MORAY EAST
OFFSHORE WINDFARM

Design Statement

Moray East Offshore Wind Farm and

Associated Offshore Transmission Infrastructure

October 2018

Moray Offshore Windfarm (East) Limited

Produced by Optimised Environments on behalf of Moray Offshore WindFarm (East) Limited	
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Sign off by qualified landscape architect	
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This document represents the professional views of [redacted], Landscape Architect.	

Review / Approval

Moray East Ecological Clerk of Works	**Legal Review**
[redacted] [Royal Haskoning DHV]	[redacted] [Shepherd and Wedderburn]

Review / Approval

Moray East		
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List of Abbreviations

TI	Transmission Infrastructure
OfTI	Offshore Transmission Infrastructure
CMLI	Chartered Member of the Landscape Institute
ES	Environmental Statement
DSLP	Development Layout and Specification Plan
SLVIA	Seascape, Landscape and Visual Impact Assessment
LMP	Lighting and Marking Plan
BOWL	Beatrice Offshore Wind Limited
OSPs	Offshore Substation Platforms
WTGs	Wind Turbine Generators
LAT	Lowest Astronomical Tide
HAT	Highest Astronomical Tide
MS	Marine Scotland
OPEN	Optimised Environments Limited
SNH	Scottish Natural Heritage
THC	The Highland Council
WCS	Worst Case Scenario
ZTV	Zone of Theoretical Visibility

Definitions

The following definitions have been used throughout this document with respect to the company, the consented wind farms and how these definitions have changed since submission of the Moray East Environmental Statement (ES) in 2012 and the Modified Transmission Infrastructure ES in 2014.

- **Moray Offshore Windfarm (East) Limited (formerly known as Moray Offshore Renewables Limited and hereinafter referred to as Moray East)** – the legal entity submitting this Design Statement document;
- **Moray East Offshore Wind Farm** - the wind farm to be developed in the Moray East site (also referred to as the Wind Farm);
- **The Moray East site** - the area in which the Moray East Offshore Wind Farm will be located. Section 36 Consents and associated Marine Licences to develop and operate up to three generating stations on the Moray East site were granted in March 2014. At that time the Moray East site was known as the "Eastern Development Area (EDA)" and was made up of three sites known as the Telford, Stevenson and MacColl offshore wind farm sites; The Section 36 Consents and Marine Licences were subsequently varied in March 2018;
- **Telford, Stevenson and MacColl wind farms** – these names refer to the three consented offshore wind farm sites located within the Moray East site;
- **Transmission Infrastructure (TI)** - includes both offshore and onshore electricity transmission infrastructure for the consented Telford, Stevenson and MacColl wind farms. Includes connection to the national electricity transmission system near New Deer in Aberdeenshire encompassing AC offshore substation platforms (OSPs), AC OSP interconnector cables, AC export cables offshore to landfall point at Inverboyndie continuing onshore to the AC collector station (onshore substation) and the additional regional Transmission Operator substation near New Deer. A Marine Licence for the offshore TI was granted in September 2014 and a further Marine Licence for two additional distributed offshore substation platforms (OSPs) was granted in September 2017. The onshore TI was awarded Planning Permission in Principle in September 2014 by Aberdeenshire Council and a Planning Permission in Principle under Section 42 in June 2015;
- **Offshore Transmission Infrastructure (OfTI)** – the offshore elements of the transmission infrastructure, comprising AC OSPs, OSP inter-connector cables and AC export cables offshore to landfall (for the avoidance of doubts some elements of the OfTI will be installed in the Moray East site);
- **Moray East ES 2012** – The ES for the Telford, Stevenson and MacColl wind farms and Associated Transmission Infrastructure, submitted August 2012;
- **Moray East Modified TI ES 2014** – the ES for the TI works in respect to the Telford, Stevenson and MacColl wind farms, submitted June 2014;
- **The Development** – the Moray East Offshore Wind Farm and Offshore Transmission Infrastructure (OfTI);
- **Design Envelope** - the range of design parameters used to inform the assessment of impacts; and
- **OfTI Corridor** – the export cable route corridor, i.e. the OfTI area as assessed in the Moray East Modified TI ES 2014 excluding the Moray East site.

- **Moray East Offshore Wind Farm Consents** – are comprised of the following:

  Section 36 Consents:

  - Section 36 consent for the Telford Offshore Wind Farm (as varied) – consent under section 36 of the Electricity Act 1989 for the construction and operation of the Telford Offshore Wind Farm assigned to Moray East on 19 June 2018.
  - Section 36 consent for the Stevenson Offshore Wind Farm (as varied) – consent under section 36 of the Electricity Act 1989 for the construction and operation of the Stevenson Offshore Wind Farm assigned to Moray East on 19 June 2018.
  - Section 36 consent for the MacColl Offshore Wind Farm (as varied) – consent under section 36 of the Electricity Act 1989 for the construction and operation of the MacColl Offshore Wind Farm assigned to Moray East on 19 June 2018.

  Marine Licences

  - Marine Licence for the Telford Offshore Wind Farm (as varied) – Licence Number: 04629/18/1 – consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area transferred to Moray East on 19 July 2018.
  - Marine Licence for the Stevenson Offshore Wind Farm (as varied) – Licence Number: 04627/18/1 – consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area transferred to Moray East on 19 July 2018.
  - Marine Licence for the MacColl Offshore Wind Farm (as varied) – Licence Number: 04628/18/2 (as varied) - consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area transferred to Moray East on 19 July 2018.

- **OfTI Licences** – are comprised of the following:
  - Marine Licence for the Offshore Transmission infrastructure – Licence Number 05340/14/0 – consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area (referred to as the "OfTI Marine Licence").
  - Marine Licence for two additional distributed OSPs – Licence Number 06347/17/1 – consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction, operation and maintenance works and the deposit of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area (referred to as the "OSP Marine Licence").

Executive Summary

This document provides information regarding the visual aspects of the design evolution of the Moray East layout and specification based upon the approved Moray East Development Specification and Layout Plan (DSLP) to inform interested parties of the final Wind Farm scheme and offshore transmission infrastructure (OfTI) to be built as required by the conditions of the Section 36 Consent and the OfTI Licences which require the preparation of this Design Statement.

The review has been undertaken by Chartered Landscape Architects whose finding is that the design evolution has improved the visual effects of the Wind Farm and OfTI during both the daytime and night time as a result in a reduction in the maximum WTG height and number, a reduction in the scale and maximum number of the OSPs and the alignment of the WTG rows in a direction that does not run perpendicular to the Caithness coast.

Produced by

OPEN undertook the Seascape, Landscape and Visual Impact Assessment (SLVIA) of the Moray East Offshore Wind Farm as part of the Section 36 application (Moray East ES 2012) and the OfTI Marine Licence application (Moray East Modified TI ES 2014). Lynda Thomson (BA Hons Landscape Architecture CMLI) was the Project Director for the SLVIA work and is also the author of this Design Statement. She has 20 years' experience in the assessment of Wind Farm development in Scotland. Simon Martin (CMLI) has undertaken a review of this Design Statement. Simon was the author of the SLVIAs contained in the aforementioned ESs.

1 Introduction

1.1 Background

Section 36 Consents were granted in March 2014 for the construction and operation of three offshore wind farms (Telford, Stevenson and MacColl) within the Moray East site. Marine Licences for the three offshore wind farms were granted in September 2014 (together the Section 36 Consents and Marine Licences for the Wind Farm are referred as the Moray East Offshore Wind Farm Consents). Moray East was granted a Marine Licence for *inter alia* two Offshore Substation Platforms (OSPs) in September 2014 (OfTI Marine Licence) and in 2017 a Marine Licence was granted for two additional distributed OSPs (OSP Marine Licence) (together these licences are referred to as the OfTI Licences).

Moray East is a joint venture partnership between EDP Renewables, Engie and Diamond Generating Europe and has been established to develop, finance, construct, operate, maintain and decommission the Moray East Offshore Wind Farm.

In order to accord with the requirements of the Section 36 condition 13 and OfTI Licences conditions 3.2.2.7 and 3.2.2.8 (for the OfTI Marine Licence and OSP Marine Licence respectively) Moray East has appointed chartered landscape architects (Chartered Member of the Landscape Institute (CMLI)) at Optimised Environments Limited (OPEN) to undertake the preparation and 'sign off' of this Design Statement.

1.2 Objectives of this Document

The Section 36 Consents and OfTI Licences contain a variety of conditions that must be discharged through approval by the Scottish Ministers prior to the commencement of offshore construction. One such requirement is to inform interested parties of the final Wind Farm and OfTI scheme proposed to be built through the preparation and approval of a Design Statement.

The relevant conditions setting out the requirement for a Design Statement for approval are set out in full in Table 1-1 below.

This document is intended to satisfy the requirements of the Section 36 Consents and OfTI Licences conditions by providing a Design Statement.

Table 1-1: Consent conditions to be discharged by this Design Statement.

Consent Document	Condition Reference	Condition Text	Reference in this Design Statement
Section 36 Consents	13	The Company must, prior to the Commencement of the Development, submit a Design Statement ("DS"), in writing, to the Scottish Ministers that includes representative wind farm visualisations from key viewpoints agreed with the Scottish Ministers, based upon the DSLP, as approved by the Scottish Ministers (as updated and amended from time to time by the Company). The DS must be provided, for information only, to the Planning Authorities and the JNCC, SNH and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. The DS must be prepared and signed off by at least one qualified landscape architect, instructed by the Company prior to submission to the Scottish Ministers.	This document as well as the associated visualisation figures included in Appendix 1 sets out the Design Statement to inform interested parties.

Consent Document	Condition Reference	Condition Text	Reference in this Design Statement
OfTI Marine Licence	3.2.2.7	The Licensee must, prior to the Commencement of the Works, submit a DS, in writing, to the Licensing Authority that includes representative visualisations from key viewpoints agreed with the Licensing Authority, based upon the DSLP, as approved by the Licensing Authority (as updated and amended from time to time by the Licensee). The DS must be provided, for information only, to the Highland Council, Moray Council, Aberdeenshire Council, the JNCC, SNH and any such other advisors or organisations as may be required at the discretion of the Licensing Authority. The DS must be prepared and signed off by at least one qualified landscape architect, instructed by the Licensee prior to submission to the Licensing Authority.	This document as well as the associated visualisation figures included in Appendix 1 sets out the Design Statement to inform interested parties.
OSP Marine Licence	3.2.2.8	The Licensee must, no later than 6 months prior to the Commencement of the Development, submit a Design Statement ("DS"), in writing, to the Licensing Authority. The DS, which must be signed off by at least one qualified landscape architect, as instructed by the Licensee prior to submission to the Licensing Authority, must include representative wind farm visualisations from key viewpoints as agreed with the Licensing Authority, based upon the final DSLP as approved by the Licensing Authority as updated or amended. The DS must be provided, for information only, to The Highland Council, Moray Council, Aberdeenshire Council and SNH and any such other advisors or organisations as may be required at the discretion of the Licensing Authority.	This document as well as the associated visualisation figures included in Appendix 1 sets out the Design Statement to inform interested parties.

1.3 Document Structure

In response to the specific requirements of the Section 36 Consents and OfTI Licences conditions, this Design Statement has been structured to clearly set out how each part of the specific requirements has been met and that the relevant information has been provided to inform interested parties. The document structure is set out in Table 1-2 below.

Table 1-2: Design Statement Document Structure

Section		Summary of Contents
1	Introduction	Sets out the structure and objectives of the Design Statement.
2	Consultation	Sets out the consultation that took place in order to obtain agreement on the viewpoints to be included.
3	Project overview	Information about the design and appearance of the Wind Farm and OfTI.
4	Guidance	Sets out the guidance followed when completing this document.
5	Visualisations and Zone of Theoretical Visibility	Sets out the viewpoints and visualisations used to illustrate the design of the Wind Farm and OfTI and provides an appraisal of these when compared with those of the original applications as well as consideration of the comparative ZTV.
6	Design Aims	Sets out the objectives considered when designing the WTG layout and specification.

Section		Summary of Contents
7	Comparison with the Application	Compares the design and appearance of the Wind Farm and OfTI with what was described in the original applications and is as assessed in the Environmental Statements (ES) or other documentation.

1.4 Linkages with other consent plans

This Design Statement document sets out how the proposed design and layout for the Wind Farm and the OfTI compares with that considered in the ESs and the report entitled "Offshore Substation Platforms, Marine Licence, Statement Regarding Implications for the ES and HRA" (Moray East, 2017). However, ultimately it draws upon a suite of approved documents that provides the framework for the construction process and in some cases the operation of the scheme – namely the other consent plans required under the Section 36 Consent and OfTI Licences.

The consent conditions that require the development of a Design Statement do not explicitly identify linkages between this and other consent plans. However, other conditions require that several consent conditions plans be consistent with the Design Statement; these plans are identified in Table 1-3 below.

Table 1-3: Design Statement consistency and links to other consent plans

Condition	Consent Plan	Consistency with and linkage to Design Statement
Section 36 Condition 12; OfTI Marine Licence Condition 3.2.2.6; & OSP Marine Licence: Condition 3.2.2.7	DSLP	Provides details of the proposed development.
Section 36 Condition 19; OfTI Marine Licence Condition 3.2.2.14; & OSP Marine Licence Condition 3.2.2.5	Lighting and Marking Plan (LMP)	Provides details of the aviation lighting used to prepare the night time visualisation.

2 Consultation

Advice and agreement was sought from Marine Scotland Licensing Operations Team (MS-LOT), Scottish Natural Heritage (SNH) and The Highland Council (THC) on the viewpoints and visualisations, which are required to be included in this Design Statement. A note was produced detailing the proposed approach to the Design Statement (letter dated 18/06/2018) and sent to MS-LOT for consultation. MS-LOT consulted on the proposed approach with SNH and THC. Advice was received from SNH however no response on these matters was received from THC.

Table 2-1 below provides a summary of the consultation undertaken.

Table 2-1: Stakeholder consultation on the approach to the Design Statement.

Consultee	Scope of consultation / consultation response	Date	Moray East comments
SNH	**Response to Moray East's proposed approach to Design Statement (letter dated 18/06/2018)** • Agreed with suggested approach • Recommended that notification provided to MS on exact locations of WTGs and OSPs constructed. • 12 agreed viewpoints to have comparative wirelines illustrating WCS and DSLP layouts. • Recommended night time visualisation prepared for Sarclet.	17/07/2018	Design Statement produced in line with advice provided. Further advice sought on whether Wick view could be used in place of Sarclet as OPEN has this baseline photograph.
SNH	**Email correspondence on approach to the Design Statement** • Confirmation provided that SNH are in agreement with night-time visualisation to be prepared using the existing photography from Wick and not Sarclet.	01/08/2018	Design Statement produced in line with advice provided.
SNH	**Email correspondence on the approach to the Design Statement** • Confirmation provided that SNH is in agreement that only photomontages are prepared for the key design viewpoints and that not all viewpoints have photomontages prepared.	23/08/2018	Design Statement produced in line with advice provided.
MS-LOT	**Email correspondence with MS-LOT** • Confirmation provided that the Design Statement should be produced taking into account feedback from SNH only as no consultation response was received from THC.	23/08/2018	Design Statement produced in line with advice provided.

3 Project Overview

This Section of the Design Statement provides a brief overview of the Wind Farm and OfTI design and specification and how this compares with the Wind Farm and OfTI worst case scenario (WCS) assessed in the Moray East ES 2012 and the Moray East Modified TI ES 2014 as well as considered in the Offshore Substation Platforms Marine Licence Statement Regarding Implications for the ES and HRA (Moray East, 2017).

3.1 Development Overview and Layout

The closest point the Wind Farm lies at a distance of 23.8 km from the Caithness coast at Sarclet, approximately 26.6 km from Wick and 41.2 km from Portnockie. Of importance is that the Moray East site is located partially beyond the under construction Beatrice Offshore Wind Limited (BOWL) wind farm in views from the Caithness coast. In more southerly views from the coast of Highland it appears beyond and as an extension to BOWL.

The location of the Moray East site to BOWL and the Caithness coast is shown on Figure 3-1.

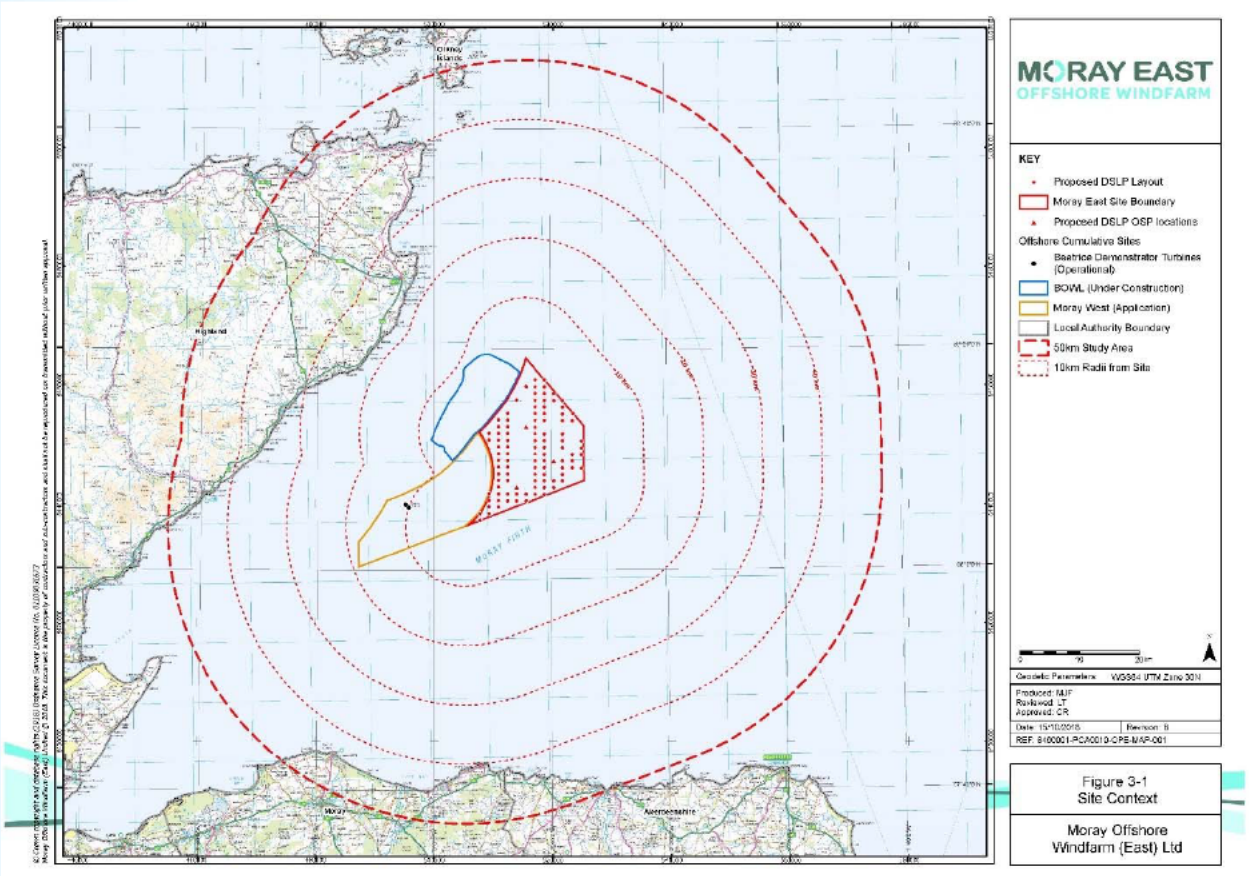

Figure 3-1: Moray East Site Context

The Wind Farm and OfTI will consist of the following main components that are of relevance to this Design Statement:

- 100 Wind Turbine Generators (WTGs) of 9.525 MW generating capacity;
- Aviation lighting (2000/200 Candela visible red flashing lights) on the hubs of the perimeter WTGs;
- 3 Offshore Substation Platforms (OSPs);

- Jacket substructures; and
- Minor elements such as a met mast, buoys and markers

Figure 3-2 illustrates the layout of the WTGs and OSPs within the Moray East site. The locations of the WTGs to be lit for aviation purposes is also shown. There are currently 12 spare locations (nine included within the DSLP dated September 2018 and three additional potential WTG locations selected following submission of the DSLP[1]) that may be utilised if ground conditions are encountered during the foundation installation operations at one or more of the WTG or OSP locations that cannot be overcome by micro-siting. Changes to the layout in relation to the 12 possible spare locations will not materially affect the appearance of the Wind Farm or change the comparison with the consented design carried out in this document.

Further details of the design and specification (including coordinates and lighting proposals) are contained in the DSLP and LMP documents. The DSLP also provides information regarding the technical constraints and requirements that have defined the layout.

The cables linking the Wind Farm to the shore are sub-sea and whilst the cable laying operations will be visible the implications of this are considered to be as per the Moray East Modified TI ES 2014 and not relevant to the appearance of the above sea surface elements of the proposals with which this Design Statement is concerned.

Moray East has chosen to install MHI Vestas V164 9.5 MW WTGs. The dimensions of the WTGs are summarised in Table 3-1. The variation in turbine height is by cluster with further details of this provided in the DSLP.

Table 3-1: Key dimensions of the WTGs

Parameter	Dimension (measured above HAT)
Height to blade tip	Upper ("12 o'clock") 190.7-194.2 m above HAT (195.4-198.9 m above LAT) Lower ("6 o'clock") 26.7-30.2 m above HAT (31.4-34.9 m above LAT)
Height to hub	108.7-112.2 m above HAT (113.4-116.9 m above LAT)
Rotor diameter	164 m (blade length 80 m)

The three OSPs are comprised of the OSP topside which sits upon the tubular jacket substructure. The key dimensions for the OSPs are provided in Table 3-2 below.

Table 3-2: Key dimensions of the OSPs

Parameter	Dimension (measured above HAT)
OSP topside dimensions	36 m (length) x 31 m (width) x 20 m (height)
Height of OSP jacket	16.3 m above HAT (21 m above LAT)
Height of topside	30.1 m above HAT (34.8 m above LAT)

The Seascape Landscape and Visual Impact Assessment (SLVIA) contained in the Moray East ES 2012 and the Moray East Modified TI ES 2014 was based on the WCS layouts and dimensions of the WTGs and OSPs. These WCSs were agreed with the consultees.

The OfTI Marine Licence included two 'large OSPs'. In 2017 Moray East applied for two additional 'small OSPs' (i.e. distributed OSPs). Whilst the alternative development scenario proposed was not assessed in

[1] Further revisions of the DSLP will reflect any changes to the layout.

detail an environmental report was submitted. OPEN provided advice to Moray East on the relative effects of the OSPs proposed as compared to those assessed in the Moray East Modified TI ES 2014. It was concluded that the effects of the distributed OSPs will be consistent with the original assessment[2].

The WCS for the consented Telford, Stevenson and MacColl Offshore Wind Farms (Figure 3-3) was defined as Layout 4c in the Moray East ES 2012 (Chapter 8.4). This included 216 WTGs of up to 204 m (LAT) to tip with jacket foundations as well as two AC OSPs sited close to the Moray East site boundaries closest to Caithness and Moray/Aberdeenshire. The two 'large OSPs' were defined as having a maximum platform length of 100 m, platform width of 100 m and platform height of 70 m. The maximum height of 70 m is the total height of the topside structure (the substation 'box') and the visible jacket foundations (up to 6 no.) / air gap, above LAT.

The WTGs around the perimeters of each of the consented Telford, Stevenson and MacColl Offshore Wind Farms were to have red flashing aviation lighting (2000 candela) at hub height.

The subsequently approved alternative for the OSPs allows the deployment of 4 'small OSPs' with a maximum platform length of 50 m, platform width of 50 m and platform height of 70 m.

[2] Moray East (2017) Offshore Substation Platforms Marine Licence, Statement Regarding Implications for the ES and HRA, April 2017. Available through https://www.gov.scot/Resource/0051/00518600.pdf.

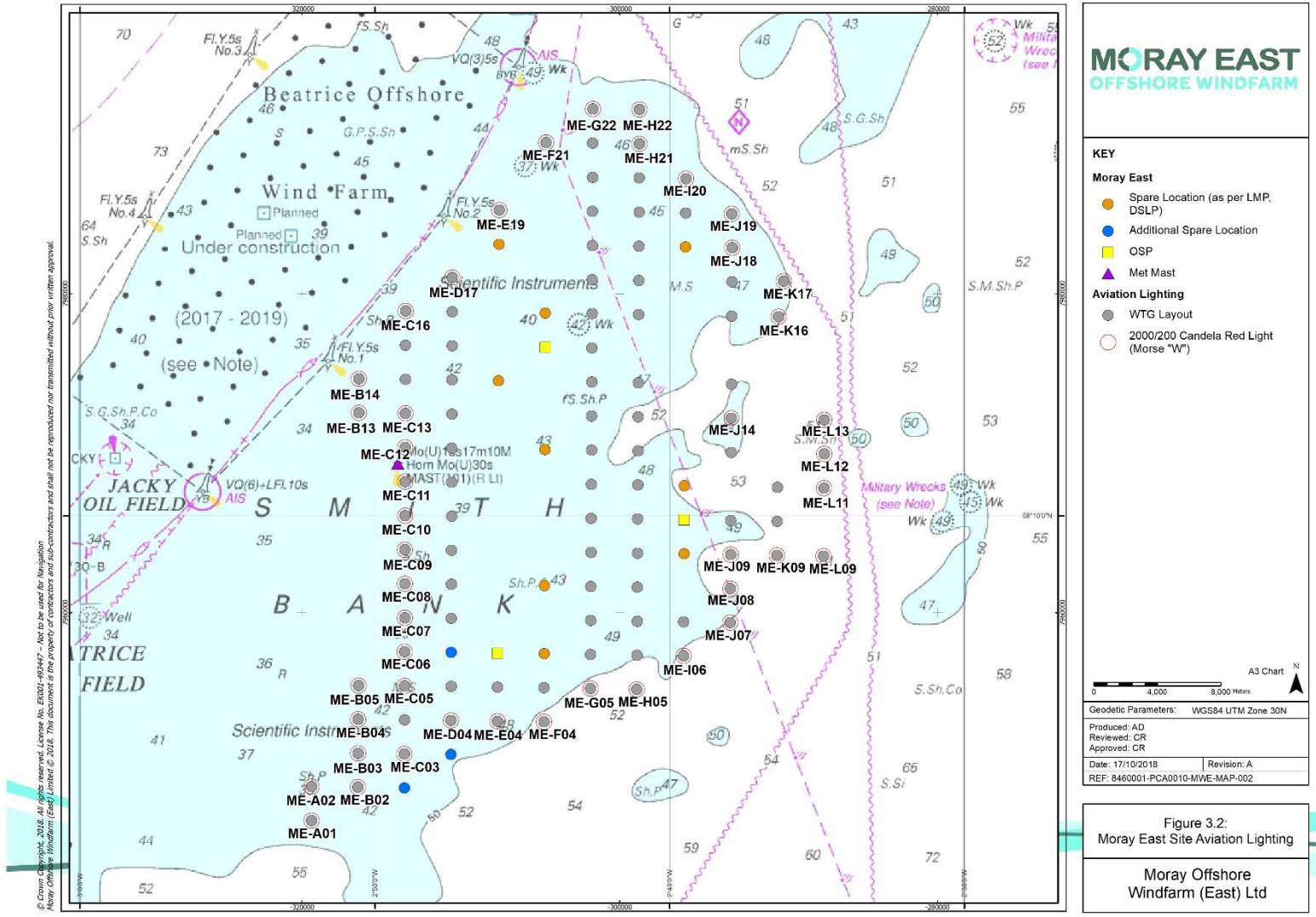

Figure 3-2: DSLP Layout Plan

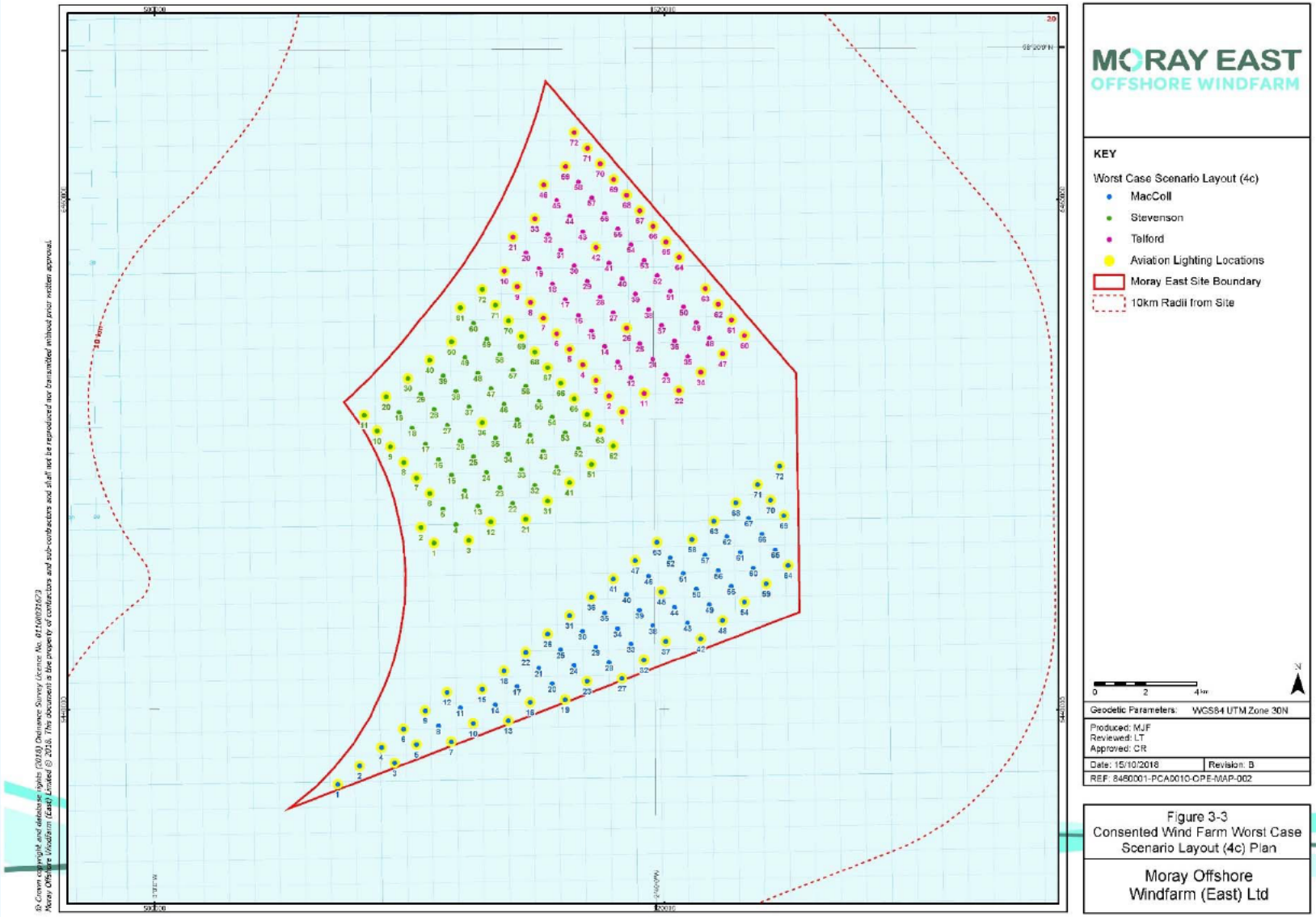

Figure 3-3: Consented Wind Farm Worst Case Scenario Layout (4c) Plan

4 Guidance

In preparing this Design Statement reference has been made to the following guidance:

- SNH Advice on Offshore Wind Design Statements (SNH undated); and
- Visual Representation of Wind Farms Guidance Version 2.2 (SNH February 2017).

An overview of the consultation undertaken on the approach to the Design Statement is provided in Section 2 above.

5 Visualisations and Zone of Theoretical Visibility

The following Section sets out the methodology for the preparation of the visualisations and provides a description of how the views of the Wind Farm and OfTI contained in the DSLP and LMP compare with the views of the WTGs and OSPs included in the application documentation.

5.1 Viewpoints

Visualisations have been prepared for the viewpoints shown in Table 5-1 as agreed with MS and SNH. Their locations are shown on Figure 5-1.

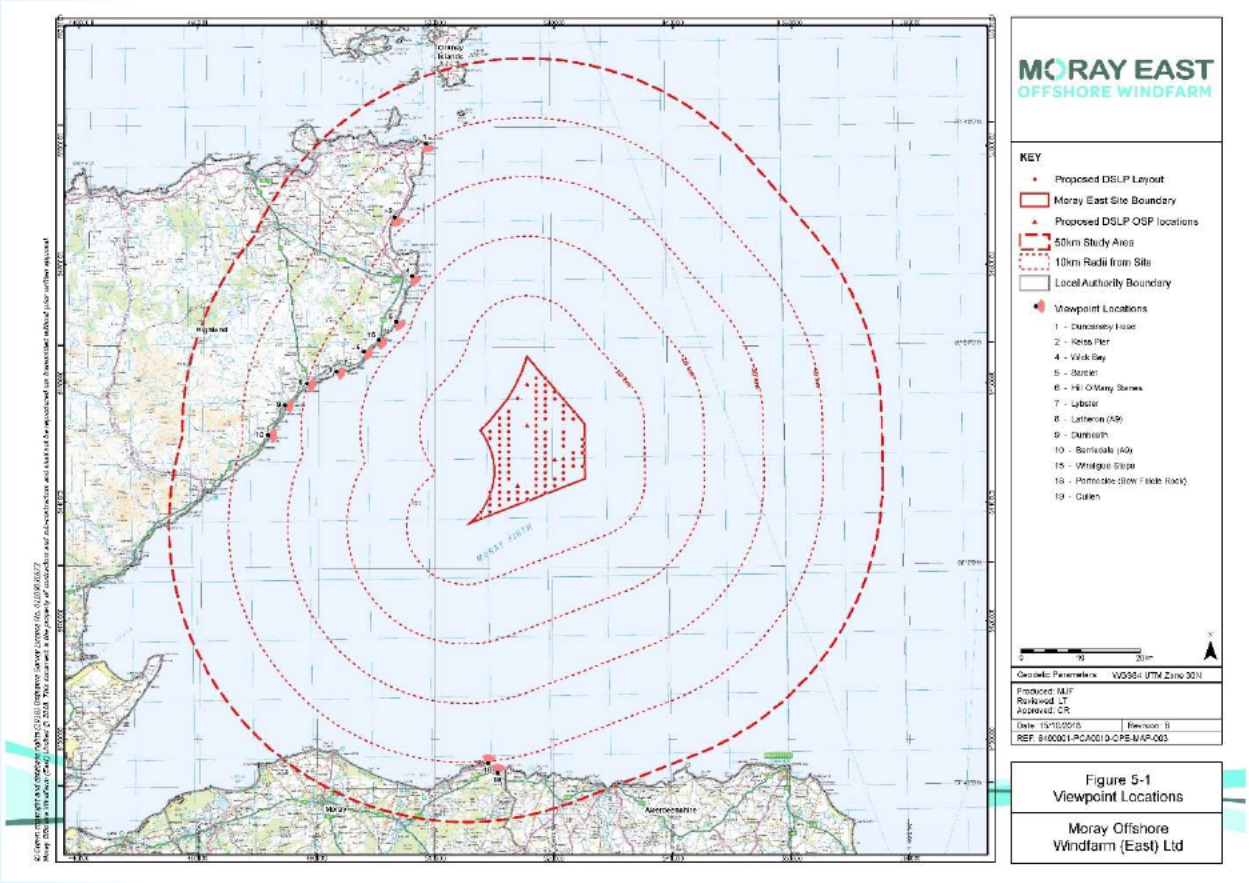

Figure 5-1: Viewpoint Locations

Some of these were as used in the Moray East ES 2012 and some have been selected from the Moray West ES 2018 as the photography is more recent. In some cases, the Moray West ES photographs were taken from different locations within settlements to those used in the Moray East ES, although the numbering still reflects the original Moray East ES general locations to allow some consistency and cross reference to the Moray East ES 2012.

Viewpoint location plans are presented for each of the selected viewpoints which are contained in Appendix 1 of this document.

Table 5-1: Viewpoints Considered in Design Statement

Agreed Viewpoint Locations		
Viewpoint	**Distance from Moray East site**	**Photomontage Included**
1. Duncansby Head	42 km	
2. Keiss Pier	34.5 km	Y
4. Wick Bay	26.2 km	Y
5. Sarclet	23.0 km	Y
6. Hill O'Many Stanes	24.2 km	Y
7. Lybster	26.7 km	
8. Latheron (A9)	30.7 km	
9. Dunbeath	33.7 km	Y
10. Berriedale (A9)	36.1 km	
15. Whaligoe Steps	23.1 km	
18. Portnockie (Bow Fiddle Rock)	41.1 km	
19. Cullen	42.8 km	

5.2 Comparative wirelines

The Design Statement includes 90 degree field of view, cylindrically projected, panoramic baseline photography and comparative wirelines that show the difference between the assessed WCS for the consented Telford, Stevenson and MacColl Offshore Wind Farms and the DSLP WTG layouts.

In accordance with SNH guidance the wirelines have been prepared to illustrate the Wind Farm in the context of the other offshore cumulative wind farms which in the case of the wirelines include the under construction BOWL, Beatrice Demonstrator (operational) and application stage Moray West (WCS) wind farms.

The DSLP wirelines also show markers for the OSPs, which indicate their locations and maximum heights only. It is not possible to indicate the OSP consented locations due to the possibility of the alternative scenarios that have been consented.

The baseline views include a photomontage of the under construction BOWL wind farm as agreed with MS and SNH.

Baseline night time photography has also been included for Viewpoint 4: Wick as a night time photomontage has been requested by SNH.

5.3 Photomontages

The photomontages have been prepared to provide a more realistic impression of how the Wind Farm and OfTI would appear in a selection of views from the Caithness, Moray and Aberdeenshire coast. The views selected are those that were considered of importance in relation to the design of the Wind Farm in the Moray East ES 2012. In addition, a photomontage has also been prepared for Viewpoint 5: Sarclet as it is the closest to the Moray East site.

A night time photomontage, which illustrates the aviation lighting as defined in the LMP is included for Viewpoint 4: Wick.

The photomontages have been prepared in accordance with SNH guidance and are 53.5 degree field of view planar images.

In accordance with SNH's requirements, as set out in SNH Advice on Offshore Wind Design Statements, the photomontages show the form and colour of the WTGs and OSPs. The form of the jacket foundations is not illustrated.

5.4 Zone of Theoretical Visibility (ZTV)

ZTVs illustrate the area within which the Wind Farm may be theoretically visible. It does not take account of any above ground features and in this instance has been based on Terrain 50 DTM.

A ZTV has been prepared for the WCS assessed in the ESs for the consented Moray East Wind Farm and a further ZTV has been prepared for the DSLP layout and specification. Figure 5-2 illustrates where the extents of these two ZTVs differ.

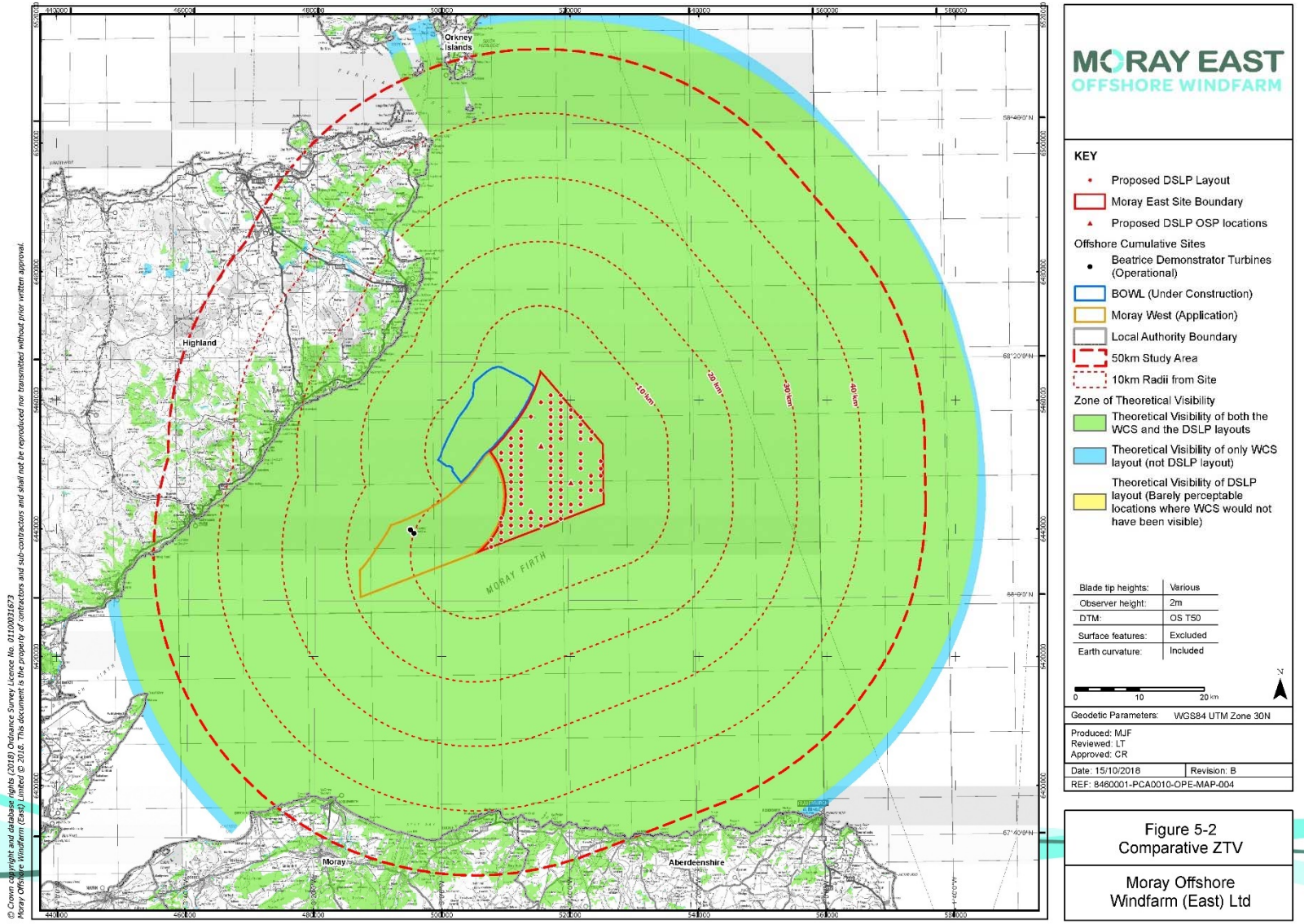

Figure 5-2: Comparative ZTV

6 Design Aims

Through the evolution of the Wind Farm layout and specification consideration has been given to the following design objectives:

- To maintain the same or reduce the overall horizontal extent of the field of view affected by the Wind Farm from that considered in the Moray East ES 2012;
- To maintain the same or reduce the WTGs dimensions;
- To maintain the same or reduce the number of WTGs;
- To maintain or reduce the apparent density of the WTG layout;
- To avoid, where possible, excessive WTG stacking or overlapping in key views from the most populated parts of the Caithness coast through not orientating the WTG rows perpendicular to the coastline;
- To avoid, where possible, WTGs that appear as 'outliers'; and
- To maintain the same or reduce the number or scale of the OSPs and to locate them away from the closest parts of the Moray East site boundaries to the Caithness and Moray coasts.

Achieving these aims will ensure that the effects of the DSLP layout and specification will be less than or equal to those assessed in the ESs.

6.1 Design Process

This Section provides a description of how the design has evolved from that included in the Moray East WCS assessed in the ESs to the DSLP layout and specification. This is carried out through the consideration of each of the aims identified above.

Reference should be made to the comparative wirelines and the photomontages which illustrate the differences in the WTG layouts and specification and the appearance of the DSLP layout respectively as included in Appendix 1.

6.1.1 Horizontal extent

The Wind Farm is located generally within the same part of the Moray East site as was the case for the consented Telford, Stevenson and MacColl Offshore Wind Farms. Its relationship to the coast and the BOWL wind farm is therefore similar and the horizontal extent of the views affected by the Wind Farm is similar or in some cases reduced.

There is a small increase in the extent of the Wind Farm in views from the northern Caithness coast (Viewpoints 1 and 2). This is due to the WTGs being marginally closer to the north-east boundary than was the case in the WCS. In the context of BOWL it is considered that this will not be readily noticeable.

The horizontal extent of the DSLP is slightly reduced in the views from other locations along the southern sections of the Highland coast (Viewpoints 4-15), where the increase in the horizontal extents of the wind farm developed skyline (including BOWL) were most marked and resulted in significant cumulative visual effects in the context of BOWL.

6.1.2 WTG dimensions

The height of the WTGs has reduced from a maximum assessed height of 204 m above LAT to 198.9 m above LAT. This ensures that the WTGs appear slightly smaller in the views and also more akin in their dimensions to those of the BOWL wind farm.

In addition, the siting of more of the WTGs within the eastern part of the Moray East site results in more of the WTGs being located at a greater distance from the Caithness coast and therefore perceived to be smaller than was previously the case in the WCS layout.

6.1.3 Number of WTGs

The number of WTGs within the Moray East site is substantially reduced from the 216 of the WCS considered in the SLVIAs to 100 WTGs within the DSLP layout. The overall density of the WTGs seen within the views is therefore markedly reduced and this has the result of reducing the visual impact of the Wind Farm, particularly in the context of BOWL.

6.1.4 Apparent density of the WTGs

The WCS layout included a large area to the east of the Moray East site (i.e. furthest from the Caithness coast) that did not have any WTGs located within it. This resulted in areas of higher WTG intensity nearer the Caithness coast (and Highland viewpoints). The more even and less dense configuration of the WTGs in the DSLP ensures a more consistent and less intense spread of WTGs across the views. The reduction in the apparent density is the most notable change between the layouts, giving rise to the reduced visual effects.

6.1.5 Orientation of WTG rows

The orientation of the WCS WTGs illustrated a high degree of overlap or 'stacking' of WTGs in views from the most settled and closest parts of the Caithness coast. This occurred through the alignment of the rows of the most closely spaced WTGs perpendicular to the coast i.e. in a broadly north-west to south-east alignment.

The DSLP layout has the most closely spaced WTG rows aligned in a north-south orientation with the more widely spaced rows aligned west to east. This orientation within the DSLP layout ensures that the stacking of WTGs in the closest views from the coast is avoided or reduced.

It is noted that there is an increase in the 'stacking' of WTGs in the views from the Moray and Aberdeenshire coast, however it is considered that the greater distance of over 40km limits the effect of this.

6.1.6 WTG 'outliers'

The WCS layout included WTGs within the narrowly configured section of the southern part of the site. This resulted in two 'rows' of one turbine and then a further 'row' of two WTGs. When seen from the coast these WTGs appeared as 'outliers' as there were no more distant WTGs to fill in the apparently wider gaps as occurs within the wider sections of the Moray East site.

Within the DSLP layout this effect is reduced slightly so that there are no rows of single WTGs. The configuration of the rows within the southern part of the site ensures that the spacing between the end rows is also less pronounced in views from the Highland coast than was the case in the WCS layout.

6.1.7 OSP number, scale and location

The WCS considered in the Moray East OfTI ES 2014 included two large OSPs located on the boundaries of the Moray East site where they would be closest to the Caithness and Moray coasts. An alternative proposal for four small OSPs assumed to be located similarly was also approved.

The DSLP layout locates three even smaller OSPs set back from the Moray East site boundaries and within the main body of the area surrounded by WTGs and this results in a reduction in visual effect.

6.2 Viewpoints

This Section provides a detailed review of the difference in the visual effect of the DSLP layout and specification compared with the effect of the WCS considered in the ESs. This is carried out in relation to each of the agreed viewpoints and is set out in Table 5-2. Reference should be made to the viewpoint wirelines contained in Appendix 1 which illustrate this comparison.

The OSPs are not shown on the wirelines but in all cases they will be seen at a greater distance, at a smaller scale and lesser number than the consents allow.

Table 5-2: Difference in visual effect of DSLP layout and specification when compared with the WCS.

Viewpoint review	
Viewpoint	**Difference in visual effect**
1. Duncansby Head	Slight increase in horizontal extent of DSLP layout to north. Overall horizontal extent of Wind Farm remains as per WCS layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine increased.
2. Keiss Pier	Slight increase in horizontal extent of DSLP layout to north. Overall horizontal extent of Wind Farm remains as per WCS layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine increased. Stacking of WTGs markedly reduced.
4. Wick Bay	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine increased. Stacking of WTGs markedly reduced. One slight outlier apparent in north of Wind Farm. In the night time view there will be markedly less WTGs with aviation lighting.
5. Sarclet	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine slightly increased. Stacking of WTGs reduced.
6. Hill O'Many Stanes	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine slightly increased. Stacking of WTGs reduced. Incidence of southerly outliers slightly less apparent.
7. Lybster	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine slightly increased. Stacking of WTGs reduced. Incidence of southerly outliers slightly less apparent.

Viewpoint review	
Viewpoint	**Difference in visual effect**
8. Latheron (A9)	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine slightly increased. Stacking of WTGs reduced. Incidence of southerly outliers slightly less apparent.
9. Dunbeath	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine slightly increased. Stacking of WTGs reduced although there are still some incidences of this. Incidence of southerly outliers slightly less apparent.
10. Berriedale (A9)	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine slightly increased. Stacking of WTGs reduced although there are still some incidences of this. Incidence of southerly outliers slightly less apparent.
15. Whaligoe Steps	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Distance to nearest turbine slightly increased. Stacking of WTGs reduced although there are still some incidences of this. Incidence of southerly outliers slightly less apparent.
18. Portnockie (Bow Fiddle Rock)	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Reduction in turbine height and number in the closer parts of the Moray East site means that more WTGs are visible only as blades and hubs rather than their towers also being visible. Stacking of WTGs occurs in longer rows of WTGs at distances of greater than 40 km.
19. Cullen	Decrease in horizontal extent of DSLP layout. WTG height and density reduced. Notable reduction in number of closer WTGs. Reduction in turbine height and number in the closer parts of the Moray East site means that more WTGs are visible only as blades and hubs rather than their towers also being visible. Stacking of WTGs occurs in longer rows of WTGs at distances of greater than 40 km.

6.2.1 Conclusion in relation to design evolution

Taking each of the aspects considered during the evolution of the layout in Section 6.1 above in turn and with reference to each of the viewpoints, it is considered that the effects of the Moray East Offshore Wind Farm and OfTI (as detailed within the DSLP) would be reduced from those assessed as the WCS in the ESs during both day and night time. In some cases the overall improvement in the appearance of the Wind Farm and the reduction in its visual effect is quite marked.

Reductions in the visual effects from the coast will also reduce the landscape and seascape effects of the Moray East Offshore Wind Farm and OfTI.

7 Comparison with the Application

A review of the evolution of the design from what was assessed in the ESs WCS has been undertaken by Chartered Landscape Architects to inform interested parties of the final wind farm scheme to be built in accordance with Section 36 condition 13 and OfTI Licences conditions 3.2.2.7 and 3.2.2.8 (for the OfTI Marine Licence and OSP Marine Licence).

It is the professional opinion of the landscape architect that the seascape, landscape and visual effects of the DSLP layout and specification will be reduced when compared with those assessed in relation to the parameters for the consented layout and specification.

Appendix 1

[Provided as a separate document]

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OFFSHORE WINDFARM

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