Highland Wind Limited

Pentland Floating Offshore Wind Farm

EIA Scoping Addendum Report

ASSIGNMENT A100671-S01
DOCUMENT A-100671-S01-REPT-005

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REV	DATE	DESCRIPTION	ISSUED	CHECKED	APPROVED	CLIENT
A02	17/12/2021	Issued for Use	SP	MM	MM	
A01	06/12/2021	Issued for Use	MM	NB	NB	
R02	29/10/2021	Issued for Review	SP	MM	MM	
R01	15/10/2021	Issued for Review	SP	NB	NB	

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ACRONYMS AND ABBREVIATIONS

BT	British Telecom
CAA	Civil Aviation Authority
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EPS	European Protected Species
HAT	Highest Astronomical Tide
HIAL	Highland and Islands Airport Limited
IFP	Instrument Flight Procedures
JRC	Joint Radio Company
Km	Kilometre
kV	Kilovolt
LOS	Line of Sight
m	Metre
MMMP	Marine Mammal Mitigation Protocol
m/s	Metres per second
MoD	Ministry of Defence
MSS	Marine Scotland Science
MU	Management Units
MW	Megawatts
PCoD	Population Consequences of Disturbance
PFOWF	Pentland Floating Offshore Wind Farm
PMF	Priority Marine Feature
PSR	Primary Surveillance Radar
PTS	Permanent Threshold Shifts
RSPB	Royal Society for the Protection of Birds
SAR	Search and Rescue
SLVIA	Seascape, Landscape and Visual Impact Assessment
SMRU	Sea Mammal Research Unit
SSR	Secondary Surveillance Radar
THC	The Highland Council
UK	United Kingdom
WLA	Wild Land Area
WTG	Wind Turbine Generators
ZTV	Zone of Theoretical Visibility

1 INTRODUCTION

1.1 Project Overview

Highland Wind Limited is proposing to demonstrate a floating offshore wind farm with an installed capacity of up to 100 megawatts (MW) approximately 6.5 km off the coast of Dounreay, Caithness, referred to throughout this document as the Pentland Floating Offshore Wind Farm (PFOWF) or 'the Project'. The Project is in the same location as the Dounreay Trì Floating Demonstration Project which was granted key consents and a marine licence in 2017. Highland Wind Limited was assigned the Section 36 Consent and Marine Licences awarded to Dounreay Tri Limited (in administration) for the Dounreay Tri Floating Demonstration Project on the 3rd March 2021. Highland Wind Limited's aim for the PFOWF is to test and demonstrate a technology solution for floating offshore wind in Scotland. The proposed Offshore Area for the PFOWF covers the same area as the Dounreay Trì marine licence, however it's southern boundary has been set back from the coast of the mainland by 1 km (see Figure 1.1).

The PFOWF will comprise an offshore array of up to ten floating Wind Turbine Generators (WTGs) connected to one another by subsea inter-array cables supported by floating structures. Up to two offshore export cables will carry the power generated by the PFOWF to a landfall location at the Dounreay coast. A buried onshore cable will then transmit the power inland to a new onshore substation, where it will connect to the transmission network.

It is the intention that the PFOWF will be developed in two phases:

- Phase 1: Pentland Floating Offshore Wind Demonstrator Project - A single demonstrator turbine will be deployed ahead of the wider PFOWF Array in 2024 to trial the technology required for the PFOWF Array (subject to Final Investment Decision scheduled for Q3 2022). The development of this phase will utilise the existing consent (with a variation to the Section 36 consent) for Dounreay Tri Floating Demonstration Project, and does not form part of this Scoping Addendum Report; and
- Phase 2: PFOWF Array – Subject to granting of the Section 36 Consent and Marine Licences, a floating offshore wind array comprising up to ten turbines will be deployed by 2025 to test and demonstrate commercial scale floating wind technologies in Scotland.

The proposed Project is shown in Figure 1.1.

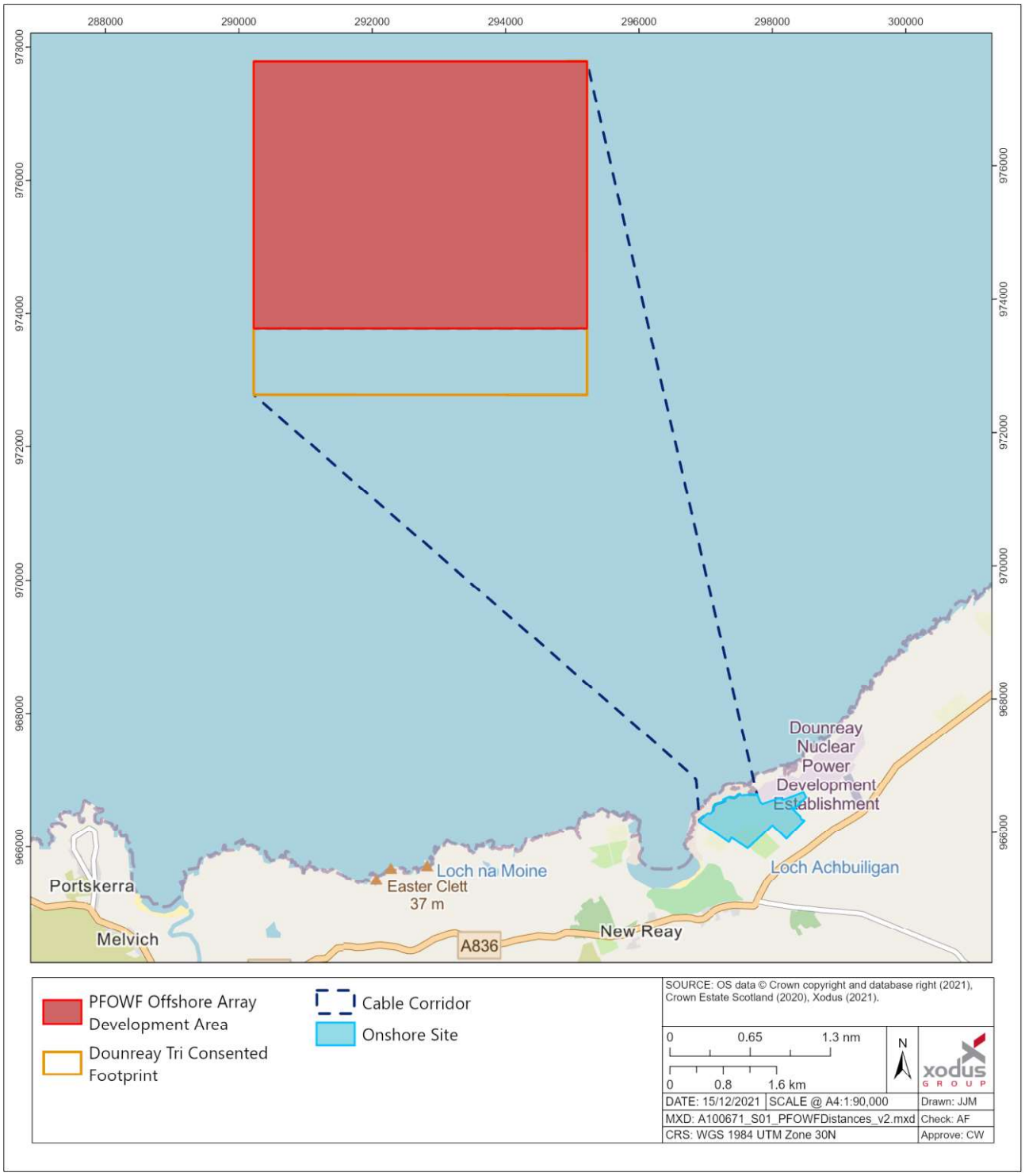

Figure 1.1 Location of the Project

1.2 Purpose of This Document

The Project requires an Environmental Impact Assessment (EIA) to be undertaken under Schedule 2 of the Electricity Works EIA 2017 (Scotland) Regulations and the Marine Works EIA 2017 (Scotland) Regulations. Scoping is required to determine the content of the EIA Report and the matters to be addressed by the EIA. The PFOWF Scoping Report (A-100671-S00-REPT-001) was submitted to Marine Scotland in December

2020, and the Scoping Opinion was received in September 2021. However, during this time slight amendments to the Project are being proposed and therefore, in order to ensure the impacts have been scoped in according to the updated project requirements this Scoping Addendum Report will discuss any impact changes.

This Scoping Addendum Report supplements the 2020 Scoping Report by providing further information regarding changes to the project description and addresses any potential alterations to impact scopes resulting from these. Namely, the increase in upper blade tip height, increasing the rotor diameter and hub height of the potential turbine to be deployed and the addition of driven piles as an alternative anchor solution. The changes are detailed in Table 2.1 below.

The Onshore and Offshore EIA will now be completed as two separate EIA Reports and submitted separately for determination to Marine Scotland, on behalf of the Scottish Ministers, and to The Highland Council (THC) respectively.

In order to keep this addendum concise, where information has remained unchanged from the original Scoping Report, the information has not been repeated. The focus on this Scoping Addendum Report is to identify potential increase in risk for the assessed impacts and any potential changes in the methodology for the EIAR that are due to the Project changes.

Chapter 3 identifies the potential impacts on receptors from the Project changes. Ornithology, Aviation and Radar, and Seascape, Landscape and Visual Impact (SLVIA) have been identified as potential receptors that may require a reassessment of the potential impacts due to the change in tip height. Fish and Shellfish Ecology and Marine Mammals and Other Megafauna have been identified as potential receptors that may require reassessment of the potential impacts due to the possible need for pile driving. The impact tables for the five topics have been updated from the original Scoping Report with an added column identifying whether there is "*Potential for increased impacts from proposed project changes*". In addition, if any changes to the method of assessment are required, they have also been outlined.

2 PROJECT DESCRIPTION

The project parameters that have changed since the Scoping Report (A-100671-S00-REPT-001) was submitted are presented within Table 2.1, with the new proposed parameters highlighted in blue text.

Table 2.1 Key Offshore Project Parameters

Project aspect	Description	Worst case parameters (as per Scoping Report)	New worst case parameters
Turbine specifications	WTGs with a total installed capacity of 100 MW. The turbine spacing will be a min. of 800 m.	No. of WTGs: 6-10 Hub Height: Max. 150 m Lower Blade tip height: Min. 22 m Upper blade tip height: Max. 270 m Rotor diameter: Max. 240 m Rotation Speed: Max. 25-30 m/s	No. of WTGs: up to 10 Hub Height: Max. 190 m Lower Blade tip height: Min. 22 m Upper blade tip height: Max. 300 m [1] Rotor diameter: Max. 260 m Rotation Speed: Max. 25-30 m/s
Floating substructure options	Four types of floating substructures: Barge / semi-submersible / spar / tension leg platform	Length: Max. 124 m Breadth: Max. 124 m Height: Max. 77.5 m Overall footprint: 15,376 m2 Proportion of depth above water: Max. 15 m	Length: Max. 124 m Breadth: Max. 124 m Height: Max. 77.5 m Overall footprint: 15,376 m^2 Proportion of depth above water: Max. 30 m
Moorings	Taut spread mooring / catenary mooring / semi-taut mooring	3 – 6 moorings per WTG Spread radius of up to ~ 600 m Material of mooring lines: Chains, cables or synthetic rope (or a combination of technologies)	3 – 8 (potentially up to 12) moorings per WTG Spread radius of up to 1,250 m
Anchors	Four types of anchors: drag, gravity, suction bucket and vertical load	Up to 6 anchors per WTG	3 – 8 (potentially up to 12) anchors per WTG
Piles	Two types of piling: hammer/ driven piles or drilled/ screw piles	Only drilled piles were included in the Scoping Report.	3 – 8 (potentially up to 12) driven piles per WTG, each pile being up to approximately 8 m in diameter. Note that drilled piles still remain an option that will be considered within the EIA.
* Blue text indicates the changes to the potential Project parameters that have been made since the Scoping Report was submitted.			

[1] The maximum tip height of the turbine is not yet decided, if a 300 m tip height is required it is likely only five turbines will be needed to be deployed to reach the total project capacity. If smaller turbines were installed up to ten turbines may be required to reach the total project capacity.

3 POTENTIAL IMPACTS ON RECEPTORS FROM PROJECT CHANGES

As can be seen in Table 2.1 the proposed parameters that have altered since submitting the original Scoping Report are:

- Maximum hub height;
- Maximum blade tip height;
- Maximum rotor diameter;
- Proportion of depth above water for the floating substructure;
- The potential number of mooring lines, anchors and mooring spread that may be required has increased; and
- The introduction of driven piles.

The increase in number of mooring lines, anchors and mooring spread have the potential to cause impacts to a variety of receptors (marine physical processes, benthic ecology, fish ecology, marine mammals, commercial fisheries, shipping and navigation, and archaeology and cultural heritage). However, having reviewed the Scoping Opinion there are no consultee comments that relate specifically to the number of mooring lines or anchors. Furthermore, the potential impacts that may result from these increases are not new impacts from those presented in the Scoping Report and the approach to assessing them will not alter. Additionally, it is not expected that the slight increase in the proportion of the floating substructure above water will create new impacts from those previously presented or change the assessment approach. Consequently, these changes are not considered further in this Scoping Addendum.

Table 3.1 highlights the receptors that are considered to require reassessment as a result of the other proposed changes listed above.

Table 3.1 Potential Impacts on Receptors from the Proposed Project Changes

Topic	Justification
Fish and Shellfish Ecology	Potential change to the following impact: - Disturbance or damage to sensitive species due to underwater noise generated from construction activities. Pile driving will increase the level of underwater noise during construction. This can cause potential injury and/or disturbance to fish and shellfish ecology. Therefore, the **impacts will potentially increase as a result of the project changes.**
Marine Mammals and Other Megafauna	Potential change to the following impact: - Noise-related impacts to marine mammals associated with construction noise, including the risk of physiological impacts, barrier effects and displacement; and The use of pile driving will increase the level of underwater noise during construction. This can cause potential injury and/or disturbance to marine mammals and other megafauna. Therefore, the **impacts will potentially increase as a result of the project changes**.
Ornithology	Potential change to the following impact: - Collision risk, in particular for migratory species/populations There is a potential increase in collision risk due to the increase in tip height and rotor diameter. Therefore, the **impacts will potentially increase as a result of the project changes.** However, this will not have an impact on the approach to collision risk modelling as the approach/ methodology is not altered.

Topic	Justification
Aviation and radar	Potential change to the following impacts due to the increase in tip height: > Interference with civil airport operations during construction; > Interference with Low Flying aircraft (military, civilian, helicopters and Search & Rescue (SAR) operations) during construction; > Interference with civil en-route operations during operation and maintenance; > Interference with low flying operations during operation and maintenance; and > Interference with SAR operations during operation and maintenance. Therefore, the **impacts will potentially increase as a result of the project changes.**
Seascape, landscape and visual impact	Potential change to the following impact: > Presence of offshore turbines and floating substructures. The larger WTGs will make a slight increase to the extent and level of landscape and visual effect. This is an incremental increase only as the maximum tip height will be 1/9 larger than in the original Scoping Report; 30 m increase on 270 m. Therefore, the **impacts will potentially increase as a result of the project changes.**

The proposed increase in overall tip height, hub height and rotor diameter and the introduction of pile driving will not impact other topics as there would be no pathway to impact from these project changes. Please note, to accommodate a larger WTG the associated infrastructure, such as the size of the floating substructures (other than the maximum height above sea level), do not need to increase in their scale from what was proposed in the Scoping Report. In conclusion, the following topics have therefore not needed to be reconsidered in this Scoping Addendum:

Offshore	Onshore
Marine physical processes	Geology, physical processes and land use
Water and sediment quality	Terrestrial ornithology
Benthic ecology	Terrestrial ecology
Commercial fisheries	Archaeology and cultural heritage[3]
Shipping and navigation	Air quality
Archaeology and cultural heritage	Landscape and visual impact
Other users of the marine environment[2]	Traffic and transport
Socio-economics, recreation and tourism	Electric and magnetic fields (EMF)
	Major accidents and disasters

[2] The Scoping response from the Joint Radio Company (JRC) stated that they do not foresee any potential problems based on known interference scenarios and the data provided in the Scoping Report, however they requested to be informed of any future changes in project design. This Scoping Addendum will be provided to the JRC, but it is not anticipated that there will be any increased impacts to their operations.

[3] The increase in tip height will increase the area and possible number of sites where effects on the setting of Scheduled Monuments, Listed Buildings and other designated archaeological and cultural heritage assets are assessed. Assessment on setting will be based on the Zone of Theoretical Visibility (ZTVs) produced for the Seascape, Landscape and Visual Assessment, but will also consider sites outwith the ZTV as appropriate. However, the increase does not change the approach and methods that will be used for assessing potential impacts to the historic environment; the proposed methodology (ORCA, 2021) has been circulated amongst relevant consultees for comment.

	Onshore noise[4]

For topics where it is considered that reassessment of impacts as a result of the increase in tip height, hub height and rotor diameter and the addition of driven piles is required (i.e. those topics in Table 3.1), each impact has been detailed in the Sections below.

[4] The increase in tip height may increase the noise associated with the turbine. The methodology of assessment will be agreed with THC and modelling will be carried out on a worst case scenario candidate turbine. This approach will be adopted regardless of turbine height.

4 FISH AND SHELLFISH ECOLOGY

4.1 Description of Potential Additional Impacts

Table 4.1 outlines the impacts identified to be assessed in the EIA as identified in the original Scoping Report. The "*Potential for increased impacts from proposed project changes*" column has been added to justify whether the impact will / will not increase in risk as a result of project changes.

The Scoping Opinion received from Marine Scotland agrees with the potential impacts which have been identified for fish and shellfish ecology however, it advises that some of the impacts that were proposed to be scoped out must be scoped in and fully addressed by the Developer in the EIA Report are:

- The potential impacts from Electromagnetic Fields (EMFs) from subsea and dynamic cables; and
- Fish aggregation around floating structures and associated infrastructure.

These impacts will not be influenced by pile driving, nor by the increase in tip height, rotor diameter and hub height, and therefore will not be discussed further within this Scoping Addendum.

Table 4.1 Summary of the potential impacts upon fish and shellfish ecology features to be considered within the EIA and whether there is potential for increased impacts from the proposed project changes

Impact	High Level Impact Summary and Justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
Potential Impacts During Construction			
Disturbance or damage to sensitive species due to underwater noise generated from construction activities	Disturbance to fish populations caused by underwater noise generated during construction (i.e. pin pile drilling) including effects on migratory fish and fish spawning behaviour. This may depend on the number of pin piles required, and the duration and timing of installation activities. Impacts likely to be highly localised.	Yes	Yes, the introduction of pile driving will increase underwater noise which increases the potential for mortality, injury and/ or disturbance of fish and shellfish ecology. Therefore, the desk based assessment to be undertaken will include underwater noise modelling for pile driving activities (see Section 5.3 for the methodology changes).
Direct habitat loss due to disturbance of spawning and nursery grounds during the installation of export cables and placement of anchors on seabed	The Offshore Study Area occupies very small proportions of potential habitat for a number of Priority Marine Feature (PMF), commercial or sensitive species. The extent of habitat loss will depend on type of anchors and export cable installation methods. Disturbance may be temporary, and Impacts are likely to be highly localised.	Yes	No change as the Scoping Report considered a variety of anchor types and installation methods, which will have similar impacts to that of pile driving.
Effects of increased sedimentation / smothering on fish and shellfish during construction activities	Increased sedimentation may lead to smothering of slow moving or sessile species. However, due to the small scale of the Project and the dynamic conditions in the area (including sediment disturbance from swell, tide and fishing activity), any disturbance from construction activity is likely to be highly localised. The findings of	No	No change as the Scoping Report considered a variety of anchor types and installation methods, which will have similar impacts to that of pile driving.

Impact	High Level Impact Summary and Justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
	the Dounreay Try EIA (2016) indicate that the sediment type in the Offshore Study Area will not lead to high sediment suspension, and that any burial of sensitive species would be minimal. The slight increase in the number of WTGs is not expected to cause a significant increase in suspension of sediments, and therefore the impacts of increased sedimentation due to construction activities is expected to be no more than the assessed impacts in the Dounreay Trì EIA (2016). On this basis this impact has been scoped out of further assessment.		
Potential Impacts During Operations and Maintenance			
The impacts that were considered in the original Scoping Report were: > Habitat loss of spawning and nursery grounds due to presence of anchors and export cable on the seabed; > Effects of EMFs from subsea and dynamic cables on sensitive species; > Barrier effects on migratory fish from the presence of the floating platform and associated infrastructure; > Effects of operational noise on sensitive species; > Fish aggregation around the floating structure and associated infrastructure; and > Ghost fishing due to lost fishing gear becoming entangled in installed infrastructure. The proposed change to include pile driving activities will only take place during construction, therefore there is no additional pathway to impact from any activities associated with operations and maintenance, and consequently no need to re-assess the impacts in this Scoping Addendum.			
Potential impacts during decommissioning			
Potential impacts arising during the decommissioning phase are expected to be similar to, but not exceeding, those arising during the construction phase. Furthermore, pile driving will only occur during construction, and therefore there is no need to re-assess the impacts in this Scoping Addendum.			
Potential cumulative impacts			
It is considered feasible that there may be cumulative impacts arising from the interaction of the Offshore Study Area with future wind farm developments associated with the ScotWind N1 Draft Plan Option area, Orkney-Caithness Interconnector and the proposed Pentland Floating Offshore Wind Demonstrator.		Scoped in	Yes, as the Project may require pile driving during construction, which could result in injury and disturbance of fish and shellfish ecology. The key cumulative impact is likely to relate to underwater noise from pile driving. There is the potential for this impact to have a large spatial footprint (with regard to disturbance effects, and the potential to act cumulatively with

Impact	High Level Impact Summary and Justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
			disturbance effects from other offshore activities). For fish and shellfish ecology receptors the approach to cumulative impact assessment will include pile driving of other OWFs together with any other offshore construction developments that are planned within the vicinity of the Project.

4.2 Changes to Method of Assessment

In addition to the assessments outlined in the Scoping Report, the following additional assessment is required:

In addition to the desk based assessment suggested in the Scoping Report, underwater noise propagation from the pile driving activities will be modelled and a comparison made with relevant criteria and the existing noise levels in the region where data is available.

To assess the environmental effect of noise, measurements must be interpreted and processed in a biologically significant way. Fish can be disturbed or injured by the introduction of underwater noise. Their behaviour can also be altered by a change to the local conditions, which can have indirect effects.

All underwater noise impacts are assessed against relevant criteria fish species groups (Popper *et al.* 2014). As per Popper *et al.* 2014, fish species are categorised into the relevant hearing groups dependent on their sensitivity to sound. The underwater noise modelling will consider each of these groups individually with the modelling outputs feeding into the Fish and Shellfish Ecology Impact Assessment.

Further details on the underwater noise assessment methodology is provided in Section 5.3.1.

5 MARINE MAMMALS AND OTHER MEGAFAUNA

5.1 Updated Baseline

The marine mammal management units (MU) and estimated densities have been updated based on the updated guidance (Table 5.1) (Hammond *et al.*, 2021; IAMMWG, 2021).

Table 5.1 Estimated density and MU for key marine mammal species in the vicinity of the Project

Species Name	Estimated Density (individuals/km^2) (SCANS III, 2021)	MU / Biogeographical Population Estimate (IAMMWG, 2021)
Harbour porpoise (*Phocoena phocoena*)	0.152	346,601
White-beaked dolphin (*Lagenorhynchus albirostris*)	0.021	43,951
Bottlenose dolphin (*Tursiops truncatus*)	0.0037	189
Minke whale (*Balaenoptera acutorostrata*)	0.0095	20,118
Risso's Dolphin (*Grampus griseus*)	0.0135	12,262

5.2 Description of Potential Additional Impacts

Table 5.2 outlines the impacts identified to be assessed in the EIA as per the original Scoping Report. The "*Potential for increased impacts from proposed project changes*" column has been added to justify whether the impact will / will not increase in risk as a result of project changes.

The Scoping Opinion broadly agrees with the impacts to be scoped into the EIA Report, although, advises that the comments identified in the Marine Scotland Science (MSS) and NatureScot advice regarding pre-construction noise impacts, entanglement risk, long-term habitat change, alternative methods for installing the anchors and disturbance from vessel activity must be fully considered and assessed in the EIA Report. However, these impacts (apart from the consideration of alternative anchor methods) will not be influenced by pile driving, nor by the increase in tip height, rotor diameter and hub height, and therefore will not be discussed further within this Scoping Addendum.

Table 5.2 Summary of the potential impacts upon marine mammals and other megafauna features to be considered within the EIA and whether there is potential for increased impacts from proposed project changes

Impact	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
Potential Impacts During Construction			
Noise-related impacts to marine mammals associated with construction noise, including the risk of physiological impacts, barrier	The Project may require pin-piled anchors as a part of the mooring systems of the WTGs. This activity would constitute the greatest noise source associated with construction. Piling noise can result in the potential for auditory injury (Permanent Threshold Shift, PTS) and behavioural disturbance to marine mammals. The	Yes	Yes, as the Project may require piling during construction, which could result in injury and disturbance of marine mammals. Noise modelling will be required to assess the risk of PTS and to assess the risk of disturbance from

Impact	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
effects and displacement	evidence base suggests that mitigation ensures such impacts are generally limited to short term and temporary displacement or disturbance effects. Regardless, impacts related to disturbance of European protected species (EPS) and other protected species, as well as those associated with protected sites, requires further consideration.		pile driven anchors. Additionally, population modelling will be conducted to determine if the Project alone impacts could result in population- level changes (see Section 5.3.1 for methodologies). As part of the design process, a number of designed-in measures will be proposed to reduce the potential for impacts on marine mammal receptors. These will evolve over the development process as the EIA progresses and in response to consultation. Given the addition of pile driving into the design envelope, the Project commits to the implementation of a piling Marine Mammal Mitigation Protocol (MMMP) to minimise the risk of PTS-onset to negligible levels. The requirement and feasibility of any mitigation measures included within the piling MMMP will be consulted upon with statutory consultees throughout the EIA process.
Indirect impacts of construction noise on the prey species of marine mammals	See Section 4.1 for Fish and Shellfish Ecology details.	Yes	See Section 4.1 for Fish and Shellfish Ecology details.
Disturbance due to the physical presence of vessels	The potential for the physical presence of installation vessels to generate a disturbance response in EPS or other protected species is considered negligible, given the high levels of shipping activity which characterise the baseline environment in the PFOWF. Given the importance of the PFOWF region to passenger, cargo and other vessel activities, the addition of a small number of vessels during the construction phase of the project is considered negligible.	No	No known changes in the number of installations vessels.
Risk of injury resulting from collision of marine mammals and basking sharks with installation vessels	Increased localised vessel traffic as a result of construction within the Offshore Study Area is not expected to increase collision risk to marine mammals or basking sharks. Vessel movements will be managed to preclude any negative impacts to navigation in other sea users, which have positive effects on minimising potential impacts to other large marine receptors. Vessel activities will fall within standard (e.g. transit) speeds and will follow prescribed routes (i.e. non-random movement), thereby reducing the possibility	No	No known changes in the number of installations vessels.

Impact	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
	of collision. Highland Wind Limited will consider the implementation of additional mitigations to further reduce any potential collision events, including: maintaining manned bridges, training vessel crew in the Scottish Marine Wildlife Watching Code and following the relevant (i.e. activity-specific) JNCC guidance for minimising the risks of injury to marine mammals during construction, which may include use of a marine mammal observer.		
Impacts associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity.	Cable laying activities, particularly those associated with the installation of the export cable, comprise the primary pathway which may influence water quality through disturbed sediments. Changes in turbidity due to cable laying are short-lived, with resettlement taking place within hours or days. Cetaceans, pinnipeds and basking sharks regularly occupy waters with varying levels of turbidity, including exceptionally murky tidal waters, for extended periods without any important impacts to their biology or behaviour. Marine mammals have adapted to utilise other sense organs as their primary sensory modality in their marine environment, with pinnipeds using tactile information via their vibrissae (whiskers) and cetaceans using sound (including echolocation) to successfully survive in the ocean. Similarly, basking sharks are known to occupy very deep, dark waters for months at a time, employing their electro-sensory organs in place of visual cues. For these reasons, highly localised and temporary changes in water quality from sediment disturbance will not generate important impacts to marine mammals or basking sharks.	No	No change. This impact will not change as piling will not influence cable laying, therefore there is no impact pathway.
Potential Impacts During Operation and Maintenance			
The impacts that were considered in the original Scoping Report were: > Risk of injury resulting from entanglement of marine mammals or basking sharks with mooring lines or cables, including secondary interactions with derelict fishing gears, or entrapment with mooring systems; > Risk of injury resulting from collision of marine mammals or basking sharks with WTG foundations; > Impacts of operational noise; > Displacement or barrier effects resulting from the physical presence of devices and infrastructure; > Disturbance due to the physical presence of vessels; > Risk of injury resulting from collision of marine mammals and basking sharks with operations and maintenance vessels; > Risk associated with EMFs associated with subsea cabling;		

Impact	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
> Impacts associated with effects upon marine water quality due to any accidental release of pollutants; and > Long term habitat change, including the potential for change in foraging opportunities. The proposed inclusion of pile driving activities will only take place during construction. Therefore, there is no additional pathway to impact from any activities associated with operations and maintenance, and consequently no need to re-assess the impacts in this Scoping Addendum.			
Potential Effects During Decommissioning			
Potential impacts arising from decommissioning phase are expected to be similar to those arising during the construction phase and would be temporary and of short duration. Furthermore, pile driving will only occur during construction, and therefore there is no need to re-assess the impacts in this Scoping Addendum.			
Potential Cumulative Impacts			
Construction noise	The main sources of noise considered in project-specific cumulative impact assessments are piling, with cumulative effects with construction and vessel noise associated with surrounding projects and commercial shipping activities.	Yes	Yes, as the Project may require pile driving during construction, which could result in increased injury and disturbance of marine mammals. The key cumulative impact is likely to relate to underwater noise from pile driving. There is the potential for this impact to have a large spatial footprint (with regard to disturbance effects, and the potential to act cumulatively with disturbance effects from other offshore activities). For marine mammal receptors the approach to cumulative impact assessment will be holistic and combine all potential sources of underwater noise including pile driving of OWFs together with any other offshore construction developments that are planned within the relevant MUs for each species.
Other cumulative impacts were considered in the original Scoping Report, but these are not considered to be affected by the addition of pile driving activities and so are not considered further in this Scoping Addendum. These are: > Displacement or barrier effects resulting from the physical presence of devices and infrastructure; and > Long term habitat change, including the potential for change in foraging opportunities.			
Potential Inter-Related Impacts			
The addition of pile driving is unlikely to change the inter-relationships between different receptors, therefore the method of assessment for this remains unchanged from that presented in the Scoping Report.			

5.3 Changes to Method of Assessment

In addition to the assessments outlined in the Scoping Report, the following additional assessments/ models are required:

5.3.1 Underwater noise modelling

The Marine Mammal and Other Megafauna EIA Chapter will be supported by the underwater noise modelling outputs, which will provide a key input into the impact assessment. The underwear noise modelling will be provided by Subacoustech Environmental Ltd. To model the underwater noise from pile driving, Subacoustech use the INSPIRE model which is a semi-empirical underwater noise propagation model. It is based around a combination of numerical modelling, using a combined geometric and energy flow/hysteresis loss methodology, and actual measured data, and has been validated in Thompson *et al.* (2013). The model has been widely used in the consent phase for offshore wind projects around the United Kingdom (UK) and has been tuned for accuracy using over 80 datasets of underwater noise propagation from monitoring offshore piling activities.

Underwater noise level contours will be produced to describe the potential impact zones for the marine mammal receptors. These will include PTS-onset and disturbance.

Noise impact contours produced by the underwater noise model will be provided as spreadsheets and GIS shapefiles. The impact pile driving scenarios and modelling location(s) are to be determined in the initial discussions with COP's engineering project team.

5.3.2 PTS-onset assessment

The Southall *et al.* (2019) thresholds will be used to assess the risk of PTS-onset. The risk of injury will be based on the dual criteria of cumulative sound exposure level (SELcum) and peak sound pressure level (SPLpeak). To assess the SELcum criterion, the predictions of received sound level over 24 hours are frequency weighted, to reflect the hearing sensitivity of each functional hearing group. The SPLpeak criterion is for unweighted received sound level.

The PTS-onset contours resulting from the underwater noise modelling with be overlain on species density surfaces in order to estimate the number of animals at risk.

5.3.3 Disturbance assessment

The assessment of disturbance from piling will be based on the current best practice methodology. This will incorporate the application of a dose-response approach rather than a fixed behavioural threshold approach. Noise contours at 5 dB intervals will be generated by noise modelling and will be overlain on species density surfaces and scaled using the dose-response function to predict the number of animals potentially disturbed.

A dose-response curve is used to quantify the probability of a response from an animal to a dose of a certain stimulus or stressor and is based on the assumption that not all animals in an impact zone will respond (Dunlop *et al*. 2017, Sinclair *et al.* 2021). Using a species-specific dose-response approach rather than a fixed behavioural threshold to assess disturbance is currently considered to be the best practise methodology and the latest guidance provided in Southall *et al.* (2021).

A dose-response curve for behavioural response to pile driving is available for harbour porpoise (Graham *et al.,* 2017) and harbour seals (Whyte *et al.,* 2020). In the absence of species-specific dose-response curves for other species, the harbour porpoise dose-response curve will be applied for all cetacean species and the harbour seal dose-response curve will be applied for grey seals. The assumptions and precautions of this approach will be detailed in the assessment.

5.3.4 Population modelling

Population modelling will be conducted using the iPCoD model, developed and maintained by SMRU Consulting. iPCoD is a protocol for implementing an interim version of the Population Consequences of Disturbance (PCoD) approach for assessing and quantifying the potential consequences for marine mammal

populations of any disturbance and/or injury that may result from offshore energy developments. The model allows the user to predict the population consequences of PTS and disturbance on five marine mammal species found in the UK: bottlenose dolphins, harbour porpoise, minke whales, harbour seals and grey seals.

The applicant seeks feedback and guidance on the proposed assessment and modelling methodologies and will commit to taking that advice through to the Offshore EIA Report.

6 ORNITHOLOGY

6.1 Description of Potential Additional Impacts

Table 6.1 Outlines the impacts identified to be assessed in the EIA as per the original Scoping Report. The "*Potential for increased impacts from proposed project changes*" column has been added to justify whether the impact will / will not increase in risk as a result of project changes.

The Scoping Opinion received from Marine Scotland agrees with the impacts that had been proposed to be scoped in and out in the original Scoping Report. NatureScot, Royal Society for the Protection of Birds (RSPB) Scotland and MSS have suggested some additional impacts to be considered, however, these impacts are not related to the change in tip height or inclusion of pile driving, and therefore will not be discussed further within this Scoping Addendum. Ongoing conversations and meetings with stakeholders have been held to confirm the exact scope of assessment.

The increase in tip height and rotor diameter have the potential to impact on *Procellariform* species (petrels, shearwaters and fulmars) from a collision risk perspective. However, Furness and Wade (2013) indicate low collision risk for petrels, shearwaters and fulmars and they would not normally be included in the collision risk modelling. The species are also not being recorded in any great numbers within the Project area; this will be confirmed in the 12 month survey report once all the data has been analysed. In addition, nocturnal activity of seabirds and their potential attraction to turbine lighting will be considered qualitatively as part of the collision risk assessment. As this impact is not related to the change in tip height, rotor diameter, hub height or the addition of pile driving, it will not be discussed further within the Scoping Addendum Report.

Table 6.1 Summary of the potential impacts upon ornithological features to be considered within the EIA and whether there is potential for increased impacts from proposed project changes

Impact	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
Potential Impacts During Construction			
The impacts that were considered in the original Scoping Report were: > Potential impact of disturbance/displacement/exclusion due to construction noise or physical presence; > Potential for a barrier effect due to physical presence; > Potential change in habitat/prey availability; > Potential increase in suspended sediment affecting visibility; and > Potential accidental release of pollutants. The proposed increase in tip height, rotor diameter, hub height, or the addition of pile driving will not create any additional or increased impacts during construction and are therefore not considered further in this Scoping Addendum. The addition of potential pile driving may have a localised impact on habitat/prey availability and a temporary increase in suspended sediments, however these impacts are not likely to be greater or additional to other anchoring solutions considered in the Scoping Report, and so are not considered further in this Scoping Addendum.			
Potential Impacts During Operation and Maintenance			
Potential impact of disturbance/ displacement/ exclusion due to physical presence, marine noise and maintenance works	The potential for the physical presence of the Project to lead to disturbance/displacement/exclusion will be for the duration of the Project, however noise levels will be less, and habituation is more likely to be a factor. A number of monitoring studies provide an evidence base.	Yes	No change. An increase in the tip height, hub height and rotor diameter is unlikely to make a material difference to the displacement assessment. In addition, the air gap between the lowest sweep of the rotor blades and the sea will remain the same.

Impact	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
			However, a change in the number of turbines may potentially change the impact risk. For example, if the number of turbines was reduced to five instead of six this would potentially decrease the displacement impact risk as the turbines may be spaced more widely across the footprint.
Collision risk, in particular for migratory species/populations	The potential for collision risk is very well studied, with numerous guidance documents, recommended methods/approaches and increasing numbers of monitoring studies available.	Yes	Yes, the increase in maximum tip height and rotor diameter may slightly alter the collision risk to birds but it is not anticipated to be a material difference. Note that the air gap between the lowest sweep of the rotor blades and the sea will remain the same.
Other impacts during operation and maintenance were considered in the original Scoping Report, but these are not considered to be affected by the increase in tip height, rotor diameter, maximum hub height, the potential increase in mooring lines and spread or pile driving, and so are not considered further in this Scoping Addendum. These are: > Potential for a barrier effect due to physical presence; > Potential change in habitat/prey availability; > Potential increase in suspended sediment affecting visibility; > Creation of a roosting habitat or foraging opportunities; and > Potential accidental release of pollutants.			
Potential Impacts During Decommissioning			
As per impacts during construction, the proposed increase in tip height, rotor diameter, maximum hub height, the potential increase in mooring lines and spread or pile driving will not create any additional or increased impacts during decommissioning and so are not considered further in this Scoping Addendum.			
Potential Cumulative Impacts			
Potential impact of disturbance/displacement to physical presence	Disturbance and displacement effects will be considered in the EIA	Yes	No, a change in the tip height of the turbines or change in the hub height or rotor diameter is unlikely to make a material difference to the displacement assessment. However, a change in the number of turbines would change the impact risk. For example, if the number of turbines was reduced to five instead of six this would potentially decrease the displacement impact risk
Collision risk, in particular for migratory species/populations	The potential for collision risk is very well studied, with numerous guidance documents, recommended methods/approaches and increasing numbers of monitoring studies available from operational offshore wind farms.	Yes	Yes, the minor increase in maximum tip height and rotor diameter may slightly alter the collision risk to birds but it is not anticipated to be a material difference. Note that the air gap between the lowest sweep of the rotor blades and the sea will remain the same.

Impact	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
Other cumulative impacts were considered in the original Scoping Report, but these are not considered to be affected by the increase in tip height, rotor diameter, hub height or the addition of pile driving and so are not considered further in this Scoping Addendum. These are: > Potential for a barrier effect due to physical presence; > Potential change in habitat/prey availability; and > Potential increase in suspended sediment affecting visibility.			
Potential Inter-Related Impacts			
The increase in tip height, rotor diameter, hub height or the addition of pile driving is unlikely to change the inter-relationships between different receptors, therefore the method of assessment for this remains unchanged from that presented in the Scoping Report.			

6.2 Changes to Method of Assessment

In respect of the proposed increase in the height of the offshore WTGs from 270 m to 300 m there will be no change to the methods of assessment required. The methodology set out in the Scoping Report is equally relevant to the assessment of the 300 m turbines as to the 270 m turbines. This is also true of the proposed change in hub height (from 150 m to 190 m) and rotor diameter (from 240 m to 260 m); these changes will not require a change in the method of assessment.

7 AVIATION AND RADAR

7.1 Description of Potential Additional Impacts

Table 7.1 outlines the impacts identified to be assessed in the EIA as per the original Scoping Report. The *"Potential for increased impacts from proposed project changes"* column has been added to justify whether the impact will / will not increase in risk as a result of project changes.

The Scoping Opinion received from Marine Scotland agrees with the impacts proposed to be scoped in. However, Marine Scotland advises that additionally the potential to impact the Instrument Flight Procedures (IFP) for Wick Airport must be scoped in and that representations from the Highland Council, Ministry of Defence (MoD), Highland and Islands Airport Limited (HIAL), and British Telecom (BT) must be fully addressed by the Developer. HIAL further request that an IFP assessment is carried out on Wick Airport's IFPs by a Civil Aviation Authority (CAA)-approved procedure design company. This Scoping Addendum therefore includes the impact on IFP for Wick Airport during the construction and operation and maintenance of the wind farm.

Table 7.1 Potential impacts associated with aviation during construction, operations and maintenance and decommissioning of the Project and whether there is potential for increased impacts from proposed project changes

Impacts	High level impact summary and justification (from original Scoping Report)	To be assessed in EIA	Potential for increased impacts from proposed project changes
Potential Impacts During Construction			
Interference with civil airport operations	The wind farm may present a physical obstruction and effect regional airport operations. The Scoping Opinion advises that the construction process may impact on Wick Airport's IFP.	Yes	Yes – the increased height of the wind turbines creates greater potential for adverse impact on airport operations.
Interference with civil, military and meteorological radar systems	No significant infrastructure is necessary during the construction phase, e.g. high cranes. No overlap with radar systems.	No	Nil. Provided crane heights do not exceed maximum turbine tip height. Radar systems will not be affected during construction phase as turbine blades need to be moving to create adverse impact on radar displays.
Interference with MoD Air Defence Operations	Preliminary analysis indicates that the WTGs within the Offshore Study Area are unlikely to be detectable by these systems.	No	Nil. Radar systems will not be affected during construction phase as turbine blades need to be moving to create adverse impact on radar displays.
Interference with Low Flying aircraft (military, civilian, helicopters and SAR operations)[5]	Physical presence of infrastructure during the construction phase and installation of WTGs may present a physical obstruction and affect SAR and helicopter operations.	Yes	Yes - increased height of obstacles will need to be taken into account by SAR and helicopter operators; in particular, in assessing Minimum Safety Altitude whereby, in poor weather conditions, pilots are required to maintain 1,000 ft separation from obstacles (such as WTGs).

[5] Impact has been amended since the Scoping Report to combine SAR and helicopter operations under Low Flying aircraft

Potential Impacts During Operations and Maintenance			
Interference with civil en-route operations	Analysis indicates no Line of Sight (LOS) to Civil En-route Primary Surveillance Radar (PSR) systems. However, Scottish Ministers advised in their Scoping Opinion that, as a surveillance system is proposed to be introduced at Wick Airport, this must also be scoped in and considered once the type and location of the surveillance system is defined.	Yes	Yes - PSR systems can be affected during the operational phase as the movement of turbine blades can create adverse impact on radar displays.
Interference with civil airport operations	The wind farm may present a physical obstruction and effect regional airport operations.	No (as this will be considered for the construction phase).	Any impact of increased height of WTGs creates greater potential for adverse impact on airport operations. However, this will be considered for the construction phase, and so will not be considered further for the operations and maintenance phase.
Interference with Low Flying aircraft (military, civilian, helicopters and SAR operations)[6]	The Offshore Study Area may present a physical obstruction and affect operations of Military Low Flying aircraft or SAR operations.	Yes	Yes - increased height of obstacles will need to be taken into account; in particular, in assessing Minimum Safety Altitude whereby, in poor weather conditions, pilots are required to maintain 1,000 ft separation from obstacles (such as WTGs).
Other impacts that were considered in the original Scoping Report were: > Interference with MoD aerodrome operations; > Interference with MoD air defence operations; > Interference with civil/military Secondary Surveillance Radar (SSR); > Interference with Met Office radar; and > Interference with helicopter operations. These impacts were scoped out in the Scoping Report. The proposed increase in tip height and rotor diameter will not create any additional or increased impacts during operations and maintenance, and so are not considered further in this Scoping Addendum.			
Potential Impacts During Decommissioning			
The proposed increase in tip height, rotor diameter, hub height, or the addition of pile driving will not create any additional or increased impacts during decommissioning and so are not considered further in this Scoping Addendum.			

[6] Impact has been amended since the Scoping Report to combine SAR and helicopter operations under Low Flying aircraft

Potential Cumulative Impacts
The potential for cumulative impacts will be assessed during the EIA process. The EIA will consider the impacts of the construction, operations and maintenance, and decommissioning of the Project cumulatively with other relevant projects that have been consented and are yet to be constructed as well as relevant projects for which an application has been submitted but which are not yet consented. Other projects in the area that are likely to cumulatively impact upon civilian and/or military aviation will be identified during the EIA process. Any increased cumulative impacts due to the increase in tip height will be considered during this assessment.

7.2 Changes to Method of Assessment

In respect of the proposed increase in the height of the offshore WTGs from 270 m to 300 m there will be no change to the method of assessment required. The methodology set out in the Scoping Report is equally relevant to the assessment of the 300 m turbines as to the 270 m turbines. This is also true of the proposed change in hub height (from 150 m to 190 m) and rotor diameter (from 240 m to 260 m); these changes will not require a change in the method of assessment.

8 SEASCAPE, LANDSCAPE AND VISUAL IMPACT

8.1 Description of Potential Additional Impacts

Table 8.1 outlines the impacts identified to be assessed in the EIA as per the original Scoping Report. The *"Potential for increased impacts from project changes*" column has been added to justify whether the impact will/ will not increase in risk as a result of project changes.

Consultation with THC to discuss the Project change in maximum turbine height from six turbines at 270 m to five indicative turbines at 300 m took place on the 29th August 2021. Wireline diagrams were produced for this meeting to allow for a comparison between 270 m and 300 m turbines (see Appendix A). Due to the proposed increase in overall tip height, a decision was made to submit a Scoping Addendum in order to ensure the assessment in the EIA reflected any advice provided specifically on the larger WTGs. Although it was anticipated that a 30 m increase would not have a notable effect on the Zone of Theoretical Visibility (ZTV), a comparative ZTV assessment has been included within this Scoping Addendum to show the minor change (Appendix B).

The Scoping Opinion received from Marine Scotland broadly agrees with the receptors proposed to be scoped in however, Marine Scotland agree with NatureScot that effects on the landscape character types and landscape designations listed in its representation must be considered in the SLVIA. However, these additions to the scope of assessment are not influenced by the change in tip height and therefore will not be discussed further within this Scoping Addendum.

The Scoping Opinion received did not confirm the exact detail of photography viewpoints and the assessment methodologies required for the EIA. NatureScot's consultation representation agreed with the eight initial viewpoints to be used in the SLVIA and while THC did not present specific comment on the viewpoint selections, they reserved the right to comment on the final list. The viewpoints and assessment methodologies have either been agreed and /or are in process of being agreed with THC, NatureScot and Orkney Islands Council.

Table 8.1 Potential Impacts associated with SLVIA during Construction, Operations and Maintenance and Decommissioning of the Project and whether there is potential for increased impacts from proposed project changes

Source of Impacts	Potential Impacts (from original Scoping Report)	Potential Receptors affected	To be assessed in EIA	Potential for increased impacts from proposed project changes
Potential Impacts During Construction				
Presence and activity of marine construction plant and vessels	The presence and activity of the marine construction plant used to construct and erect the offshore components of the wind farm will form a notable addition into an area of the Atlantic Ocean where currently there is no development. Other potential impacts may result from increased vessel movements in the area as plant, materials and personnel are moved to and from the Site.	Indirect, temporary and short-term impacts on coastal and landscape character where the presence and activity of marine construction plant, emergence of offshore turbines and floating substructures and use of night-time lighting would alter their contextual character. Indirect, temporary and short-term impacts on landscape designations and Wild Land Areas (WLAs), especially where special landscape qualities or wildness qualities relate to associations with the Atlantic Ocean. Indirect, temporary and short-term impacts on onshore visual receptors, especially where formal viewpoints, settlements, roads, footpaths, hill-tops and other amenity locations have a close association with the Atlantic Ocean. The movement of vessels, activity of construction and use of lighting will add to the potential visual impact. While the majority of visual	Yes	No change in the presence and activity of marine construction plant and vessels anticipated. The increase in tip height, hub height and rotor diameter will have no direct effect on the SLVIA of the activity of vessels during maintenance.
Emergence of offshore turbines and floating substructures	Introduction of large-scale vertical structures and bright coloured floating substructures into an area of the Atlantic Ocean where currently there is no development. While operational onshore wind farms form part of the baseline character, the emergence of larger offshore turbines will create a new human influence.			The emerging turbines will be constructed to a slightly taller dimension. This change will be incremental and will not require a change to the method or scope of the SLVIA.
Use of lighting during construction	Construction vessels will be working continuously and will be lit at night. The lighting will be visible within an otherwise dark outlook over the Atlantic Ocean.			No change in the use of lighting during construction anticipated. The increase in tip height will have no direct effect on the SLVIA of the use of lighting during construction.

Source of Impacts	Potential Impacts (from original Scoping Report)	Potential Receptors affected	To be assessed in EIA	Potential for increased impacts from proposed project changes
		receptors will be onshore, offshore receptors will also be affected and could experience closer range views.		
Potential Impacts During Operations and Maintenance				
Presence of offshore turbines and floating substructures	The presence of the 6 to 10 floating turbines up to a maximum height of 270 m (above Highest Astronomical Tide (HAT)) will introduce development into an area of the Atlantic Ocean where currently there is no development. The movement of the blades will add a dynamic feature and there may also be some movement of the turbine structures. The floating substructures will form substantial bases with possible dimensions being 124 m x 124 m x 54.25 m. These will be coloured yellow for navigational safety.	Indirect, temporary and long-term impacts on coastal and landscape character where the presence and movement of offshore turbines, brightly coloured floating substructures and use of night-time lighting would alter their contextual character. Indirect, temporary and long-term impacts on landscape designations and WLAs, especially where special landscape qualities or wildness qualities relate to associations with the Atlantic Ocean. Indirect, temporary and long-term impacts on onshore visual receptors, especially where formal viewpoints, settlements, roads, footpaths, hill-tops and other amenity locations have a close association with the Atlantic Ocean. The movement of the turbine blades and use of night-time lighting will add to the potential visual impact.	Yes	The offshore turbines will be slightly taller, and the rotor diameter and hub height will also increase. These changes will be incremental and will not require a change to the method or scope of the SLVIA. A comparative ZTV of the 270 m and 300 m offshore turbines and a Comparative Wireline is presented in Appendix A. The SLVIA methodology is based on GLVIA3 and as such, is based on a standard methodology that would be applied regardless of the height of the offshore wind turbines. The SLVIA methodology has been applied in multiple offshore and onshore wind farm developments, many of which have gone through Public Local Inquiry and some of which in England have been National Infrastructure Projects. Through the Scoping Opinion and pre-application meetings with THC, there has been general agreement to the SLVIA

Source of Impacts	Potential Impacts (from original Scoping Report)	Potential Receptors affected	To be assessed in EIA	Potential for increased impacts from proposed project changes
		While the majority of visual receptors will be onshore, offshore receptors will also be affected and could experience closer range views.		methodology proposed. The SLVIA methodology will ensure a robust and detailed assessment of potentially significant and not significant effects, following best practice as recognised by the landscape industry.
Use of lighting during operations and maintenance	The turbines will require night-time lighting for aviation safety.			Aviation lighting will be set on slightly higher hubs. This change will be incremental and will not require a change to the method or scope of the assessment
Activity of vessels during maintenance	Maintenance checks and repairs will require the activity of vessels, although the occurrence is likely to be infrequent with maintenance activities smaller in scale than construction activities.			No change in vessel maintenance activity anticipated. The increase in tip height, hub height or rotor diameter will have no direct effect on the SLVIA of the activity of vessels during maintenance.
Potential Impacts During Decommissioning				
Potential impacts arising during the decommissioning phase are expected to be similar to, but not exceeding those arising during the construction phase. These would be indirect, temporary and short-term.			Yes	Same as construction.
Potential Cumulative Impacts				
The potential for cumulative impacts will be assessed during the EIA process. The EIA will consider the impacts of the construction, operations and maintenance, and decommissioning of the Project cumulatively with other operational and proposed onshore and offshore wind farms and cable projects listed in the Scoping Report.			Yes	No change.

8.2 Changes to Method of Assessment

In respect of the proposed increase in the height of the offshore WTGs from 270 m to 300 m there will be no change to the method of assessment required. The methodology set out in the Scoping Report is equally relevant to the assessment of the 300 m turbines as to the 270 m turbines. In terms of the Offshore Study Area of 50 km radius, this also remains relevant. The Comparative ZTV, which shows the extent of theoretical visibility of the five turbines at 270 m and 300 m combined on the one plan, highlights the very similar extent of theoretical visibility with only localised and limited extents of additional visibility arising. Where areas of additional visibility arise, these will typically comprise visibility of tips or blades and not the full extent of the turbines. This means that the slightly larger turbines would not be opening up visibility in any substantial new areas and, therefore, that the 50 km Offshore Study Area and the proposed scope of the SLVIA, which has developed through discussions with THC, still remain relevant (Appendix B). In terms of the extent to which the offshore WTGs would be visible, a comparative wireline from the closest landward viewpoint at Sandside Bay (8.16 km) has been included to demonstrate the incremental increase that would arise as a result of the revised height. All other viewpoints are more distant and with increasing separation distances from the Offshore Development, the height difference will become increasingly indiscernible.

In summary, the methodology for the SLVIA and the scope of the receptors to be assessed in detail is not affected by the proposed increase in the blade tip height of the offshore WTGs from 270 m to 300 m. The detailed assessment of each landscape and visual receptor will consider the effects of the 300 m offshore WTGs. This is also true of the proposed change in hub height (from 150 m to 190 m) and rotor diameter (from 240 m to 260 m); the method of assessment will remain the same. These increases do not, however, require an extension to the Offshore Study Area or inclusion of additional receptors, owing to its incremental nature as demonstrated by the Comparative ZTV and Comparative Wireline in Appendix A.

9 CONCLUSIONS AND NEXT STEPS

The detail presented in this Scoping Addendum Report shows that the proposed changes to some of the turbine parameters (rotor diameter, hub height and overall tip height) does not materially alter the position of the original Scoping Opinion as the methodologies of assessment will remain the same.

The decision to include pile driving however requires additional assessments and modelling to assess the impact of underwater noise on marine mammals and other megafauna, and fish and shellfish ecology. The applicant seeks feedback and guidance on the proposed assessment and modelling methodologies and will commit to taking that advice through to the Offshore EIA Report.

The applicant has already engaged with some of the key consultees in defining the definition of assessment methodologies and requirements for the EIA, and plan to meet with those not engaged with yet. The purpose of this Scoping Addendum is to ensure any further requirements are considered and adopted as part of the formal Scoping Opinion, and therefore will be considered in the EIA.

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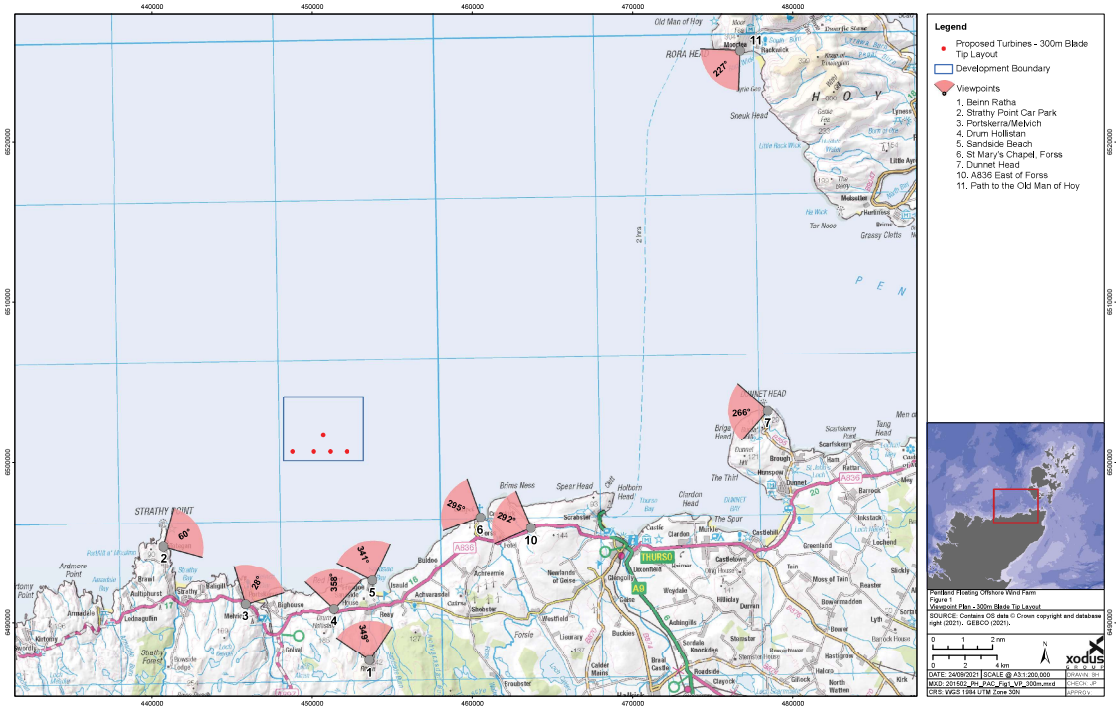
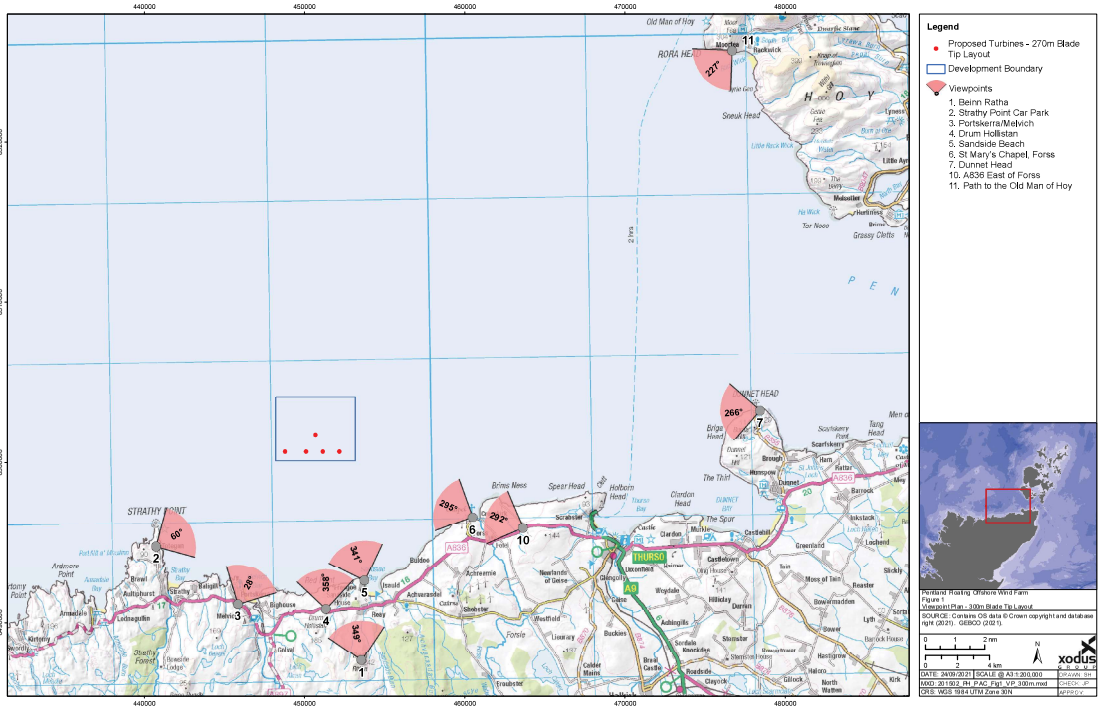
APPENDIX A COMPARATIVE WIRELINES 300M VS 270M

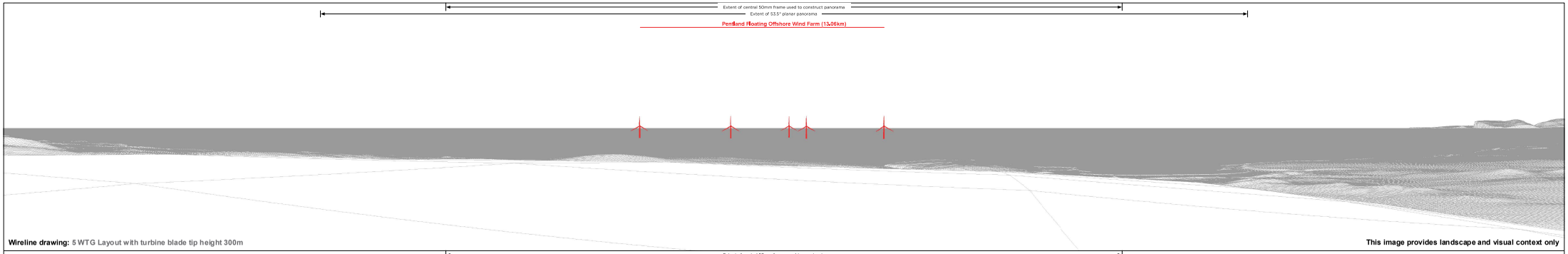


Proposed Development Plan: 5 WTG Layout with turbine blade tip height 300m



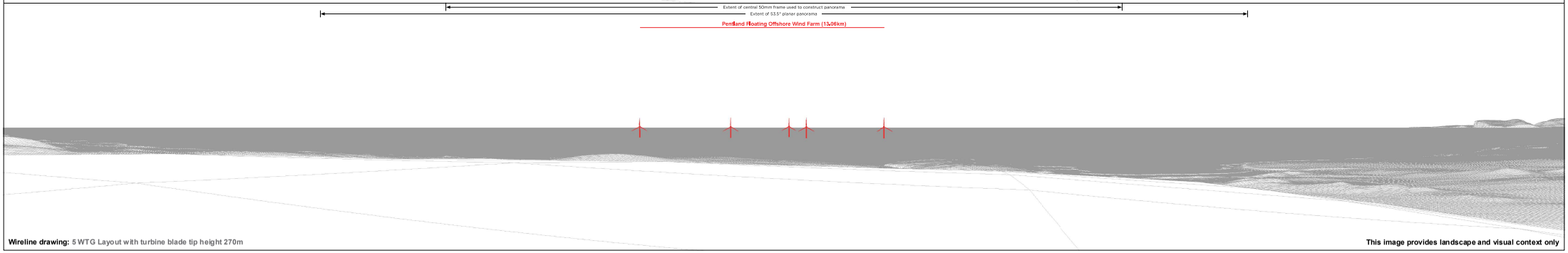
Proposed Development Plan: 5 WTG Layout with turbine blade tip height 270m

Figure: 1b
Comparative Layouts 300m vs 270m Tip and Viewpoint Plan



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

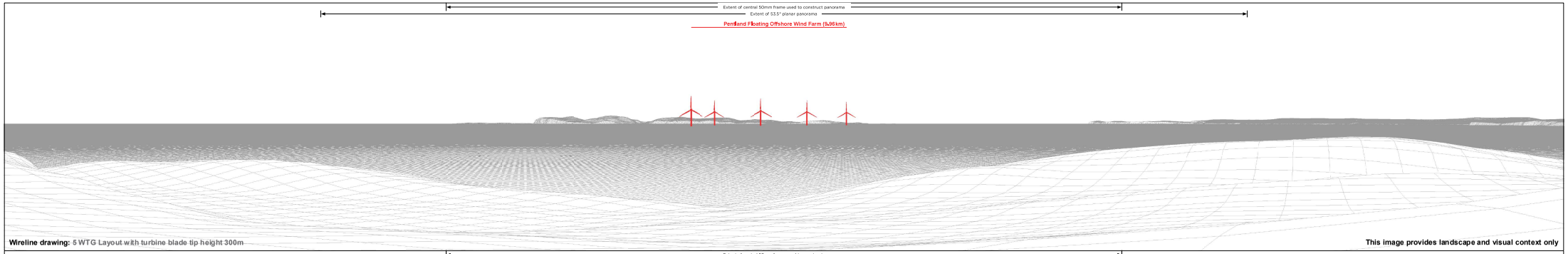
This image provides landscape and visual context only

OS reference:	295429 E 961302 N	**Horizontal field of view:**	90° (cylindrical projection)
Eye level:	241.77 m AOD	**Principal distance:**	522 mm
Direction of view:	349°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

Comparative Wirelines

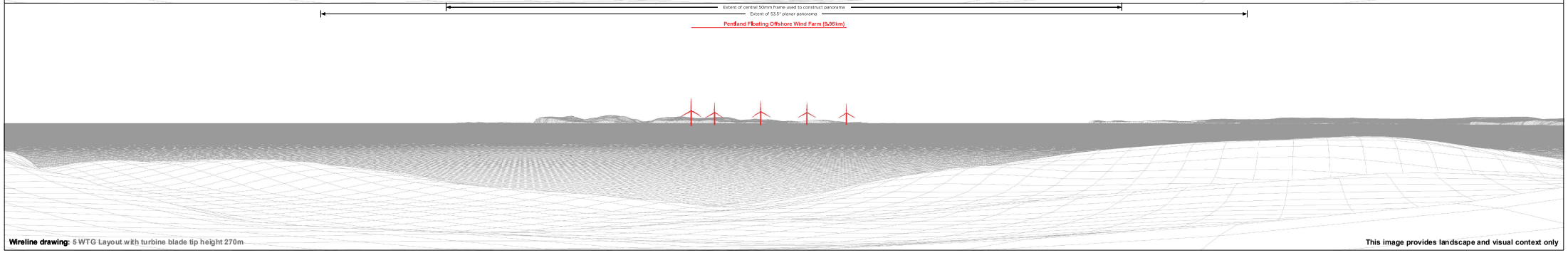
Figure: 2b

Viewpoint 1: Beinn Ratha



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

This image provides landscape and visual context only

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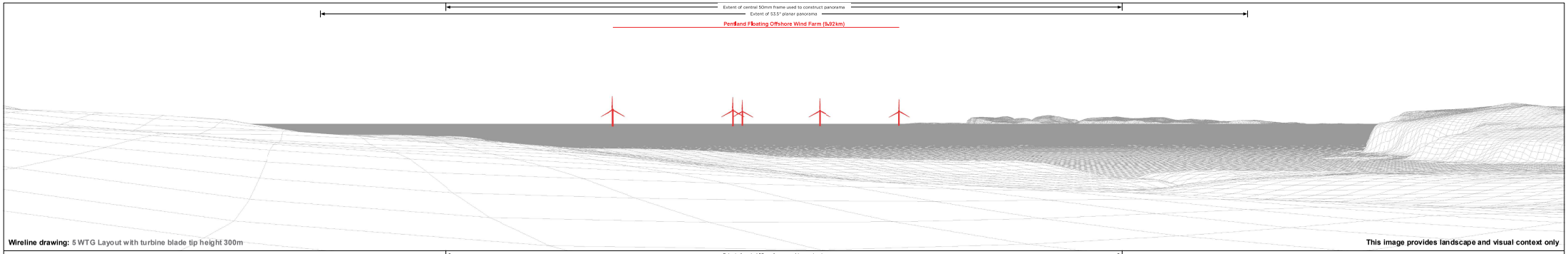
Eye level:	61.44 m AOD	**Principal distance:**	522 mm
Direction of view:	60°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

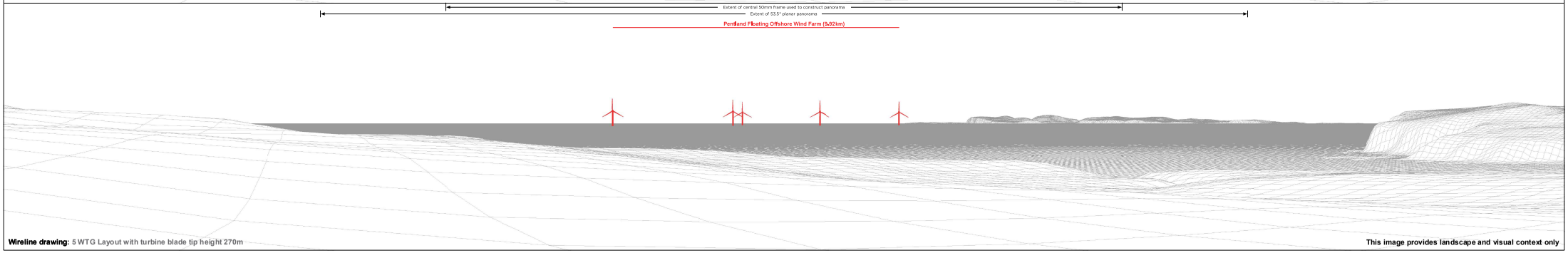
Comparative Wirelines

Figure: 3b
Viewpoint 2: Strathy Point Car Park



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

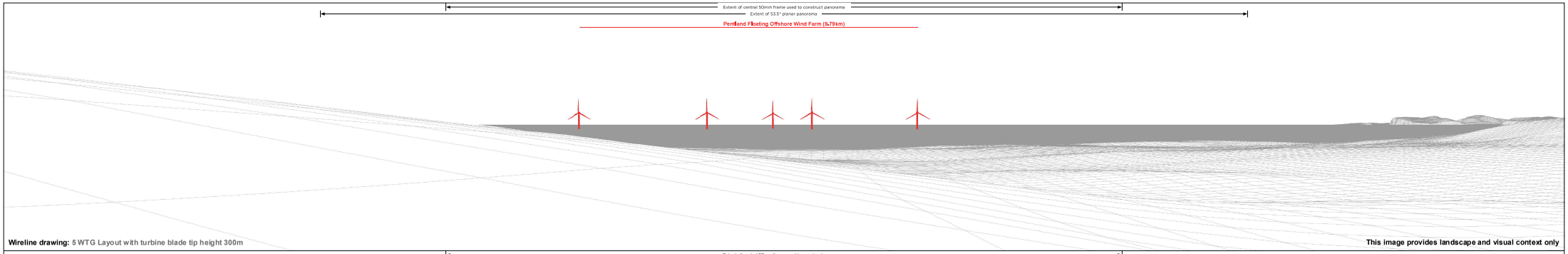
This image provides landscape and visual context only

OS reference:	287762 E 964929 N	**Horizontal field of view:**	90° (cylindrical projection)
Eye level:	62.75 m AOD	**Principal distance:**	522 mm
Direction of view:	28°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

Comparative Wirelines

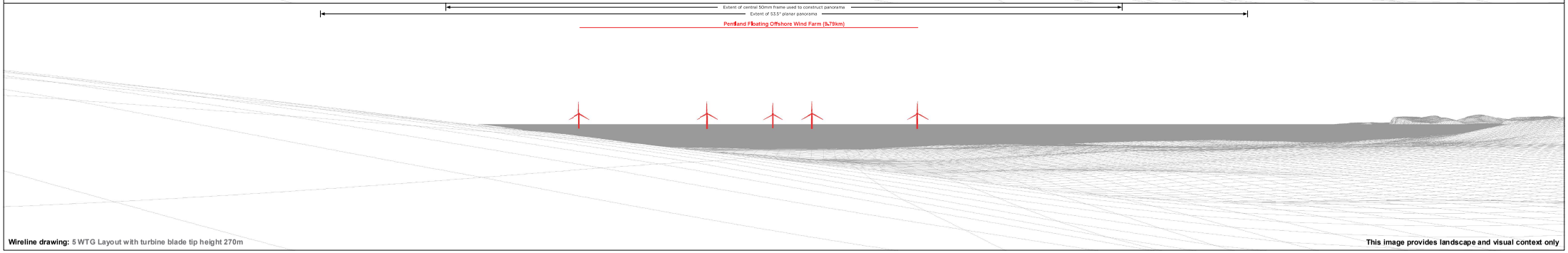
Figure: 4b

Viewpoint 3: Portskerra / Melvich



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

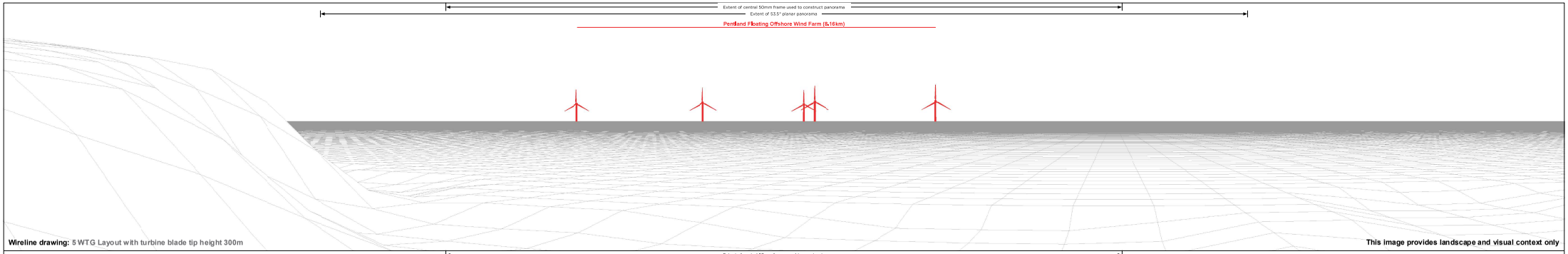
This image provides landscape and visual context only

OS reference:	293266 E 964533 N	**Horizontal field of view:**	90° (cylindrical projection)
Eye level:	90.15 m AOD	**Principal distance:**	522 mm
Direction of view:	358°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

Comparative Wirelines

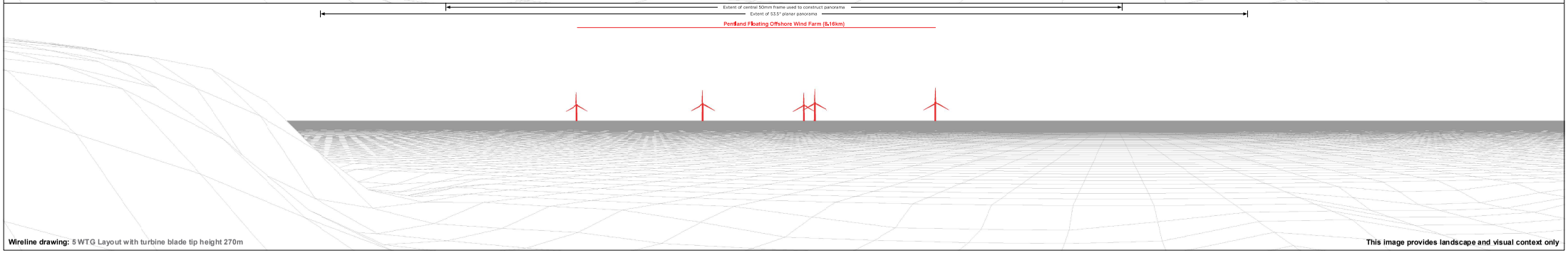
Figure: 5b

Viewpoint 4: Drum Hollistan



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

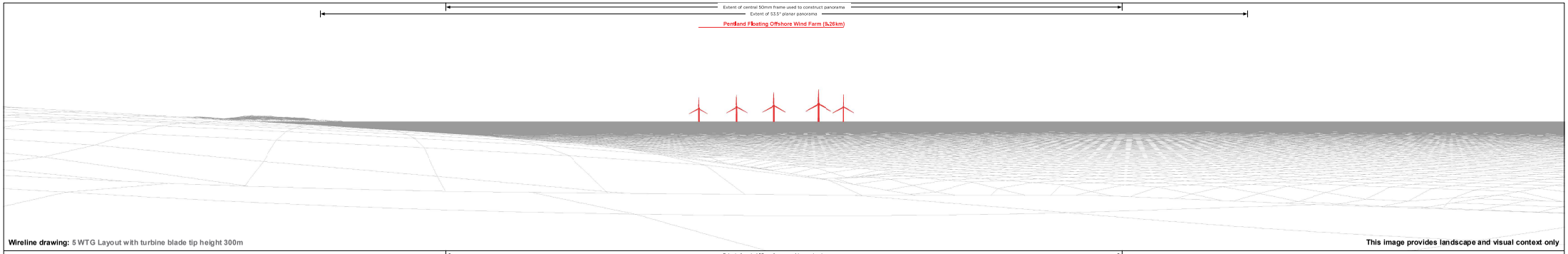
This image provides landscape and visual context only

OS reference:	295695 E 966278 N	**Horizontal field of view:**	90° (cylindrical projection)
Eye level:	12.78 m AOD	**Principal distance:**	522 mm
Direction of view:	341°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

Comparative Wirelines

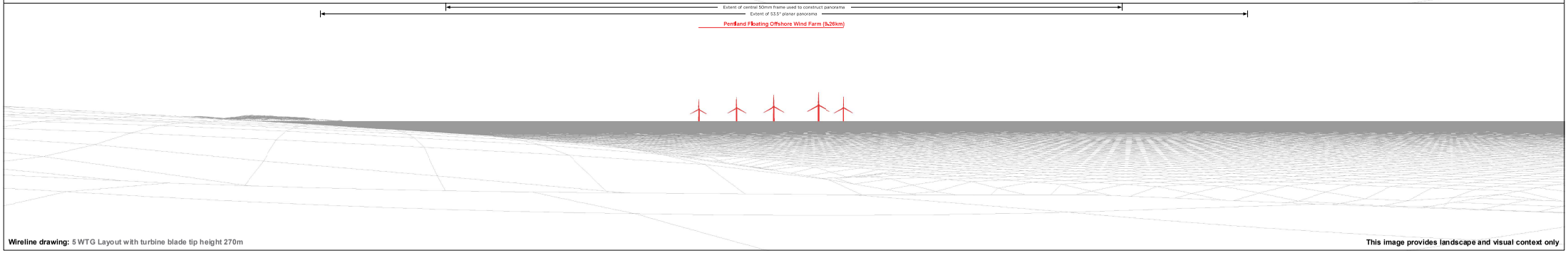
Figure: 6b

Viewpoint 5: Sandside Beach



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

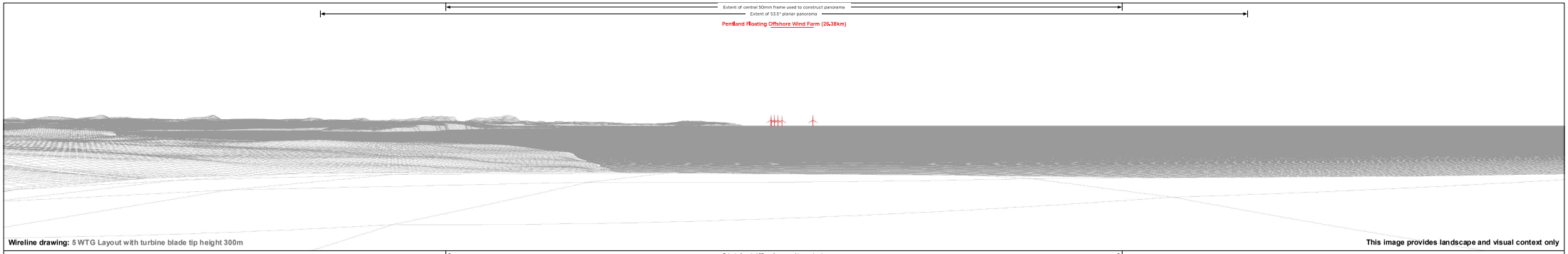
This image provides landscape and visual context only

OS reference:	302497 E 970105 N	**Horizontal field of view:**	90° (cylindrical projection)
Eye level:	16.66 m AOD	**Principal distance:**	522 mm
Direction of view:	295°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

Comparative Wirelines

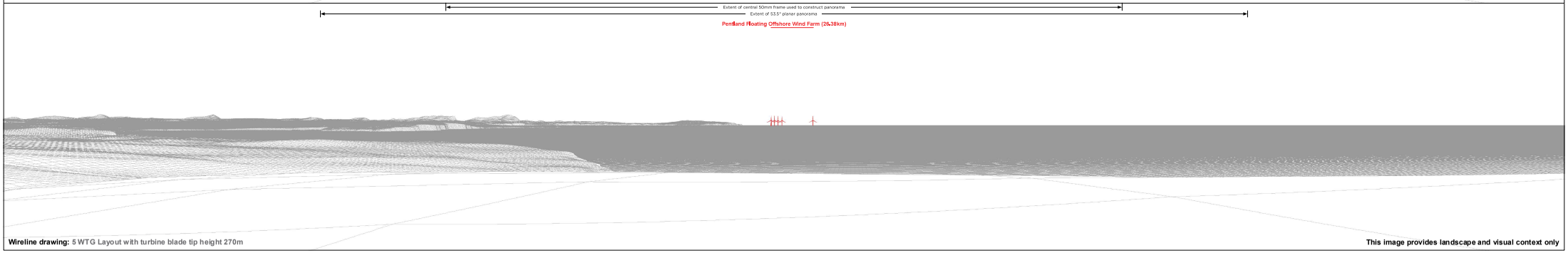
Figure: 7b

Viewpoint 6: St Mary's Chapel, Forss



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

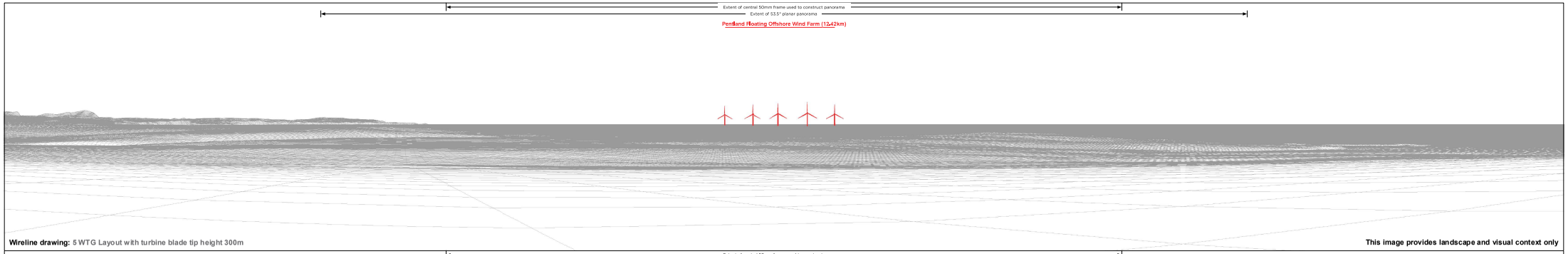
This image provides landscape and visual context only

OS reference:	320532 E 976496 N	**Horizontal field of view:**	90° (cylindrical projection)
Eye level:	127.13 m AOD	**Principal distance:**	522 mm
Direction of view:	266°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

Comparative Wirelines

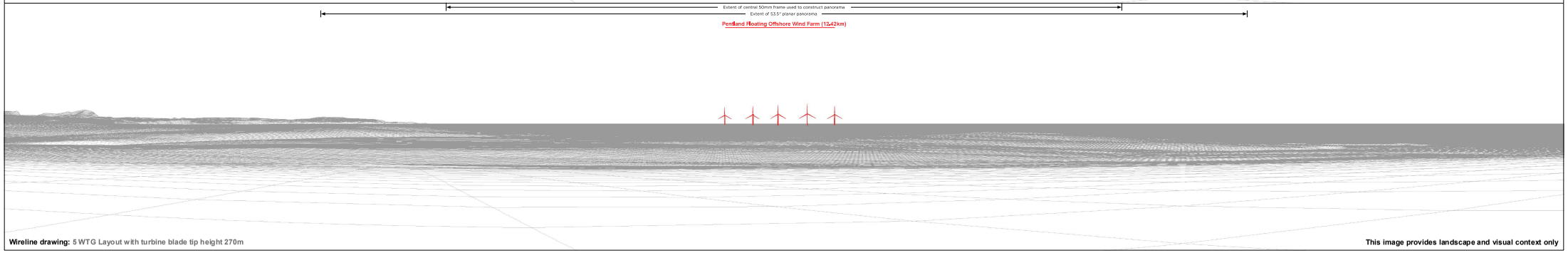
Figure: 8b

Viewpoint 7: Dunnet Head



Wireline drawing: 5 WTG Layout with turbine blade tip height 300m

This image provides landscape and visual context only



Wireline drawing: 5 WTG Layout with turbine blade tip height 270m

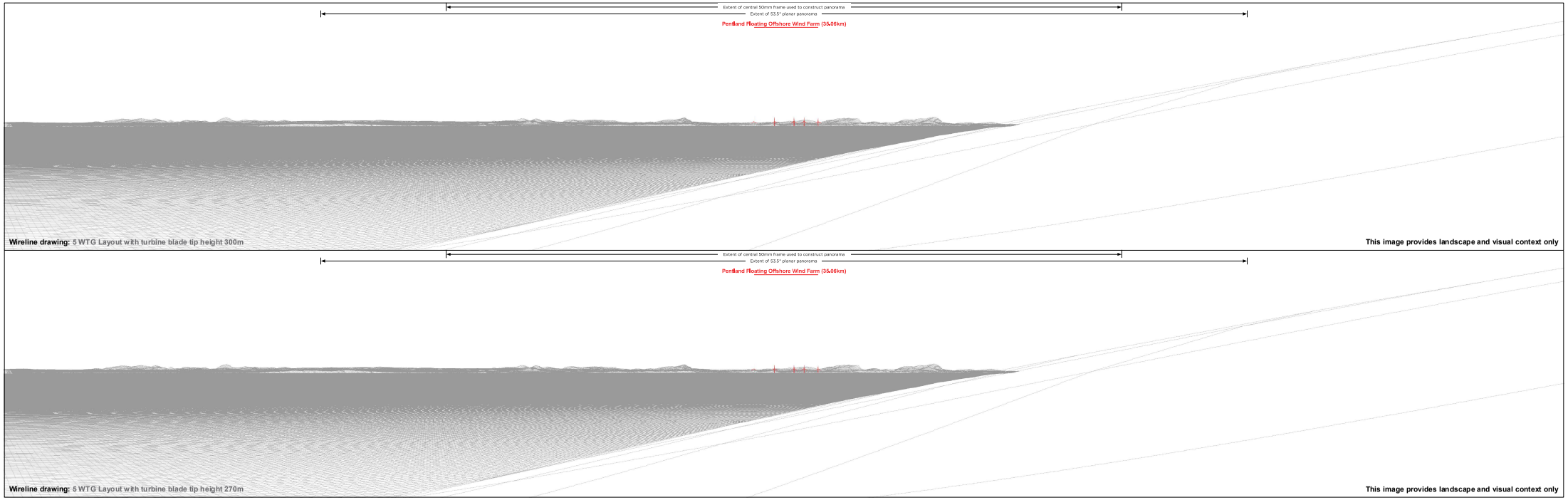
This image provides landscape and visual context only

OS reference:	305643 E 969387 N	**Horizontal field of view:**	90° (cylindrical projection)
Eye level:	72.61 m AOD	**Principal distance:**	522 mm
Direction of view:	292°	**Paper size:**	841 x 297 mm (half A1)
Nearest Turbine:		**Correct printed image size:**	820 x 130 mm

Comparative Wirelines

Figure: 9b

Viewpoint 10: A836 East of Forss



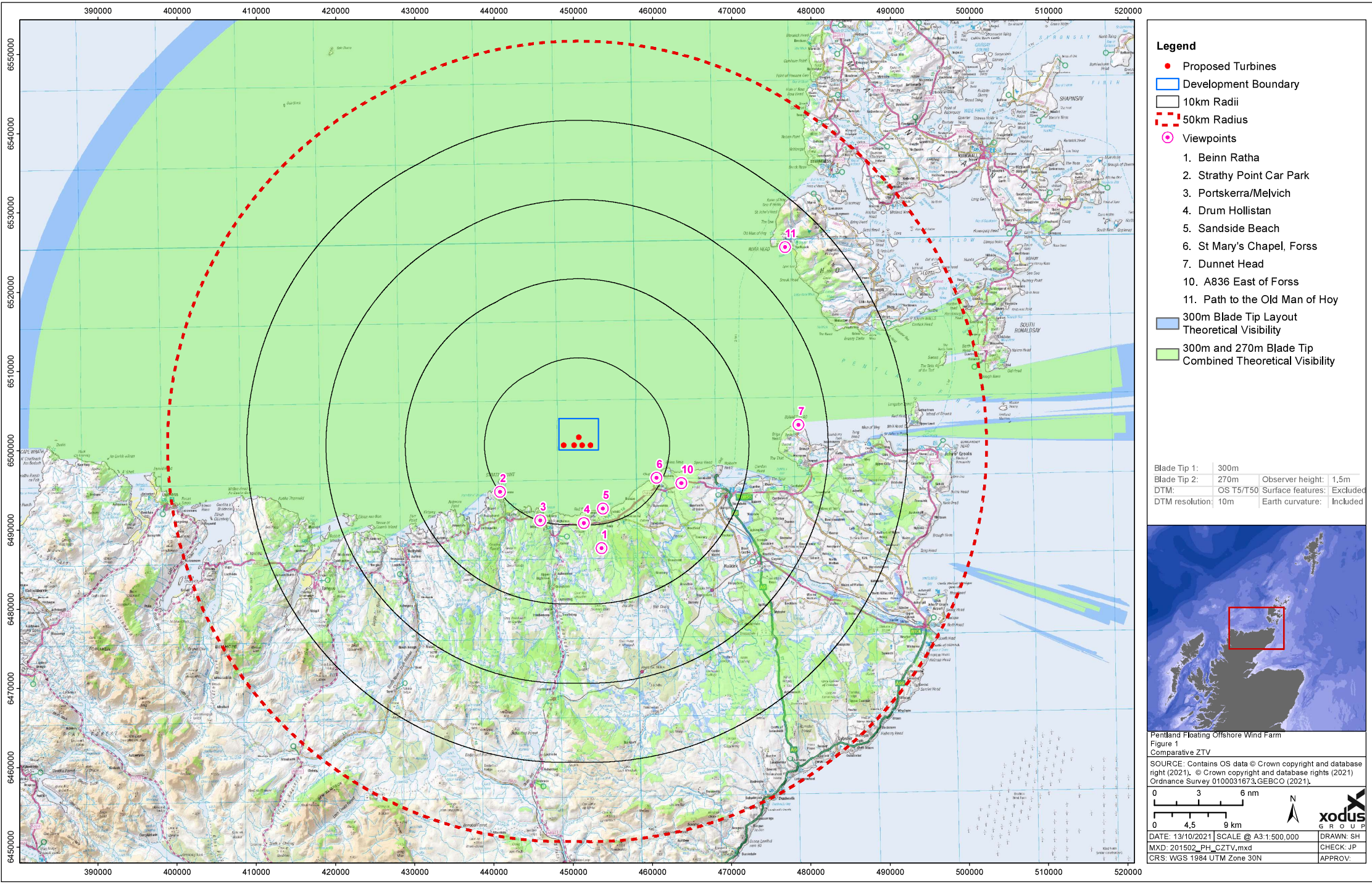
OS reference: 319147 E 998988 N
Eye level: 141.75 m AOD
Direction of view: 227°
Nearest Turbine:

Horizontal field of view: 90° (cylindrical projection)
Principal distance: 522 mm
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 130 mm

Comparative Wirelines

Figure: 10b
Viewpoint 11: Path to the Old Man of Hoy

APPENDIX B COMPARATIVE ZTV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11
Legend
Proposed Turbines
Development Boundary
10km Radii
50km Radius
Viewpoints
1. Beinn Ratha
2. Strathy Point Car Park
3. Portskerra/Melvich
4. Drum Hollistan
5. Sandside Beach
6. St Mary's Chapel, Forss
7. Dunnet Head
10. A836 East of Forss
11. Path to the Old Man of Hoy
300m Blade Tip Layout Theoretical Visibility
300m and 270m Blade Tip Combined Theoretical Visibility
Blade Tip 1: 300m
Blade Tip 2: 270m
Observer height: 1.5m
DTM: OS T5/T50
Surface features: Excluded
DTM resolution: 10m
Earth curvature: Included
Pentland Floating Offshore Wind Farm
Figure 1
Comparative ZTV
SOURCE: Contains OS data © Crown copyright and database right (2021). © Crown copyright and database rights (2021) Ordnance Survey 0100031673.GEBCO (2021).
0 3 6 nm
0 4.5 9 km
N
xodus GROUP
DATE: 13/10/2021
SCALE @ A3:1:500,000
DRAWN: SH
MXD: 201502_PH_CZTV.mxd
CHECK: JP
CRS: WGS 1984 UTM Zone 30N
APPROV: