
Beskrivelse af havbundsundersøgelse for området i umiddelbar nærhed af DanWEC's målebøje vest for Hanstholm Havn.

I området vest for Hanstholm havn har DanWEC udlagt målebøje som en del af den service centret tilbyder udviklere af Bølgeenergi anlæg.

For bedre at kunne beskrive forholdene omkring bøjen og i den fremherskende bølgeretning fra bøjerne, ønskes der foretaget målinger af havbunden, dybden og sediment tykkelsen, samt dennes beskaffenhed.

Kortet herunder viser området hvor der ønskes foretaget en Side Scan måling og en Subbottom profiling.

Det forventes at undersøgelserne vil blive foretaget så snart der er mulighed for det.

Undersøgelserne er forløberer til en vurdering af om det er nødvendigt at foretage Vibrocore undersøgelser efterfølgende.

Skulle der fra nærværende myndigheder være indvendinger eller kommentarer til disse undersøgelser vil vi meget gerne have dette så hurtigt det er muligt.

Det samlede areal for undersøgelsen er **4,63 km²**

Placering af DanWEC's målebøje(W2) og Afmærkningsbøjer/Kardinalbøjer.(WK1-EK1)

W2	N57° 07' 00.12" E008° 30' 59.94"
WK1	N57° 07' 00.12" E008° 30' 54.54"
EK1	N57° 07' 00.12" E008° 31' 05.28"

Det afgrænsede område de ønskes undersøgt
Her angivet med koordinater.

N	N57° 07' 33.57" E008° 31' 38.19"
S	N57° 06' 51.68" E008° 32' 13.52"
E	N57° 06' 40.89" E008° 31' 29.53"
W	N57° 07' 23.01" E008° 30' 54.87"

Bilag inkluderet:

Bilag 1- Beskrivelse af undersøgelses metoder.

Bilag 2. Oversigt over sandsynlige Vibrocore områder.



4. Method statement

For the geophysical survey we intend to use a set-up with Side scan sonar, Innomar (sub-bottom profiler) and Sparker. Vibrocoring will be performed at suitable sites based on results of the geophysical survey. In the following, the proposed methods and available equipment will be described in detail. Further equipment specifications are listed in Appendix B.

4.1 Subbottom profiling

It is proposed to use a combination of the Innomar SES 2000 parametric sub-bottom profiler and the GeoSpark 200 sparker. The Innomar is used to map the near surface sediment layers and the GeoSpark 200 sparker is used for deeper penetration.

The Geo sparker 200 is a high resolution Multitip sparker designed for use with the GeoSpark 1000 pulsed powersupply and the Georesources single channel 8 sensors mini-streamer. The Geo sparker 200 has an effective seabed penetration of approximately 30 meters below seabed with around 30 cm resolution, and operates with a 200 tip array pulsed at between 50 and 1000 joule per ping. A detailed description of the seismic equipment is given in Appendix B.

4.2 Side scan sonar

As side-scan sonar GEUS will use the Edgetech 4125 sidescan sonar. This is a dual frequency sidescan sonar operating at 400 and 900 kHz simultaneously, with an operation range between 75 and 150 meters. The maximum resolution of the sidescan is 1.5 cm. A detailed description is given in Appendix B.

4.3 Vibrocoring

Sampling can be made to 6 m below the sea bed. For the coring, GEUS' vibrocorer W. Schmidt VKG 6/3 shall be used with core barrel length of 6 m, easing handling and operation procedures (data sheet included in Appendix B). The VKG is an electrically driven vibrocorer system, vibrating at around 28 Hz, coring bottom samples in up to 100 m water depth. PVC core liners with an inner diameter of 106 mm will be used.

To ensure maximum core recovery in varying sediment material, core catchers of different stiffness and tightness will be available. Penetration rate will continuously be recorded during coring, and possible settlement of the seabed due to the net weight of the vibrocorer will be registered. If at least 50% core recovery is not achieved for each vibrocorer site, the coring attempt will be repeated, at least once. Upon retrieval, the sediment cores shall be preserved in the core barrel liner. Core liners with samples will be cleaned and cut into one-meter lengths.

After a preliminary sediment description of the one-meter sample, this will be carefully sealed with sealing wax of low shrinking type and core liner tubes. The samples will be stored in boxes on the vessel for later transportation to the storage. A careful record will be kept of the depths where the samples are taken, and the results of sampling will be presented in a vibrocorer profile.

Bilag 2.

Vibrocoreing Chart.

Oversigt over områder til Vibrocore borer i forbindelse med testcenter DanWEC i Hansholm.

Der ønskes foretaget op til 3 borer i hvert område.

Tilsammen i alt max 6 borer.

Området "Planned Cable" ønskes undersøgt til en afstand så tæt på kysten som muligt.

Et kort i dansk udgave kan fremstilles hvis det ønskes.

Det markerede område med A,B,C,D indikerer området hvor der forud for Vibrocoreing undersøgelsen vil blive foretaget Side Scan- og Subbottom profiling. Området svar til Beskrivelsens N, E, S, W

De afgrænsede område der ønskes foretaget Vibrocore borer i er angives ved følgende Koordinater.

V1

1	N57° 06' 58.82" E008° 33' 43.42"
2	N57° 06' 37.14" E008° 33' 20.22"
3	N57° 06' 50.45" E008° 32' 37.43"
4	N57° 07' 12.42" E008° 33' 00.94"

V2

5	N57° 07' 33.57" E008° 31' 38.19"
6	N57° 06' 51.68" E008° 32' 13.52"
7	N57° 06' 40.89" E008° 31' 29.53"
8	N57° 07' 23.01" E008° 30' 54.87"

