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Baseline Survey Dogger Bank Area 2005

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Appendix 1. List of Stations, coordinates and sample information **Error! Bookmark not defined.**

1. Introduction

Plans are made to develop the offshore production of gas in the Dogger Bank Area. TNO Built Environment and Geosciences is requested to prepare a study to describe the baseline situation in order to facilitate approval for the drilling and production activity from the competent authorities. The Dogger Bank Area is indicated as an area of special interest because of its natural values.

At present there are no guidelines for dealing with applications for offshore exploration drilling within areas that might be designated to the NATURA 2000 network or as a Marine Protected Area within the Dutch Continental Shelf. Because of this, the proposed options in this work plan are based on the guidance documents from OSPAR (e.g. OSPAR 03/17/1-E, Annex 7) and EU documents on the implementation of Special Areas of Conservation under NATURA 2000.

The objective of the environmental base line survey in 2005 is to describe the current state of the environment at the exploration drilling site before the activities are started in order to make an assessment of the environmental effects of the activity. A field survey forms part of the environmental base line study. The survey will provide information on the benthic community as well as on the present situation with regard to physical-chemical parameters of the sediment at the Dogger Bank area.

The survey is based upon the requirements for a complete baseline survey as described within the OSPAR guidelines of 2000 for environmental impact studies of oil and gas development and production in the North Sea. The field study was set up in such a way that it can be repeated in the case of future monitoring studies.

The Dogger bank area is a relatively uniform sandy area in the North Sea with a moderate depth between 30 – 45 m. However, gradients in depth and in sediment structure are present and therefore possible differences in macrofauna assemblages might occur. In addition to the environmental base line survey an investigation was carried by TNO to describe the habitat characteristic of this area over a gradient in sediment structure. This study is carried out as part of an EU INTERREG IIIB program entitled 'Development of a framework for Mapping European Seabed habitats (MESH)', in which 12 international partners collaborate.

1.1 Choice of sampling stations and sampling method

The sampling grid proposed for the baseline study is based on OSPAR guidelines for environmental impact studies in the North Sea. Samples are taken at the central station and the stations at distances of 250, 500 and 1000 m from the exploration drilling location together with an additional reference station. This reference station is located at a distance of approximately 6 km from the central drilling location.

The stations over the transect were chosen in such a way that a gradient in depth and in sediment was sampled.

The positions of the actual sampling stations for the baseline study as well as for the habitat transect study are given in the Figure 1. At all stations the positions of the samples were within a range of approximately 15 m meters.

Samples for the ground truting were taken with a Hamon grab with a minimum sampling depth of 10 cm. The Hamon grab was during the survey adjusted because of difficulties to reach the minimum sampling depth of 10 cm. Next to the Hamon Grab also a Van Veen grab was used at several stations.

At each station 1-9 samples were taken for grain size and macrofauna analysis. Replicate samples were taken to be able to detect spatial variation within a sample location and between different locations.

Macrobenthos samples were washed on board over a sieve of 1 mm diameter. From each sample the material left behind on the sieve was collected separately into polyethylene containers and preserved with 4% buffered formaldehyde in seawater solution. On two stations a 0.5 mm sieve was used to study the differences in results of different sieve mesh sizes.

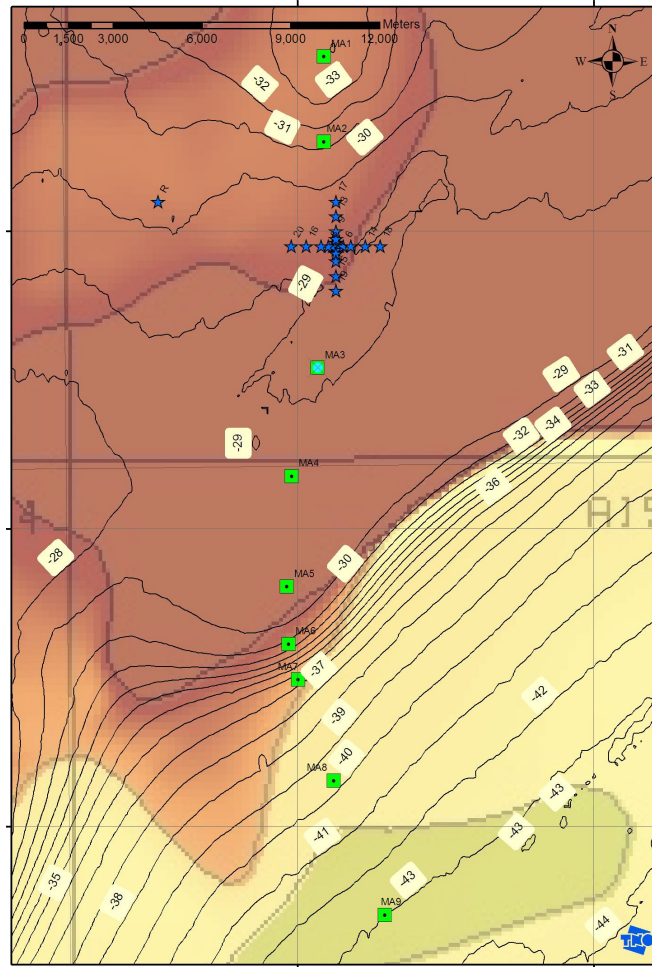


Figure 1: *Schematic layout of the sampling grid used at the Dogger Bank area in the 2005 survey. In blue the locations of the base line study, in green the positions of the stations intended for the MESH project.*

2. Results

2.1 Sampling

For the survey the ship 'Oil Express' from Vroon Offshore Services B.V. was used which was equipped with a crane capable of handling the sampling equipment very well. It was equipped with a GPS navigation system for the positioning of the sediment samplers. General information on time of sampling and allocation of samples was recorded at each sampling station. Mr. Hans Sink of Geocom surveyed the positioning of the ship with an offset for the positioning of the crane and therefore of the grab sampler.

A visual inspection of the sediment was made directly on deck in order to make a sediment description based on the colour and type of sediment. Also a close observation was made whether any suspicious traces revealing the presence of hydrocarbons (colour, smell, oil layer) were found or not.

Macrobenthic samples were collected separately into polyethylene containers and preserved with 4% buffered formaldehyde in seawater solution.

At each station for the base line study three (replicate) samples were collected for chemical analysis (metals and hydrocarbons). Each sample was mixed to obtain a representative sample. From this sediment, samples were taken for metal analysis and hydrocarbon analysis. The sediments taken for hydrocarbon analysis were stored in glass jars with a Teflon cap inlay. The samples are stored at -20 °C pending analysis. Sediment was also collected for the analysis of grain size and TOM. The sediment samples were stored in a freezer at about 4° C.

2.2 First results

The sampling of the stations was done successfully. The seabed samples were of good quality and taken to a minimum depth of 15 cm. Most samples were taken to a depth of over 20 cm. Occasionally samples were rejected due to insufficient depth and a new samples were taken.

During the direct visual and olfactory inspection of the samples at neither location nor in any sample an indication for the presence of hydrocarbons was found. Also no other anomalous observations were made.

3. Daily Reports

Tuesday 9th and Wednesday 10th May

Start mobilization at Vroon 'Oil Express' at 1700 hrs. Leaving Den Helder harbor at 19:00 hrs, start sailing to Dogger Bank Area

Weather conditions decreased during night up to wave height 3.5 m improving during the morning of 20th April. Weather has calmed down to wind force 3, wave heights 1.5 m.

Transect sampling for habitat description started at Wednesday and continued up to Thursday morning.

Contact was made with XXXXX to discuss start of contracted activities on behalf of XXXXX.

Dailey Report I

From: J.A. van Dalfsen

Party Chief Environmental Base line survey XXXXX , 2005

order: SSC-XX-0511

Attn.. XXXXX

Date: 12-5-2005; 22:25 hrs

Thursday 12th May

Finished work of Contractor on the Doggerbank area transect. Contacted XXXXX by telephone on arrival at the study area to discuss the start of contracted activities on behalf of XXXXX. Start of preparations and sampling at 08:30hrs. Also due to ideal weather conditions sampling of the stations went successful. During the day and evening sampling was completed at 13 stations, including the reference station.

End of activities at 22:30 hrs.

Weather prognoses for Friday 13th are good. Expectations are to finish all stations by Friday afternoon.

Dailey Report II

From: J.A. van Dalfsen

Party Chief Environmental Base line survey XXXXX , 2005

Unocal order: SSC-XX-0511

Attn. XXXXX

Date: 13-5-2005; 22:45 hrs

Friday 13th May

Start of activities at 7:45. Completed all remaining stations at 15:00 hrs. All 18 stations at the proposed drilling location have been successfully sampled, including the reference station. Started return sailing to Den Helder port at 15:00 hrs. Expected arrival time Den Helder at Saturday morning 08:00 hrs.

Saturday 14th May.

Arrival at Den Helder Port at 8:00 hrs.