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Status Final

Benthic Investigations Doordewind Wind Farm Zone

Annex 5 - Section IV

Scope of Work Benthic Survey

Investigation Area in Doordewind Wind Farm Zone

Colophon

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References

EN ISO 9001:2015	Quality management systems — Requirements. International Organization for Standardization (ISO), 2015.
BS 1377	Soils for civil engineering purposes Part 1 to 9. British Standard, 1990 to 2022 depending on the section (latest version of each part to be considered).
ISO/IEC 80000:2022	Quantities and Units – Part 1: General. International Organization for Standardization (ISO), 2022.
ISO 16665:2014	Water quality — Guidelines for quantitative sampling and sample processing of marine soft-bottom macrofauna.
ISO 5667-19:2004	Water quality — Sampling — Part 19: Guidance on sampling of marine sediments.
ISO/IEC 17025:2017	General requirements for the competence of testing and calibration laboratories.
OSPAR Commission	Guidelines for monitoring contaminants in sediments.
Rijkswaterstaat	Guidance documents and monitoring protocols for marine benthic surveys in Dutch waters.

LIST OF ABBREVIATIONS

ALARP	As Low As Reasonably Practicable
CMID	Common Marine Inspection Document
CS-000	Certificatie Opsporen Ontplofbare Oorlogsresten (Certification for Detecting Explosive Remnants of War)
DDW WFZ	Doordewind Wind Farm Zone
DPR	Daily Progress Report
ERP	Emergency Response Plan
ETRS89	European Terrestrial Reference System 1989
eDNA	Environmental DNA
GIS	Geographic Information System
HSE	Health, Safety and Environment
IA	Investigation Area
LAT	Lowest Astronomical Tide
MAG	Magnetometer
MBES	Multibeam Echo Sounder
MDS	Multidimensional Scaling
MPK	Maritieme Plankaart, Marine Planning Base Map
OCR	Offshore Client Representative
OSPAR	Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PEP	Project Execution Plan
POB	Persons On Board
PSD	Particle Size Distribution
PQP	Project Quality Plan
QA	Quality Assurance
QC	Quality Control
ROV	Remotely Operated Vehicle
RVO	Rijksdienst voor Ondernemend Nederland
RWS	Rijkswaterstaat
RWS-V	Rijkswaterstaat Voorschriften (Procedures)
SI	International System of Units
SIMOPS	Simultaneous Operations
SIMPER	Similarity Percentages
SIMPROF	Similarity Profile

SSS	Side-Scan Sonar
TBT	Tributlin
TNO	Netherlands Organisation for Applied Scientific Research
TOC	Total Organic Carbon
UXO	Unexploded Ordnance
UTM	Universal Transverse Mercator
WFZ	Wind Farm Zone

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1 Introduction & Background

1.1 Scope Document

This document details the scope of the WORK that will form part of the AGREEMENT with the CLIENT when this tender is awarded to the successful CONTRACTOR, for carrying out benthic investigations at the Investigation Area (IA) in the Doordewind Wind Farm Zone (DDW WFZ).

1.2 Background

The Ministry of Climate Policy and Green Growth is responsible for the legislative framework for the development of offshore wind farms in the Netherlands. Within this framework (a) (concession) tender(s) for construction and operation of (a) wind farm(s) will be organised under the Offshore Wind Energy Act. As part of the tender documentation, the participants will receive an information package in which detailed information on the offshore site is included, including detailed information on the soil conditions at the sites.

1.3 Objective of Benthic Survey

The overall objective of the benthic survey is to collect factual benthic data to validate the findings of a desktop study on reef detection in the DDW WFZ (results expected in July, 2026), and to establish a baseline measurement of the benthic environment in the area. These findings can be used to incorporate specific measures to enhance or conserve benthic communities in the tender or site decision, and/or for wind farm developers to include in their design.

This scope includes:

- Retrieval of 40 sediment samples from different sample locations
- Retrieval of 40 water samples
- Visual seabed survey of parts of the seabed at 15 of the sediment sample locations in DDW WFZ
- Laboratory programme for analysis of samples for determination of:
 - o Benthic species and community composition
 - o Environmental DNA (eDNA) analysis
 - o Particle size distribution (PSD)
 - o Chemical contaminants
- Interpretation of data to produce a benthic habitat map
- Reporting

Details on the scope of the benthic survey, analysis and reporting are provided in Section 2. The location plan for the samples will be provided by the Contracting Authority at the start of the CONTRACT. The locations are to be expected to be fairly evenly distributed over the DDW WFZ.

1.4 Site Description

A detailed description of the Doordewind Wind Farm Zone can be found in Annex 7: Starting Points and Assumptions.

1.5 Doordewind Wind Farm Zone

The Doordewind Wind Farm Zone is illustrated in Figure 1 below.

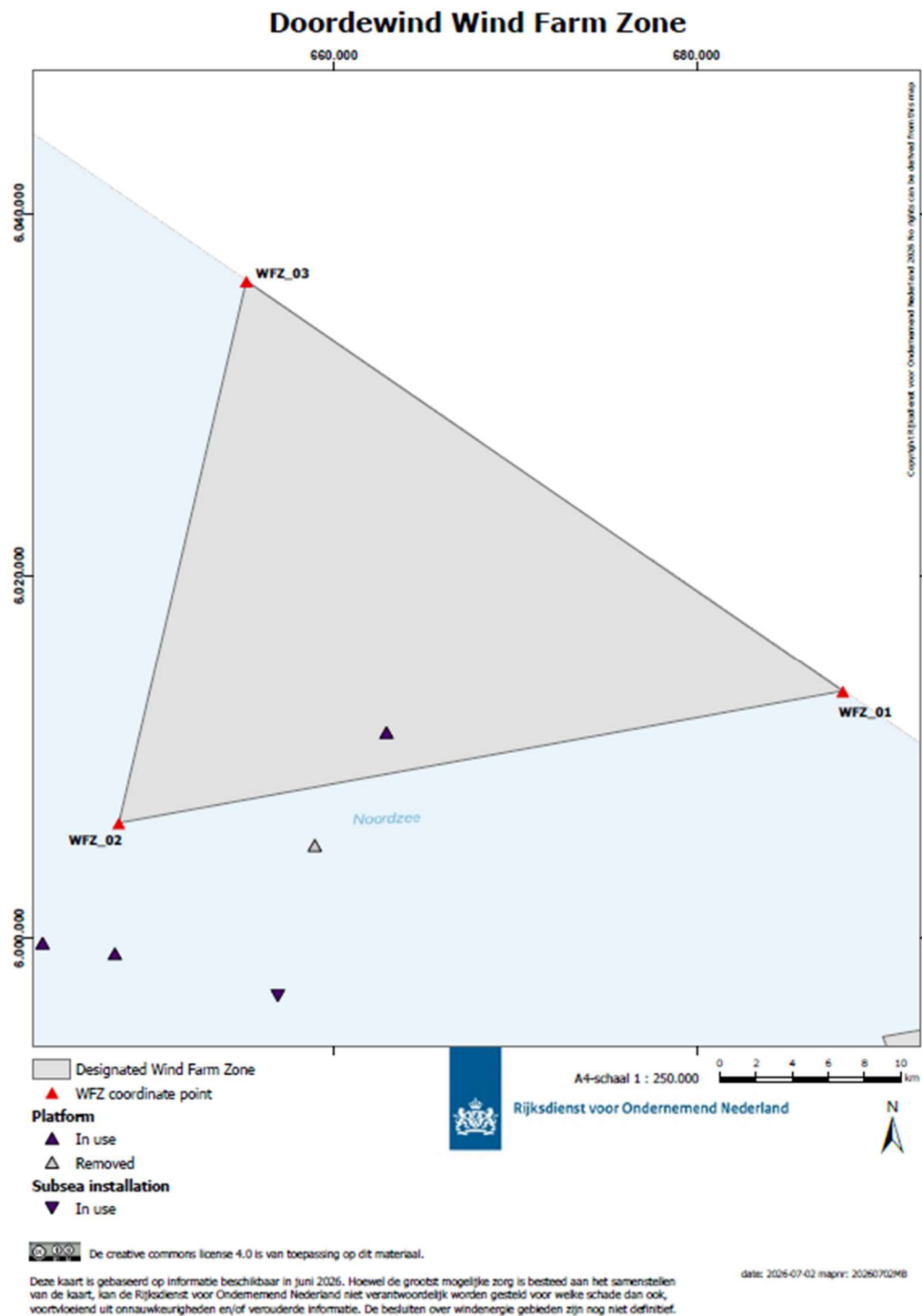


Figure 1: Map of the Doordewind WFZ.

The Wind farm zone size is approximately 580 km². The coordinates defining the circumference to the DDW WFZ are provided in Table 1.

Table 1 Coordinates of the DDW WFZ

Doordewind Wind Farm Zone		
Coordinates according EPSG 25831		
Point No.	Easting	Northing
WFZ_01	688080,9	6013582,7
WFZ_02	648113,4	6006321,6
WFZ_03	655159,0	6036270,3

1.6 Simultaneous Operations (SIMOPS)

The CONTRACTOR shall take into account the potential requirement for SIMOPS, and shall coordinate survey planning, including timing and locations, with other contractors working at the site, where required.

1.7 Planning of the Benthic Survey

The offshore benthic survey is foreseen to start between 1 February 2027 and 1 May 2027. The key milestones for the execution of the offshore benthic survey are summarised in Annex [4].

As part of the tender submission, tenderers shall provide a letter from their nominated onshore laboratory(s) confirming that they have sufficient reserved capacity to meet the proposed testing schedule(s).

The overall project schedule is highly time-driven in order to comply with Rijksdienst voor Ondernemend Nederland (RVO)'s schedule to deliver all data in Q1 2028. Therefore, it is imperative, that the key dates, as mentioned in the Annex [4] will be met. The CONTRACTOR shall take note of the provided project schedule and indicated key dates.

1.8 Interfaces & Responsibilities

The DDW benthic survey follows on the desktop study executed by Netherlands Organisation for Applied Scientific Research (TNO), in which potential reef structures are identified using the available geophysical data from the DDW IA. If potential reef structures are identified, this benthic survey should aim to validate the presence of these reefs.

1.9 Available Information

The following studies will be provided by the CLIENT separately to the CONTRACTOR before start of the WORK :

- Marine Planning Base Map (MPK) containing information on location, attached to Annex [7]: Starting Points and Assumptions;
- Geophysical survey report of DDW WFZ and associated digital data will be available before start of the Contract on Soil Doordewind · Offshorewind RVO.

- Geotechnical survey report of DDW WFZ and associated digital data will be made available before start of the Contract on Soil Doordewind . Offshorewind RVO
- TNO reef detection study report of DDW WFZ.

2 Scope of Work

The Scope of Work described below is applicable to the IA in DDW WFZ unless otherwise specified.

2.1 Activities

The activities to be carried out in order to achieve the objectives described in Section 1.3 include the following:

Preparation

- All preparatory work required for the offshore benthic survey, including preparation of relevant plans and documentation, shall be provided and approved by the CLIENT prior to mobilisation of offshore activities. This includes preparation and agreement of a Project Execution Plan (PEP), to include sampling design and survey methods, a HSE plan and a quality assurance management plan (QAMP).

Mobilisation

- Onboarding of all necessary survey personnel;
- Onboarding and installation of all necessary survey equipment;
- Dry and wet testing of survey equipment, where applicable;
- Equipment calibrations, where applicable;
- Transit to site and positioning on first investigation location; and
- Production of Mobilisation Report.

Data acquisition

- Visual seabed survey using drop-down video or Remotely Operated Vehicle (ROV)-based video system;
- Sediment sampling using box coring or equivalent sampling methods, as described in this Scope of Work;
- Collection of sediment samples for determination of faunal analysis, PSD and chemical contaminants;
- Collection of water samples for eDNA analysis;
- Preliminary factual reporting, with results to be presented in Benthic Survey Field Report covering the IA; and
- Delivery of associated digital data.

Onshore laboratory analysis

- Laboratory analyses to be undertaken shall include, as a minimum:
 - Benthic species analysis (40 samples);
 - PSD analysis (40 samples);
 - Chemical contaminant analysis of sediment samples (20 samples);
 - eDNA analysis of water samples (40 samples);
- Associated reporting with results to be presented in the Environmental Baseline Report; and
- Delivery of associated digital data.

Data processing and reporting

- Processing of all data obtained during the offshore benthic survey;
- Interpretation of results in support of the survey objectives described in Section 1.3;

- Delivery of all digital data in consistent formats throughout the project, including raw data, positioning information, metadata, documentation of processing steps, and associated quality assurance information;
- Provision of a Benthic Survey Field Report following completion of the survey activities;
- Provision of an Environmental Baseline Report, presenting completed analyses, interpretation and mapping outputs, with laboratory results included as appendices;
- Delivery of a coherent and well-documented data package that allows third parties to evaluate, reprocess, reinterpret, or otherwise rework the data for their own purposes.

General

- This Scope of Work defines a **minimum** specification. Tenderers shall describe their proposed methods and specifications in sufficient detail to demonstrate how the survey objectives will be achieved.
- The Contractor shall clearly identify any limitations associated with the proposed survey methods and describe any assumptions or constraints relevant to interpretation of the results.

2.2 Preparation

2.2.1 Review of Available Information

CONTRACTOR shall review and scrutinise the information made available by the CLIENT that is relevant to the WORK. This information shall be taken into account when preparing and executing the WORK. This shall include, where available, relevant geophysical datasets (e.g. Multibeam Echo Sounder (MBES), SSS (Side-Scan Sonar) and Magnetometer (MAG)) and outputs from previous studies, including the TNO reef detection study, to support sampling design and safe execution of the WORK. CONTRACTOR shall familiarise itself with the anticipated seabed, environmental and metocean conditions prior to mobilisation.

2.2.2 Documentation

Permits

CONTRACTOR shall be responsible for obtaining and arranging all necessary permissions and/or notifications required to perform the offshore benthic survey. (including all permissions and fees necessary for safely accessing harbours and offshore locations).

Project Plans

CONTRACTOR shall prepare all project documentation required for the execution of the WORK and/or as described in the CONTRACT. These documents shall be provided to the CLIENT for review and approval 35 days prior to mobilisation and shall include, but not be limited to:

- PEP, including applicable method statements, risk assessments, project schedule, vessel layout diagrams and sampling design and distribution (also see Section 2.5.1);
- Quality Assurance management plan describing procedures for QA, document control, data traceability, and internal review; and
- Health, Safety and Environment (HSE) documentation, including an Emergency Response Plan (ERP).

CONTRACTOR shall maintain regular communication with the CLIENT regarding survey progress and risks and shall promptly notify the CLIENT of any issues that may affect safety, data quality, or programme. The CONTRACTOR shall operate a quality management system aligned with EN ISO 9001:2015 or equivalent. Project quality arrangements shall be described in the Project Quality Plan (PQP) or equivalent quality documentation.

CONTRACTOR shall ensure that all required project documentation has been reviewed and approved by CLIENT prior to mobilisation of offshore survey activities. Key dates for delivery of all project plans are defined in Annex [4].

2.2.3 *Unexploded Ordnance (UXO) Risk Assessment and Mitigation Measures*

The CONTRACTOR shall be responsible for undertaking an Unexploded Ordnance (UXO) risk assessment for the proposed sampling locations. The UXO risk assessment and any associated mitigation measures shall be undertaken, as a minimum, in accordance with the most recent applicable Certificatie Opsporen Ontploffbare Oorlogsresten (CS-OOO) legislation and relevant Dutch regulatory requirements.

The CLIENT will make available existing geophysical data for the IA, including MAG data, which may be used by the CONTRACTOR to inform the UXO risk assessment and to support avoidance-based mitigation measures. The CONTRACTOR shall assess whether the available data are sufficient for the proposed survey activities.

Where, in the opinion of the CONTRACTOR, the available data are insufficient to reduce UXO risk to as low as reasonably practicable (ALARP), the CONTRACTOR shall identify any additional data acquisition and/or mitigation measures required. Any such additional measures shall be clearly described and separately priced in Annex [4] of the Invitation to Tender.

The UXO risk assessment and the proposed mitigation measures shall be submitted to the CLIENT for review and approval no later than 28 days prior to mobilisation. The proposed approach to UXO risk assessment and mitigation shall be described in the PEP.

Prior to undertaking the UXO risk assessment, the CONTRACTOR shall review all available project documentation and data provided by the CLIENT.

2.3 **Mobilisation**

Mobilisation considers the deployment of the survey vessel to the IA, complete with all necessary survey equipment and personnel. The CONTRACTOR shall include sufficient consumables, and equipment spares in the mobilisation plan to allow for any foreseeable events. Costs for the consumables and spares shall be included in the mobilisation rate in Annex [4]. The CONTRACTOR shall indicate the proposed port of mobilisation and demobilisation.

The port to be used for mobilisation of survey vessel, equipment and personnel shall be approved by the CLIENT.

Mobilisation commences with the installation of equipment and continues through the performance of harbour and offshore trials (e.g. positioning and navigational equipment), and finishes with the completion of equipment calibrations, transit to site and positioning on the first investigation location.

A detailed mobilisation checklist shall be presented in the PEP and shall be approved by the CLIENT prior to departure to the site.

Mobilisation shall be considered complete when:

- All trials and calibrations have been completed to the satisfaction of the Offshore Client Representative (OCR) and the CONTRACTOR, and confirmation of completion has been incorporated into the Mobilisation Report;
- The survey vessel is at the first investigation location and ready to deploy the survey equipment to perform the WORK;
- A draft Mobilisation report has been issued to the CLIENT.

WAITING ON WEATHER can only be recorded once the mobilisation has been completed, as described above.

The CONTRACTOR shall provide a Mobilisation Report, which must document as a minimum:

- Survey equipment mobilised on board and any deviations from the CONTRACTOR's standard procedures;
- Equipment trials and calibrations undertaken;
- Relevant equipment calibration certificates, where applicable;
- Vessel Safety Audit not older than 6 months before start of Mobilisation;
- Persons On Board (POB) list; and
- Any non-critical defects identified during mobilisation.

2.4 Positioning

The CONTRACTOR shall ensure that the positions of all sampling and survey activities are accurately determined and recorded using appropriate positioning systems suitable for the proposed survey methods.

Positioning data will be used alongside existing geophysical datasets to support the interpretation and mapping of the different benthic habitats present within the IA. The CONTRACTOR shall describe the proposed positioning approach, expected positional accuracy, and quality control (QC) procedures in the PEP.

For video surveys, positioning data shall be recorded continuously throughout each video transect. In addition, the start and end positions of each transect and the position of any still images captured shall be recorded separately.

For sediment and water sampling, the position at which each sample is taken shall be recorded. Water depth at each sampling location shall also be recorded using vessel-mounted instrumentation (e.g. echo sounder or equivalent).

Where repositioning of sampling equipment is required due to obstructions or seabed conditions, the revised location shall be selected to ensure the survey objectives are met (e.g. representative habitat or feature type) and shall be discussed and agreed with the OCR.

2.4.1 *Coordinate Reference System and Datum*

International System of Units (SI) (ISO/IEC8000) are applicable to this Scope of Work.

All positioning data shall be collected in the European Terrestrial Reference System 1989 (ETRS89) and projected using ETRS89 Transverse Mercator Coordinate Reference System (Universal Transverse Mercator (UTM) Zone 31N). The reference for this system is EPSG Projection code 25831 - ETRS89 / UTM zone 31N. The Epoch to consider will be provided by CLIENT.

The vertical datum for the survey is Lowest Astronomical Tide (LAT) using the NL LAT 2018 reference surface as described on the website <https://www.defensie.nl/downloads/applicaties/2020/06/12/nllat2018>.

2.5 Survey Execution

2.5.1 *Sampling Design and Distribution*

40 seabed sampling locations shall be investigated within the WFZ. On 15 of these locations shall be surveyed using drop-down video or ROV prior to undertaking grab or box core sampling.

Sediment samples for chemical contaminant analysis shall be collected at 20 of the 40 sample locations. Water samples for eDNA shall be collected at all 40 seabed sampling locations.

All these locations shall be selected by the CONTRACTING AUTHORITY to ensure representative spatial coverage and reflect the range of habitats and sediment types present. Selection shall be informed by MBES/SSS-derived sediment patterns and habitat variability, supporting robust interpretation of species presence across the IA.

The proposed list of sample locations, including the proposed subset of locations for chemical contaminants and eDNA sampling, will be provided by the CONTRACTING AUTHORITY at the start of the CONTRACT.

2.5.2 *Visual Seabed Survey*

A visual seabed survey shall be undertaken prior to sediment sampling to support habitat mapping and verification, identification of seabed features and benthic species, and confirmation of suitable sampling locations. The visual survey shall provide imagery suitable for classification of benthic habitats and identification of flora and fauna to the lowest practicable taxonomic level from video and still imagery, particularly where sediment sampling may not be feasible. The visual survey shall be carried out using a drop-down video system or ROV, as proposed by the CONTRACTOR.

The visual survey methodology shall be consistent with recognised Dutch marine survey practice and shall take into account approaches commonly applied in monitoring programmes commissioned by Rijkswaterstaat (RWS). The proposed visual survey methodology shall be described in the tender submission. Detailed operational procedures may be refined in the PEP following contract award.

The visual survey shall be designed to:

- Verify seabed characteristics at sampling stations,
- Support interpretation of geophysical data,
- Identify sensitive habitats or features of interest,
- Identify potential obstructions or hazards prior to sampling.

The proposed visual system shall, as a minimum:

- Record high-definition colour video footage with a minimum resolution of 1080p;
- Include sufficient lighting to ensure consistent seabed visibility under expected turbidity conditions;
- Be operated at an altitude of no more than 1m above the seabed where feasible, or as close as possible while maintaining a clear and stable field of

view sufficient to support habitat classification and identification of fauna and flora;

- Include a scaling reference (e.g. paired lasers or equivalent) to support size estimation;
- Allow capture of still images where features of interest are observed.

The CONTRACTOR shall describe how image quality will be maintained under varying seabed and environmental conditions, including turbidity and current strength.

Visual inspection shall be undertaken at 15 sampling stations prior to deployment of other sampling equipment unless otherwise agreed with the OCR. Additional video transects may be undertaken where required to clarify habitat boundaries or investigate features identified in the geophysical data.

The length of video transects shall be sufficient to characterise seabed conditions at each location. Shorter transects may be appropriate in areas where geophysical data and the TNO reef detection study indicate homogeneous and featureless seabed conditions.

The CONTRACTOR shall ensure that:

- Footage and still images are of sufficient quality to allow habitat classification and identification of benthic flora and fauna to the lowest practicable taxonomic level;
- Observations of notable seabed features, fauna, anthropogenic debris or obstructions are logged in real time where practicable;
- Video and still images are clearly linked to positioning data.

Where visual observations indicate that the planned sampling location is unsuitable due to seabed conditions, obstructions, environmental sensitivity, or safety concerns, this shall be discussed with the OCR prior to any relocation.

2.5.3 *Sediment Sampling*

Sediment sampling shall be undertaken to support analysis of macrobenthic communities, PSD, and chemical contaminants. Sampling shall be carried out using equipment suitable for the seabed conditions encountered, such as a grab sampler or box corer, as proposed by the CONTRACTOR.

The selected sampling method shall aim to recover sediment samples with an undisturbed surface layer and sufficient volume to meet the analytical requirements for all planned laboratory analyses. The CONTRACTOR shall define the required sample volume and sample acceptance criteria in accordance with best practice and the proposed sampling equipment. These criteria shall ensure that samples are suitable for biological, physical, and chemical analysis.

Sampling methods shall be consistent with recognised Dutch marine benthic sampling practices (RWS-V where applicable) and shall aim to:

- Minimise disturbance to sediment structure;
- Prevent washout or loss of fine material;
- Ensure representative sampling of the target habitat;

At each sampling station, visual inspection results (drop-video or ROV) shall be reviewed prior to deployment to confirm suitability of the seabed for sampling.

The CONTRACTOR shall record, for each sample:

- Sampler used;

- Penetration depth;
- Qualitative assessment of sample condition;
- Any deviations from expected sediment characteristics;
- Photographic records of the sample surface.

Samples shall be handled, stored, and transported in accordance with recognised best practice and the requirements of the selected laboratories to ensure adequate preservation and suitability for the intended analyses.

Where sampling is unsuccessful or sample quality is deemed unacceptable, re-sampling shall be undertaken in accordance with Section 2.5.5.

Sampling methods shall be consistent with recognised Dutch marine benthic sampling practice (including relevant RWS protocols where applicable).

Available geophysical and environmental data for previously investigated WFZs can be accessed via offshorewind.rvo.nl and may be used by the CONTRACTOR to inform survey planning and selection of appropriate sampling methods.

The CONTRACTOR shall decide if multiple sample deployments are required to obtain a suitable amount of sediment for each of the required analysis (faunal, PSD and contaminants). This shall be included in the PEP and agreed with the CLIENT at least 35 days before mobilisation. Best efforts will be made to ensure that, as a minimum, macrofauna and PSD samples are taken from the same deployment, to ensure consistency between the fauna identified and the associated sediment composition.

Sediment Sampling for PSD

Sediment samples for PSD analysis shall be collected at all sediment sampling stations. PSD sampling shall support interpretation of benthic communities, habitat classification, and sediment characterisation.

Subsampling for PSD analysis, including container types, preservation and storage conditions shall be defined by the CONTRACTOR in consultation with the selected laboratory to ensure sufficient material is collected and that the sample handling approach is compatible with the proposed analytical methods. The proposed PSD sampling and handling procedures shall align with recognised best practice for marine benthic surveys.

Sediment Sampling for Macrofauna

Sediment samples for macrobenthic analysis shall be collected at all sediment sampling stations. Sampling shall support quantitative assessment of benthic community composition, abundance, and diversity.

Macrobenthic subsampling, preservation and storage methods shall be defined by the CONTRACTOR in consultation with the selected laboratory. Procedures shall ensure that samples are suitable for taxonomic identification and quantitative analysis

Methods shall align with recognised best practice for marine benthic surveys, including appropriate sieve sizes, fixatives, labelling and sample handling requirements.

Sediment Sampling for Chemical Contaminants

Sediment samples shall be collected for chemical contaminant analysis at 20 of the 40 sampling stations, as defined in the Sampling Design and Distribution (Section 2.5.1). The sampling locations shall be defined by the CONTRACTING AUTHORITY.

The analytical suite shall be suitable for marine sediment baseline characterisation and shall align with recognised best practice for sediment quality monitoring in Dutch marine waters and the wider North Sea region.

As a minimum, the following analytes shall be included:

- Arsenic (As)
- Cadmium (Cd)
- Chromium (Cr)
- Copper (Cu)
- Mercury (Hg)
- Nickel (Ni)
- Lead (Pb)
- Zinc (Zn)
- Polycyclic Aromatic Hydrocarbons (PAHs) (standard laboratory suite)
- Total Organic Carbon (TOC)

The CONTRACTOR shall propose a detailed analyte list in consultation with the selected laboratory, taking into account sediment characteristics and best practice for offshore baseline surveys. The inclusion of additional parameters such as Polychlorinated Biphenyls (PCBs), organotin compounds (including Tributyltin (TBT)), or other relevant organic contaminants may be proposed where justified. Any proposed deviations or additions shall be clearly described and agreed with the CLIENT as part of the PEP, which is to be supplied at least 28 days prior to mobilisation.

All analyses shall be undertaken using recognised and validated laboratory methods appropriate for marine sediments. Laboratories shall operate under QA systems consistent with ISO 17025:2015 accreditation. Detection limits shall be suitable for environmental baseline assessment and consistent with recognised international best practice.

Analytical approaches shall align with monitoring principles applied by RWS and regional frameworks such as OSPAR (Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic).

2.5.4 *Water Sampling for eDNA Analysis*

Water sampling for eDNA analysis shall be undertaken to support detection of species presence within the IA and to complement visual and benthic sampling data.

The eDNA analysis shall be designed to support detection of vertebrate species, such as fish, marine mammals, and turtles.

The CONTRACTOR shall propose an appropriate methodology based on recognised international best practice. The proposed approach shall be suitable for offshore marine conditions and shall be described in detail.

The proposed eDNA sampling methodology shall include:

- Sampling equipment and materials;
- Sample volumes to be collected;
- Measures to minimise contamination during collection, handling, and processing;
- Filtration methods where applicable;

- Preservation and storage procedures;
- Transport arrangements to the selected laboratory;
- QA and QC measures, including field blanks and controls.

The CONTRACTOR shall ensure that the proposed sampling approach is agreed with the selected laboratory prior to mobilisation to ensure compatibility with analytical requirements. This shall be included as part of the PEP, which is to be supplied at least 35 days prior to mobilisation.

Strict contamination control procedures shall be followed throughout sampling, handling, and storage. The CONTRACTOR shall describe procedures for equipment cleaning, use of sterile materials, and prevention of cross-contamination.

All samples shall be clearly labelled and recorded, with full traceability maintained from collection through to laboratory delivery.

2.5.5 *Re-sampling on Location*

The CONTRACTOR shall define clear sample acceptance criteria for sediment and water samples, based on the proposed sampling equipment, intended laboratory analyses, and selected laboratories. These criteria shall be described in the PEP.

Where a retrieved sample does not meet the defined acceptance criteria, the CONTRACTOR shall re-deploy the sampling equipment at the same location at no additional cost to the CLIENT. In line with RWS sampling practice, a maximum of three sampling attempts in total shall be made at a given station, unless otherwise agreed with the OCR.

Where acceptable samples cannot be obtained after three attempts, the CONTRACTOR may propose relocation of the sampling position, subject to agreement with the OCR. Prior to any relocation, available geophysical data shall be reviewed to ensure that the revised location remains appropriate to the survey objectives and does not introduce additional safety or environmental risks. Relocation shall be considered on a station-by-station basis.

All re-sampling attempts and relocations shall be documented and reported.

2.5.6 *Lost Equipment*

The CONTRACTOR shall be responsible, at their own cost, for marking the location and recovery of equipment dropped or lost during execution of the project, in accordance with the obtained permit by the CONTRACTOR. The CONTRACTOR shall mark the positions of equipment on or below the seabed with marker buoys where necessary and recover the equipment at the earliest practicable opportunity.

2.5.7 *Sample Handling, Preservation, and Chain of Custody*

All samples collected during the survey shall be handled, stored, and transported in a manner that preserves sample integrity and prevents contamination, degradation, or loss of material prior to laboratory analysis.

The CONTRACTOR shall establish and implement documented procedures for sample handling and preservation, taking into account the requirements of the selected laboratory and recognised best practice for marine environmental sampling.

Procedures shall include, as a minimum:

- Use of appropriate, clean, and clearly labelled sample containers;
- Prevention of cross-contamination between samples;

- Appropriate preservation methods depending on sample type and intended analysis;
- Storage under suitable environmental conditions (e.g. temperature control) prior to laboratory delivery;
- Secure packaging and transport arrangements to maintain sample integrity.

All samples shall be uniquely identified using a consistent labelling system that ensures full traceability from collection through transport and laboratory receipt.

A chain of custody record shall be maintained for all samples, documenting:

- Sample identification;
- Date, time, and location of collection;
- Personnel responsible for collection and handling;
- Storage conditions;
- Transfer of custody to laboratory personnel.

Any deviations from planned handling or preservation procedures shall be documented and reported.

2.5.8 *Demobilisation*

Upon completion of the survey, all CONTRACTORS personnel shall be demobilised from the vessel(s) in accordance with the CONTRACT. CONTRACTOR is responsible for the removal of all equipment, instrumentation and materials from the IA following CLIENT approval of survey completion.

Demobilisation is achieved when all survey operations have been completed to CLIENT satisfaction and after approval by means of a sign-off by the OCR.

2.6 **Onshore Laboratory Analysis**

Laboratory analysis shall be undertaken by suitably qualified laboratories with demonstrated experience in marine environmental sample processing. Laboratories shall operate under QA systems consistent with ISO/IEC 17025 accreditation for relevant analytical methods.

Any subcontracted laboratory work shall require approval by the CLIENT as part of the PEP. Laboratories shall provide documentation of analytical procedures, QA/QC protocols, and detection limits. All test data shall be delivered in digital formats suitable for further analysis and integration.

Laboratory analysis shall include, as applicable:

2.6.1 *Macrofauna*

- Sample sieving, sorting, identification, and enumeration;
- Identification to the lowest practical taxonomic level;
- Biomass determination where appropriate.

2.6.2 *Particle Size Analysis*

- Sieve and laser or pipette methods suitable for marine sediments;
- Reporting consistent with recognised sediment classification standards.

2.6.3 *Chemical Contaminants*

- Analysis of metals, PAHs, and supporting parameters (e.g. TOC);
- Analytical detection limits appropriate for environmental baseline assessment.

2.6.4 eDNA

- Filtration, extraction, amplification, and sequencing methods suitable for marine biodiversity assessment;
- Appropriate contamination controls.

2.7 Data Processing and Reporting

The CONTRACTOR shall process all survey and laboratory data and present results in clear, structured reports supported by appropriate spatial and statistical outputs. Reporting shall ensure transparency, traceability, and suitability for future use in environmental assessment and planning.

All reports shall be written in English and submitted in digital format.

Document control requirements, including file naming conventions and version control, shall be applied consistently throughout the project.

2.7.1 Daily Progress Reporting (DPR)

During offshore operations, the CONTRACTOR shall provide DPRs for each active survey day.

Daily reports shall include, as a minimum:

- Summary of survey activities completed;
- Stations visited and sampling undertaken;
- Weather and sea conditions;
- Equipment performance and any technical issues;
- Preliminary observations where relevant;
- Planned activities for the following survey day.

Daily reports shall be submitted to the CLIENT within 24 hours of the reporting period. The formatting of the daily progress report is specified in Annex [5] Section VI of this Contract.

2.7.2 Benthic Survey Field Report

Following completion of offshore survey activities, the CONTRACTOR shall prepare a Field Report summarising offshore operations and preliminary findings.

The Field Report shall include:

- Description of survey execution;
- Final list of completed sampling stations;
- Deviations from the planned survey design and justification;
- Preliminary observations;
- Summary of sediment sampling outcomes;
- Preliminary Geographic Information System (GIS) outputs showing station locations;
- Summary of any operational challenges encountered.

The Field Report shall be delivered within 6 weeks of demobilisation.

2.7.3 Environmental Baseline Report

The CONTRACTOR shall prepare a comprehensive Environmental Baseline Report presenting the results of field surveys and laboratory analyses.

The report shall include, as a minimum:

- Description of survey objectives and methods;
- QA and data validation procedures;
- Habitat classification and benthic habitat mapping outputs;
- Species lists, abundance, and diversity analyses;
- PSD results;
- Chemical contaminant analysis results;
- eDNA findings and interpretation;
- Statistical analyses, including as a minimum:
 - Multivariate analysis of PSD data: cluster analysis and Multidimensional Scaling (MDS) with Similarity Profile (SIMPROF)
 - Macrofauna univariate metrics: species richness, abundance and diversity indices
 - Macrofauna multivariate analyses: similarity matrices, nMDS ordination, cluster analyses;
 - Similarity Percentages (SIMPER) analysis or equivalent
 - Assessment of relationships between biological communities and environmental variables
- Integrated interpretation of survey findings;
- Identification of notable or sensitive habitats and species, including any invasive non-native species;
- Assessment of potential reef features and evaluation of their ecological relevance, where applicable;
- Habitat map and GIS deliverables integrating MBES/SSS interpretation with ground-truthing from video imagery, macrofauna, and PSD results.
- Provision of GIS layers (e.g., point and polygon feature classes and associated metadata) to support reuse.

The CONTRACTOR shall provide a draft version of the Environmental Baseline Report containing sufficient detail to allow comprehensive review by the CLIENT. The draft report shall be updated following receipt of CLIENT comments and submitted as a final version upon approval. Final deliverables shall be provided in electronic format in accordance with agreed project milestones.

Draft and final report delivery shall follow the schedule outlined in **Annex [4]** or as otherwise agreed with the CLIENT.

2.8 Other Requirements

2.8.1 Pre-Mobilisation Documents

CONTRACTOR shall deliver all pre-mobilisation documentation, reports and assessments in accordance with CLIENT requirements (Section 2.3) a minimum of 28 calendar days prior to mobilisation. These shall include but not be limited to:

- Common Marine Inspection Document (CMID) Vessel audit;
- Documentation of vessel station-keeping capability appropriate to the proposed survey methods;
- Positioning acceptance report comprising position check against proposed sampling locations (see Section 2.4.1);
- Calibration certificates for positioning systems used, where applicable
- PEP, including Method Statements, Risk Assessments and quality management procedures;
- HSE Plan, as described in Annex 5 Section V;
- ERP;
- The CONTRACTOR shall ensure sufficient communication capability to meet DPR requirements.

- Location clearance or risk assessment report for proposed sampling stations, including UXO considerations where applicable.

Following completion of mobilisation, the CONTRACTOR shall provide a brief Mobilisation Report confirming equipment readiness, calibration status, and any deviations from the approved PEP.

2.8.2 *Progress meetings*

Meetings are expected to be scheduled on a bi-weekly (once every 2 weeks) basis for the duration of the contract, depending on project needs.

The CONTRACTOR may be requested to provide brief written progress updates in advance of meetings, summarising progress of the WORK, upcoming activities, identified risks, and any anticipated deviations from scope or schedule.

2.8.3 *Workshops/Meetings*

The CONTRACTOR shall be required to attend meetings and workshops at various stages throughout the contract period. These meetings may be used to discuss survey progress, preliminary findings, interpretation of results, alignment with related studies, or to address issues arising during execution of the WORK.

Meetings may include, separately or combined as appropriate:

- In person Project Kick-off Meeting and close-out meeting;
- Biweekly progress meetings;
- In person vessel kick-off meeting(s) organised by the CONTRACTOR, agreed with the CLIENT;
- HIRA/HAZID meeting prior to mobilisation;
- Daily vessel stand-ups;
- Technical meetings to review survey findings and interpretation;
- Meetings related to QA of data processing and reporting;
- Any other meetings as specified in the CONTRACT or requested by the CLIENT.

The CLIENT reserves the right to request additional meetings when deemed necessary during execution of the WORK. The CONTRACTOR shall make relevant representatives available for such meetings.

Progress reporting requirements are described in Annex [5] Section VI, Quality requirements & Administrative Instructions.

2.8.4 *Roles and Responsibilities*

The CONTRACTOR shall be responsible for the planning, execution, and reporting of the WORK as described in this document. The CLIENT shall review and approve deliverables in accordance with the requirements of this CONTRACT.

The CONTRACTOR shall cooperate with the CLIENT and other relevant stakeholders, where required, to support effective execution of the WORK.

2.8.5 *Project and Site Description*

The Contractor shall provide a 2 to maximum 5-page summary including the aims, objectives and approach and the main results to be published in the Project and Site Description. An example is provided here: https://offshorewind.rvo.nl/file/download/ecc2486b-f8a7-40a2-a8a5-d26f480342c3/nwi-a_20250715_psd_v8_wcag.pdf. The summary for the Project and Site Description shall be provided as Word file.

2.9 Answering Additional Questions and Memorandum of Change (MOC)

It is anticipated that additional questions (from market or CLIENT) regarding the benthic survey will be received after delivery of the study results. The CONTRACTOR is requested to support the CLIENT in answering these questions.

Where adjustments to procedures or scope are proposed by either the CLIENT or the CONTRACTOR, these may be agreed through a Memorandum of Change (MOC).

Any time or financial implications arising from agreed changes shall be managed through a Variation Order.

2.10 Offshore Client Representation

The CLIENT may assign OCRs to observe offshore survey activities.

The CONTRACTOR shall provide appropriate safety inductions and reasonable cooperation to enable OCR participation, where applicable.

The CONTRACTOR shall communicate anticipated sailing schedules to the CLIENT at least one to two weeks in advance where possible to support OCR planning.

Where OCRs are present on board, the CONTRACTOR shall provide suitable workspace and access to communication systems, where reasonably practicable.

2.11 Risk Mitigation for COVID 19 and Other Diseases

CONTRACTOR shall propose suitable measures against transmittable diseases (e.g., COVID-19) that may negatively impact the execution of the investigations, subsequent office work and laboratory testing as part of the required HSE management documentation.

3 Key Milestone

The DDW benthic Investigation project is a time driven project due to the planned permit tender for the OWF in Q 2028. The key milestone "4m: Key Milestone: Acceptance of Final Version Environmental baseline report" as per Annex 4 is set for no later than 15 December 2027.