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Status Final

## **Site Studies Wind Farm Zone IJmuiden Ver**

### **Expert support soil**

### **Annex 5a**

### **Scope of Work**

## Colophon

|                 |                                                     |
|-----------------|-----------------------------------------------------|
| Project name    | Expert support Ijmuiden Ver Wind Farm Zone (IJVWFZ) |
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## Introduction

### Scope document

This document details the Scope of Work for soil expert support services for IJmuiden Ver Wind Farm Zone (IJVWFZ).

### Background

The Ministry of Economic Affairs is responsible for the legislative framework for the development of offshore wind farms in the Netherlands. Within this framework (a) (concession) tender(s) for subsidy for construction and operation of (a) wind farm(s) will be organized. As part of the tender documentation, the participants will receive an information package in which detailed information on the offshore site is included. Detailed information about soil and wind & water conditions at the site will be part of this information package.

The Contracting Authority for this assignment is the Netherlands Enterprise Agency (Rijksdienst voor Ondernemend Nederland (RVO)), sometimes also referred to as CLIENT

### Objective

RVO has been requested to prepare and collect all site data required for commercial developers to prepare a competitive bid. In order to achieve the highest results from the site investigations, RVO intends to contract high quality experts who can support RVO in managing the site investigations. The objective of this tender is to conclude an agreement with Contractors who can support RVO on the different site investigations regarding contracting, quality control and operational support.

RVO is looking for an expert support Contractor who can support RVO with managing the site investigations (some for IJVWFS I-IV, mainly for IJVWFS V-VI) and the interfaces between the site investigations. RVO is specifically looking for expertise in the field of soil investigations (Lot 1) and wind & water investigations (Lot 2).

This scope of work is part of Lot 1: expert support services for soil investigations.

### Site Description

The IJVWFZ is located 80 kilometres off the west coast of the Netherlands. The IJVWFZ consists of six Wind Farm Sites (see Figure 1). IJVWFS I-IV are currently being developed by RVO by means of site investigations. IJVWFS V and VI will now be developed as well. The soil investigations comprise the IJVWFS Sites I-VI for the morphodynamical assessment and IJVWFS V-VI for the geophysical and geotechnical investigations and the ground model.

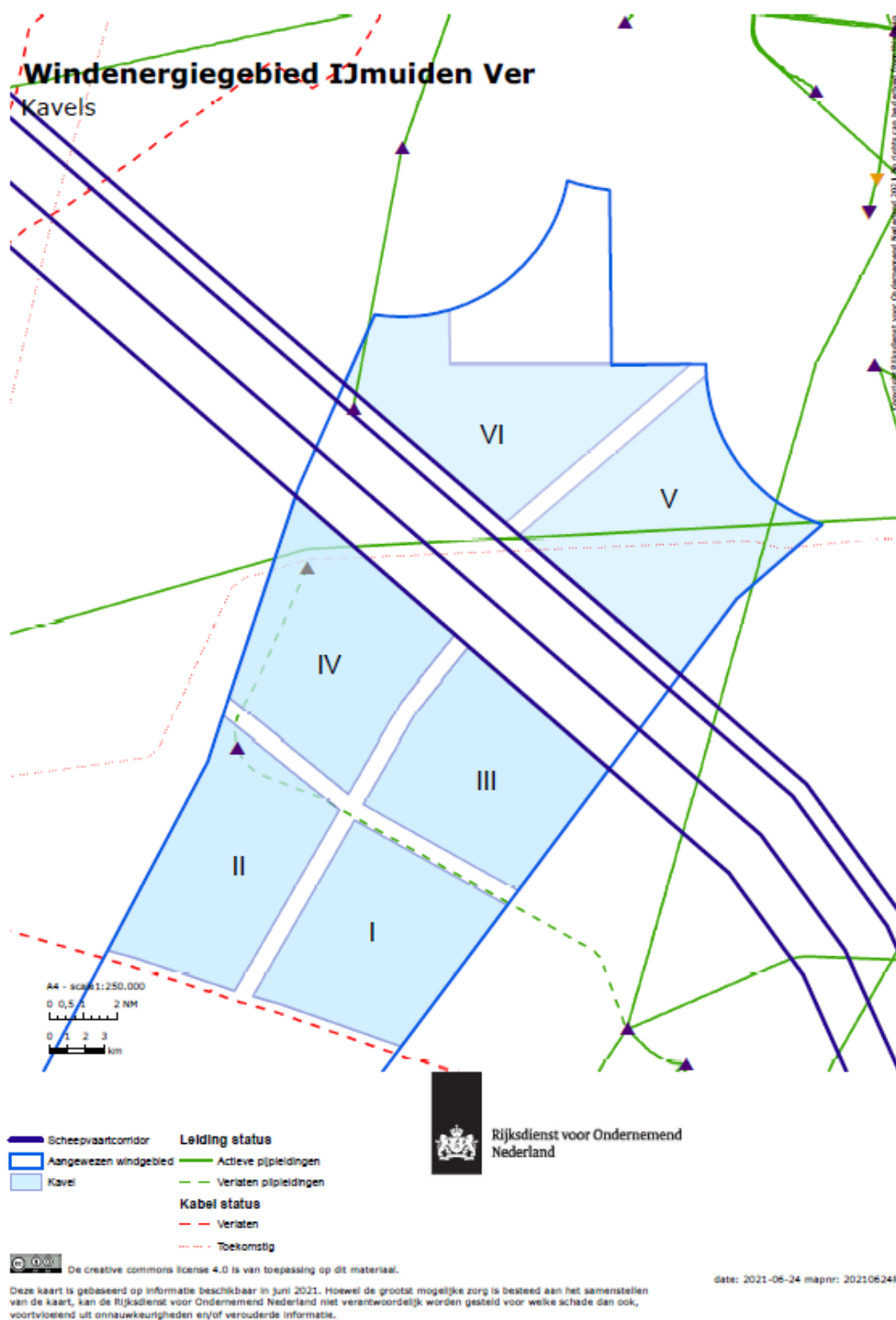


Figure 1: Wind Farm Sites within the IJmuiden Ver Wind Farm Zone

## Scope of Work

The Contracting Authority intends to conclude the contract with one Contractor, in order to manage the interfaces regarding the studies below adequately.

For expert support during the soil investigations for the IJWVFZ, the following expertise is requested for the following tasks:

1. Geophysical survey (WFS V-VI)
2. Geotechnical survey (WFS V-VI)
3. Ground model (WFS V-VI)
4. Morphodynamical assessment (WFS I-VI)
5. Project management support
6. Document Control

The scope of work is divided in 3 sections;

1. Project set-up
2. Roles and responsibilities
3. Schedule and key dates

### 1. Project set-up

The IJmuiden Ver Soil package for Site V and VI will contain the site characterization studies as indicated in Figure 2.

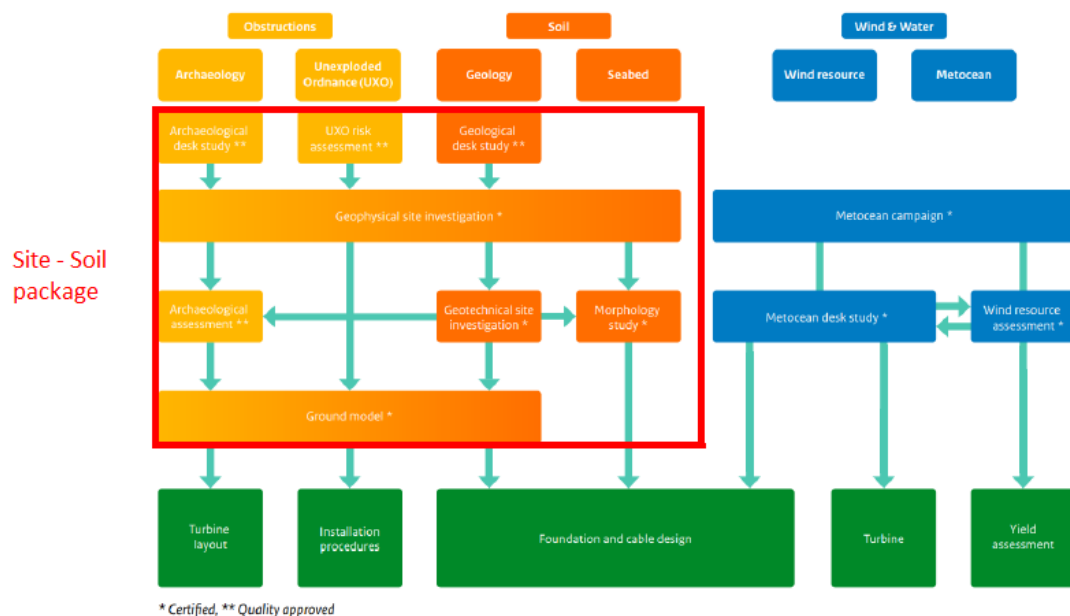


Figure 2: Soil site characterization package

With regards to the package as presented in Figure 2 it should be noted that the Geological desk study is already performed.

RVO will manage the soil site characterisations for IJWVFZ, hereafter called PROJECT.

Expert support will be required to assist the RVO team with in-depth knowledge during:

- 1) Outline of the procurement documents for site study Contractors to execute the studies
- 2) Review process of Contractor bids
- 3) Developments during execution of studies
- 4) Quality and completeness review of Contractor documents

## 5) Operational support during execution of field works

To visualize the PROJECT team set up an organization chart is presented in Figure 3.

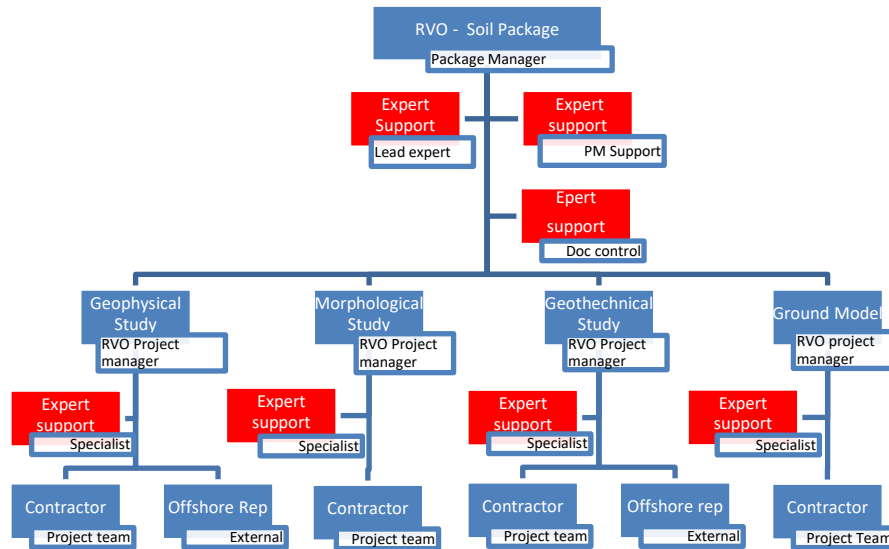


Figure 3: Organization chart IJmuiden Ver site V-VI

Items marked in red present the areas where in-depth knowledge support by external experts is requested by means of this SOW. The input to the Geological desk study is excluded, as this study has already been performed but the outcomes should be taken into consideration into the interfaced studies.

The PROJECT organization will be built under supervision of a package manager from RVO. The package manager will be responsible for the interfaces between studies, overall planning and overall budget.

In addition to the package manager from RVO there will be multiple RVO project managers assigned to the PROJECT to manage the individual studies. A single RVO project manager can be assigned to multiple studies and can change during the duration of the PROJECT.

From the expert support contractor it is expected to supply lead expert(s) and specialists. The lead expert will need overall knowledge to participate into the different studies and to advise the RVO package manager where necessary. The main task of the lead expert will consist of interfacing between the studies. For in-depth discussions, reviews and support throughout the PROJECT the lead expert (and the RVO project managers) can call in the specialist experts. For detailed roles and responsibilities of the requested expert support reference is made to section 2 of this SOW.

The aim of the project set up as described is to optimize the interfaces and optimize the use of the specialist knowledge.

During the execution of the PROJECT all the communication between the different parties as described above and the site study Contractors will be managed by the RVO project manager. The communication lines are visualized in Figure 4.

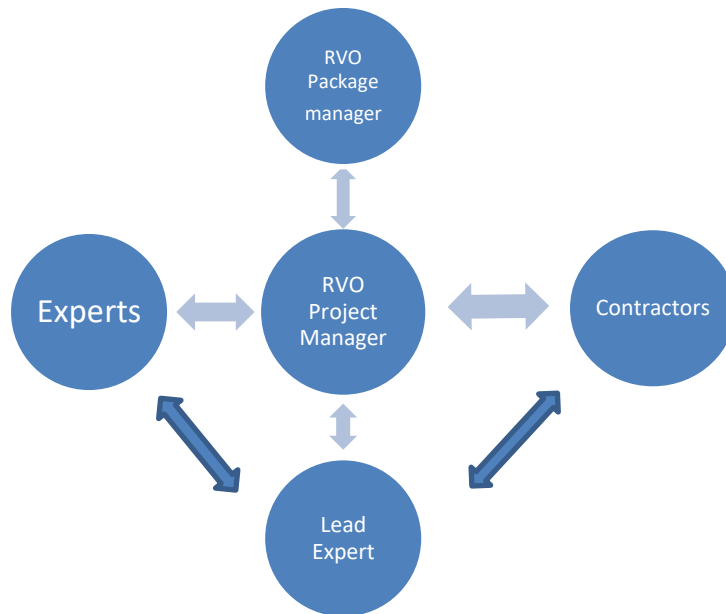


Figure 4: Communication lines

Note: If required during the PROJECT direct communication lines can be established between the Experts and site study Contractors upon discretion of the RVO project manager(s).

## 2. Roles and Responsibilities

This section describes the roles and responsibilities for the expert support during the PROJECT.

### Lead Expert (approximately 2000 h)

This expert must have Geophysical, Geotechnical and Morphological knowledge. The lead expert will be the interface during progress meetings with RVO and the site study Contractors. The lead expert shall be capable to participate during the calls as representative of all specialist experts. The lead expert should be able to answer questions related to the studies or be able to capture the essence and transfer them to the experts to arrange follow up.

To improve interfaces and consistency it is important that a single lead expert will supervise and participate in all studies together with the RVO project managers.

If required a deputy (temporary) lead expert can be assigned to support the lead expert during absence or when workload requires.

Required know-how: the lead expert will need to have general knowledge regarding geotechnics, geophysics, morphology and ground models of the North Sea. For detailed in-depth knowledge the lead expert can consult the specialist experts in the team, but the lead expert will need the following required know-how:

- a. Project management and interface skills;

- b. The general site conditions, especially the shallow geology till 100 metres BSF, in the North Sea;
- c. Interpretation of geophysical results for post processing into the ground model, morphological study, archaeological study and geotechnical site investigation;
- d. Interpretation of geotechnical results for wind turbine foundation and infield cable design purposes;
- e. State-of-the-art methods and equipment for the geophysical surveys (e.g. hydrographical and geophysical methods);
- f. State-of-the-art lab tests (standard and cyclic; MIC).

Activities and responsibilities (but not limited to)

- Participate in meetings related to the geophysical study, geotechnical study, morphological study, ground model and vessel calls during project execution;
- During the meetings it is expected that the lead expert can represent the expert group and participate in discussions;
- Manage interfaces between studies, experts and RVO;
- The lead expert will have to share information between the teams so that all experts have all the required information. When questions arise the lead expert will arrange follow up with the correct party;
- Quality assurance and quality control;
- Participate in webinars;
- Drafting the scope of work for contractors to execute the studies;
- Assessing the contractor's bids.

Expert support contractors are requested to offer **one** senior expert for the lead expert position. Additional experts offered will be assessed as back-up experts.

### Geophysical Specialist Expert(s) (approximately 1,000 h)

These expert(s) must be geophysicist(s) with experience in geophysical soil investigations and operations for wind farm / foundation / infield cable design for projects in the North Sea. Experience in other geographical areas with similar conditions to the North Sea is also considered relevant.

Required know-how (the experts together must cover the required know-how)

- a. The general site conditions, especially the shallow geology till 100 metres BSF, in the North Sea;
- b. Relevant state of the art research, data acquisition and analysis methodologies of geophysical campaigns for wind farm / foundation / infield cable design projects;
- c. State of the art equipment (vessels, hydrographical and geophysical (in particular seismic survey equipment)).

Activities (but not limited to):

- Preparation of the procurement documents for geophysical survey tender;
- Review and evaluate proposals of the geophysical survey tender;
- Support in managing the geophysical survey: check the planning, assist in document control (including check on required actions from progress meetings);
- Onshore QC of data samples during project execution in co-operation with the on-board Client Representative;
- Review of deliverables (for example reports, hydrographical data, geophysical data);
- Support in transferring results of the geophysical survey to the geotechnical survey and the ground model;
- Support in disclosing deliverables (check of content offshorewind.rvo.nl and HDD (Hard Disk Drive), webinars, PSD (Project Site Descriptions), etc.).

Expert contractors are requested to offer **two** available experts. One of them should be a senior expert and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

### Geotechnical Specialist Expert(s) (approximately 2000 h)

These experts must have geotechnical engineering skills with experience in operations for wind farm / foundation / infield cable design for projects in the North Sea. Experience in other geographical areas with similar conditions to the North Sea is also considered relevant.

Required know-how (the experts together must cover the required know-how)

- a. The general site conditions, especially the shallow geology till 100 metres BSF, in the North Sea;
- b. State-of-the-art methods and equipment for the in situ tests (e.g. PCPTs, SCPTs, sampling with bore holes and vibro cores, seismic tests, MIC testing);
- c. State-of-the-art lab tests (standard and cyclic, MIC);
- d. Interpretation of results for wind turbine foundation and infield cable design purposes;
- e. State-of-the-art design methods for wind turbine foundations;
- f. Reviewing ground models.

Activities (but not limited to):

- Drafting Scope of Work for the geotechnical campaign tender;
- Review and evaluate proposals (e.g. project documentation, suitability vessels and equipment, equipment set up, project execution plan, line plan), in some cases providing a second opinion;
- Contribute to defining a CPT and borehole plan;
- Contribute in defining a lab testing programme (standard and cyclic);
- Onshore QC of results during project execution in co-operation with the on-board Client REP;
- Review of deliverables (for example reports and geotechnical data);
- Support in disclosing deliverables (check of content offshorewind.rvo.nl and HDD, webinars, PSD, etc.).

Expert contractors are requested to offer **two** available experts. One of them should be a senior expert and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

### Ground model Specialist Expert(s) (approximately 2000 h)

These experts must have ground model engineering skills with experience for wind farm / foundation / infield cable design for projects in the North Sea. Experience in other geographical areas with similar conditions to the North Sea is also considered relevant.

Required knowhow

- a. The general site conditions, especially the shallow geology till 100 metres BSF, in the North Sea;
- b. Interpretation of geotechnical and geophysical results for wind turbine foundation and infield cable design purposes;
- c. State-of-the-art design methods for wind turbine foundations;
- d. Compiling or reviewing ground models;
- e. Working with Kingdom© software or other ground model software (software must be available, will not be supplied by CLIENT).

Activities (but not limited to):

- Drafting procurement documents for the ground model tender;

- Review and evaluate proposals (e.g. project documentation, suitability vessels and equipment, equipment set up, project execution plan, line plan), in some cases providing a second opinion;
- Contribute to defining a CPT and borehole plan;
- Contribute in defining a lab testing programme (standard and cyclic);
- Review of deliverables (for example reports and geoscience data);
- Support in disclosing deliverables (check of content offshorewind.rvo.nl and HDD, webinars, PSD, etc.);

Expert contractors are requested to offer **two** available experts. One of them should be a senior expert and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

### Morphological Specialist Expert(s) (approximately 500 h)

These experts must be morphodynamic experts, preferably with experience with seabed conditions and morphodynamics for wind farm / foundation / infield cable design for projects in the (Dutch sector of the) North Sea.

Required know-how:

- a. Experience with assessment of morphodynamical desk studies ((morpho)dynamics, physics) for offshore wind farms or cable lay-out;
- b. The general seabed conditions in the (Dutch sector of the) North Sea;
- c. Experienced in seabed morphodynamics, sand waves and bedform migration, morphodynamical analysis.

Activities (but not limited to):

- Drafting procurement documents for the morphodynamical assessment tender;
- Review and evaluate proposals of the morphodynamical assessment tender;
- Review of the (draft) reports of the morphodynamical assessment;
- Review of the data;
- Reporting and document control, e.g. during review of deliverables;
- Participate in expert meetings;
- Disclosure of information to the market (publication at offshorewind.rvo.nl, contribution to the PSD, market questions, webinars, etc.)

Expert contractors are requested to offer **two** available experts. One of them should be a senior expert and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

### PM support (Option – approximately 500 h)

Optionally RVO would like to extend the PROJECT team with PM support. The PM support can work alongside the RVO project manager and support in managing the interfaces.

Required know-how:

- a. Procurement and (contract) management of geophysical and / or geotechnical surveys;
- b. General understanding of geophysical and geotechnical surveys;

Activities (but not limited to):

- Interface management;
- Prepare Minutes of Meeting;
- Manage document review procedures;
- Support contract management.

### Document controller (Option – approximately 500 h)

Optionally RVO would like to extend the project team with a document controller to assist the RVO project managers and the experts in document control.

Activities (but not limited to):

- Manage and trace project documents;
- Arrange document storage and ensure project folders remain up to date;
- Prepare and distribute minutes of meeting.

Expert support contractors are requested to offer one available person for each requested position. Additional experts offered will be assessed as back-up experts.

| Role                  | Senior expert | Medior/junior expert |
|-----------------------|---------------|----------------------|
| Lead expert           | 1             | -                    |
| Geophysical campaign  | 1             | 1                    |
| Geotechnical campaign | 1             | 1                    |
| Ground Model          | 1             | 1                    |
| Morphological study   | 1             | 1                    |
| PM support*           | -             | 1                    |
| Document controller*  | -             | 1                    |

*Table 1: Required experts per position for soil*

\*These persons will not be assessed

It should be clear in the project plan who the above mentioned main persons per position are and which persons are offered as back-up per position.

It is envisaged that no more than 3 persons from the expert group will participate in the weekly meetings with the site study Contractors in order to make sure the meetings stay effective. Other experts can be consulted outside of these meetings when necessary. The participation of the specialist experts in meetings is to be agreed at the start of the project. In this way the interfaces can be kept to a minimum and no information is lost throughout studies and within the core team.

## 3. Schedule of Key Dates

At this moment Contracting Authority anticipates that the geophysical and geotechnical surveys will be executed covering a Wind Farm Site suitable for 2000 MW (IJmuiden Ver sector 5 and 6). A best estimate of the planning of activities is given below:

#### **Planning geophysical survey:**

|                                                                                           |         |
|-------------------------------------------------------------------------------------------|---------|
| Procurement geophysical survey                                                            | Q4 2021 |
| Earliest mobilisation:                                                                    | Q1 2022 |
| Finalisation offshore work                                                                | Q2 2022 |
| Reporting (including draft CPT-BH plan)                                                   | Q3 2022 |
| Support in additional questions from the market and disclosure information of the market: | Q4 2022 |

#### **Planning geotechnical survey:**

|                                  |         |
|----------------------------------|---------|
| Procurement geotechnical survey  | Q2 2022 |
| Finalisation SoW and CPT-BH plan | Q1 2023 |
| Earliest mobilisation:           | Q1 2023 |
| Latest completion offshore work  | Q3 2023 |

|                                                                                           |         |
|-------------------------------------------------------------------------------------------|---------|
| Latest finalisation reporting                                                             | Q3 2024 |
| Support in additional questions from the market and disclosure information of the market: | Q4 2024 |
| <b>Planning integrated ground model:</b>                                                  |         |
| Procurement ground model                                                                  | Q4 2021 |
| Start data integration                                                                    | Q2 2022 |
| End data integration                                                                      | Q2 2024 |
| Reporting                                                                                 | Q3 2024 |
| Support in additional questions from the market and disclosure information of the market: | Q4 2024 |
| <b>Planning morphological study:</b>                                                      |         |
| Procurement morphological study IJV I-IV                                                  | Q4 2021 |
| Executing study IJV I-IV                                                                  | Q2 2022 |
| Reporting IJV I-IV                                                                        | Q3 2022 |
| Support in additional questions from the market and disclosure information of the market: | Q4 2022 |
| Procurement morphological study IJV V-VI                                                  | Q4 2023 |
| Executing / Reporting IJV V-VI                                                            | Q2 2024 |
| Reporting IJV V-VI                                                                        | Q3 2024 |
| Support in additional questions from the market and disclosure information of the market: | Q4 2024 |