel Remaining         11. Party Chief Comments         Work progressing to plan, n         12. Report submitted by:         Party Chief         Keith Co         12 <sup>th</sup> June 2009         Cefas Endeavour         Mini-M Phone       00 87176         Mini-M Fax       N/A         Addressee Organisation         MEPF         Client       MEPF	Lub Oil Remaining o problems to report. Doper Client Representation 53998027 Attention	westoft <sup>th</sup> June (Pilot boat) westoft :00 09/06/2009 A g ive J Coppock Mobile ( E-mail g Telefax	18 <sup>th</sup> May TBA 15 <sup>th</sup> June 20 14 <sup>th</sup> June 20 Water Ro Master Cefas 07799773456 cefas.endeavour@g e-ma	09 (~14:00) emaining <u>A Reading</u> tships.com ail meill@wessexarch. C33-

**Period** 12<sup>th</sup> June 2009

1. Ship's Po Date	sition & St 12 <sup>th</sup> Jur	tatus ne 2009			Latitude	52.1	2.500 ' N		
Time	GMT	24:	:00		Longitud		16.700 ' E		
Present Acti	ivity	Tra	anche 3 gro	ound-truth station	ns (0.1m2 H	amon grabs, 2	2m beam trav	wls)	
2. Summary	y of Events	;							
Time zone	GMT	D i	<b>a</b> 1						
From 00:00	То 09:45	Duration 09:45	Code	Activity Acoustic surv	ou of avroa	d graval ara	(Trancha 2	(antion 3)	
00.00 09:45	24:00	14:15	Ops Ops	Tranche 3 gro					rawle)
07.45	24.00	14.15	Ops	Tranche 5 gro	Junu-u'uun si		2 Hamon gra	os, 2111 ocani (	1 <i>a</i> w15)
3. Time An	alysis					Code	Today	Previous	Dresont
Activity Operational						Ops	<b>Today</b> 24:00	547:45	<b>Present</b> 571:45
Standby at s		r)				StbyW	0	0	0
Stand-down		.)				StbyO	0	0	0
Mob / Demo						Mob	ů 0	41:00	41:00
Contractors		sel)				CtV	0	5:30	5:30
Contractor's						Ct	0	5:45	5:45
						Total:	24:00	600:00	624:00
. Producti	on Summa	rv							
Data g	athered	-		Today	Previous	Total	Remaining		% Complete
	nell grabs			0	0	19	0	10	190
Vibroc				0	0	38	0	30	126
Hamon	a stations			4 7	152 73	156 80	0 0	80 30	195 266
Beam t				3	73 124	80 127	0	30 30	200 423
	esolution su	rvevs (km)		5 75km	124 1066km	127 1141 km	NA	30 N/A	100
		b (Archaeol	ngv)	0	0	30	0	30	100
		b compariso		ů 0	0	10	0 0	10	100
		b (grab com		0	0	10	0	10	100
NB									
	umber of H	Iamon, came	era and bea	ım trawls taken f	rom tender				
5. Weather									
Time	Obs Win	d		Obs Sea State		Remar	·ks		
04:00	340° 10			020° 1 m 020° 1 m					
08:00	330° 06								
12:00 16:00	130° 08 180° 06			030° <1 m slight					
20:00	180°00 090°07			slight					
20.00 24:00	110° 11			$090^{\circ} < 1 \text{ m}$					
<b>Outlook</b> va				0)0 <1 III					
W 2-4									
6. Safety &	Environm	ental							
Safety incid			None						
Cetacean wa			None						
7. Personne	el								
Marine Cre	w				Surve	y Crew			
Master			Reading			scientist		n Cooper	
1 <sup>st</sup> Mate			Ritchie			y engineer		Meadows	
<sup>3<sup>rd</sup> Mate</sup>			Dakham			y engineer	Ken	-	
Chief Engin		S T	weedie			y engineer		n Pearson	
+ 12 additio	nal crew					c ecologist		s Barrio	
						ic ecologist		Curtis	
						ic ecologist		nne Ware	
						ic ecologist ic ecologist	-	ny Pearce Grubb	
					Geolo	-		stean Wilson	
					Geolo			Crummy	
						eologist		a Perez-Ferna	ndez
						survey	12		
Total crew		16							
Others									

Client representative MEPF Student	John Copp Rauhan W						
Total	2						
Total persons onboard	30						
8. Next 24 Hours Continue work on Tranche	3						
9. Key Dates		Lo	ocation		Date		
Last Port call			owestoft		18 <sup>th</sup> Ma	ıy	
Next crew change		10	<sup>th</sup> June (Pilot b	oat)	TBA		
Expected completion of ac	quisition	Ţ			15 <sup>th</sup> Jur		
Next Port call Last safety muster			owestoft 5:00 09/06/2009	)	14 Jur	ne 2009 (~14:0	)())
Next safety muster		N/					
<b>10. Vessel Status</b> Fuel Remaining	т	ub Oil Remaining	а.		Wat	er Remaining	
-			5		•• at		
<b>11. Party Chief Comment</b> Work progressing to plan,		report.					
<b>12. Report submitted by:</b> Party Chief Keith C		lient Representat	ive J Coppoc	ŀ	Master	Δ Γ	Reading
Faity Chief Keith C	cooper C	inent Representat	ive scoppor	ĸ	Waster		Ceaung
13 <sup>th</sup> June 2009							
Cefas Endeavour				Ce	fas		
Mini-M Phone 00 871' Mini-M Fax N/A	763998027		<b>Mobile</b> E-mail		799773456 f <u>as.endeavou</u>	ur@gtships.co	<u>m</u>
Addressee Organisation MEPF	Attention Euan Mc		Telefax			e-mail e.mcneill@wo	essexarch.co.u
ClientMEPFProjectEast CoaReport No26Period13 <sup>th</sup> June	-	ironmental Chara	cterisation Surv	/ey	Cefas Emai		C3340
1. Ship's Position & Statu	15						
Date 13 <sup>th</sup> June 2			Latitude	52 3	4.900 ' N		
Time GMT Present Activity	24:00 Tranche 3	ground-truth stat	Longitude ions (0.1m2 Ha		51.700 ' E 2m beam trav	wls)	
2. Summary of Events							
Time zone GMT							
	uration Code		1				1 \
	1:45 Ops 3:01 Ops		ground-truth sta rvey of expose				rawis)
	1:30 Ops		ground-truth sta				rawls)
	2:44 Ops		rvey of expose				
3. Time Analysis				Cal	T - 1	<b>D</b>	Durant
<b>Activity</b> Operational				Code Ops	<b>Today</b> 24:00	Previous 571:45	<b>Present</b> 595:45
Standby at sea (weather)				StbyW	0	0	0
Stand-down alongside				StbyO	0	0	0
Mob / Demob				Mob	0	41:00	41:00
				CtV	0	5:30	5:30
Contractors Time (Vessel)				Ct	0	5:45	5:45
				Total:	24:00	624:00	648:00
Contractors Time (Vessel)		Today	Previous			624:00	

Vibrocores			0	0	38	0	30	126	
Hamon gra Camera sta			6	156	162	0	80 20	202	
Beam traw			3 4	80 127	83 131	0 0	30 30	277 437	
	ution surveys	(km)	4 88km		1229 km	NA	JU N/A	100	
	Swin grab (Arc		0	0	30	0	30	100	
	abs (grab com		0	0	10	0	10	100	
	Win grab (grab		0	0	10	0	10	100	
NB 1. Planned num	ber of Hamon,	camera and bea	m trawls taker	n from tender					
5. Weather									
	Obs Wind		Obs Sea Stat	e	Remar	ks			
	10° 12		090° 1 m						
	00° 15		130° 1-2 m						
	00° 20		190° 1-2 m						
	80° 13		190° 1 m						
	80° 16		190° 1 m						
	90° 18		090° 1 m						
<b>Outlook</b> var 1- W 2-4	-3								
6. Safety & En Safety incidents		None							
Cetacean watch		None							
7. Personnel									
Marine Crew					y Crew				
Master		A Reading			scientist		ith Cooper		
l <sup>st</sup> Mate		G Ritchie			y engineer		l Meadows		
3 <sup>rd</sup> Mate		A Oakham			y engineer		n May		
Chief Engineer		S Tweedie			y engineer		non Pearson		
+ 12 additional	crew				ic ecologist		ris Barrio		
					ic ecologist		tt Curtis		
					ic ecologist		zanne Ware		
					ic ecologist		ony Pearce		
					ic ecologist		a Grubb		
				Geolo			ristean Wilso	on	
				Geolo			ia Crummy		
				Archae Total	eologist	Ма 12	rta Perez-Fe	ernandez	
Total crew		16		10101	survey	12			
Others									
Client represent	tative	John Coppoc	k						
MEPF Student		Rauhan Wan							
Total		2							
Total persons o	onboard	30							
8. Next 24 Hou									
9. Key Dates				ocation		Date			
Last Port call				westoft	4)	18 <sup>th</sup> N	hay		
Next crew chan Expected comp		sition	10	<sup>th</sup> June (Pilot b	ioal)	TBA 15 <sup>th</sup> I	une 2009		
Expected comp. Next Port call	iction of acqui	5111011	Lo	owestoft			une 2009 (~	14.00)	
Last safety mus	ter			:00 09/06/200	9	14 J	une 2009 (~	17.00)	
Next safety mus			N/		-				
10. Vessel Stat									
Fuel Remaining	5	Lub	Oil Remaining	5		W	ater Remain	ning	
11. Party Chie Work progressi		problems to repo	ort.						
2. Report sub	mitted by								

12. Report submitted by:

N/A	nmental Charact vey of exposed § Activity	Latitude Longitud gravel area (T vey of expose	vey 'N e 'E 'ranche 3, opt	Cefas Emai ion 3).	s Ref il Ref:	vessexarch.co.u C3340
Euan McNeil gional Environ N/A Acoustic surv on Code Ops	nmental Charact yey of exposed § Activity Acoustic sur	terisation Sur Latitude Longitud gravel area (T vey of expose	vey ' N e ' E 'ranche 3, opt ed gravel area	Emai	e.mcneill@v s Ref il Ref:	
N/A Acoustic surv on Code Ops	vey of exposed § Activity Acoustic sur	Latitude Longitud gravel area (T vey of expose	' N e ' E 'ranche 3, opt ed gravel area	Emai	il Ref:	C3340
Acoustic surv on Code Ops	Activity Acoustic sur	Longitud gravel area (T vey of expose	e 'E Tranche 3, opt	a (Tranche 3,	, option 3).	
Acoustic surv on Code Ops	Activity Acoustic sur	gravel area (T	e 'E Tranche 3, opt	a (Tranche 3,	, option 3).	
Ops	Acoustic sur				, option 3).	
			Cada	<b>T</b> 1		
			Code Ops StbyW StbyO Mob CtV Ct Total:	<b>Today</b> 07:04 0 06:41 0 0 <b>24:00</b>	Previous 595:45 0 41:00 5:30 5:45 624:00	s Present 602:49 0 47:41 5:30 5:45 648:00
eology) rison)	<b>Today</b> 0 0 0 0 40km 0 0 0	<b>Previous</b> 0 0 0 0 1229km 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<b>Total</b> 19 38 162 83 131 1269 km 30 10 10	<b>Remaining</b> 0 0 0 0 0 NA 0 0 0 0	<b>g Planned</b> 10 30 80 30 30 N/A 30 10 10	% Complete 190 126 202 277 437 100 100 100 100
	stances were 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c c} CtV \\ Ct \\ \hline Total: \\ \hline \\ $	$\begin{array}{c cccc} CtV & 0\\ Ct & 0\\ \hline Total: 24:00\\ \hline \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

J Coppock

Master

Client Representative

A Reading

Party Chief

Keith Cooper

5. weathe			
Time	Obs Wind	Obs Sea State	Remarks
04:00	110° 12	090° 1 m	
08:00	200° 15	130° 1-2 m	
12:00	200° 20	190° 1-2 m	
16:00	180° 13	190° 1 m	
20:00	180° 16	190° 1 m	
24:00	190° 18	090° 1 m	
Outlook	var 2-4		
W 2-4			

None None

6. Safety & Environmental

Safety incidents:	
Cetacean watch:	

7. Personnel		a a	
Marine Crew		Survey Crew	Kaith Caran
Master 1 <sup>st</sup> Mate	A Reading G Ritchie	Senior scientist	Keith Cooper Bill Meadows
3 <sup>rd</sup> Mate	A Oakham	Survey engineer Survey engineer	Ken May
Chief Engineer	S Tweedie	Survey engineer	Simon Pearson
+ 12 additional crew	5 Tweedle	Benthic ecologist	Chris Barrio
		Benthic ecologist	Matt Curtis
		Benthic ecologist	Suzanne Ware
		Benthic ecologist	Bryony Pearce
		Benthic ecologist	Lisa Grubb
		Geologist	Christean Wilson
		Geologist	Julia Crummy
		Archaeologist	Marta Perez-Fernandez
Total crew	16	Total survey	12
Others			
Client representative	John Coppock		
MEPF Student	Rauhan Wan Hussin		
Total	2		
Total persons onboard	30		
8. Next 24 Hours			
Continue work on Tranche	3		
9. Key Dates		Location	Date
Last Port call Next crew change		Lowestoft 10 <sup>th</sup> June (Pilot boat)	18 <sup>th</sup> May TBA
Expected completion of acq	misition	10 Julie (Fliot boat)	15 <sup>th</sup> June 2009
Next Port call	uisition	Lowestoft	13 <sup>th</sup> June 2009 (~14:00)
Last safety muster		16:00 09/06/2009	14 Julie 2009 (14.00)
Next safety muster		N/A	
10. Vessel Status			
Fuel Remaining	Lub Oil Rem	aining	Water Remaining
11. Party Chief Comment			
Work progressing to plan, r	o problems to report.		
<b>12. Report submitted by:</b> Party Chief Keith C	ooper Client Repres	sentative J Coppock	Master A Reading

# Appendix 5 Personnel

### Survey Personnel Leg 1

John Coppock	Client Rep	MEPF	Whole survey
David Limpenny	Scientist-in-Charge	CEFAS	$19^{th}$ May $-24^{th}$ May
Nigel Lyman	Survey Engineer	CEFAS	$19^{th}$ May $- 24^{th}$ May
Neil Campbell	Senior BGS Technician	BGS	$19^{th}$ May $-24^{th}$ May
Lee Baines	Geological Technician	BGS	$19^{th}$ May $-24^{th}$ May
Julia Crummy	Geologist	BGS	Whole survey
Mike Wilson	Geological Technician	BGS	$19^{th}$ May $-24^{th}$ May
David Baxter	Geological Technician	BGS	$19^{th}$ May $-24^{th}$ May
Mary Mowat	Geologist	BGS	$19^{th}$ May $-24^{th}$ May
Marta Perez-Fernande	z Archaeologist	Wessex	$19^{th}$ May $- 11^{th}$ June
Stephanie Arnott	Archaeologist	Wessex	$19^{th}$ May $- 24^{th}$ May
Theo Gaussen	MSc Student	MEPF	$19^{th}$ May $- 24^{th}$ May

### Survey Personnel Leg 2

John Coppock	Client Rep	MEPF	Whole survey
Keith Cooper	Scientist-in-Charge	CEFAS	$24^{th}$ May $- 14^{th}$ June
Julia Crummy	Geologist	BGS	Whole Survey
Marta Perez-Fernande	z Archaeologist	Wessex	19 <sup>th</sup> May – 11 <sup>th</sup> June
Bryony Pearce	Benthic ecologist	MESL	$24^{th}$ May $- 14^{th}$ June
Lisa Grubb	Benthic ecologist	MESL	$24^{th}$ May $- 14^{th}$ June
Christian Wilson	Geophysicist	CEFAS	$24^{th}$ May $- 14^{th}$ June
Chris Barrio	Senior benthic ecologis	t CEFAS	$24^{th}$ May $- 14^{th}$ June
Suzanne Ware	Benthic ecologist	CEFAS	$24^{th}$ May $- 14^{th}$ June
Matt Curtis	Benthic ecologist	CEFAS	$24^{th}$ May $-11^{th}$ June
Rauhan Wan Hussin	MSc Student	MEPF	$24^{th}$ May $- 14^{th}$ June
Bill Meadows	Senior technician	CEFAS	$24^{th}$ May $- 14^{th}$ June
Simon Pearson	Technician (training ou	twith MEPF)	$24^{th}$ May $- 14^{th}$ June
Ken May	Technician (training ou	twith MEPF)	$24^{th}$ May $- 14^{th}$ June

#### **R/V CEFAS Endeavour Crew**

A Reading	Master
B Salter	1 <sup>st</sup> Mate
G Ritchie	2 <sup>nd</sup> Mate

A Oakham 3<sup>rd</sup> Mate

S Tweedy Chief Engineer

12 additional members of the crew onboard.

# Appendix 6 Equipment Layback Diagram

Vessel offsets are defined from the pitch roll centre of the vessel – the Common Reference Point (CRP) used by the Tower CEMAP software to calculate offsets.

A dimensional survey was carried out at vessel commissioning and during the vessels dry dock period from the 19<sup>th</sup> to the 21<sup>st</sup> December 2007 (Table 3). This defines the stern roller point very accurately but stern gantry and side gantry being movable are not part of the fixed vessel offset array. Therefore taped offset measurements were performed and used in the navigation software to calculate gantry positions or post-processing for other pieces of data acquired.

For a full list of offsets please see Appendix 3 (page 54) in the CEND 07 08 Dogger Bank cruise report (Limpenny, 2008) which can be found on the BGS network (cruise folder: *NONBGS2008\_CEFAS\_CEND\_7\_08*).

Gantry	X (to starboard)	Y (to bow)	Z (vertical upwards)
Side	10.65	-0.1	0
Stern	0	-36.6	0
GPS Mast Antenna (Centre)	-0.01	-4.01	-21.09
Drop Keel Starboard MBES	0.26	14.49	6.47
Drop Keel Port MBES	-0.25	14.50	6.46
Drop keel offsets are as surveyed positions. No correction has been made to the fully deployed position.			

Table 5 Selected offsets from the Common Reference Point.

### BGS Layback Diagram

## RV CEFAS Endeavour - Survey BGS2009/4 / CEND 09/09

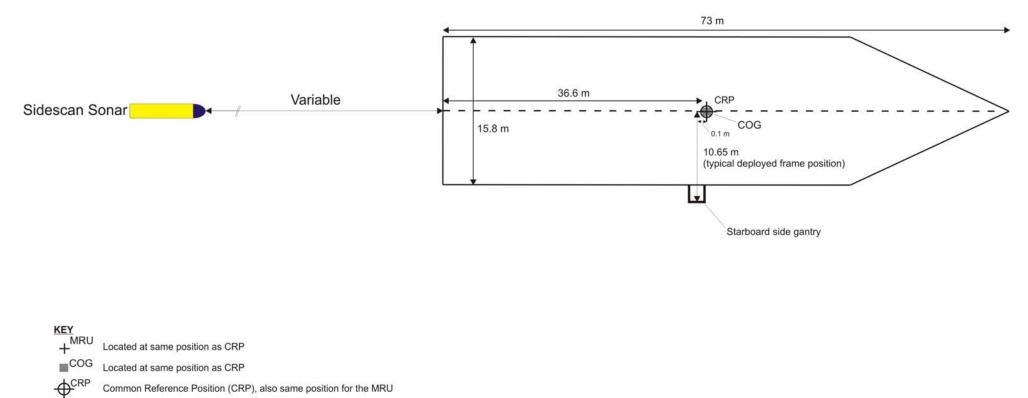
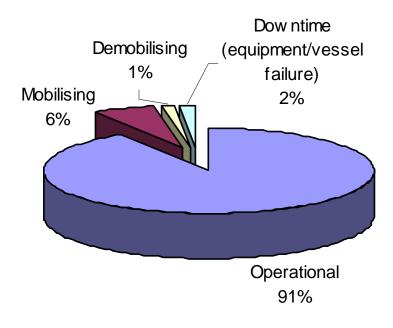


Figure 13 Equipment layback diagram for the *R/V CEFAS Endeavour*.

# Appendix 7 Time Utilisation Diagram



# Glossary

AGDS	Acoustic Ground Discrimination System
BGS	British Geological Survey
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
MBES	Multibeam Echo-Sounder
SIC	Scientist In Charge
SSS	Sidescan Sonar

# References

Most of the references listed below are held in the Library of the British Geological Survey at Keyworth, Nottingham. Copies of the references may be purchased from the Library subject to the current copyright legislation.

LIMPENNY, D. 2008. Dogger Bank SAC Cruise Report. (Lowestoft: CEFAS)

CAMPBELL, N. 2009. BGS Geoscience Resources and Facilities Directorate. Marine Operations. Health and Safety at Sea. Guidance for Geophysics Operations on 'R/V CEFAS Endeavour' – East Coast REC.

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