Date 1st October 2021
Status Final

Metocean Campaign IJmuiden Ver Investigation Area

Annex 6 – Section VII

Starting Point and Assumptions

IJmuiden Ver Investigation Area

Colophon

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Approved	M. Brijder

Revision History

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Contents

1 Introduction

This document provides the starting points and assumptions for the IJmuiden Ver Investigation Area. The starting points and assumptions are to be used by contractors when executing investigations, studies or likewise, for the development of the IJmuiden Ver Investigation Area and commissioned by one of the following organisations:

- The Ministry of Economic Affairs and Climate Policy
- The Ministry of Infrastructure and Water Management
- Netherlands Enterprise Agency (RVO)
- Rijkswaterstaat
- Tennet TSO B.V.

This document is part of the QA/QC process for these studies.

Please note:

- This is a living document; before use check the revision history for the latest updates (to be confirmed by your client)

If you have any queries please contact your client.

2 General introduction to the offshore wind energy in the Netherlands

2.1 Existing offshore wind farms

The Netherlands' existing offshore wind farms have a combined capacity of approximately 3,000 MW, of which 2,000 MW is fully operational

Windfarm	Sites	Distance of the coast	Year of commissioning	Turbines	Owner
Offshore Wind Farm Egmond aan Zee (OWEZ)		10-18 km	2008	36 Vestas 3 MW	Noordzeewind (joint venture NUON and Shell)
Prinses Amalia Wind Farm		23 km (12 NM)	2009	60 Vestas 2 MW	Eneco
Luchterduinen		23 km (12 NM)	2015	43 Vestas 3 MW	joint venture Eneco and Mitsubishi Corporation
Gemini		85 km	2017	150 Siemens 4 MW	Northland Power, Siemens, Van Oord and HVC
Borssele	I - II	22 km	2020	94 Siemens 8 MW	Ørsted
	III - IV		2020	77 Vestas 9,5 MW	Blauwwind
	V		2021	2 Vestas 9,5 MW	Two Towers
Hollandse Kust Zuid	I - IV	18 km	Under Construction	140 Siemens 11 MW	Vattenfall

Table 1 Wind Farms in the Dutch North Sea

2.2 The roadmap 2030 towards 49 TWh/a offshore wind power

As part of its climate goals, the Dutch Government aimed to have 49 TWh/a of offshore wind energy feeding into the grid by 2030. This equals around 40% of the current Dutch electricity consumption. The roadmap to achieve this goal sets out a schedule of tenders, with each tender offering 700 MW up to 2,000 MW of development in the period 2015 – 2025. Only recently the Dutch Government has raised the goal to have 55 TWh/a of offshore wind energy feeding into the grid by 2030 under the same roadmap and legislation.
The Tender for IJmuiden Ver sites V and VI is an addition to the original roadmap 2030, tender is scheduled around 2026.

The wind farms will be built in designated Wind Farm Zones. Wind farms outside these Wind Farm Zones are prohibited. Within the designated Wind Farm Zones, the government defines the specific sites where wind farms can be constructed using a so-called Wind Farm Site Decision ('Kavelbesluit'). This Wind Farm Site Decision contains all conditions for building and operating a wind farm on that specific site.
The Dutch Government provides comprehensive site data and Dutch transmission system operator TenneT is responsible for grid connection.
Developers can apply in tenders for the permits to build and operate a wind farm according to a Wind Farm Site Decision. Winners of these permit tenders will be granted a permit and a grid connection

to the main land. RVO is responsible for the site data, which can be used for the preparation of bids for these tenders.

Wind Farm Zones in the Dutch North Sea				
Wind Farm Zone	**Wind Farm Site**	**Tender**	**Capacity**	**Owner**
Borssele	I and II	2015	752 MW	Ørsted Borssele 1 B.V.
	III and IV	2016	731 MW	Blauwwind II C.V. (Shell, Van Oord, Eneco, Diamond Generating Europe)
	V	2016	19 MW	Two Towers
Hollandse Kust (zuid)	I and II	2017	740 MW	Chinook (Vattenfall)
Hollandse Kust (zuid)	III and IV	2018	760 MW	Vattenfall
Hollandse Kust (noord)	V	Q4 2019	≥700 MW	Crosswind
Hollandse Kust (west)	VI and VII	Q4 2021	2 x ≥700 MW	t.b.d.
Ten noorden van de Waddeneilanden	I	Q4 2022	≥700 MW	t.b.d.
IJmuiden Ver	I and II	Q4 2023	≥ 2 x 1,000 MW	t.b.d.
	III and IV	Q4 2025	≥ 2 x 1,000 MW	t.b.d.
	V and VI	t.b.d.	≥ 2 x 1,000 MW	t.b.d.

Table 2 Wind Farm Zones in the Dutch North Sea

A tender to develop the IJmuiden Ver Wind Farm Zone is scheduled to open in three stages. Wind farm site I and II will open in 2023. Wind farm site III and IV will open in 2025. An overview for the roadmap 2030 is provided in Figure 1*.

*Figure 1 does not show IImuiden Ver sites V and VI as they are not part of the original roadmap 2030. More information can be found on: https://windopzee.nl/onderwerpen/wind-zee/wanneer-hoeveel/wind-zee-2030-0/

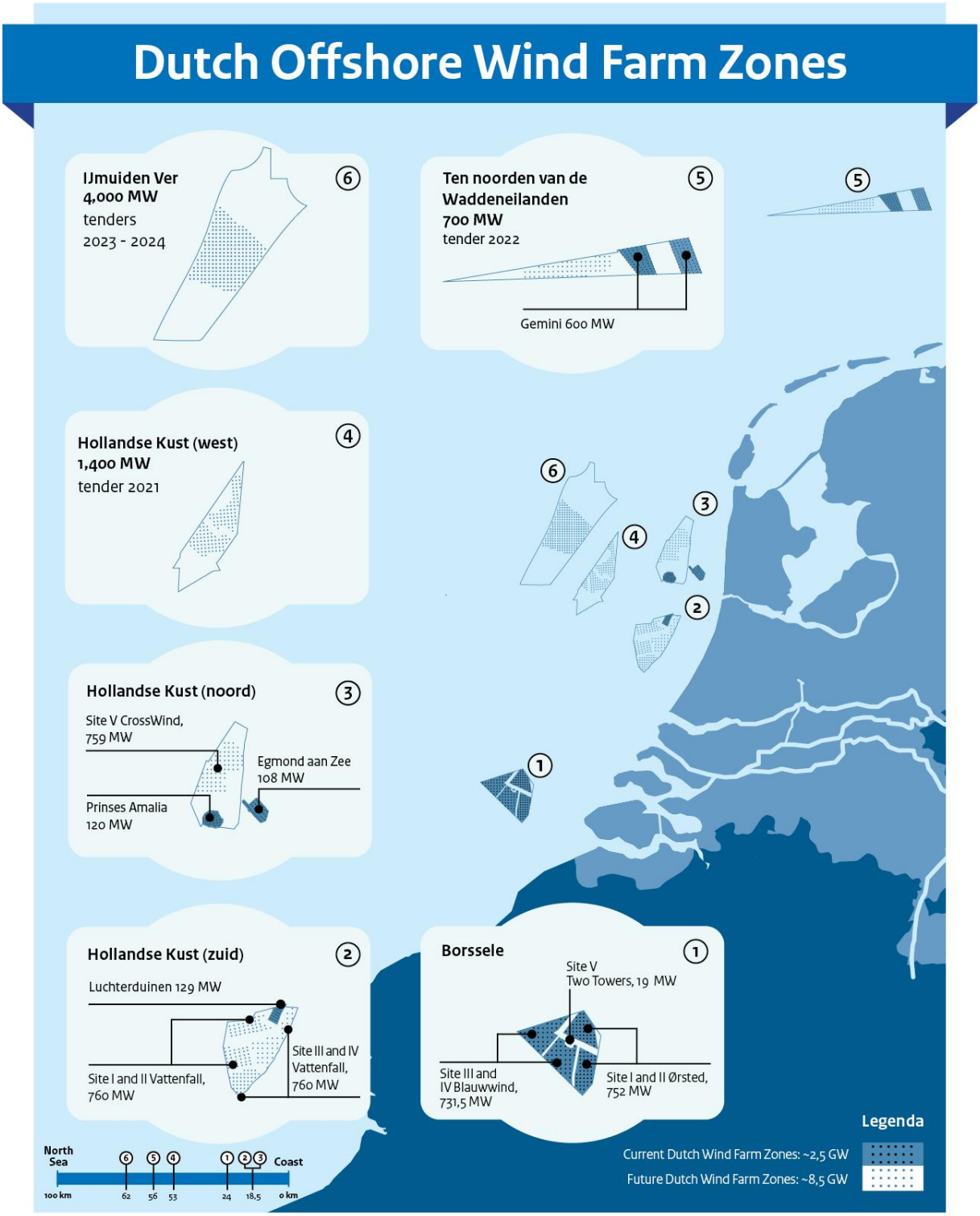

Figure 1: Dutch Offshore Wind Farm Zones overview for road map 2030

3 General introduction IJmuiden Ver Investigation Area

3.1 Layout & coordinates

The IJmuiden Ver Investigation Area is located in the western part of the Dutch shelf of the North Sea. The IJmuiden Ver Wind Farm Zone (IJVWFZ) is situated inside the IJmuiden Ver Investigation Area (see Figure 3) and is located 80 kilometres off the west coast of the Netherlands. General characteristics of the IJVWFZ are shown in Table 3. Table 4 shows the coordinates of the IJVWFZ. Figure 2 shows the Wind Farm Zone. Figure 3 shows the IJmuiden Ver Investigation Area.

Characteristics	
Water depth	Approximately 16.5-47 LAT
Distance from shore	Approximately 80 km
Total Wind Farm Sites (I-VI) area	Approximately 687 km^2

Table 3 Characteristics of the IJmuiden Ver Wind Farm Zone

IJmuiden Ver Wind Farm Zone Coordinates according EPSG 25831 – WKID: 25831 Authority ESPG					
Point No.	Easting	Northing	Point No.	Easting	Northing
WFZ_01	537146,3	5884508,1	**WFZ_28**	555466,8	5880241,4
WFZ_02	537853,5	5884419,1	**WFZ_29**	555626,4	5879482,4
WFZ_03	538565,5	5884.384,5	**WFZ_30**	555849,3	5878739,5
WFZ_04	539278,0	5884405,3	**WFZ_31**	556134,5	5878018,3
WFZ_05	539986,7	5884481,6	**WFZ_32**	556478,0	5877323,0
WFZ_06	540687,6	5884611,2	**WFZ_33**	556877,6	5876658,3
WFZ_07	541376,5	5884794,5	**WFZ_34**	557332,4	5876030,0
WFZ_08	542049,1	5885030,6	**WFZ_35**	557838,1	5875441,9
WFZ_09	542701,5	5885318,0	**WFZ_36**	558391,1	5874898,0
WFZ_10	543330,1	5885654,1	**WFZ_37**	558988,2	5874402,8
WFZ_11	543930,5	5886038,2	**WFZ_38**	559624,7	5873959,7
WFZ_12	544499,5	5886467,6	**WFZ_39**	560295,9	5873571,1
WFZ_13	545034,1	5886939,0	**WFZ_40**	560996,7	5873238,8
WFZ_14	545531,2	5887449,8	**WFZ_41**	561723,3	5872967,5
WFZ_15	545988,2	5887996,8	**WFZ_42**	561003,6	5872341,7
WFZ_16	546400,1	5888578,6	**WFZ_43**	557030,4	5868886,8
WFZ_17	546766,2	5889190,2	**WFZ_44**	541321,4	5847922,1
WFZ_18	547084,8	5889827,7	**WFZ_45**	531462,7	5834765,1
WFZ_19	547353,9	5890487,7	**WFZ_46**	530715,4	5833767,8
WFZ_20	547571,5	5891166,5	**WFZ_47**	530715,4	5833767,7
WFZ_21	547735,6	5891860,2	**WFZ_48**	527949,9	5830076,5
WFZ_22	548494,6	5891621,1	**WFZ_49**	514283,0	5830052,5
WFZ_23	549271,7	5891449,5	**WFZ_50**	512848,4	5830468,0
WFZ_24	550044,2	5891346,6	**WFZ_51**	512933,5	5831549,4
WFZ_25	550145,0	5881716,6	**WFZ_52**	527989,9	5859978,7
WFZ_26	555339,4	5881786,1	**WFZ_53**	532962,6	5875021,7
WFZ_27	555370,5	5881011,1			

Table 4 Coordinates of the IJmuiden Ver Wind Farm Zone

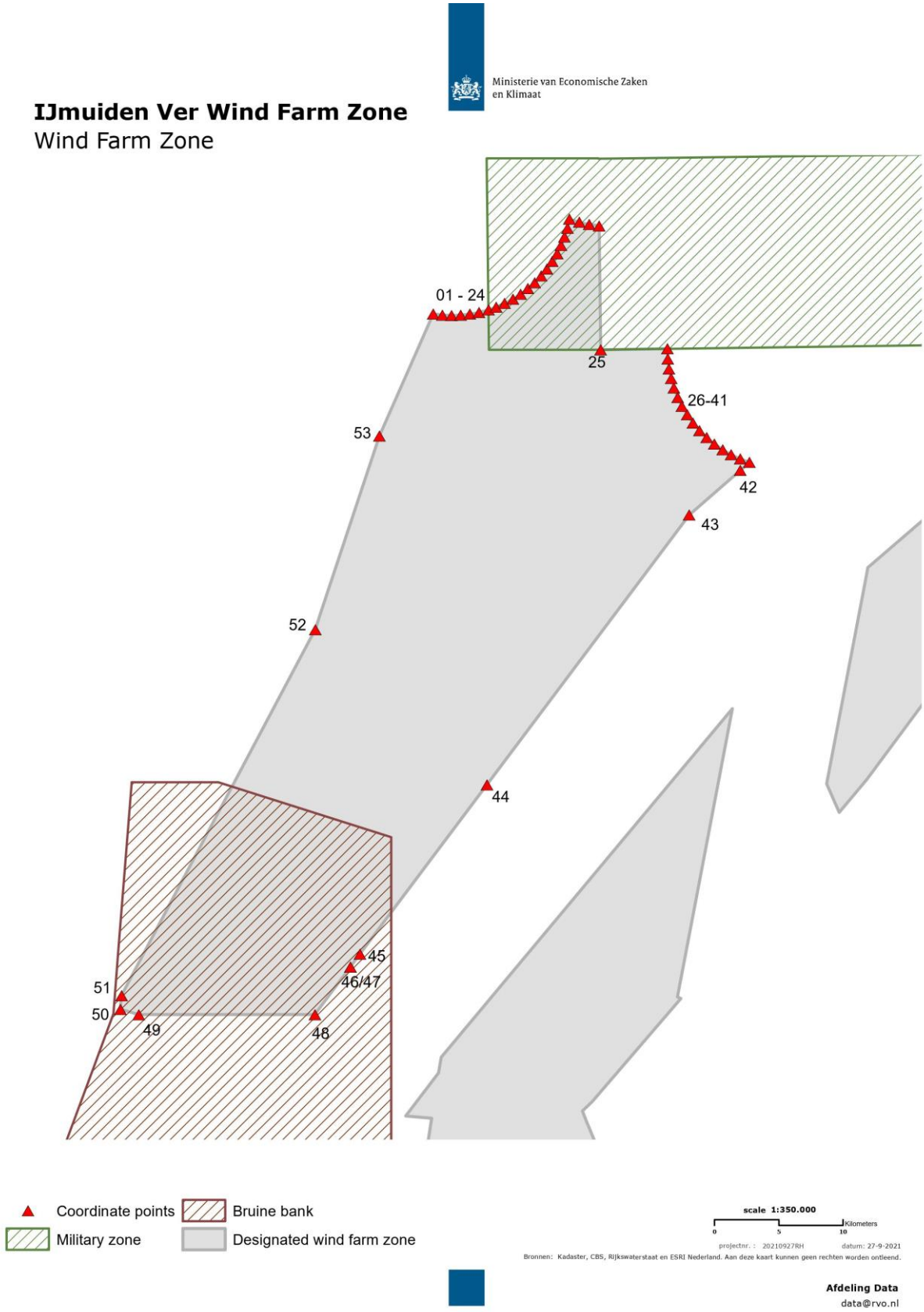

Figure 2: Map of the IJmuiden Ver Wind Farm Zone

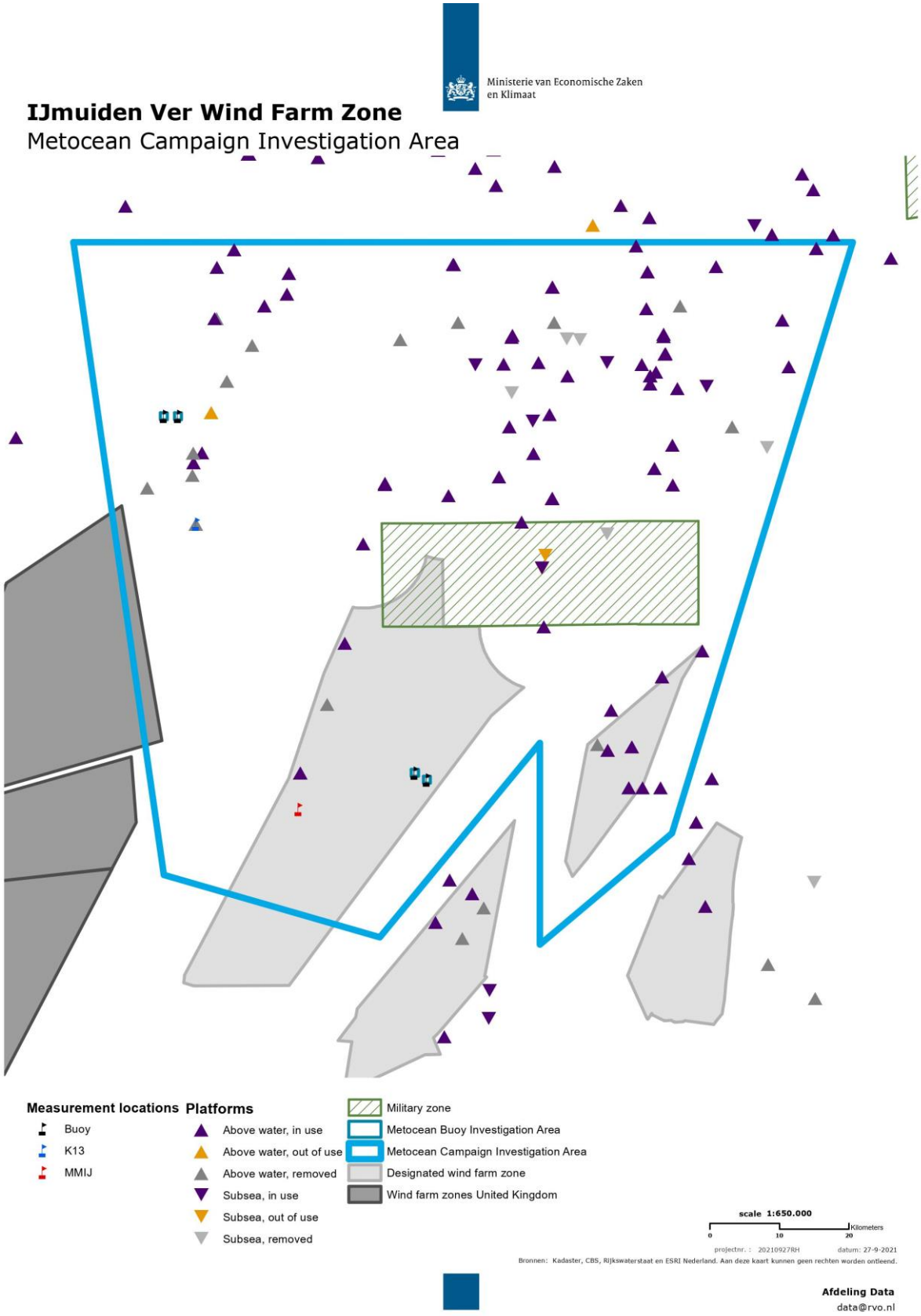

Figure 3: Map of the IJmuiden Ver Investigation Area

4 Units of measurement and vertical and horizontal datum

4.1 Units

SI units (ISO/IEC 8000) are applicable for any activities carried out at the Wind Farm Zone.

4.2 Vertical and horizontal datum

The chart datum is Lowest Astronomical Tide (LAT).

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

5 Quality requirements

This chapter describes quality requirements including data model and GIS data deliveries. During the process and delivery of the data further information or explanations can be requested at RVO.

As RVO will make this data publicly available, the metadata needs to be in line with the GDPR (AVG) requirements.

5.1 Spatial data

All created data in the study will be delivered by the supplier in GIS format. The supplier will need to comply with the data requirements set out by RVO and provide an inventory list of the deliverables supplied. The inventory should include project name, name of contractor and responsible person, survey date, product medium (i.e. hard drive, web service, etc.), folder structure and description of data contents.

- The data should be delivered in one of the following formats: ESRI File Geodatabase, TIFF or ESRI Shapefile (.shp). Should another format be used, this can only be delivered after consulting with RVO.
- Both raw data and processed data along with any relevant GIS workspaces (MXDs) are required and should also include the associated reports and charts.
- Data preferably in a data model format like the *SeaBed Survey Data Model* (http://www.iogp.org/bookstore/product/guidelines-for-the-use-of-the-seabed-survey-data-model/)
- Data described in the IHO S44 standards should be delivered according to that standard: https://www.iho.int/iho_pubs/standard/S-44_5E.pdf
- The geodetic system used for horizontal projections is European Terrestrial Reference System 1989 (ETRS89). EPSG code: 25831 http://www.epsg-registry.org/. If another CRS is used the transformation parameters to ETRS89 needs to be included.
- All GIS data shall be provided with Metadata describing specific details and origin regarding the spatial data. The requirements regarding the metadata are included in Annex A.

5.2 Taxonomy

All contractors must use the taxonomy as presented in the taxonomy list, which is available online at https://offshorewind.rvo.nl/file/view/55039930/Taxonomy+List+Offshore+Wind+Energy+-+Dutch_English

5.3 GIS Metadata requirements

The requirements for GIS metadata which all Contractors shall comply with is shown in Annex A of this document.

5.4 Mandatory data delivery BRO

RVO as a government agency is obligated by law to provide subsurface data to the central 'subsurface register' in the Netherlands. Therefore, below the mandatory delivery to the "Basisregistratie Ondergrond (BRO)" is provided below.

The contractor shall carry out its work in compliance with the obligations resulting from the Law "Basisregistratie Ondergrond (BRO)", including the implementation on behalf of RVO of the user duty, the delivery and the duty of investigation related to the delivery of data to databases in the BRO-Law ('LV BRO'). The contractor shall use and consult the LV BRO on presence of relevant data before the start of the project. If the contractor has reasonable doubt about the accuracy of data in the LV

BRO, the contractor should notify LV BRO following the applicable procedure, in accordance to article 30 of the Act on behalf of the client.

If the contractor generates subsurface data, these should comply with the requirements and the format of the LV BRO. The contractor has obtained background information within 20 working days of the date of acquisition to the Source holder Portal BRO.

The contractor has to supply the relevant the subsurface data, complying with the metadata data requirements in the annex "Fill instruction format LV BRO" available on the website https://www.basisregistratieondergrond.nl/.

5.5 Document control requirements

The naming of the documents shall be standardized in order to facilitate the document control during the whole project. The following naming code is required for all documents produced within the project:

IJV_Date_Organization_Name document_Author_Version_Status

- IJV: IJmuiden Ver
- Date: yyyymmdd, e.g. 20210101
- Organization: Name of the organization e.g.
    - "RVO" for all internal and general documents produced by the Netherlands Enterprise Agency (RVO)
    - Consultant or Contractor name (shortened)
- Name document: Make sure the name clearly explains the content, include here the original name if from external party
- Author: Abbreviation of the author if an internal document. Author shall be removed for final documents
- Version: Revision number or date, respectively V01 till V0x_D or 20200101_F
- Status: (D) for draft documents, F for signed and approved documents

5.6 Standards, formats, templates

All reports will be written in English and include both an English and Dutch management summary.

Contractors provide for each completed study a publishable summary for the Project and Site description. Maximum 1 A4.

All reports must use the terminology as specified in Annex A of the Starting points and assumptions. For your convenience this dictionary is also available as XLSX file.

Reports and deliverables will be delivered by contractors in pdf and original, regular, formats (docx; xlsx; ppt; etc).
Final reports will have a cover according to the corporate identity of the Netherlands Enterprise Agency, with the following text:

- Front:

Offshore wind energy Netherlands
Site data IJmuiden Ver Wind Farm Zone
Name document

- Back:

A colophon with the following content:

The creative commons license 4.0 apply to this material. (including a Creative Commons logo

and hyperlink to the relevant Creative Commons website page: https://creativecommons.org/licenses/by/4.0/)

- The (investigation) (report) was carried out by <<name contractor>>, commissioned by RVO, an agency of the Ministry of Economic Affairs. Whilst a great deal of care has been taken in compiling the contents of this document and the mentioned investigations, Netherlands Enterprise Agency (RVO) cannot be held liable for any damages resulting from any inaccuracies and/or outdated information.

- Contact

Netherlands Enterprise Agency (RVO)
Croeselaan 15 | 3521 BJ | Utrecht | The Netherlands
P.O. box 8242 | 3503 RE | Utrecht | The Netherlands
www.rvo.nl/ http://english.rvo.nl

- Netherlands Enterprise Agency (RVO) | Date of publication

5.7 General introduction of WFZ

In order to maintain continuity throughout all reports it is suggested to include the following general introduction of the IJmuiden Ver Wind Farm Zone:

As part of its climate goals, the Dutch Government aimed to have 49 TWh/a of offshore wind energy feeding into the grid by 2030. This equals around 40% of the current Dutch electricity consumption. The roadmap to achieve this goal sets out a schedule of tenders, with each tender offering 700 MW up to 2,000 MW of development in the period 2015 – 2025. Only recently the Dutch Government has raised the goal to have 55 TWh/a of offshore wind energy feeding into the grid by 2030 under the same roadmap and legislation.
The Tender for IJmuiden Ver sites V and VI is an addition to the original roadmap 2030.
The wind farms will be built in designated Wind Farm Zones. Wind farms outside these Wind Farm Zones are prohibited. Within the designated Wind Farm Zones the government defines the specific sites where wind farms can be constructed using a so-called Wind Farm Site Decision ('Kavelbesluit'). This Wind Farm Site Decision contains all conditions for building and operating a wind farm on that specific site.
The Dutch Government provides comprehensive site data and Dutch transmission system operator TenneT is responsible for grid connection.
Developers can apply in tenders for the permits to build and operate a wind farm according to a Wind Farm Site Decision. Winners of these permit tenders will be granted a permit and a grid connection to the main land. RVO is responsible for the site data, which can be used for the preparation of bids for these tenders.

The Ijmuiden Ver Wind Farm Zone is planned for a total capacity of 6000 MW divided over 6 sites of 1000 MW each. The development of the IJVWFZ is divided in 3 tenders of 2 sites scheduled between 2023 and 2026. IJmuiden Ver Wind Farm Sites V and VI will be the final tender within the Wind Farm Zone and is an addition to the roadmap 2030.

5.8 Other data

In the case of collected data: primary data must be delivered in regular formats.

5.9 Deliverables (results / maps)

All maps (in GIS and PDF) will not show the investigation areas nor the specific Wind Farm Sites. The maps will only show the outer boundary of the Wind Farm Zone boundary of the Ijmuiden Ver Wind Farm Zone.

5.10 Storage of data (electronic / hardcopy)

The Netherlands Enterprise Agency will store all reports and other relevant documents for at least five years both electronically and hardcopy.

6 Communication

6.1 Confidentiality

All information provided to contractors/suppliers by the Ministry of Economic Affairs and Climate Policy and/or the Netherlands Enterprise Agency and/or the Ministry of Infrastructure and Water Management and/or Rijkswaterstaat and/or TenneT must be regarded confidential.

All deliverables produced by contractors/suppliers remain confidential until a deliverable has been made public by the Ministry of Economic Affairs and Climate Policy and/or the Netherlands Enterprise Agency and/or the Ministry of Infrastructure and Water Management and/or Rijkswaterstaat and/or TenneT.

6.2 Accessibility public information

- Site investigations: offshorewind.rvo.nl
- SDE: http://english.rvo.nl/subsidies-programmes/stimulation-sustainable-energy-production-sde
- Wind farm Site Decisions and EIA: https://www.rvo.nl/subsidies-regelingen/bureau-energieprojecten/lopende-projecten

6.3 Authorities

Wind Farm Site Decision ('Kavelbesluit'):

Ministry of Economic Affairs and Climate Policy
Camiel van der Hout
E c.j.r.vanderhout@minezk.nl
T +31 (0)6-11 02 81 31

Rijkswaterstaat
Raoul Syrier
E raoul.syrier@rws.nl
T +31 (0)6 11072554

Site data:

Netherlands Enterprise Agency
Matté Brijder
E matte.brijder@rvo.nl
T + 31 (0)6 27878952

Grid connection ('Transmissiesysteem op zee'):

TenneT TSO BV
Johan Dekkers
E johan.dekkers@tennet.eu
T +31 (0)6 29360328

6.4 Media

All media contacts will be coordinated by the Ministry of Economic Affairs and Climate Policy. If a supplier is approached by press representatives than he/she should refer to the spokesman of the Ministry only.

Ministry of Economic Affairs and Climate Policy

Caspar Itz
c.itz@minez.nl
+ 31 610551061

6.5 Email

All emails related to the site investigations must be send in CC to the project mailbox: IJV@rvo.nl

The subject of an email related to Ijmuiden Ver needs to start with the date and the abbreviation of Ijmuiden Ver so IJV. Then also it needs to be followed by an abbreviation of the type of site survey. E.g. : 20210806 IJV MC for the Metocean campaign for IJmuiden Ver Investigation Area

6.6 Emergency Response

In case of an emergency suppliers are obliged to inform the Netherlands Enterprise Agency immediately.

Annex A. GIS Metadata requirements

Goal of metadata requirements is to make sure the future users of this data can use this data in the appropriate way and find out what the constraints of the usage of the data is from the metadata.

Format

All data collected, either in the field or in a desktop study, by third parties must be provided with metadata. Data is preferably collected in an ArcGIS file geodatabase (version 10.6 or lower). In this case, metadata is stored within the data in the database. In case of a shapefile, GML or GRID metadata must be provided in pure XML-format as separate files.

Metadata must be compliant with the Dutch standard for metadata ISO 19115 version 2.0.0[1] (or any version available at the time of creating the data), in addition the column names of all datarecords More information on the standard can be found here:
https://www.geonovum.nl/geo-standaarden/metadata/nederlands-metadataprofiel-op-iso-19115-geografie

To validate your metadata a validator is available from the website of Geonovum:
http://www.geonovum.nl/validator-nederlands-metadataprofiel-op-iso-19115

Manufacture options

Creating metadata should preferably done when the data is acquired or created and checked and finalised before delivering the data.

Preferred option:
Organisations that use Esri software can use the GeoSticker application to create and edit metadata: http://www.esri.nl/geosticker.

Other options:
The Metadatamaker offered by the RWS can also be used to make the metadata and can be found at http://rws.metainfomaker.nl/
The Nationaal Georegister (NGR) allows meta data to be made, to do this a guest account is required. This can be requested by mailing to EZ geodatabeheer (geodatabeheer.GISCC@rvo.nl)

Other options are possible as long as the data will be validated by the metadata validator for ISO 19115 version 2.0.0 (or newer version available at the time of creating the data) at the website of Geonovum

Metadata elements with explanation:
Identification

1. File title:
No abbreviations, complete title of the dataset covering the content of the dataset.

2. Status:
According a standard list:
completed; historicalArchive; obsolete; onGoing; planned; required; underDevelopment.

3. Source data date:
a. creation YYYY-MM-DD
b. publication YYYY-MM-DD (date of approval by RVO)
c. revision YYYY-MM-DD

4. *abstract*:

[1] There is one major difference between the Dutch metadata standard ISO 19115 version 2.0.0 and the RVO metadata requirements: the description of the content of the dataset. A description of all attributes, including - if applicable – all possible values and its measurement is mandatory and not optional.

Short description of the content of the dataset.

5. Subject / topics:
Define the key topic(s) of the dataset

6. Keywords:
Keywords describing the dataset, e.g.
- Wind Farm Site
- Wind Farm Zone … (Borssele or Hollandse Kust)
- …
- …

7. Revision frequency:
N/A

8. Next revision date:
N/A

9. Purpose of production:
Concise description of the original aim of the dataset

10. Denominator :
Scale on which the dataset can be used.

11. useLimitation :
Applications for which the data set is not to be used. I.e. Not to be used for navigation. Not to be used on a scale larger then 1:50.000

12. accessConstraints:
None, data will be published in the public domain

13. useConstraints:
The creative commons license 4.0 apply to this material. See hyperlink
https://creativecommons.org/licenses/by/4.0/

This investigation was carried out by …, commissioned by RVO, an agency of the Ministry of Economic Affairs and Climate Policy. Whilst a great deal of care has been taken in compiling the contents of this investigation, RVO cannot be held liable for any damages resulting from any inaccuracies and/or outdated information.

14. otherConstraints :
Other restriction(s) if any.

15. Description complementary document or website:
On the RVO website general information about offshore wind energy can be found as well as links to more detailed information regarding the information of the investigation where this deliverable resulted from.

Quality

16. General origin:
General description of when, how and where the data was created / collected.

17. Accuracy:
Describe accuracy of the dataset.

18. Completeness:
Is the dataset complete? If not, a description of the incompleteness is necessary.

19. Processing of data (if applicable):
If data is processed, description of each step is required i.e. transformation or generalisation

20. Source datasets (if applicable):

Description of used source datasets (if any).

Coverage

21. Geographical coverage:
Geographical coverage of the file e.g. The Netherlands, North Sea.

22. Validity period:
Define start and end date of validity of the dataset.

Content

23. Attribute information:
Description of all attributes, including - if applicable – all possible values and its measurement.

General

24. Contact information:
As this information will be made publicly available personal information should be avoided and generic contact details should be provided. If personal email addresses are provided that person should have given consent to use their e-mail address.

Contact information of client and/or creator and/or point of contact. At least one contact is mandatory. Name organisation, role organisation (owner, processor, point of contact, administrator, provider, creator), and an generic email address of contact department
If website is available, name of contact and role of contact

Do to the GDPR it is no longer desirable to have personal information in the data, it is preferred to have a general email instead of a personal one and a function title instead of a person's name.

Client:
Business Name: …
Contact Person: …
Address: …
Telephone: …
Email

Creator:
Business Name: …
Contact Person: …
Address: …
Telephone: …
Email: ...