

**MORAY OFFSHORE WINDFARM (WEST) LIMITED**

## **Section 36 Consent Variation Application Report**

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## Abbreviations and Acronyms

Abbreviation and Acronym	Expanded Term
AEoI	Adverse Effect on Integrity
Al	Aluminium
AR	Avoidance Rates
CAA	Civil Aviation Authority
CF	Conversion Factor
CfD	Contracts for Difference
Cu	Copper
EC	European Commission
EIA	Environmental Impact Assessment
EPR	Ethylene propylene rubber insulated
EPS	European Protected Species
GBBG	Great Black-Backed Gull
HAT	Highest Astronomical Tide
HRA	Habitats Regulations Assessment
Kj	Kilojoules
KV	Kilovolt
MCA	Maritime and Coastguard Agency
MOD	Ministry of Defence
MSLOT	Marine Scotland Licensing and Operations Team
MSS	Marine Scotland Science
MSS-MAU	Marine Scotland Science Marine Analytical Unit
MW	Megawatt
NATS	National Air Traffic Services
NETS	National Electricity Transmission System
NLB	Northern Lighthouse Board
NM	Nautical Miles
OSP	Offshore Substation Platform
OfTI	Offshore Transmission Infrastructure

Abbreviation and Acronym	Expanded Term
OnTI	Onshore Transmission Infrastructure
PCH	Potential Collision Height
pSPA	Potential Special Protection Area
PVA	Population Viability Analysis
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SFF	Scottish Fishermen's Federation
SNCB	Statutory Nature Conservation Body
SNH	Scottish Natural Heritage
SPA	Special Protection Area
TEC	Transmission Entry Capacity
THC	The Highland Council
WCS	Worst Case Scenario
WTG	Wind Turbine Generator
XLPE	Cross-linked polyethylene

# 1 Introduction

## 1.1 Purpose of this Document

In June 2019, Scottish Ministers granted Moray Offshore Windfarm (West) Limited “Moray West” consent under Section 36 of the Electricity Act 1989, Part 4 of the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 to construct and operate the Moray West Offshore Wind Farm and associated Offshore Transmission Infrastructure (OfTI) “the Development”.

An overview of the consented Development is provided in Section 1.2 below.

Moray West is now seeking to vary the Section 36 Consent for the Moray West Offshore Wind Farm in accordance with Section 36C of the Electricity Act 1989 (as amended).

The main requirements for the variation include:

- Requirement to increase the blade width of Wind Turbine Generators (WTGs) specified in the Section 36 Consent – Annex 1 under the 72 turbine scenario from 6 m to 6.6 m; and
- Request for removal of reference to Moray West having a ‘maximum generating capacity of around 850 MW’.

On 25<sup>th</sup> August 2020, Moray West requested a formal Screening Opinion from Scottish Ministers in regard to proposed changes to the Moray West Section 36 Consent, and associated offshore generating station Marine Licence (Marine Licence 06763/19/0). To support the request for a formal Screening Opinion, Moray West submitted a Screening Report, the main purpose of which was to demonstrate why the proposed variations would not lead to a development which is fundamentally or substantially different in terms of scale and/or nature from what is authorised in the existing consent and therefore can appropriately be authorised under Section 36C of the Electricity Act 1989; and explain why the proposed variations are not considered to comprise EIA development.

A formal Screening Opinion under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (“2017 EW Regulations”) and Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2007 (as amended) (“2007 MW Regulations”) was made by Scottish Ministers on 12<sup>th</sup> November 2020. This concluded that the proposed changes to the Moray West Section 36 Consent do not comprise EIA development under the 2017 EW Regulations and the 2007 MW Regulations and therefore an EIA is not required to be carried out in respect of the proposed changes.

This Section 36 Consent Variation Report has been produced to support an application to vary the Moray West Section 36 Consent, and associated offshore generating station Marine Licence. The purpose of this report is to describe, and explain the need for, the variation sought, and provide relevant environmental information to support the variation application.

## 1.2 Overview of the Development (as consented)

The Moray West Offshore Wind Farm will be located within the Moray West Site which covers an area of approximately 225 km<sup>2</sup> on the Smith Bank in the Outer Moray Firth, approximately 22.5 km from the

Caithness coastline (Figure 1.1). The associated Offshore Export Cable Corridor, which covers an area of approximately 185 km<sup>2</sup>, runs south from the Moray West Site to the north Aberdeenshire Coast.

Key components of the Moray West Offshore Wind Farm are summarised below:

- Up to 85 WTGs with maximum blade tip height of 230 m (HAT) and rotor diameter of 195 m or up to 72 WTGs with maximum blade tip height of 265 m (HAT) and rotor diameter of 230 m;
- Up to 85 foundations and substructures, and associated fixtures, fittings and protections;
- Design of the WTG substructures will be chosen from the following options (monopiles, jacket foundations, gravity base structures or suction caissons);
- No more than 275 km of subsea inter array cables;
- Scour and inter array cable protection; and
- Monitoring equipment, such as metocean buoys (if required).

Up to two Offshore Substation Platform (OSP) will be installed in the Moray West Site to collect electricity generated by the wind farm. This electricity will then be exported to shore via two offshore export cable circuits which will make landfall at a location on the north Aberdeenshire Coast, approximately 65 km south of the Moray West Site. The OSPs, OSP interconnector cables and export cable circuits comprise the Offshore Transmission Infrastructure (OfTI).

Once onshore, electricity generated by the Development will be transmitted via underground cables to a substation at Whitehillock in Moray where the electricity will then be connected into the National Electricity Transmission System (NETS) at the existing Blackhillock substation. The landfall, onshore underground cables and substation comprise the Moray West Onshore Transmission Infrastructure (OnTI). The OnTI, together with the Development (Moray West Offshore Wind Farm and OfTI) comprise “the Project”.

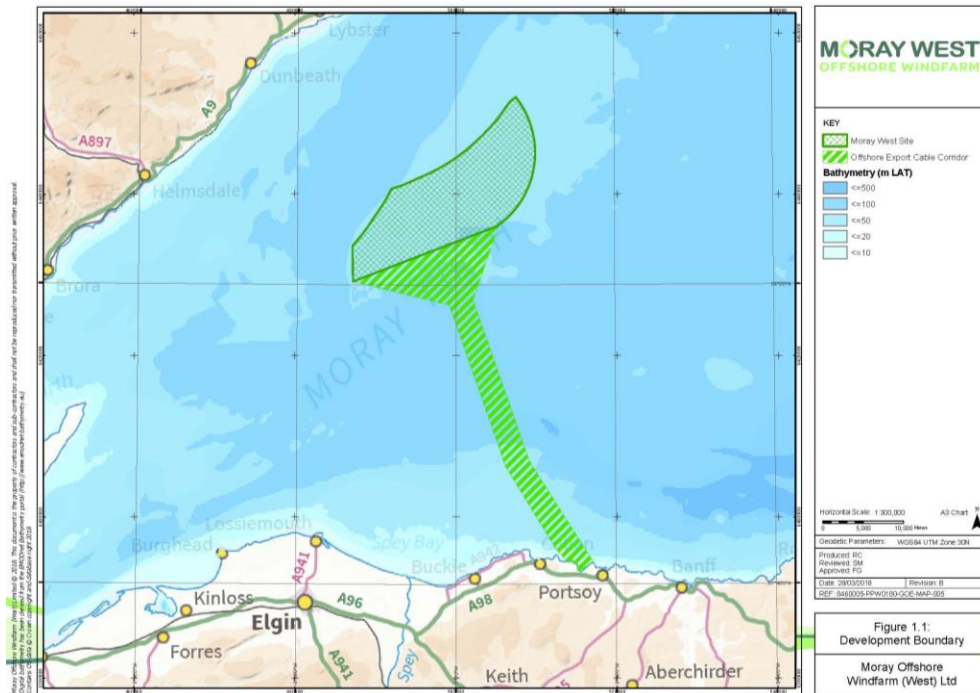


Figure 1.1: Development Boundary



## 2 Need for the Variation

### 2.1 Rationale

As described in Section 1 of this report, Moray West is seeking to vary the existing Section 36 Consent, and associated Generating Station Marine Licence, for the following reasons:

- Increase the WTG blade width from 6 m to 6.6 m; and
- Request for removal of reference to the ‘maximum of around 850 MW’ cap for installed capacity.

The rationale for each of the variations is provided below.

#### 2.1.1 Requirement for increase in blade width

Blade width is one of the physical design parameters listed in *Section 1.5 - Application and Description of the Development* and *Annex 1: Description of the Development* of the Section 36 Consent, as well as in the *Description of Works* Section 2.1 of the associated Offshore Generating Station Marine Licence.

Having been unsuccessful in the last CfD Auction round, Moray West has been exploring various options for developing the project, including the installation of larger WTGs. However, through further modelling and discussions with WTG suppliers it has become evident that, when looking at larger WTGs with larger rotor diameters, there is a corresponding increase in blade width.

Moray West is therefore seeking to increase the blade width specified for the 72 turbine scenario where tip height exceeds 230 m but is no greater than 265 m (measured from HAT) from 6 m to 6.6 m in order to accommodate these larger WTGs. Blade width for the smaller, 85 turbine scenario where tip height does not exceed 230 m (measured from HAT) will remain unchanged (6 m). These changes are illustrated in Section 2.1.3 below – summary of requested changes to the Moray West Section 36 Consent.

Based on information presented in Chapter 3 of the Moray West Section 36 Consent Variation Screening Report (reproduced in Chapter 3 of this report for information), it was concluded that, while the variation does comprise a change to a physical design parameter specified in Annex 1 of the Section 36 Consent, the increase in blade width will not affect any of the conclusions presented in the EIA or HRA with respect to predicted effect significance including in relation to ornithology and landscape, seascape and visual amenity.

Scottish Ministers in their Screening Opinion (12<sup>th</sup> November 2020) also concluded that the proposed changes to the Moray West Section 36 Consent are not considered to be EIA development under the 2017 EW Regulations and the 2007 MW Regulations and therefore an EIA is not required to be carried out in respect of the proposed changes.

### 2.1.2 Request to remove reference to ‘maximum generating capacity of around 850 MW’

Throughout the consenting process the size of the Moray West Offshore Wind Farm for which consent was sought was defined in terms of a physical Design Envelope comprising a maximum number of WTGs and maximum design parameters (e.g. maximum rotor diameter and maximum blade tip height). This Design Envelope was described and assessed by reference to the theoretical physical WTG parameters (referred to in the Moray West EIA Report as WTG Model 1, 2, 3 and 4 (as submitted), with Model 1, 2 and 3 falling within the consented Design Envelope as presented in Annex 1 of the Section 36 Consent). At no stage was the size of the Offshore Wind Farm referred to in terms of maximum installed MW. There was also no reference made to the size (in MW) of the different WTG models.

As stated in the Moray West EIA Report - Volume 2, Chapter 4: Description of the Development, Section 4.4.1 Offshore Wind Turbine Generator (WTGs), Moray West requires flexibility in WTG choice to ensure that anticipated changes in available technology and project economics can be accommodated within the Development design.

Moray West also specifically states (paragraph 4.4.1.2) that “this development description, does not refer directly to the capacity of individual WTGs, but rather their number and physical dimensions. In recent years, the capacity of the current generation of WTGs has become more flexible and may be different depending on the environmental conditions at a particular site; therefore, it is not considered appropriate to constrain the Design Envelope based on WTG capacity. It should be noted that the EIA assessments presented in subsequent chapters are not linked to or affected by WTG capacity”.

There are a number of WTGs available on the market that currently fall within the consented Design Envelope for Moray West (maximum rotor diameter (230 m) and maximum tip height (265 m above HAT)). The rated MW output capacity of these different WTGs varies depending on specific design specifications of each type of WTG, but generally increases with increased rotor diameter and maximum tip height. The final installed capacity of the wind farm therefore is dependent on these specific design specifications and the total number of turbines installed (up to 72 for WTGs with maximum 230 m rotor diameter and 265 m tip height).

Further variation in MW per WTG type is also expected when considering the rate of development of WTG technology. For example, WTG manufacturers are constantly working to improve the performance of the generator and other electrical components contained within the nacelle thereby increasing the output of a WTG (in terms of MW) without making changes to any other design parameters associated with the WTG. The result of this is that within a couple of years a 10 MW WTG can become a 12 MW WTG or 13 MW WTG without a change to any of the design parameters upon which the consent is based.

At present, the wording within the Moray West Section 36 Consent and Marine Licences relating to the ‘maximum generating capacity of around 850 MW’ introduces an element of uncertainty with respect to Moray West’s ability to optimise the Project in terms of WTG type and numbers. This uncertainty relates to both the maximum generating capacity of the wind farm and the extent to which overplanting can be achieved to ensure maximum generating capacity can be achieved at all times even when some WTGs are not operating (e.g. during routine maintenance) or WTG failure.

Given that the earliest commissioning date Moray West will be targeting is 2024, there remains scope for existing WTGs to increase their rated outputs (based on existing design parameters) and for new WTGs to enter the market prior to Moray West securing a deal with a WTG supplier. Removal of the reference to 'maximum generating capacity of around 850 MW' within the Section 36 consent and Marine Licences would enable Moray West to remain as flexible as possible to accommodating any new and improved WTGs that may come available in the future within its consented Design Envelope.

It should also be noted that, while the final capacity of the Offshore Wind Farm will be based on the rated output (MW) of the selected model of WTG which complies with the consented WTG design parameters and numbers, the total maximum generating capacity (MW) will also be influenced by the capacity of the OfTI and the grid connection (Transmission Entry Capacity (TEC)).

### 2.1.3 Draft of requested changes to the Moray West Section 36 Consent

In accordance with Regulation 3 of The Electricity Generating Stations (Application for Variation of Consent) (Scotland) Regulations 2013, the requested changes to the Moray West Section 36 Consent are presented in Appendix A of this report (and Annex A of the accompanying variation application letter). These changes apply to:

- Annex 1: Description of the Development (and also reproduced in the introductory section of the Section 36 Consent document – Section 1.5); and
- The definition of the term 'Application' as included in Annex 2: Section 36 Consent Conditions – Definitions and Glossary of Terms which has been amended to make reference to this consent variation application.

An extract of the wording from Annex 1 of the Section 36 Consent and proposed changes to this wording (shown as strikethrough text and ***bold italics***) are provided below.

The Application is for the construction and operation of an offshore energy generating station, ~~within a maximum generating capacity of around 850 megawatts ("MW").~~ The offshore generating station shall comprise either:

1. No more than 85 three-bladed horizontal axis Wind Turbine Generators ("WTG") each with:
  - a. a maximum rotor tip height of 230 metres (measured from Highest Astronomical Tide ("HAT"));
  - b. a maximum rotor diameter of 195 metres;
  - c. a maximum hub height of 132.5 metres (measured from HAT);
  - d. a minimum blade tip clearance of 35 metres (measured from HAT);
  - e. blade width of up to 6 metres; and
  - f. a minimum spacing of 1,050 metres crosswind and 1,200 metres downwind.

**Or**

If the rotor tip height of the WTGs exceeds 230 metres (measured from HAT), no more than 72 WTGs each with:

- a. a maximum rotor tip height of 265 metres (measured from HAT);
- b. a maximum rotor diameter of 230 metres;
- c. a maximum hub height of 150 metres (measured from HAT);
- d. a minimum blade tip clearance of 35 metres (measured from HAT);
- e. ~~blade width of up to 6 metres~~ **blade width of up to 6.6 metres**; and
- f. a minimum spacing of 1,050 metres crosswind and 1,200 metres downwind.

2. No more than 275km of inter-array cable;
3. Monitoring equipment, such as metocean buoys;
4. Up to 85 foundations and substructures, and associated fixtures, fittings and protections;
5. Scour and inter-array cable protection; and
6. The design of the WTG substructure will be chosen from the following options:
  - i. Gravity base;
  - ii. Monopile;
  - iii. Jacket Foundation;
  - iv. Suction Caisson;

All as described in the Application ***and except to the extent modified by the foregoing.***

## 3 Information from Moray West Section 36 Consent Variation Screening Report: Chapter 3 Implications for EIA and HRA

### 3.1 Introduction

An assessment of the potential implications of the proposed changes to the Section 36 Consent and the associated offshore generating station Marine Licence on conclusions from the Moray West EIA and HRA was carried out to inform the Moray West Section 36 Consent Variation Screening Report. This information has been reproduced below for information in support of the application to vary the Section 36 Consent.

### 3.2 Overview of Moray West EIA and HRA documentation

An overview of the various documents submitted as part of the Section 36 Consent and Marine Licence Applications for the Moray West Offshore Wind Farm and associated Offshore Transmission Infrastructure (OfTI) is provided below.

#### 3.2.1 Application documents (July 2018)

The Section 36 Consent and associated Marine Licence applications submitted to Scottish Ministers in July 2018 were supported by the following documents:

- Moray West Environmental Impact Assessment (EIA) Report (July 2018) – Volumes 1 to 4 prepared in accordance with:
  - Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
  - Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017; and
  - Marine Works (Environmental Impact Assessment) Regulations 2007.
- Moray West Report to Inform an Appropriate Assessment (RIAA) (July 2018) prepared in accordance with:
  - The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (the Habitats Regulations) for Scottish Territorial Waters (0 to 12 nautical miles (nm)); and
  - The Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Offshore Habitats Regulations) which apply to the offshore marine area (12 to 200 nm).

The July 2018 consent applications also included a draft Decommissioning Programme prepared in accordance with the Energy Act 2004; a Safety Zone Statement, also prepared in accordance with the Energy Act 2004 and the Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007; and information to support a European Protected Species (EPS) Licence Application which is required under the 1994 Habitats Regulations and the 2017 Offshore Habitats Regulations for any activities that would potentially disturb any species protected under Annex IV of the European Habitats Directive (EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna).

### 3.2.2 Application Addendum Document (November 2018)

In November 2018 Moray West submitted an Application Addendum Document. This included additional information provided in response to representations received during consultation on the application, with particular regard to the following:

- Provision of additional information to address comments raised by NatureScot (formerly Scottish Natural Heritage (SNH)); Royal Society for the Protection of Birds (RSPB) and Marine Scotland Science (MSS) in relation to potential effects on ornithology. This included objections to the Project received from both SNH and RSPB on the grounds of possible adverse effects on the integrity (AEol) of a number of Special Protection Areas (SPAs) including in particular the East Caithness Cliffs SPA and North Caithness Cliffs SPA;
- Results from additional underwater noise modelling undertaken to demonstrate any potential difference in the results from the assessment of effects on marine mammals when using Conversion Factors (CFs) of 1% and 0.5%;
- Additional information relating to the socio-economics of the project in response to an objection from Marine Scotland Science Marine Analytical Unit (MSS-MAU); and
- Additional information provided in relation to proposed variations to the application including an assessment of revised design parameters which included the removal of the largest (Model 4) WTG in order to mitigate potential adverse landscape and visual impacts and reduction in the operational period of the Development from 50 years to 25 years to further reduce the potential for any AEol of the East Caithness Cliffs SPA and North Caithness Cliffs SPA.

### 3.2.3 Great Black-Backed Gull (GBBG) Report (March 2019)

In March 2019, Moray West submitted a report providing information on refinements to the assessment of in combination effects on the great black-backed gull feature of East Caithness Cliffs SPA (Moray West, 2019b).

Copies of all documents submitted as part of the Moray West Section 36 Consent and associated Marine Licence Applications are available to download from the Moray West Website or the Marine Scotland Website:

- <https://www.moraywest.com/document-library>
- <http://marine.gov.scot/ml/moray-west-offshore-windfarm>

## 3.3 Influence of design parameter in the impact assessment process

In accordance with current best practice Moray West adopted a Design Envelope approach (based on the Rochdale Principle) to defining the design of the Project. The basis of this approach is to maintain sufficient flexibility in the consented design parameters such that developments in WTG technology, substructure and / or OSP design, and installation methods or equipment can be accommodated in the final design of the Project.



The Design Envelope, by its nature, comprises a range of options in terms of sizes of WTG, substructure types, cable layouts and sizes and methods of installation. In order to determine the potential effects of these various options it is therefore necessary to identify the minimum or maximum parameters for each design feature. These parameters are then used to define the 'worst case scenario' (WCS) that is to be assessed in order to determine potential effects on the environment. The WCSs are highly receptor and impact specific, therefore can vary significantly across EIA topics. The extent of the variation between WCSs can be such that what might be a worst case for one receptor actually comprises the 'best case' for another.

With respect to the Moray West Project, of the four WTG models included in the original application (Moray West, 2018a), the WCSs generally comprised parameters associated with either the Model 1 (and 2) WTGs given this represented the highest number of turbines (85) or the Model 4 WTG (on the basis this comprised the largest turbine parameters). With the removal of the Model 4 WTG, the Model 3 WTG (the 72 turbine scenario as presented in the Section 36 Consent – Section 1.5 and Annex 1) became the new WCS for those topics / receptors where Model 4 had been the assessed WCS.

The key WTG design parameters, as consented, and forming the basis of this consent variation with respect to an increase in rotor blade width are summarised in Table 3.1 below.

Table 3.1 WTG Design Parameters Referred to in the 2018 Consent Application and Proposed Changes				
Design Envelope Parameter	WTG Model 1	WTG Model 2 (parameters relating to the 85 turbine scenario presented in the Section 36 Consent)	WTG Model 3 (parameters relating to the 72 turbine scenario presented in the Section 36 Consent)	Change
Maximum WTG numbers	85	85	72	No change
Maximum rotor tip height (WTGs)	199 m	230 m	265 m	No change
Maximum rotor blade diameter	164 m	195 m	230 m	No change
Minimum blade tip clearance (m) for all WTG models	35 m	35 m	35 m	No change
Blade width	5.4 m	Up to 6 m	Up to 6 m	Request to increase from up to 6 m to up to 6.6 m for the 72 turbine scenario (Model 3 WTG). Blade width for WTG Model 1 and WTG Model 2 will remain the same.

Table 3.1 WTG Design Parameters Referred to in the 2018 Consent Application and Proposed Changes				
Design Envelope Parameter	WTG Model 1	WTG Model 2 (parameters relating to the 85 turbine scenario presented in the Section 36 Consent)	WTG Model 3 (parameters relating to the 72 turbine scenario presented in the Section 36 Consent)	Change
Minimum spacing (downwind)	1,200 m	1,200 m	1,200 m	No change
Minimum spacing (crosswind)	1,050 m	1,050 m	1,050 m	No change
Layout	Grid	Grid	Grid	No change
WTG colour	RAL 7035 (light grey)	RAL 7035 (light grey)	RAL 7035 (light grey)	No change

### 3.4 Request to vary blade width for the Model 3 turbine – potential EIA and HRA implications

The exception to the WCS comprising either the Model 1 or Model 4 WTGs was ornithology where the assessed WCS for collision impacts was based on the Model 2 WTG<sup>1</sup> (85 turbine scenario as presented in the Section 36 Consent, Section 1.5 and Annex 1).

Collision impacts are assessed by carrying out Collision Risk Modelling (CRM). This relies on a range of input parameters, some species specific such as flight heights and speeds, some project specific such as turbine parameters. The turbine parameters included in the CRM carried out to inform the assessment of collision impacts presented in the Moray West application documents and the subsequent Appropriate Assessment carried out by Scottish Ministers are listed in Table 3.2 below (column 2). These are based on the 85 turbine scenario.

Given that the 85 turbine scenario (Model 2 WTG) comprised the WCS for the CRM in the application it was not necessary to present any CRM input parameters or modelled outputs for the 72 turbine scenario (Model 3 WTG) as consented in any of the application documents.

The proposed changes considered in this Consent Variation Screening Report relate specifically to an increase in maximum blade width (from 6 m to 6.6 m) for the 72 turbine scenario (Model 3 WTG) only. There are no proposed changes to the 85 turbine scenario (Model 2 WTG) which will remain at 6 m. The consented parameters for the 72 turbine scenario (as specified in the Section 36 Consent) are presented in Table 3.2 below (column 3). The parameters included in the CRM carried out as part of this screening report with respect to the proposed changes to blade width for the 72 turbine scenario (Model 3 WTG) are presented in Table 3.1 (column 5).

<sup>1</sup> When using Band (2012) Collision Risk Model Option 2. See Moray West EIA Volume 4 - Technical Appendix 10.2: Collision Risk Modelling \*CRM) for further detail.



It should be noted that, although listed as a design parameter in the Section 36 Consent, the only EIA topic where blade width is considered as an assessed WCS parameter is ornithology, specifically CRM. Blade width does not have any influence on the assessment of effects on any of the other topics e.g. landscape and visual, military and civil aviation included in the consent application documents (EIA and HRA). As such, there is no reference to blade width in any of the consent documents except for Chapter 10 of the EIA Report (Volume 1) and supporting Technical Appendix 10.2: Collision Risk Modelling and in Annex A: Collision Risk Modelling Parameters of the GBBG Report (March 2019).

**Table 3.2 Turbine Parameters Used for Collision Risk Modelling (CRM) in the 2018 Application and CRM to inform this Consent Variation Screening Report**

Collision Risk Modelling (CRM) input parameters		Design envelope parameters included in the Section 36 Consent – Annex 1		CRM parameters used in 2018 consent application (Model 2 WTG)	CRM parameters used to inform assessment of increased blade width for 72 turbine scenario
		85 turbine scenario (Model 2 WTG)	72 turbine scenario (Model 3 WTG)		
Number of turbines		85	72	85	72
Rotor radius (m)		97.5 (195 m rotor diameter)	115 (230 m rotor diameter)	97.5	115
Hub height (m)		132.5	150	132.5	150
Minimum blade tip clearance		35	35	35	35
Max blade width (m)		6	6	6	6.6 (increase from 6 m as specified in the Section 36 Consent)
Monthly proportion of time operational (all moths) (%)		Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	85	85
Pitch (°)		Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	8	8
Rotor speed (rpm)	Minimum	Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	6.0	6.0
	Maximum	Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	9.8	9.8

### 3.4.1 Validation of conclusions from the assessment of collision risk impacts presented in the EIA Report and Application Addendum Document

The following section presents a summary of the results from additional CRM carried out as part of EIA Screening to inform the validation of conclusions from the assessment of collision risk on kittiwake, great black-backed gull, gannet and herring gull with respect to an increase in blade width from 6 m to 6.6 m. Further detail on the approach to the additional CRM and results for kittiwake, great black-backed gull, herring gull and gannet are presented in Appendix B. The additional CRM presented in the Moray West Section 36 Consent Variation Screening Report, and reproduced below, was carried out by NIRAS who carried out the original ornithological impact assessment for the Moray West application.

#### 3.4.1.1 Validation of conclusions of effect significance – EIA (Project alone)

Results from the validation of conclusions of effect significance of collision mortality impacts on kittiwake, great black-backed gull, gannet and herring gull are summarised in Table 3.2. Results from the additional CRM carried out for the 6.6 m blade width for the 72 turbine scenario (Model 3 WTG) are presented in Appendix B of this document, along with an assessment of the implications of these results on the conclusions of effect significance presented in the Moray West EIA Report – Volume 2: Chapter 10 Ornithology (for all species) and the Moray West Application Addendum Document – Part 1 (kittiwake only). The CRM methodology used in Appendix B was exactly the same as that used in the Application Documents. No changes to the CRM methodology in terms of updated guidance or revised input parameters were identified.

Based on the information presented in Table 3.2 and Appendix B it was concluded that there is no increase in predicted annual collision mortality rates associated with an increase in blade width from 6 m to 6.6 m for the 72 turbine scenario as defined in the Section 36 Consent – Annex 1 and Offshore Generating Station Marine Licence, Section 2.1. Conclusions of effect significance presented in the Moray West EIA – Volume 2 Chapter 10 (all species) and Moray West Application Addendum Document (2018) (kittiwake) therefore remain valid.

Table 3.3 Results from Validation of Conclusions of Effect Significance (EIA) of Collision Impacts				
Band Model Option + Avoidance Rate (AR)	Results from Moray West Application Documents (Moray West 2018a; Moray West 2018b; and Moray West 2019)		Results from additional collision risk modelling (2020 assessment – proposed varied parameters for Model 3 WTG (6.6 m blade width)	
	Predicted annual collision mortality <sup>Note 2 and 3</sup>	Conclusions of effect significance	Predicted annual collision mortality	Validation of conclusions of effect significance
<b>Kittiwake</b>				
Option 2 <sup>Note 1</sup> (98.9%)	109	Minor adverse. Not significant in EIA terms.	107	Conclusions of effect significance presented in the Moray West EIA and Moray West Application Addendum Document remain valid.

Table 3.3 Results from Validation of Conclusions of Effect Significance (EIA) of Collision Impacts				
Band Model Option + Avoidance Rate (AR)	Results from Moray West Application Documents (Moray West 2018a; Moray West 2018b; and Moray West 2019)		Results from additional collision risk modelling (2020 assessment – proposed varied parameters for Model 3 WTG (6.6 m blade width))	
	Predicted annual collision mortality <sup>Note 2 and 3</sup>	Conclusions of effect significance	Predicted annual collision mortality	Validation of conclusions of effect significance
<b>Great black-backed gull</b>				
Option 2 (99.5%)	9.3	Minor adverse. Not significant in EIA terms.	9.04	Conclusions of effect significance presented in the Moray West EIA remain valid.
<b>Gannet</b>				
Option 2 (98.9%)	12.4	Negligible to minor adverse. Not significant in EIA terms.	12.0	Conclusions of effect significance presented in the Moray West EIA remain valid.
<b>Herring gull</b>				
Option 2 (99.5%)	12.6	Minor adverse. Not significant in EIA terms.	12.2	Conclusions of effect significance presented in the Moray West EIA remain valid.
<p><b>Note 1:</b> Both the Basic and Extended models of Band (2012) allow for the use of two 'Options' termed Options 1-4. Options 1 and 2 use the Basic model with Options 3 and 4 utilising the Extended model. The difference between the two Options under each model is linked to the use of flight height data. Options 2 and 3 use generic data from Johnston et al. (2014) whereas Options 1 and 4 use site-specific data derived from site-specific surveys. Option 2 was used for the Moray West assessment for kittiwake on the basis that site specific flight height data was not available for the assessment.</p> <p><b>Note 2:</b> Results for predicted annual collision mortality for kittiwake are based on information presented in the Moray West Application Addendum Document – PART 1- Chapter 2, Table 2.5.</p> <p><b>Note 3:</b> Collision mortality rates for great black-backed gull are based on information presented in the Moray West EIA Report – Volume 2, Chapter 10, Table 10.8.9.</p>				

### 3.4.1.2 Validation of conclusions of effect significance – EIA (cumulative effects)

Results presented above are in relation to the project level impacts only. Results from the cumulative assessment were not presented in the Moray West Consent Variation Screening Report on the basis that, as shown in Table 3.2, it was concluded that there would be no change to the conclusions from the assessment of effect significance for the Project alone. It therefore was also concluded that there will be no change or implications for the conclusions of cumulative effect significance as a result of the increase in blade width from 6 m to 6.6 m.

### **3.4.2 Validation of conclusions from the assessment of AEol in relation to kittiwake feature of East Caithness Cliffs SPA**

#### **3.4.2.1 Conclusion from assessment of AEol - kittiwake**

The conclusions from the assessment of AEol due to collision mortality impacts on the kittiwake feature of the East Caithness Cliffs SPA as presented in the Moray West Application Addendum Document 2018 (which updated information included in the Moray West RIAA 2018) are presented below.

For Moray West alone, the predicted kittiwake collision mortality apportioned to the East Caithness Cliffs SPA is 57 birds per annum (based on Band Option 2 and a 98.9% avoidance rate). The Population Viability Analysis (PVA) modelled outputs indicate that after 25 years, based on a predicted collision mortality of 57 the kittiwake population of the East Caithness Cliffs SPA would be 97% the size of the unimpacted population (ratio impacted to un-impacted population size of 0.966). It was therefore concluded that there would be no AEol of the kittiwake feature of the East Caithness Cliffs SPA for Moray West alone.

Kittiwake collision mortalities apportioned to the East Caithness Cliffs SPA as a result of the Moray West Project in-combination with other projects range from 325 birds per annum to 172 birds per annum. This range in annual collision mortality takes into account the application of a range of refinements that were applied to the assessment of in-combination effects. These refinements included revised flight speeds, updated Design Envelopes for other projects (Moray East and Nearth na Gaoithe), updated approaches to apportioning and a reduction in collisions from the Moray West project from 57 to 53 through a reduction in turbine numbers, design refinements or both (approx. 7% reduction in collision). Further detail on the various refinements applied to the assessment of in-combination effects presented in the Moray West Application Addendum Document (2018) PART 1, Chapter 3 Section 3.6.2.

Of the nine refinements presented in the Application Addendum Document, only four (refinements 1 to 4) were accepted by Scottish Natural Heritage (SNH). Taking these four refinements into account, the final accepted in-combination collision mortality rate for kittiwake presented in the Moray West Appropriate Assessment (Scottish Ministers, 2019) was 250 birds per annum (as presented in Table 3.47 of the Moray West Application Addendum Document 2018). The PVA modelled outputs indicate that after 25 years, based on 250 collisions per annum, the kittiwake population of the East Caithness Cliffs SPA would be 86% the size of the unimpacted population (ratio impacted to un-impacted population size of 0.858). It was concluded there would be no AEol of the East Caithness Cliffs SPA.

#### **3.4.2.2 Validation of conclusions from assessment of AEol for kittiwake**

Table 3.3 below presents unapportioned and apportioned collision risk estimates for kittiwake feature of East Caithness Cliffs SPA as presented in the Moray West Application Addendum Document 2018 compared with unapportioned and apportioned collision risk estimates calculated using the 72 turbine scenario (Model 3 WTG) parameters with increased blade width to 6.6 m.

**Table 3.4 Collision risk estimates for kittiwake feature of East Caithness Cliffs SPA using the 72 turbine scenario (Model 3 WTG) parameters with increased blade width compared to results presented in the Moray West Application Addendum Document 2018.**

Collisions	Results from Moray West Application Addendum Document 2018 (based on parameters for Model 2 WTG)				Results from additional collision risk modelling (2020 assessment) based on proposed varied parameters for Model 3 WTG (6.6 m blade width)			
	Breeding	Post-breeding	Pre-breeding	Annual	Breeding	Post-breeding	Pre-breeding	Annual
Unapportioned collisions	79	24	7	109	77	23	7	107
Collisions apportioned to East Caithness Cliffs SPA	55	1	1	57	54	1	1	56
Collisions apportioned to East Caithness Cliffs SPA with 7% reduction	51	1	0	53 <sup>Note 1</sup>	50	1	0	52 <sup>Note 2</sup>
<b>Note 1</b> – Annual total presented as a rounded value. Actual values (breeding = 51.12, post breeding = 1.28 and pre-breeding = 0.48) = 52.88								
<b>Note 2</b> – Annual total presented as a rounded value. Actual values (breeding = 50.25, post breeding = 1.26 and pre-breeding = 0.47) = 51.99								

As illustrated above, the recalculated collision rates based on the 72 turbine scenario (Model 3 WTG) parameters with an increased blade width from 6 m to 6.6 m, are lower than the collision rates used to support the conclusions reached in the Moray West Application Addendum Document 2018 and the Scottish Minister's Appropriate Assessment for the kittiwake feature of the East Caithness Cliffs SPA. It was therefore concluded that the conclusions reached by Moray West and the Scottish Ministers in relation to the effects of the Project alone on the integrity of the East Caithness Cliffs SPA remain valid.

The conclusions reached by Moray West and the Scottish Ministers with respect to the effect of the Project in-combination with other plans and projects on the integrity of the East Caithness Cliffs SPA therefore also remain valid.

### 3.4.3 Validation of conclusions from the assessment of AEoI in relation to the great black-backed gull feature of East Caithness Cliffs SPA

#### 3.4.3.1 Conclusion of assessment of AEoI – great black-backed gull

Based on information presented in the GBBG Report (Moray West, 2019) it was concluded that, for Moray West alone, the predicted collision mortality apportioned to the East Caithness Cliffs SPA for GBBG is 1.96 birds per annum (GBBG Report – Table 1.4). The PVA modelled outputs indicate that after 25 years, based

on 1.96 collisions per annum, the GBBG population of the East Caithness Cliffs SPA would be 90% the size of the unimpacted population (ratio impacted to un-impacted population size of 0.898).

As with the assessment of AEol undertaken for the Moray West Project in combination with other projects for the kittiwake features of the East Caithness Cliffs SPA, a number of refinements were also applied to the assessment of AEol on the East Caithness Cliffs SPA GBBG population. In total, seven refinements were presented in the GBBG Report. These were all accepted by Marine Scotland Science (MSS) and SNH. Based on the application of these refinements the predicted GBBG collision mortality for Moray West in combination with other projects apportioned to the East Caithness Cliffs SPA is 3.36 birds per annum (based on Band Option 3 and 98.9% avoidance rate) as stated in the Moray West Appropriate Assessment (Scottish Ministers, 2019).

The PVA modelled outputs as presented in the GBBG Report – Table 1.4 indicate that after 25 years, based on 3.36 collisions per annum as a result of Moray West in-combination with other projects, the GBBG population of the East Caithness Cliffs SPA would be 85% the size of the unimpacted population (ratio impacted to un-impacted population size of 0.851).

Based on these results it was concluded in the Moray West Appropriate Assessment (Scottish Ministers, 2019) that, subject to the application of conditions requiring pre-construction monitoring of GBBG through a programme of gull tagging, there will be no adverse effect on the site integrity of East Caithness Cliffs SPA in respect of GBBG as a result of Moray West alone or in-combination with the other Moray Firth Projects (Moray East and Beatrice).

### 3.4.3.2 Validation of conclusions from assessment of AEol for great black-backed gull

Table 3.4 below presents unapportioned and apportioned collision risk estimates for great black-backed gull at East Caithness Cliffs using the 72 turbine scenario (Model 3 WTG) parameters with increased blade width to 6.6 m.

Table 3.5 Collision risk estimates for great black-backed gull feature of East Caithness Cliffs SPA using the 72 turbine scenario (Model 3 WTG) parameters with increased blade width compared to results presented in the Moray West Application Addendum Document 2018.						
Collisions	Results from Moray West GBBG Report 2019 (based on parameters for Model 2 WTG)			Results from additional collision risk modelling (2020 assessment) based on proposed varied parameters for Model 3 WTG (6.6 m blade width)		
	Breeding	Non-breeding	Annual	Breeding	Non-breeding	Annual
Unapportioned collisions	5.30	4.00	9.30	3.89	5.15	9.04
Collisions apportioned to East Caithness Cliffs SPA	1.54	0.42	1.96	1.50	0.41	1.91



As illustrated above, the recalculated collision rates based on the 72 turbine scenario (Model 3 WTG) parameters with an increased blade width from 6 m to 6.6 m, are lower than the collision rates used to support the conclusions reached in the Moray West Application Addendum Document 2018, Moray West GBBG Report and the Scottish Minister's Appropriate Assessment for the great black-backed gull feature of the East Caithness Cliffs SPA. It was therefore concluded that the conclusions reached by Moray West and the Scottish Ministers in relation to the effects of the Project alone on the integrity of the great black-backed gull feature of the East Caithness Cliffs SPA remain valid.

The conclusions reached by Moray West and the Scottish Ministers with respect to the effect of the Project in-combination with other plans and projects on the integrity of the great black-backed gull feature of the East Caithness Cliffs SPA therefore also remain valid.

### 3.4.4 Validation of conclusions from the assessment of AEol in relation to the herring gull feature of East Caithness Cliffs SPA

#### 3.4.4.1 Conclusion from assessment of AEol – herring gull

The conclusions from the assessment of AEol due to collision mortality impacts on the herring gull feature of the East Caithness Cliffs SPA as presented in the Moray West RIAA 2018 are presented in Table 3.6 below against the collision estimates calculated for this variation proposal using the envelope for the 72 turbine scenario (Model 3 WTG) parameters with an increased blade width from 6 m to 6.6 m.

Table 3.6 Collision risk estimates for herring gull feature of East Caithness Cliffs SPA using 72 turbine scenario (Model 3 WTG) parameters with increased blade width to 6.6 m compared to results presented in the Moray West Application Addendum Document 2018.						
Collisions	Results from Moray West RIAA 2018 (based on parameters for Model 2 WTG)			Results from additional collision risk modelling (2020 assessment) based on proposed varied parameters for Model 3 WTG (6.6 m blade width)		
	Breeding	Non-breeding	Annual	Breeding	Non-breeding	Annual
Unapportioned collisions	11.7	0.9	12.6	11.4	0.8	12.2
Collisions apportioned to East Caithness Cliffs SPA	3.8	0.01	3.9	3.7	0.01	3.7

Of the 13 herring gull collisions predicted per annum using Band Option 2 with 99.5% avoidance rate, four are apportioned to the East Caithness Cliffs SPA. This represents 0.02% of the SPA population and a 0.09% increase in baseline mortality.

It was concluded in the Moray West RIAA 2018 that predicted level of collision mortality apportioned to the East Caithness Cliffs SPA represents a negligible proportion of the SPA population and a negligible increase in the baseline mortality of the SPA population. It was therefore concluded there would be no AEol on the herring gull feature of the East Caithness Cliffs SPA as a result of collision risk impacts.

#### **3.4.4.2 Validation of conclusion from assessment of AEol – herring gull**

The collision risk estimates presented in Table 3.6 for the 72 turbine scenario (Model 3 WTG) with increased blade width to 6.6 m are lower than the corresponding collision risk estimates used to support the conclusions reached in the Moray West RIAA and Scottish Minister's Appropriate Assessment 2019 for the herring gull feature at East Caithness Cliffs SPA (i.e. those presented in Table 3.6). This confirmed that the proposed changes to the turbine parameters considered in the Moray West Section 36 Consent Variation Screening Report (i.e. an increase in blade width from 6 m to 6.6 m for the 72 turbine scenario) would not increase the collision rates for the herring gull feature of the East Caithness Cliffs SPA when compared to the collision risk estimates used to support previous assessments conducted by the Applicant and Scottish Ministers.

### **3.5 Request to remove reference to 'maximum generating capacity of around 850 MW'**

As stated in Chapter 2, Section 2.1.2, and the Moray West EIA Report - Volume 2, Chapter 4: Description of the Development, Section 4.4.1 Offshore Wind Turbine Generator (WTGs), in order to retain flexibility in the choice of WTG to be installed at the Moray West Site and ensure that anticipated changes in available technology and project economics can be accommodated within the Project design, Moray West purposely avoided making any reference to either a maximum MW capacity for the offshore wind farm or MW capacity for any of the WTG models.

As such it was concluded in the Moray West EIA Report - Volume 2, Chapter 4: Description of the Development, Section 4.4.1 Offshore Wind Turbine Generator (WTGs) (paragraph 4.4.1.2) that the EIA assessments presented in the topic specific chapters were not linked to or affected by WTG capacity.

With respect to assessing the implications of the request to remove the reference to Moray West having a 'maximum generating capacity around 850 MW' given that no assessment of this MW cap was ever undertaken in the EIA, there were no conclusions of effect significance against which a validation exercise could be carried out. Therefore, given that the statement presented in paragraph 4.4.1.2 of the Moray West EIA Report - Volume 2 Chapter 4: Description of the Development, remains unchanged "the EIA assessments presented in the topic specific chapters are not linked to or affected by WTG capacity" it was concluded that the conclusions from the assessment of effect significance presented in these topic specific



chapters remain valid with respect to removal of reference to a 'maximum generating capacity around 850 MW'.

## 4 Conclusions from the Moray West Section 36 Consent Variation Screening Report

### 4.1 Introduction

A summary of the key conclusions from the Moray West Section 36 Consent Variation Screening Report are provided below.

#### 4.1.1 Proposed change to blade width

As discussed in Chapter 3, results from additional collision risk modelling carried out for the 72 turbine scenario with an increase in blade width from 6 m to 6.6 m confirmed that, for all four species assessed for collision risk impacts (kittiwake, great black-backed gull, gannet and herring gull) the revised collision risk estimates are lower than those used to support the Moray West Offshore Wind Farm application and the consent decision reached by Scottish Ministers.

It was therefore concluded that the conclusions reached in the Moray West Offshore Wind Farm consent application documents, and by Scottish Ministers, with respect to effect significance (EIA) for all four species (kittiwake, great black-backed gull, gannet and herring gull) in terms of both the project alone and in-combination with other projects, remain valid.

With regard to the assessment of AEol (HRA), the conclusions reached by Moray West and the Scottish Ministers with respect to the effect of the Project alone and in-combination with other plans and projects on the integrity of the kittiwake, great black-backed gull and herring gull features<sup>2</sup> of the East Caithness Cliffs SPA also remain valid.

#### 4.1.2 Removal of reference to ‘maximum generating capacity of around 850 MW’

Given that there was no reference to a MW capacity included in the Moray West offshore wind farm consent application and that none of the EIA assessments presented in topic specific chapters of the EIA Report were linked to, or affected by WTG capacity, it was concluded that removal of reference to Moray West having a ‘maximum generating capacity of around 850 MW’ will not affect any of the conclusions of effect significance presented in these chapters of the EIA Report (and all other application documentation). The conclusions of effect significance therefore remain valid with respect to removal of reference to a ‘maximum generating capacity of around 850 MW’.

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<sup>2</sup> Gannet was not assessed in the Moray West application as an HRA species.

## 5 References

Moray West (2018a). Moray West EIA Report – Volumes 1 to 4. July 2018.

Moray West (2018b). Moray West Report to Inform an Appropriate Assessment (RIAA). July 2018.

Moray West (2019a). Moray West Letter Requesting Removal of Alternative Site Boundary. February 2019.

Moray West (2019b). Information to inform HRA - Refinement to the assessment of in-combination effects on great black-backed gull feature of East Caithness Cliffs SPA (Great Black-Backed Gull Report). March 2019.

Scottish Ministers. Section 36 Consent – Decision Notice and Conditions. 14<sup>th</sup> June 2019.

Scottish Ministers. Moray West Appropriate Assessment. 14<sup>th</sup> June 2019.

Marine Scotland, Licence to construct, alter or improve any works and deposit any substance or object within the UK Marine Licensing Area, Licence Number: 06763/19/0, 14<sup>th</sup> June 2019.

## Appendix A – Requested Changes to Moray West Section 36 Consent

Mr Daniel H. Finch  
Moray Offshore Windfarm (West) Limited  
C/O Shepherd And Wedderburn LLP  
Condor House  
10 St. Paul's Churchyard  
London  
EC4M 8AL

Our Reference: 012/OW/MORLW – 8

14 June 2019

Dear Mr Finch

**THE ELECTRICITY ACT 1989 (AS AMENDED)**

**THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT)  
(SCOTLAND) REGULATIONS 2017 (AS AMENDED)**

**DECISION NOTICE FOR THE SECTION 36 CONSENT FOR THE CONSTRUCTION  
AND OPERATION OF THE MORAY WEST OFFSHORE WIND FARM,  
APPROXIMATELY 22.5KM SOUTHEAST FROM THE CAITHNESS COASTLINE**

**1 Application and description of the Development**

1.1 On 5 July 2018, Moray Offshore Windfarm (West) Ltd (Company Number 10515140) having its registered office at Condor House, 10 St. Paul's Churchyard, London EC4M 8AL ("Moray West" or "the Company"), submitted to the Scottish Ministers applications under the Electricity Act 1989 (as amended) ("the Electricity Act 1989") for:

- A consent under section 36 ("s.36") of the Electricity Act 1989 for the construction and operation of the Moray West Offshore Wind Farm, approximately 22.5km southeast off the Caithness coastline ("the Application").

1.2 The Application was accompanied by an Environmental Impact Assessment Report ("EIA Report") as required under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) ("the 2017 EW regulations") and a Habitats Regulations Appraisal ("HRA") as required under the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended) and the Conservation of Habitats and Species Regulations 2017

(collectively hereinafter referred to as “the Habitats Regulations”). An addendum of additional information (“EIA Addendum Report”) concerning ornithology and seascape and landscape visual impacts was submitted by the Company on 23 November 2018. A Report to Inform the Appropriate Assessment (“RIAA”) was submitted on 5 July 2018. A Population Viability Analysis Report (“PVA Report”) to amend and update the RIAA was submitted on 31 August 2018. On 18 March 2019, the Company also submitted an “Information to Inform HRA– Great Black-Backed Gull” Report (“GBBG Report”) in addition to the RIAA. The EIA Addendum Report, PVA Report and the GBBG Report are also referred to as part of the Application.

1.3 The Scottish Ministers carried out four consultation exercises:

- 1) A consultation on the Application (“the Original Consultation”);
- 2) A consultation on the PVA Report; this consultation was carried out at the same time as the Original Consultation. Responses were included within the Original Consultation. Therefore the PVA consultation is considered part of the Original Consultation;
- 3) A consultation on the EIA Addendum Report (“the EIA Addendum Consultation”); and
- 4) A consultation on the GBBG Report (“the GBBG Report Consultation”).

1.4 In addition to the Application, the Company has also applied for two marine licences (under the Marine and Coastal Access Act 2009 and the Marine (Scotland) Act 2010) to construct the offshore renewable energy works and offshore transmission infrastructure (“OfTI”). Separate decision notices will be issued in respect of any marine licences granted.

1.5 The Application is for the construction and operation of an offshore energy generating station. ~~within a maximum generating capacity of around 850 megawatts (“MW”).~~ The offshore generating station shall comprise either:

1. No more than 85 three-bladed horizontal axis Wind Turbine Generators (“WTG”) each with:
  - a. a maximum rotor tip height of 230 metres (measured from Highest Astronomical Tide (“HAT”));
  - b. a maximum rotor diameter of 195 metres;
  - c. a maximum hub height of 132.5 metres (measured from HAT);
  - d. a minimum blade tip clearance of 35 metres (measured from HAT);
  - e. blade width of up to 6 metres; and
  - f. a minimum spacing of 1,050 metres crosswind and 1,200 metres downwind.

**or**

If the rotor tip height of the WTGs exceeds 230 metres (measured from HAT), no more than 72 WTGs each with:

- a. a maximum rotor tip height of 265 metres (measured from HAT);
- b. a maximum rotor diameter of 230 metres;
- c. a maximum hub height of 150 metres (measured from HAT);
- d. a minimum blade tip clearance of 35 metres (measured from HAT);
- e. ~~blade width of up to 6 metres~~ *blade width of up to 6.6 metres*; and
- f. a minimum spacing of 1,050 metres crosswind and 1,200 metres downwind;

2. No more than 275km of inter-array cable;
3. Monitoring equipment, such as metocean buoys;
4. Up to 85 foundations and substructures, and associated fixtures, fittings and protections;
5. Scour and inter-array cable protection;
6. The design of the WTG substructure will be chosen from the following options:
  - i. Gravity base;
  - ii. Monopile;
  - iii. Jacket Foundation;
  - iv. Suction Caisson;

All as described in the Application *and except to the extent modified by the foregoing.*

- 1.6 The total area within the Moray West Offshore Wind Farm ("the Development"), site boundary is 225km<sup>2</sup>. The location and boundary of the Development site is shown in Figure 1.

**This decision notice contains the Scottish Ministers' decision to grant consent for the Development detailed above, in accordance with regulation 21 of the 2017 EW regulations.**

**Sections 2 to 10 of the Section 36 Consent Document have not been reproduced here as no changes are required to these sections.**

## Annex 1 – DESCRIPTION OF THE DEVELOPMENT

The Application is for the construction and operation of an offshore energy generating station. ~~within a maximum generating capacity of around 850 megawatts (“MW”).~~ The offshore generating station shall comprise either:

1. No more than 85 three-bladed horizontal axis Wind Turbine Generators (WTG) each with either:

- a. a maximum rotor tip height of 230 metres (measured from HAT);
- b. a maximum rotor diameter of 195 metres;
- c. a maximum hub height of 132.5 metres (measured from HAT);
- d. a minimum blade tip clearance of 35 metres (measured from HAT);
- e. blade width of up to 6 metres; and
- f. a minimum spacing of 1,050 metres crosswind and 1,200 metres downwind.

**or**

If the rotor tip height of the WTGs exceeds 230 metres (measured from HAT), no more than 72 WTGs each with:

- a. a maximum rotor tip height of 265 metres (measured from HAT);
- b. a maximum rotor diameter of 230 metres;
- c. a maximum hub height of 150 metres (measured from HAT);
- d. a minimum blade tip clearance of 35 metres (measured from HAT);
- e. ~~blade width of up to 6 metres~~ *blade width of up to 6.6 metres*; and
- f. a minimum spacing of 1,050 metres crosswind and 1,200m downwind

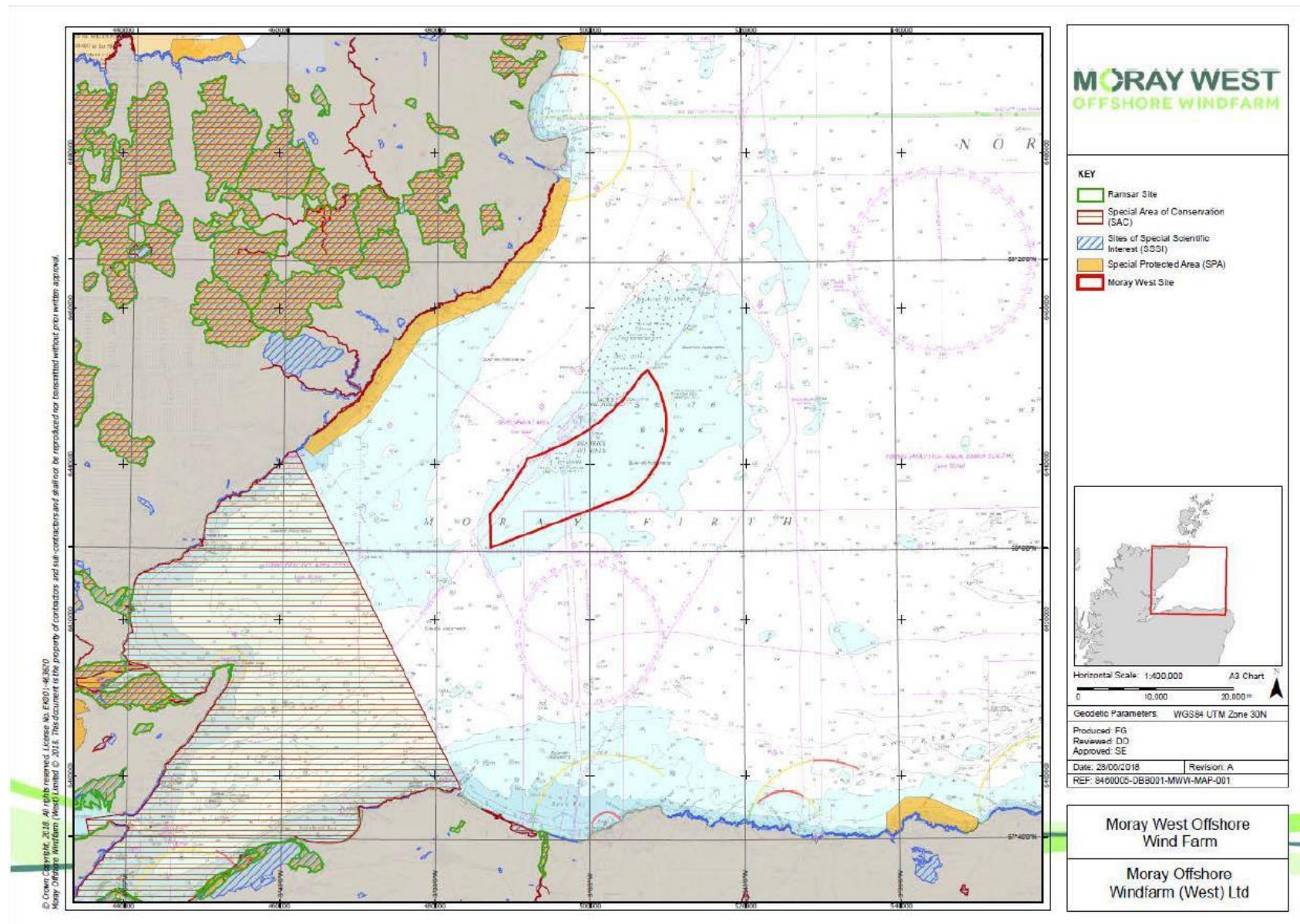
2. No more than 275km of inter-array cable;
3. Monitoring equipment, such as metocean buoys;
4. Up to 85 foundations and substructures, and associated fixtures, fittings and protections;
5. Scour and inter-array cable protection; and
6. The design of the WTG substructure will be chosen from the following options:
  - i. Gravity base;
  - ii. Monopile;
  - iii. Jacket Foundation;
  - iv. Suction Caisson;

All as described in the Application *and except to the extent modified by the foregoing.*



## Annex 1 – Description of the Development

Figure 1 Moray West Offshore Windfarm Site



## **ANNEX 2 – SECTION 36 CONSENT CONDITIONS**

**The consent granted under Section 36 of the Electricity Act 1989 is subject to the following conditions:**

The Company must submit the requested plans as detailed in the conditions prior to the Commencement of the Development, where required, in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with any such advisors or organisations as detailed in the conditions or as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approvals are granted.

The Development must, at all times, be constructed in accordance with the approved plans as updated or amended.

Any updates or amendments made to the approved plans must be submitted, in writing, to the Scottish Ministers for their prior written approval.

The Company must satisfy itself that all contractors or sub-contractors are aware of the extent of the Development for which this consent has been granted, the activity which is consented and the terms of the conditions attached to this consent. All contractors and sub-contractors permitted to engage in the Development must abide by the conditions set out in this consent.

The Company must ensure that all personnel adhere to the Scottish Marine Wildlife Watching Code, where appropriate, during all construction, operation and maintenance activities.

### **Part 1 – Conditions Attached to Section 36 Consent**

#### **1. Duration of the Consent**

The consent is for a period of 25 years from the date of Final Commissioning of the Development.

Written confirmation of the dates of First Commissioning of the Development and Final Commissioning of the Development must be provided by the Company to the Scottish Ministers and to Aberdeenshire Council, Moray Council, the Highland Council and Scottish Ministers no later than one calendar month after these respective dates.

**Reason: To define the duration of the consent.**

#### **2. Commencement of the Development**

The Commencement of the Development must be no later than five years from the date of this consent, or in substitution such other later period as the Scottish Ministers may hereafter direct in writing. The Company must provide written confirmation of the intended date of Commencement of the Development to the Scottish Ministers and to Aberdeenshire Council, Moray Council and the Highland Council no later than one calendar month before that date.

**Reason:** *To ensure that the Commencement of the Development is undertaken within a reasonable timescale after consent is granted.*

### **3. Decommissioning**

There must be no Commencement of the Development unless a Decommissioning Programme (“DP”) has been submitted to and approved in writing by the Scottish Ministers. Such approval may only be granted following consultation by the Scottish Ministers with Scottish Environmental Protection Agency (“SEPA”) and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. The DP must outline measures for the decommissioning of the Development, proposals for the removal of the Development, the management and timing of the works and, environmental management provisions.

The Development must be decommissioned in accordance with the approved DP, unless otherwise agreed in writing in advance with the Scottish Ministers.

**Reason:** *To ensure the decommissioning and removal of the Development in an appropriate and environmentally acceptable manner, and in the interests of safety and environmental protection.*

### **4. Assignment**

This consent must not be assigned without the prior written authorisation of the Scottish Ministers. The Scottish Ministers may authorise the assignment of the consent (with or without conditions) or refuse assignment as they may see fit. The consent is not capable of being assigned, alienated or transferred otherwise than in accordance with the assignment procedure as directed by Scottish Ministers.

**Reason:** *To safeguard the obligations of the consent if transferred to another company.*

### **5. Redundant wind turbine generators**

If one or more Wind Turbine Generator (“WTG”) fails to generate electricity for a continuous period of 12 months, then unless otherwise agreed in writing by the Scottish Ministers, the Company must: (i) by no later than the date of expiration of the 12 month period, submit a scheme to the Scottish Ministers setting out the manner in which the relevant WTG(s) and associated infrastructure will be removed from the site and the sea bed restored; and (ii) implement the approved scheme within six months of the date of its approval, or such other date as agreed in writing by the Scottish Ministers, all to the satisfaction of the Scottish Ministers.

**Reason:** *To ensure that any redundant WTG(s) is/are removed from the site, in the interests of safety, amenity and environmental protection.*

## **6. Incident Reporting**

In the event of any breach of health and safety or environmental obligations relating to the Development during the period of this consent, the Company must provide written notification of the nature and timing of the incident to the Scottish Ministers within 24 hours of the incident occurring. Confirmation of remedial measures taken and/or to be taken to rectify the breach must be provided, in writing, to the Scottish Ministers within a period of time to be agreed by the Scottish Ministers.

**Reason:** *To keep the Scottish Ministers informed of any such incidents which may be in the public interest.*

## **7. Implementation in accordance with approved plans and requirements of this consent**

Except as otherwise required by the terms of this consent, the Development must be constructed and operated in accordance with the Application, any other supplementary and supporting information lodged in support of the Application (such as the additional environmental information (“EIA Addendum Report”), submitted by the Company on 23 November 2018, the Population Viability Analysis Report (“PVA Report”) submitted by the Company on 31 August 2018 and “the Information to Inform HRA - Great Black-Backed Gull” Report (“GBBG Report”), submitted on 18 March 2019).

**Reason:** *To ensure that the Development is carried out in accordance with the approved details.*

## **8. Transportation for site inspections**

As far as reasonably practicable, the Company must, on being given reasonable notice by the Scottish Ministers (of at least 72 hours), provide transportation to and from the site for any persons authorised by the Scottish Ministers to inspect the site.

**Reason:** *To ensure access to the site for the purpose of inspecting compliance with this consent.*

## **9. Construction Programme**

The Company must, no later than six months prior to the Commencement of the Development, submit a Construction Programme (“CoP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with Scottish Natural Heritage (“SNH”), Aberdeenshire Council, Scottish Fishermen’s Federation (“SFF”) and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted. The CoP must set out:

- a) The proposed date for Commencement of the Development;

- b) The proposed timings for mobilisation of plant and delivery of materials, including details of onshore lay-down areas;
- c) The proposed timings and sequencing of construction work for all elements of the Development infrastructure;
- d) Contingency planning for poor weather or other unforeseen delays; and
- e) The scheduled date for Final Commissioning of the Development.

The final CoP must be sent to Aberdeenshire Council, Maritime and Coastguard Agency (“MCA”), Northern Lighthouse Board (“NLB”), Moray Council and the Highland Council for information only.

**Reason:** *To confirm the timing and programming of construction.*

## **10. Construction Method Statement**

The Company must, no later than six months prior to the Commencement of the Development submit a Construction Method Statement (“CMS”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH, MCA, NLB, SFF, Aberdeenshire Council and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The CMS must include, but not be limited to:

- a) Methods of construction as they relate to all aspects of the Development.
- b) Details of the commencement dates, duration and phasing for the key elements of construction, the working areas, the construction procedures and good working practices for installing the Development.
- c) Details of the roles and responsibilities, chain of command and contact details of company personnel, any contractors or sub-contractors involved during the construction of the Development.
- d) Details of the manner in which the construction related mitigation steps proposed in the Application are to be delivered.

The CMS must adhere to the construction methods assessed in the Application. The CMS also must, so far as is reasonably practicable, be consistent with the Design Statement (“DS”), the Environmental Management Plan (“EMP”), the Vessel Management Plan (“VMP”), the Navigational Safety Plan (“NSP”), the Piling Strategy (“PS”), the Cable Plan (“CaP”) and the Lighting and Marking Plan (“LMP”).

The final CMS must be sent to Moray Council and the Highland Council for information only.

**Reason:** *To ensure the appropriate construction management of the Development, taking into account mitigation measures to protect the environment and other users of the marine area.*

## 11. Piling Strategy

The Company must, no later than six months prior to the Commencement of the Development, submit a Piling Strategy (“PS”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH and any such other advisors as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The PS must include, but not be limited to:

- a) Details of expected noise levels from pile-drilling/driving in order to inform point d below;
- b) Full details of the proposed method and anticipated duration of piling to be carried out at all locations;
- c) Details of soft-start piling procedures and anticipated maximum piling energy required at each pile location; and
- d) Details of any mitigation such as Passive Acoustic Monitoring (“PAM”), Marine Mammal Observers (“MMO”), use of Acoustic Deterrent Devices (“ADD”) and monitoring to be employed during pile-driving, as agreed by the Scottish Ministers.

The PS must be in accordance with the Application and must also reflect any relevant monitoring or data collection carried out after submission of the Application. The PS must demonstrate the means by which the exposure to and/or the effects of underwater noise have been mitigated in respect to harbour porpoise, minke whale, bottlenose dolphin, harbour seal, grey seal and Atlantic salmon.

The PS must, so far as is reasonably practicable, be consistent with the EMP, the Project Environmental Monitoring Programme (“PEMP”) and the CMS.

**Reason:** *To mitigate the underwater noise impacts arising from piling activity.*

## 12. Development Specification and Layout Plan

The Company must, no later than six months prior to the Commencement of the Development, submit a Development Specification and Layout Plan (“DSLPL”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH, Royal Yachting Association Scotland (“RYA”), MCA, NLB, Ministry of Defence (“MOD”), Civil Aviation Authority (“CAA”), SFF, Aberdeenshire Council, Moray Council, the Highland Council, Joint Radio Company (“JRC”) and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The DSLPL must include, but not be limited to the following:

- a) A plan showing the location of each individual WTG (subject to any required micro-siting), including information on WTG spacing, WTG identification/numbering, seabed conditions, bathymetry, confirmed foundation type for each WTG and any key constraints recorded on the site;

- b) A list of latitude and longitude co-ordinates accurate to three decimal places of minutes of arc for each WTG. This should also be provided as a Geographic Information System shape file using WGS84 format;
- c) A table or diagram of each WTG dimensions including - height to blade tip (measured above Lowest Astronomical Tide (“LAT”)) to the highest point, height to hub (measured above LAT to the centreline of the generator shaft), rotor diameter and maximum rotation speed;
- d) The generating output of each WTG used on the site (Figure 1) and a confirmed generating output for the site overall;
- e) The finishes for each WTG (see condition **20** on WTG lighting and marking); and
- f) The length and proposed arrangements on the seabed of all inter-array cables.

**Reason:** *To confirm the final Development specification and layout.*

### **13. Design Statement**

The Company must, no later than six months prior to the Commencement of the Development, submit a Design Statement (“DS”), in writing, to the Scottish Ministers. The DS, which must be signed off by at least one qualified landscape architect, as instructed by the Company prior to submission to the Scottish Ministers, must include representative wind farm visualisations from key viewpoints as agreed with the Scottish Ministers, based upon the final DSLP as approved by the Scottish Ministers as updated or amended. The Company must provide the DS, for information only, to Aberdeenshire Council, Moray Council, the Highland Council, SNH, MCA and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers.

**Reason:** *To ensure that the Development is carried out in accordance with the approved details, and to inform interested parties of the final wind farm scheme proposed to be built.*

### **14. Environmental Management Plan**

The Company must, no later than six months prior to the Commencement of the Development, submit an Environmental Management Plan (“EMP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The EMP must provide the over-arching framework for on-site environmental management during the phases of development as follows:

- a) All construction as required to be undertaken before the Final Commissioning of the Development; and



- b) The operational lifespan of the Development from the Final Commissioning of the Development until the cessation of electricity generation (environmental management during decommissioning is addressed by the Decommissioning Programme provided for by condition 3).

The EMP must be in accordance with the Application insofar as it relates to environmental management measures. The EMP must set out the roles, responsibilities and chain of command for the Company personnel, any contractors or sub-contractors in respect of environmental management for the protection of environmental interests during the construction and operation of the Development. It must address, but not be limited to, the following over-arching requirements for environmental management during construction:

- a) Mitigation measures to prevent significant adverse impacts to environmental interests, as identified in the Application and pre-consent and pre-construction monitoring or data collection, and include reference to relevant parts of the CMS (refer to condition 10);
- b) Marine Pollution and Contingency Plan (“MPCP”);
- c) Management measures to prevent the introduction of invasive non-native marine species;
- d) A site waste management plan (dealing with all aspects of waste produced during the construction period), including details of contingency planning in the event of accidental release of materials which could cause harm to the environment. Wherever possible the waste hierarchy of reduce, reuse and recycle should be encouraged; and
- e) The reporting mechanisms that will be used to provide the Scottish Ministers and relevant stakeholders with regular updates on construction activity, including any environmental issues that have been encountered and the way in which these have been addressed.

The EMP must be regularly reviewed by the Company and the Scottish Ministers or Moray Firth Regional Advisory Group (“MFRAG”), at intervals agreed by the Scottish Ministers. Reviews must include, but not be limited to, the reviews of updated information on construction methods and operations of the Development and updated working practices.

The EMP must be informed, so far as is reasonably practicable, by the baseline monitoring or data collection undertaken as part of the Application and the PEMP.

**Reason: To ensure that all construction and operation activities are carried out in a manner that minimises their impact on the environment, and that mitigation measures contained in the Application, or as otherwise agreed are fully implemented.**

## **15. Vessel Management Plan**

The Company must, no later than six months prior to the Commencement of the Development, submit a Vessel Management Plan (“VMP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following



consultation by the Scottish Ministers with SNH, MCA, RYA, SFF and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The VMP must include, but not be limited to, the following details:

- a) The number, types and specification of vessels required;
- b) How vessel management will be coordinated, particularly during construction but also during operation;
- c) Location of working port(s), the routes of passage, the frequency with which vessels will be required to transit between port(s) and the site and indicative vessel transit corridors proposed to be used during construction and operation of the Development; and

The confirmed individual vessel details must be notified to the Scottish Ministers in writing no later than 14 days prior to the Commencement of the Development, and thereafter, any changes to the details supplied must be notified to the Scottish Ministers, as soon as practicable, prior to any such change being implemented in the construction or operation of the Development.

The VMP must, so far as is reasonably practicable, be consistent with the CMS, the EMP, the PEMP, the NSP, and the LMP.

**Reason:** *To mitigate the impact of vessels.*

## **16. Operation and Maintenance Programme**

The Company must, no later than three months prior to the Commissioning of the first WTG, submit an Operation and Maintenance Programme (“OMP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH, Aberdeenshire Council and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers.

The OMP must set out the procedures and good working practices for operations and the maintenance of the WTG's, substructures, and inter-array cable network of the Development. Environmental sensitivities which may affect the timing of the operation and maintenance activities must be considered in the OMP.

The OMP must, so far as is reasonably practicable, be consistent with the EMP, the PEMP, the VMP, the NSP, the CaP and the LMP.

The final OMP must be sent to MCA and the Highland Council for information only.

**Reason:** *To safeguard environmental interests during operation and maintenance of the Development.*

## **17. Navigational Safety Plan**

The Company must, no later than six months prior to the Commencement of the Development, submit a Navigational Safety Plan (“NSP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following

consultation by the Scottish Ministers with MCA, NLB, RYA, SFF and any other navigational advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The NSP must include, but not be limited to, the following issues:

- a) Navigational safety measures;
- b) Construction exclusion zones;
- c) Notice(s) to mariners and radio navigation warnings;
- d) Anchoring areas;
- e) Temporary construction lighting and marking; and
- f) Buoyage.

The Company must confirm within the NSP that they have taken into account and adequately addressed all of the recommendations of the MCA in the current Marine Guidance Note (“MGN”) 543, and its annexes that may be appropriate to the Development, or any other relevant document which may supersede this guidance prior to approval of the NSP.

**Reason:** *To mitigate the navigational risk to other legitimate users of the sea.*

## **18. Emergency Response Co-operation Plan**

The Company must, no later than six months prior to the Commencement of the Development, submit an Emergency Response Co-operation Plan (“ERCoP”) for the construction, operation, maintenance and decommissioning phases of the Development, in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with the MCA and any other navigational advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted. The ERCoP should follow the MCA [template and guidance](#). The ERCoP must be developed in discussion with the MCA.

**Reason:** *For emergency response planning relating to the Development and requirements for Search And Rescue (“SAR”) helicopter operations.*

## **19. Inter Array Cable Plan**

The Company must, no later than six months prior to the Commencement of the Development, submit an Cable Plan (“CaP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH, MCA, SFF and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted. The CaP must be in accordance with the Application.

The CaP must include, but not be limited to, the following:

- a) The vessel types, location, duration and cable laying techniques for the inter array cables;
- b) The results of monitoring or data collection work (including geophysical, geotechnical and benthic surveys) which will help inform inter array cable routing;
- c) Technical specification of inter array cables, including a desk based assessment of attenuation of electro-magnetic field strengths and shielding;
- d) A Cable Burial Risk Assessment (“CBRA”) to ascertain burial depths and where necessary alternative protection measures;
- e) Methodologies for post construction and operational surveys (e.g. over trawl) of the inter array cables where mechanical protection of cables laid on the sea bed is deployed; and
- f) Methodologies for inter array cable inspection with measures to address and report to the Scottish Ministers any exposure of inter array cables.

Any consented cable protection works must ensure existing and future safe navigation is not compromised. The Scottish Ministers will accept a maximum of 5% reduction in surrounding depth referenced to Chart Datum. Any greater reduction in depth must be agreed in writing by the Scottish Ministers.

**Reason:** *To ensure all environmental and navigational issues are considered for the location and construction of the inter array cables.*

## **20. Lighting and Marking Plan**

The Company must, no later than six months prior to the Commencement of the Development, submit a Lighting and Marking Plan (“LMP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH, MCA, NLB, CAA, MOD, RYA, Aberdeenshire Council, the Highland Council, Moray Council and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The LMP must provide that the Development be lit and marked in accordance with the current CAA and MOD aviation lighting policy and guidance that is in place as at the date of the Scottish Ministers approval of the LMP, or any such other documents that may supersede this guidance prior to the approval of the LMP. The LMP must also detail the navigational lighting requirements detailed in the International Association of Marine Aids to Navigation and Lighthouse Authorities (“IALA”) Recommendation O-139 or any other documents that may supersede this guidance prior to approval of the LMP.

**Reason:** *To ensure navigational safety and the safe marking and lighting of the Development.*

## 21. Aviation Radar

The Company must, prior to the Commencement of the Development, submit an Air Traffic Control Radar Mitigation Scheme (“ATC Scheme”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation on the ATC Scheme with the Ministry of Defence (“MOD”). Commencement of the Development cannot take place until such approval is granted.

The ATC Scheme is a scheme designed to mitigate the impact of the Development upon the operation of the Primary Surveillance Radar at RAF Lossiemouth (“the Radar”) and the air traffic control operations of the MOD, which is reliant upon the Radar. The approved ATC Scheme must be in place for the operational life of the Development provided the Radar remains in operation.

No WTGs forming part of the Development may become operational, unless and until all those measures required by the approved ATC Scheme to be implemented prior to the operation of the turbines, have been implemented, and the Scottish Ministers have confirmed this in writing. The Development must thereafter be operated fully in accordance with the approved ATC Scheme.

**Reason:** *To mitigate the adverse impacts of the Development on the Air Traffic Control Radar.*

## 22. MOD Notification

The Company must notify MOD, at least 14 days prior to the Commencement of the Development, in writing of the following information:

- a) the earliest date of the Commencement of the Development;
- b) the earliest date any WTGs are brought into use;
- c) the maximum height of any construction equipment 50 metres or greater in height above mean sea level, to be used; and
- d) the maximum heights of any WTG, offshore platforms or other, temporary or permanent, offshore structures 50 metres or greater in height, above mean sea level, to be deployed or constructed.

**Reason:** *For aviation safety.*

## 23. Primary Radar Mitigation Scheme

No part of any WTG shall be erected above mean sea level until a Primary Radar Mitigation Scheme (“PRMS”) has been submitted to and approved in writing by the Scottish Ministers following consultation with NATS (En Route) Public Limited Company (“NERL”). Commencement of the Development cannot take place until such approval is granted.

No blades shall be fitted to any WTG until the technical mitigation measures set out in the approved PRMS have been implemented in accordance with its terms and the Development must thereafter be operated fully in accordance with such approved Primary Radar Mitigation Scheme.

**Reason:** *To mitigate adverse impact to the Allanshill radar and associated air traffic operations.*

#### **24. Charting requirements**

The Company must, prior to the Commencement of the Development, and following confirmation of the approved DSLP by the Scottish Ministers (refer to condition **12**), provide the positions and maximum heights of the WTGs, and construction equipment to the United Kingdom Hydrographic Office (“UKHO”), MOD and Defence Geographic Centre for aviation and nautical charting purposes. The Company must, within one month of the Final Commissioning of the Development, provide the coordinates accurate to three decimal places of minutes of arc for each WTG, position and maximum height of the WTGs to UKHO, MOD and Defence Geographic Centre for aviation and nautical charting purposes.

**Reason:** *For aviation and navigational safety.*

#### **25. Project Environmental Monitoring Programme**

The Company must, no later than six months prior to the Commencement of the Development, submit a Project Environmental Monitoring Programme (“PEMP”), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with SNH, SFF, the Highland Council and any other environmental advisors or organisations as required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted. The PEMP must be in accordance with the Application as it relates to environmental monitoring.

The PEMP must set out measures by which the Company must monitor the environmental impacts of the Development. Monitoring is required throughout the lifespan of the Development where this is deemed necessary by the Scottish Ministers. Lifespan in this context includes pre-construction, construction, operational and decommissioning phases.

The Scottish Ministers must approve all initial methodologies for the above monitoring, in writing and, where appropriate, in consultation with the Highland Council for the socio-economic receptor and MFRAG referred to in condition **26** of this consent in respect to all the other receptors listed in point a).

Monitoring must be done in such a way so as to ensure that the data which is collected allows useful and valid comparisons between different phases of the Development. Monitoring may also serve the purpose of verifying key predictions in the Application. In the event that further potential adverse environmental effects are identified, for which no predictions were made in the Application, the Scottish Ministers may require the Company to undertake additional monitoring.

The PEMP must cover, but not be limited to, the following matters:

- a) Pre-construction, construction and post-construction (if considered appropriate by the Scottish Ministers) monitoring or data collection as

relevant in terms of the Application, and any subsequent monitoring or data collection for impacts on the following receptors:

1. Birds, including the pre-construction monitoring of the great black-backed gull of the East Caithness SPA;
2. Marine Mammals;
3. Commercial Fisheries;
4. Socio-economic; and
5. Benthic communities.

- b) The participation by the Company to contribute to data collection or monitoring of wider strategic relevance, identified and agreed by the Scottish Ministers.

Due consideration must be given to the Scottish Marine Energy Research (“ScotMER”) programme, or any successor programme formed to facilitate these research interests.

Any pre-consent monitoring or data collection carried out by the Company to address any of the above issues may be used in part to discharge this condition subject to the written approval of the Scottish Ministers.

The PEMP is a live document which will be regularly reviewed by the Scottish Ministers, at timescales to be determined by them to identify the appropriateness of on-going monitoring. Following such reviews, the Scottish Ministers may, in consultation with the MFRAG require the Company to amend the PEMP and submit such an amended PEMP, in writing, to the Scottish Ministers, for their written approval. Such approval may only be granted following consultation with the MFRAG and any other environmental, or such other advisors as may be required at the discretion of the Scottish Ministers.

The Company must submit written reports and associated raw and processed data of such monitoring or data collection to the Scottish Ministers at timescales to be determined by them. Consideration should be given to data storage, analysis and reporting and be to Marine Environmental Data and Information Network (“MEDIN”) standards.

Subject to any legal restrictions regarding the treatment of the information, the results are to be made publicly available by the Scottish Ministers, or by such other party appointed at their discretion.

The Scottish Ministers may agree, in writing, that monitoring may be reduced or ceased before the end of the lifespan of the Development.

**Reason:** *To ensure that appropriate and effective monitoring of the impacts of the Development is undertaken.*

## **26. Regional Advisory Group**

The Company must participate in the Moray Firth Regional Advisory Group (“MFRAG”) or any successor group, established by the Scottish Ministers for the purpose of advising the Scottish Ministers on research, monitoring and mitigation programmes for, but not limited to, ornithology, marine mammals, and commercial fish. The extent

and nature of the Company's participation in the Regional Advisory Group is to be agreed by the Scottish Ministers.

**Reason:** *To ensure effective environmental monitoring and mitigation is undertaken at a regional scale.*

## **27. Fisheries Management and Mitigation Strategy**

The Company must no later than six months prior to the Commencement of the Development, submit a Fisheries Management and Mitigation Strategy ("FMMS"), in writing, to the Scottish Ministers for their written approval, in consultation with SFF and other fisheries representatives. Commencement of the Development cannot take place until such approval is granted. The FMMS must be defined and finalised in consultation with the Moray Firth Commercial Fisheries Working Group ("MFCFWG").

In order to inform the production of the FMMS, the Company must monitor or collect data as relevant and agreed with Scottish Ministers.

The FMMS must include a transit plan, which must lay out guidelines to address potential interactions with fishing activity, for vessels operating in and around the Development and transiting to the Development.

As part of any finalised FMMS, the Company must produce and implement a mitigation strategy for each commercial fishery that can prove to the Scottish Ministers that they would be adversely affected by the Development. The Company any contractors, or sub-contractors working for the Company must implement the mitigation measures committed to be carried out by the Company within the FMMS. The Company must participate in and remain a member of the MFCFWG or any successor group formed to facilitate commercial fisheries dialogue.

**Reason:** *To mitigate the impact on commercial fishermen.*

## **28. Environmental Clerk of Works**

Prior to the Commencement of the Development, the Company must at its own expense, and with the approval of the Scottish Ministers in consultation with SNH, appoint an independent Environmental Clerk of Works ("ECoW"). The ECoW must be appointed in time to review and approve the draft version of the first plan or programme submitted under this consent to Scottish Ministers, in sufficient time for any pre-construction monitoring requirements, and remain in post until agreed by the Scottish Ministers. The terms of appointment must also be approved by the Scottish Ministers in consultation with SNH.

The terms of the appointment must include, but not be limited to:

- a) Quality assurance of final draft versions of all plans and programmes required under this consent;
- b) Responsible for the monitoring and reporting of compliance with the consent conditions and the environmental mitigation measures for all wind farm infrastructure;

- c) Provision of on-going advice and guidance to the Company in relation to achieving compliance with consent conditions, including but not limited to the conditions relating to and the implementation of the CMS, the EMP, the PEMP, the PS, the CaP and the VMP;
- d) Provision of reports on point b & c above to the Scottish Ministers at timescales to be determined by the Scottish Ministers;
- e) Induction and toolbox talks to onsite construction teams on environmental policy and procedures, including temporary stops and keeping a record of these;
- f) Monitoring that the Development is being constructed in accordance with the plans and this consent, the Application and in compliance with all relevant regulations and legislation;
- g) Reviewing and reporting incidents/near misses and reporting any changes in procedures as a result to the Scottish Ministers; and
- h) Agreement of a communication strategy with the Scottish Ministers.

**Reason:** *To ensure effective monitoring of and compliance with the environmental mitigation and management measures associated with the Development.*

## **29. Fisheries Liaison Officer**

Prior to the Commencement of the Development, a Fisheries Liaison Officer (“FLO”), must be appointed by the Company and approved, in writing, by the Scottish Ministers (following consultation with SFF and the MFCFWG). The FLO must be appointed by the Company for the period from Commencement of the Development until the Final Commissioning of the Development. The identity and credentials of the FLO must be included in the EMP (referred to in condition 14). The FLO must establish and maintain effective communications between the Company, any contractors or sub-contractors, fishermen and other users of the sea during the construction of the Development, and ensure compliance with best practice guidelines whilst doing so.

The responsibilities of the FLO must include, but not be limited to:

- a) Establishing and maintaining effective communications between the Company, any contractors or sub-contractors, fishermen and other users of the sea concerning the overall Development and any amendments to the CMS and site environmental procedures;
- b) The provision of information relating to the safe operation of fishing activity on the site of the Development; and
- c) Ensuring that information is made available and circulated in a timely manner to minimise interference with fishing operations and other users of the sea.

**Reason:** *To facilitate engagement with the commercial fishing industry.*



### 30. Protocol for Archaeological Discoveries

The Company must, no later than six months prior to the Commencement of the Development, submit a Protocol for Archaeological Discoveries (“PAD”) and a Written Scheme of Investigation (“WSI”) which sets out what the Company must do on discovering any marine archaeology during the construction, operation, maintenance and monitoring of the Development, in writing, to the Scottish Ministers for their written approval. Such approval may be given only following consultation by the Scottish Ministers with Historic Environment Scotland (“HES”) and any such advisors as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted. The Reporting Protocol must be implemented in full, at all times, by the Company.

The final PAD and WSI must be sent to Aberdeenshire Council for information only.

**Reason:** *To ensure any discovery of archaeological interest is properly and correctly reported.*

### 31. Construction Traffic Management Plan

In the event that major offshore components require onshore abnormal load transport, the Company must, no later than six months prior to the Commencement of the Development, submit a Construction Traffic Management Plan (“CTMP”) in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with Transport Scotland and any such other advisors as may be required at the discretion of the Scottish Ministers. Commencement of the Development cannot take place until such approval is granted.

The CTMP must include:

- a) A mitigation strategy for the abnormal loads on the trunk road network including any accommodation measures required, incorporating the removal of street furniture, junction widening, or traffic management of road based traffic and transportation associated with the construction of the Development. All construction traffic associated with the Development must conform to the approved CTMP; and
- b) Any additional signing or temporary traffic control measures deemed necessary due to the size or length of loads being delivered as a result of the Development.

**Reason:** *To maintain the free flow and safety of the trunk road network.*

## DEFINITIONS AND GLOSSARY OF TERMS

- “AA” means the Appropriate Assessment;
- “ADD” means Acoustic Deterrent Devices;
- “Application” means the EIA Report, HRA Report and supporting documents submitted by the Company on 5 July 2018 to construct and operate an offshore generating station and transmission works, it also includes the PVA Report submitted on 31 August 2018, the EIA Addendum Report submitted on 23 November 2018; the GBBG Report submitted on 18 March 2019 **and the application submitted by the Company on 30 March 2021 under Section 36C of the Electricity Act 1989 (the “variation application”) (and in the event that the details proposed in the variation application are inconsistent with the details in earlier application documents submitted then the details in the variation application shall take precedence).**
- “ATC” means Air Traffic Control;
- “Commencement of the Development” means the date on which the first construction activity occurs in accordance with the EIA Report submitted by the Company on 5 July 2018;
- “CRM” means collision risk modelling;
- “Development” means the Moray West Offshore Wind Farm, approximately 22.5km southeast off the Caithness coastline;
- “dSPA” means draft Special Protection Area;
- “ECOW” means Environmental Clerk of Works;
- “EIA Addendum Report” means the Environmental Impact Assessment Addendum Report submitted by the Company on 23 November 2018;
- “EIA Report” means Environmental Impact Assessment Report;
- “EIA” means Environmental Impact Assessment,
- “EPS” means European Protected Species;
- “Final Commissioning of the Development” means the date on which the last wind turbine generator constructed forming the Development has supplied electricity on a commercial basis to the National Grid, or such earlier date as the Scottish Ministers deem the Development to be complete;
- “First Commissioning of the Development” means the date on which the first wind turbine generator constructed forming the Development has supplied electricity on a commercial basis to the National Grid;
- “FLO” means Fisheries Liaison Officer;
- “FTE” means full-time equivalent;
- “GBBG Report” means the Information to Inform HRA – Great Black-backed Gull Report submitted on 18 March 2019;
- “GBBG” means great black-backed gulls;
- “GHG” means greenhouse gas;
- “GVA” means Gross Value Added;
- “HAT” means Highest Astronomical Tide;
- “HDD” means Horizontal Directional Drilling;
- “HRA Report” means Habitats Regulations Appraisal Report;
- “HRA” means Habitats Regulations Appraisal;
- “IALA” means International Association of Marine Aids to Navigation and

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Lighthouse Authorities;

- “Local Study Area” means the combined local authorities of Highlands, Moray, Aberdeenshire & Aberdeen City;
- “LSE” means Likely Significant Effect;
- “MMO” means Marine Mammal Observer;
- “Moray Firth Developments” means combinations of existing consents for the Moray East Offshore Wind Farm (granted in March 2014 and varied in March 2018) and the Beatrice Offshore Wind Farm (granted in March 2014);
- “MW” means megawatt;
- “OEC” means Offshore Export Cable;
- “OfTI” means Offshore Transmission Infrastructure;
- “PAM” means passive acoustic monitoring;
- “PLI” means Public Local Inquiry;
- “pMPA” means Proposed Marine Protected Area;
- “pSPA” means Proposed Special Protection Areas;
- “PSR” means Primary Surveillance Radar;
- “PVA Report” means the Population Viability Analysis Report submitted on 31 August 2018;
- “PVA” means Population Viability Analysis;
- “RIAA” means Report to Inform the Appropriate Assessment;
- “s.36” means section 36 of the Electricity Act 1989 (as amended);
- “SAC” means Special Area of Conservation;
- “SAR” means Search and Rescue;
- “ScotMER” means Scottish Marine Energy Research Programme;
- “SIDS” means Standard Instrument Departures;
- “SLA” means Special Landscape Area;
- “SLVIA” means Seascape, Landscape and Visual Impact Assessment;
- “SNCBs” means the Statutory Nature Conservation Bodies;
- “SPA” means Special Protection Area;
- “SSC” means Suspended Sediment Concentration;
- “SSSI” means Site of Special Scientific Interest;
- “the Company” means Moray Offshore Windfarm (West) Limited (Company Number 10515140) registered at Condor House, 10 St. Paul’s Churchyard, London EC4M 8AL;
- “the EIA Addendum Consultation” mean the consultation on the EIA Addendum Report;
- “the GBBG Report Consultation” means consultation on the GBBG Report;
- “the Original Consultation” means consultation on the Application for s.36 consent, EIA Report and RIAA;
- “the Radar” means the Primary Surveillance Radar at Leuchars Airfield; and
- “WTG” means wind turbine generators.

### Organisations and Companies

- “SNH” means Scottish Natural Heritage;
- “BT” means BT Radio Network Protection;

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- “CAA” means the Civil Aviation Authority;
- “CFWG” means Commercial Fisheries Working Group;
- “FMS” means Fisheries Management Scotland;

- “FSDCC” means Fordyce, Sandend and District Community Council;
- “HES” means Historic Environment Scotland;
- “HIE” means Highlands and Islands Enterprise;
- “IHO” means International Hydrographic Office;
- “JNCC” means Joint Nature Conservation Committee;
- “JRC” means Joint Radio Company Limited;
- “MAU” means Marine Scotland Marine Analytical Unit;
- “MCA” means the Maritime and Coastguard Agency;
- “MFCFWG” means the Moray Firth Commercial Fisheries Working Group;
- “MFRAG” means Moray Firth Regional Advisory Group;
- “MOD” means the Ministry of Defence;
- “Moray East” means Moray Offshore Windfarm (East) Limited;
- “Moray West” means Moray Offshore Windfarm (West) Limited;
- “MS-LOT” means Marine Scotland Licensing Operations Team;
- “MSS” means Marine Scotland Science;
- “NATS” means National Air Traffic Service Safeguarding;
- “NERL” means NATS (En Route) Public Limited Company;
- “NLB” means the Northern Lighthouse Board;
- “RAF” means the Royal Air Force;
- “RAG” means Regional Advisory Group;
- “RSPB Scotland” means the Royal Society for the Protection of Birds Scotland;
- “RTC” means River Tweed Commission;
- “RYA” means the Royal Yachting Association Scotland;
- “SEPA” means the Scottish Environment Protection Agency;
- “SFF” means the Scottish Fishermen’s Federation; and
- “UKHO” means United Kingdom Hydrographic Office.

#### Plans and Programmes

- “ATC Scheme” means Air Traffic Control Radar Mitigation Scheme;
- “CaP” means Inter Array Cable Plan;
- “CBRA” means Cable Burial Risk Assessment;
- “CMS” means Construction Method Statement;
- “CoP” means Construction Programme;
- “CTMP” means Construction Traffic Management Plan;
- “DP” means Decommissioning Programme;
- “DS” means the Design Statement;
- “DSL P” means Development Specification and Layout Plan;
- “EMP” means Environmental Management Plan;
- “ERCoP” means Emergency Response Co-operation Plan;
- “FMMS” means Fisheries Management and Mitigation Strategy;
- “LMP” means Lighting and Marking Plan;
- “MGN” means Marine Guidance Note;
- “MPCP” means Marine Pollution Contingency Plan;
- “NMP” means the National Marine Plan;

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- “NPF3” means Scotland’s National Planning Framework 3;
- “NRA” means Navigation Risk Assessment;
- “NRIP” means National Renewables Infrastructure Plan;
- “NSP” means Navigational Safety Plan;
- “OMP” means Operation and Maintenance Programme;
- “PAD” means Protocol for Archaeological Discoveries;
- “PEMP” means Project Environmental Monitoring Programme;
- “PRMS” means Primary Radar Mitigation Scheme;
- “PS” means Piling Strategy;
- “SPP” means Scottish Planning Policy 2014;
- “Transit Plan” means a plan which sets out measures to be taken to avoid or reduce the impact of vessel movement on the local fishing industry and to promote a sustainable coexistence. It will include indicative transit routes for vessels operating in and around the Development and transiting to the site from relevant ports;
- “VMP” means Vessel Management Plan; and
- “WSI” means Written Scheme of Investigation.

### Legislation

- “the 1994 Habitats Regulations” means the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended);
- “the 2009 Act” means the Marine and Coastal Access Act 2009.
- “the 2010 Act” means the Marine (Scotland) Act 2010;
- “the 2017 EW Regulations” means the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended);
- “the Birds Directive” means Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds, as amended and as codified by Directive 2009/147/EC of the European Parliament and of the Council of 30th November 2009;
- “the Electricity Act” means the Electricity Act 1989 (as amended);
- “the Habitats Directive” means Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora (as amended); and
- “the Habitats Regulations” means the Conservation of Offshore Marine Habitats and Species Regulations 2017 and the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

## Appendix B – Collision Risk Modelling for Updated Turbine Parameters

**MORAY OFFSHORE WINDFARM (WEST) LIMITED**

## **Section 36 Consent Variation – Appendix B Collision Risk Modelling for Updated WTG Parameters (Blade Width)**

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## 1 Introduction

This appendix presents the results from the additional Collision Risk Modelling (CRM) carried out to inform the validation of conclusions from the assessment of collision risk on kittiwake, great black-backed gull, gannet and herring gull as presented in the Moray West consent application documents with respect to a proposed increase in blade width from 6 m to 6.6 m for the 72 turbine scenario (as presented in the Section 36 Consent – Annex 1, see section 2 below for further detail). This additional CRM has been carried out by NIRAS who carried out the original ornithological impact assessment for the Moray West application.

The results from the additional CRM are compared to those estimates calculated as part of the original application for Moray West Offshore Wind Farm and relevant submissions made during the determination phase of the consent application (for kittiwake and great black-backed gull). This report is therefore structured as follows:

- Section 2: Proposed turbine changes in relation to collision risk modelling;
- Section 3: Updated CRM undertaken for kittiwake, great black-backed gull, gannet and herring gull using the 72 turbine scenario (based on maximum 230 m rotor diameter and maximum 265 m tip height WTG design parameters) with proposed increase in blade width from 6 m to 6.6 m; and
- Section 4: Implications of the additional collision risk estimates in terms of the conclusions of effect significance (as presented in the Moray West EIA Report for all four species) and conclusions of Adverse Effects on Integrity (AEoI) presented in the Moray West Report to Inform Appropriate Assessment (RIAA) 2018, Moray West Application Addendum Document 2018 and the Scottish Ministers' Appropriate Assessment for kittiwake, great black-backed gull and herring gull<sup>3</sup>.

## 2 Proposed turbine changes

The decision notice for the Section 36 consent for Moray West outlined two project design scenarios for the offshore generating station. The first of these scenarios was based on the parameters used in the collision risk modelling undertaken as part of the application (85 turbine scenario). The second was based on a maximum of 72 turbines and those design parameters presented in the “consented parameters” column of Table 3.2 below. When compared to this design scenario, Moray West are proposing to change only the maximum blade width from 6 m to 6.6 m (Table 2.1).

Two scenarios were included as part of the consent for Moray West (85 and 72 turbine scenarios) with the parameters associated with these scenarios presented in Table 2.1 (columns 2 and 3). The 85 turbine scenario was also the scenario used as part of the collision risk modelling that informed the assessments undertaken as part of the application and subsequently the Appropriate Assessment produced by the Scottish Ministers (column 4). The proposed changes considered in this report affect the 72 turbine scenario and represent an increase in the blade width associated with this scenario (see column 5 in Table

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<sup>3</sup> Gannet was not identified as a HRA species in the Moray West consent application.

2.1). There are no proposed changes to the 85 turbine scenario which will remain part of the consent for Moray West.

Table 2.1 Turbine Parameters Used for Collision Risk Modelling (CRM) in the 2018 Application and CRM to inform this Consent Variation Screening Report					
Collision Risk Modelling (CRM) input parameters		Design envelope parameters included in the Section 36 Consent – Annex 1		CRM parameters used in 2018 consent application (Model 2 WTG)	CRM parameters used to inform assessment of increased blade width for 72 turbine scenario
		85 turbine scenario (Model 2 WTG)	72 turbine scenario (Model 3 WTG)		
Number of turbines		85	72	85	72
Rotor radius (m)		97.5 (195 m rotor diameter)	115 (230 m rotor diameter)	97.5	115
Hub height (m)		132.5	150	132.5	150
Minimum blade tip clearance		35	35	35	35
Max blade width (m)		6	6	6	6.6 (increase from 6 m as specified in the Section 36 Consent)
Monthly proportion of time operational (all months) (%)		Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	85	85
Pitch (°)		Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	8	8
Rotor speed (rpm)	Minimum	Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	6.0	6.0
	Maximum	Not specified in Section 36 Consent - Annex 1	Not specified in Section 36 Consent - Annex 1	9.8	9.8

### 3 Updated collision risk modelling

#### 3.1 Methodology

In order to provide a comparison with the collision risk modelling conducted as part of the application and post-application submissions all aspects of the modelling process (i.e. use of the Band (2012) CRM, species-specific parameters and other parameters for which changes are not proposed as identified in Table 3.2) and subsequent analyses (e.g. apportioning) are identical.

The following collision risk estimates are presented:

- Kittiwake
  - o Total collision risk estimates (i.e. EIA scale/unapportioned) compared to the collision risk estimates presented in Table 3.32 in the Ornithological Addendum submitted in November 2018 (Table 3.1 in Section 3.2 below).
  - o Apportioned collision risk estimates compared to the collision risk estimates presented in Table 3.32 in the Ornithological Addendum submitted in November 2018 and those upon which PVA metrics were based in the Scottish Ministers Appropriate Assessment (Table 3.1 in Section 3.2 below); and
  - o Apportioned collision risk estimates compared to the collision risk estimates presented in Table 3.32 in the Ornithological Addendum submitted in November 2018 plus a commitment to reduce collision risk estimates by 7% and those upon which the Scottish Ministers decision were based in the Appropriate Assessment (Table 3.1 in Section 3.2 below).
- Great black-backed gull
  - o Total collision risk estimates (i.e. EIA scale) compared to the total collision risk estimate presented in Table 3.2 (Section 3.2 below); and
  - o Apportioned collision risk estimates compared to those calculated when applying those refinements described in Table 3.2 (Section 3.2 below) and those upon which decisions in the Scottish Ministers Appropriate Assessment were based.
- Gannet
  - o Total collision risk estimates (i.e. EIA scale/unapportioned) compared to the collision risk estimates presented in Table 2.4 in the Ornithological Addendum submitted in November 2018 (Table 3.3 in Section 3.2 below).
- Herring gull
  - o Total collision risk estimates (i.e. EIA scale) compared to the total collision risk estimate presented in Table 3.4 (Section 3.2 below); and
  - o Apportioned collision risk estimates compared to those calculated when applying those refinements described in Table 3.4 (Section 3.2 below) and those upon which decisions in the Scottish Ministers Appropriate Assessment were based.

## 3.2 Results

### 3.2.1 Kittiwake

Table 3.1 below presents the unapportioned and apportioned collision risk estimates for kittiwake at East Caithness Cliffs SPA as presented in the Moray West application documents against the collision estimates calculated for this variation proposal using the envelope for the larger consented turbine (maximum 72 WTGs) with a proposed varied maximum blade width of 6.6 m. During the determination phase Moray West committed to reducing collision risk estimates by 7% (i.e. from 57 to 53 collisions apportioned to the East Caithness Cliffs SPA). This is to be achieved through either a reduction in maximum number of turbines installed or changes to other WTG design parameters.

**Table 3.1 Collision risk estimates for kittiwake feature of East Caithness Cliffs SPA using proposed varied parameters for the Model 3 WTG (blade width) compared to results presented in the Moray West Application Addendum Document 2018.**

Collisions	Results from Moray West Application Addendum Document 2018 (based on parameters for Model 2 WTG)				Results from additional collision risk modelling (2020 assessment) based on proposed varied parameters for Model 3 WTG (6.6 m blade width)			
	Breeding	Post-breeding	Pre-breeding	Annual	Breeding	Post-breeding	Pre-breeding	Annual
Unapportioned collisions	79	24	7	109	77	23	7	107
Collisions apportioned to East Caithness Cliffs SPA	55	1	1	57	54	1	1	56
Collisions apportioned to East Caithness Cliffs SPA with 7% reduction	51	1	0	53	50	1	0	52

The collision risk estimates presented in Table 3.1 are lower than the corresponding collision risk estimates used to support the conclusions reached in the Moray West RIAA 2018, Moray West Application Addendum Document 2018 and the Scottish Minister's Appropriate Assessment of 2019 for the kittiwake feature at East Caithness Cliffs SPA (i.e. those presented in Table 3.1). This confirms that the proposed changes to the turbine parameters considered in this report (i.e. an increase in blade width from 6 m to 6.6 m for the 72 turbine scenario) would not increase the collision rates for the kittiwake feature of the East Caithness Cliffs SPA when compared to the collision risk estimates used to support previous assessments conducted by the Applicant and Scottish Ministers.

### 3.2.2 Great black-backed gull

Table 3.2 below presents unapportioned and apportioned collision risk estimates for great black-backed gull at East Caithness Cliffs SPA as presented in the Moray West application documents against the collision estimates calculated for this variation proposal using the envelope for the larger consented turbine (maximum 72 WTGs) with a proposed varied maximum blade width of 6.6 m.

**Table 3.2 Collision risk estimates for great black-backed gull feature of East Caithness Cliffs SPA using proposed varied parameters (blade width) compared to results presented in the Moray West Application Addendum Document 2018.**

Collisions	Results from Moray West GBBG Report 2019 (based on parameters for Model 2 WTG)			Results from additional collision risk modelling (2020 assessment) based on proposed varied parameters for Model 3 WTG (6.6 m blade width)		
	Breeding	Non-breeding	Annual	Breeding	Non-breeding	Annual
Unapportioned collisions	5.3	4.0	9.3	3.89	5.15	9.04
Collisions apportioned to East Caithness Cliffs SPA	1.54	0.42	1.96	1.50	0.41	1.91

The collision risk estimates presented in Table 3.2 are lower than the corresponding collision risk estimates used to support the conclusions reached in the Moray West Application Addendum Document 2018, the Great Black-Backed Gull (GBBG) Report 2019 and Scottish Minister's Appropriate Assessment 2019 for the great black-backed gull feature at East Caithness Cliffs SPA (i.e. those presented in Table 3.2). This confirms that the proposed changes to the turbine parameters considered in this report (i.e. an increase in blade width from 6 m to 6.6 m for the 72 turbine scenario) would not increase the collision rates for the great black-backed gull feature of the East Caithness Cliffs SPA when compared to the collision risk estimates used to support previous assessments conducted by the Applicant and Scottish Ministers.

### 3.2.3 Gannet

Table 3.3 below presents collision risk estimates for gannet at an EIA scale as presented in the Moray West application documents, against the collision estimates calculated for this variation proposal using the envelope for the larger consented turbine (maximum 72 WTGs) with a proposed varied maximum blade width of 6.6 m.

**Table 3.3 Collision risk estimates for gannet using proposed varied parameters (blade width) compared to results presented in the Moray West Application Addendum Document 2018.**

Collisions	Results from Moray West Application Addendum Document 2018 (based on parameters for Model 2 WTG)				Results from additional collision risk modelling (2020 assessment) based on proposed varied parameters for Model 3 WTG (6.6 m blade width)			
	Breeding	Post-breeding	Pre-breeding	Annual	Breeding	Post-breeding	Pre-breeding	Annual
Unapportioned collisions (EIA scale)	10.2	1.5	0.7	12.4	9.8	1.5	0.7	12.0

The collision risk estimates presented in Table 3.3 are lower than the corresponding collision risk estimates used to support the conclusions reached in the Moray West Environmental Statement and those presented in the Moray West Application Addendum Document 2018 (i.e. those presented in Table 3.3). This confirms that the proposed changes to the turbine parameters considered in this report (i.e. an increase in blade width from 6 m to 6.6 m for the 72 turbine scenario) would not increase the collision rates for gannet when compared to the collision risk estimates used to support previous assessments conducted by the Applicant and Scottish Ministers.

### 3.2.4 Herring gull

Table 3.6 below presents unapportioned and apportioned collision risk estimates for herring gull at East Caithness Cliffs SPA as presented in the Moray West application documents against the collision estimates calculated for this variation proposal using the envelope for the larger consented turbine (maximum 72 WTGs) with a proposed varied maximum blade width of 6.6 m.

Table 3.4 Collision risk estimates for herring gull feature of East Caithness Cliffs SPA using proposed varied parameters (blade width) compared to results presented in the Moray West Application Addendum Document 2018.						
Collisions	Results from Moray West RIAA 2018 (based on parameters for Model 2 WTG)			Results from additional collision risk modelling (2020 assessment) based on proposed varied parameters for Model 3 WTG (6.6 m blade width)		
	Breeding	Non-breeding	Annual	Breeding	Non-breeding	Annual
Unapportioned collisions	11.7	0.9	12.6	11.4	0.8	12.2
Collisions apportioned to East Caithness Cliffs SPA	3.8	0.01	3.9	3.7	0.01	3.7

The collision risk estimates presented in Table 3.6 are lower than the corresponding collision risk estimates used to support the conclusions reached in the Moray West RIAA and Scottish Minister's Appropriate Assessment 2019 for the herring gull feature at East Caithness Cliffs SPA (i.e. those presented in Table 3.6). This confirms that the proposed changes to the turbine parameters considered in this report (i.e. an increase in blade width from 6 m to 6.6 m for the 72 turbine scenario) would not increase the collision rates for the herring gull feature of the East Caithness Cliffs SPA when compared to the collision risk estimates used to support previous assessments conducted by the Applicant and Scottish Ministers.

## 4 Implications of updated collision risk estimates

### 4.1 Overview

This appendix has considered the changes proposed to the turbine parameters associated with Moray West and therefore the potential effects these changes may have on the assessments produced to support the Moray West application and the Scottish Ministers' Appropriate Assessment. This section



outlines the implications for these assessments as a result of the updated collision risk estimates for Moray West alone and, if any changes are identified that would affect those conclusions reached in relation to in-combination impacts (i.e. an increase in collision risk associated with Moray West), then the effect this has on cumulative/in-combination conclusions is discussed.

#### **4.2 Implications for conclusions presented in the EIA and HRA (addendum) for kittiwake**

Collision risk modelling undertaken for the Moray West application predicted collision mortality of 53-57 collisions / annum for kittiwakes from the East Caithness Cliffs SPA. On the basis of an impact of this magnitude the HRA addendum and Scottish Ministers' Appropriate Assessment concluded that there would not be an adverse effect on the integrity of the East Caithness Cliffs SPA.

Collision risk modelling of a 72 turbine project design with a blade width of 6.6 m predicts a lower collision rate (52-56 collisions / annum for kittiwake from the East Caithness Cliffs SPA) than that included in the application for Moray West and the consent decision reached by Scottish Ministers. A variation to increase the allowed maximum blade width to 6.6 m for the 72 turbine scenario would not, therefore, lead to a change to the conclusions reached by either the Applicant or the Scottish Ministers in relation to the Development in isolation or in-combination with other plans and projects (i.e. there would be no adverse effect on the integrity of the East Caithness Cliffs SPA).

#### **4.3 Implications for conclusions presented in the EIA and HRA (addendum) for great black-backed gull**

The HRA addendum predicted a total, EIA scale, collision mortality from the Moray West alone of 9-10 collisions/annum of which no more than 2.0 birds would comprise breeding adult great black-backed gulls from the East Caithness Cliff SPA. On the basis of an impact of this magnitude the HRA addendum and Scottish Ministers' Appropriate Assessment concluded that there would not be an adverse effect on the integrity of the East Caithness Cliff SPA.

Collision risk modelling of a 72 turbine project design with a blade width of 6.6 m predicts a lower collision rate 1.9 collisions / annum for great black-backed gull from the East Caithness Cliffs SPA) than that included in the application for Moray West and the consent decision reached by Scottish Ministers. A variation to increase the allowed maximum blade width to 6.6 m for the 72 turbine scenario would not, therefore, lead to a change in the conclusions reached by either the Applicant or the Scottish Ministers in relation to the Development in isolation or in-combination with other plans and projects (i.e. there would be no adverse effect on the integrity of the SPA).

#### **4.4 Implications for conclusions presented in the EIA for gannet**

The EIA predicted a total collision mortality from Moray West alone of 12.4 collisions/annum. On the basis of an impact of this magnitude the EIA concluded that the effect was of negligible or minor adverse significance which is not significant in EIA terms.

Collision risk modelling of a 72 turbine project design with a blade width of 6.6 m predicts a lower collision rate of 12.0 collisions / annum for gannet than that included in the application for Moray West and the

consent decision reached by Scottish Ministers. A variation to increase the allowed maximum blade width to 6.6 m for the 72 turbine scenario would not, therefore, lead to a change in the conclusions reached by either the Applicant or the Scottish Ministers in relation to the Development in isolation or cumulatively with other plans and projects (i.e. there would be no significant impact on gannet).

#### **4.5 Implications for conclusions presented in the EIA and HRA for herring gull**

The HRA addendum predicted a total, EIA scale, collision mortality from Moray West alone of 12.6 collisions/annum of which 3.9 birds would comprise breeding adult herring gulls from the East Caithness Cliff SPA. On the basis of an impact of this magnitude the HRA addendum and Scottish Ministers' Appropriate Assessment concluded that there would not be an adverse effect on the integrity of the East Caithness Cliff SPA.

Collision risk modelling of a 72 turbine project design with a blade width of 6.6 m predicts a lower collision rate 3.7 collisions / annum for herring gull from the East Caithness Cliffs SPA than that included in the application for Moray West and the consent decision reached by Scottish Ministers. A variation to increase the allowed maximum blade width to 6.6 m for the 72 turbine scenario would not, therefore, lead to a change in the conclusions reached by either the Applicant or the Scottish Ministers in relation to the Development in isolation or in-combination with other plans and projects (i.e. there would be no adverse effect on the integrity of the SPA).