

British Telecom

From: radionetworkprotection@bt.com
To: [MD Marine Renewables](#)
Cc: [Amy Woodward](#); [Toni-marie Mcginn](#); [Kirsten Watson](#); [Rebecca Ross](#); radionetworkprotection@bt.com
Subject: RE: WID14158 February 2026 MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026
Date: 21 January 2026 08:45:42
Attachments: [image004.png](#)
[RE WID13479 - SCOP 0049 - Thistle Wind Partners Limited - Ayre Offshore Wind Farm - Scotwind NE2 site - Scoping consultation - Response required by 3 August 2024.msg](#)

General



-

OUR REF: WID14158 & PREV WID13479

Thank you for your email dated 11/12/2025.

Please find attached regarding this proposal that remains the same.

If there are any changes with regards to structures at height please confirm and we will reassess for you.

Kind Regards

Lisa Smith

National Radio Planner
Radio & Satellite Platforms



This email contains information from BT Group that might be privileged or confidential. And it's only meant for the person above. If that's not you, we're sorry - we must have sent it to you by mistake. Please email us to let us know, and don't copy or forward it to anyone else. Thanks.

We monitor our email systems and may record all our emails.

British Telecommunications plc
R/O : 1 Braham Street, London, E1 8EE
Registered in England: No 1800000

British Telecommunications plc is authorised and regulated by Financial Conduct Authority for the provision of consumer credit

From: [Redacted]
To: [Redacted]
Cc: [Redacted]
Subject: RE: WID13479 - SCOP 0049 - Thistle Wind Partners Limited - Ayre Offshore Wind Farm - Scotwind NE2 site - Scoping consultation - Response required by 3 August 2024
Date: 01 August 2024 16:35:24
Attachments: [image003.png](#)
[image004.png](#)
[image006.png](#)

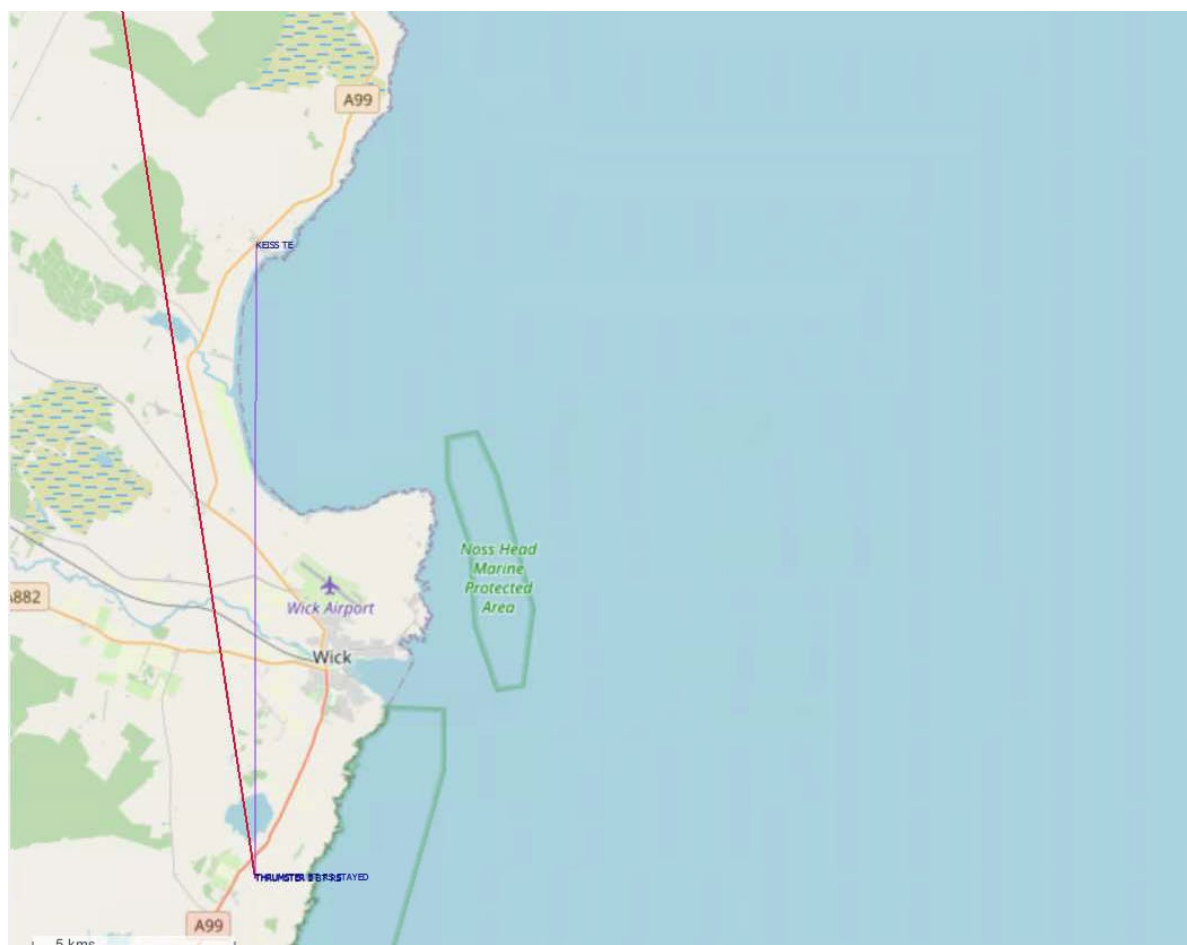


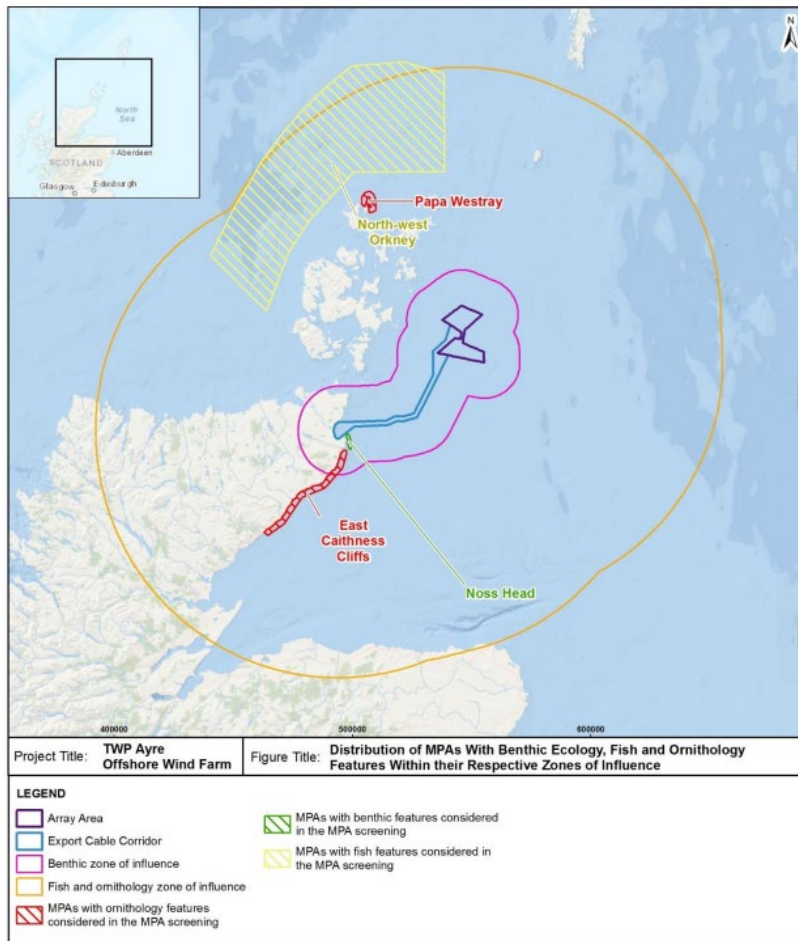
OUR REF; WID13479

Thank you for confirming this with the developers Amy.

We have studied this Thistle Wind Partners Limited Ayre Offshore Wind Farm scoping proposal with respect to EMC and related problems to BT point-to-point microwave radio links.

The conclusion is that, the project indicated should not cause interference to BT's current and presently planned radio network.





BT requires 100m minimum clearance from any structure to the radio link path. If the proposed locations change, please let us know and we can reassess this for you.

Please note this refers to BT Radio Links only, you will need to contact other providers separately for information relating to other supplier links / equipment.

Please direct all queries to radionetworkprotection@bt.com

Kind regards

REDACTED
National Radio Planner
Network Planning

E: radionetworkprotection@bt.com



This email contains information from BT Group that might be privileged or confidential. And it's only meant for the person above. If that's not you, we're sorry - we must have sent it to you by mistake. Please email us to let us know, and don't copy or forward it to anyone else. Thanks.

We monitor our email systems and may record all our emails.

British Telecommunications plc
R/O : 1 Braham Street, London, E1 8EE

Registered in England: No 1800000

British Telecommunications plc is authorised and regulated by Financial Conduct Authority for the provision of consumer credit

From: [Redacted]

Sent: Friday, July 26, 2024 4:30 PM

To: [Redacted]

Cc: [Redacted]

Subject: RE: WID13479 - SCOP 0049 - Thistle Wind Partners Limited - Ayre Offshore Wind Farm - Scotwind NE2 site - Scoping consultation - Response required by 3 August 2024

Good afternoon,

Thank you for your email.

The developer has confirmed that there will be no structures at height in the 'Export Corridor'.

Please let me know if you require anything further.

Kind regards,
Amy

Amy Woodward

Marine Licensing and Consenting Casework Officer, Licensing Operations Team, Marine Directorate

Scottish Government, Victoria Quay, Edinburgh, EH6 6QQ

E: [Redacted]

The Scottish Government



**In the service
of Scotland**



Integrity



Inclusivity



Innovation



Collaboration



Kindness

[Marine Directorate](#) | [Marine Directorate Blog](#) | [@ScotGovMarine](#) | [Marine Directorate LinkedIn](#)

To see how we use your personal data, please view our [privacy notice](#):

[Marine licensing and consenting: privacy notice - gov.scot \(www.gov.scot\)](#)

From: radionetworkprotection@bt.com <radionetworkprotection@bt.com>

Sent: Wednesday, July 17, 2024 1:44 PM

To: MD Marine Renewables <MD.MarineRenewables@gov.scot>

Cc: radionetworkprotection@bt.com

Subject: FW: WID13479 - SCOP 0049 - Thistle Wind Partners Limited - Ayre Offshore Wind Farm - Scotwind NE2 site - Scoping consultation - Response required by 3 August 2024



-
-

OUR REF; WID13479

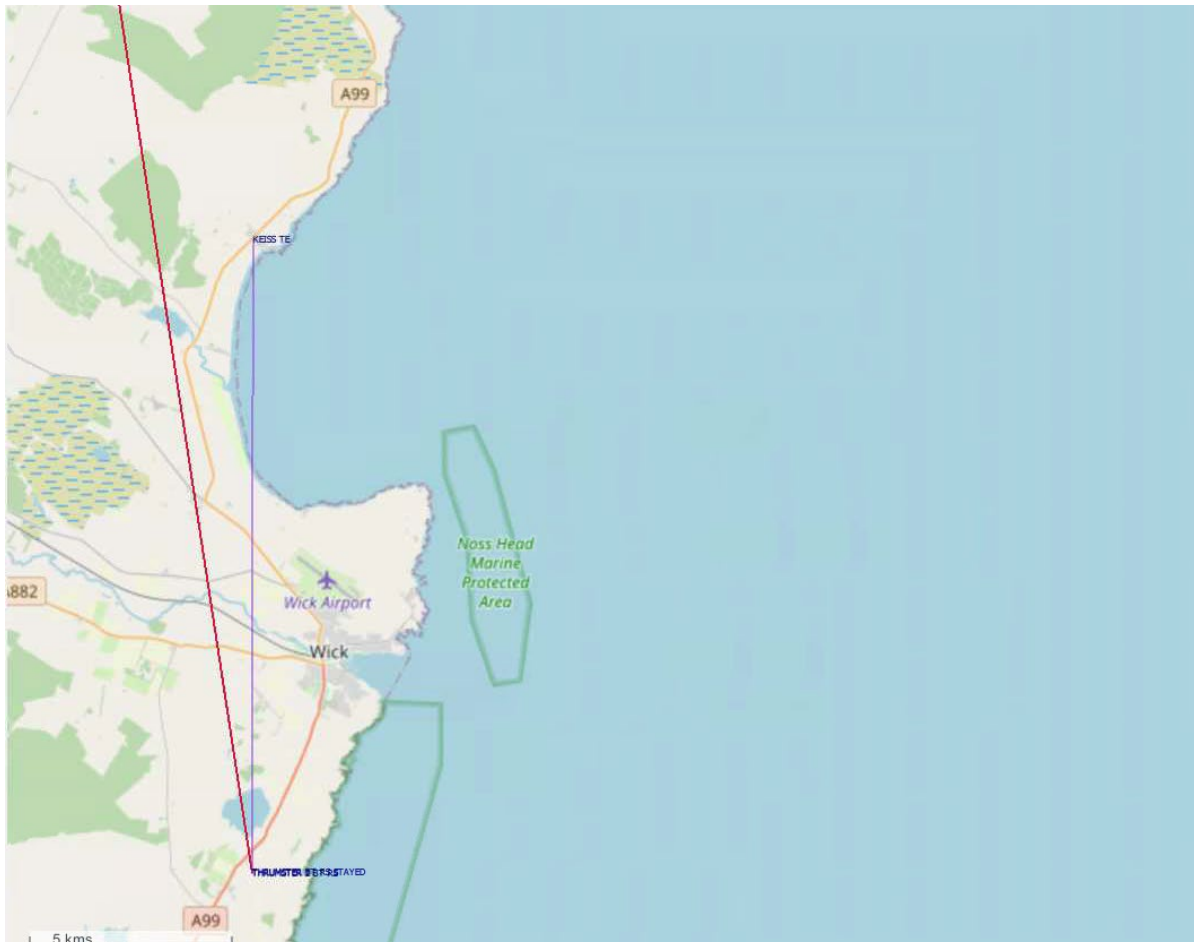
Thank you for your email dated 04/07/2024.

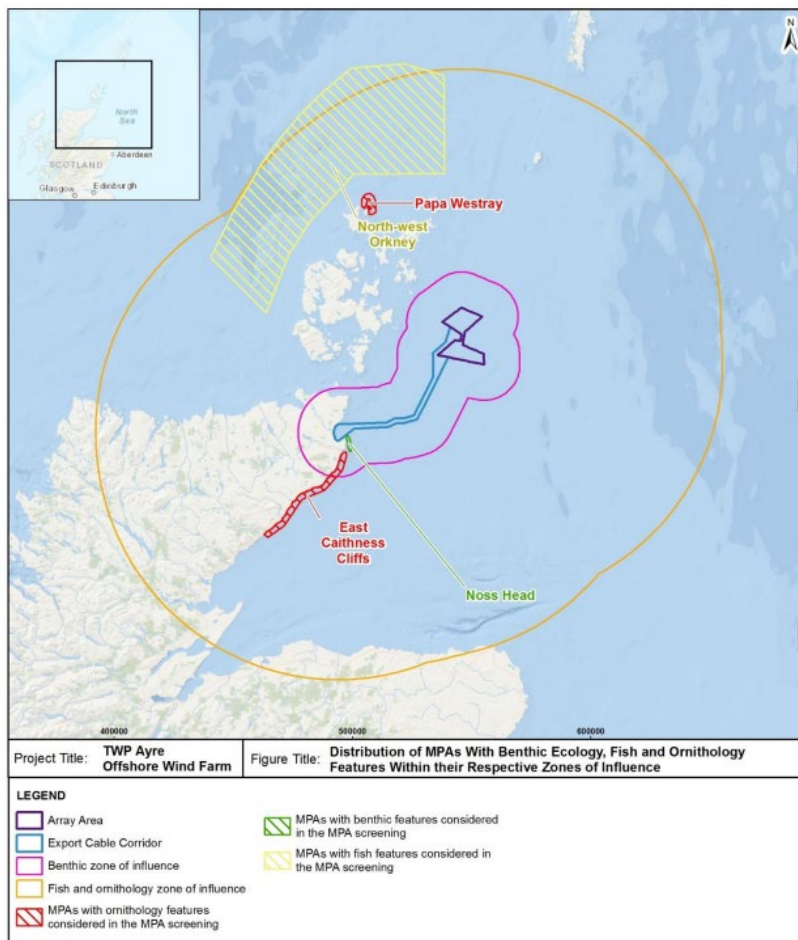
We have studied this Windburn Wind Farm scoping proposal with respect to EMC and related problems to BT point-to-point microwave radio links.

The conclusion is that, the 'Array Area' indicated should not cause interference to BT's current and presently planned radio network.

BT do have a Radio Link from THUMSTER BT RS to KEISS TE which is in the vicinity of the 'Export Corridor'. Can you please confirm with the applicant that there will be no structures at height in the 'Export Corridor'?

We would need this clarified in order to fully assess this scoping proposal.





BT requires 100m minimum clearance from any structure to the radio link path. If the proposed locations change, please let us know and we can reassess this for you.

Please note this refers to BT Radio Links only, you will need to contact other providers separately for information relating to other supplier links / equipment.

Please direct all queries to radionetworkprotection@bt.com

Kind regards

[Redacted]
National Radio Planner
Network Planning

E: radionetworkprotection@bt.com



This email contains information from BT Group that might be privileged or confidential. And it's only meant for the person above. If that's not you, we're sorry - we must have sent it to you by mistake. Please email us to let us know, and don't copy or forward it to anyone else. Thanks.

We monitor our email systems and may record all our emails.

British Telecommunications plc
R/O : 1 Braham Street, London, E1 8EE
Registered in England: No 1800000

British Telecommunications plc is authorised and regulated by Financial

**Caithness
District Salmon
Fishery Board**

Caithness District Salmon Fishery Board

[Redacted]

6th February, 2026

Ms Amy Woodward
Licensing Operations Team,
Marine Directorate,
Scottish Government,
Victoria Quay, Edinburgh, EH6 6QQ.

MD.MarineRenewables@gov.scot

Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications

Dear Amy,

Thank you for the opportunity to comment on the Ayre Offshore Wind Farm applications.

To be clear, the Board has no record of having been consulted by Ayre OWF since providing a scoping opinion at the start of the consultation process.

Regarding the Board's interests, two related issues still require attention from the Applicant – (1) The possibility of adverse effects of direct visual cues from moving turbine blades on migrating salmonids passing through the wind farm site and (2) the additional, related effects of shadow flicker when the sun, moving turbine blades and the receptor are aligned. In the first case, potential exposure of near-surface receptors to cues mediated by reflected sunlight or sky-light is 100% of annual daylight hours; in the second case exposure is more constrained.

The Applicant's view appears to be that potential barrier effects from such cues can be scoped out of the EIA although the arguments made in support of this case are very weak, indeed.

Two important background considerations are repeated below.

1. *"MSS do not consider it appropriate for an EIA/HRA to conclude there is no or negligible impact just because no evidence exists of the impact. **MSS advise that impacts to diadromous fish must be adequately investigated, rather than relying on a lack of evidence to claim there is no impact**". (see Ayre EIA Report, Volume 2, Chapter 9, page 28).*

2. On p8 of the EIA Report, headed Summary of Relevant Policy it is stated *"Where evidence of impacts on salmon and other diadromous species is inconclusive,..... **information on impacts on diadromous species from monitoring of developments should be used to inform subsequent marine decision making**".*

Yet on page 22 of the EIA Report the Applicant states that “*The purpose of this EIA is to identify and proportionately assess significant impacts upon fish and shellfish receptors using **strong scientific evidence***” and scopes out visual effects on this basis. In this regard, therefore, the Applicant’s position diverges from regulatory policy.

Until visual cues (both direct cues and shadow flicker) around Ayre OWF are adequately scaled there can be no basis for (1) environmentally-sensitive project design or (2) for monitoring of the interactions of migrating salmonids with the final iteration of the Ayre turbine array – for example, as per the proposed, but as yet unspecified *Project Environmental Monitoring Programme*.

Multiple parties (the Scottish Ministers, MD-LOT, NatureScot, IFM and CDSFB) have agreed, in the context of Ayre OWF, or in related contexts that the groundwork necessary to explore visual cues for aquatic receptors should be carried out. Williamson et al (2024) have provided the tools to do so. Yet the Applicant has failed to respond.

In line with its statutory duties, therefore, the Board objects to the Ayre OWF proposal because the developer has not addressed concerns regarding (1) the continued free passage of diadromous migrants (smolts and returning adults) through the Ayre turbine array and (2) the cumulative effects of the multiple OWFs existing/ proposed for construction across probable migratory routes.

On the other hand, preliminary accounts presented at the ScotMer conferences of 2024 and 2025 (available on YouTube) describing the Wick River smolt-tracking projects of 2023 and 2024 showed smolts passing eastwards through the BOWL and/ or Moray East turbine arrays. The final analysis of these data has not been made available by MD-LOT. **If the passage of the Wick smolts is shown to prove similar to the passage of smolts as previously documented for the Inner Moray Firth rivers (where turbines are not a factor) the Board will reconsider its objection to Ayre OWF.**

Yours sincerely,

Fisheries Management Scotland



T: +44 (0)131 221 6567

E: [Redacted]

Licensing Operations Team
Marine Directorate
By e-mail

8 February 2026

Dear Sir/Madam

MS-00011515 and MS-00011516–Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications

As you know, Fisheries Management Scotland is the representative body for Scotland's District Salmon Fishery Boards, the River Tweed Commission and charitable Rivers and Fisheries Trusts. Our members work to conserve Scotland's valuable and iconic wild salmon and freshwater fish and fisheries and the aquatic environment on which they depend.

We provide the following comments regarding Chapter 9 of the EIA report. In common with the majority of EIA assessments that we have reviewed regarding marine renewable development we have significant outstanding concerns about the approach adopted and the conclusions that have been reached.

In particular we highlight the following concerns:

The developer argues that the impact of visual effects from turbine blades should be scoped out, but, in common with other applications that we have responded to, they focus only on the issue of shadow flicker, while ignoring the much more significant issue of direct visual cues. To be clear, there are two classes of visual cue. The general case refers to *direct* visual cues arising from sunlight or diffuse skylight reflected from moving turbine blades and passing into aquatic space via the air-water interface; the exposure of salmon to such cues is up to 100% of annual daylight hours. The additional, special case arises when the sun, a moving turbine blade and a receptor are aligned. When conditions allow, salmon will be exposed to periods of shadow flicker (typically of multiple hours) at particular times of day in a seasonally variable pattern. The developer has focussed on the latter, but has not

addressed the former. As we stated previously, we note, and support, the recent position that the Marine Directorate have taken - "*MSS do not consider it appropriate for an EIA/HRA to conclude there is no or negligible impact just because no evidence exists of the impact. MSS advise that impacts to diadromous fish must be adequately investigated, rather than relying on a lack of evidence to claim there is no impact*".

The proposed development is in waters which are potentially very important migration routes for both post smolts leaving rivers and adult salmon returning to Scottish rivers. If visual effects result in salmon avoiding the development area, this could prolong the period of time taken to reach feeding grounds, and potentially exacerbate existing impacts arising from the more northerly location of prey species associated with climate change. Atlantic salmon across Great Britain are now considered to be endangered, and all potential impacts need to be taken seriously and properly assessed. We would expect to see, at the very least, proposed developments across Scotland contributing to research to understand these impacts.

We do not agree that only 8 SACs have been identified within the EIA. Any area identified must be ecologically coherent, and no evidence is presented to infer that salmon from other SAC rivers, or those from rivers which are SACs for freshwater pearl mussel, will not pass through the development area. Unless this can be discounted (and we are not aware of any studies which show this) potential impacts arising from the development would extend to all SACs in Scotland, but at the very least, all SACs on the East coast. The Fish and Shellfish Ecology Study Area therefore appears arbitrary in the case of Atlantic salmon.

We do not agree with the conclusions of the EIA regarding the impact of hard substrates on diadromous fish. Section 9.10 also discusses the impact of hard substrates on gadoid fish, such as cod, but does not seem to recognise that cod (and a range of other fish species and sea birds) also predate salmon and sea trout post smolts. The document accepts that marine mammals have been demonstrated to utilise wind farm sites in Dutch and UK waters, and recognises (in a different section) that predatory fish are likely to accumulate in the area. The EIA also fails to recognise that adult returning salmon are also likely to pass through the proposed development site, focussing only on the movement of smolts. It also fails to recognise more recent work undertaken by the Marine Directorate and presented at ScotMER which demonstrates that post smolts do not always move swiftly through coastal waters, presumably taking time to forage when feeding opportunities arise. We still have significant concerns about the potential for predation of salmon post smolts, sea trout and returning adult salmon due to aggregation of fish, marine mammals and predatory birds in the vicinity of the development, and we do not agree that this is of minor adverse significance.

As we have stated previously, offshore renewable energy has an important role to play if the Scottish Government are to meet their commitment for Scotland to reach net-zero emissions of all greenhouse gases by 2045. However, there remains considerable uncertainty around the potential for impacts of offshore wind farms on Atlantic salmon and other diadromous fish species, and we are disappointed at the limited evidence presented to support claims of **lack** of impacts. Given the significant decline in wild Atlantic salmon populations in recent years we are strongly of the view that a more precautionary approach in assessments is required. We therefore expect to see proposals for strategic research **and** mitigation. In the case of mitigation, this should be focused, in line with international advice via NASCO, on projects which improve freshwater conditions and increase the number of healthy wild salmon and sea trout smolts leaving Scotland's rivers.

Conclusion

It should be emphasised that we have no wish to prevent or delay any proposed development unnecessarily and we remain keen to work constructively with the developers and the Marine Directorate to identify appropriate monitoring programmes which will allow us to be able to assess the acknowledged risks of this development, and other proposed developments in a more appropriate manner. There is a clear and urgent need to fund, plan and start strategic research on the movement, abundance, swimming depth, feeding behaviour and impact pathways relevant to diadromous fish. Such research would clearly feed into the potential mitigation measures that might be deemed appropriate, and the conditions under which such mitigation should be enacted. Developers should be required to work together to fund strategic monitoring, in order to allow more certainty for all involved.

In the light of the ongoing failure to understand, quantify and address concerns relating to impacts on diadromous fish, we object to the proposal as currently set out. Should the developer make a clear and costed commitment to contributing to strategic research to address these information gaps, as a specific condition of consent, and also commit to supporting projects relevant to the conservation and restoration of diadromous fish populations, we may be in a position to lift our objection. We would be very happy to discuss potential options to alleviate these concerns.

Yours faithfully,
[Redacted]

Alan Wells
CEO, Fisheries Management Scotland

Focus North

23rd January 2026

Scottish Ministers
Marine Directorate – Licensing Operations Team
Scottish Government
375 Victoria Road
Aberdeen
AB11 9DB

Re: Section 36 Consent Application (Reference 00011515/00011516)– Construction and Operation of Generating Station – Ayre Offshore Wind Farm.

Dear Sirs,

I am writing to you in my capacity as the Independent Chair of Focus North in support of the Section 36 consent application by Ayre Offshore Windfarm.

Focus North, the partnership of the main public and private sector bodies with a socio-economic remit in the far north of mainland Scotland, has been working to develop the economy in Caithness and North Sutherland since 2007 (previously CNSRP). Partners are: - The North Highland Chamber of Commerce; NRS Dounreay; The Highland Council; Highlands & Islands Enterprise; The Nuclear Decommissioning Authority; Skills Development Scotland; UHI North, West and Hebrides and The Scottish Government.

Strategic direction for the partnership is driven by the Executive board, consisting of chief executives, directors, and other senior officers of the partner organisations. Supporting the Executive board is an Advisory Board, led by the leader of the Highland Council which provides strong links to community, third sector, commercial and other public body representatives. As a result, the partnership's activities are formed through widespread stakeholder discussion and consensus.

The economic opportunities for the north coast have grown significantly in recent years and Offshore wind developments and related infrastructure are vital to both the regional economy and to Scotland's response to climate change. These new undertakings complement the existing operations at Dounreay, on its critical decommissioning journey, and from local businesses including vibrant tourism and hospitality industries. Alongside the recently inscribed Flow Country UNESCO World Heritage site, these large-scale investments together offer a once-in-a-generation opportunity to transform the economy in the north of mainland Scotland. As a result, working under the banner Focus North the key public and private sector organisations, including the Chamber of Commerce, have developed an ambitious programme to support economic growth built on the Just Transition to net zero.

To crystallise the local benefits and provide transformational economic benefits it is essential that the projects outlined above progress in a timely manner. The Ayre Offshore wind farm is one of these vital opportunities, and as a result is built into the planning for the Focus North programme. The project could result in substantial investment in local ports and facilities and provide well-paid long-term employment in a growing industry. The skills development, and future opportunities for young people are crucial for the future population growth in our region. Through collaborations wind farm

developers have already committed £900,000 to STEM activity around the region, and expansion of apprenticeships and further skills investments are expected to grow as these projects progress. Whilst the developer has yet to select its port of operations, this has the potential to provide more than 100 well-paid, long-term jobs should it be established in Caithness. The Beatrice offshore wind farm operation at Wick harbour has shown how beneficial such an operation can be to the local economy.

On its own this project is extremely important to our regional economic development, but the synergistic effect of this alongside other projects should not be underestimated. Developing a critical mass of renewable energy activity in the region, which already produces 12.5 times the power it consumes, will help retain young people in the region and attract other working age families here. This clustering effect will also help increase the speed and reduce the costs of development of some of the nation's other most critical renewable energy projects.

Through the Focus North Industry group, Ayre Windfarm is already collaborating with other major developers in renewable energy and space developments to look at the skills and personnel needs in the region over the next 10 to 15 years. This gives further opportunity to develop capacity to deliver the skills needs of these industries in the locality, to expand the career pathways available to local young people. This will be a vital step in increasing retention of young working people in the region to counteract the predicted reduction in population.

I therefore hope it is clear how vitally important it is that the Ayre windfarm development continues to the Focus North programme. Partners are fully engaged in developing the local economy to helping grow the economy in a remote and rural area and we fully support the planning application to help achieve this.

Yours faithfully

[Redacted]

Simon Middlemas, OBE
Independent Chair, Focus North

Focus North is a partnership between Caithness Chamber of Commerce, NRS Dounreay, Highland Council, Highlands & Islands Enterprise, Nuclear Decommissioning Authority, UHI North West, and Hebrides, Skills Development Scotland and The Scottish Government.

Historic Environment Scotland



HISTORIC
ENVIRONMENT
SCOTLAND

ÀRAINNEACHD
EACHDRAIDHEIL
ALBA

By email to:

MD.MarineRenewables@gov.scot

Marine Directorate (Marine Renewables)
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Enquiry Line: 0131 668 8716
HMConsultations@hes.scot

Your ref: MS-00011515
MS-00011516
Our case ID: 300068373

9 February 2026

Dear Marine Directorate

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017

The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017
Ayre Offshore Windfarm - Section 36 Consent - Environmental Impact Assessment Report

Thank you for consulting us on this Environmental Impact Assessment (EIA) Report and planning application. We received the consultation on 11 December 2025. We have reviewed the report and considered the proposed development in terms of our historic environment interests. This covers cultural World Heritage Sites, scheduled monuments and their settings, category A-listed buildings and their settings, inventory gardens and designed landscapes, inventory battlefields and Historic Marine Protected Areas.

The relevant local authority archaeological and cultural heritage advisors will also be able to offer advice on impacts on the historic environment. This may include topics covered by [our advice-giving role](#), and also other topics such as unscheduled archaeology, category B and C listed buildings, and conservation areas.

Our advice

We are content that the EIA report provides sufficient information to come to a view on the application. We consider that the conclusions reached within the cultural heritage chapter of the EIA report have underestimated the severity of impacts upon several heritage assets and their setting. We **do not object** to the application and believe that the proposed development can be accommodated in this location without raising impacts on assets in our remit which may raise issues of national interest. Additional comments are provided in the annex of this letter.

Our comments are provided as a material consideration, and this advice should be taken into account in your decision making. Our decision not to object should not be taken as our support for the proposals. This application should be determined in accordance with

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH
Scottish Charity No. **SC045925**
VAT No. **GB 221 8680 15**

national and local policy on development affecting the historic environment, together with related policy guidance.

Further information

Decisions that affect the historic environment should take the [Historic Environment Policy for Scotland](#) (HEPS) into account as a material consideration. HEPS is supported by our [Managing Change guidance series](#).

We hope this is helpful. If you would like to submit more information about this or any other proposed development to us for comment, please send it to our consultations mailbox, hmconsultations@hes.scot. If you have questions about this response, please contact Kevin Mooney [Redacted].

Yours sincerely

Historic Environment Scotland

Annex

Proposed Development

We understand that the proposed development comprises the construction and operation of the following elements which are located circa 22km east of Orkney:

- Up to 40 wind turbines (max 356m to tip) and associated foundations, mooring and anchoring systems.
- A network of up to 185km of inter array cables and up to 60km of Interconnector cables.
- Subsea collectors used to connect turbine clusters to offshore substation platforms
- Up to two offshore substation platforms, including foundations and scour protection
- Offshore export cables (360km) and cable protection/crossings where required.

Background

Scoping (27 August 2024)

We responded to the proposed development at scoping stage. In our response, we provided detailed information on underwater archaeology assets along with the potential for impacts on terrestrial assets. We identified a number of concerns surrounding the applicants proposed methodology and the lack of reasoning and evidence presented within the report for the proposed scoping of assets out of further assessment. We suggested that we would review our position on scoping out impacts on the Heart of Neolithic Orkney World Heritage Site (WHS) on receipt of additional evidence for the suggested lack of impacts.

Pre-application (8 April 2025)

We responded to additional evidence provided by the applicant that included a number of wirelines which presented the potential impacts on the Heart of Neolithic Orkney WHS. In our response, we welcomed the provision of this additional information and subsequently confirmed that we were content with scoping out setting impacts on the WHS.

Pre-application (27 October 2025)

The applicant approached for additional consultation and requested a review of the draft Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD). In our response, we noted that no designated assets appeared within the Offshore Development area and directed review of the documents to the Marine Directorate. We also noted that the terrestrial elements of the proposed development would be considered and consulted on separately.

EIA Report

The cultural heritage and marine archaeology assessment is included within Chapter 21 and is supported by a number of figures, visualisations, and annexes. We welcome that a full assessment has been provided within the application and we are satisfied that the



chapter provides a detailed assessment of the potential impacts from the proposed development.

Within the applicants assessment, they repeatedly reference ‘*visual change*’ in relation to setting. As per the [Managing Change Guidance in the Historic Environment: Setting guidance](#), setting’ is the way the surroundings of historic asset or place contribute to how it is understood, appreciated and experienced. This extends to a range of factors which also includes non-visual factors.

We note that the applicant has assessed the night time impacts from the proposed development and state that they have only included lighthouses in this assessment as the potential impacts are restricted to this type of asset:

‘The other receptors are not lit and therefore cannot be experienced at night. Nighttime views do not therefore contribute to their cultural significance and the Proposed Development’s appearance in such views has no potential to result in an adverse impact’ (Paragraph 21.10.130)

We disagree with this statement. The monuments on Orkney and their setting are clearly discernible at dawn and dusk, notably during the summer months when hours of darkness are very short due to Orkney’s northern latitude. The natural light at these times can be particularly atmospheric and contributes to the understanding, appreciation, and experience of the assets. This is also the case on nights lit by the moon, the stars, or the aurora borealis.

Our Historic Environment Interests

We can confirm that here is unlikely to be any physical impacts on assets within our remit. We consider that the conclusions reached within the cultural heritage chapter of the EIA report have underestimated the severity of impacts upon several heritage assets and their setting.

Scheduled Monuments

There is the potential that the proposed development would result in adverse impacts on the setting of a number of scheduled monuments. These assets include open views out to sea:

- **Quoyness, chambered cairn, Els Ness, Sanday** ([SM90243](#))
- **Ward of Housebay, chambered cairn SSW of Housebay** ([SM1411](#))
- **Hellier Holm, chambered cairn** ([SM1275](#))
- **Brough of Deerness, chapel and settlement** ([SM4654](#))
- **Scad Head, coastal artillery battery, camp and railway, Hoy** ([SM13497](#))
- **Roan Head, coastal battery and camp (WW1)** ([SM10945](#))
- **Burray Ness, anti-aircraft battery (WW1), Burray** ([SM13499](#))
- **Isbister, chambered cairn 450 m ESE of** ([SM2136](#))
- **Castle Girnigoe and Castle Sinclair** ([SM622](#))



A number of these monuments have settings which exploit their relationship with seaways, other monuments and the sense of being on the edge of the land, coupled with an embedded feeling of isolation. The chambers of a number of the cairns were also deliberately oriented towards the sea, which concentrates the role of the sea within their settings. These aspects are also enhanced for Castles Girnigoe and Sinclair have a dramatic clifftop location and a sense of abandonment. The Second World War monuments were built for more functional control of the seaways, but their subsequent decay can often add to a sense of isolation from modern settlement and coastal focus can add to how they are experienced today.

The proposed development would be visible across the horizon in views from nearly all of these monuments and would substantially detract from the relationship with sea and any sense of isolation felt at these monuments. However these impacts are not of the severity that we would object to the application.

Category A Listed Buildings

There is the potential that the proposed development would result in adverse impacts on the setting of a number of category A listed buildings.

- **North Kirk (St Peters) and Kirkyard (Church of Scotland) ([LB18718](#))**
- **Churchill Barrier No 4, Burray to South Ronaldsay, excluding concrete edge beam, crash barriers, modern road surfacing, car parking area and toilet block to northeast, Orkney Islands ([LB52417](#))**
- **Former Naval Headquarters and Communications Centre, Wee Fea, Lyness, Hoy ([LB48378](#))**

In addition, we note that the applicant has not assessed impacts from the proposed development on the Category A listed **Lamb Holm, The Italian Chapel, (Roman Catholic), Including Statue ([LB12728](#))**. Our own assessment indicates that whilst there would be the potential for some visibility from the immediate area surrounding, this is likely to be screened by topography and landform.

The proposed development would be visible across the horizon in views from the assets identified above and would again substantially detract from the relationship with the sea and remote coastal setting. However these impacts are not of the severity that we would object to the application.

Our Position

The lack of assessment of impacts on the Category A listed Italian Chapel notwithstanding, we are content that the EIA report provides sufficient information to come to a view on the application. We consider that the conclusions reached within the cultural heritage chapter of the EIA report have underestimated the severity of impacts upon several heritage assets and their setting.



HISTORIC
ENVIRONMENT
SCOTLAND

ÀRAINNEACHD
EACHDRAIDHEIL
ALBA

However, we **do not object** to the application and believe that the proposed development can be accommodated in this location without raising impacts on assets in our remit which may raise issues of national interest.

Historic Environment Scotland

9 February 2026

The Highland Council

From: [Redacted]
To: [MD Marine Renewables](#)
Cc: [Amy Woodward](#)
Subject: MS-00011515 & MS-00011516- Ayre Offshore Wind Farm
Date: 11 February 2026 15:35:25

Dear Amy,

Thank you for consulting Highland Council on the above application.

We have reviewed the application and do not wish to raise objection or make further comment.

Kind Regards,

Jack

Jack Wiseman

Principal Planner- Strategic Projects Team
Planning & Building Standards I Development & Infrastructure Service
The Highland Council, Glenurquhart Road, Inverness, IV3 5NX

E: [Redacted]

T: [Redacted]

You're invited to share feedback on your recent experience with Highland planning authority! On behalf of planning authorities across Scotland, the National Planning Improvement Team is undertaking an annual survey. This survey is intended to be filled out by all users of planning authorities in Scotland to collect your views on the service you have received. This is your opportunity to say what is working and where improvements could be made. It should only take a few moments of your time, it is completely anonymous, and all your responses help the planning authorities improve their offer to you. The National Planning Improvement team will publish the results of the survey at the beginning of next year and each planning authority will be provided with a breakdown for their area.

[National Planning Improvement - Customer and Stakeholder Survey 2025](#)

Follow up documentation for existing planning applications must be submitted via the 'Post Submission Additional Document' (PSAD) online form, quoting the correct application reference number at [ePlanning.scot](https://eplanning.scot). If your submission relates to the satisfaction of planning conditions for a National or Major development please upload the form available at <https://shorturl.at/APQT9> with your PSAD submission. This advice is given without prejudice to the future consideration of and decision on any application received by the Council. Register at consult.highland.gov.uk to be kept updated on Development Plan documents in Highland.

Unless related to the business of The Highland Council, the views or opinions expressed within this e-mail are those of the sender and do not necessarily reflect those of The Highland Council, or associated bodies, nor does this e-mail form part of any contract unless so stated.

Mura h-eil na beachdan a tha air an cur an cèill sa phost-d seo a' buntainn ri gnothachas Chomhairle na Gàidhealtachd, 's ann leis an neach fhèin a chuir air falbh e a tha iad, is chan eil iad an-còmhnaidh a' riochdachadh beachdan na Comhairle, no buidhnean buntainneach, agus chan eil am post-d seo na phàirt de chunnradh sam bith mura h-eil sin air innse.

**Highland and
Islands Airports
Limited**

From: [Safeguarding](#)
To: [MD Marine Renewables](#)
Cc: [Amy Woodward](#); [Toni-marie Mcginn](#); [Kirsten Watson](#); [Rebecca Ross](#); [Safeguarding](#)
Subject: Re: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026
Date: 08 February 2026 09:48:16
Attachments: [image001.png](#)
[values2025_49f0881e-b581-44a4-b961-1aecd2620b56.png](#)

OFFICIAL

Your Reference: MS-00011515 and MS-00011516

Our Reference: 2026/025/KOI

Proposal: ELECTRICITY ACT 1989

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017

The Electricity (Applications for Consent) Regulations 1990

MARINE (SCOTLAND) ACT 2010

The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017

MARINE AND COASTAL ACCESS ACT 2009

The Marine Works (Environmental Impact Assessment) Regulations 2007

MS-00011515 and MS-00011516 - Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – Scotwind NE2 Site – Approximately 22 km from Orkney

Dear Sir / Madam

Highlands and Islands Airports Ltd has been consulted on the above proposed development, received by this office on: 11/12/25

With reference to the above proposal, our preliminary assessment showed that, at the position and heights the proposed wind farm may have impacted the safeguarding criteria and operation of Kirkwall Airport Kirkwall and Wick John O Groats Airport.

This assessment was confirmed by the IFP Impact Assessment provided by the developer in "Volume 3, Technical Appendix 15.2 IDL-025-1-RPT-054 V1.1

The proposed Windfarm does impact the Instrument Flight Procedures at Kirkwall and Wick John O Groats Airport, therefore furthermore discussions will continue with the Developer and our ATC to explore any mitigation options.

HIAL apply a **holding objection** to this proposed development until appropriate mitigation can be identified and agreed, to ensure there is no impact on our published Instrument Flight Procedures.

Kind Regards

Michael Balmain



Safeguarding

Highlands and Islands Airports Ltd
Inverness Airport Dalcross IV2 7JB
www.hial.co.uk

Our Values



Joint Nature Conservation Committee

From: [JNCC Offshore Industries Advice](#)
To: [MD Marine Renewables](#); [JNCC Offshore Industries Advice](#)
Cc: [Amy Woodward](#); [Toni-marie Mcginn](#); [Kirsten Watson](#); [Rebecca Ross](#)
Subject: RE: MS-00011515 & MS-00011516 Ayre OWF - EIA Section 36 & Marine Licence - JNCC
Date: 12 December 2025 14:16:47
Attachments: [image002.png](#)
[image003.png](#)

Good Afternoon Amy,

Thank you for consulting JNCC on the Ayre Offshore Wind Farm Limited, which we received on 11/12/2025.

JNCC's role in relation to offshore renewables in Scottish waters has been delegated to NatureScot.

NatureScot is now authorised to exercise the JNCC's functions as a statutory consultee in respect of certain applications for offshore renewable energy installations in inshore and offshore waters (0-200nm) adjacent to Scotland. As the operations do not impact any offshore MPAs we would delegate to NatureScot. Therefore, NatureScot should provide a full response.

As such JNCC have not reviewed this document and will not be providing further comment.

Kind regards,

Jon Cannon

Offshore Industries Advice Officer

Marine Management Team

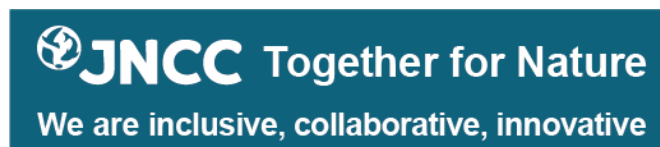
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA

Tel: [Redacted]

Working pattern: Monday to Friday

[Website](#) [Twitter](#) [Facebook](#) [LinkedIn](#)

[Sign up to the JNCC Nature News monthly newsletter](#)



-

Joint Radio Company

From: [Joint Radio Company](#)
To: [MD Marine Renewables](#)
Cc: [Amy Woodward](#); [Toni-marie McGinn](#); [Kirsten Watson](#); [Rebecca Ross](#)
Subject: Re: Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – MS-00011515 and MS-00011516– EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026
Date: 06 January 2026 11:19:03

If any details of this proposal change, particularly the position or scale of any turbine(s), this clearance will be void and re-evaluation of the proposal will be necessary.

Dear Amy

Planning Ref: MS-00011515 & MS-00011516

Name/Location: Ayre Offshore Wind Farm

Site at location*:



(*NB. we have also used the NGR coordinates provided in your previous response to advise our analysis and clearance - figure above used for illustrative purposes).

Max. Hub Height: 193m
Max. Rotor Radius: 163m
Max. No. Turbines: 67

This offshore proposal is cleared - subject to 50m Micrositing - with respect to radio link infrastructure operated by the local energy networks.

JRC analyses proposals for wind farms on behalf of the UK Fuel & Power Industry. This is to assess their potential to interfere with radio systems operated by utility companies in support of their regulatory operational requirements.

In the case of this proposed wind energy development, JRC does not foresee any potential problems based on known interference scenarios and the data you have provided. However, if any details of the wind farm change, particularly the disposition or scale of any turbine(s), it will be necessary to re-evaluate the proposal.

In making this judgement, JRC has used its best endeavours with the available data, although we recognise that there may be effects which are as yet unknown or inadequately predicted. JRC cannot therefore be held liable if subsequently problems arise that we have not predicted.

It should be noted that this clearance pertains only to the date of its issue. As the use of the spectrum is dynamic, the use of the band is changing on an ongoing basis and consequently, developers are advised to seek re-coordination prior to considering any design changes.

Regards

Wind Farm Team

Friars House
Manor House Drive
Coventry CV1 2TE
United Kingdom

Office: 02476 932 185

JRC Ltd. is a Joint Venture between the Energy Networks Association (on behalf of the UK Energy Industries) and National Grid.

Registered in England & Wales: 2990041

[About The JRC](#) | [Joint Radio Company](#) | [JRC](#)

We maintain your personal contact details and are compliant with the Data Protection Act 2018 (DPA 2018) for the purpose of 'Legitimate Interest' for communication with you. If you would like to be removed, please contact [Redacted]

Marine Analytical Unit

Ayre Offshore Wind Farm

Marine Analytical Unit (“MAU”) Response **Marine Directorate**

A section 36 consent, marine licence application, Environmental Impact Assessment (“EIA”) report and supporting documentation has been provided by Ayre Offshore Wind Farm Limited. The EIA report includes a description of a range of potential impacts, of which this response focuses only on the assessment of social and economic impacts.

Methodology

The applicant states that the epicentres of impact are expected to be the ports used during construction, operation and maintenance (“O&M”), and decommissioning of the project. The developer assumes that the operation and maintenance port will be in the study area of Highland and Orkney.

The applicant outlined that due to the port(s) not being known at this stage, they have not assessed the majority of social impacts at this level for construction and decommissioning. The increase in employment and GVA, changes to tourism receptors and changes to recreation receptors have been assessed at the construction, O&M, and decommissioning stages.

The socioeconomic study areas that are considered are:

- The Regional Socio-Economics Study Area (i.e. the local authorities of Highland and Orkney)
- Scotland
- The United Kingdom

The applicant states that assessments of social impacts presented with the report draw inferences from evidence “collected across communities in Scotland” and references how activity could affect ‘modelled’ port locations within the Regional Socio-Economics Study Area. A modelled “urban” port location and “rural” port location were developed as part of the assessment. In the cases where a shortlisted port list is not feasible, then this “modelled” ports approach has potential.

However, it is difficult to assess the accuracy and validity of the reporting in the application as the applicant does not disclose how/what inferences were drawn, what the evidence base for those inferences were, nor the methodology for how the “urban” and “rural” port locations were determined. For instance, we could not find the modelled population size for the respective ports, the modelled employment rate etc. A hypothetical example is provided of the population of Inverness vs Orkney, but it is unclear if those are the values used across comparisons. As such, although there is potential to this approach, there is insufficient information provided here to allow MAU to assess the suitability or validity of this approach. Further information

on how these models were constructed and associated assumptions made would be required to do so. In addition the MAU would suggest that a short list of existing ports would be beneficial to clarify the social impacts and supplement this modelling approach in the absence of known port locations, especially as even with these potential models, the applicant states that the significance of certain social impacts during construction cannot be ascertained due to the lack of a construction port being known. Additionally, it is recommended that all socio-economic impacts are considered at this lower spatial level.

The tourism and recreation study areas that have been identified are Orkney and Caithness (defined as the electoral wards of Thurso and Northwest Caithness, and Wik and East Caithness).

The assessment uses magnitude and significance methodology. The magnitude is determined by the importance of the receptor (economic, social or tourism and recreation). The sensitivity is determined by the ability of the study area to absorb the change. The magnitude and sensitivity are combined to identify the significance of the effect, with a significant effect defined as a major or moderate effect, which is intermediate to a very large change in receptor condition, which are likely to be an important consideration to the study area.

In the technical appendix 18.2, (1.2.2) the applicant mentions that the costs are reported in nominal terms stating that “costs have been adjusted for inflation, therefore the values given reflect the nominal, or face value, the contracts will have at the time they are completed”. Where values are adjusted for inflation, they should be real values.

Assessment of impacts

All socio-economic impacts identified during the scoping stage were considered. Socio-cultural impacts, which were scoped out during decommissioning, have also been considered.

The assessments considered the following potential effects:

- Increase in employment and GVA
- Demographic changes
- Changes to housing demand
- Changes to local and public services
- Changes to tourism receptors
- Changes to recreation receptors
- Socio-cultural Impacts

The increase in employment and GVA has been considered for the three study areas highlighted above. For some impacts, a modelled hypothetical “rural” and “urban” port has been used. While this is welcomed, a short list of existing ports with more detail would help clarify economic and social impacts and/or further detail on the construction of the modelled ports

Inter-related effects and cumulative effects have also been considered while Transboundary socio-economic effects have been scoped out due to being in

unknown countries outside the UK. A subset of those impacts that are considered for the Project alone assessment have been considered for the cumulative effects assessment. This includes:

- Increased offshore wind supply chain in Scotland and rest of UK
- Increased competition for resources
- Social Impacts
- Changes to tourism receptors
- Changes to recreation receptors

Impacts

The assessment anticipates a moderate (significant) beneficial effect in terms of increases in employment and GVA for the regional socio-economic study area during the construction and O&M phases. Employment and GVA is assessed as a negligible (not significant) beneficial effect for Scotland and the UK at all phases.

For demographic, housing, access to services and socio-cultural impacts, no significance assessment was provided for the construction and decommissioning phases. For O&M whether the impact was significant or not was dependent on whether the port was rural or urban. Demographic changes are anticipated to have a minor (not significant) to major (significant) beneficial effect, changes to housing demand a minor (not significant) to major (significant) adverse effect, and changes to other local public and private services a minor (not significant) to major (significant) effect, that could be beneficial or adverse based on the type of service and area under consideration. The only exception was socio-cultural impacts which were predicted to be non-significant regardless of the port location.

For recreation and tourism impacts, the applicant predicted no significant impacts for construction, O&M or deconstruction for tourism or recreation.

With regards to cumulative effects, the assessment anticipates a moderate (significant) beneficial effect in terms of increased offshore wind supply chain in Scotland during construction. The significance of the economic effects during O&M, and of the social effects has not been determined, as they are dependent on the location of the port(s) which is currently unknown. The applicant mentions that once the port location(s) is known, then further assessment will be done.

A number of mitigation and enhancement measures have been outlined within the socioeconomic impact assessment that will be drafted post consent. The MAU cannot comment on the suitability of the mitigations and enhancements themselves. However, applicants should endeavour to include affected communities in decision-making, in line with the MAU's advice on best practice.

Consultation and engagement

The applicant states they hosted events and engaged with stakeholders throughout the consultation process. The applicant also mentions their intention to engage with other developers as part of the accommodation strategy. It is noted that a list of consultees will be drafted once the port(s) location is known. At this stage it is

expected to include: The Highland and Orkney Islands Councils, housing accommodation, accommodation providers, and other businesses planning to build infrastructure in the area. As this will happen post consent, MAU cannot comment on the validity of the approach., however applicant should include local communities and members of the public in this consultation.

Summary

Overall, the assessment of socio-economic impacts during O&M is conducted to a satisfactory methodological standard. Where there has been impacts assessed for construction and decommissioning, this is also satisfactory. The inclusion of a modelled “rural” and “urban” port is welcome, however more detail needs to be provided on how these models were created and utilised. For most social impacts, the significance for construction and decommissioning were not assessed, even with this “hypothetical port” modelling approach. As such, the MAU cannot comment on these potential impacts. Where a lower spatial level is included for some impacts, all impacts should be assessed at this level. A short list of ports and more detail to help clarify economic and social benefits is recommended in addition to potential modelling approaches.

Maritime and Coastguard Agency



Vaughan Jackson
Maritime and Coastguard Agency
UK Technical Services Navigation
105 Commercial Road
Southampton
SO15 1EG

www.gov.uk/mca
6th February 2026

Licensing Operations Team,
Marine Directorate,
Scottish Government,
Victoria Quay,
Edinburgh,
EH6 6QQ.

By email to MD.MarineRenewables@gov.scot

Dear Marine Directorate,

APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1989 AND MARINE LICENCES UNDER PART 4 OF THE MARINE (SCOTLAND) ACT 2010 AND PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 FROM AYRE OFFSHORE WIND FARM LIMITED TO CONSTRUCT AND OPERATE THE AYRE OFFSHORE WIND FARM.

Thank you for the opportunity to comment on the applications for consent under Section 36 of the Electricity Act 1989 and marine licences under the Marine (Scotland) Act 2010 for the Ayre Offshore Wind Farm.

The Maritime and Coastguard Agency (MCA) is an Executive Agency of the Department for Transport and is responsible throughout the UK for implementing and developing the UK Government's maritime safety and environmental protection policy. This includes co-ordinating maritime Search and Rescue (SAR) through His Majesty's Coastguard 24 hours a day and checking that ships meet UK and international safety rules. The MCA works to prevent the loss of lives at the coast and at sea, to ensure that vessels are safe, and to prevent coastal pollution. The UK Technical Services Navigation Branch is responsible for UK radiocommunication and navigation policy. This primarily covers SOLAS Convention (Safety of Life at Sea Convention 1974, as amended) Chapters IV and V; the COLREG Convention (International Regulations for Preventing Collisions at Sea 1972, as amended); and the ITU Convention (International Telecommunications Convention 1932, as amended).

The Navigation Risk Assessment (NRA) and the shipping and navigation elements of the Environmental Impact Assessment Report have been reviewed and we would like to comment as follows:

Navigation Risk Assessment

Nash Maritime has undertaken a detailed Navigation Risk Assessment (NRA) in accordance with MCA guidance (MGN 654) and NRA risk assessment methodology. This NRA, which is presented in

Volume 3, Technical Appendix 14.1, informs the Shipping and Navigation chapter of the EIA presented in Volume 2, Chapter 14.

We are satisfied that appropriate traffic data has been collected in accordance with MGN 654, which includes two 14-day marine vessel traffic surveys. The first of the surveys was conducted in Summer 2023 (15th – 29th July). As a result of some delays in the preparation for application, the survey fell outside of the two-year validity period. As the planned submission was to be 5 months after this two-year limit, in discussion with the applicant it was agreed that another full survey would be needed to be compliant. This additional survey was carried out in summer 2025 between 1st – 15th July. The winter survey preceded this and was undertaken in December 2023 (6th – 21st). The site-specific survey details are all presented in Table 14.5 of Chapter 14 of the EIA and Table 3.3 of the NRA. In addition, 12 months of Automatic Identification System (AIS) data from September 2023 to August 2024 has been collected for use in the traffic analysis of the Export Cable Corridor (ECC) and for the validation of the overall survey data.

The MCA is content that the hazard log presented in Annex A, Table A1.1 of the NRA is a reasonable and proportional assessment of the risks. A completed MGN 654 Checklist has also been provided in Annex B, Table B1.1 as part of the NRA, and the MCA is satisfied that all recommendations have been addressed.

It is noted that some of the older studies carried out by the MCA regarding Navigation, Communication, and Position Fixing Equipment are referred to in Section 8.8 of the NRA. These are supported by other more recent studies which is welcomed. There may be additional benefit in referring to more recent helicopter trials and documents written by the MCA in 2019, titled: “MCA report following aviation trials and exercises in relation to offshore windfarms” and “MCA report following aviation trials at Hornsea Project 1 windfarm”. However, we are content with the conclusions on the impact on Radar Communications and Positioning systems presented by the applicant.

Emergency Response and Search and Rescue

A SAR checklist based on the requirements in MGN 654 Annex 5 will need to be completed in agreement with MCA before construction starts. This will include the requirement for an approved Emergency Response Co-operation Plan (ERCoP) and will be incorporated as a condition of the Marine Licence.

During SAR discussions, particular consideration will need to be given to the implications of the site size and location. As there are various possible scenarios regarding the build out of Ayre Offshore Wind Farm as detailed in Volume 2 chapter 3: Project Description, and section 4.2 of the NRA, it would be beneficial for the applicant to confirm the final build out scenario as early in these SAR discussions as possible.

Attention should be paid to the level of radar surveillance, AIS and shore-based VHF radio coverage and give due consideration for appropriate mitigation such as radar, AIS receivers and in-field, Marine Band VHF radio communications aerial(s) (VHF voice with Digital Selective Calling (DSC)) that can cover the entire wind farm sites and their surrounding areas.

Cumulative Impacts

A Cumulative Effects Assessment (CEA) has been made based on existing and proposed developments in the study area as explained in Volume 3, Appendix 4.4 Cumulative Effects Assessment - Screening. These developments are summarised in Section 8.14 of the NRA and section 14.12 of the Shipping and Navigation chapter of the EIA.

The main commercial routes and those with potential for deviations have also been identified. 7 routes are highlighted and presented in Figure 8.6 of the NRA. Expected cumulative deviations are also represented. We are content with this approach to the CEA at this stage.

Layout Design

The turbine layout design will require MCA and Northern Lighthouse Board (NLB) approval prior to construction to minimise the risks to surface vessels, including rescue boats, and search and rescue aircraft operating within the site. The MCA will seek to ensure all structures are aligned in straight rows and columns with a minimum of two lines of orientation. Further advice will be provided to the project once the layout discussions have started.

Marking, Lighting and Construction Programme

The MCA will seek to ensure the turbine numbering system follows a 'spreadsheet' principle and is consistent with other windfarms in the UK. All lighting and marking arrangements will need to be agreed with the MCA and the NLB. The MCA requires all aviation lighting to be visible 360° and compatible with night vision imaging systems, as detailed in CAP 764 and MGN 654 Annex 5. We would also expect to see some form of linear progression of the construction programme avoiding disparate construction sites across the development area, and the consent needs to include the requirement for an agreed construction plan to be in place ahead of any works commencing.

Wet Storage

It is noted from the non-technical summary and project description that both fixed and floating foundations are being considered. The MCA agree that wet storage options, especially around fully constructed floating WTGs (as mentioned in 3.6.41, Volume 2, Chapter 3: Project Description), are yet to be fully explored and we would encourage the applicant when discussing any potential options to consult other relevant maritime stakeholders including the MCA and NLB.

Regarding the storing of components on the seabed within the array area as mentioned in paragraph 8.2.8 of the NRA, as the charted depths range from approximately 70m-90m, it is not expected that any storage would increase the risk to surface navigation. However, the MCA will need to be informed of materials to be stored within the array (and along the export cable corridor) and made aware of any that will exceed a 5% reduction in surrounding depth referenced to Chart Datum.

Mooring Arrangements

As there is potential that Ayre Offshore Wind Farm will include floating structures, Third Party Verification of the mooring arrangements for all floating devices will be required prior to construction to provide assurance against loss of station. Ideally this will be a condition of the marine licence. Guidance on regulatory expectations on mooring arrangements can be found on our website: <https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping>.

Compliance with regulatory expectations on moorings for floating wind and marine devices (Health and Safety Executive (HSE) and MCA, 2017), has been listed as embedded mitigation measure as number 37.

The applicant has stated in volume 2 Chapter 14, paragraph 14.10.220 and section 8.11 of the NRA that loss of station has formed part of the scope of assessment. As such, there is an expectation from the MCA that a system of continuous monitoring for each individual floating WTG be incorporated. There is acknowledgment in paragraph 8.11.3 of the NRA and paragraph 14.10.223 of the Shipping and Navigation chapter that a system will be required but no overview of what the applicant's system may include. The use of GPS in this system would be expected but inclusion of AIS on all floating structures, the overall particulars of this system and recovery arrangements in case of a loss of station will need further discussion with the MCA and NLB prior to construction.

Hydrographic Surveys

MGN 654 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. Further information can be found in MGN 654 Annex 4 supporting document titled 'Hydrographic Guidelines for Offshore Developers', available on our website: <https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping>. This includes surveys during the pre-construction, post-construction and post-decommissioning stages. We would like to highlight the need to provide the data in either GSF or CARIS format and that Total Vertical and Horizontal Uncertainty (TVU & THU) calculations must be provided.

Cable Routes

The exact export cable route to the landfall at Sinclair's Bay is reasonably fully developed as presented in figure 3.20 and Table A1.2 of Volume 1 Chapter 3: Project Description. It is noted in table 1.1 of Volume 3, Technical Appendix 4.6: Schedule of Mitigation and Commitments (as Mitigation 4) that a Cable Burial Risk Assessment (CBRA) is to be carried out and a cable plan (CaP) produced. Any consented cable protection works must ensure existing and future safe navigation is not compromised. The MCA would accept a maximum of 5% reduction in surrounding depth referenced to Chart Datum.

As stated in Table 3.1: Volume 1 Chapter 3, High Voltage Alternating Current (HVAC) transmission infrastructure is to be used. Therefore, a pre-construction compass deviation study will not be required.

Safety Zones

The requirement and use of safety zones as detailed in the application, specifically as mitigation measure 16 in table 1.1 of Volume 3, Technical Appendix 4.6: Schedule of Mitigation and Commitments, is noted. MCA supports the use of safety zones and will comment on the safety zone application once submitted, as a statutory consultee.

Liaison with local MCA Marine Office

The applicant should be reminded that their contractors and subcontractors must have the required certification for all vessel operations, and early engagement with the local MCA Marine Office should be undertaken where necessary to ensure there are no issues with regards to survey and inspections, towage, and safety requirements. Various additional certificates including a load line exemption for any floating turbine platforms will be required prior to any towage to site and the applicant must ensure any ballast water requirements are addressed.

Embedded Mitigation

We have the following comments on the proposed risk controls in section 9, Table 9.6 of the NRA:

1. Cable Burial Risk Assessment;
 - In case of damage to, or destruction or decay of, the authorised project seaward of MHWS or any part thereof, excluding the exposure of cables, notification must be issued to MCA, NLB, the Kingfisher Information Service of Seafish and the UKHO within 24 hours of becoming aware.
 - In case of exposure of cables on or above the seabed, the undertaker must within three days following identification of a potential cable exposure, notify mariners and inform Kingfisher Information Service of the location and extent of exposure. Copies of all notices must be provided to the MCA, NLB, and the UKHO within 5 days.

- The plan must include proposals for monitoring offshore cables including cable protection during the operational lifetime of the authorised scheme which includes a risk-based approach to the management of unburied or shallow buried cables.
- Attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and subject to the traffic volumes, an anchor penetration study may be necessary.

2. Navigational Safety and Vessel Management Plan (NSVMP);

- Local notification to mariners must be issued at least 14 days prior to the commencement of the authorised project or any part thereof advising of the start date of each work and the expected vessel routes from the construction ports to the relevant location. They must be updated and reissued at weekly intervals during construction activities and at least 5 days before any planned operations (or otherwise agreed) and maintenance works and supplemented with VHF radio broadcasts agreed with the MCA.
- The Kingfisher Information Service of Seafish, must be informed of details of the vessel routes, timings and locations relating to the construction of the authorised project or any part thereof by email to kingfisher@seafish.co.uk :-
 - i. at least 14 days prior to the commencement of offshore activities, for inclusion in the Kingfisher Fortnightly Bulletin and offshore hazard awareness data, and;
 - ii. as soon as reasonably practicable and no later than 24 hours of completion of all offshore activities.
- Post construction monitoring is required and must include vessel traffic monitoring by automatic identification system for a duration of three consecutive years following the completion of construction of the authorised project. An appropriate report must be submitted to the MCA and NLB at the end of each year of the three-year period.

Conclusion

The comments detailed above are not considered to be blocks to development, but they are provided to highlight any areas which may require further discussion. Subject to the applicant meeting requirements addressed in this letter and meeting the licence conditions, it provides a cautious acceptance of the application for consent.

Yours faithfully,

[Redacted]

[Redacted]

Vaughan Jackson
Offshore Renewables Project Lead
UK Technical Services – Navigation

Peter Lowson
Head of Operational Procedures
and Information Management.
**HM Coastguard Governance,
Procedures, Assurance and
International**

Ministry of Defence



Defence Infrastructure Organisation

Wendy Talbot
Assistant Safeguarding Manager
Ministry of Defence
Safeguarding
Defence Infrastructure Organisation
St George's House
DMS Whittington
Lichfield, Staffordshire
WS14 9PY
United Kingdom

Application Ref: MS-00011515 and MS-00011516

Our Reference: DIO10063568

E-mail: DIO-Safeguarding-Wind@mod.gov.uk

Amy Woodward
Scottish Government
Licensing Operations Team
Marine Directorate
Victoria Quay
EDINBURGH
EH6 6QQ

5 February 2026

Dear Amy

ELECTRICITY ACT 1989

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017

The Electricity (Applications for Consent) Regulations 1990

MARINE (SCOTLAND) ACT 2010

The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017

MARINE AND COASTAL ACCESS ACT 2009

The Marine Works (Environmental Impact Assessment) Regulations 2007

MS-00011515 and MS-00011516 - Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – Scotwind NE2 Site – Approximately 22 km from Orkney

Thank you for consulting the Ministry of Defence (MOD) in relation to the above Section 36 application and Marine Licences through your communication dated 11 December 2025.

The Defence Infrastructure Organisation (DIO) Safeguarding Team represents the MOD as a consultee in UK planning and energy consenting systems to ensure that development does not compromise or degrade the operation of defence sites such as aerodromes, explosives storage sites, air weapon ranges, and technical sites or training resources such as the Military Low Flying System.

I write to advise the safeguarding position of the MOD in relation to the above applications to construct and operate the Ayre Offshore Wind Farm. This response is based on the Ayre Offshore Wind Farm Offshore Environment Impact Assessment Report, dated November 2025 as published on the marine.gov.scot website.

This scheme will comprise of:-

- up to 67 Wind Turbine Generators (WTGs), with a maximum height to blade tip of up to 356 metres (m) above Lowest Astronomical Tide (LAT), located approximately 22 kilometres (km) offshore east of Orkney;

- up to two Offshore Substation Platforms (OSPs) with a maximum height of 60m above LAT;
- interconnector cables; and
- up to four offshore HVAC export cables connecting the OSPs to the landfall at Sinclair's Bay, Caithness.

The onshore components are subject to a separate application for planning permission from The Highland Council.

The principal concerns of the MOD with respect to this proposed wind farm relate to the impact of the development on Defence Maritime Training and Operational Interests and the potential to create a physical obstruction to air traffic movements.

Defence Maritime Training and Operational Interests

Impact on military activity has been recognised in Environment Impact Assessment (EIA) Report, Vol 2, Chapter 15: Aviation and Radar. Paragraphs 15.10.25 through to 15.11.4 identify that the Array Area lies within the boundaries of Danger Areas EGD809N and EGD809C. The lower vertical limits of blocks of danger area airspace are also noted.

The development zone for the Offshore Wind Farm outlined in the submission will be located within MOD Danger Areas EGD809N and EGD809C. The extent of MOD Practice and Exercise Areas in the locality have been accurately identified in the EIA Report, Vol 2, Chapter 15: Aviation and Radar. When active Danger Areas EGD809N and EGD809C have vertical limits from the sea surface up to 55,000ft above Mean Sea Level, and are associated with MOD activities including ordnance, munitions and explosives, unmanned aircraft systems, and high energy manoeuvre activities.

The Report also acknowledges the requirement from Mod for prior notification of any works to be undertaken before vessels can enter the Danger Area complex. The EIA Report, Vol 4, Appendix 29: Outline Navigation Safety and Vessel Management Plan also states at paragraph 3.12 that

The NSVMP will also establish a communication protocol between the Developer and Danger Area range operator for the presence of surface vessels throughout all phases of the Proposed Development. This communication will be established pre-construction

The MOD agree with this assessment and at Appendix A have provided wording for a works management plan/communications protocol condition. The MOD also welcome the opportunity for ongoing engagement on this subject in order to develop the works management plan prior to the start of the construction phase for this development.

Physical Obstruction

In this case the development falls within Low Flying Area 14 (LFA 14). Within this area fixed wing aircraft may operate as low as 250 feet or 76.2 metres above surface level to conduct low level flight training. The addition of turbines and other structures in this location would introduce a physical obstruction to low flying aircraft operating in the area.

As this development includes structures that exceed a height of 50m above LAT it would be subject to the lighting requirements set out in the Air Navigation Order 2016. In addition to any CAA requirements the MOD will require the submission, approval and implementation of an aviation safety lighting specification that details the installation of MOD accredited aviation safety lighting.

Table 15.10 (Embedded Mitigation) of the EIA Report, Vol 2, Chapter 15: Aviation and Radar indicates at ID19 that "Details of temporary obstacles associated with the Proposed Development which are of more than 91.4m in height are to be alerted to aircrews by means of the NOTAM system". As military fixed wing aircraft

may operate as low as 76.2m when undertaking military low flying activities the MOD require that any structure, temporary or permanent, within the Proposed Development of more than 50m in height should be alerted via NOTAM. Additionally any activity from sea level upwards, especially during the construction phase within the confines of Danger Areas D809N and D809C (see above Defence Maritime Training and Operational Interests) will require NOTAM action to ensure all airspace users know to avoid the area.

Suggested condition wordings for MOD lighting and marking requirements are set out in Appendix B.

Military Radars – Air Traffic Control (ATC) and Air Defence (AD)

EIA Report Vol 2, Chapter 15: Aviation and Radar identifies at paragraphs 15.6.7 and 15.6.8 that none of the proposed WTGs will be Line of Site (LOS) of any military ATC or AD radars. The MOD operational assessments have identified no reason to disagree with this finding.

Unexploded Ordnance (UXO)

The potential for UXO to be present within the development area and the necessity for clearance is considered in paragraphs 3.5.6 through to 3.5.10 of the EIA Report, Vol 1, Chapter 3: Project Description and addresses the approach to be taken should UXOs be found. The MOD acknowledges the proposed approach and would like to advise that a separate Marine Licence application would be required prior to construction for UXO investigation and clearance works.

Summary

In summary, subject to the inclusion in any Section 36 Consent granted for the Proposed Development of the conditions detailed in Appendices A (Works Management Plan for D809N and D809C) and B (Lighting and Charting), the MOD have no objection to the Proposed Development.

I trust this is clear however should you have any questions please do not hesitate to contact me.

Yours faithfully

[Redacted]

Wendy Talbot
Assistant Safeguarding Manager

Appendix A

Condition – Works Management Plan / Communications Protocol

No stage of the offshore works (construction, operation, maintenance or decommission) may commence until a works management plan for that stage has been submitted to and approved by the Scottish Government in consultation with the Ministry of Defence. The works management plan should be submitted at least 4 weeks prior to the commencement of works for each stage (construction, operation, maintenance and decommission) and should detail when surface vessels and construction workers will be present within Danger Areas EGD809N and EGD809C.

Reason for condition.

To maintain aviation safety.

Appendix B

Condition - Aviation Lighting

Prior to commencing construction of any structure, or deploying any construction equipment or temporal structure(s) 50 metres or more in height (above surface level) the undertaker must submit an aviation lighting scheme for the approval of the Scottish Government in conjunction with the Civil Aviation Authority and the Ministry of Defence defining how the development will be lit throughout its life to maintain civil and military aviation safety requirements as required under the Air Navigation Order 2016 determined necessary for aviation safety by the Civil Aviation Authority.

This should set out:

- a) details of any construction equipment and temporal structures with a total height of 50m or greater (above surface level) that will be deployed during the construction of the offshore wind farm and details of any aviation warning lighting that they will be fitted with; and
- b) the location and height of each Wind Turbine Generator and any other structure of 50m or greater (above surface level) identifying the position of the lights on the Wind Turbine Generator/structure; the type(s) of lights that will be fitted and the performance specification(s) of the lighting type(s) to be used.

Thereafter, the undertaker must exhibit such lights as detailed in the approved aviation lighting scheme. The lighting installed will remain operational for the lifetime of the development.

Reason for condition.

To maintain aviation safety.

Condition - Aviation Charting and Safety Management

The undertaker must notify the Ministry of Defence, at least 14 days prior to the commencement of the works, in writing of the following information:

- a) the date of the commencement of the erection of the Wind Turbine Generators or other structures greater than 50m (above surface level);
- b) the maximum height of any construction equipment to be used in the erection of the Wind Turbine Generators or other structures greater than 50m (above surface level);
- c) the date any Wind Turbine Generators are brought into use;
- d) the latitude and longitude and maximum heights of each Wind Turbine Generator and other structure greater than 50m (above surface level)

The Ministry of Defence must be notified of any changes to the information supplied in accordance with these requirements and of the completion of the construction of the development.

Reason for condition.

To maintain aviation safety.

National Air Traffic Services

From: [NATS Safeguarding](#)
To: [MD Marine Renewables](#)
Cc: [Amy Woodward](#); [Toni-marie Mcginn](#); [Kirsten Watson](#); [Rebecca Ross](#)
Subject: RE: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026 [SG37744]
Date: 15 December 2025 12:41:51
Attachments: [image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[image008.png](#)

Our Ref: SG37744

Dear Sir/Madam

The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal.

However, please be aware that this response applies specifically to the above consultation and only reflects the position of NATS (that is responsible for the management of en route air traffic) based on the information supplied at the time of this application. This letter does not provide any indication of the position of any other party, whether they be an airport, airspace user or otherwise. It remains your responsibility to ensure that all the appropriate consultees are properly consulted.

If any changes are proposed to the information supplied to NATS in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.

Yours faithfully

NATS

NATS Safeguarding

E: natssafeguarding@nats.co.uk

4000 Parkway, Whiteley,
Fareham, Hants PO15 7FL
www.nats.co.uk



NatureScot – 3
February 2026

Marine Directorate
Scottish Government
Victoria Quay
Edinburgh
EH6 6QQ
Sent by email only

03 February 2026

Our ref: CNS REN OSWF - Ayre

Dear Amy,

AYRE OFFSHORE WIND FARM

APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1989 AND MARINE LICENCES UNDER THE MARINE (SCOTLAND) ACT AND PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE THE AYRE OFFSHORE WIND FARM

Thank you for consulting NatureScot on the Section 36 and Marine Licence applications submitted by Ayre Offshore Wind Farm Limited (the Applicant) for the proposed Ayre Offshore Wind Farm (the Project). These are accompanied by an Environmental Impact Assessment Report (hereafter referred to as the Offshore EIAR), Report to Inform Appropriate Assessment (RIAA) and Shadow Derogation Case provided on a without prejudice basis.

Our advice in this letter is in relation to the Ayre Array Area, the Export Cable Corridor (ECC) and landfall (up to Mean High Water Springs (MHWS) only), hereafter referred to as the Proposed Development. Onshore components will be subject to separate terrestrial planning applications.

Policy context

Working within the context of a climate emergency and a biodiversity crisis, we seek to provide advice that is enabling and secures the right development in the right place with most benefit for climate change reduction and that which avoids damage and can achieve restoration and enhancement of biodiversity.

As a statutory consultee, NatureScot works in support of the Scottish Government's vision for a Blue Economy¹ with its six outcomes acting as focal points to ensure the marine environment supports ecosystem health, improved livelihoods, economic prosperity, social inclusion and wellbeing. We provide advice in the spirit of Scottish Government's ambition for Offshore Wind as outlined in the Sectoral Marine Plan for Offshore Wind Energy (SMP-OWE) published in 2020 and now undergoing an Iterative Plan Review (IPR) (noting that consultation on the draft updated SMP-OWE closed, on 22 August 2025) and the Offshore Wind Policy Statement (consultation closed 13 August 2025). The SMP-OWE aims to balance the promotion of the sustainable development of offshore wind, whilst protecting and restoring our biodiversity and sits within the wider context of the National Marine Plan for Scotland.

In response to the new Scottish Biodiversity Strategy to 2045, we support the current work of the Scottish Government in considering a new policy direction of nature positive requirements for marine industries, including Offshore Wind. We seek further consideration and engagement on what can be delivered in terms of biodiversity enhancement that would also align with the renewable energy production aims and objectives of this proposal, in the context of the climate emergency and biodiversity loss crisis, if consented.

Background

The Applicant proposes to develop an offshore wind farm (with fixed and / or floating turbines) as part of the ScotWind Leasing Round.

The ScotWind Leasing Round was launched in June 2020 and has resulted in 20 projects being awarded leases with the potential total energy generation of 27.6GW. As detailed in Chapter 1: Introduction, of the EIA Report Volume 1, the Applicant was awarded the opportunity to develop the NE2 Plan Option Area.

The Proposed Development

The Proposed Development is located approximately 22km offshore from Orkney at its closest point and includes an Array Area (200 km²) and Export Cable Corridor (ECC). The proposed ECC is 90 km in length and makes landfall at Sinclair's Bay, Caithness.

An installed capacity of up to 1.0 Gigawatt (GW) is intended, with an anticipated operational life of 30 years. The Applicant has taken a Project Design Envelope (PDE) approach, allowing for incorporation of potential emerging technology and engineering requirements – this should also consider benefits to biodiversity. The PDE comprises:

- Two Wind Turbine Generators (WTG) scenarios are under consideration, 67 x 15 MW machines or 40 x 20 MW machines.
- The WTGs include a maximum rotor blade tip height of 356m; maximum rotor diameter (inclusive of rotor hub) of 326m; and a minimum rotor blade clearance of 30m above MHWS.
- Both fixed and floating foundations are under consideration, with piled, drilled or drive-drill-drive design options for fixed foundations; and semi-submersible or tension-leg platform design options for floating foundations.

¹ Scottish Government (2022) A Blue Economy Vision for Scotland. Available at: <https://www.gov.scot/publications/blue-economy-vision-scotland/>

- For the fixed piled jacket foundations, 3-legged and 4-legged designs are under consideration, with a maximum number of one pile per leg, resulting in a maximum number of 268 piles in total. The maximum hammer energy is 4,500 kJ.
- For floating foundations, mooring and anchoring types under consideration include taut, semi-taut, catenary; and driven piles, drilled piles, gravity bases.
- Depending on the WTG scenario, either six mooring lines (67 WTGs) or nine mooring lines (40 WTGs) would be required per floating foundation, with a maximum of one anchor per mooring line.
- Up to two Offshore Substation Platforms (OSPs) on fixed foundations, either 6-legged or 8-legged jacket designs, with up to 18 pin piles per OSP.
- Maximum length of 185 km of inter-array cabling, with a minimum burial depth of 0.5 m and cable burial techniques to include pre-lay plough, plough, trenching, cutting and/or jetting techniques, and dredging and refill.
- Up to three interconnector cables, with a maximum total cable length of 60 km.
- Up to 20 subsea collectors as an alternative solution for connecting inter-array cabling are being considered.
- Up to four Offshore Export Cables (OEC), each 90 km in length, 360 km combined. Multiple installation techniques to be employed using hybrid installation equipment, noting that HDD will be used at landfall.
- Cable protection will be required for a maximum of 50% of all cables, which may include PU, PE, steel or iron Cable Protection Systems (CPS), rock protection, grout bags and concrete mattresses.

The construction phase, including pre-construction surveys and site preparation works, is expected to take approximately five years; with works beginning in 2030 with an aim to be fully operational in 2035. The operational phase is expected to be 30 years; this will include a programme of upkeep and maintenance of Array assets.

Decommissioning is briefly addressed within Section 3.8 of the Project Description (EIA Report Volume 1, Chapter 3). The requirement for a Decommissioning Programme is correctly referred to in this section. We advise that the development of a Decommissioning Plan / Programme post-consent should be informed by current requirements² and predicated on full removal of all infrastructure in line with current policy³.

Storage and assembly of turbines (wet storage)

It is noted in Section 3.6.41 of the Project Description (EIA Report Volume 1, Chapter 3) that the integrated floating WTGs may be queued at a wet storage area. In Section 3.6.52 of the Project Description (EIA Report Volume 1, Chapter 3), the Applicant has outlined their expectation that the storage of WTGs at ports is to be covered by port operators' permissions, or through separate consenting processes undertaken by the port operators / storage operators should a Marine Licence be required.

² <https://www.gov.scot/publications/marine-licensing-and-consenting-decommissioning-programmes-overview/>

³ <https://www.gov.scot/publications/offshore-renewable-energy-decommissioning-guidance-scottish-waters/>

Assessment approach

The Applicant has largely followed standard EIA and HRA processes. Information contained within the Offshore EIAR has been laid out sufficiently to aid our review and understanding.

Design development

Our conclusions on EIA significance and the potential for Adverse Effects on Site Integrity (AEoSI) are based on the worst-case scenarios presented within the assessments. It is recognised that as Proposed Development parameters are refined, many of the impacts and environmental effects may reduce. Where we report significant effects in our own appraisal, we suggest this is managed via additional mitigation beyond embedded measures. Often this is achieved using specific mitigation and construction plans and their content (e.g. Marine Mammal Mitigation Plan and Piling Strategy), secured as part of the consent conditions and developed and agreed prior to construction as designs progress. Any impacts which are likely to reduce through design evolution should be clearly evidenced, with any implications for mitigation requirements confirmed through consultation with NatureScot and Marine Directorate.

NatureScot advice summary

We provide a short summary of our advice under relevant subheadings below. Within our detailed advice we request further consideration and clarifications regarding several issues across various receptor topics (see Appendices A to I).

Physical processes – EIA

The assessment for Physical Processes, which we support, concludes **no significant impacts, both alone and cumulatively**.

Benthic ecology – EIA

The assessment for Benthic Ecology which we support concludes **no significant impacts, both alone and cumulatively**.

Fish and shellfish ecology – EIA

The assessment for Fish and Shellfish Ecology concludes **significant impacts, both alone and cumulatively, for herring spawning grounds. As such, mitigation for herring spawning grounds will be required, with detail presented post-consent through the development of the Piling Strategy**.

Moreover, the EIA Report has indicated areas where grab samples were unable to be taken as the ground was too rocky, with some images presented suggesting that the sample sites are suitable habitat for common skate complex. Common skate complex, which includes flapper skate *Dipturus intermedius* and blue skate *D. flossada*, are categorised as Critically Endangered on the IUCN red list of threatened species and are a Priority Marine Feature (PMF) in Scotland.

Before we can provide advice as to the significance of these potential impact pathways, we need to better understand habitat usage of the site by common skate complex.

We require:

- **All Drop-Down Camera (DDC) and Drop-Down Video (DDV) footage at the locations where grab samples were unable to be taken (ENV_003, 007, 008, 009, 021, 022 and 038).**

These should be re-analysed for the presence of common skate complex, as well as any evidence of eggs, including any 'historic' egg cases wedged between the cobbles and boulders. NatureScot has expertise in this field if further advice is required.

- Depending on the results of this analysis we may require further assessment, including consideration of the impact pathways discussed in C.4.1 – this may also require revision of magnitude scores.
- Assessment may require consideration of potential implication for the national status of these species and further consideration of mitigation and/or monitoring requirements may also be required.

Marine mammals – EIA and RIAA

The assessment for marine mammals concludes no significant impacts alone, and significant impacts for harbour porpoise cumulatively for disturbance from piling. However, we raise an issue regarding the sensitivity scoring in our advice below, and as such we disagree with the outcome of the assessment. **Instead, we conclude significant impacts for disturbance from the piling scenarios presented –**

- both for the proposal alone and cumulatively for grey seal, Risso's dolphin and white-beaked dolphin; and
- cumulatively for harbour porpoise and bottlenose dolphin.

As such, should Scottish Ministers grant consent, we advise that:

- The Applicant will need to consider the implications further, through the development of the Piling Strategy and Marine Mammal Mitigation Protocol (MMMP) post-consent, for all species considered in the EIA Report.
- A monitoring proposal to validate the EIA Report predictions particularly with floating wind technology development to better understand the likelihood of impacts for disturbance from piling

There are various aspects where we request clarification, including:

- Whether the number of animals with the potential for auditory injury has been included in the iPCoD modelling.
- Whether the worst-case scenario for turbine spacing was used, for both the single and concurrent installation scenarios.
- Justification as to why a single piling event has been used as the worst-case scenario for cumulative SEL.
- That the developer confirms our understanding is correct regarding the white-beaked dolphin reference population used.

We have concluded **No Adverse Effect on Site Integrity (AEoSI)** for all European sites with marine mammal qualifying species. However, **we request the Applicant to contribute to strategic post-consent monitoring of the Sanday SAC harbour seal and Moray Firth SAC bottlenose dolphin populations as part of ongoing understanding of the species and their distributional and behavioural responses to marine industries development activities.**

Offshore and intertidal ornithology – EIA

For ornithology we agree with the Applicant's conclusion of **no significant** adverse impact for **proposal alone** impacts under EIA.

We conclude that the **cumulative effects** are **significant** in EIA terms, both including and excluding Berwick Bank Offshore Wind Farm for:

- Kittiwake through collision and displacement
- Razorbill through displacement
- Puffin through displacement

We conclude that the cumulative effects are **significant** in EIA terms for the following species, where a Berwick Bank Offshore Wind Farm scenario was not included in the assessment due to a lack of connectivity or assessment of this species by Berwick Bank Offshore Wind Farm.

- Great black-backed gull through collision
- Herring gull through collision
- Guillemot through displacement

We conclude that the cumulative effects are **not significant** in EIA terms for Gannet, both including and excluding Berwick Bank Offshore Wind farm.

In line with established EIA practice, we expect the full mitigation hierarchy to be considered where a significant adverse effect is identified.

Without prejudging the outcome of the Appropriate Assessment (discussed further in Appendix F), we anticipate, should consent be granted, that compensatory measures would need to be secured for Kittiwake, Herring gull, Guillemot, Razorbill, and Puffin. We consider that agreed compensation measures would be sufficient to address impacts predicted under EIA for these species.

We were unable to make a conclusion for great black-backed gull due to multiple errors in the assessment of this species. We discuss this matter further in Appendix E.

Offshore and intertidal ornithology – RIAA

The key points of our advice on the information provided for the Appropriate Assessment can be summarised as follows:

Project alone assessment of AEoSI

We conclude no AEoSI for herring gull, kittiwake, gannet, guillemot, razorbill and puffin at all relevant SPAs.

For great black-backed gull we are unable to reach a conclusion of no AEoSI for Calf of Eday, Copinsay, East Caithness Cliffs and Hoy SPAs due to errors in the assessments. Further information is required as detailed in Appendix F.

In-combination assessment of AEoSI:

For the qualifying species and sites listed below, we have concluded **AEoSI** in-combination with other offshore wind farm projects for **both scenarios** – in-combination including Berwick Bank Offshore Wind Farm and in-combination excluding Berwick Bank Offshore Wind Farm:

- Kittiwake at Buchan Ness to Collieston Coast SPA

- Herring gull at East Caithness Cliffs SPA
- Kittiwake at East Caithness Cliffs SPA
- Razorbill at East Caithness Cliffs SPA
- Gannet at Forth Islands SPA
- Kittiwake at Fowlsheugh SPA
- Kittiwake at North Caithness Cliffs SPA
- Puffin at North Caithness Cliffs SPA
- Kittiwake at Troup, Pennan and Lion's Heads SPA
- Kittiwake at West Westray SPA.

For guillemot at the sites listed below, we have concluded **AEoSI** in-combination with other offshore wind farm projects excluding Berwick Bank Offshore Wind Farm only, as guillemot were not assessed for Berwick Bank at these sites:

- Guillemot at East Caithness Cliffs SPA
- Guillemot at Sule Skerry and Sule Stack SPA

For the qualifying species and sites listed below, we are **unable to conclude no AEoSI** in-combination with other offshore wind farm projects for **both scenarios** – in-combination including Berwick Bank Offshore Wind Farm and in-combination excluding Berwick Bank Offshore Wind Farm:

- Kittiwake at Copinsay SPA
- Razorbill at Fair Isle SPA
- Razorbill at North Caithness Cliffs SPA
- Razorbill at Troup, Pennan and Lion's Heads SPA

For guillemot at Copinsay SPA, we are **unable to conclude no AEoSI** in-combination with other offshore wind farm projects excluding Berwick Bank Offshore Wind Farm only, as guillemot were not assessed for Berwick Bank at this site.

Impacts from Vessel Movements

We are **unable to conclude no AEoSI** for the Moray Firth and Scapa Flow SPAs due to the impact on the qualifying species from disturbance and displacement caused by vessel movements. However, we advise that these adverse effects can be avoided by the adherence to additional suggested mitigation as provided in our detailed advice.

Offshore bats – EIA

Very little evidence is available to allow an accurate assessment on the potential impacts of offshore wind on migratory bats. We advise that the risk is unknown and that the impact assessment of low risk cannot be concluded. We advise on the need for a monitoring programme and further advice is provided in our detailed advice in Appendix G.

Seascape, Landscape and Visual Impacts – EIA

We do not consider that this proposed development raises issues of National Interest in relation to its landscape, visual or cumulative effects. This is not to say that the development would not result in significant landscape or visual effects, rather that NatureScot does not judge these effects to meet our threshold in respect of our national remit for landscapes.

Blue carbon (Climatic Change) – EIA

The assessment for Blue Carbon which we support concludes **no significant impacts**.

Noting however, we request clarification on the calculations used in the Blue Carbon assessment.

Compensatory measures under HRA

The Applicant has provided a derogation case alongside the Section 36 and Marine Licence applications for Ayre Offshore Wind Farm. This includes limited summary information on each measure and next steps to be provided through a Compensation Roadmap.

We advise there is insufficient information to have confidence that the proposed measures could compensate for the predicted impacts of the Project to seabirds. Further detailed advice is provided in **Appendix J**.

We hope this advice is helpful. Please contact Caitlin Cunningham

[Redacted]

or Fiona Cruickshank

[Redacted]

in the

first instance for any further advice, copying in our marine energy mailbox – marineenergy@nature.scot.

Yours sincerely,

Erica Knott

Head of Marine Energy – Sustainable Coasts and Seas.

Contents

Policy context	1
Background.....	2
The Proposed Development	2
Storage and assembly of turbines (wet storage)	3
Assessment approach.....	4
Design development.....	4
NatureScot advice summary.....	4
Physical processes – EIA.....	4
Benthic ecology – EIA.....	4
Fish and shellfish ecology – EIA	4
Marine mammals – EIA and RIAA	5
Offshore and intertidal ornithology – EIA	5
Offshore and intertidal ornithology – RIAA	6
Offshore bats – EIA	7
Seascape, Landscape and Visual Impacts – EIA	7
Blue carbon (Climatic Change) – EIA.....	8
Compensatory measures under HRA	8
Contents	9
Appendix A – Physical processes.....	12
A.1 Study area	12
A.2 Assessment approach	12
A.3 Impact assessment.....	12
A.4 Cumulative assessment.....	13
A.5 Mitigation.....	13
A.6 Monitoring	13
Appendix B – Benthic ecology.....	14
B.1 Study area	14
B.2 Baseline characterisation.....	14
B.3 Assessment approach	15
B.4 Impact assessment.....	15
B.5 Cumulative assessment.....	17
B.6 Mitigation.....	17
B.7 Monitoring	17
B.8 MPA Assessment.....	17
B.9 RIAA.....	17
Appendix C – Fish and shellfish ecology	18
C.1 Study area	19
C.2 Baseline characterisation.....	19
C.3 Assessment approach	20
C.4 Impact assessment.....	20

C.5	Cumulative assessment.....	22
C.6	Mitigation.....	22
C.7	Monitoring	23
C.8	RIAA.....	23
Appendix D – Marine mammals.....		24
D.2	Baseline characterisation.....	25
D.3	Assessment approach	27
D.4	Impact assessment.....	29
D.5	Cumulative assessment.....	32
D.6	Southern Trench NCMPA Assessment	35
D.7	Mitigation.....	36
D.8	Monitoring	36
D.9	RIAA.....	37
Appendix E – Offshore and intertidal ornithology – EIA.....		41
E.1	Summary	41
E.2	Content and quality of the application	42
E.3	Methodology and approach to assessments	42
E.4	Specific comments on aspects of the assessment process.....	42
E.5	Technical Appendix – 11.4 Collision risk modelling technical report.....	45
E.6	Technical Appendix 11.5 – Migratory bird CRM technical report.....	46
E.7	Technical Appendix 11.6 – EIA and RIAA P3A SPA apportioning technical report.....	46
E.8	Technical Appendix 11.7 – EIA Population Viability Analysis (PVA).....	47
E.9	Impact Assessment	47
E.10	Cumulative effects assessment (CEA) approach.....	52
E.11	Cumulative Assessment – Results.....	53
E.12	Proposed monitoring	57
E.13	Transboundary effects	57
E.14	Annex 1 – Further discussion of issues in technical appendices on apportioning.....	58
Appendix F – Offshore and intertidal ornithology – RIAA		61
F.1	Quality and content of the Application.....	61
F.2	NatureScot approach to PVA results and determination of AEoSI for SPAs.....	61
F.3	Proposal Alone Assessment of impacts on breeding seabird SPAs	61
F.4	In-combination assessment of impacts on breeding seabird SPAs.....	65
F.5	Individual SPA assessments	69
F.6	Annex 2 - Great black-backed gull.....	80
F.7	Annex 3 - Moray Firth SPA survey data comparison.....	81
Appendix G – Offshore bats.....		84
G.1	Data and Literature Review	84
G.2	Offshore Bats EIA Report	84
G.3	Magnitude of impact (Section 12.10)	85
G.4	Cumulative Effects	85
G.5	Mitigation.....	85
G.6	Monitoring	85
G.7	NatureScot Conclusion.....	85
Appendix H – Seascape, Landscape and Visual Impacts (SLVIA) – EIA		86
H.1	Additional comments	86
Appendix I – Blue carbon.....		87
I.1	Study area.....	87

I.2	Baseline characterisation	87
I.3	Assessment approach.....	88
I.4	Impact assessment	90
I.5	Cumulative assessment	90
I.6	Mitigation and monitoring	90
Appendix J – Derogation.....		91
J.1	Derogation Case – Habitats Regulations Appraisal: Applicant’s Case for Derogation	91
J.2	Derogation Case – Compensation Roadmap	91

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix A – Physical processes

Physical processes are considered in Chapter 7 (Volume 2) and the following relevant supporting appendices:

- Volume 3, Technical Appendix 7.1: Physical Processes Baseline Environment
- Volume 3, Technical Appendix 7.2: Physical Processes Model Design and Validation
- Volume 3, Technical Appendix 7.3: Physical Processes Technical Assessment
- Volume 3, Technical Appendix 7.4: Physical Processes Assessment of Potential Changes to Stratification and Frontal Systems

Overall, the documents provided are presented well and are of a high quality. The assessment for Physical Processes concludes **no significant impacts, both alone and cumulatively**, which we support.

In this Appendix, we provide comments and advice which addresses elements of the assessment process but does not affect the outcome of the assessment or the overall conclusion of our advice.

A.1 Study area

The study area is based on several elements: one spring tidal ellipse buffer (suspended sediment plumes); coastal sub-cell boundaries (littoral transport); and expert judgement / evidence base (wave blockage). This aligns with what was presented at Scoping.

A.2 Assessment approach

We are content with the approach to assessment for physical processes, this includes the impacts scoped in/out as per 7.8 and Section 7.7.2.

A.3 Impact assessment

Overall, we agree with the EIA Report assessment conclusion of not significant for construction, operation and maintenance and decommissioning phases for physical processes, with further commentary on specific impacts below.

A.3.1 *Impact 3 – Potential Impacts to Coastal Morphology*

Table 7.4 notes that in our Scoping response, we advised assessment of the risk of re-exposure of buried cables, which could potentially lead to the requirement for additional cable protection. Section 7.10.104 discusses cable re-exposure and states that any re-exposed cable(s) will be re-buried, and no additional protection will be applied. This commitment is welcome; however, we note that it does not feature within Table 7.13 of embedded mitigation. This commitment should be included within a Cable Plan.

A.3.2 *Impact 6 – Potential Changes to the Sediment Transport Regime*

In Section 7.10.149, it is stated that based on the numerical wave modelling, measurable changes to wave height will not extend to adjacent coastlines. However, reviewing Figures 7.7 (Ayre) and 7.9 (Ayre and Stromar cumulatively), which present modelled wave shadow effect of the Array Area(s), this indicates that changes to wave height may just reach certain coasts of Orkney in medium storm events (50% no exceedance). Such events are less able to effect significant coastal

sediment transport than the larger 10-, 50- and 100-year events that were also modelled. This therefore supports the overall conclusion in Section 7.10.149 that the maximum reduction in wave height on those coasts would not be sufficient to measurably alter coastal sediment transport.

A.4 Cumulative assessment

The cumulative impact pathways have been correctly identified, with an appropriate level of detail presented, and we are content with the conclusion of not significant for cumulative impacts for all phases of the Proposed Development.

A.5 Mitigation

Because all impacts are assessed as not significant, no additional mitigation measures are proposed beyond the embedded mitigation outlined in Table 7.13, which is largely the production of and adherence to post-consent plans and programmes. Plans and programmes themselves do not strictly constitute mitigation – it is the measures contained within the plan that will mitigate impacts. However, we are content for this to be addressed through the development of the post-consent plans.

A.6 Monitoring

The impact of large-scale floating offshore wind farms on mixing and seasonal stratification is an emerging topic with significant uncertainties. This proposal provides an early opportunity to contribute towards this evidence gap through pre- and post-construction monitoring in alignment with the recommendation set out in Section 5.4 of the Scottish Government report '*Scoping an Offshore Wind Sustained Observation Programme (OW-SOP)*'⁴.

The following ScotMER research project is currently in progress '*Development of marine physical process modelling guidelines for offshore wind farm environmental impact assessments*'. We acknowledge the timing for this proposal may not align with the outputs of this research project however it may be useful to consider the research outputs when designing monitoring, if consented.

The following research programmes are also underway and research outputs should be considered when designing physical processes monitoring:

- ECOWind "Physics-to-Ecosystem Level Assessment of Impacts of Offshore Windfarms" (PELAGIO)⁵
- Enabling Sustainable Wind Energy Expansion in Seasonally Stratified Seas (eSWEETS3)⁶

Further advice should be sought from MD-SEDD on this aspect.

⁴ <https://www.gov.scot/publications/scoping-offshore-wind-sustained-observation-programme-ow-sop/>

⁵ <https://ecowind.uk/projects/pelagio/>

⁶ <https://pcwww.liv.ac.uk/~jons/research.htm>

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix B – Benthic ecology

Benthic interests are considered in Chapter 8 (Volume 2) and the following relevant supporting appendices:

- Volume 3, Technical Appendix 8.1: Benthic Ecology
- Volume 3, Technical Appendix 8.2: Benthic Characterisation Survey 2024: Survey Report
- Volume 3, Technical Appendix 8.3: Marine Protected Areas Assessment

Overall, the documents are presented well and provide an appropriate level of detail. The assessment for Benthic Ecology concludes **no significant impacts, both alone and cumulatively**, which we support.

In this Appendix, we provide comments and advice which addresses elements of the assessment process but does not affect the outcome of the assessment or the overall conclusion of our advice.

B.1 Study area

The study area is defined at a local and regional scale. The local benthic ecology study area encompasses the site boundary (Array Area and Export Cable Corridor (ECC)) and a buffer of one spring tidal excursion ellipse. For the regional benthic ecology study area, it extends further into the Northern North Sea, informed by the Sectoral Marine Plan (SMP) North-East Region. We are content with this approach.

B.2 Baseline characterisation

The data collection methods for baseline characterisation follow standard methodologies for benthic and environmental sampling and refers to the relevant quality control protocols and guidance. It provides a suitable approach to characterising the baseline environment to inform the EIA.

Existing and site-specific data has been reviewed and clearly presented, with species and habitats of conservation value identified and considered, including a number of Scottish Priority Marine Features (PMFs) and Annex I habitats.

B.2.1 *Sabellaria spinulosa* reef

We note that *Sabellaria spinulosa* is missing from Table 8.10 (IEFs Within the Proposed Development) despite being recorded within 19 separate images across 16 sampling stations during the benthic survey. Section 8.6.16 states that the *S. spinulosa* aggregations do not constitute Annex I reef habitat based on the criteria adopted by Gubbay (2007)⁷ and images recorded.

Pearce and Kimber (2020) describe *S. spinulosa* bommies as being topographically distinct and meeting many of the broader criteria for reef detailed in the Habitats Directive and OSPAR reef definitions. As such, *S. spinulosa* bommies, if recorded, should also be treated as Annex I reef.

⁷ Gubbay, S. (2007). Defining and managing *Sabellaria spinulosa* reefs: Report of an inter-agency workshop 1-2 May. JNCC. Peterborough pp.26.

We advise that should *S. spinulosa* be identified in the refined cable route, regardless of its 'reefiness', micrositing of cables and infrastructure should be employed wherever possible. Further advice is provided under B.6 (Mitigation) below.

B.3 Assessment approach

We are content with the approach to assessment for benthic ecology, including the impacts scoped in/out as per Tables 8.11 and 8.12, as well as the matrix used for the assessment of significance (Table 8.15), which applies a gradient approach, with outcomes appropriately distributed.

B.4 Impact assessment

Overall, we agree with the EIA Report assessment conclusion of not significant for construction, operation and maintenance and decommissioning phases for benthic and intertidal receptors, with further commentary on specific impacts below.

B.4.1 Ocean quahog – habitat loss and disturbance

Ocean quahog (two juveniles and ten adults) were recorded across 12 grab samples, including across both the Array Area and ECC. Grab sampling typically collects only the top 10-20 cm of sediment and penetration is often reduced in hard sediments. Ocean quahog, particularly adults, may be found deeper in the sediment than this (variable depths from upper few cm to 10 cm+). To that end, we expect that the grab sampling is likely to underestimate the number of individual animals present. We therefore recommend using the total extent of subtidal sands and gravels as a proxy for potential habitat for ocean quahog, whilst recognising this may over-estimate potential impacts. We note that an assessment of impacts to offshore subtidal sands and gravel has been considered, as this is deemed suitable habitat for ocean quahog.

The overall sensitivity for ocean quahog and offshore subtidal sands and gravel has been deemed as 'high', in line with FeAST⁸, which reflects the conservation value of the species, as well as the low tolerance to most of the pressures and the likelihood of slow recovery, due to this species being slow-growing and having long generational times. We are content with this approach.

The survey area subtidal sediments ranged from slightly gravelly muddy sand to gravelly sand, with most stations classified as slightly gravelly sand (91.22%), as per Sections 5.1.5 and 6.1.1 of the Technical Appendix 8.1: Benthic Ecology. However, in the assessment presented in Chapter 8: Benthic Ecology, the maximum area extents are considered for this receptor, as detailed in Section 8.10.

The maximum temporary habitat loss and/or disturbance from site preparation, construction and maintenance activities is estimated as 18,000,341 m² during the construction phase and 2,632,500 m² during the operation and maintenance phase, representing 4.64% and 0.68% of the site boundary, respectively. For long-term habitat loss and disturbance from the installation of the infrastructure during the construction phase and throughout the operation and maintenance phase, a total of 3,042,840 m² is estimated, representing 0.78% of the site extent.

⁸ <https://www.nature.scot/professional-advice/protected-areas-and-species/priority-marine-features-scotlands-seas/feature-activity-sensitivity-tool-feast>

Given the widespread nature of the sands and gravels habitat throughout the Scottish⁹ and UK¹⁰ waters, the magnitude of this impact is likely to be 'low', in line with the EIA Report conclusions. **Although a specific PMF assessment was not undertaken, based on previous experience, our assessment concludes that there is likely to be an impact on ocean quahog but without significant impact on national status.**

The EIA Report sensitivity of 'high' and magnitude of 'low' results in a significance of minor to moderate using the Applicant's significance matrix (Table 8.15). As above, given the widespread nature of the sands and gravels habitat, we are content that the effect is concluded as minor, which is not significant in EIA terms.

B.4.2 Horse mussel beds – increased Suspended Sediment Concentrations (SSCs)

Noss Head Nature Conservation Marine Protected Area (ncMPA) is designated for horse mussel beds and is located 2.5 km away at the closest point from the ECC site boundary.

We agree that horse mussel beds are highly sensitive to smothering and siltation rate changes and thus are content with the sensitivity classification as 'high'.

In terms of magnitude, Section 8.10.116 states that modelling indicated that increased Suspended Sediment Concentrations (SSC) are likely to be greatly reduced by sediment resettlement by the time it is advected to the Noss Head ncMPA and that any increased SSC exposure would be for a short duration. We agree with this assessment and as such, the magnitude is deemed as 'low'. Our reasoning is due to the distance to the ncMPA of 2.5 km and that any impact from increased SSC would be short-term and could be further reduced by methods of cable laying.

The EIA Report sensitivity of 'high' and magnitude of 'low' results in a significance of minor to moderate using the Applicant's significance matrix (Table 8.15). Overall, we consider that the risk to the horse mussel feature of the ncMPA is small, and we are content that the effect is concluded as minor, which is not significant in EIA terms.

B.4.3 Electromagnetic Fields (EMF)

Table 8.23 presents the typical EMF levels over power cables from offshore wind farms, which is useful to see. It is stated that where feasible, a minimum burial depth of 0.5 m applies to all cables, however there will be a target burial depth of 1.5 m. Where burial is not possible, cable protection will be used. We agree that the risk of exposure to EMF is lower for the buried portions of cabling and highlight that a burial depth of 1-2 m is preferable.

Overall, we agree with the significance conclusion of minor, which is not significant in EIA terms. We are also aware that through ScotMER a project undertaking in-field measurements of EMF is underway and once this has reported, this may, influence future assessment and / or mitigation requirements in terms of EMF effects.

⁹ <https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=953>

¹⁰ <https://www.marlin.ac.uk/species/detail/1519>

B.5 Cumulative assessment

The cumulative impact pathways have been correctly identified, and we welcome the level of detail presented, and we are content with the conclusion of **not significant** for cumulative impacts at all phases of the Proposed Development.

B.6 Mitigation

Because all impacts are assessed as not significant, no additional mitigation measures are proposed beyond the embedded mitigation outlined in Table 8.17, which is largely the production of and adherence to post-consent plans and programmes. Plans and programmes themselves do not strictly constitute mitigation – it is the measures contained within the plan that will mitigate impacts. However, we are content for this to be addressed through the development of the post-consent plans.

With respect to *S. spinulosa*, if the proposal is consented, we advise:

- **Potential impacts to Annex I *Sabellaria spinulosa* reef should be minimised by micro-siting of cables and infrastructure, wherever possible. This could be achieved through the use of an exclusion zone of 50 metres.**

B.6.1 Appendix 24: Outline Environmental Management Plan (Volume 4) Annex B Marine Invasive and Non-Native Species Biosecurity Plan

This seems to be a comprehensive mitigation and contingency plan, clearly presented and in line with guidance. Section B3 lays out the proposed biosecurity measures, which we are content with.

B.7 Monitoring

As all impacts are assessed as not significant, no monitoring is proposed. Where possible, we recommend that any data collected is shared with strategic monitoring, or research programmes such as ScotMER projects.

B.7.1 Appendix 24: Outline Environmental Management Plan (Volume 4) Annex B Marine Invasive and Non-Native Species Biosecurity Plan

This seems to be a comprehensive and targeted INNS monitoring programme, clearly presented and in line with guidance. Section B4 lays out the proposed monitoring, inspection and reporting requirements, which we are content with. Additionally, Section B5 includes a clear response strategy, should biosecurity measures for INNS fail.

B.8 MPA Assessment

The Technical Appendix 8.3: Marine Protected Areas Assessment screens in the Noss Head ncMPA for further assessment. We agree with the assessment presented, noting the detailed advice on horse mussel beds presented above in B.4.2. As such, we conclude that the Proposed Development is not capable of affecting (other than insignificantly) the horse mussel beds protected feature of the ncMPA.

B.9 RIAA

No sites with Annex I habitats were advanced to the RIAA stage, which is in line with our advice on the HRA Screening Report and as such, we are content with this approach.

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix C – Fish and shellfish ecology

Fish and shellfish interests are considered in Chapter 9 (Volume 2) and the following relevant supporting appendices:

- Volume 3, Technical Appendix 9.1: Fish and Shellfish Ecology Technical Report
- Volume 3, Technical Appendix 8.2: Benthic Characterisation Survey 2024: Survey Report
- Volume 3, Technical Appendix 10.4: Subsea Noise Technical Report

Overall, the documents are well presented and provide an appropriate level of detail. The assessment for Fish and Shellfish Ecology concludes **significant impacts, both alone and cumulatively, for herring spawning grounds. As such, mitigation for herring spawning grounds will be required, with detail to be presented post-consent through the development of the Piling Strategy, if consented.**

Moreover, the EIA Report has indicated areas where grab samples were unable to be taken as the ground was too rocky, with some images presented suggesting that the sample sites are suitable habitat for common skate complex. Common skate complex, which includes flapper skate *Dipturus intermedius* and blue skate *D. flossada*, are categorised as Critically Endangered on the IUCN red list of threatened species and are a PMF in Scotland. Orkney is a hotspot for skate eggs washed up on beaches, and it is assumed by the number of egg cases collected that seas around Orkney are important for these critically endangered species. In addition, Orkney Islands Council recently identified an area that could be a flapper skate egg nursery site¹¹, which further highlights the potential importance of the area.

Before we can provide advice as to the significance of these potential impact pathways, we need to better understand habitat usage of the site by common skate complex.

We require:

- **All Drop-Down Camera (DDC) and Drop-Down Video (DDV) footage at the locations where grab samples were unable to be taken (ENV_003, 007, 008, 009, 021, 022 and 038). These should be re-analysed for the presence of common skate complex, as well as any evidence of eggs, including any 'historic' egg cases wedged between the cobbles and boulders. NatureScot has expertise in this field if further advice is required.**
- **Depending on the results of this analysis we may require further assessment, including consideration of the impact pathways discussed in C.4.1 – this may also require revision of magnitude scores.**
- **Assessment may require consideration of potential implication for the national status of these species and further consideration of mitigation and/or monitoring requirements may also be required.**

¹¹ <https://www.orkney.gov.uk/latest-news/flapper-skate-egg-nursery-site-discovery-in-scapa-flow/>

C.1 Study area

The study area for fish and shellfish ecology is a 100km buffer around the Array Area and Export Cable Corridor (ECC) and includes the Moray Firth. This buffer is large enough to include all impacts, and we are content with this distance based on the evidence provided.

C.2 Baseline characterisation

Table 9.8 provides details on the data sources used to inform the baseline. The data is drawn from existing offshore wind farms around the proposed Ayre development, publicly available data, and literature. Additional sources suggested at Scoping have been included.

Additionally, site-specific surveys were conducted, which included eDNA samples, drop down video (DDV), drop down camera (DDC), and digital aerial surveys (DAS) to determine species present, and particle size analysis (PSA) was used to determine habitat suitability for sandeel and herring spawning. We welcome this approach but consider that the interpretation and application of survey results in the assessment is lacking, particularly for the eDNA sampling, though noting that this does not affect the outcome of our assessment or the overall conclusion of our advice.

C.2.1 Key species

The EIA Report uses Important Ecological Features (IEF) to narrow down the list of fish to be considered within the impact assessment. The list is presented in Table 9.14 and contains the species we expect to be included. The species are then assigned a value of International, National, Regional, or Local importance – the reasoning behind this is not fully explained or well used within the impact assessment, though noting that this does not affect the outcome of the assessment or the overall conclusion of our advice.

Section 9.6.13 discusses the importance of benthic interactions during life stages for herring eggs and sandeel. We agree with this paragraph pointing out the substrate specific spawners with higher risk from habitat disturbance, but it should also include cod and common skate complex. Cod is a benthopelagic fish where mating activity takes place on the seabed; males choose a suitable area or territories (known as leks) that they defend from other males. They emit characteristic grunting and rumbling sounds to attract a mate. Physical disturbance and underwater noise may disrupt this activity, making this species more vulnerable to construction impacts during the mating period.

C.2.1.1 Common skate complex

Table 9.14 has listed flapper skate and common skate. In 2010, it was found that the fish previously known as 'common skate' is two distinct species; Flapper skate (*Dipturus intermedius*) and blue skate (*Dipturus flossada*). The list should therefore either include flapper and blue skate or combine the two and have one entry as common skate complex. The list would benefit from including Latin names to prevent misinterpretation.

In Sections 9.6.17-9.6.19, it states that there is potentially suitable habitat for critically endangered flapper skate. Whilst some rocky (and potentially suitable egg laying substrates) are present within the site boundary, they represent a minority of the overall sediment classification. It is concluded that, on average across the site, due to the high sand content and consistent water depths of over 50m, this area is unlikely to represent suitable egg laying habitat for flapper skate. However, we disagree with this methodology and conclusion for identifying skate. The average habitat type and

depth in this instance is not helpful for identifying habitat suitable for these critically endangered species.

Within the Technical Appendix 8.2: Benthic Characterisation Survey 2024: Survey report, there are images showing rocky ground that have potential to be common skate complex habitat. As mentioned above, Orkney waters are thought to be important for these critically endangered species. However, very little is known about the location of skate nursery grounds, hence the requirement for further assessment of the survey report.

The EIA Report has presented areas where grab samples were unable to be taken as the ground was too rocky (seven locations in total across the Array Area and ECC), with some images presented in Plate 3 of the Technical Appendix 8.2 suggesting that the sample sites ENV_007, ENV_008 and ENT_009 are suitable habitat.

Before we can provide advice as to the significance of these potential impact pathways, we need to better understand habitat usage of the site by common skate complex.

We require:

- **All DDC and DDV footage at the locations where grab samples were unable to be taken (ENV_003, 007, 008, 009, 021, 022 and 038). These should be re-analysed for the presence of common skate complex, as well as any evidence of eggs, including any ‘historic’ egg cases wedged between the cobbles and boulders. NatureScot has expertise in this field if further advice is required.**
- **Depending on the results of this analysis we may require further assessment, including consideration of the impact pathways discussed in C.4.1 – this may also require revision of magnitude scores.**
- **Assessment may require consideration of potential implication for the national status of these species and further consideration of mitigation and / or monitoring requirements may also be required.**

C.3 Assessment approach

We are content with the potential impacts scoped in and out of the assessment, as per Table 9.16. The maximum design parameters are presented in Table 9.15, including area estimates of each potential impact. This is useful in understanding the extent of impacts.

For each impact, the species are split into Vulnerable Ecological Receptors (VER) groups: pelagic, demersal, shellfish, elasmobranchs and diadromous fish. Spawning herring and sandeel are considered separately where impacts would be greater due to their life cycle being intrinsically linked to the seabed, which we agree with. However, depending on the outcome from reviewing the DDV/DDC footage, common skate complex may need to be considered separately for each impact. Further advice regarding common skate complex is provided in C.4.1 for the relevant impacts.

C.4 Impact assessment

Overall, we broadly agree with the EIA Report assessment conclusions and provide additional commentary where this is not the case below.

C.4.1 *Common skate complex*

For certain impacts, the sensitivity of common skate complex should be changed to 'high'. This applies to the following impacts:

- Impact 1 – Temporary Habitat Loss and/or Disturbance
- Impact 2 – Long Term Habitat Loss and/or Disturbance
- Impact 4 – Increased Suspended Sediment Concentrations (SSC) and Associated Deposition
- Impact 5 – Subsea Noise Impacting Fish and Shellfish Receptors

Before we can provide advice as to the significance of these potential impact pathways, we need to better understand habitat usage of the site by common skate complex. Depending on the outcome from reviewing the DDV/DDC footage as per C.2.1.1 above, the magnitude score (currently set as 'low') may need to be revised, which would have implications for the overall significance.

C.4.2 *Impact 2 – Long Term Habitat Loss and/or Disturbance*

In Section 9.10.60, sandeel is described as having a regional value, however Table 9.14 assigns them as national value. Regardless, this does not change the sensitivity score of 'medium' and does not affect the outcome of the assessment or the overall conclusion of our advice.

C.4.3 *Impact 4 – Increased Suspended Sediment Concentrations (SSC) and Associated Deposition*

Section 9.10.11 does not describe the magnitude of the impact well, and a map showing the extent of SSC plume would have been helpful. This section describes the concentration in terms of mg/l but there is no indication of when increased concentrations will return to background levels or how far the sediment plume is expected to travel.

Moreover, the argument given for limited impact on sandeel arising from increased SSC in Section 9.10.120 is not convincing. It is stated that increased SSCs in the areas of suitable spawning habitat within the site boundary and wider zone of influence may lead to avoidance behaviour. This would be a reasonable argument for adult sandeel but does not consider sandeel eggs, which remain in the sediment and require a flow of oxygen to survive. Increased sedimentation has the potential to smother the eggs and reduce oxygen flow compromising egg survival. However, Section 9.10.129 concludes that herring and sandeel are deemed to be of medium sensitivity, and despite the issues outline above, we agree with the sensitivity score and the assessment overall.

C.4.4 *Impact 5 – Subsea Noise Impacting Fish and Shellfish Receptors*

In Section 9.10.158, it is stated that the impact (from piling) is predicted to be of local spatial extent, short term duration, intermittent over the construction phase and high reversibility. We disagree that the impact will be of short duration, as the maximum duration of piling assessed is up to 20 hours per WTG. Despite this, we accept that the overall magnitude is low, based on the definitions presented in Table 9.18.

C.4.4.1 *Sandeel*

Section 9.10.203 does not address the prey species that are reliant on sandeel within the site boundary. Sandeels are a very important component of the diet of many seabird species, marine mammals and other fish. For kittiwake, puffin and razorbill in particular there is a strong relationship between sandeel abundance and breeding success. There are several SPA colonies of

these species within foraging range of the Proposed Development, and significant numbers of these species were observed in the DAS data. These species have limited foraging ranges and depending on the location of alternative prey sources, may be beyond the limit of these species. Similarly, sandeels comprise a large component of the diet of harbour seals and there are SACs within connectivity range of the Proposed Development. Without context of knowing where alternative prey resources are, or the limitations of the species targeting this prey it is unjustified to assume sandeel outside of the boundary would be alternative food source.

For Section 9.10.206, all fish have been grouped together other than herring. This is a little ambiguous as prior to this the fish have been split into groups. Sandeel should be considered separately outside of this larger grouping (remaining marine and diadromous IEFs). Especially as the whole Array Area has sediment suitable for sandeel based on the PSA results, and sandeel were recorded in the eDNA survey so we can assume that they are present. Considering the ban of sandeel fishing from Scottish Government primarily for the protection of declining seabird populations, alongside threats from climate change and biodiversity loss, more consideration should be given to this species.

As such, we disagree with the sensitivity assigned to sandeel of 'low' and consider that this should be 'medium'. However, the overall significance remains the same (minor), which is not significant in EIA terms.

C.4.4.2 Herring

We agree with the overall sensitivity for herring spawning grounds (for piling) as 'high', with the magnitude as 'low', resulting in a moderate significant effect, which is **significant in EIA terms. As such, mitigation for herring spawning grounds will be required, with detail presented post-consent through the development of the Piling Strategy, if consented.**

C.5 Cumulative assessment

The cumulative impact pathways have been correctly identified, with an appropriate level of detail presented.

For impacts to herring spawning grounds from subsea noise (piling), the overall sensitivity is considered as 'high', with the magnitude as 'low', resulting in a moderate significant effect, which is **significant in EIA terms. As such, mitigation for herring spawning grounds will be required, with detail presented post-consent through the development of the Piling Strategy, if consented.**

C.6 Mitigation

As above, mitigation for herring spawning grounds will be required, with detail presented post-consent through the development of the Piling Strategy, if consented.

C.6.1 Fisheries Mitigation, Monitoring and Communication Plan

This plan is largely intended for commercial fishers. However, we note the inclusion of possible mitigation measures to reduce the impact to herring, to be discussed and agreed post-consent, which may require site-specific surveys to determine key herring spawning periods and / or include noise abatement systems.

C.7 Monitoring

No monitoring is proposed. However, given mitigation is required for herring spawning grounds from piling (to be developed through the Piling Strategy) if consented, **some form of monitoring would be required to identify if the mitigation is successful.**

C.8 RIAA

At the EIA Scoping and HRA Screening stage we provided our position on diadromous fish whereby impacts should be assessed through the EIA process and not through HRA. This position reflects:

- Limited knowledge of spatial and temporal distribution and behaviour of these species in the marine environment,
- Lack of evidence to inform impact pathways, and,
- Lack of reference population figures which prevents impact apportioning to SACs.

However, the following SACs have been advanced to the RIAA stage, as per Table 5.1 of the RIAA:

- Berriedale and Langwell Waters SAC – Atlantic salmon
- River Thurso SAC – Atlantic salmon
- River Borgie SAC – Atlantic salmon and freshwater pearl mussel
- River Naver SAC – Atlantic salmon and freshwater pearl mussel
- River Spey SAC – Atlantic salmon, freshwater pearl mussel and sea lamprey
- River Evelix SAC – Freshwater pearl mussel
- River Oykel SAC – Atlantic salmon and freshwater pearl mussel
- Foinaven SAC – Freshwater pearl mussel
- Ardvar and Loch a' Mhuilinn Woodlands SAC – Freshwater pearl mussel

Based on our Scoping advice, we offer no comments on the assessment for diadromous fish (and freshwater pearl mussel) through HRA. However, we do note that a conclusion of no AEOSI has been reached for all SACs with diadromous fish (and freshwater pearl mussel) qualifying species.

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix D – Marine mammals

Marine mammal interests are considered in Chapter 10 (Volume 2) and the following relevant supporting appendices:

- Volume 3, Technical Appendix 10.1: Marine Mammal Technical Report
- Volume 3, Technical Appendix 10.2: Marine Mammal Digital Aerial Survey Report
- Volume 3, Technical Appendix 10.3: Marine Mammal iPCoD Modelling Report
- Volume 3, Technical Appendix 10.4: Subsea Noise Technical Report
- Volume 3, Technical Appendix 10.5: Unexploded Ordnance Technical Report
- Report to Inform Appropriate Assessment: Part 2 – Special Areas of Conservation

Overall, the documents provide an appropriate level of detail and were presented well. However, we note various transcription and other minor errors across the appendices, which we highlight in our advice below where relevant, noting that it does not affect the outcome of the assessment or the overall conclusion of our advice.

D.1.1 EIA Summary

The assessment for marine mammals concludes no significant impacts alone, and significant impacts for harbour porpoise cumulatively for disturbance from piling. However, we raise an issue regarding the sensitivity scoring in our advice below, and as such we disagree with the outcome of the assessment. **Instead, we conclude significant impacts for disturbance from piling –**

- **both for the proposal alone and cumulatively for grey seal, Risso’s dolphin and white-beaked dolphin; and**
- **cumulatively for harbour porpoise and bottlenose dolphin.**

As such, should Scottish Ministers grant consent, we advise that:

- **The Applicant will need to consider the implications further, through the development of the Piling Strategy and Marine Mammal Mitigation Protocol (MMMP) post-consent, for all species considered in the EIA Report.**
- **A monitoring proposal to validate the EIA Report predictions particularly as a floating wind technology development to better understand the likelihood of impacts for disturbance from piling**

There are various aspects where we request clarification, including:

- **Whether the number of animals with the potential for auditory injury has been included in the iPCoD modelling.**
- **Whether the worst-case scenario for turbine spacing was used, for both the single and concurrent installation scenarios.**
- **Justification as to why a single piling event has been used as the worst-case scenario for cumulative SEL.**
- **That the developer confirms our understanding is correct regarding the white-beaked dolphin reference population used.**

D.1.2 RIAA Summary

We have concluded **No Adverse Effect on Site Integrity (AEoSI)** for all European sites with marine mammal qualifying species. However, **we request the Applicant to contribute to strategic post-**

consent monitoring of the Sanday SAC harbour seal and Moray Firth SAC bottlenose dolphin populations as part of ongoing understanding of the species and their distributional and behavioural responses to marine industries development activities.

D.2 Baseline characterisation

D.2.1 Reference populations

The Applicant has presented the percentage of the reference population affected in relation to both the full Management Unit (MU) and the UK portion of the MU, for relevant species. This approach is welcomed.

D.2.2 Bottlenose dolphin

In Section 10.6.6, we note that design-based modelled density estimates were used for offshore bottlenose dolphin of the Greater North Sea (GNS) MU, however, it appears that the same density estimate was applied to coastal bottlenose dolphin of the Coastal East Scotland (CES) MU. The coastal strip out to 5 km within the CES is known to be of a higher density particularly along the southern coast of the Moray Firth extending down to the Forth and Tay. The coastal bottlenose dolphin are not distinguished from the offshore population in the species account (Section 10.6.6) or in Table 10.19, which sets out a summary of species scoped in, densities to be used for assessment and the population figures.

However, in the Technical Appendix 10.1 – Marine Mammal Technical Report, Section 6.2.25 recognises the distinction between offshore ecotypes and coastal bottlenose dolphins and states that the EIA Report will focus on the coastal bottlenose population. This contradicts the method of merging the GNS and CES population as has been done for the EIA in the main Chapter 10. In Figure 6.7, it is also unclear where the Proposed Development overlaps with the CES boundary, or where potential impacts from underwater noise extend beyond this.

For clarity, we advise that the GNS and the CES populations are assessed separately using a population of 226 for the CES MU for bottlenose dolphin along with a density of 0.2 animals/km² out to 5 km for the coastal strip along the Moray Firth, then using the SCANS density out to the remaining 12 NM of the CES boundary.

However, after reviewing the noise contours shown in Figure 10.11, we are content that calculating the number of animals disturbed from piling for the coastal bottlenose dolphins is not necessary in this case. This is because Ayre is situated at the most northern extent of the Moray Firth and CES range.

For any updated assessments provided post-consent, we advise that the GNS and CES populations are assessed separately as above.

D.2.3 Common dolphin

For the concurrent piling scenario, the assessment states that 22 individuals are estimated to be at risk of disturbance using the 140 dB dose-response curve, but this should be 150 individuals. This appears to be pulled incorrectly from Table 10.51 and relates to bottlenose not common dolphin. The corrected proportion of the UK portion of the MU impacted should be 0.27%, not 1.01%.

D.2.4 White-beaked dolphin

In Table 10.19, we highlight a transcription error where the Applicant has used the UK portion population estimate for white-sided dolphin instead of white-beaked dolphin. This means the assessment for Ayre was carried out against a population of 12,293 instead of 34,025 – this makes assessment outputs for white-beaked dolphin unrealistically high.

Table D-1 below shows the corrected % of the population potentially disturbed from piling for the project alone, using the UK portion of the corrected white-beaked dolphin population estimate and how this differs from those presented in Table 10.51.

Table D-1. Comparison of results using corrected white-beaked dolphin population estimates.

WBD disturbance from piling	Animals disturbed >120dB	% UK population	% UK population (corrected)	Animals disturbed >140dB	% UK population	% UK population (corrected)
Single	4579	51.12	13.46	1402	15.64	4.12
Concurrent	6955	77.64	20.44	2358	26.32	6.93

Our advice is based on the understanding that the incorrect reference population was used to calculate the percentage of the MU disturbed, and we have presented the corrected values as a result. We would request that the developer confirms that our understanding is correct.

The DAS derived / MRSea model-based density estimate was 0.9 individuals per km² for white-beaked dolphin. Whilst our standard advice is to use the highest available density estimate across DAS and SCANS, we are content that the Applicant has used SCANS on this occasion. The DAS derived estimate provides the highest density, but in this instance due to the small sample size detected and the low predictive power this is not considered appropriate.

D.2.5 Harbour porpoise

Section 10.10.50 outlines that the numbers of harbour porpoise potentially affected is likely to be an overestimate due to the single density estimate being used (Gilles *et al*, 2023)¹² for the full impact range, rather than the density surface from Gilles *et al*. (2025). This statement is difficult to validate by looking at Figure 10.7 alone, which shows the surface density estimates from Gilles *et al*. (2025). It would have been useful if the estimated number of animals disturbed using both the single density estimate and the surface estimate had been provided to allow for a direct comparison.

D.2.6 Other cetacean species

The Ayre proposal straddles SCANS survey blocks CS-K and NS-E, as such, we are content that the highest density estimates of the two were used where available for each cetacean species. We note a small inconsistency between the UK portion of the population for common dolphin, as it is

¹² Gilles, A., Authier, M., Ramirez-Martinez, N. C., Araújo, H., Blanchard, A., Carlström, J., Eira, C., Dorémus, G., Fernández-Maldonado, C., Geelhoed, S. C. V., Kyhn, L., Laran, S., Nachtsheim, D., Panigada, S., Pigeault, R., Sequeira, M., Sveegaard, S., Taylor, N. L., Owen, K.,...Hammond, P. S. (2023). *Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys.*

listed as 54,417 in Table 10.19, but we have 57,417 on record. This typo error makes no material difference to our conclusions.

D.2.7 Seals

In Table 10.19, we note that the Applicant has combined the North Coast & Orkney and Moray Firth Seal Management Units (SMUs) for both harbour and grey seal, and we agree with this approach. The estimates for harbour seal were derived from Stevens (2024)¹³ (based on SCOS 2022), which we are content with. However, for both species, we highlight that there are likely to be more recent figures, for example the new SCOS (2025) report¹⁴ and updated figures for Orkney due in 2026, which we recommend is used for any updated assessments that may be required post-consent.

For grey seal, the reference populations were derived from Stevens (2024) presumably based on scalars from SCOS (2022). For future assessments, we advise to use the PBR (Nmin column) from SCOS (2024) for grey seal SMUs of relevance. Whilst this was not the approach taken by the Applicant, we are content that the population figures fed into the assessment were still comparable to what we would have expected (41,571 vs 37,160) and there is no material difference to our conclusions.

D.3 Assessment approach

D.3.1 Magnitude

The magnitude criteria are presented in Table 10.25, defined using the duration of impact: long-term as over 15 years (high magnitude), medium-term between seven to 15 years (medium magnitude) or temporary / short-term if the effect is under seven years duration (low magnitude). We do not agree with these definitions, as they do not appear to be based on any biological factors and justification has not been provided. Where we disagree with the magnitude assigned, this is indicated in our advice below and Table D-2 and *Table D-4*.

D.3.2 Sensitivity

During Scoping, we advised that *“Value is consistently considered within the sensitivity criteria across other ecological receptors. Not including value/importance within the sensitivity criteria disregards the inherent reason why cetaceans and seals are given a high level of legislative protection through the Habitats Regulations and fails to fully acknowledge the potential risks to individuals and populations.”* Our advice on this remains the same and we note value has not been included as part of the sensitivity criteria.

Much of the auditory injury assessment is based on the outcome of a workshop (Booth and Heinis, 2018)¹⁵ which relied on expert opinion rather than empirical evidence, and which has not been peer-reviewed or published. Therefore, there is a lot of uncertainty around the sensitivity

¹³ Stevens, A. (2024). *Seal haul-out and telemetry data in relation to the Ayre Offshore Wind Farm* (Submitted To Tetra Tech RPS Energy Limited and Ayre Offshore Wind Farm Limited, Issue.

¹⁴ <https://www.smru.st-andrews.ac.uk/files/2025/05/SCOS-2024.pdf>

¹⁵ Booth, C.G, Heinis, F & Harwood J. Updating the Interim PCoD Model: Workshop Report - New transfer functions for the effects of disturbance on vital rates in marine mammal species. 2018. Report Code SMRUC-BEI-2018-011, submitted to the Department for Business, Energy and Industrial Strategy (BEIS), February 2019 (unpublished).

categories. Given this high level of uncertainty, we consider that the scores assigned are underplaying the sensitivity of some of the impacts and therefore the conclusions reached.

As above, where we disagree with the sensitivity assigned, this is indicated in our advice below and Table D-2 and *Table D-4*.

D.3.3 Subsea noise assessment

We are content that both Southall *et al.* (2019)¹⁶ and NMFS (2024)¹⁷ thresholds have been presented and modelled in the Technical Appendix 10.4: Subsea Noise Technical Report, but the impact assessment has been carried out based on the NMFS thresholds. The swim speeds discussed and presented during Scoping have been used.

D.3.4 Dose-response curve

A variety of methods have been modelled in Technical Appendix 10.4: Subsea Noise Technical Report (Volume 3) to ascertain potential disturbance ranges from impact piling, which include the full dose-response curve (Graham *et al.*, 2017)¹⁸, the dose-response curve capped at 140 dB, in addition to the NMFS (2005)¹⁹ disturbance thresholds for mild and strong reactions. We welcome the extensive evidence and justification for including the 140 dB cut off for the dose-response and providing the full dose-response (120 dB) for comparison. The Applicant's assessment has been based on the numbers using the 140 dB cut off, however our advice is based on both outputs.

In the project alone assessment, numbers presented jump between the full dose-response and the 140 dB cut off (Tables 10.75-10.80) – a consistent approach is not applied across species or scenarios. After cross-referencing with the Technical Appendix 10.3: Marine Mammal iPCoD Modelling Report (Volume 3), only the 140 dB cut off values were included in the iPCoD modelling. As such, it is not clear why the 140 dB cut off was not presented for all species and scenarios in Tables 10.75-10.80. Whilst this does not change our overall advice or conclusions, for future assessments we recommend that the same assessment approach is consistently applied and presented throughout the documents.

D.3.4.1 Low frequency cetaceans

For LF cetaceans, NatureScot recommend using the full dose-response approach for these receptors, due to their high sensitivity to low frequency sound and uncertainties around their behavioural response to underwater noise. Therefore, we do not accept the use of a 140 dB capped dose-response for low frequency cetaceans.

¹⁶ Southall, B. L., Finneran, J. J., Reichmuth, C., Nachtigall, P. E., Ketten, D. R., Bowles, A. E., Ellison, W. T., Nowacek, D. P., & Tyack, P. L. (2019). Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals*, 45(2), 125-232.

¹⁷ NMFS. (2024). *Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (v3): Underwater and In-Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts*.

¹⁸ Graham, I. M., Pirota, E., Merchant, N. D., Farcas, A., Barton, T. R., Cheney, B., Hastie, G. D., & Thompson, P. M. (2017). Responses of bottlenose dolphins and harbor porpoises to impact and vibration piling noise during harbor construction. *Ecosphere*, 8(5), e01793.

¹⁹ NMFS. (2005). Scoping Report for NMFS EIS for the National Acoustic Guidelines on Marine Mammals. *Federal Register*, 70(7), 1871-1875.

However, we are content that the Applicant has presented the number of minke whales disturbed using both the full and capped dose-response curve, noting that iPCoD has been based on the outputs from the capped dose-response only for both project alone and cumulative assessments.

Due to the small difference in the number of individuals disturbed using both methods, resulting percentage of the population affected and the results from iPCoD modelling, we can accept this approach in this instance only. **We will be advising that all other developers use the full dose-response minke whale outputs from Ayre for input into future cumulative assessments.**

D.3.5 iPCoD modelling

In Chapter 10 (Volume 2), it is stated that animals with the potential for auditory injury after 15 minutes ADD use have been included in iPCoD modelling (Sections 10.10.16–17). However, after cross-referencing this with Technical Appendix 10.4: Subsea Noise Technical Report (Volume 3), it is unclear whether this has occurred. Section 2.7.2 of Appendix 10.4 states that it has been accounted for, but the tables show the number of animals disturbed included in the model but there is no reference to the final auditory injury numbers that have been used.

For clarity, we do not require for this to be included and therefore our advice would not change. However, to better understand the outputs, **it would be helpful to receive clarification on whether the number of animals with the potential for auditory injury has been included in the iPCoD modelling.**

D.3.5.1 Harbour porpoise

As outlined within Technical Appendix 10.3: Marine Mammal iPCoD Modelling Report (Volume 3), all iPCoD modelling used the 140 dB dose-response curve. However, a 120 dB iPCoD graph is also included for concurrent floating and OSP installation for harbour porpoise, with no explanation of this in the appendix.

It would have been useful if the impacted vs non-impacted numbers were included in the appendix, as all we have for comparison is the output figure, which is difficult to tease apart at this resolution. However, we note the iPCoD trajectory does appear to be consistent between these two figures.

D.4 Impact assessment

Overall, we broadly agree with the EIA Report assessment conclusions and provide additional commentary where this is not the case below.

Table D-2. Ayre EIA Report conclusions and NatureScot revised scores based on our assessment for the project alone. Cells are shaded where our conclusions differ and significant conclusions are in bold. Receptor codes are as follows: CD - common dolphin; BND - bottlenose dolphin; GS - grey seal; MW – minke whale; RD – Risso’s dolphin; WBD – white-beaked dolphin; HP – harbour porpoise; HS – harbour seal.

Effect	Receptor	EIA Report assessment conclusions			NatureScot revised conclusions		
		Magnitude	Sensitivity	Significance	Magnitude	Sensitivity	Significance
Injury from piling	All	Negligible	Medium	Minor	Low	High	Minor
Disturbance from piling	CD, BND	Low	Low	Minor	Low	Medium	Minor
	GS	Medium	Low	Minor	Medium	Medium	Moderate
	MW	Low	Low	Minor	Low	Medium	Minor
	RD	Medium	Low	Minor	Medium	Medium	Moderate
	WBD	Medium	Low	Minor	Medium	Medium	Moderate
	HP	Low	Medium	Minor	Low	Medium	Minor
	HS	Low	Low	Minor	Low	Medium	Minor
	All other	Low	Low	Minor	Low	Medium	Minor

D.4.1 Impact 1 – Injury and Disturbance from Subsea Noise Generated During Piling

D.4.1.1 Injury from Piling

We note that the underwater noise modelling included the closest potential separation distance of 1.9 km as a parameter for the instantaneous injury ranges for both the single and concurrent installation scenarios. However, in Chapter 3 Project Description (Volume 1), the closest potential separation distance has been identified as 1 km. For Very High Frequency (VHF) cetaceans under the concurrent scenario, a smaller spacing between turbines may have a larger impact range. **We request clarification as to which worst-case scenario for turbine spacing was used, for both the single and concurrent installation scenarios.**

The assessment is based on the single pile installation scenario, based on the NMFS (2024) cumulative SEL (SEL_{cum}) metric. Considering the largest impact range from a single piling event for SEL_{cum} is 6,320 m and 7,360 m for concurrent installation for Low Frequency (LF) cetaceans, our view is that the assessment for SEL_{cum} should have been carried out on the concurrent piling as the worst-case scenario instead. **We request justification as to why a single piling event has been used as the worst-case scenario for cumulative SEL.**

We present below in Table D-3 our assessment of the numbers of individuals with the potential for cumulative PTS, noting these are only marginally bigger using the worst-case scenario. Our overall conclusions do not differ or are likely to change but note our separate request for clarification on turbine spacing above.

Table D-3. NatureScot assessment using concurrent piling installation of floating turbine anchors, with a separation of 1.9 km, based on the NMFS (2024) cumulative SEL metric, compared to the Applicant’s assessment using the single piling event. Codes: MW – minke whale; LF – low frequency; HP – harbour porpoise; VHF – very high frequency.

Species	Density	EIA Report values (single)			NatureScot corrected (concurrent)		
		Impact range	No. of animals	% of reference population (UK)	Impact range	No. of animals	% of reference population (UK)
MW (LF)	0.016	125.48	2	0.02	170.18	2.7	0.03
HP (VHF)	0.516	0.131	<1	0	0.194	<1	0

We do not agree that for LF cetaceans a 7,360 km impact radius is ‘highly localised’ in terms of area impacted. In addition, we disagree that short-term impact duration to be between one to seven years and would categorise three years of piling, albeit not continuously, as medium-term duration. However, in terms of the proportion of the population impacted, we agree that this would be a low magnitude for all species. Due to the cumulative PTS not being fully mitigated, we do not agree that the magnitude with embedded mitigation measures would be negligible and instead recommend this remains as low.

A medium sensitivity score underplays the possible consequences of auditory injury from piling, and as such, we advise that the sensitivity should be revised as high for all species.

The significance of impact would be minor or moderate based on the updated sensitivity to auditory injury from pile driving. However, considering the embedded mitigation measures, we would agree with the Applicant's conclusion of **minor** which is **not significant in EIA terms**.

D.4.1.2 Disturbance from Piling

As above, we do not consider this impact to be of a short-term duration. However, we agree with the overall magnitude scoring for all species.

The Applicant has concluded low sensitivity to disturbance for all species with the exception of harbour porpoise, which has been considered as medium. However, there is a large degree of uncertainty around the consequences of disturbance, and we therefore advise that all species are scored as medium.

For grey seal, Risso's dolphin and white-beaked dolphin, the updated sensitivity for disturbance results in a conclusion of **moderate**, which is **significant** in EIA terms.

The Applicant will need to consider the implications of our revised conclusions further, through the development of the Piling Strategy and Marine Mammal Mitigation Protocol (MMMP) with updated assessments, post-consent, to identify reductions to the predicted impact to Risso's dolphins, white-beaked dolphin and grey seal. Given these predicted impacts, we advise that monitoring to validate the EIA Report predictions and better understand the likelihood of these impacts may be required.

D.4.2 Impact 2 – Injury and Disturbance from Subsea Noise Generated During UXO Clearance

We are content that full mitigation measures for auditory injury from UXO clearance can be considered post-consent when more information is known on the exact number and size of the UXOs that will be required to clear. Please note our preference and recommendation for low-order deflagration as the primary method of disposal, in line with UK and Scottish Government guidance. Low-order deflagration has been successfully concluded at another wind farm in Scottish waters²⁰ as a viable method for reducing sound levels and impact ranges.

D.4.2.1 Disturbance from UXO clearance

The Applicant has used TTS onset as a proxy for single detonations and then applied a behavioural threshold of –5 dB from TTS onset for multiple detonations within a 24-hour period, citing NMFS (2024). We are content with this approach.

D.5 Cumulative assessment

During Scoping, it was stated that the full Regional Marine Mammal Study Area would be used, however, only projects that align to the western boundary of the North Sea MU and Greater North Sea MU have been screened in (with the exception of West of Orkney Offshore Wind Farm). Overall, the important species-specific MUs have still been covered, and we are content to accept this approach.

²⁰ Low-order deflagration of unexploded ordnance reduces underwater noise impacts from offshore wind farm construction - <https://oceanwinds.com/wp-content/uploads/2024/05/OW-UXO-BusinessCase.pdf>

The cumulative impact pathways have been correctly identified, with an appropriate level of detail presented.

Table D-4 provides a summary of our conclusions for each impact for the cumulatively.

Table D-4. Ayre EIA Report conclusions and NatureScot revised scores based on our assessment for the project cumulatively. Cells are shaded where our conclusions differ and significant conclusions are in bold. Receptor codes are as follows: CD - common dolphin; BND - bottlenose dolphin; GS - grey seal; MW – minke whale; RD – Risso’s dolphin; WBD – white-beaked dolphin; HP – harbour porpoise; HS – harbour seal.

Effect	Receptor	EIA Report assessment conclusions			NatureScot revised conclusions		
		Magnitude	Sensitivity	Significance	Magnitude	Sensitivity	Significance
Disturbance from piling	HP	High	Medium	Moderate	High	Medium	Moderate
	WBD	Medium	Low	Minor	Medium	Medium	Moderate
	RD	Medium	Low	Minor	Medium	Medium	Moderate
	CD, MW, HS	Low	Low	Minor	Low	Medium	Minor
	GS	Low	Low	Minor	Medium	Medium	Moderate
	BND	Medium	Low	Minor	Medium	Medium	Moderate

D.5.1 Impact 1 – Injury and Disturbance from Subsea Noise Generated During Piling

D.5.1.1 Injury from Piling

Auditory injury from piling has been screened out based on the principle that all project-alone impacts should be mitigated. We are content with this approach.

D.5.1.2 Disturbance from Piling

For harbour porpoise, white-beaked dolphin, Risso's dolphin, grey seal and bottlenose dolphin, the updated sensitivity for disturbance results in a conclusion of **moderate**, which is **significant** in EIA terms. **The Applicant will need to consider the implications of our revised conclusions further, through the development of the Piling Strategy and Marine Mammal Mitigation Protocol (MMMP) with updated assessments, post-consent, for all species considered in the EIA Report.**

D.5.1.3 Tier 3 projects

Tier 3 projects have not been included within the cumulative assessment even though there is a potential spatial and temporal overlap. Our advice for cumulative assessments is that if Tier 3 projects, as outlined in this EIA Report, have identified a timeline for the construction phase and an indicative number of WTGs and OSPs, then EDRs and SCAN IV density estimates can be used to identify the potential number of animals disturbed during the construction period.

Moreover, Green Volt has been excluded from iPCoD modelling as no piling schedule was available at the time. We do not agree with this approach, if a representative piling schedule was not available, then the piling activities should have been spread across the construction period.

However, for most species, the effect is significant in EIA terms, and there would be no material change to our conclusions as a result. **Therefore, we advise that an updated assessment should be provided post-consent, as above.**

D.6 Southern Trench NCMPP Assessment

Minke whale is a protected species of the Southern Trench Nature Conservation Marine Protected Area (NCMPA). For the project alone assessment, we agree that the disturbance from pile driving does not hinder the achievement of the site Conservation Objectives.

Although the assessment uses the capped dose-response, which we do not agree with as per D.3.4.1, we can agree with the conclusion that disturbance from pile driving does not hinder the achievement of the site Conservation Objectives for several reasons in this case:

- The total number of animals disturbed using the full dose-response is 166 for single piling and 252 for concurrent piling.
- Using the unweighted SELs contours which overlap with the NCMPPA, there is a ~10-15% probability of response in individuals within the NCMPPA.
- The closest distance between the NCMPPA and the Proposed Development is approximately 97 km.

A cumulative assessment has not been carried out for the potential for individuals to be disturbed from pile driving events. Based on our experience with similar developments and the reasons outlined above, we are content that the disturbance from pile driving does not hinder the achievement of the site Conservation Objectives when considered cumulatively. However, **we request that the Applicant contributes to post-consent strategic monitoring of the Southern Trench NCPA to validate the assessment conclusions, if consented.**

D.7 Mitigation

Table 10.34 lists the proposed embedded mitigation measures and overall, we are content with those listed, noting that most measures are related to the development of plans, which does not constitute mitigation. Engineering decisions can influence the magnitude of certain impacts, for example, mooring line tautness may correlate to the level of noise produced. Where possible, transient noise from floating wind farm moorings and cables should be reduced as part of the embedded mitigation.

D.7.1 Outline Marine Mammal Mitigation Protocol

In Section 2.2.3, we note the maximum predicted instantaneous PTS range was 1,075 m for harbour porpoise, and we are content that this should be able to be fully mitigated through the use of PAM, ADDs, MMOs, soft start and ramp-up. The details around timings, etc should be agreed post-consent as part of the Piling Strategy, if consented.

Table 7.1 offers a good summary of each impact considered. We advise that adherence to the Scottish Marine Wildlife Watching Code should be included as best practice, as well as embedded mitigation for secondary entanglement of marine mammals with floating structures.

D.7.2 Outline Navigational Safety and Vessel Management Plan (NSVMP)

As above, we advise that adherence to the Scottish Marine Wildlife Watching Code should be included as best practice.

Once ports and harbours have been selected, we recommend that a qualitative assessment of disturbance from specific routes to these harbours is included as an appendix to the NSVMP.

Should the use of uncrewed vessels be considered at any stage of the Proposed Development, bespoke mitigation should be discussed through consultation with NatureScot, to ensure JNCC guidance can be adhered to, particularly in relation to geotechnical and geophysical surveys.

D.8 Monitoring

It is stated that mooring lines will undergo more frequent inspections for the initial two years, decreasing to an annual schedule afterwards. We are content with this from a secondary entanglement perspective, and we would welcome further engagement post-consent.

We advise that monitoring to validate the EIA Report predictions and better understand the likelihood of these impacts of disturbance from piling and UXO clearance will be required. Site-specific noise monitoring during should be undertaken to validate the assessments in the EIA Report and we recommend that the NPL Good Practice Guide (2014)²¹ is followed. Furthermore, **we advise that monitoring of transient noises from mooring lines and cables will be required** due to the lack of understanding of this potential impact.

As above, if consented, **we request that the Applicant contributes to post-consent strategic monitoring of the Southern Trench NCMPA to validate the assessment conclusions.**

D.8.1 Outline Environmental Management Plan

We note that monitoring is highlighted as a critical component of the Outline EMP and we are content that this would be a mechanism where post-consent monitoring for marine mammals could be incorporated. Specifically, we recommend including strategic work for grey seal, Risso's dolphin, white-beaked dolphin, harbour porpoise and bottlenose dolphin, as per EIA conclusions. Strategic work should also include minke whale of the Southern Trench NCMPA, as well as harbour seal (Sanday SAC) and bottlenose dolphin (Moray Firth SAC) based on our HRA advice in D.9.2.2 and D.9.5.2 below.

D.9 RIAA

We note that the following SACs with marine mammal qualifying species have been screened into the Report to Inform Appropriate Assessment (as per RIAA: Part 2 – Special Areas of Conservation):

- Caithness and Sutherland Peatlands SAC – otter
- Sanday SAC – harbour seal
- Dornoch Firth and Morrich More SAC – harbour seal
- Moray Firth SAC – bottlenose dolphin

Overall, we are broadly content with the conclusions reached, such that there is **No Adverse Effect on Site Integrity (AEoSI) for any SAC with marine mammal or otter qualifying species either alone or in-combination.** For disturbance from piling, there are some instances where we disagree with the assessment approach or that the process is unclear. We provide further comments and advice which addresses this below, noting that it does not affect the outcome of the assessment or the overall conclusion of our advice.

D.9.1 Caithness and Sutherland Peatlands SAC – otter – all impacts

The nearest point of the Caithness and Sutherland Peatlands SAC is 2.1 km from the ECC, noting that most of the SAC is beyond the zone where impacts on the SAC otter feature are likely. Otters are semi aquatic and those utilising the coastal habitats restrict their foraging activity to the shallow inshore waters (up to 80m from the shore). Whilst there is potential

²¹ Good Practice Guide for Underwater Noise Measurement, National Measurement Office, Marine Scotland, The Crown Estate, Robinson, S.P., Lepper, P. A. and Hazelwood, R.A., NPL Good Practice Guide No. 133.

for disturbance during the construction phase, this is likely be localised and relatively short-lived/incidental, particularly as otters do not typically forage continuously for many hours at a time.

Table 5.9 summarises the pathways for LSE and potential impacts on otter features. Because only a very small proportion of the total otter population that uses the SAC may be affected by the Proposed Development, we are content with the conclusion that there will be no AEOsI for the otter feature of the SAC, either alone or in-combination.

D.9.2 Sanday SAC – harbour seal – disturbance from piling

D.9.2.1 Project alone

From Table 6.14, we note that disturbance from piling has been assessed against the combined North Coast & Orkney (NC&O) and Moray Firth (MF) SMUs, and we agree with this approach. With a maximum of 3% of the reference population potentially disturbed from piling for the project alone and iPCoD results in Technical Appendix 10.3: Marine Mammal iPCoD Modelling Report (Volume 3) showing no change in the impacted vs unimpacted populations, we are content with the conclusion that there will be no AEOsI for the harbour seal feature of the SAC for the project alone.

D.9.2.2 In-combination

In Table 10.82 of Chapter 10 (EIA, Volume 2) we note that the number of disturbed harbour seals are set out and broken down by projects scoped in for the CEA. However, it is unclear what the overall proportion of the combined NC&O and MF SMUs is cumulatively and hence in-combination for HRA purposes. From our calculations, the cumulative (in-combination) total of the reference population would be 409 animals, and against a reference population of 2,388 for harbour seal (SCOS 2025) this gives a proportion of 17.13%.

For in-combination, we recognise that it is unlikely that all screened in projects could feasibly be piling at the same time, and iPCoD shows no change in population trajectory, thus we are content to conclude no AEOsI. However, we highlight that harbour seal are in decline across the relevant SMUs and counts for the Sanday SAC show a similar trend, with a continuing decline at 14.24% p.a. (95% CIs: 17.87,10.28) since 2006 (SCOS, 2020). Harbour seal is classed as unfavourable declining at Sanday SAC and the conservation objectives (particularly 2b) are relevant in this case.

As such, we request the Applicant to contribute to strategic post-consent monitoring of the Sanday harbour seal population as part of ongoing understanding of the species and their distributional and behavioural responses to marine industries development activities.

D.9.3 Sanday SAC – harbour seal – all other impacts

Providing mitigation measures set out in the MMMP are adhered to, we are content with the screening, justification and overall conclusions for all other impacts assessed, such that there would be no AEOsI for the harbour seal feature of Sanday SAC, either alone or in-combination.

D.9.4 Dornoch Firth and Morrich More SAC – harbour seal – all impacts

We welcome the inclusion of the Dornoch Firth and Morrich More SAC despite it being over the 50km screening distance for harbour seal, due to telemetry studies showing overlap with the potentially impacted area. We are content that this was a precautionary approach, due to the irregular use of, the proposed array area by the SAC harbour seals. We are content with the conclusion that there will be no AEoSI for the harbour seal feature of the SAC, either alone or in-combination.

D.9.5 Moray Firth SAC – bottlenose dolphin – disturbance from piling

D.9.5.1 Project alone

In the modelled density surface maps from Gilles *et al.* 2025, Figure 10.11 of Chapter 10 (EIA, Volume 2), it shows a raised density of bottlenose dolphin along the southern coast of the Moray Firth. Whilst each 10km grid cell is spatially explicit, there is a maximum of 0.15 animals/km². This is comparable to the numbers submitted in recent applications, which we have advised / accepted for assessment of the CES bottlenose dolphin coastal strip.

Section 6.2.15 explains that as the modelled density surfaces from SCANS IV reflect the coastal distribution of bottlenose dolphin, the average density of 0.004 animals/km² was most appropriate for the assessment of the CES MU. We do not agree that this figure is representative of the CES coastal strip, particularly along the southern coast of the Moray Firth extending to the Forth & Tay.

However, we recognise that sightings of bottlenose dolphin along the northern coastline (the small section of the CES where the 140 dB extends to) and Orkney are lesser than in the core areas of the CES coastal strip and it may be appropriate in this instance to use this lower average density.

In Section 6.3.25, it is implied that the Applicant has run iPCoD with the CES population of 226, however, this is misleading as the Technical Appendix 10.3: Marine Mammal iPCoD Modelling Report (Volume 3) explains that iPCoD has only been run with CES and GNS combined, which is not our advised approach. Our standard advice is that these two populations are assessed separately. However, given the small overlap of the 140dB contour with the CES coastal strip and the infrequent sightings of bottlenose along the northern coast, we agree with the overall conclusions that there will be no AEoSI for the bottlenose dolphin feature of the SAC for the Proposed Development alone.

D.9.5.2 In-combination

Sections 6.4.14-6.4.23 make no mention of the total number of bottlenose dolphin impacted from the CES in-combination. Based on Table 6.14, there could be a contribution of up to 10 animals (4.29% of the CES) from the Proposed Development. From the information in the CEA of Chapter 10 (EIA, Volume 2) and from our experience of reviewing cumulative assessments for the CES bottlenose dolphin, around 15% of the CES MU could potentially be disturbed in-combination.

Whilst overall we agree with the conclusion in Section 6.4.23, that there is no AEOI in-combination, if consented and the MMMP and Piling strategy indicate that this predicted impact remains as is, then we will **request the Applicant to contribute to strategic post-consent monitoring of the Moray Firth bottlenose dolphin population as part of ongoing understanding of the species and their distributional and behavioural responses to marine industries development activities.**

D.9.6 Moray Firth SAC – bottlenose dolphin – all other impacts

Providing mitigation measures set out in the MMMP are adhered to, we are content with the screening, justification and overall conclusions for all other impacts assessed, such that there would be no AEOI for the bottlenose dolphin feature of Moray Firth SAC, either alone or in-combination.

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix E – Offshore and intertidal ornithology – EIA

The marine ornithology interests are presented in the following documents:

- Volume 2 – Chapter 11 – Ornithology EIA Report
- Volume 3 – Technical Appendix 11.2 - Nearshore, Intertidal and Offshore Ornithology Along the Export Cable Corridor Baseline Report
- Volume 3 – Technical Appendix 11.4 - Collision Risk Model Technical Report
- Volume 3 – Technical Appendix 11.5 – Migratory Bird CRM
- Volume 3 – Technical Appendix 11.6 – Apportioning Technical Report
- Volume 3 – Technical Appendix 11.6 – Annex A – Apportioning Technical Report – or Annex A – Distances used
- Volume 3 – Technical Appendix 11.6 – Annex B - Apportioning Technical Report - Annex B – full breeding season reports
- HRA – RIAA – P3A – Special Protection Areas and Ramsar Sites
- Volume 3 – Technical Appendix 11.7 – PVA Technical Report

E.1 Summary

E.1.1 Proposal alone assessment

We agree with the Applicant’s conclusion of **not significant** adverse impact for proposal alone impacts under EIA.

E.1.2 Cumulative assessment

We conclude that the cumulative effects are **significant** in EIA terms, both including and excluding Berwick Bank Offshore Wind Farm for:

- Kittiwake through collision and displacement
- Razorbill through displacement
- Puffin through displacement

We conclude that the cumulative effects are **significant** in EIA terms for the following species, where a Berwick Bank Offshore Wind Farm scenario was not included in the assessment due to a lack of connectivity or assessment of this species by Berwick Bank Offshore Wind Farm

- Great black-backed gull through collision
- Herring gull through collision
- Guillemot through displacement

We conclude that the cumulative effects are **not significant** in EIA terms for Gannet, both including and excluding Berwick Bank Offshore Wind farm.

In line with established EIA practice, we expect the full mitigation hierarchy to be considered where a significant adverse effect is identified.

Without prejudging the outcome of the Appropriate Assessment (discussed further in Appendix F), we anticipate, should consent be granted, that compensatory measures would need to be secured for kittiwake, herring gull, guillemot, razorbill, and puffin. We consider that agreed compensation measures would be sufficient to address impacts predicted under EIA for these species.

We were unable to make a conclusion for great black-backed gull due to multiple errors in the assessment of this species. We discuss this matter further in Appendix F.

E.2 Content and quality of the application

The application is of a high quality. The assessments and results are clearly presented. The inputs and outputs are provided in sufficient detail for the working to be checked, and the calculations appear to have been mostly performed correctly. Our guidance and advice have largely been followed. There are a small number of minor errors, however, these do not impact our conclusions for the EIA.

E.3 Methodology and approach to assessments

The approach to collating colony counts for apportioning in the HRA and the regional population estimate in the EIA included counts from surveys prior to those included in Seabirds Count²². Counts from 2000 to 2014 are likely to be inaccurate. Great black-backed gull in particular has experienced severe population declines, and post-Seabirds Count data is available and more contemporaneous to the DAS regime. The outputs in the EIAR for great black-backed gull should therefore be considered with caution.

E.4 Specific comments on aspects of the assessment process

E.4.1 Methodology - Selection of Valued Ornithological Receptors for EIA

“Valued Ornithological Receptors” (VORs) were identified based on the abundance of bird species within the Offshore Ornithology Study Area, their vulnerability to an impact pathway, their conservation status and their status as a qualifying feature of SPAs or Ramsar site with theoretical connectivity to the proposed development.

As advised previously in correspondence with the developer (dated 10 October 2025), we are content with the list of VORs identified.

E.4.2 Leach’s storm petrel

As a minor note - the Applicant states that Leach’s storm petrels would be unlikely to be utilizing the proposed development area, citing three studies which show that petrels

²² Burnell, D., Perkins, A.J., Newton, S.F., Bolton, M., Tierney, T.D., & Dunn, T.E. (2023). Seabirds Count: a census of breeding seabirds in Britain and Ireland (2015-2021)

remain in the intertidal zone during the night. However, we note that all three sources cited are studies of European storm petrels, not Leach's storm petrels, and that none of these studies were performed in Scotland.

As these studies were performed on a different species, and in different locations where the foraging environment may be different, the results may not be indicative of the nocturnal behaviour of Leach's storm petrels in Scotland throughout the year.

Leach's storm petrel foraging behaviour and diet can vary significantly depending on the location. However, Leach's storm petrels do commonly forage in deep waters (>1000m) at night, as they primarily prey on myctophid fishes only present at the seas surface during the night, and which occur beyond the continental shelf (Deakin et al., 2022²³). Therefore, the Applicant's suggestion that Leach's storm petrels may not be present in the offshore area at night is not supported by the cited literature.

We note they are not assessed further within the EIA assessment, and we do not request further information or assessment.

E.4.3 Technical Appendix 11.2 Nearshore, Intertidal and Offshore Ornithology along the Export Cable Corridor Baseline Report

E.4.3.1 Methods

The Export Cable Corridor (ECC) Study Area consists of the export cable corridor route plus a 10km buffer up to mean high water springs (MHWS). Four designated sites fall within this study area: North Caithness Cliffs SPA, East Caithness Cliffs SPA, Caithness and Sutherland Peatlands SPA and Ramsar and Caithness Loch SPA and Ramsar. The Applicant identified key species for the ECC baseline surveys based on the species which are qualifying interests at these sites.

The Applicant performed intertidal surveys over one non-breeding season (September 2023 to March 2024), and nearshore vantage point surveys over one breeding season (June 2024 to September 2024). The methodology of these surveys follows industry standards.

E.4.3.2 Results

The most abundant species recorded in the intertidal surveys were wigeon, turnstone, ringed plover, red shank and oystercatcher during high tide, and wigeon, oystercatcher, ringed plover, redshank, curlew, greylag geese, dunlin and turnstone during low tide.

The most abundant species recorded during the breeding season nearshore surveys were common gull, herring gull, curlew, oystercatcher, common tern, common ringed plover, gannet, and shag.

The Applicant has assessed whether the abundance of the species designated for the four nearby SPAs exceeds 1% of the SPA population. This threshold is exceeded for cormorant at

²³ Deakin, Z., Cook, A., Daunt, F., McCluskie, A., Morley, M., Witcutt, E., Wright, L., and Bolton, M., A review to inform the assessment of the risk of collision and displacement in petrels and shearwaters from offshore wind developments in Scotland, Scottish Government, 2022

East Caithness Cliffs SPA (peak count of 5 = 2.17%) and greenshank at Caithness and Sutherland Peatlands SPA (peak count of 7 = 1.07%).

E.4.3.3 Applicant's survey data vs WeBs data

The Applicant has also provided a comparison of the survey data and WeBs data covering high tide counts from 2022 to 2023, and the five-year average peak count from 2018/19 to 2022/23. This comparison is very helpful and provides a means for the Applicant's survey data to be further supported.

A number of species that were not identified as being present in significant numbers in the Applicant's surveys, were present in higher numbers in the WeBs data: pink-footed geese, long-tailed duck, great northern diver, lapwing, golden plover, shag, and great black-backed gull.

Table E-1. Bird species where the peak count from the intertidal surveys was significantly lower than peak count data from WeBS.

Species	Peak count from intertidal surveys	Peak WeBS count data (2022/2023)	Average five-year peak WeBs count data
Pink-footed goose	0	17	77
Long-tailed duck	4	41	31
Great Northern Diver	0	17	24
Lapwing	0	0	117
Golden Plover	2	0	58
Shag	7	36	96
Great black-backed gull	3	25	23

We do note that the WeBs count data covers the entire Bay, while the ECC study area covers only a portion of the Bay, and as such, the differences between the WeBs count data and the Applicant's intertidal and nearshore survey data may be due to an uneven distribution of birds. Alternatively, the snapshot nature of surveys means that these species may be utilizing the ECC study area but were not present during the survey days and times.

Of these species, only two – shag and great black-backed gull, are designated species at one of the four nearby SPAs (East Caithness Cliffs SPA). If the peak WeBs count were to be used to calculate the percentage of the SPA population potentially present at the site, the 1% threshold would be exceeded for these species.

We therefore recommend that cable construction activities should be planned with the potential impacts to the species identified within the WeBs data in mind, as well as those identified from the Applicant's surveys. The geese, ducks, waders, and divers were likely present in these numbers during the non-breeding season, and this could be determined from a closer examination of the WeBs data. Therefore, the ECC construction activities, currently planned for the breeding season of 2031, would be unlikely to impact these species. Great black-backed gulls are unlikely to be sensitive to disturbance caused by

construction activities (Wade et al., 2016)²⁴. Shag has been taken forward as a VOR and has therefore already been considered by the Applicant.

E.4.3.4 Incorporation of results into the assessment

Greenshank were not selected as a VOR in the EIA assessment's qualitative assessment, despite the peak number of greenshanks seen being over 1% of Caithness and Sutherland Peatlands SPA (peak count of 7 = 1.07%). This peak occurred during the breeding season vantage point surveys. As greenshank were present in only two months, in small numbers, and were not recorded in the WeBs data presented, we are content for greenshank to not be selected as a VOR.

Shag and cormorant were selected as VORs in the EIA assessment's qualitative assessment for their presence in the nearshore and intertidal survey area and the connectivity of East Caithness Cliffs SPA to the ECC study area. Wigeon were also screened in for qualitative assessment for impacts within the Export Cable Corridor due to the high number of individuals observed within the nearshore and intertidal surveys.

E.5 Technical Appendix – 11.4 Collision risk modelling technical report

The approach to collision risk modelling (CRM) follows NatureScot guidance. CRM was conducted for gannet, kittiwake, great black-backed gull, herring gull and Arctic tern. CRM was undertaken for the Array Area with Band CRM and sCRM via the sCRM shiny app (version 0.1.1; Caneco, 2022). Option 2 was used as advised in the Ayre Offshore Scoping Opinion (MD-LOT, 2024). Two scenarios were modelled, the worst-case scenario (WCS) and the most likely scenario (MLS). The WCS includes the use of maximum rotation speeds with fixed foundation wind turbines and no curtailment.

The seabird parameters used match NatureScot guidance, and a CRM has been performed for gannet with a 70% macro avoidance rate in the non-breeding season, as per NatureScot advice. Band CRM was undertaken for the highest and lowest nocturnal activity levels of great black-backed gull and herring gull.

A 0% nocturnal flight activity has been applied for Arctic tern, based on a score of 1 out of 5 from Garthe and Huppopp (2004). NatureScot's current advice is that a nocturnal flight activity proportion of 0.125 should be applied for Arctic tern, as in West of Orkney's additional information (West of Orkney Windfarm, Offshore Ornithology SEI, Annex 3B. CRM input parameters from NatureScot March 2024). However, due to the small difference in Nocturnal Activity Factor (NAF) proportions and the very low predicted impacts to Arctic tern, we are content to accept the results of this assessment.

We are content with the methodology used for the CRM analysis.

²⁴ Wade, H.M., Masden, E.A., Jackson, A.C., and Furness, R.W., Incorporating data uncertainty when estimating potential vulnerability of Scottish seabirds to marine renewable energy developments, Marine Policy, Volume 70, 2016

E.6 Technical Appendix 11.5 – Migratory bird CRM technical report

The approach to collision risk modelling for migratory birds follows NatureScot guidance. The Applicant has used both the Strategic Ornithological Support Services Migration Assessment Tool (SOSSMAT) and mCRM shiny tool to calculate migratory collision mortalities, allowing a comparison of the two approaches.

The mCRM analysis found that most migratory birds have a collision estimate of below 0.5 of a bird, except for wigeon, teal, mallard, golden plover, dunlin and turnstone. These species were taken forward to EIA and HRA, along with shelduck, tufted duck, common scoter, lapwing, snipe, and redshank (*Tringa totanus robusta* and *T. t. totanus*).

We are content with the methodology used for the migratory bird CRM.

E.7 Technical Appendix 11.6 – EIA and RIAA P3A SPA apportioning technical report

The approach used for apportioning seabirds to SPA and non-SPA colonies follows NatureScot guidance. Sites have been screened into the apportioning process using foraging distance, with distances between sites and the project area measured from the closest edge to the closest edge. Apportioning calculations used distances measured from the geometric centre to the geometric centre.

For the breeding season the proportion of the population which was apportioned to adults was calculated using adult proportions calculated from DAS for gannet and kittiwake and derived from survival rates presented in Horswill and Robinson (2015) for other species. Due to difficulties in identifying different age classes of kittiwakes, and a likely underestimation of immature birds, the DAS based age proportions were corrected using values from Horswill and Robinson (2015). We are content with this approach to calculating adult proportions.

For the non-breeding season, the proportion of the Biologically Defined Minimum Population Size (BDMPS) which was apportioned to adults was calculated using the “immatures per adult” values calculated by Furness et al 2015. This is an appropriate approach. We are also content with the sabbatical rates applied within the RIAA.

We have checked the apportioning calculations for a subset of the species: Arctic tern, common guillemot, and great black-backed gull. The apportioning calculations have been carried out correctly. We have found some issues with the collation of colony counts, described below with detail provided in Annex 1. These errors, however, did not significantly affect our conclusions for the EIA assessment.

E.7.1 Arctic tern colony counts

There are some issues with the use of colony counts for Arctic tern, which affect the apportioning values used in the RIAA and the breeding season regional population used in the EIA. However, the difference between the colony counts calculated by the Applicant,

and those calculated when the correct corrections is applied is relatively small and does not affect the apportioning or the regional population estimate significantly. Therefore, this issue does not impact our conclusions in either the HRA or the EIA. We discuss this and some other issues identified relating to apportioning in Annex 1.

E.7.2 Colony count time period

Colony counts collated for the SPA apportioning and the EIA regional population estimate were primarily taken from Seabirds Count and were supplemented with counts taken from the SMP database for sites, which were last counted between 2000 and 2015 (paragraph 3.2.6, RIAA: Part 3, Appendix 3A: Offshore Ornithology SPA apportioning technical report and paragraph 2.2.6, EIA report Volume 3, Technical Appendix 11.6: Offshore ornithology apportioning technical report). Considering the significant population changes which have occurred in the past 25 years, it is probable that counts from 2000 to 2014 will be the most appropriate to use as they appear to lead to an over-estimation of the regional population size, and subsequently affect the apportioning to SPA. We discuss this issue further in Annex 1.

E.7.3 Linga Holm – great black-backed gull

The number of great black-backed gulls at Linga Holm has been overestimated due to confusion caused by changes in survey section names. Please see Annex 1 for further detail.

E.7.4 Summary of comments on apportioning

Our interpretation of the results of the great black-backed gull assessments have additional caution due to our low confidence in the colony counts used in the assessments.

We are content to accept the apportioning and regional population estimates used for the other key species.

E.8 Technical Appendix 11.7 – EIA Population Viability Analysis (PVA)

The approach to the PVA performed for the EIA follows NatureScot guidance. PVAs were conducted for great black-backed gull (collision), herring gull (collision), guillemot (displacement), razorbill (displacement), puffin (displacement), gannet (collision and displacement) and kittiwake (collision and displacement). PVA was undertaken using the R version of the Seabird PVA Tool developed by Natural England (Version 2, Searle et al., 2019). The methods and input parameters used in the PVA modelling fit with NatureScot guidance and advice.

We are content with the methodology used for the EIA PVA assessment.

E.9 Impact Assessment

The following impacts were scoped out of the assessment for Offshore Ornithology:

- Collision risk with substructure and underwater infrastructure

- Accidental release of contaminants
- Permanent habitat loss

We are content for these impacts to be scoped out.

E.9.1 Impact 1 – Collision risk mortality

Impacts due to collision risk mortality were assessed quantitatively for Arctic tern, gannet, kittiwake, great black-backed gull, and herring gull. The collision risk modelling was performed as per NatureScot's guidance, and we are content with how the assessment of this impact has been performed for these VORs.

E.9.2 Impact 2 – Distributional responses

Impacts due to displacement were assessed quantitatively for fulmar, gannet, kittiwake, guillemot, razorbill and puffin. The displacement assessment was undertaken according to NatureScot's guidance, and we are content with how the assessment of this impact has been performed for these VORs.

E.9.3 Impact 3 – Disturbance and displacement to birds from vessel movements

In the maximum design scenario, vessel movements during the construction phase are planned to consist of a maximum of 46 vessels on site at any one time, totalling 2,823 return trips over the 5 years of the construction period. A maximum of two helicopters on site at any one time, totalling 290 return trips during construction is also planned.

In the maximum design scenario: vessel movements during the operation and maintenance (O&M) phase, the maximum number of vessel movements occurs for floating foundations. This consists of a maximum of 12 vessels on site at any one time, totalling 662 return trips per year, and a maximum of 2 helicopters on site at any one time, totalling 12 return trips per year.

We agree with the species scoped in for assessment.

E.9.3.1 Within the array area

The Applicant has quantitatively estimated the potential annual mortality due to distributional responses to vessel activity within the Array Area at a given time using peak density estimates recorded in DAS and displacement matrices. We welcome the Applicant's quantitative approach to this impact and found it very helpful in assessing this impact. The resulting predicted mortality estimates are very low, and do not represent a significant proportion of the regional population.

Due to the short term and small extent of each incidence of disturbance and displacement due to increased vessel movements, the Applicant has determined that the magnitude of impact for all VORs within the Array Area is negligible. Therefore, the Applicant has

concluded that the impacts of vessel activity within the Array Area will not be significant in EIA terms

We are content with the conclusion of **not significant** for this impact.

E.9.3.2 Within the Export Cable Corridor

Activities related to the installation of the Offshore Export Cables are only expected to occur during Quarter 2 and 3 of 2031 and are therefore expected to be short term in nature. Due to the lower numbers and nature of the vessel activity associated with construction of the Export Cable Corridor, and the short time period for installation, the Applicant determined that the magnitude of impact for all VORs within the Export Cable Corridor is negligible and therefore not significant.

We are content with the conclusion of **not significant** for this impact.

E.9.3.3 Between ports and the proposed development

The Applicant states that the exact routes and ports to be used during all phases of the Proposed Development are unknown but may be similar to those identified for the West of Orkney OWF. These ports include Scapa Deep Water Quay (proposal), Port of Nigg, Port of Ardersier and Port of Cromarty. Consequently, the following species have been screened in for assessment: common eider, common scoter, goldeneye, great northern diver, long-tailed duck, red-breasted merganser, red-throated diver, scaup, shag, Slavonian grebe and velvet scoter at Moray Firth SPA; and black-throated diver, common eider, great northern diver, long-tailed duck, red-breasted merganser, red-throated diver, shag and Slavonian grebe at Scapa Flow SPA. The Applicant also notes that the red throated diver feature of Hoy SPA and Orkney Moors SPA is functionally linked to Scapa Flow SPA.

SPA specific assessments have been carried out for these SPAs in the RIAA part 3: Special Protection Areas and Ramsar Sites. We provide further advice on European designated sites in Appendix F, noting that this assessment and our conclusions are preliminary at this stage and if consented, this is likely to be further refined and should be reconsidered and discussed further with NatureScot.

The Outline Navigation Safety and Vessel Management Plan provided in Volume 4, Appendix 29 does not currently provide details of how bird sensitivities will be considered, however, the intent to address this aspect pre-construction is stated.

We welcome the implementation of a NSVMP, and would also recommend that vessels should take care to follow the principles of the [Scottish Marine Wildlife Watching Code](#).

E.9.4 Impact 4 - Disturbance to prey species and their habitats

During construction, up to 4.11% of the total site boundary (15,951,469 m²) of subtidal habitat is expected to be temporarily lost and/or disturbed due to sand wave clearance and deposition, cable installation, the removal of disused cables, jack up operations and

clearance of Unexploded Ordnance (UXO). During the O&M phase up to 0.68% of the total site boundary (2,632,500m²) is expected to be temporarily lost and/or disturbed over the 30-year lifecycle of the proposed development, due to cable reburial/protection for repair.

We agree with the species scoped in for this impact. The Applicant states that construction activities will be restricted temporally and spatially, affecting only a small area of the site at any one time. The impacts associated with construction will be confined to the construction period only, and once this phase concludes adverse impacts will cease and any changes to prey species are likely to be reverted. The impact on ornithological receptors is predicted to be of local spatial extent, medium duration, intermittent and reversible. The Applicant therefore considered the magnitude to be negligible and the impacts to be **negligible to minor**.

Volume 2, chapter 9: fish and shellfish, predicts a moderate adverse impact on herring due to subsea noise. The mitigation proposed for herring in Appendix C will also be important for reducing impacts to the species as important prey for the surrounding seabird population.

Based on benthic surveys, the whole of the array area has sediment suitable for sandeel. As stated in Appendix C, sandeel are an important prey species for puffin, kittiwake and razorbill. These species have limited foraging ranges and without specific information on alternative feeding areas, these may be beyond their range. We note the overall significance of impacts has been assessed as minor, which is not significant in EIA terms. As stated in Appendix C, we are of the view that more consideration should be given to the impacts on sandeel, given their conservation importance. In particular, without knowing where the location of alternative resources are, or the limitations of the species targeting this prey species, we consider that the conclusions have not been fully justified.

E.9.5 Impact 5 - Temporary habitat loss and/or habitat disturbance

Temporary habitat loss and/or habitat disturbance is expected to consist of the 4.11% of the total site boundary temporarily lost and/or disturbed due to construction activities, and the vessel movements outlined in the sections above. Additionally, up to one wind turbine will be towed at any one time, with 59.7 hours of towing to site at a speed to 2 knots.

We agree with the species scoped in for assessment. The impact is predicted to be of local spatial extent, intermittent and medium-term duration, (only a small proportion of the total area will be affected at any one time, with individual elements of construction having much shorter durations) and will affect any birds in the vicinity of these activities directly. The construction disturbance and temporary loss of habitat impacts will also be of high reversibility. The Applicant considers the magnitude to be negligible for all species being considered for habitat disturbance and/or temporary loss of habitat impacts (kittiwake, guillemot, razorbill, puffin, fulmar and gannet).

We are content with the conclusion of **not significant** for this impact.

E.9.6 Impact 6 - Attraction to light

Impacts due to attraction to light may occur due to aviation lighting (winching lights, periphery WTG lights, and OSPs).

Manx shearwater and European storm petrel were scoped in for this impact.

The Applicant states that fledgeling Manx shearwater and European storm petrels are the main individuals at risk of being attracted to artificial lighting at the proposed development. The Applicant also highlights that the red, flashing aviation lighting used in the Proposed Development, is less likely to result in attraction than other types of lighting. The Applicant has therefore determined that the impacts of light attraction will be negligible and therefore not significant in EIA terms.

We are content with the conclusion of **not significant** for this impact.

E.9.7 Impact 7 - Entanglement

The impact is predicted to be of local spatial extent, long-term duration, continuous and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude of impact is therefore considered to be negligible, and of minor significance.

We are content with the conclusion of **not significant** for this impact.

E.9.8 Impact 8 - Direct impacts from Unexploded Ordnance (UXO) clearance

UXO clearance activity will be intermittent and of local spatial extent throughout the construction phase (Table 11.9), affecting only birds in the vicinity of these activities directly. Therefore, the magnitude of UXO clearance is considered to be negligible. Given the magnitude of impact is negligible, and the sensitivity is very high, the significance of the effects on all diving VORs are concluded to be of Minor adverse significance, which are not significant in EIA terms.

We are content with the conclusion of **not significant** for this impact.

E.9.9 Impact 9 - Indirect impacts from construction/decommissioning noise

Indirect impact of construction noise will be intermittent and of local spatial extent throughout the construction phase, affecting only birds in the vicinity of these activities directly. Therefore, the indirect impacts of construction noise are considered to be negligible, and the sensitivity of species is considered to be high. Therefore, the effect of the indirect impact of noise in the construction phase is of Minor adverse significance to the population which is not significant in EIA terms.

We are content with the conclusion of **not significant** for this impact.

E.9.10 Export Cable Corridor and landfall construction activities.

VORs within the ECC are expected to experience barrier effects and disturbance caused by construction activities associated with the laying of the Offshore Export Cables. As this activity would occur during the breeding season, the species expected to be impacted would be those identified through the breeding season vantage point surveys, and species designated as breeding season features of the nearby SPAs.

Construction activities are expected to be temporary with a limited spatial extent and are expected to occur in Quarter 2 and 3 of 2031. As the effect of displacement is only expected to occur infrequently over a small spatial extent within the Export Cable Corridor for a limited time during the construction phase of the Proposed Development, the Applicant considered the magnitude of impact to be negligible.

The Applicant therefore concludes that impacts of displacement caused by construction activities on shag, cormorant and wigeon would be negligible to minor and therefore not significant. Displacement from activities for the ECC during the O&M phase are expected to be equal to or less than those carried out during the construction phase.

We are content with the conclusion of **not significant** for this impact.

In addition to the mitigation proposed, we would also recommend that vessels involved in ECC survey and construction activities should follow the principles of the [Scottish Marine Wildlife Watching Code](#).

E.10 Cumulative effects assessment (CEA) approach

The Cumulative Effects Assessment (CEA) performed by the Applicant includes projects which fall under Tiers 2 and 3 of the Applicant's tiered approach to the CEA.

- Tier 2: Projects that have an application submitted, are consented, under construction or operational to the extent not already captured within the baseline.
- Tier 3: Projects which have submitted a Scoping Report and/or have received a Scoping Opinion.

The long list of projects was narrowed down into a short list for each species using the recommended foraging ranges and BDMPs region. However, this screening appears to have been performed based on whether the distance between Ayre's proposed development and a given project exceeded the foraging range, rather than whether a seabird colony is within foraging range of both Ayre's proposed development and another project. However, as we have concluded significant impacts for kittiwake, great black-backed gull, herring gull, guillemot, razorbill and puffin based on the current assessment, our conclusions for these species would not be affected by adopting this standard approach. Our conclusion of no significant impact on gannet would also be unaffected by changing to this standards approach, due to the large foraging range of this species.

Several projects in tier 3 were excluded due to limited available information: Arven, Bellrock, Broadshore Hub, Bowdun, Buchan, Dogger Bank D, Havbredey, Marram, Morven, Spiorad na Mara, and Stromar. One Tier 2 project, Buchan OWF, was assessed as a Tier 3 project due to timing, and was not included within the quantitative assessment. The Applicant has provided a summary of the results of Buchan OWF's assessment for context.

We also note that projects where compensation is agreed have not been excluded.

Impacts due to collision risk, and distributional responses were assessed within the CEA. The Applicant appears to have re-calculated collision and displacement mortalities for each application. Limited detail has been provided, however, the methodology outlined does match NatureScot guidance for CRM and displacement assessment.

E.11 Cumulative Assessment – Results

We agree with the Applicant's conclusion of **not significant** adverse impact for gannet under the cumulative assessment, including and excluding Berwick Bank Offshore Wind Farm.

We conclude that the cumulative effects are **significant** in EIA terms, both including and excluding Berwick Bank Offshore Wind Farm for:

- Kittiwake through collision and displacement
- Razorbill through displacement
- Puffin through displacement

E.11.1 Kittiwake

The Applicant concludes a **Moderate adverse** cumulative impact for kittiwake from the combined effects of collision and displacement, which is significant in EIA terms.

However, we conclude that the cumulative effects on kittiwake in the regional population would result in a **Major Adverse** impact both including and excluding Berwick Bank. This conclusion is based on:

- The low Counterfactual of Population Size (CPS) values, which represent a decrease in the regional population size after 30 years of 14.7 to 17.9% excluding Berwick Bank, and 16.1 to 22.6% including Berwick Bank.
- The relatively low Counterfactual of Growth Rate (CGR)CGR values, which represent a decrease in the population growth rate after 30 years of 0.5 to 0.6% excluding Berwick Bank, and a 0.6 to 0.8% including Berwick Bank.
- The status of the kittiwake population, with a 57% decrease in Scottish and a 43% decrease in the UK populations between Seabird 2000 and Seabirds Count.

Table E-2. Summary of the results of the cumulative impact assessment for kittiwake, including collision and displacement mortality estimates and the resulting counterfactuals from the 30-year PVA assessment.

Project contribution to mortality		30-year PVA results		
Collision	Displacement	Scenario	Median CGR	Median CPS
17.89	3 to 11	Excluding BB	0.994 (0.994-0.994) to 0.995 (0.995-0.995)	0.821 (0.812-0.830) to 0.853 (0.944-0.863)
		Including BB	0.992 (0.991-0.992) to 0.994 (0.994-0.995)	0.774 (0.764-0.783) to 0.839 (0.829-0.848)

E.11.2 Razorbill

The Applicant concludes a Moderate adverse cumulative impact for razorbill from displacement, which is significant in EIA terms.

However, we conclude that the cumulative effects on razorbill in the regional population would result in a **Major Adverse** impact. This conclusion is based on:

- The very low CPS values, which represent a decrease in the regional population size after 30 years of 17.1 to 40.9% excluding Berwick Bank, and 18.5 to 43.9% including Berwick Bank.
- The low CGR values, which represent a decrease in the population growth rate after 30 years of 0.6 to 1.7% excluding Berwick Bank, and 0.7 to 1.8% including Berwick Bank.
- The status of the razorbill population, with a 2% decrease in Scottish and a 18% increase in the UK populations between Seabird 2000 and Seabirds count.

Table E-3. Summary of the results of the cumulative impact assessment for razorbill, including displacement mortality estimates and the resulting counterfactuals from the 30 year PVA assessment.

Project contribution to mortality		30-year PVA results		
Displacement		Scenario	Median CGR	Median CPS
29 to 57		Excluding BB	0.983 (0.983-0.984) to 0.994 (0.994-0.994)	0.591 (0.579-0.602) to 0.829 (0.817-0.841)
		Including BB	0.982 (0.981-0.982) to 0.993 (0.993-0.994)	0.561 (0.549-0.571) to 0.815 (0.802-0.827)

E.11.3 Puffin

The Applicant concludes a Minor adverse cumulative impact for puffin from displacement, which is not significant in EIA terms.

However, we conclude that the cumulative effects on puffin in the regional population would result in a **Moderate Adverse** impact, and the impact would therefore be **significant** in EIA terms. This conclusion is based on:

- The low CPS values, which represent a decrease in the regional population size after 30 years of 8.9 to 16.8% excluding Berwick Bank, and 10.3 to 19.5% including Berwick Bank.
- The relatively low CGR values, which represent a decrease in the population growth rate after 30 years of 0.3 to 0.6% excluding Berwick Bank, and 0.3 to 0.7% including Berwick Bank.
- The status of the comparable puffin population, with a 32% in Scottish and a 23% decrease in the UK populations between Seabird 2000 and Seabirds count.

Table E-4. Summary of the results of the cumulative impact assessment for puffin, including displacement mortality estimates and the resulting counterfactuals from the 30 year PVA assessment.

Project contribution to mortality	30-year PVA results		
	Scenario	Median CGR	Median CPS
22 to 48	Excluding BB	0.994 (0.993-0.995) to 0.997 (0.996-0.998)	0.832 (0.812-0.852) to 0.911 (0.889-0.932)
	Including BB	0.993 (0.992-0.994) to 0.997 (0.996-0.997)	0.805 (0.785-0.824) to 0.897 (0.874-0.918)

We conclude that the cumulative effects are **significant** in EIA terms for the following species, where a Berwick Bank Offshore Wind Farm scenario was not included in the assessment due to a lack of connectivity or assessment of this species by Berwick Bank Offshore Wind Farm

- Great black-backed gull through collision
- Herring gull through collision
- Guillemot through displacement

E.11.4 Great black-backed gull

The Applicant concludes a Major adverse cumulative impact for great black-backed gull from collision, which is significant in EIA terms.

We also conclude that the cumulative effects on great black-backed gull in the regional population would result in a **Major Adverse** impact. This conclusion is based on:

- The low CPS values, which represent a decrease in the regional population size after 30 years of 28.6% excluding Berwick Bank.
- The low CGR values, which represent a decrease in the population growth rate after 30 years of 1.1% excluding Berwick Bank.

- The status of the great black-backed gull population, with a 63% decrease in Scottish and a 52% decrease in the UK populations between Seabird 2000 and Seabirds count. Great black-back gulls have continued to decline since Seabirds Count.
- Our low confidence in the regional population estimate used in the assessment, which we believe may significantly overestimate the regional population.

Table E-5. Summary of the results of the impact assessment for great black-backed gull, including collision mortality estimates and the resulting counterfactuals from the 30 year PVA assessment.

Project contribution to mortality	30-year PVA results		
Collision	Scenario	Median CGR	Median CPS
21.83	Excluding BB	0.989 (0.989-0.989)	0.714 (0.708-0.720)

E.11.5 Herring gull

The Applicant concludes a Major adverse cumulative impact for herring gull from collision, which is significant in EIA terms.

We also conclude that the cumulative effects on herring gull in the regional population would result in a **Major Adverse** impact. This conclusion is based on:

- The very low CPS values, which represent a decrease in the regional population size after 30 years of 33.5% excluding Berwick Bank
- The low CGR values, which represent a decrease in the population growth rate after 30 years of 1.3% excluding Berwick Bank
- The status of the coastal herring gull population, with a 45% decrease in Scottish and a 45% decrease in the UK populations between Seabird 2000 and Seabirds count.

Table E-6. Summary of the results of the cumulative impact assessment for herring gull, including collision mortality estimates and the resulting counterfactuals from the 30-year PVA assessment.

Project contribution to mortality	30-year PVA results		
Collision	Scenario	Median CGR	Median CPS
7.9	Excluding BB	0.987 (0.985-0.988)	0.665 (0.628-0.701)

E.11.6 Guillemot

The Applicant concludes a **Minor adverse** cumulative impact for guillemot from displacement, which is not significant in EIA terms.

However, we conclude that the cumulative effects on guillemot in the regional population would result in a **Moderate Adverse** impact, and the impact would therefore be **significant** in EIA terms. This conclusion is based on:

- The low CPS values, which represent a decrease in the regional population size after 30 years of 7.4 to 13.7% excluding Berwick Bank.
- The low CGR values, which represent a decrease in the population growth rate after 30 years of 2.0 to 4.5% excluding Berwick Bank.
- The status of the guillemot population, with a 31% decrease in Scottish and a 11% decrease in the UK populations between Seabird 2000 and Seabirds count.

Table E-7. Summary of the results of the cumulative impact assessment for guillemot, including displacement mortality estimates and the resulting counterfactuals from the 30 year PVA assessment.

Project contribution to mortality	30-year PVA results		
Displacement	Scenario	Median CGR	Median CPS
223 to 424	Excluding BB	0.955 (0.995-0.995) to 0.998 (0.997-0.998)	0.863 (0.858-0.867) to 0.926 (0.922-0.931)

E.12 Proposed monitoring

The Applicant concluded moderate effects for razorbill and kittiwake, and major effects for great black-backed gull and herring gull. The Applicant states that a “strong, statistically robust and strategic bird monitoring programme” considering foraging patterns, population trends and productivity at key colonies in Caithness and Orkney for these species, as well as puffin and guillemot, will be considered prior to the construction of the proposed development.

We welcome the consideration of a strong and statistically robust bird monitoring programme and would encourage the Applicant to discuss the details of implementing such a programme with NatureScot as they become available.

E.13 Transboundary effects

The Applicant has considered the potential for significant transboundary effects from the proposed development upon the interests of European Economic Area (EEA) states. As the project alone impacts of the proposed development were determined to be not significant in EIA terms, the Applicant has determined that transboundary effects will be negligible, and therefore not significant in EIA terms, which we agree with

E.14 Annex 1 – Further discussion of issues in technical appendices on apportioning

E.14.1 Arctic tern colony count issues

Seabirds Count states that numbers of counted individual terns (IND) should be adjusted to Apparently Occupied Nests (AON), by dividing IND by 1.5. Numbers of AON would then be converted into numbers of breeding adult individuals by multiplying by 2. The Applicant appears to have applied this correction in some cases, but not in others. However, the difference between the colony counts calculated by the Applicant, and those calculated when the correct corrections is applied is relatively small and does not affect the apportioning or the regional population estimate significantly. Additionally, the colony count for Auskerry SPA, the only SPA within range designated for Arctic tern, has been used correctly, and so the PVA assessment of impacts to this SPA will not be affected by this issue.

E.14.2 Colony Count time period

We have compared colony counts of a subset of species: Arctic tern, guillemot, great black-backed gull, with and without counts from prior to Seabirds Count’s dataset. For Arctic tern and guillemot, the inclusion of counts from prior to Seabirds Count’s dataset makes little difference to the total regional population estimate. However, for great black-backed gull there are several non-SPA colonies where the last count was performed between 2000 and 2014.

Table E-8 below provides examples of master sites with count sections where the most recent survey was conducted prior to Seabirds Count. These examples were selected as the sites with the largest 2000 to 2014 counts and does not represent an exhaustive list of the affected sites. As the great black-backed gull population has declined significantly between Seabirds 2000 and Seabirds Count and continues to decline when more recent count data in the SMP database is considered, these colony counts are likely to be a significant overestimation. As such, the inclusion of counts from prior to Seabirds Count’s dataset may have impacted the regional population estimate and apportioning to SPA. Overestimated non-SPA colony counts will result in a lower proportion of the total impact being apportioned to the designated SPA colonies, and an overestimated regional population estimate may affect the results of the PVA assessment of the EIA (see Appendix F for further detail).

Table E-8. Examples of master sites with great black-backed gull count sections where the most recent survey was conducted prior to Seabirds Count (Burnell et al., 2023). Due to the amount of time that has passed since these surveys, and the general decline in the great black-backed gull population, these counts may be an overestimate.

Site	Count section	Year of count	Number of adult breeding individuals	Total
Cava and Rysa Little	Cava 1	2000	4	118
	Cava 2	2000	30	
	Cava 3	2000	35	

	Cava 4	2000	3	
	Cava 5	2000	3	
	Rysa Little 1	2000	25	
	Rysa Little 2	2000	18	
Faray, Holm of Faray & Rusk Holm	<i>Faray</i>	2018	18	218
	Holm of Faray	2006	200	
Holm of Huip and Little Linga Holm	Little Linga	2000	22	322
	Holm of Huip	2000	300	
Switha	Switha (Whole Island)	2000	240	240

Table E-9. Comparison of colony counts derived from a) the Applicant's collation of colony counts, b) a collation of colony counts from the Seabirds Count dataset only (2015-2021), and c) colony counts from the Seabirds Count datasets plus more recent count data obtained from the SMP database from 2022 to 2025 (database accessed December 2025 to January 2026). Please note that a number of the sites listed by the Applicant are not named Master sites in the SMP database and therefore we could not verify which count sections would be included within these sites and Seabirds Count and SMP database counts could not be collected for these sites.

	Number of breeding adult individuals		
	a) Applicant's count	b) Count using Seabirds Count values	c) Count using Seabirds Count and 2022-2025 counts from SMP database
Calf of Eday SPA	116	116	28
Copinsay SPA	134	134	98
East Caithness Cliffs SPA	532	532	264
Hoy SPA	64	88	95
Non-SPA colonies	2941	1836	1886
<i>Non-SPA colonies where the provided name is not a SMP master site name</i>	805		

Additionally, we also note that there are several great black-backed gull counts on Hoy which on the SMP database do not appear when the master site for Hoy SPA is selected but are in fact within Hoy SPA. These sections appear to have been collated separately to Hoy SPA by the Applicant. We recommend that any sites with count names beginning "GBBGU/SKUA" or similar should be checked using GIS software, or contact with the BTO, in order to determine whether these sections are within a protected site.

E.14.3 Linga Holm – great black-backed gull

The number of great black-backed gulls at Linga Holm has been overestimated due to confusion caused by changes in survey section names. The site Linga Holm was surveyed for great black-backed gull as master site (82181) in the year 2000, with a total of 189 breeding adult individuals. Linga Holm was again surveyed in the 2021 survey of the "SKUA/GBBGU - Stronsay & Auskerry" master site (111374), as count section HY6227 - which has a surveyor note attached stating "Data entered into this square (HY6227) but is data for the whole of

Linga Holm." (SMP database, accessed 12/01/2026). The 2021 count of Linga Holm has total of 49 individuals (24 AON and therefore 48 individuals in Seabirds Count).

Table B1.4 of Annex B: Full breeding season apportioning results has entries for both Linga Holm and SKUA/GBBGU - Stronsay & Auskerry, where the numbers match the inclusion of both datasets. Therefore, the inclusion of the 2000 Linga Holm count data in Table B1.4 and the apportioning results in a duplication of the count data from this site. The 189 breeding adult individuals from the 2000 Linga Holm count should not have been included in this analysis.

Please note that there are several other sites named in Table B1.4 which are not equivalently named in the Seabirds Count spreadsheet (e.g. Orkney Mainland Moors SPA, East Sanday Coast SPA, Caithness and Sutherland Peatlands SPA), and so this overestimation of count data due to changes in survey section names may have occurred for other sites as well.

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix F – Offshore and intertidal ornithology – RIAA

The documents reviewed in our assessment of the RIAA include the following:

- HRA - RIAA - P3 - Special Protection Areas and Ramsar Sites
- HRA - RIAA - P3A - Offshore Ornithology Special Protection Area Apportioning Technical Report
- HRA - RIAA - P3B - Offshore Ornithology SPA PVA Technical Report

F.1 Quality and content of the Application

The RIAA documents were generally found to be of a good standard and where we have concerns these are explained in more detail. In general, NatureScot guidance and advice have been followed with regards the methodology and approach to assessment. Exceptions to this are discussed in more detail below.

We found some errors in the data presented and some issues with the transcribing of data from one document to another and these are also discussed in more detail below.

F.2 NatureScot approach to PVA results and determination of AEoSI for SPAs

Our assessments of AEoSI are primarily based on the PVA Counterfactual of Population Size (CPS) outputs, after 30 years. However, in reaching our conclusions we also consider a range of other factors including:

- Counterfactual of Population Growth Rate (CGR) outputs and the % decrease in population growth rate
- Status of the population including short and long-term trends
- Condition of the feature
- Species ecology
- Proportional importance of the species in Scotland and UK
- Impacts of HPAI and other recent mortality events.

PVAs were undertaken for the following impact pathways:

- Collision
- Distributional responses
- Collision and displacement combined for gannet and kittiwake.

F.3 Proposal Alone Assessment of impacts on breeding seabird SPAs

We agree with the Applicant's project alone conclusion of no AEoSI for all species and sites, assessed, except for great black-backed gull. Where we conclude no AEoSI these are shown in Table F-1.

For great black-backed gull we are unable to come to a conclusion due to errors in the assessment. These are detailed further below.

Table F-1. Determination of AEoSI for proposal alone impacts.

Species	SPA	Determination of AEoSI
Fulmar	Buchan Ness to Collieston Coast	No AEoSI
	Calf of Eday	No AEoSI
	Cape Wrath	No AEoSI
	Copinsay	No AEoSI
	East Caithness Cliffs	No AEoSI
	Fair Isle	No AEoSI
	Fetlar	No AEoSI
	Foula	No AEoSI
	Fowlsheugh	No AEoSI
	Hermaness, Saxa Vord & Valla Field	No AEoSI
	Hoy	No AEoSI
	North Caithness Cliffs	No AEoSI
	North Rona & Sula Sager	No AEoSI
	Noss	No AEoSI
	Rousay	No AEoSI
	St Kilda	No AEoSI
	Sumburgh Head	No AEoSI
	Troup, Pennan & Lion's Heads	No AEoSI
West Westray	No AEoSI	
Arctic tern	Auskerry	No AEoSI
Gannet	Fair Isle	No AEoSI
	Forth Islands	No AEoSI
	Hermaness, Saxa Vord & Valla Field	No AEoSI
	North Rona & Sula Sgeir	No AEoSI
	Noss	No AEoSI
	St Kilda	No AEoSI
	Sule Skerry & Sule Stack	No AEoSI
Herring gull	East Caithness Cliffs*	No AEoSI
Kittiwake	Buchan Ness to Collieston Coast	No AEoSI
	Calf of Eday	No AEoSI
	Cape Wrath	No AEoSI
	Copinsay	No AEoSI
	East Caithness Cliffs	No AEoSI
	Fair Isle	No AEoSI
	Forth Islands	No AEoSI
	Foula	No AEoSI
	Fowlsheugh	No AEoSI
	Handa	No AEoSI
	Hermaness, Saxa Vord & Valla Field	No AEoSI

	Hoy	No AEoSI
	Marwick	No AEoSI
	North Caithness Cliffs	No AEoSI
	North Rona & Sula Sgeir	No AEoSI
	Noss	No AEoSI
	Rousay	No AEoSI
	St Abbs head to Fast Castle	No AEoSI
	Sumburgh Head**	No AEoSI
	Troup, Pennan & Lion's Heads	No AEoSI
	West Westray	No AEoSI
Guillemot	Calf of Eday	No AEoSI
	Copinsay	No AEoSI
	Fair Isle	No AEoSI
	Foula	No AEoSI
	Hoy	No AEoSI
	Marwick	No AEoSI
	North Caithness Cliffs	No AEoSI
	Noss	No AEoSI
	Rousay	No AEoSI
	Sule Skerry & Sule Stack	No AEoSI
	Sumburgh Head	No AEoSI
	West Westray	No AEoSI
Razorbill	East Caithness Cliffs	No AEoSI
	Fair Isle	No AEoSI
	Forth Islands	No AEoSI
	Fowlsheugh	No AEoSI
	North Caithness Cliffs	No AEoSI
	St Abbs Head to Fast Castle	No AEoSI
	St Kilda	No AEoSI
	Troup, Pennan & Lion's Heads	No AEoSI
	West Westray	No AEoSI
Puffin	Cape Wrath	No AEoSI
	Fair Isle	No AEoSI
	Foula	No AEoSI
	Hermaness, Saxa Vord & Valla Field	No AEoSI
	Hoy	No AEoSI
	North Caithness Cliffs	No AEoSI
	North Rona & Sula Sgeir	No AEoSI
	Noss	No AEoSI
	Sule Skerry & Sule Stack	No AEoSI

** For herring gull at East Caithness Cliffs The non-breeding season mortalities are presented as 0.87 birds/annum, but should be 1.29 birds/annum, which makes the annual mortality 1.3. This affects the increase in mortality rate, which changes from 0.013 to 0.01969. This is*

very close to the threshold for PVA, as when rounded up the value would be 0.02. However, due to the low project alone collision mortality for herring gull, we consider it unlikely that, if PVA had been undertaken, the counterfactuals would have been of concern.

**** For kittiwake at Sumburgh Head** the increase in mortality rate should have been 0.022 not 0.002 for the high displacement value. However, given the low collision mortality at this site we don't consider that, if PVA had been undertaken, the counterfactuals would have been of concern.

F.3.1 Great Black-Backed Gull

We note that a mistake has been made in *Table 5.10: Predicted and Apportioned Mortalities due to Collision Risk for Great Black-Backed Gull*.

The non-breeding season mortalities (all age classes) has been entered as 0.1 birds/annum. According to the CRM report this should be 21.7 birds/annum.

This changes the total apportioned mortalities (breeding adults) presented for each SPA in *Table 5.10*, as shown in *Table F-2* below:

Table F-2. Corrected predicted and apportioned non-breeding season mortalities due to collision risk for Great Black-Backed Gull.

SPA	Non-breeding season				
	Mortalities (all age classes) – corrected value	Proportion of adults	Apportioning value	Proportion of Adults (Breeding Adults)	Total Annual Apportioned Mortalities
Calf of Eday	21.7	0.317	0.014	0.096	0.097
Copinsay	21.7	0.317	0.011	0.075	0.079
East Caithness Cliffs	21.7	0.317	0.009	0.062	0.064
Hoy	21.7	0.317	0.003	0.021	0.021

These changes affect the decrease in survival rates presented in *Table 5.11: Impact on Survival Rates due to Collision Risk for Great Black-Backed Gull*, as shown in *Table F-3* below:

Table F-3. Corrected impact on survival rates due to collision risk for Great Black-Backed Gull.

SPA	Population (Breeding Individuals) (Burnell <i>et al.</i> , 2023)	Annual Apportioned Mortalities (Breeding Adults)	Decrease in Survival (Percentage Points) Applicant's figures in brackets

Calf of Eday	116	0.097	0.084 (0.001)
Copinsay	134	0.079	0.059 (0.002)
East Caithness Cliffs	532	0.064	0.012 (0.000)
Hoy	64	0.021	0.033 (0.001)

Our revised calculations show that PVAs should have been undertaken for Calf of Eday, Copinsay and Hoy SPAs, as the decrease in survival exceeds the 0.02 percentage point threshold.

We also have concerns about the breeding season apportioning for great black-backed gull because of the colony counts used. Our concerns are the same as summarised in Appendix E, and further in Annex 1 to this document:

As a result of the above issues, from the information presented we are unable to adequately assess the potential impacts on great black-backed gull and advise that further information is required as follows:

- **A recalculation of the non-breeding season apportioned mortalities using the correct total non-breeding season mortality.**
- **A recalculation of the breeding season apportioning using colony counts no older than Seabirds Count and including more recent counts from 2022-25 where available, with a detailed table/spreadsheet showing all the count sections within master sites.**
- **Using the updated mortalities and apportioning undertake PVAs where the decrease in survival equals or exceeds 0.02 percentage points.**

We are particularly concerned about any additional impacts on the declining and vulnerable great black-backed populations at the four SPAs assessed. Given this, it may be precautionary to withdraw the 0.2 birds/annum threshold for in-combination assessment (which is no longer used) and undertake in-combination assessments for great black-backed gull as well, depending on the results of the revised project alone assessments.

F.4 In-combination assessment of impacts on breeding seabird SPAs

F.4.1 Approach to in-combination assessment

Two scenarios are presented

- Including Berwick Bank impacts
- Excluding Berwick Bank impacts.

We note that Berwick Bank is now consented, and compensation will be required for a number of features and SPAs. These compensated for impacts have not been removed from in-combination assessments. Therefore the 'including Berwick Bank' scenario comprises both compensated for and uncompensated for impacts. The 'excluding Berwick Bank' scenario removes all impacts, whether or not they will be compensated for.

Our assessments are based on the data as it is presented in the Application and do not take into account the implications of not removing Berwick Bank compensated for impacts,

although we acknowledge that not removing compensated impacts will add precaution in some instances.

In addition, we note that compensated for impacts have not been removed for the following consented projects: Salamander and West of Orkney. As a result, where this is relevant, assessments may be more precautionary.

It is also noted that Buchan OFW impacts have not been included in assessments.

The Applicant also presents two other scenarios for some assessments:

- Consented – this refers to the number of mortalities as presented within applications.
- As built – this refers to a corrected number of mortalities for a project as built out and is only relevant to operational projects and for collision impacts.

In general, the differences between these two scenarios are small. Our advice is based on the ‘as built’ scenario as it reflects the most realistic situation.

F.4.2 In-combination assessment criteria

For some SPAs and species assessed, the percentage point change in adult survival did not meet the 0.02 threshold or the mortality from the project was less than 0.2* birds/annum and, therefore, in-combination PVA was not required. In addition, for some features there were no other offshore wind farms with impacts on the feature/site, so an in-combination assessment could not be undertaken.

As a result, we can conclude no AEoSI for the species/sites shown in Table F-4 below.

**At the time when the Ayre application was being developed, we still advised using this threshold and therefore accept its use here.*

Table F-4. Species and SPAs where % point change in adult survival did not meet the threshold for PVA/or mortality was less than 0.2 birds/or no other OFW had impacts on the feature/site

Species	SPA	Determination of AEoSI
Kittiwake	Calf of Eday	No AEoSI
	Copinsay	No AEoSI
	Fair Isle	No AEoSI
	Forth Islands	No AEoSI
	Foula	No AEoSI
	Hermaness, Saxa Vord & Valla Field	No AEoSI
	Hoy	No AEoSI
	Marwick Head	No AEoSI
	Noss	No AEoSI
	North Rona & Sula Sgeir	No AEoSI
	Rousay	No AEoSI
St Abbs Head to Fast Castle	No AEoSI	
Great black-backed gull*	Calf of Eday	No AEoSI
	Copinsay	No AEoSI

	East Caithness Cliffs	No AEoSI
	Hoy	No AEoSI
Herring Gull	Buchan Ness to Collieston Coast	No AEoSI
	Fowlsheugh	No AEoSI
Guillemot	Foula	No AEoSI
	Noss	No AEoSI
	Sumburgh Head	No AEoSI
Razorbill	Forth Islands	No AEoSI
	Foula	No AEoSI
	Fowlsheugh	No AEoSI
	St Kilda	No AEoSI
	St Abbs Head to Fast Castle	No AEoSI
Puffin	Cape Wrath	No AEoSI
	Fair Isle**	No AEoSI
	Foula	No AEoSI
	Hermaness, Saxa Vord & Valla Field	No AEoSI
	North Rona & Sula Sgeir	No AEoSI
	Noss	No AEoSI
Gannet	St Kilda	No AEoSI

** We are particularly concerned about any additional impacts on the declining and vulnerable great black-backed populations at the four SPAs assessed. Given this, it may be precautionary to withdraw the 0.2 birds/annum threshold for in-combination assessment (which is no longer used) and undertake in-combination assessments for great black-backed gull as well, depending on the results of the revised project alone assessments.*

*** For puffin at Fair Isle the decrease in survival should have been 0.025 for the high displacement value and a PVA therefore undertaken. Considering the PVA undertaken for West of Orkney for puffin at this SPA, where counterfactuals were high, we don't consider that adding the low mortality from Ayre would result in counterfactuals of concern - we therefore conclude no AEoSI.*

F.4.3 In-combination assessments

For the remaining sites and species assessed PVA was undertaken, and we provide advice on the PVA results and our determination of AEoSI for seabird SPAs. This is provided below in the form of:

- a summary table
- more detailed assessments for individual SPAs and species where we have concluded AEoSI or have been unable to conclude no AEoSI.

Counterfactuals presented are over 30 years, representing the lifetime of the project.

Table F-5. Summary of in-combination assessment where PVA has been undertaken.

Special Protection Area (SPA)	Qualifying species	CPS (with Berwick Bank)*	CPS (without Berwick Bank)*	Determination of AEoSI
Buchan Ness to Collieston Coast	Kittiwake	0.851-0.805	0.868-0.828	AEoSI
Calf of Eday	Guillemot	Not assessed	0.980-0.959	No AEoSI
Copinsay	Kittiwake	0.941-0.913	0.948-0.923	Unable to conclude no AEoSI
	Guillemot	Not assessed	0.949-0.900	Unable to conclude no AEoSI
East Caithness Cliffs	Herring gull	Not assessed	0.827	AEoSI
	Kittiwake	0.809-0.727	0.823-0.746	AEoSI
	Guillemot	Not assessed	0.850-0.730	AEoSI
	Razorbill	0.879-0.766	0.883-0.777	AEoSI
Fair Isle	Guillemot	Not assessed	0.992-0.981	No AEoSI
	Razorbill	0.953-0.874	0.957-0.887	Unable to conclude no AEoSI
	Gannet	0.973-0.947	0.975-0.951	No AEoSI
Forth Islands	Gannet	0.850-0.791	0.880-0.831	AEoSI
Fowlsheugh	Kittiwake	0.779-0.719	0.868-0.824	AEoSI
Hermaness, Saxa Ford & Valla Field	Gannet	0.977-0.951	0.978-0.953	No AEoSI
Hoy	Guillemot	Not assessed	0.979-0.959	No AEoSI
Marwick Head	Guillemot	Not assessed	0.987-0.973	No AEoSI
North Caithness Cliffs	Kittiwake	0.834-0.777	0.850-0.799	AEoSI
	Guillemot	Not assessed	0.956-0.914	No AEoSI
	Razorbill	0.932-0.832	0.927-0.843	Unable to conclude no AEoSI
	Puffin	0.812-0.709	0.863-0.785	AEoSI
North Rona & Sule Sgeir	Gannet	0.995-0.989	0.994-0.990	No AEoSI
Noss	Gannet	0.974-0.948	0.976-0.990	No AEoSI
Rousay	Guillemot	Not assessed	0.986-0.971	No AEoSI
Sule Skerry & Sule Stack	Guillemot	Not assessed	0.798-0.685	AEoSI
	Puffin	Not assessed	0.980-0.967	No AEoSI
	Gannet	0.950-0.931	0.950-0.932	No AEoSI
Troup, Pennan and Lion's Heads	Kittiwake	0.853-0.799	0.870-0.820	AEoSI
	Razorbill	0.929-0.848	0.938-0.863	Unable to conclude no AEoSI
West Westray	Kittiwake	0.729-0.632	0.765-0.677	AEoSI

	Guillemot	Not assessed	0.988-0.973	No AEOsI
	Razorbill	0.965-0.915	0.968-0.992	No AEOsI

*CPS values - low displacement mortality rate value followed by high displacement mortality rate value

F.5 Individual SPA assessments

F.5.1 Buchan Ness to Collieston Coast SPA

Table F-6. PVA results for Buchan Ness to Collieston Coast SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional mortality from project alone (birds/annum)	Determination of AEOsI
Kittiwake	0.851-0.805	0.868-0.828	0.49-0.68	AEOsI

*CPS values - low displacement mortality rate value followed by high displacement mortality rate value

We conclude AEOsI for kittiwake at Buchan Ness to Collieston Coast SPA, considering:

- the moderately low CPS values with and without Berwick Bank
- a population decline of up to 19.5%
- a decrease in population growth rate of up to 0.7%
- the unfavourable condition of the feature
- a 19% population decline between Seabird 2000 and Seabirds Count.

The Applicant also concluded AEOsI for kittiwake at Buchan Ness to Collieston Coast SPA

F.5.2 Copinsay

Table F-7. PVA results for Copinsay SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional mortality from project alone (birds/annum)	Determination of AEOsI
Guillemot	Not assessed	0.949-0.900	30.9-60.27	Unable to conclude no AEOsI
Kittiwake	0.941-0.0.913	0.948-0.923	0.55-0.8	Unable to conclude no AEOsI

For guillemot, a decrease in population growth rate of 0.3% and a decrease in population size of 10% would not normally be of concern. However, considering the following factors **we are unable to conclude no AEOsI for the high displacement rate:**

- 1% population decline between Seabird 2000 and Seabirds Count

- the recent impact of HPAI resulting in a recent 56% decline in population (Tremlett 2023²⁵)
- the unfavourable condition of the feature
- the significant contribution from the project.

For kittiwake a decrease in population growth rate of 0.3% and a decrease in population size of 7% would not normally be of concern. However, considering the following factors **we are unable to conclude no AEOI for the high displacement rate:**

- 78% population decline between Seabird 2000 and Seabirds Count
- the recent impact of HPAI resulting in a further 69% decline in population (Tremlett 2023)
- the unfavourable condition of the feature

The Applicant concluded no AEOI for guillemot and kittiwake at Copinsay SPA.

F.5.3 East Caithness Cliffs SPA

Table F-8. PVA results for East Caithness Cliffs SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional annual mortality from project alone	Determination of AEOI
Herring gull	Not assessed	0.827	0.88	AEOI
Kittiwake	0.809-0.727	0.823-0.746	2.28-3.21	AEOI
Guillemot	Not assessed	0.850-0.730	32.19-62.78	AEOI
Razorbill	0.879-0.766	0.883-0.777	5.21-8.84	AEOI

We conclude AEOI for herring gull at East Caithness Cliffs SPA, considering:

- the significantly low CPA value
- a population decrease of up to 17%
- a decrease in population growth rate of up to 0.4%
- a 4% population decline between Seabird 2000 and Seabirds Count
- NEEOG²⁶ funded surveys show a 67% decline since Seabirds Count.

We conclude AEOI for kittiwake at East Caithness Cliffs SPA, considering:

- the very low CPS values with and without Berwick Bank
- a population decrease of up to 27% over 35 years
- a decrease in population growth rate of up to 1.0%
- a 39% population decline between Seabird 2000 and Seabirds Count.

²⁵ Tremlett et al 2024 - UK seabird colony counts in 2023 following the 2021-22 outbreak of Highly Pathogenic Avian Influenza. RSPB Research Report 76

²⁶ Zisman, S., Swann, R. and Burt, D. (2025). The Numbers and Distribution of Cliff Breeding Seabird on the East Coast of Caithness in 2025. Report to Thistle Wind Partners

We conclude AEOsI for guillemot at East Caithness Cliffs SPA, considering:

- the very low CPS values for both high and low displacement rates
- a population decrease of up to 27%
- a decrease in population growth rate of up to 1.0%
- a 6% population decline between Seabird 2000 and Seabirds Count
- the significant contribution from the project.

We note the favourable condition of the feature and that NEEOG-funded surveys for East Caithness Cliffs SPA recorded an increase of 35% when compared to the Seabird Counts census. However, despite this, we consider that the very low counterfactual values will result in AEOsI.

We conclude AEOsI for razorbill at East Caithness Cliffs SPA, considering:

- the very low CPS values with and without Berwick Bank
- a population decrease of up to 23%
- a decrease in population growth rate of up to 0.9%.

We note the favourable condition of the feature and the increasing population between Seabird 2000 and the Seabirds Count of 69%, with further increases shown in the NEEOG funded surveys.

However, despite this, we consider that the very low counterfactual values will result in AEOsI.

The Applicant concluded AEOsI for kittiwake, guillemot and razorbill, but not herring gull at East Caithness Cliffs Spa.

F.5.4 Fair Isle

Table F-9. PVA results for Fair Isle SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional mortality from project alone (birds/annum)	Determination of AEOsI
Razorbill	0.953-0.874	0.957-0.887	0.28-0.48	Unable to conclude no AEOsI

We are unable to conclude no AEOsI for razorbill at Fair Isle SPA considering:

- the moderately low CPS values for the high displacement scenario with and without Berwick Bank
- a population decrease of up to 12.6%
- a decrease in population growth rate of up to 0.4%
- a 47% decrease in population between Seabird 2000 and Seabirds Count
- the unfavourable condition of the feature.

The Applicant concluded no AEoSI for razorbill at Fair Isle SPA.

F.5.5 Forth Islands SPA

Table F-10. PVA results for Forth Islands SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional mortality from project alone	Determination of AEoSI
Gannet	0.850-0.791	0.880-0.831	1.47-2.15	AEoSI

We conclude AEoSI for gannet at Forth Islands SPA considering:

- the significantly low CPS values both with and without Berwick Bank
- a population decrease of up to 20.9%
- a decrease in population growth rate of up to 0.8%
- a 57% increase in population between Seabird 2000 and Seabirds Count, but a 32% decline resulting from HPAI (Tremlett 2023)

The Applicant concludes AEoSI for gannet at Forth Islands SPA.

F.5.6 Fowlsheugh SPA

Table F-11. PVA results for Fowlsheugh SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional mortality from project alone	Determination of AEoSI
Kittiwake	0.779-0.719	0.868-0.824	0.36-0.50	AEoSI

We conclude AEoSI for kittiwake at Fowlsheugh SPA considering:

- the very low CPS with and without Berwick Bank
- a population decline of up to 28%
- a decrease in population growth rate of up to 1.1%
- a 51% decrease in population between Seabird 2000 and Seabirds Count
- the unfavourable condition of the feature

The Applicant concludes AEoSI for kittiwake at Fowlsheugh SPA.

F.5.7 North Caithness Cliffs SPA

Table F-12. PVA results for North Caithness Cliffs SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional mortality from project alone	Determination of AEoSI
Kittiwake	0.834-0.777	0.850-0.799	0.74-1.05	AEoSI
Razorbill	0.923-0.832	0.927-0.843	0.82-1.38	Unable to conclude no AEoSI

Puffin	0.812-0.709	0.863-0.785	0.43-0.74	AEoSI
--------	-------------	-------------	-----------	-------

We conclude AEoSI for kittiwake at North Caithness Cliffs SPA, considering:

- the significantly low CPS with and without Berwick Bank
- a population decline of up to 22%
- a decrease in population growth rate of up to 0.8%
- the unfavourable condition of the feature
- a 45% decline in the population between Seabird 2000 and Seabirds Count.

We are unable to conclude no AEoSI for razorbill at North Caithness Cliffs SPA, considering:

- the moderately low CPS for the high displacement scenario, with and without Berwick Bank
- a population decline of up to 16.8%
- a decrease in population growth rate of up to 0.6%
- a 41% increase in the population between Seabird 2000 and Seabirds Count.
- The favourable condition of the feature.

We conclude AEoSI for puffin at North Caithness Cliffs SPA, considering:

- the significantly low CPS with and without Berwick Bank
- a population decline of up to 29%
- a decrease in population growth rate of up to 1.1%
- a 56% decline in the population between Seabird 2000 and Seabirds Count.
- the unfavourable condition of the feature

The Applicant concludes AEoSI for kittiwake and puffin, but no AEoSI for razorbill at North Caithness Cliffs SPA.

F.5.8 Sule Skerry to Sule Stack SPA

Table F-13. PVA results for Sule Skerry to Sule Stack SPA.

Species	CPS* (with Berwick Bank)	CPS*(without Berwick Bank)	Additional mortality from project alone	Determination of AEoSI
Guillemot	Not assessed	0.798-0.685	0.71-1.39	AEoSI

We conclude AEoSI for guillemot at Sule Skerry to Sule Stack SPA, considering:

- the very low CPS for both high and low displacement
- a population decline of up to 31%
- a decrease in population growth rate of up to 1.2%
- a 21% decline in the population between Seabird 2000 and Seabirds Count.
- the favourable condition of the feature

We acknowledge that 97% of the in-combination mortalities come from West of Orkney OWF, with Ayre contributing a very small additional mortality. If West of Orkney

compensated impacts had been removed from the in-combination assessment, then it is likely we would have concluded no AEOsI for Ayre.

The Applicant concludes AEOsI for guillemot at Sule Skerry to Sule Stack SPA.

F.5.9 Troup, Pennan and Lion's Heads SPA

Table F-14. PVA results for Troup, Pennan and Lion's Heads SPA.

Species	CPS (with Berwick Bank)	CPS (without Berwick Bank)	Additional annual mortality from project alone	Determination of AEOsI
Kittiwake	0.853-0.799	0.870-0.820	0.65-0.91	AEOsI
Razorbill	0.929-0.848	0.938-0.863	0.31-0.55	Unable to conclude no AEOsI

We conclude AEOsI for kittiwake at Troup, Pennan and Lion's Heads SPA, considering:

- the significantly low CPS with and without Berwick Bank
- a population decline of up to 22%
- a decrease in population growth rate of up to 0.7%
- the unfavourable condition of the feature
- a 44% decline in population between Seabird 2000 and Seabirds Count

We are unable to conclude no AEOsI for razorbill at Troup, Pennan and Lion's Heads SPA considering:

- the moderately low CPS for the high displacement scenario both with and without Berwick Bank
- a decrease in population growth rate of up to 15% for the high displacement scenario
- a population decline of 0.5% for the high displacement scenario
- a 9% decline in population between Seabird 2000 and Seabirds Count
- the favourable condition of the feature.

The Applicant concludes AEOsI for kittiwake and no AEOsI for razorbill at Troup, Pennan and Lion's Heads SPA.

F.5.10 West Westray

Table F-15. PVA results for West Westray SPA.

Species	CPS (with Berwick Bank)	CPS (without Berwick Bank)	Additional annual mortality from project alone	Determination of AEOsI
Kittiwake	0.729-0.632	0.765-0.677	0.52-0.72	AEOsI

We conclude AEoSI for kittiwake at West Westray SPA, considering

- the very low CPS values for both scenarios, with and without Berwick Bank
- a population decline of up to 36.8%
- a decrease in population growth rate of up to 1.5%
- the unfavourable declining condition of the feature
- a 92% decline in population between Seabird 2000 and Seabirds Count

The Applicant concludes AEoSI for kittiwake at West Westray SPA.

F.5.11 Outer Firth of Forth and St Andrews Bay Complex (OFFSABC)

Our assessment of impacts to the OFFSABC marine SPA breeding seabird qualifying features was undertaken with respect to the functionally linked breeding colony SPAs.²⁷ The assessed SPAs/features are listed in the table below along with our colony SPA conclusions for AEoSI.

Table F-16. Summary of NatureScot conclusions for OFFSABC.

SPA	Species	Colony SPA conclusion
Buchan Ness to Collieston Coast	Kittiwake	AEoSI
Forth Islands	Gannet	AEoSI
Fowlsheugh	Kittiwake	AEoSI
Troup, Pennan and Lion's Heads	Kittiwake	AEoSI
	Razorbill	Unable to conclude no AEoSI

F.5.12 Seabird assemblage features

Any named qualifying species of an assemblage feature in an SPA is protected in its own right. The SPA Conservation Objectives are set for individual species rather than the assemblage and therefore the features should be assessed and any impacts concluded at the individual species level.

This has been the established position in Scotland for quite some time, although we understand that this differs from the approach taken in England.

For those SPAs which have a seabird assemblage feature, where we have concluded AEoSI for at least one named species of the seabird assemblage, then that is also the conclusion for the assemblage feature.

F.5.13 Fulmar in-combination assessments

We note that no in-combination assessments have been undertaken for fulmar.

Fulmar mortalities exceeded the 0.2 proposed development alone mortality threshold, due to distributional responses, for the following six sites:

²⁷ Conservation and Management Advice (2022) Outer Firth of Forth and St Andrews Bay Complex Special Protection Area (SPA)

- Copinsay SPA
- East Caithness Cliffs SPA
- Fair Isle SPA
- Foula SPA
- Hoy SPA
- North Caithness Cliffs SPA.

However, the Applicant states that, at the time of writing this report, there was not enough information available from other projects to carry out a robust in-combination assessment for fulmar.

It is noted that West of Orkney OWF carried out a quantitative in-combination assessment for fulmar and that this data would have been available to Ayre. We have considered whether the combination of West of Orkney and Ayre mortalities would have resulted in any concerns. We can conclude that mortalities for both projects are very low and it would be unlikely that, for any of the sites assessed for both projects, the 0.02 increase in mortality threshold would have been reached.

F.5.14 Disturbance and Displacement to Birds from Vessel Movements – marine SPAs

At the time of the Application, the ports to be used during construction and decommissioning phases are unknown. However, the Applicant acknowledges that there is potential for the use of ports within marine SPAs and has presented assessments for two of these – Moray Firth and Scapa Flow marine SPAs – which presumably represent the most likely sites to be impacted by the development.

The assessments appear to be taken from those presented by West of Orkney OWF.

F.5.15 Moray Firth SPA

Moray Firth SPA was screened in for further assessment due to potential disturbance/displacement by vessels of the SPA's diver, seaduck and shag qualifying features.

If the project uses the ports of Nigg, Ardesier or Cromarty during construction, vessels will transit through the SPA when travelling between the port and project area. Further discussions to assess and mitigate impacts will be required once port selection has been made and further details on vessel numbers and transit routes selected. We also consider further mitigation and monitoring discussions are likely to be required.

F.5.15.1 Assessment of predicted impacts alone and in-combination

It is noted that the maps provided in this section use data from 2001-07, which is very old data. We are surprised that the most recent data from 2020 has not been used - *NatureScot*

*Research Report 1280 - Inshore Wintering Waterfowl in Moray Firth Special Protection Area - 2019/20 digital aerial surveys and comparative analyses of aerial and shore-based surveys*²⁸.

We have compared the maps in this report with the maps provided by the Applicant. We have noted some differences in these which inform our assessment of impacts from vessel disturbance on the qualifying features of the site.

From these maps, and the potential indicative route proposed by the project, we have some concerns about potential impacts on great northern diver and red-throated diver from predicted increased vessel activity.

The 2020 survey maps indicate some areas of higher densities of divers in the vicinity of the ports and along the proposed route north through the SPA. These maps, and the maps from 2001-07 for comparison, are provided in Annex 3 of this document.

In our view, it will be difficult for vessels to avoid disturbing divers, using any of the ports.

F.5.15.2 Conclusion for great northern and red-throated diver

Given the high sensitivity of great northern and red-throated divers to boats, we recommend that the new data and the maps provided in the Annex are taken into account, with a view to identifying pre-construction a vessel route, if any of these ports are selected to avoid the areas where higher density of divers are likely, appreciating that this needs to be done with due regard to maritime safety.

This would enhance the mitigation measures described in Table 5.51, which we also support.

F.5.15.3 Other qualifying species

For all other qualifying species we consider that disturbance from vessels is unlikely to be of concern and we can conclude no AEoSI for the following qualifying species:

- Slavonian grebe
- Greater scaup
- Common eider
- Long-tailed duck
- Common scoter
- Velvet scoter
- Common goldeneye
- Red-breasted merganser
- European shag

This is based on our consideration of the results of the 2020 surveys.

²⁸ [NatureScot Research Report 1280 - Inshore Wintering Waterfowl in Moray Firth Special Protection Area - 2019/20 digital aerial surveys and comparative analyses of aerial and shore-based surveys | NatureScot](#)

F.5.16 Scapa Flow marine SPA

Scapa Flow marine SPA was screened in for further assessment due to potential disturbance/ displacement of the site's diver, seaduck and shag qualifying features.

If the project decides to use the proposed Scapa Deep Water Quay, vessels associated with the project would pass through the Scapa Flow marine SPA when transiting between the Project area and the Scapa Deep Water Quay.

As the port is not yet constructed there is no baseline data for vessel traffic from the actual port but there is data for the whole of Scapa Flow.

If this port is selected, we would wish to have further discussions to consider mitigation, including the any preferred entrance to Scapa Flow, due to a number of the protected species having high sensitivity to vessel disturbance. Our initial consideration of likely mitigation is as follows:

- **Project vessels should limit their speed while transiting through the SPA to 6 kts or less;**
- **Preconstruction/mobilisation briefings will be used to highlight bird sensitivity to vessel movements and the mitigations required to minimise potential impacts to birds in the marine SPA;**
- **The vessel crew will watch for aggregations of seabirds on the water and, if aggregations are seen, will alert the vessel's Master. Where necessary and having regard to maritime safety, the vessel's course and/or speed will be adjusted to avoid aggregations of birds**
- **Pre-construction undertake monitoring of disturbance of great northern divers by existing vessels along the proposed transit route to help inform potential spatial and / or seasonal mitigation for project vessels during construction**
- **In the first year of construction undertake further monitoring of great northern diver disturbance by vessels and use the results to initiate modifications or fine-tuning of transit routes if required**
- **Use the monitoring results to identify the best available vessel routes and speed to minimise impacts on sensitive species.**

NatureScot is currently undertaking a research project to consider cumulative impacts of vessel activity in Scapa Flow – this is due to report later this year and may be a helpful resource to consider if this port is selected.

F.5.16.1 Qualitative assessment of other impact pathways

This advice relates to impact pathways not already covered above. For all these pathways embedded mitigation is proposed and should be implemented (further advice on these impacts is provided in Appendix E).

Table F-17. Qualitative assessment of impact pathways occurring during all phases.

Impact pathway	NatureScot conclusion
Impact 2: Distributional Responses Along the Export Cable Corridor	No AEoSI for any SPA features assessed
Impact 3: Disturbance and Displacement to Birds from Vessel Movements	See marine SPA assessments above
Impact 4: Disturbance to Prey Species and Their Habitat	No AEoSI for any SPA features assessed
Impact 5: Temporary Habitat Loss and/or Habitat Disturbance	No AEoSI for any SPA features assessed
Impact 6: Entanglement	No AEoSI for any SPA features assessed
Impact 7: Direct Impacts from UXO Clearance	No AEoSI for any SPA features assessed
Impact 8: Indirect Impacts from Construction/Decommissioning Noise	No AEoSI for any SPA features assessed

F.6 Annex 2 - Great black-backed gull

The table below shows our assessment of percentage point change associated with the four SPAs included in the Applicant's assessment of project alone impacts. This is using the corrected non-breeding season mortality of 21.7 birds/annum apportioned to the SPAs; and revised colony counts based on Seabirds Count and more recent SMP data.

Table F-18. Great black-backed gull recalculations of mortalities and percentage point change in mortality using corrected non-breeding season mortality and adjusted colony counts.

SPA	Non Breeding Season mortality (adjusted)	Using Applicant's Breeding Season (BS) values				BS apportioning recalculated omitting pre-Seabirds Count colony counts where possible*				BS apportioning recalculated using Seabirds Count plus counts from 2022 to 2025*			
		Colony count (IND)	Apportioned mortality - BS	Annual mortality	% point change	Colony count (IND)	Apportioned mortality - BS	Annual mortality	% point change	Colony count (IND)	Apportioned mortality - BS	Annual mortality	% point change
Calf of Eday	0.0963046	116	0.0009	0.097	0.084%	116	0.0012	0.098	0.084%	28	0.0003	0.097	0.345%
Copinsay	0.0756679	134	0.0036	0.079	0.059%	134	0.0051	0.081	0.060%	98	0.0038	0.079	0.081%
East Caithness Cliffs	0.0619101	532	0.0018	0.064	0.012%	532	0.0025	0.064	0.012%	264	0.0012	0.063	0.024%
Hoy	0.0206367	64	0.0004	0.021	0.033%	64	0.0005	0.021	0.033%	95	0.0007	0.021	0.023%

- There are several sites (not designated for GBBG) for which the name provided by the Applicant does not match the name of a master site for GBBG colony counts in either Seabirds Count or the SMP database, we were therefore unable to determine which count sections would be included within these sites or what year those counts are from. The Applicant's counts have been used for these sites in the apportioning process.
- This is a rough estimate based on the values we have available, used to highlight the difference that using updated colony counts may have, the values from a more in-depth assessment may be different.

F.7 Annex 3 - Moray Firth SPA survey data comparison

F.7.1 Great northern diver

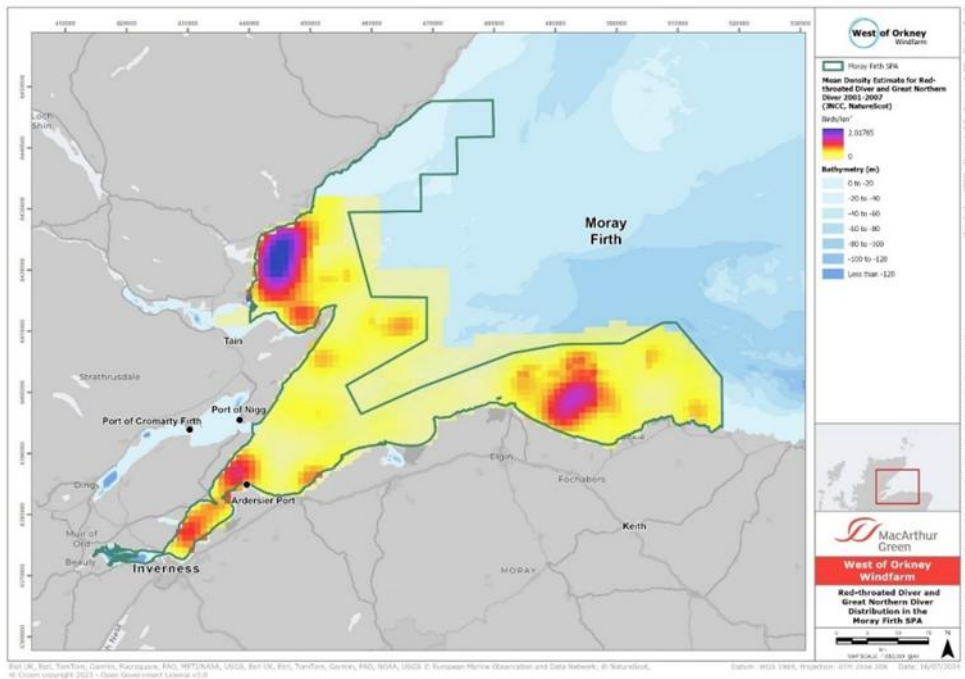


Figure 6-21. Great northern diver and red-throated diver distribution in the Moray Firth SPA from surveys recorded during the non-breeding seasons from 2001 to 2007.

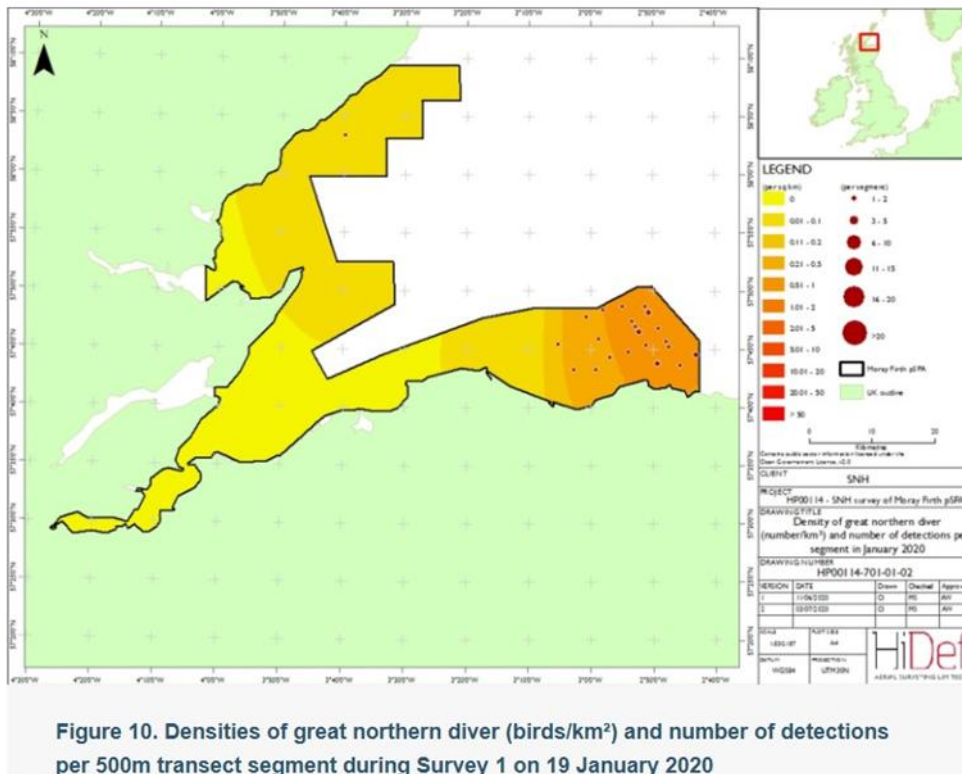


Figure 10. Densities of great northern diver (birds/km²) and number of detections per 500m transect segment during Survey 1 on 19 January 2020

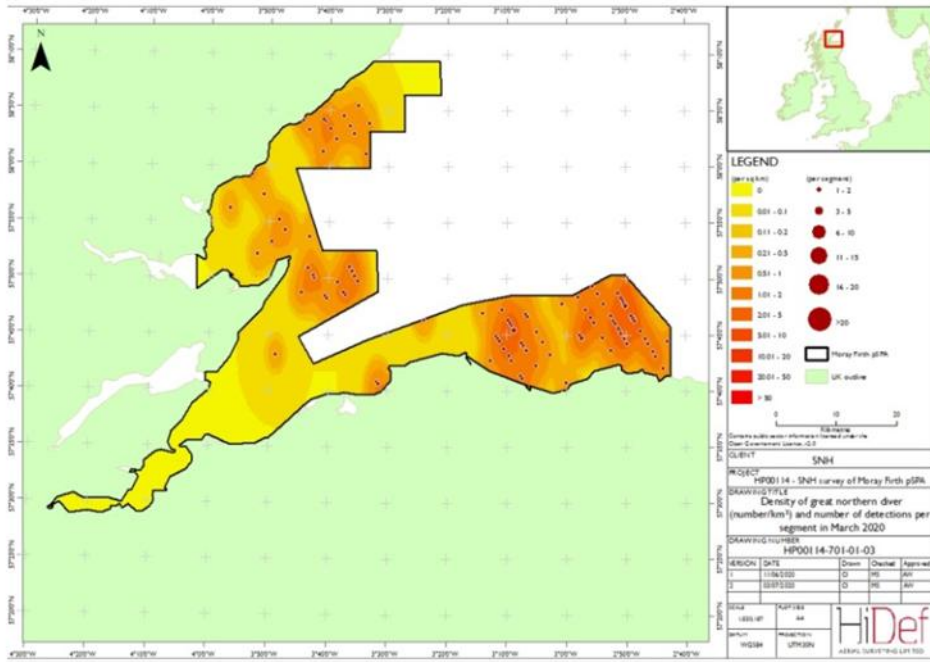


Figure 11 Densities of great northern diver (birds/km²) and number of detections per 500m transect segment during Survey 2 on 8 March 2020.

The 2020 survey results shown above did not indicate any significant densities of great northern divers in the vicinity of any of the ports. However, the March 2020 survey did indicate some higher densities of birds on the proposed route heading north, near the entrance to, and north of, the Dornoch Firth. It is likely that vessel disturbance of aggregations of divers could occur in this area.

F.7.2 Red-throated diver

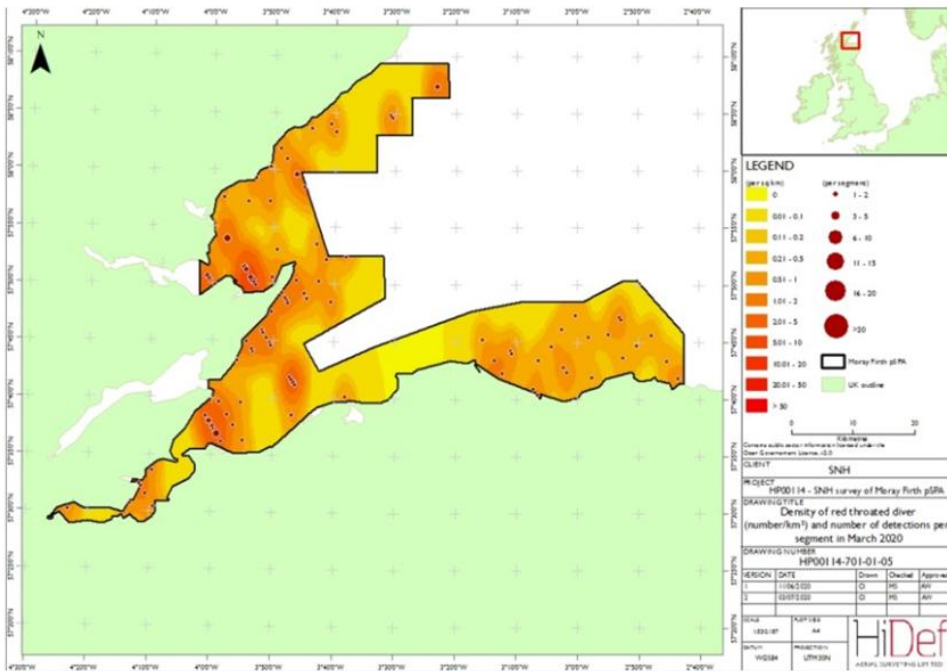


Figure 13 Densities of red-throated diver (birds/km²) and number of detections per 500m transect segment during Survey 2 on 8 March 2020.

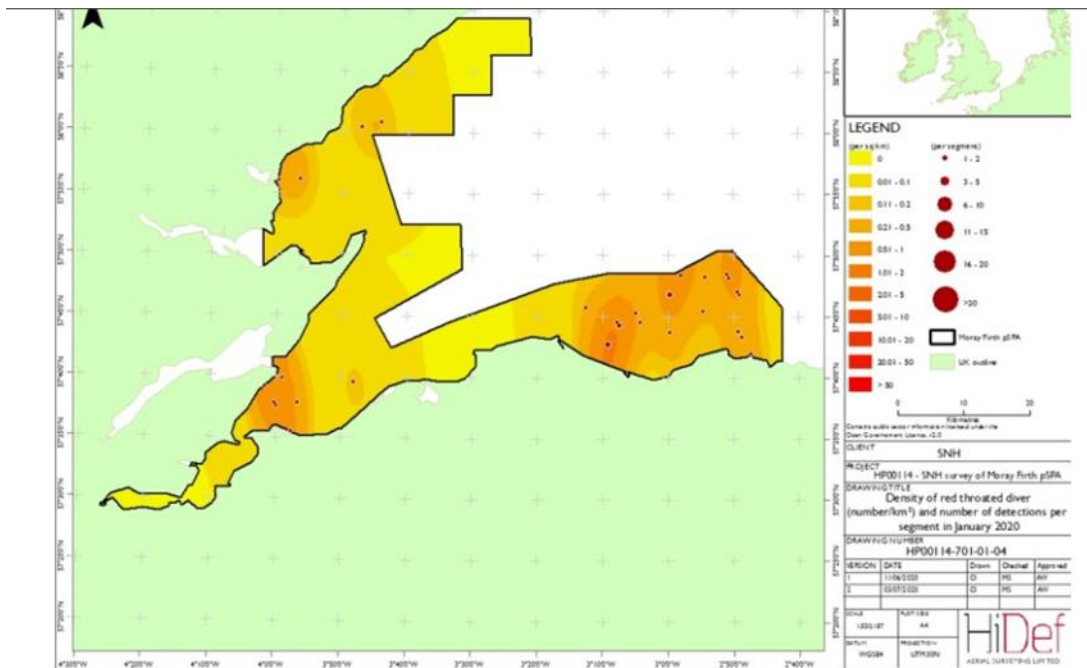


Figure 12 Densities of red-throated diver (birds/km²) and number of detections per 500m transect segment during Survey 1 on 19 January 2020.

The 2020 survey results shown above, especially the March survey, indicate areas of higher densities of divers in the vicinity of the ports and along the route north through the SPA.

Using the proposed route, it will be difficult for vessels to avoid disturbing divers, using any of the ports.

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix G – Offshore bats

We previously responded to pre-application consultation on the literature review, where we advised that we were broadly content with the review but advised some additional sources of information which could be included.

We have reviewed the following documents in relation to migratory bats:

- Volume 2, Chapter 12: Offshore Bats
- Volume 3, Technical Appendix 12.1: Offshore Bats Literature and Data Review.

G.1 Data and Literature Review

This is a thorough review which draws together the available information pertaining to northern Scotland in particular and takes account of comments made during the pre-application process.

G.2 Offshore Bats EIA Report

The *Data Sources* section (12.5.2) says “the literature review searched for any records of other migratory species such as *Nyctalus* species, which revealed that there were none.” This is not strictly true as the literature review maps include a number *Nyctalus* records from the Northern Isles (3 noctule records from Orkney and 2 (or 4) Leisler’s bat records from Shetland – para. A1.1.7 says 4, but Fig. A4 shows only 2). These are considered to be vagrants and not true migrants.

The section on the *Desktop Survey* (12.5.4) is unclear, stating “Where data was available, there were limited to no recordings of *Nathusius’ pipistrelle* within the survey area.” This is despite the literature review showing numerous *Nathusius pipistrelle* records within the Zone of Influence in Fig. 12.1.

There is further text in the paragraphs that follow, which states there is evidence of migration of *Nathusius’ pipistrelles* across the northern North Sea, as previously advised by NatureScot, but that it is not possible to identify the migration corridor with any degree of accuracy.

Important Ecological Features (IEFs – Section 12.6.6) are likely to be very limited for migratory bat species crossing the sea. In this context they are features where a bat could land and rest if it needed to. An IEF for migratory bats could be an island, an oil rig or similar, a passing ship or even a wind turbine, but the latter could potentially be a fatal option. The section does not include anything about these options, but it could, for example, have identified all permanent structures in the study area e.g., islands oil rigs (noting these may be long term rather than permanent).

We appreciate that this report is constrained by both the limited data and by an assessment framework that is not designed for the very specific circumstances that are being considered here: namely the possibility that bats migrating over the sea could become casualties at the proposed wind farm development. Much of this chapter seems to focus on process, assessment methodology, definitions and presenting facts about the proposed development, rather than suggesting what impacts might occur and how they might be mitigated. Although we accept that it may be impossible to quantify these or predict outcomes with the limited information on bats that is available.

G.3 Magnitude of impact (Section 12.10)

Given the absence of monitoring data, we do not think it is meaningful to suggest that *“The Proposed Development is therefore considered to be a low risk to migrating bats”* because the risk is unknown. Likewise, to suggest that the species has a low vulnerability to collision risk due to its suggested low flying height is also based on limited information. Flying height is likely to be heavily influenced by weather and sea conditions so we cannot confidently say that *Nathusius’ pipistrelles* will generally fly below the rotor swept area. We advise that in order to substantiate these claims, monitoring of the development area would be required.

G.4 Cumulative Effects

In Section 12.12.8, on the cumulative effects, assumptions are made about low bat activity but this is based on very limited information.

G.5 Mitigation

Section 12.10.10 states that *“No Additional Mitigation is considered necessary because the likely effect in the absence of mitigation is not significant in EIA terms.”* It is unclear what this is based on. Without any site-specific monitoring data, our view is that this statement cannot be substantiated.

G.6 Monitoring

12.13 – No monitoring is proposed but the report states *“the Applicant will engage and contribute to relevant regional and strategic monitoring, where appropriate to do so for the Proposed Development”*. We would appreciate the opportunity to discuss monitoring proposals with the Applicant. We consider further consideration of bat migration through monitoring would be helpful to better understand the impact pathways and any potential mitigation requirements.

G.7 NatureScot Conclusion

Given the lack of understanding of migratory behaviour of bats across the northern North Sea, and the potential for impact from offshore wind farms, we are keen to help advise on the development of a monitoring programme which will help to address this uncertainty. There are various options which could be explored, including the placement of static detectors on wind turbines themselves, and in the area surrounding Sinclair’s Bay. Should evidence of *Nathusius pipistrelles* be detected, then the potential for mist netting and ringing could be explored. Monitoring should ideally be continuous, where possible, from April to October. We would appreciate the opportunity to discuss monitoring proposals further with the Applicant.

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix H – Seascape, Landscape and Visual Impacts (SLVIA) – EIA

Having reviewed the Seascape, Landscape and Visual Impact Assessment (Volume 2, Chapter 20) for the Proposed Development, we do not consider that it would raise issues of National Interest in relation to its landscape, visual or cumulative effects. This is not to say that the development would not result in significant landscape or visual effects, rather that NatureScot does not judge these effects to meet our threshold in respect of our national remit for landscapes.

H.1 Additional comments

Our wider observations relating to the SLVIA are as follows:

- There is an overall lack of detail provided for the proposed turbine lighting given the high potential for landscape and visual effects and cumulative effects from this component of the proposal. We would advise that a reduced lighting scheme is sought and agreed with the UK Civil Aviation Authority (CAA), if the development proposal is consented, so as to ensure suitable mitigation is employed to reduce landscape and visual impacts from the proposed turbine lighting.
- Paragraph 20.10.2 of the SLVIA states that the assessment is based on an indicative worst case scenario layout and that the final layout will be developed post-consent. The proposed Array Area is sited in the east of the Plan Option Area (POA) (EIA Volume 1, Chapter 6; Table 6.1), current embedded mitigation stated in the SLVIA is generic (Table 20.20). We would expect post-consent design development to seek to further reduce impacts on the perceptual qualities (large-scale views, wild/ remote ‘edge of ocean’ feel, high scenic quality, awe-inspiring coastlines) of the eastern coast of Orkney (Deposition coasts of islands Coastal Character Type, Coastal Character Assessment – Orkney and North Caithness²⁹) through rationalisation of turbine height, horizontal extent, and maximising the distance of the turbines from the coast.
- The application does not include 360-degree views from the viewpoints (Mainland; Viewpoints 4 and 6). This would have been useful as it would allow for an understanding of the wider context of views, the horizontal extent and scale of the proposal, and potential successive views with the consented West of Orkney Offshore Wind Farm and Pentland Firth Demonstration Wind Farm.

²⁹ <https://www.nature.scot/doc/archive/coastal-character-assessment-orkney-and-north-caithness>

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix I – Blue carbon

Blue Carbon interests are considered in Chapter 22: Climatic Change (Volume 2) and the following relevant supporting appendix:

- Volume 3, Technical Appendix 22.2: Greenhouse Gas Technical Report

In this Appendix we provide advice on the Blue Carbon assessment and conclusions, we do not provide comment on other elements of the Climatic Change Chapter.

Overall, the documents provide an appropriate level of detail and are clearly presented. The assessment for Blue Carbon concludes **no significant impacts**, which we support.

However, we request clarification on the calculations used in the Blue Carbon assessment and the issues we raise in I.3.

We recognise that Blue Carbon assessments are a relatively new element of EIA Reports for proposed marine energy projects. Whilst advice included within this appendix is specific to the proposed Ayre Offshore Wind Farm EIA Report, there are some instances in which we provide comment on aspects of the assessment process which do not affect the outcome of the assessment or the overall conclusions reached in our advice; we hope these comments will be of benefit to future Blue Carbon assessments.

Furthermore, the biodiversity value and ecosystem functions provided by Blue Carbon habitats are well understood and afforded protection through a variety of policies. In addition, there is an increasing need to also recognise the climate change mitigation potential in line with the Blue Carbon Action Plan³⁰.

I.1 Study area

The study area is defined as the Proposed Development, including the Array Area and Export Cable Corridor (ECC). It is unclear whether this encompasses the landfall, including the intertidal area between Mean High-Water Springs (MHWS) and Mean Low-Water Springs (MLWS). Typically, we would expect inclusion of the intertidal area, especially as important coastal habitats (e.g. sand dunes, salt marsh, etc) may be present. Further advice is presented in I.4.2 below.

I.2 Baseline characterisation

Data sources used to inform the assessment are listed in Table 22.6. Many key data sources we would recommend are missing from this list, including:

- Burrows, M. T., Smeaton, C., Tillin, H., Grundy, S., Sugden, H., Moore, P., Fitzsimmons, C., Austin, W., O'Dell, A. 2024. The United Kingdom's Blue Carbon Inventory: Assessment of Marine Carbon Storage and Sequestration Potential in Scotland (Including Within Marine Protected Areas). A Report to The Wildlife Trusts, WWF and the RSPB. Scottish Association for Marine Science, Oban.
- Daewel, U., Akhtar, N., Christiansen, N., & Schrum, C. (2022). Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea.

³⁰ <https://www.gov.scot/publications/scottish-blue-carbon-action-plan/>

Communications Earth and Environment, 3(1), 1–8. <https://doi.org/10.1038/s43247-022-00625-0>

- Diesing, M., Thorsnes, T., & Rún Bjarnadóttir, L. (2021). Organic carbon densities and accumulation rates in surface sediments of the North Sea and Skagerrak. *Biogeosciences*, 18(6), 2139–2160. <https://doi.org/10.5194/bg-18-2139-2021>
- Hunt C, Demšar U, Dove D, Smeaton C, Cooper R and Austin WEN (2020) Quantifying Marine Sedimentary Carbon: A New Spatial Analysis Approach Using Seafloor Acoustics, Imagery, and Ground-Truthing Data in Scotland. *Front. Mar. Sci.* 7:588. <https://doi.org/10.3389/fmars.2020.00588>
- Smeaton, C., Austin, W., & Turrell, B. (2020). *Re-evaluating Scotland's sedimentary carbon stocks*. (2 ed.) (Scottish Marine and Freshwater Science; Vol. 11, No. 2). Marine Scotland. <https://doi.org/10.7489/12267-1>
- Smeaton, C., Hunt, C.A., Turrell, W.R. and Austin, W.E.N. 2021a. Marine Sedimentary Carbon Stocks of the United Kingdom's Exclusive Economic Zone. *Frontiers in Earth Science*, 9 <https://doi.org/10.3389/feart.2021.593324>
- Smeaton, C. and Austin, W.E.N. 2022a. Quality not quantity: Prioritizing the management of sedimentary organic matter across continental shelf seas. *Geophysical Research Letters*, 49, <https://doi.org/10.1029/2021GL097481>
- Turrell, W. R., Austin, W. E. N., Philbrick, S. P., Tilbrook, C., & Kennedy, H. (2023). Clarifying the role of inorganic carbon in blue carbon policy and practice. *Marine Policy*, 157(October), 105873. <https://doi.org/10.1016/j.marpol.2023.105873>
- Watson, S. C. L., Somerfield, P. J., Lemasson, A. J., Knights, A. M., Edwards-Jones, A., Nunes, J., ... Beaumont, N. J. (2024). The global impact of offshore wind farms on ecosystem services. *Ocean and Coastal Management*, 249 (September 2023). <https://doi.org/10.1016/j.ocecoaman.2024.107023>

However, we note that whilst Table 22.6 does not include the sources listed above, some are still referenced within the assessment.

Additionally, we note that Section 22.5.4 states that no site-specific surveys have been undertaken. However, in Technical Appendix 8.2: Benthic Characterisation Survey 2024: Survey Report (Volume 3), we note that 17 stations were sampled for Blue Carbon. It is unclear what type of data was collected, i.e. organic carbon measurements, total carbon content, habitat type, etc. However, based on Section 3.5.6 in Appendix 22.2: Climate Change Greenhouse Gas Technical Report (Volume 3), we assume that only habitat information was collected, which was then applied to carbon content values from the literature in the subsequent assessment.

1.3 Assessment approach

Our understanding is that carbon content values classified by sediment type from Smeaton *et al.* (2020) have been applied to the habitat type information collected during the site-specific benthic surveys. A breakdown of this is presented in Table 5.1 of the Appendix 22.2: Climate Change Greenhouse Gas Technical Report (Volume 3). It would have been useful to collect site-specific carbon content values, either to be used in the assessment directly or for comparison with the literature values used. However, the approach used is acceptable, noting that there are inconsistencies with the calculations as discussed below.

Section 22.10.5 of Chapter 22: Climatic Change (Volume 2) states the total area disturbed during construction as 1,595 ha. Using Table 22.7 of Chapter 22 presents the worst-case scenario area of

temporary habitat loss and disturbance and permanent habitat loss and disturbance during the construction phase as 18,000,341 m² and 3,042,840 m², respectively, which is in line with Chapter 8: Benthic Ecology. It appears that the permanent habitat loss and disturbance has been subtracted from the temporary habitat loss and disturbance to give an incorrect value of 1,595 ha (this calculation would result in 14,957,501 m², or 1,495 ha). However, it is unclear why this subtraction has occurred, given that the total value of temporary habitat loss and disturbance (18,000,341 m² or 1,800 ha) represents the maximum worst-case area of potential disturbance.

Despite this, Section 5.1.2 of the Appendix 22.2: Climate Change Greenhouse Gas Technical Report (Volume 3) only presents the total temporary habitat loss and disturbance (1,800 ha). However, we are unable to derive the same total disturbed carbon from the values presented in Table 5.1. Multiplying the average total carbon content value of 3.9 tC ha⁻¹ (taken from Smeaton *et al.* (2020) and scaled by the relevant proportion of site-specific sediment types) by the total temporary habitat loss and disturbance (1,800 ha), gives a total disturbed carbon value of 7,020 tC, not 6,228 tC as stated in Table 5.1.

Table I-1 provides an overview of the different values presented across the main Chapter 22 and Appendix 22.2, as well as what we consider the correct value to have used.

Clarification on the calculations used in the Blue Carbon assessment and the issues we raise above would be helpful, as they are currently unclear. However, despite this we have been able to come to a conclusion using a total disturbed carbon value of 7,020 tC.

*Table I-1. The various values presented across the main Chapter 22 and Appendix 22.2 relating to habitat loss and disturbance and resulting total disturbed carbon. *Our understanding is that for reasons unclear to us, permanent habitat loss and disturbance have been subtracted from temporary habitat loss and disturbance, noting that if this is the case, the value would be 1,495 ha instead.*

Temporary habitat loss / disturbance	Permanent habitat loss / disturbance	Total area disturbed	Total area disturbed	Total disturbed carbon value	Total disturbed carbon value
Table 22.7 of Chapter 22	Table 22.7 of Chapter 22	Section 22.10.5 of Chapter 22	Section 5.1.2 of Appendix 22.2	Table 5.1 of Chapter 22	NatureScot calculation
1,800 ha	305 ha	1,595 ha *	1,800 ha	6,228 tC	7,020 tC

1.3.1 Potential impacts

We are broadly content with the impacts considered for the Blue Carbon assessment, namely Impact 1 – *Disturbance of Blue Carbon Systems and Seabed Change, including Benthic and Subtidal/Intertidal Ecology, During the Construction, O&M and Decommissioning Phases*. However, this is largely focused on sedimentary carbon. Further advice regarding Blue Carbon habitats is provided in 1.4.2 below.

Moreover, we advise that changes in physical processes resulting from the presence of the subsea infrastructure associated with the Proposed Development are included in an assessment e.g. scour effects, changes in wave/tidal current regimes and resulting effects on sediment transport. We therefore recommend that future Blue Carbon assessments should also include this as an impact pathway where relevant, as sediment and associated carbon accumulation may result from these development activities. (Daewel, *et al.*, 2022; Watson *et al.*, 2024). There could be further impacts at decommissioning stage, although the impact is likely to be negligible given relatively low

sediment accumulation rates in the North Sea, noting that this does vary spatially (Diesing, Thorsnes, & Bjarnadóttir, 2021).

1.4 Impact assessment

1.4.1 Sedimentary carbon

Using the total disturbed carbon value of 7,020 tC calculated above, this represents 25,763 tCO₂ equivalent, which we consider to be ‘negligible’ due to the small footprint of the proposal relative to the total seabed area.

Regarding sensitivity, we agree that the sedimentary carbon is deemed to be of high vulnerability, low recoverability and high value. This is because sediment accumulation on the seabed can be very low and recovery therefore is slow. The sensitivity would be classed as ‘high’.

We agree with the overall significance of minor, which is not significant in EIA terms.

1.4.2 Blue Carbon habitats

Little consideration is given to Blue Carbon habitats, with the bulk of the assessment focused on sedimentary carbon instead. For instance, a mature dune complex is present along the coastline of Sinclair’s Bay within the Ayre landfall area. We would typically expect consideration of this habitat within the Blue Carbon assessment. However, in this case, we have reviewed the detailed assessment presented within Chapter 7: Physical Processes (Volume 2), particularly Impact 3 – *Potential Impacts to Coastal Morphology*, which is also relevant to the Blue Carbon aspects of the sand dune complex. We are content with the conclusion of ‘low’ magnitude and ‘medium’ sensitivity due to the HDD trenchless cable installation, which minimises disturbance to the dunes (and their carbon stores). We agree with the overall significance of minor, which is not significant in EIA terms.

Likewise, benthic Blue Carbon habitats have not been assessed in this chapter. However, as above, we have reviewed Chapter 8: Benthic Ecology (Volume 2), particularly Impact 1 – *Temporary Habitat Loss and Disturbance*, and Impact 2 – *Long-term Habitat Loss and Disturbance*, which is also relevant to the Blue Carbon aspects of the benthic habitats. We are content with the conclusions of magnitude and sensitivity, which vary by specific benthic habitat. We agree with the overall significance of minor for all benthic habitats, which is not significant in EIA terms.

1.5 Cumulative assessment

The Blue Carbon assessment presented does not include a cumulative assessment. We advise that future assessments should consider the cumulative impacts of disturbance from other developments, including longer-term carbon stored deeper.

1.6 Mitigation and monitoring

No mitigation or monitoring is proposed for Blue Carbon, which is in line with the ‘negligible’ magnitude and no significance of effect.

NATURESCOT ADVICE ON AYRE OFFSHORE WIND FARM

Appendix J – Derogation

The Applicant has submitted a derogation case alongside the s36 and Marine Licence Applications for the proposed Ayre Offshore Wind Farm. This derogation case is provided on a without prejudice basis, and includes the following documents:

- Derogation Case – Habitats Regulations Appraisal: Applicant’s Case for Derogation
- Derogation Case – Compensation Roadmap

We have considered both these reports and provide advice below.

J.1 Derogation Case – Habitats Regulations Appraisal: Applicant’s Case for Derogation

This report provides information on the legal framework, policy and guidance; consideration of alternative solutions; Imperative Reasons of Overriding Public Interest (IROPI) to justify the Proposed Development; and a brief summary of the compensation measures.

J.2 Derogation Case – Compensation Roadmap

Overall, the information presented in this report is high level and lacking in detail. This is reflected within our advice on the specific measures below. We would welcome engagement on a more detailed Compensation Plan as it develops but consider more should have been provided at this stage.

J.2.1 Compensation Plan

On the basis of our provisional appraisal of AEoSI (see Appendix F), compensation measures are likely to be required for the following species:

- Kittiwake,
- Guillemot,
- Razorbill,
- Puffin,
- Gannet, and
- Herring gull

We have been unable to provide final advice with regards to great black-backed gull and have requested additional information to allow us to make an assessment for this species. As such, we are unable to confirm whether compensation measures are likely to be required for great black-backed gull at this stage.

The Applicant identifies a number of measures that could be undertaken to compensate for impacts to kittiwake, guillemot, razorbill, puffin, and gannet. These include:

- Predator control – eradication and/or control of invasive mammalian predators, such as rats and American mink, to compensate impacts to kittiwake, guillemot, razorbill and puffin.
- Bycatch reduction – focused on commercial fishing vessels, with yet to be defined target locations, to compensate impacts to gannet.

There is no discussion of herring gull within the measures proposed and we advise that this may need to be considered further, depending on the outcomes of the Appropriate Assessment.

Likewise, we have been unable to provide final advice with regards to great black-backed gull, and compensation measures may be required for this species.

We focus our advice on the ecological feasibility of proposed compensation, submitted as part of the without prejudice derogation package. In doing so, we acknowledge that at this point in time, the Appropriate Assessment has yet to be undertaken, and limited detail has been provided.

J.2.2 Predator control

Information regarding locations, delivery partners, and mechanisms for delivery are not provided at this stage for the predator control measure. Therefore, the information presented is insufficient for us to provide any meaningful advice or determine the ecological effectiveness currently. We advise consideration of our derogation advice on the Section 36 and Marine Licence applications submitted by other Proposed Developments, as various predator control measures have been proposed and whilst most advice will be site-specific, there will be overarching principles that can be consistently applied.

Additionally, we highlight the requirement to secure landowner and land manager (if different) agreements associated with any compensation measure. Depending on the exact locations and activities, SSSI consent may also be required.

J.2.2.1 Biosecurity

We agree that biosecurity measures are essential to protect sites from the risk of re-incursion and welcome the commitment that biosecurity will be implemented for the duration of the operational lifetime of the proposed development, as per Section 6.5.2.

J.2.3 Bycatch reduction

Information regarding locations, delivery partners, and mechanisms for delivery are not provided at this stage for the bycatch reduction measure. Therefore, the information presented is insufficient for us to provide any meaningful advice or determine the ecological effectiveness currently. We advise consideration of our derogation advice on the Section 36 and Marine Licence applications submitted by other Proposed Developments, as various bycatch reduction measures have been proposed within Scottish waters and further afield, which may have overarching principles that can be consistently applied.

It is unclear whether the proposed bycatch reduction would be within Scottish waters or further afield, including European fisheries. In the case of the latter, we advise that further analysis in addition to the existing tracking studies listed in Section 7.2.3 would be required to validate likely connectivity between gannets breeding in Scottish SPA colonies and those caught in bycatch in European waters.

J.2.4 Adaptive Management

Section 9 briefly discusses adaptive management, with Table 9.1 listing some high-level potential adaptive management options relevant to each compensation measure. However, there is a lack of detail provided, regarding what constitutes the measure not being effective, i.e. the trigger point for adaptive management.

Predator control measures, such as protective fencing, may also be considered as adaptive management should evidence of predator presence at the sites arise. We highlight our advice

above around the consideration of SSSI consents, which is also relevant for erecting and maintaining an effective predator exclusion fence.

We also highlight the current work being led by Scottish Government on a Portfolio of Seabird Compensation Measures. There may well be activities that can be delivered jointly through a Marine Recovery Fund and or undertaken solely by individual developers that may be of interest that come forward through this portfolio work. We encourage developers to identify in their measures a long-term legacy for seabirds as part of any compensation measures required as part of any derogation case.

NatureScot – 14
April 2026

From: [Caitlin Cunningham](#)
To: [MD Marine Renewables](#); [MARINEENERGY](#)
Cc: [Amy Woodward](#); [Kirsten Watson](#); [Rebecca Ross](#)
Subject: RE: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 17 April 2026
Date: 14 April 2026 16:17:29
Attachments: [image001.png](#)

Good afternoon Amy,

Thank you for the query on our advice on the Ayre Offshore Wind Farm Application.

Following the reanalysis of the DDC and DDV footage at the listed sampling locations, if presence of flapper skate or blue skate ([formerly referred to as common skate complex](#)) and/or evidence of eggs are identified, then further assessment may be required. This further assessment would include changing the sensitivity of skates to 'high' for the relevant impacts (temporary habitat loss and/or disturbance; long term habitat loss and/or disturbance; increased suspended sediment concentrations and associated deposition; subsea noise), which takes into account the international importance of flapper skate and blue skate as critically endangered species. Depending on the outcome of the reanalysis of the DDC and DDV footage, the magnitude score (currently set as 'low') may also need to be revised, which would have implications for the overall significance and any requirement for further monitoring and/or mitigation. Any further assessment should also consider potential implications to the national status of flapper skate and blue skate as a Priority Marine Feature (PMF), from the impact pathways listed above.

Hope this helps clarify our advice.

Best Wishes,

Caitlin

Caitlin Cunningham (she/her) | Marine Sustainability Adviser

NatureScot | Meadowbank House | 6th Floor South | 153 London Road | Edinburgh | EH8 7AU
t: 01738 458531

[nature.scot](#) | [@NatureScot](#) | *Scotland's Nature Agency* | *Buidheann Nàdair na h-Alba*
I work compressed hours and do not work Friday afternoons.

From: MD.MarineRenewables@gov.scot <MD.MarineRenewables@gov.scot>

Sent: 14 April 2026 11:45

To: MARINEENERGY <MARINEENERGY@nature.scot>

Cc: [Redacted]

Subject: RE: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 17 April 2026

Good morning Caitlin,

Thank you for providing the NatureScot response to the above consultation.

MD-LOT requests clarification on the advice. MD-LOT notes the below from page 18 Appendix C of the response. Please can you confirm what further assessment would be

required?

- ‘All Drop-Down Camera (DDC) and Drop-Down Video (DDV) footage at the locations where grab samples were unable to be taken (ENV_003, 007, 008, 009, 021, 022 and 038). These should be re-analysed for the presence of common skate complex, as well as any evidence of eggs, including any ‘historic’ egg cases wedged between the cobbles and boulders. NatureScot has expertise in this field if further advice is required.
- Depending on the results of this analysis we may require further assessment, including consideration of the impact pathways discussed in C.4.1 – this may also require revision of magnitude scores.
- Assessment may require consideration of potential implication for the national status of these species and further consideration of mitigation and/or monitoring requirements may also be required.’

I would be grateful for a response by **Friday 17 April**. If this is not possible please get in touch.

Kind regards,
Amy

Amy Woodward

Marine Licensing and Consenting Casework Officer, Licensing Operations Team, Marine Directorate

Scottish Government, Victoria Quay, Edinburgh, EH6 6QQ

E: ^[Redacted]

The Scottish Government



**In the service
of Scotland**



Integrity



Inclusivity



Innovation



Collaboration



Kindness

[Marine Directorate](#) | [Marine Directorate Blog](#) | [@ScotGovMarine](#) | [Marine Directorate LinkedIn](#)

To see how we use your personal data, please view our [privacy notice](#):

[Marine licensing and consenting: privacy notice - gov.scot \(www.gov.scot\)](#)

Northern Lighthouse Board



Northern Lighthouse Board

84 George Street
Edinburgh EH2 3DA

Tel: 0131 473 3100
Fax: 0131 220 2093

Website: www.nlb.org.uk
Email: enquiries@nlb.org.uk

Your Ref: Ayre OWF – S36 Consent & ML Application
Our Ref: AL/OPS/ML/WIND_074_25

Ms Amy Woodward
Licensing Operations Team – Marine Directorate
Scottish Government
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB

16 December 2025

ELECTRICITY ACT 1989

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
The Electricity (Applications for Consent) Regulations 1990

MARINE (SCOTLAND) ACT 2010

The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017

MARINE AND COASTAL ACCESS ACT 2009

The Marine Works (Environmental Impact Assessment) Regulations 2007

Application for Consent Under Section 36 of the Electricity Act 1989 and Marine Licences Under Part 4 of the Marine (Scotland) Act 2010 and Part 4 of the Marine & Coastal Access Act 2009 to Construct and Operate the Ayre Offshore Wind Farm, Approximately 22km East of Orkney

Thank you for your e-mail correspondence dated 11th December 2025 relating to the application submitted by **Ayre Offshore Wind Farm Ltd** for consent to construct and operate the Ayre Offshore Wind Farm, located approximately 22km east of Orkney.

Northern Lighthouse Board note that the Ayre OWF will consist of up to 67 Wind Turbine Generators (WTG) on floating or fixed foundations, with an approximate export capacity of 1GW. Up to two Offshore Substation Platforms (OSP) will be installed within the array. The landfall for up to four offshore export cables is proposed at Sinclair's Bay, Caithness.

NLB have reviewed the documentation associated with the application, with particular reference to the navigational safety elements of the application contained within Chapter 14 (Shipping & Navigation), and Appendices 14.1 (Navigational Risk Assessment), and 14.2 and 14.3 (Marine Traffic Survey Reports).

NLB respects your privacy and is committed to protecting your personal data.
To find out more, please see our Privacy Notice at www.nlb.org.uk/legal-notice/

NLB note the hazards identified through the Navigational Risk Assessment (NRA) process, and the associated mitigations detailed throughout Chapter 14 and Appendix 14.1. NLB welcome the commitments to develop Post-Consent documentation, including a Lighting & Marking Plan (LMP), Navigation Safety Plan (NSP) and a Development Specification & Layout Plan (DSLPL).

NLB also note the inclusion of Appendices 29 (Outline Navigational Safety & Vessel Management Plan), 31 (Outline Lighting & Marking Plan) and 32 (Outline Aids to Navigation Management Plan) in support of these commitments.

Northern Lighthouse Board would request a correction be made to the following statement:

Chapter 14.10.223: “In the unlikely event a Wind Turbine was to breakout, it would still be marked and visible to other navigating vessels”.

Only structures designated as SPS or IPS¹ are fitted with marine Aids to Navigation featuring the required 96 hours of battery back-up power. All other structures have no marine AtoN installed and may not be visible in the event of a break-out. NLB do note that a response plan will be included within the ERCoP, with additional mitigations such as failure warning measures and tracking devices, as well as response and recovery procedures.

NLB also note that wet storage of Wind Turbine Units prior to deployment is not considered within the EIA, but will be assessed separately. NLB are willing to work with both the applicant, and any relevant Local Harbour Authority, with regard to this assessment process.

Table 9.9 within the Navigational Risk Assessment details that Virtual AIS (vAIS) could be utilised to mark either sunken or drifting WTG structures. As was stated by NLB during the HAZID workshop, vAIS requires physical infrastructure within close range to effectively broadcast the VHF AIS signal. Additionally, vAIS is not suitable for drifting structures as the vAIS signal would require constant manual position updates to accurately reflect the physical position of the structure.

NLB also wish to make a number of recommendations with regard to the Outline Navigational Safety & Vessel Management Plan, Lighting & Marking Plan and AtoN Management Plan.

- Outline NS&VMP Section 6.4 – Hydrographic Charts – full details of the mooring systems used (inclusive of positions) shall be provided to the UK Hydrographic Office if floating foundations are utilised.
- Outline NS&VMP Section 6.6 – Radio Navigation Warnings – inclusion of a WTG breakout in the example list.

¹ Significant Peripheral Structure or Intermediate Peripheral Structure

NLB respects your privacy and is committed to protecting your personal data.
To find out more, please see our Privacy Notice at www.nlb.org.uk/legal-notice/

- Outline NS&VMP Section 6.8 – Other Notification – inclusion of OWF MCC ability to issue immediate Maritime Safety Information warnings
- Outline Lighting & Marking Plan – temporary construction Aids to Navigation are not an NLB requirement, and are for internal navigation only during the construction phase. NLB’s only requirement for these AtoN is that they are either deactivated prior to any commissioning inspection.
- Outline AtoN Management Plan Section 4.2 – Monitoring – wording of this section requires amending to match that of Section 4.4 – remote monitoring shall be used to ensure that any faults are resolved as soon as possible and that overall availability standards are adhered to. Physical observations of AtoN should also be utilised to support the remote monitoring system (when possible).
- Outline AtoN Management Plan Section 4.5 – Temporary Removal of Structures with Key Lights – amend title to “ Temporary Removal of Structures with AtoN”.
- Outline AtoN Management Plan Section 4.5 – a range of solutions and/or a preferred option for providing temporary AtoN following a planned WTG removal should be included in this section.

The establishment, alteration and discontinuation of any Aid to Navigation is subject to the Statutory Sanction of the Commissioners of Northern Lighthouses. Further guidance and application forms can be obtained on request from the NLB Navigation Department (navigation@nlb.org.uk).

Northern Lighthouse Board have no objection to the proposed Ayre OWF, and do not consider that the development will negatively impact NLB’s statutory obligations and operations. NLB will continue to engage with the applicant with regard to the development of post-consent navigational safety documentation.

Yours sincerely
[Redacted]

Peter Douglas
Navigation Manager

North Highland Chamber of Commerce

28 January 2026

The Scottish Government
Marine Scotland Licensing Operations Team
Marine Laboratory
375 Victoria Road
Aberdeen
AB11 9DB



MD.MarineRenewables@gov.scot

Section 36 Consent Application – Construction and Operation of Generating Station – Ayre Offshore Wind Farm – Application reference 00011515/00011516

Dear Sir/Madam,

North Highland Chamber of Commerce is the lead organisation representing business within the North Highland region. It actively works to support and promote businesses from all sectors and is working alongside key agencies within the area on regeneration plans to ensure that the North Highlands has a sustainable and vibrant future.

I am writing a letter of representation for the economic and environmental benefits of the Ayre Offshore Wind Farm development.

The North Highlands are fundamental to Scotland's transition to renewable power, encompassing a highly skilled workforce, abundant natural capital, and a reputation for excellence. We have a sophisticated supply chain in place supporting the highly complex decommissioning process at Dounreay and world-class expertise in nuclear, renewables, oil and gas, engineering and energy storage.

The applicant, Thistle Wind Partners Ltd, is a Premier partner of North Highland Chamber of Commerce, demonstrating its commitment to help nurture a vibrant, sustainable, and diverse economy in the region. The project team has demonstrated a strong commitment to early supply chain engagement and investment to enhance key supplier capability and competitiveness in the region.

This development will offer significant economic benefits to the North Highlands and will enable substantial private and public sector investment into infrastructure such as local ports, transmission infrastructure and skills development. Over the lifetime of the development, it has the potential to have a transformative impact on local communities.

Alongside the creation of the Operations and Maintenance base in the North of Scotland, which is expected to create 100 full-time permanent jobs, the project is expected to offer significant opportunities to local companies during both the building and commissioning of the onshore support network in Caithness and investment in local ports and facilities.

The future job opportunities and skills development from the Ayre Offshore Windfarm are vital to halt depopulation in the north Highlands. The developer has already demonstrated a significant commitment to education and skills development across the area.

A £900,000 funding boost from the offshore wind industry, including Thistle Wind Partners is helping UHI North, West and Hebrides deliver a STEM outreach programme to early years settings and primary schools across the Highlands and Islands supporting the employment of 8 part-time and 2 full-time STEM coordinators. In addition, a training vessel was provided to the Maritime Studies Dept at UHI Orkney so they could continue training seafarers as they have been doing for 50 years.

There is no doubt that Scotland needs to accelerate the transition away from fossil fuels and replace them with clean energy sources. However, existing energy transmission infrastructure across Scotland is strained, hindering the distribution of green energy to demand centres, curtailing the potential of local renewable resources and exacerbating the nation's reliance on fossil fuels. Harnessing our home-grown natural resources is at the heart of strengthening Scotland's energy security and safeguarding a clean environment.

In summary, North Highland Chamber of Commerce is in full support of the development of the Ayre Offshore Wind Farm because it delivers benefits on so many levels - nationally, regionally, and locally. As such we hope that it will be successful in its planning application.

Yours faithfully,

[Redacted]

Trudy Morris
Chief Executive

North Highland Chamber of Commerce
Naver Business Centre, Naver House, Naver Road, Thurso, Caithness KW14 7QA
T: 01847 890076; E: info@northhighlandchamber.com; W: www.northhighlandchamber.com

North Highland Chamber of Commerce is a company limited by guarantee
Registered in Scotland no: 350926
Registered office: Naver Business Centre, Naver House, Naver Road, Thurso, Caithness KW14 7QA

Orkney Islands Council

Orkney Islands Council Consultation Response: Ayre Offshore Wind Farm

Applications for Electricity Act Section 36 Consent and Marine Licence.

Orkney Islands Council Consultation Response

This is the Orkney Islands Council (OIC) response in its capacity as:

- the planning authority; and
- as the delegate for the Orkney Islands marine region under the provisions of the Marine (Scotland) Act 2010/The Marine Licensing (Consultees) (Scotland) Order 2011.

Consent applications on which OIC has been consulted by the Scottish Government Marine Directorate - Licensing Operations Team (MD-LOT)

- Section 36 Consent Application – Construction and Operation of Generating Station – Ayre Offshore Wind Farm
- Marine Licence Application – Construction of Generating Station – Ayre Offshore Wind Farm – 00011515
- Marine Licence Application – Construction of Offshore Transmission Infrastructure – Ayre Offshore Wind Farm – 00011516

Proposed Development

The Ayre Offshore Windfarm located approximately 22 kilometres (km) east of Orkney at its closest point.

The consent applications detailed above are for the offshore elements of the proposed development which include:

- Up to 67 Wind Turbine Generators (WTGs) with floating and/or fixed-bottom foundations;
- Up to two Offshore Substation Platforms (OSPs) to transform and export power generated by the WTGs via the inter-array cables and offshore export cables;
- Up to 185 km of inter-array cables installed between the WTGs and OSPs;
- Up to 60 km of interconnector cables installed between the OSPs; and
- Up to four offshore export cables from the OSPs to landfall in Sinclair's Bay, totalling approximately 360 km in length.

The design and engineering options available for the proposed development were influenced by the specific conditions and environmental factors within the Site

Boundary. The Applicant has carried out several studies in the early development stage to address existing unknowns and to refine the design parameters. Further studies are expected to be completed beyond the planning phase and into procurement and contracting to acquire further site-specific information which will inform the final design of the proposed development. This includes determining final wind turbine numbers, size and layout, and floating or fixed foundation design. The detailed design will be confirmed post consent, subject to further site investigation and technical design studies.

Planning Policy Context – Overview

OIC has identified the following relevant planning policies (non-exhaustive) for the Ayre Offshore Wind Farm consent applications:

- National Planning Framework 4 (NPF4): Policy 1, 2, 3, 4, 5, 7, 10,11 and 25)
- National Planning Framework 4: Annex B National Developments Statements of Need
- National Marine Plan (NMP) General Policies
- NMP FISHERIES 1, FISHERIES 2 and FISHERIES 3
- NMP WILDFISH 1
- NMP RENEWABLES 1, RENEWABLES 4, RENEWABLES 5, RENEWABLES 6, RENEWABLES 7, RENEWABLES 8, RENEWABLES 9 and RENEWABLES 10
- NMP REC & TOURISM 2 and REC & TOURISM 5
- NMP TRANSPORT 1, TRANSPORT 3 and TRANSPORT 6
- NMP CABLES 1, CABLES 2 and CABLES 4
- NMP DEFENCE 1
- NMP CUMULATIVE EFFECTS
- Orkney Islands Regional Marine Plan (OIRMP) General Policy 1: Sustainable Development, Activities, and Use
- OIRMP General Policy 2 (If using Orkney Harbour areas): Safety
- OIRMP General Policy 3: Climate Change
- OIRMP General Policy 4: Supporting Sustainable Social and Economic Benefits
- OIRMP General Policy 5: Safeguarding Natural Capital and Ecosystem Services
- OIRMP General Policy 6: Water Environment
- OIRMP General Policy 8: Historic Environment

- OIRMP General Policy 9: Nature
- OIRMP General Policy 10a: Seascape and Landscape
- OIRMP General Policy 11b: Noise sensitive species
- OIRMP General Policy 14: Amenity, Wellbeing, and Quality of Life of Local Communities
- OIRMP Sector Policy 1: Commercial Fishing
- OIRMP Sector Policy 3: Shipping, Ports, Harbours and Ferries
- OIRMP Sector Policy 4: Pipeline, Electricity and Telecommunications Infrastructure
- OIRMP Sector Policy 5a: Offshore Wind Energy
- OIRMP Sector Policy 7: Tourism, Recreation, Leisure and Sport

The Delegation of Functions (Regional Marine Plan for the Scottish Marine Region for the Orkney Islands) Direction 2020 delegated regional marine planning functions to Orkney Islands Council (OIC). This established OIC as the delegate and statutory consultee for applications for a marine licence for activities in the Orkney Islands Marine Region under the provisions of the Marine (Scotland) Act 2010/The Marine Licensing (Consultees) (Scotland) Order 2011.

Approximately 18.7% of the development falls within the Orkney Islands marine region.

OIC has identified the key planning policies (non-exhaustive) in this consultation response that are considered most relevant in the Orkney context above and under the appropriate topics in this consultation response.

The proposed commercial scale offshore wind development is located in Plan Option area NE2 and therefore accords with NMP policy RENEWABLES 1.

NPF4 Annex B, National Developments Statements of Need, describes the developments to be considered as national developments for consent handling purposes. Relevant national developments for the proposed Ayre Offshore Wind Farm are:

1. Energy Innovation Development on the Islands which supports proposed developments in the Outer Hebrides, Shetland and Orkney Island groups, for renewable energy generation, renewable hydrogen production, infrastructure and shipping, and associated opportunities in the supply chain for fabrication, research and development; and

3. Strategic Renewable Electricity Generation and Transmission Infrastructure which supports renewable electricity generation, repowering, and expansion of the electricity grid.

In relation to national development 1. Energy Innovation Development on the Islands, Orkney Islands – Supporting Scapa Flow Future Fuels Hub and Orkney Harbours, class (a) applies to development that is for the delivery of the Future Fuels Hub, new quay in Scapa Flow, and the Orkney Logistics Base at Hatston, which support services for the renewable and marine energy and shipping sectors:

a) New or updated on and/or offshore infrastructure for energy generation from renewables exceeding 50 megawatts capacity.

Socio-economic impacts

Relevant planning policy context

- NPF4 Policy 11: Energy
- NPF4 Policy 25: Community Wealth Building
- NMP GEN 2: Economic Benefits
- NMP GEN 3: Social Benefits
- NMP GEN4: Co-existence
- NMP FISHERIES 1, FISHERIES 2 and FISHERIES 3
- NMP RENEWABLES 9 and RENEWABLES 10
- NMP REC & TOURISM 2, REC & TOURISM 5 and REC & TOURISM 6
- Regional Marine Plan (OIRMP) General Policy 1: Sustainable Development, Activities, and Use
- OIRMP General Policy 4: Supporting Sustainable Social and Economic Benefits
- OIRMP General Policy 14: Amenity, Wellbeing, and Quality of Life of Local Communities
- OIRMP Sector Policy 3: Shipping, Ports, Harbours and Ferries
- OIRMP Sector Policy 5: Offshore Wind, Wave and Tidal Renewable Energy Generation
- OIRMP Sector Policy 7: Tourism, Recreation, Leisure and Sport

The overarching policy and legislation applicable to the proposed development is presented in Environmental Impact Assessment Report (EIAR) Volume 1, Chapter 2: Policy and Legislation, whereas the policy and legislation applicable for the Onshore Infrastructure is set out in Onshore EIA Report (AOWFL, 2025): Volume 1, Chapter 2: Policy and Legislation.

The EIAR presents the assessment of the likely significant environmental effects on socio-economics, tourism and recreation, that may potentially occur as a result of the proposed development during the construction, operations and maintenance (O&M)

and decommissioning phases. The offshore and onshore components of the proposed development are considered in one assessment.

OIC welcomes that the applicant has provided an appraisal of the proposed development against the policies in the Orkney Islands Regional Marine Plan: Consultation Draft, which was available at the time of writing (EIAR, Chapter 2). When determining this application, MD-LOT should consider the proposed development against the relevant policies in the adopted Orkney Islands Regional Marine Plan.

OIC welcomes that the applicant has appraised the proposed development's contribution towards the strategic priorities in Orkney Islands Council Plan 2023-2028 including growing the green and blue economies, ensuring that benefits of economic growth are shared; local businesses in key sectors are thriving and creating better employment opportunities in Orkney.

EIAR Chapter 18, Table 18.1, identifies the relevance of NPF4 Policy 11c to this development proposal i.e. *Development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.* OIC identifies that this policy should play a key role in determination of the consent applications for the proposed offshore wind farm development, including maximising local and community socio-economic benefits.

NPF4 Policy 25: *Community Wealth Building* aims to support local economic development that focuses on community and place benefits as a central and primary consideration – to support local employment and supply chains. This includes improving community resilience, increasing spending within communities, ensuring the use of local supply chains and local job creation. These should be important factors in the determination of the consent applications for this proposed offshore wind farm development.

OIRMP General Policy 4: *Supporting Sustainable Social and Economic Benefits* requires this development proposal to demonstrate that opportunities have been considered to maximise sustainable employment benefits and create skilled employment in local communities. Therefore, opportunities should be considered to support local businesses, skills development, supply chains and research and development in Orkney. The proposed Workforce Strategy should be a key mechanism to secure and deliver these outcomes.

Socio-economic, Tourism and Recreation Study Areas

The Ayre Offshore wind farm EIAR has defined the socio-economic study area around the main local epicentres of impact which are expected to be the ports used during the construction, O&M and decommissioning of the development. The assessment assumes these will be in Highland and Orkney. Similarly, the Project's onshore infrastructure will be located in Highland. Therefore, the identified socio-economic study areas used for the assessment are:

- The Regional Socio-Economics Study Area (i.e. the local authorities of Highland and Orkney);
- Scotland; and
- the United Kingdom (UK).

OIC requested at the EIA Scoping stage that Orkney be identified as a study area and considered as part of the assessment of socio-economic impacts, including impacts on demographics, the local housing market, the labour market and local services.

EIAR Table 18.2 states that the assessment of socio-economic impacts at Section 18.10 focuses on the Regional Socio-economic Study Area (Highland and Orkney), Scotland and the UK. Any activity that may occur within Orkney is included in the estimates for the Regional Socio-economic Study Area of Highland and Orkney.

Due to the uncertainty on the location(s) of the proposed developments construction and O&M port(s) at the time of writing the EIAR, the assessment of socio-economic impacts at Section 18.10 has included a description of potential impacts based on a modelled rural and urban port.

OIC requests that Orkney is defined as a separate socio-economic study area and this should be supported by Orkney specific baseline data, impact assessments and mitigation to adequately address socio-economic impacts on Orkney communities. This is because as an Island Archipelago, Orkney has a unique socio-economic footprint and profile which is distinct to Highland and that of Mainland Scotland. This should include an assessment of potential effects on the Orkney economy, demographics, local housing market, labour market and local services. Identified impacts should include direct employment impacts and displacement effects on the local workforce and supply chain e.g. workers from other sectors moving to offshore wind related employment or local suppliers (e.g. freight) not being able to service existing sectors/customers. This should consider both the impacts and opportunities arising from the development. In this regard, Orkney has distinct characteristics in terms of the high level of Small and Medium-sized Enterprises (SME) business base and a significant number of businesses operating in marine and environmental sectors. Due to the scale of the Orkney economy and related economic factors, it is more sensitive to change and less able to absorb change than the Highland economy.

Orkney and Caithness are identified as Tourism and Recreation Study Areas. The Tourism and Recreation Study Area has been identified based on the location of the epicentres of impact that could affect tourism and recreation receptors with due consideration to areas with visibility of the proposed development and those coastal areas affected by any impacts on marine recreation. This approach is supported by OIC.

The socio-economics baseline identified in EIAR Chapter 18 (18.6) including population (18.6.2), economic activity (18.6.4), industrial structure (18.6.6), education (18.6.13) and housing (18.6.15) and health care provision (18.6.18) data is skewed by the characteristics of the much larger Highland area which has very different

demographics and socio-economic profile to Orkney. These comments are also relevant to the Population Projections (Future Baseline Scenario) identified at (18.6.49 – 18.6.53). It is requested that Orkney be assessed as a local study area so that the baseline data, impact assessment and mitigation adequately address socio-economic impacts on Orkney communities.

It is welcomed that the tourism and recreation data on Gross Value Added (GVA), employment and visitor numbers are Orkney specific.

18.6.28 explains that as tourism and recreation effects are a consequence of primary effects on other environmental factors (e.g. the result of visual changes), tourism and recreation assets have been scoped into the assessment on this basis. In this context, the visitor attractions identified at 18.6.30 do not identify the main relevant visitor attractions. 18.6.32 identifies localised tourism receptors across Stronsay and Deerness which are identified as more likely to be affected by the Project's Offshore Infrastructure because they are located on the east coast of Orkney and will be relatively closer to it. The identified tourism and recreation assets should include assets in North Ronaldsay, Sanday, Stronsay, Deerness, Copinsay, Holm, Lambs Holm, Burray and South Ronaldsay. In addition to Mill Bay, Vat of Kirbister, Sands of Rothiesholm, the Gloup and Mull Head Local Nature Reserve, the identified assets should include:

- North Ronaldsay Lighthouse and Beacon
- North Ronaldsay Sheep Dyke
- Start Point Lighthouse
- Bay of Lopness
- Bay of Newark
- Deerness Distillery
- Brough of Deerness
- Copinsay Lighthouse and RSPB Nature Reserve
- Dingieshowe
- The Italian Chapel
- The Churchill Barriers
- Newark Bay, South Ronaldsay
- Windwick Bay
- Tomb of the Eagles
- Quoyness Cambered Cairn, Sanday

OIC highlighted at the EIA Scoping stage that any changes in demand for housing and local services resulting from the proposed development would need to be scoped into the EIA. The impact from the proposed development on Orkney housing and accommodation provision needs to be understood in the context of the current significant shortage of housing/accommodation across all sectors and the high demand for housing for key workers, in part due to effects from other development projects within the islands. This is acknowledged in Table 18.2 *Summary of Key Consultation Issues Raised During Consultation Activities Undertaken for the Project Relevant to Socio-Economics, Tourism and Recreation*.

OIC requested at the EIA Scoping stage that embedded mitigation should include a commitment to the preparation of a Local Workforce Strategy to maximise local job opportunities and address associated local skills requirements, and that a Local Accommodation Strategy should also be identified as part of the proposed programme of embedded mitigation.

OIC welcomes that the applicant has committed to deliver a Workforce Strategy and an Accommodation Strategy, as identified in EIAR Table 18.2 and further discussed at Section 18.9. The commitment by the applicant to develop and implement a proposed Workforce Strategy is strongly supported by OIC. This strategy should be taken forward with close engagement with OIC and representatives of the relevant Orkney supply chain to maximise opportunities for local training, apprenticeships and associated economic development benefits in Orkney. It is important that this Strategy be taken forward as soon as practically possible so that the local supply chain has the opportunity to prepare and gear up to deliver the services required and local young people can receive training.

The Accommodation Strategy should demonstrate how the applicant intends to manage accommodation requirements for workers in local communities, particularly during the construction phase and potentially the O&M phase depending on the scale of the personnel requirements. It is proposed that the Accommodation Strategy will be drafted post-consent, once port location(s) is known, and it will address how temporary changes in population associated with the proposed development may affect demand for housing (18.9.2). It is recommended that work on this strategy commences as soon as possible to enable appropriate solutions to be delivered. As identified at 18.9.2, OIC will need to be closely engaged in the development of this strategy to ensure that it is fit for purpose and that it identifies appropriate measures to address the impacts of the proposed development on local accommodation provision and the housing market. These measures should seek to maximise long term housing legacy benefits for Orkney communities.

Volume 3, Technical Appendix 4.6: *Schedule of Mitigation and Commitments*, Table 1.1 identifies an Accommodation Strategy as embedded mitigation and that this will be secured in the Section 36 Consent and Marine Licences. Table 1.1 does not include a Workforce Strategy as a mitigation measure. It is recommended that the Schedule of Mitigation and Commitments be updated to include a Workforce Strategy. This Workforce Strategy will provide a key mechanism to demonstrate compliance with NPF4 Policy 11c, NPF4 Policy 25, NMP GEN 2, NMP GEN 3 and OIRMP General Policy 4 and OIRMP Sector Policy 5a i. a.

Community benefit

National Marine Plan (NMP) Renewables Policy 10 states that Good Practice guidance for community benefit from offshore wind and marine renewable energy development should be followed by developers, where appropriate.

In accordance with the Orkney Islands Council Policy on Community Benefit from Offshore Renewable Energy Developments, the Council will seek to maximise community benefits from new offshore renewable energy generation developments,

and to help direct these benefits fairly and equitably into supporting the communities of Orkney.

Orkney Islands Council's Policy on community benefit from offshore renewable energy developments is as follows:

- *We expect all developers of commercial offshore renewable energy projects in Orkney waters to commit to providing community benefit to Orkney and will seek to enter discussions with developers to achieve this.*
- *We will seek to ensure the fair and equitable distribution of benefits received as part of any community benefit scheme.*
- *We expect developers to enact a Community Benefit policy in line with the draft 'Scottish Government Good Practice Principles for Community Benefits from Offshore Renewable Energy Developments' 2018, or any future updated iteration of that document.*
- *In the absence of a clear position from the Scottish Government on the appropriate level of community benefit from offshore renewable generation, the starting point for determining the level of community benefit which should be delivered is £5,000 per megawatt installed per year index linked (as per onshore developments).*
- *We do not spatially limit our interest or claim for community benefit payments for Orkney and will seek community benefit from any project in waters adjacent to Orkney, regardless of distance from shore.*
- *There are numerous ways in which community benefit may be delivered (whether monetary or in-kind), but developers should be able to clearly demonstrate the value of community benefit that has been provided.*

The above policy relates to offshore renewable energy generation projects. Location of ancillary onshore infrastructure related to offshore generation is a separate consideration, for which the Council may seek to negotiate separate community benefit arrangements.

The Council recognises that some offshore renewable generation projects, particularly in the wave and tidal energy sectors, are pre-commercial. The above policy is only applicable to commercial projects.

The above policy does not confer support for any proposed development.

It is welcomed that the applicant proposes to establish a Community Benefit Fund (CBF). The applicant outlines at 18.9.4 in the EIAR that 'provision of a community benefit fund and/or shared ownership linked to operational performance of the wind farm are actively being considered for the Project. However, policy and requirements for community benefit are under review both by Scottish Government, but also at the UK Department for Energy Security & Net Zero; the latter is considering introduction of mandatory community benefit and how best to facilitate shared ownership. Given this policy uncertainty, as well as provision of Community Benefit not being a material consideration, further details on community benefit and shared ownership

would be agreed post consent'. It is further stated at 18.9.5 that *'the Project will meet the legislative requirements and consider updates to any guidance that emerges post consent. The Applicant looks to support community empowerment and have a positive impact on the local communities where their projects are'*.

OIC recommend that a CBF, associated governance and implementation strategy should be further developed in line with the above OIC policy, the Scottish Government Good Practice Principles for Community Benefits from Offshore Renewable Energy Developments, and any emerging relevant government policy and/or legislation, and in close collaboration with OIC, Community Councils and the wider Orkney community. It is recommended that a bespoke approach to community benefit be taken forward for Orkney in response to Orkney's circumstances and priorities including investment in physical infrastructure and connectivity. The proposed community benefit package should seek to address the Orkney Community Planning Partnership priorities including:

- Sustainable Development - supporting Community Wealth Building and achieving Net Zero by 2030.
- Cost of Living Crisis - and tackling the underlying causes of poverty.
- Local Equality - so residents in all parts of Orkney have equal opportunities.

The Orkney Community Planning Partnership (CPP) has published a policy discussion paper, Unlocking Local Benefit from Renewable Energy in Orkney. The paper sets out a bold vision to ensure that Orkney's leadership in renewable energy translates into tangible, long-term benefits for local communities.

Orkney generates more clean electricity than it consumes, yet faces challenges such as high fuel poverty and pressure on housing and services. The above discussion paper calls for a fairer share of the value created by renewable developments and proposes practical steps, including:

- Developing Orkney-specific developer principles to secure community benefits.
- Exploring a unified Orkney Community Benefit Fund to target fuel poverty, resilience, and climate adaptation.
- Expanding local and community ownership of renewable assets.
- Embedding Community Wealth Building principles in planning policy.
- Establishing a joint development forum to bring together public sector, industry, and community representatives.

The Scottish Government Good Practice Principles provide guidance regarding the identification of host communities for the purposes of designing community benefit packages. The guidance states that this process should be undertaken at an early stage to allow communities the opportunity to contribute to discussions and self-identify as a host community, in line with Scottish Government Empowerment policy.

As set out above, approximately 18.7% of the proposed Ayre Offshore Wind Farm is located within the Orkney Islands marine region to which Orkney communities have significant economic, governance and cultural connections. The proposed development will also have significant landscape, seascape and visual impacts on Orkney receptors. The Orkney Islands are therefore a principal host community for the proposed offshore wind farm development and should significantly benefit from the utilisation of the associated natural resources via a commensurate community benefit package.

Community benefits from offshore renewables projects are complementary to, but independent from, environmental, supply chain and other socio-economic benefits. OIC notes that, as outlined in the Scottish Government Good Practice Principles, voluntary monetary payments to the community (or a Community Benefit Fund) are not related to the impacts from any planning (or other consent) application. It is therefore expected that the necessary mitigation, and funding of this mitigation, to address effects identified in the proposed development consent applications and EIAR, should be delivered in addition to a CBF.

OIC expects that an appropriate binding agreement will be established to guarantee the provision of a CBF. It is not proposed that this should be secured as a condition on consent.

Shipping and navigation

Relevant planning policies:

- NMP TRANSPORT 1, TRANSPORT 3 and TRANSPORT 6
- OIRMP Sector Policy 3: Shipping, Ports, Harbours and Ferries

With reference to the Orkney Islands Council Harbour Authority (OICHA) Ballast Water Management Policy for Scapa Flow (<https://www.orkneyharbours.com/documents/oicha-ballast-water-management-policy-for-scapa-flow>) it is noted that the area covered by this proposed development is minimal and therefore should not cause any problems to shipping and navigation. If this proposed development goes ahead OICHA would amend the Policy to include a statement that there is an offshore wind turbine site in the location that would be inside the Eastern Exchange Zone, as defined in the Policy.

With reference to vessels sheltering or laying up in the Sinclair's Bay area (east coast of Caithness), as mentioned in previous comments this area is outside of OICHA Statutory Harbour Area, but we do know that vessels of all sizes use this area on a regular basis to lay up due to weather or similar conditions. In the advent of a large tanker / vessel OICHA have used this area in the past for embarkation / disembarkation of Harbour Authority marine pilots. This is unlikely to happen more than six times per annum, but along with other marine traffic it should be noted. It is suggested that that during construction, (in particular) due to the increased number of vessels in the area, very careful surveillance and details such as regular updates via Notice to Mariners should be made available. This, ultimately, is for the Maritime and Coastguard Agency to consider and take any action as they see fit.

Commercial Fisheries

OIC note that the Orkney Fisheries Association has been consulted as requested in the OIC EIA Scoping response. The Applicant should consult the Orkney Regional Inshore Fisheries Group in accordance with the Scoping opinion and OIRMP: *Commercial Fishing Policy*.

Seascape, Landscape and Visual Impacts

Relevant planning policies:

- NMP GEN 7: Landscape/seascape
- NMP REC & TOURISM 5
- NPF4 Policy 4c: Natural Places
- NPF4 Policy 11e: Energy
- OLDP Policy 9c: Natural Heritage and Landscape
- OLDP Policy 10a: Core Paths and Access
- OIRMP General Policy 10a: Seascape and Landscape
- OIRMP General Policy 14: Amenity, Wellbeing, and Quality of Life of Local Communities
- OIRMP Sector Policy 7: Tourism, Recreation, Leisure and Sport

It is acknowledged that Seascape, Landscape and Visual Impact Assessment (SLVIA) has assessed the maximum design scenario which includes the maximum height of the Wind Turbine Generators (WTGS), at 356 metres to blade tip height, and a maximum number of WTGs (40) (25 MW Wind turbine Option) sited within the Option Agreement Area resulting in the in the most extensive Zone Theoretic Visibility (ZTV).

NatureScot determined that the requested additional viewpoint within the West Mainland Natural Scenic Area (NSA) did not need to be assessed in the EIA. NatureScot were '*content for an assessment of effects on the Special Landscape Qualities of the Hoy and West Mainland NSA to be scoped out*'. However, NatureScot required that the wirelines of the viewpoints in the NSA provided to them should be included in the EIAR as '*they provide an understanding of the visibility of the proposal from this wider area*'. The wirelines for the NSA, however, are not available to view in the EIA in Volume 3, Technical Appendix 20.2: Seascape, Landscape and Visual Impact – Accompanying Graphics. Therefore, it is not possible for OIC to provide a view on the visibility of the proposed development in the NSA.

The SLVIA identifies significant adverse impact on Seascape and Landscape receptors in Orkney as follows:

- Viewpoint 1 – Stywick Bay, Sanday (Moderate adverse)

- Viewpoint 3 – Housebay, Stronsay (Moderate adverse)
- Viewpoint 7 – B9050, Deerness (Moderate adverse)
- Viewpoint 10 – Grimness, South Ronaldsay (Moderate adverse)
- Viewpoint 11 – Windwick Bay, South Ronaldsay (Moderate adverse)
- Viewpoint 12 – Ferry Link (Aberdeen – Orkney Ferry) (Moderate adverse)
- Viewpoint 15 – Orkney to Shetland Ferry Link (Moderate adverse)

OIC considers that impacts on these viewpoints will be of at least moderate adverse significance in relation to direct impacts from the proposed Ayre Offshore Wind Farm.

A cumulative impact assessment (CIA) has been undertaken. Table 20.22 provides a List of Other Projects Considered within the CIA for Seascape, Landscape and Visual Resources. This includes the Buchan, Caledonia and Stromar Offshore Windfarms. Seascape, landscape and visual effects associated with the proposed development, together with the effects from other relevant projects and activities, are likely to be significant. OIC recommend that onshore windfarms (Tier 2/Tier 3 and 4) within the study area be included and assessed in the SLVIA cumulative assessment. OIC recommend that the cumulative impacts associated with the following onshore windfarms be assessed:

- Ore Brae, Hoy
- Holodykes
- West Hill, Flotta
- Burgar Hill
- Hammars Hill
- Hammars Hill Extension
- Rennibister
- Crowness Business Park
- Kingarly Hill
- Northfield, Burray
- Hoy Community
- Costa Head
- Quanterness
- Hesta Head
- Nisthill

In addition, it is recommended that the applicant review the list of onshore wind farms currently within the planning system to ensure that an up to date CIA is carried out.

The assessment includes embedded mitigation such as:

- Development of, and adherence to, a Development Specification and Layout Plan (DSLPL). The development of the DSLPL includes consultation with the relevant authorities for approval, including the Maritime and Coastguard Agency (MCA) and Northern Lighthouse Board (NLB).
- Colouration of the Wind Turbines and blades to industry standard (light grey).
- Wind Turbines will be of identical form and rotor diameter.

The assessment however does not include any further mitigation for each impact, instead the developer acknowledges the significant effects and states '*No Additional Mitigation measures can be applied to mitigate the predicted long-term visual effect arising because of the Proposed Development.*'

OIC notes the commitment by the applicant to a Development Specification and Layout Plan (DSLPL). As part of the DSLPL, the proposed layout and spacing of the turbines should be located, sited and designed to minimise landscape and seascape adverse impacts on the identified Orkney viewpoints and landscape/seascape receptors in accordance with OIRMP General Policy 10a:

'Development and/or activities should be located, sited and designed to avoid, minimise and/or appropriately mitigate significant adverse impacts on the landscape, townscape and seascape characteristics and sensitivities identified in the Orkney and North Caithness Landscape Character Assessment, and should have regard to the natural and/or historic features that contribute to the quality of seascape and landscape.'*

Archaeology and Cultural Heritage

Relevant planning policies:

- NPF4 Policy 7: Historic assets and places
- NMP GEN 6: Historic Environment
- OIRMP General Policy 8: Historic Environment
- OLDP Policy 8: Historic Environment & Culture Heritage

This section of the OIC response addresses the EIAR Marine Archaeology and Cultural Heritage chapters and supporting technical appendices. This response is only relevant to the parts of the EIAR that relate to the Orkney Islands marine region and onshore historic assets in Orkney.

Technical Appendix 19.1: Marine Archaeology Technical Report

The contents of the Appendix are satisfactory, including the Methodology, the surveys and the Submerged Prehistory, Maritime and Aviation Archaeology

Baselines as identified. The potential likelihood levels identified for prehistoric, marine and aviation archaeology are supported.

Chapter 19: Marine Archaeology

The Marine Archaeology Study Area, Legislative and Policy Context are supported. The Baseline Environment identified and Data Sources used for this are acceptable.

The potential impacts identified and those scoped out of the study are supported.

The criteria for medium magnitude of impact, outlined in Table 19.14, are questionable. “partial loss of/damage to key characteristics, features or elements; partial loss of cultural significance (Adverse)” is classed as “not adversely affecting integrity of resource” despite loss of or damage to key characteristics and cultural significance.

Otherwise, the definitions and criteria for sensitivity of asset and significance of effect are acceptable.

The Embedded Mitigations in section 19.9 are acceptable. Note that the mitigations must be implemented so that the significance of any effect is kept as minor or avoided completely, using the archaeological exclusion zones as proposed.

The assessment of inter-related effects, cumulative effects and transboundary effects is acceptable.

The proposed monitoring is satisfactory.

Appendix 33: Written Scheme of Investigation and Protocol for Archaeological Discoveries

The Written Scheme of Investigation and Protocol for Archaeological Discoveries is acceptable. It must be implemented and monitored as outlined in the Appendix.

Technical Appendix 21.1: Cultural Heritage and Technical Appendix 21.2: Cultural Heritage Technical Appendix supporting figures

The Cultural Heritage Study Area and the assets selected to represent heritage receptors are acceptable, except for the absence of the Italian Chapel.

The data sources summarised in Table 3.1 omit the National Record for the Historic Environment database. It would appear that it has been consulted occasionally via Canmore (as shown in References), but this is a standard desk-based resource that should always be consulted.

Despite this, the reasoning for choosing the cultural heritage receptors chosen (Table 5.1) and the description of their key attributes and setting (Section 6) are mostly sufficient for the purposes of the appraisal, although sometimes the importance of the sea to prehistoric and mediaeval assets, use as a navigational aid for example, or location by the sea because accessed from the sea not just land, or south-east oriented passages opening to the sea, is underestimated. Similarly, the requirement for open sea views from the Burray Ness Battery is underestimated, a fundamental requirement being the ability to spot aeroplanes as they approach.

This is especially important for Asset CH5, the Brough of Deerness, where the reasoning and the description omits one of its key characteristics as a Viking/Norse stronghold controlling the seaways on the eastern side of Orkney and thus a key aspect of its setting, with open views over the sea to the east. The appendix has not identified with what the Brough of Deerness has a “fortuitous aesthetic relationship”. The setting description of the Brough of Deerness includes that there “are open views to the North Sea to the west and south-west. To the north-west and north, Auskerry and Stronsay are visible, open views to the North Sea to the west and south-west”. The open views are all in the 180 degree view centred **eastwards** towards, not away from, the proposed development.

The supporting visualisations and wireframes in Appendix 21.2 are acceptable, except for the omission of a visualisation for CH13 Isbister Chambered Cairn and one for the Italian Chapel, which has not been identified as a CH asset. Both are highly important to the local tourist economy, but not included in the Socio-economics, Tourism and Recreation Chapter 18.

Chapter 21: Cultural Heritage

The Cultural Heritage Study Area is supported. The data sources summarised in Table 21.6 omit the National Record for the Historic Environment. It would appear that it has been consulted occasionally via Canmore (as shown in References), but this is a standard desk-based resource that should always be consulted.

The reasoning for the Heritage Assets selected to represent cultural heritage receptors. (Table 21.9) is mostly sufficient for the purposes of the appraisal, although the reason for the choice of assessing two barriers rather than one barrier and the Italian Chapel (including approaches to it) is not clear. The summary description of the asset within the reasoning column is mostly acceptable, although the “fortuitous aesthetic relationship” assigned to CH5 is not explained, nor is it stated what the relationship is with. If this is meant to be with sea views, these are not fortuitous, but key to the function of the site.

The key parameters for assessment are acknowledged and the impacts scoped out of the assessment are supported.

The definitions of magnitude of impact and significance of effect are acceptable. It is agreed that levels of moderate or above are considered significant effects in terms of the EIA Regulations.

The Adopted Embedded Mitigations are acceptable, although from the visualisations provided currently Mitigation ID 24 does not appear to have been applied and has not yet provided much of an appearance of uniformity and coherence from many heritage assets. It may be that this is not possible, in which case that must be stated.

The importance of the sea to some heritage assets and the magnitude of change to their setting is underappreciated, resulting in an underestimation of significance of impact on certain cultural heritage receptors. Even though the topics are different, the divergence of levels of impact assigned with those assigned to similar viewpoints

in Chapter 20 (Seascape, Landscape and Visual Impact Assessment) is notable, especially when focussing on visual change.

It would appear that the array is classified as 'distant' in views, whether 22 km (e.g. Ward of Housebay) or over 50 km (e.g. Scad Head). This does not allow for clear differences in visibility and impact and is not acceptable.

The reasoning for assets where it is considered that the impact is underestimated and likely to be Significant is outlined below. It is recommended that these are reconsidered and reassessed.

CH1 Quoyness Chambered Cairn.

The open views to the south-east are important, both in the approach to the cairn and the view from the entrance to the passage. The impact of emerging from the passage into the open is as important as the axis of the passage, not just the constrained view from within the passage as posited.

The supporting visualisation clearly shows that the array would be central in the key view of the open sea to the south-east and all devices would be visible on the horizon, whether the towers or just hubs and blade tips. This is an asset that is promoted as a visitor attraction. There will be a noticeable change to a key axis and view that contributes to the understanding and experience of the asset and is higher than the negligible magnitude proposed, resulting in a Significant Effect.

CH2 Ward of Housebay

The cairn is reported as having a passage that was orientated towards the south-east, although it is not currently exposed.

Rather than the turbines appearing offset from the cairn during the approach and as distant recessive features, the supporting visualisation shows that the windfarm would be central in the south-east axis out to the open sea and all turbine towers, not just hubs and blades, would be visible on the horizon.

There will be a noticeable change to a key axis and view that contributes to the understanding and experience of the asset with an effect higher than the negligible magnitude proposed, resulting in a Significant Effect.

CH5 Brough of Deerness

The setting description includes open views to the North Sea to the west and south-west. This should be open views to the north-east, east and south-east. The analysis of the asset does not include that whilst the Pictish period religious settlement is likely located here due to its isolation, the Norse period stronghold is deliberately sited here to look out over and control the eastern seaboard of Orkney.

These key aspects of the setting and the understanding and experience of the asset will be affected by the proposed development being visible across an extensive portion of this panorama of open seascape, with all turbines fully visible and prominent above the horizon. Therefore, the effect will be higher than the minor level proposed, resulting in a Significant Effect.

CH11 Burray Ness Ant-Aircraft Battery

Without a 40x25 MW photomontage to accompany the baseline photo and wireframe, it is not possible to properly assess the effect on the key understanding of this asset's function commanding the approaches from the east.

CH12 St Peter's Church and Cemetery

The analysis of the setting omits that many churches and graveyards in Orkney have coastal locations because they were accessed by boat as well as land, and this was a key part of how they functioned. Without a 40x25 MW photomontage to accompany the baseline photo and wireframe, it is not possible to properly assess the effect.

CH13 Isbister Chambered Cairn (Tomb of the Eagles)

The location of the tomb and the opening of its passage directly out to sea are key elements of the understanding, experience and appreciation of the asset. The tomb is open to the public and a promoted tourist destination. Without a 40x25 MW photomontage to accompany the baseline photo and wireframe, it is not possible to properly assess the effect on the asset, which could be Significant.

It is noted that the Cumulative Impact Assessment (CIA) does not include relevant onshore windfarms in Orkney, both existing and in the planning system, such as: Spur Ness, Sanday; Rothiesholm, Stronsay; Neven Point, Eday; and Hesta Head, South Ronaldsay. This is not satisfactory. Refer to the relevant comments above regarding the SLVIA/CIA.

The assessment of the effect on VP5 Balfour Castle with its associated Inventoried Garden and Designed Landscape in Chapter 20 (Seascape, Landscape and Visual Impact Assessment) is noted and supported.

It is noted that effects on neither the Tomb of the Eagles (Isbister) nor the Italian Chapel are included in Chapter 18 Socio-Economics, Tourism and Recreation (nor in Chapter 21 Cultural Heritage), despite the Italian Chapel being included in a list (18.6.30). Both of these are extensively promoted as visitor destinations. The list of nine Orkney attractions extracted from the Visit Scotland website is inadequate and a random selection of what is on the Visit Scotland portal and their interactive map, and does not reflect the range of cultural heritage attractions that is promoted in Orkney, or found on the Visit Scotland portal, which links through to 106 history- and archaeology-related attractions on Orkney.com. This is not satisfactory. Refer to the relevant comments above regarding the identification of tourism and recreation assets.

Habitats Regulations – proposed compensation measures

Relevant planning policies:

- NMP GEN 9 Natural Heritage
- NMP GEN 13 Noise
- OIRMP General Policy 9: Nature

- OLDP Policy 9c: Natural Heritage and Landscape

Off-site compensation measures are proposed by the applicant, as shown in Table 5 of the Applicant’s Case for Derogation, below.

The Habitats Regulations Appraisal: Applicant’s Case for Derogation, does not identify any location within Orkney for delivery of the proposed compensation measures. Table 5 of the Applicant’s Case for Derogation identifies that selected island(s) would be chosen for target rat species eradication, to enhance target seabird breeding success at designated colony(ies).

The Applicant states: ‘Detailed evidence supporting proposed predator control compensation measures will be presented within an Ecological Evidence Report provided post-Application (alongside the Compensation Plan)’.

Table 5 provides an Overview of the Proposed Compensation Measures:

Compensation Measure and Species Covered	Measure Description
Rat Eradication Guillemot, razorbill and puffin	Eradicate target rat species (such as brown rats <i>Rattus norvegicus</i>) on selected island(s) in order to enhance target seabird breeding at designated colony(ies).
Mink Control Guillemot, razorbill, puffin, and kittiwake.	Implementation or continuation of a mink control programme, to maintain a reduced mink population across the control area.
Seabird Bycatch Reduction Gannet	This measure will decrease the bycatch mortality rates of gannet through the application of bycatch reduction techniques.

The Applicant states that to give Scottish Ministers confidence that the identified compensatory measures can be secured and will be effective, summary information on each measure and next steps has been provided in the Compensation Roadmap appended to the Derogation Case.

OIC notes that the Applicant intends to submit a detailed Compensation Plan post-application and prior to determination of the application. The Compensation Plan will present further detail on the potential sites, approach to securing delivery, and the organisations and partners which will help to deliver measures.

OIC notes that site selection for a rat eradication measure is currently underway, with engagement and negotiations to secure agreements with the relevant landowners and leaseholders ongoing. It is proposed that the Compensation Plan will set out the

preferred site(s) for implementation, along with appropriate evidence such as site visit data, calculations for capacity, and written agreements with necessary parties. OIC requests that should sites in Orkney be proposed for such compensation measures, engagement with OIC takes place to ensure that the proposed compensatory measures and associated impacts on the Orkney environment, cultural heritage and communities are appropriately addressed.

It is proposed by the applicant that the requirement to implement compensatory measures can be secured by means of a suspensive condition on the Section 36 Consent and Marine Licences. OIC notes the alternative proposal that a payment to a Marine Recovery Fund could be made wholly or partly in substitution for the implementation of the compensatory measures. OIC agree that a suspensive condition would be appropriate.

Biodiversity and Environmental Enhancement

Relevant planning policies:

- NPF4 Policy 3b (Biodiversity)
- NMP GEN 9: Natural heritage
- OIRMP General Policy 3: Climate Change
- OIRMP General Policy 9: Nature

National Marine Plan policy GEN9 (c) states that *development and use of the marine environment must protect and, where appropriate, enhance the health of the marine area*. National Marine Plan, para. 4.40, states that *marine planners and other decision makers should act in the way best calculated to further the achievement of sustainable development and use, including the protection and, where appropriate, enhancement of the health of the Scottish marine area*. This reflects the statutory duty on Scottish Ministers and public authorities in Marine (Scotland) Act 2010, section 3.

OIRMP General Policy 9 b i. states that *proposals for development and/or activities should contribute, where appropriate, to the enhancement and/or restoration of the coastal and/or marine environment utilising best practice assessment and implementation methods*.

Marine restoration and enhancement proposals delivered as part of the proposed development should have regard to the appropriate guidance provided by NatureScot. Marine and coastal enhancement framework:

<https://www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-and-seas/marine-enhancement>

Mitigations associated with the Project's Offshore Infrastructure are listed in Offshore EIA Volume 3, Technical Appendix 4.6 Schedule of Mitigation and Commitments. These include a range of measures such as implementation, management and monitoring of cable protection; adherence to a Navigational Safety and Vessel Management Plan and the development and adherence to an Entanglement

Management Plan. The Applicant has also committed to the development of and adherence to an Environmental Management Plan (EMP). All these measures seek to protect the marine environment, its flora and fauna, through appropriate mitigation. However, within the EIAR, there are limited marine environmental enhancement proposals.

The Applicant proposes that specific enhancement proposals will be determined post consent as Matters Specified in Conditions, these include:

- *planning for Biodiversity Enhancement: the Project will go beyond simply avoiding environmental deterioration, aiming to deliver a net gain in biodiversity compared to the existing baseline for the onshore works. This will be assessed by professional ecologists.*
- *taking a phased approach: the exact form of enhancement will depend on design elements still in development, such as the final route of the onshore cables and the layout of the Substation. These details will be confirmed at the Matters Specified in Conditions stage of the planning process.*
- *responding to Planning Requirements: The Project is expected to be subject to planning conditions which will include requirements for detailed landscaping and biodiversity proposals as part of the Matters Specified in Conditions for the onshore elements. The Project is prepared to meet these expectations with plans to enhance local habitats and biodiversity.*

The Technical Appendix 18.2: Socio-economic, Tourism and Recreation Onshore and Offshore Technical Report states that '*biodiversity enhancement is a fundamental part of the Applicant's approach and embedded in the Project design*'. However, no specific proposals for marine enhancement have been proposed. In accordance with NMP policy GEN9 (c) and OIRMP General Policy 9 b i. on marine environmental and biodiversity enhancement, it is recommended that appropriate marine enhancement measures be secured as part of the relevant consents utilising best practice assessment and implementation methods. Potential options which have been utilised elsewhere which are not explored by the applicant include artificial reef creation through reef friendly rock placement/scour protection and cable materials, attachment of reef cages to foundations, marine litter removal projects, and the delivery of off-site restoration projects (e.g. native oyster bed restoration), for example.

Marine environmental enhancement measures could be identified and secured through these consent applications, including proposals within the Orkney Islands marine region.

Marine Physical and Coastal Processes, Water and Sediment Quality

Relevant planning policies:

- NMP GEN 10: Invasive and Non-Native Species
- NMP GEN 12: Water Quality and Resource
- NMP GEN 21: Cumulative Impacts

- NMP Cables 1
- NMP Cables 2
- NMP Cables 4
- OIRMP General Policy 6i: Water environment
- OIRMP General Policy 7b: Coastal processes

OIC broadly agree with the assessment of impacts made within the Physical Processes Chapter. Overall, it is concluded that there will be no likely significant environmental effects arising from the Proposed Development during the construction, O&M or decommissioning phases on physical processes receptors.

It should be noted that where scour protection is used, methods for combining this with biodiversity enhancement techniques (e.g. reef friendly materials) should be considered. See Biodiversity Enhancement comments above for further information.

Benthic Subtidal and Intertidal Ecology

Relevant planning policies:

- NMP GEN 9: Natural heritage
- NMP GEN 10: Invasive and non-native species
- NPF4 Policy 3 Biodiversity
- NPF4 Policy 4 Natural places
- OIRMP General Policy 6i: Water environment
- OIRMP General Policy 9: Nature
- OIRMP General Policy 13: Non-native and Invasive Non-native Species

The impacts assessed include:

- temporary habitat loss and/or disturbance;
- long term habitat loss and/or disturbance;
- introduction of artificial structures and subsequent colonisation;
- changes to SSC, bed levels and sediment type;
- changes in physical processes;
- increased risk of introduction and spread of INNS;
- removal of hard substrates; and
- impacts to benthic ecology due to EMFs.

Overall, it is concluded that there will be no likely significant environmental effects arising from the Proposed Development during the construction, O&M or decommissioning phases.

Regarding Invasive and non-native species, protocols such as The Great Britain Invasive Non-native Species Strategy and relevant policies listed above should be

adhered to minimise any further introduction or spread of INNS. The prevention aspect of the three-stage approach (Prevention, Rapid Response, Control) is particularly important as, in most cases, it would not be possible to control a species once it has been introduced. Within Great Britain, the Non-Native Species Secretariat provides biosecurity advice to prevent the spread of invasive plants and animals in British waters and many of the best practice measures are applicable to the marine environment. The final Environmental Management Plan should identify areas where further action is needed.

Fish and Shellfish Ecology

Relevant planning policies:

- NMP GEN 9: Natural heritage
- OIRMP General Policy 9: Nature

The impacts assessed include:

- Temporary habitat loss and/or disturbance;
- Long term habitat loss and/or disturbance;
- Introduction of artificial habitat and subsequent colonisation of hard structures;
- Increased SSCs and associated deposition;
- Subsea noise impacting fish and shellfish receptors;
- Impacts to fish and shellfish receptors due to EMF;
- Impacts to fish and shellfish receptors due to entanglement;
- Accidental pollution to the surrounding environment.

Overall, it is concluded that there will be no likely significant environmental effects arising from the Proposed Development during the construction, O&M or decommissioning phases.

Although a likely significant effect (moderate adverse) was concluded for the herring Important Ecological Feature (IEF) resulting from piling during the construction phase. Mitigation measures within the Piling Strategy will be agreed as part of a stepped strategy post consent. It is expected by the Applicant that the mitigation measures will reduce the significance of effect to minor adverse which is not significant in EIA terms.

Marine Mammals and Megafauna

Relevant planning policies:

- NMP GEN 9: Natural heritage
- OIRMP General Policy 9: Nature
- OIRMP General Policy 11: Surface and Underwater Noise, and Vibration

No significant effects apart from cumulative disturbance from subsea noise generated during piling for harbour porpoise only. No Comment from OIC.

Public
Representation
- 29 January
2026

From: [Redacted]
To: [MD Marine Renewables](#)
Subject: Ayre Offshore Wind Farm ref MS-00011515 / MS-00011516
Date: 29 January 2026 10:50:28

I wish to object to this application.

This development is not required. Not only is it just a commercial venture intended to make money for its investors, based on what has happened to date it will be subject to longer term subsidy for its operations, all paid for by the UK taxpayers who already pay inflated energy prices.

There are already indications that speculative commercial ventures such as this feel that they are in a position to attempt to dictate to the UK Government the terms on which they will operate. They claim that the north of Scotland is the best place to site wind turbines but are not prepared to pay their share in what are necessarily higher transmission charges [1]

Whilst, despite recent declines in energy demand across the UK, there is an accepted increase in the demand for electricity production. However, a significant part of this projected demand is for the massive power requirements of the growth in the number of data centres and associated AI activities. This needs to be carefully assessed in light of the firm belief of most financial analysts that it is a matter of "when" not "if" the AI Bubble will burst [2]

It is also time to question the Scottish Government's apparent belief that locating data centres in Scotland will bring employment opportunities in associated industries. The evidence no longer exists. The once golden ticket of a degree in Computer Science has turned to dust with graduates unable to secure jobs. [3] Relying on a tech start-up strategy for employment seems highly speculative against a background of uncertain infrastructure.

It is surely time for the Scottish Government to revisit the data centres component of its *Green data centres and digital connectivity vision and action plan*? [4] Launched in 2021 and updated in 2023, it aimed to position Scotland as a leading location for data centres. So why has little happened so far? Location is suggested as the main reason. [5] Companies prefer to host facilities close to their main user base. Hence, 80% of the UK's co-location data supply is around London. Locating in Scotland creates additional problems of latency affecting internet transmission speed as well as issues in the area of energy transmission. In other words, more significant investment would be required in order for Scotland to compete in what is basically a global market and where there are always going to be cheaper and more efficient solutions to both the data centre and energy transmission problems.

[1] K. K. S. environment, energy, and R. A. Correspondent, 'Plans for huge wind farm paused over "unfair" grid charges', BBC News. Accessed: Jan. 28, 2026. [Online]. Available: <https://www.bbc.co.uk/news/articles/c8x919v8g19o>

[2] 'What does an AI bubble mean for Scotland?' Accessed: Jan. 28, 2026. [Online]. Available: <https://www.savecaithness.org/ai-bubble>

[3] 'Computer science used to be a golden ticket to a lucrative career. Now graduates can't get a job'. Accessed: Jan. 28, 2026. [Online]. Available: <https://www.telegraph.co.uk/money/jobs/schools-universities/computer-science-graduates-cant-get-job/>

[4] 'Green datacentres and digital connectivity: vision and action plan for Scotland'. Accessed: Jan. 28, 2026. [Online]. Available: <https://www.gov.scot/publications/green-datacentres-and-digital-connectivity-vision-and-action-plan-for-scotland/>

[5] 'Scotland's renewable energy: Fuelling the future of data centres'. Accessed: Jan. 28, 2026. [Online]. Available: <https://www.cbre.co.uk/insights/articles/scotlands-renewable-energy-fuelling-the-future-of-data-centres>

[Redacted]

h

k

K

2026 - 1

of 4

From: [Redacted]
To: [MD Marine Renewables](#)
Subject: Formal objection to the planning application for the Ayre Offshore Wind Farm (Offshore Works)
Date: 30 January 2026 10:46:45
Attachments: [Redacted]

Dear Sir / Madam,

I am writing to formally object to the planning application for the Ayre Offshore Wind Farm (Offshore Works).

It is considered that the Environmental Impact Assessment (EIA) fails to fully assess likely significant effects on the marine environment, human health, coastal communities, and infrastructure. As explained in attached letter, key gaps in the assessment, combined with scientific uncertainty and unquantified cumulative impacts, mean that the application cannot yet be determined as compliant with Scottish planning and EIA requirements. Further detailed assessment and mitigation are therefore required before consent can be granted.

Thank you for your attention to this objection.

Kind Regards,

[Redacted]

Address: [Redacted]
E-mail: [Redacted]

[Redacted]
Address: [Redacted]
E-mail: [Redacted]

Date: 30 January 2026

To: Scottish Ministers (Marine Scotland – Marine Directorate)

MD.MarineRenewables@gov.scot

Subject: Objection to the Planning Application for Ayre Offshore Wind Farm (Offshore Works)

Dear Sir / Madam,

I am writing to formally object to the planning application for the Ayre Offshore Wind Farm.

It is considered that the Environmental Impact Assessment (EIA) fails to fully assess likely significant effects on the marine environment, human health, coastal communities, and infrastructure. As explained in the following sections, key gaps in the assessment, combined with scientific uncertainty and unquantified cumulative impacts, mean that the application cannot yet be determined as compliant with Scottish planning and EIA requirements. Further detailed assessment and mitigation are therefore required before consent can be granted.

The sea as legal entity

The concept of granting legal personhood to the ocean or other natural resources has been the subject of serious academic and policy studies and has already been implemented in various parts of the world. In Scotland, for example, the ocean has been afforded representation at the board level of the Scottish Association for Marine Science (SAMS) [1].

These developments illustrate a changing relationship between humans and the marine environment, highlighting that impacts by the Proposed Development considered acceptable today may not align with societal expectations or legal standards for future generations.

Vulnerability to terroristic, militaristic, and criminal attacks

The Proposed Development includes up to 360 km of subsea cables and covers 200 km², located at least 22 km offshore [2]. Its remote location and large spatial extent make turbines, cables, and infrastructure potentially vulnerable to criminal, terrorist, or grey-zone activities [3]. While the Applicant states, “such risks are “effectively managed through industry standards, risk assessments, and operational plans” [4], no detailed assessment or evidence is provided, which is a matter of public concern.

Recent reports of the Russian intelligence vessel *Yantar* operating off Scotland, capable of deploying mini submarines to cut cables or plant sabotage devices, underscore the vulnerability of offshore infrastructure [5]. Although SSEN confirmed that recent outages in Orkney and Caithness originated locally [6], worries persist regarding the vulnerability of the Northern Isles’ energy and telecoms infrastructure to interference [7,8].

Additional concerns include potential rogue communication devices in offshore hardware and the use of foreign-manufactured turbine components, including Chinese suppliers such as Mingyang, which MI5 has identified as a security risk [3]. The application provides no information on the origin or security vetting of major hardware, and given the Proposed Development's location within a designated military exercise area, a specific security assessment should be required before consent is granted.

Unexploded ordnance on the seabed

There are hundreds of thousands of items of unexploded ordnance (UXO) in the UK and European waters, creating serious risks to marine users during offshore wind development. The EIA considers these hazards only within the Array Site and Export Cable Corridor [9], but does not address the displacement of fishermen into higher-risk areas, as has occurred in the Firth of Forth [10].

The UXO risk assessment should extend beyond the Array Site and Export Cable Corridor to include areas where fishing and other marine activities may be displaced, to fully capture potential hazards to human safety.

Impact on phytoplankton growth and primary production

Phytoplankton play a critical role in oxygen production and oceanic carbon uptake and form the base of the marine food web. While essential, excessive phytoplankton growth can lead to harmful algal blooms [3,11]. Offshore wind turbines may influence phytoplankton growth in multiple ways, and can both enhance and reduce primary production [3,11].

The Applicant's qualitative assessment suggests that the impact on phytoplankton growth is minimal [12]. However, this assessment appears to consider changes only within the Array Area and does not clearly explain the mechanisms of impact or potential effects further offshore.

In particular, wind wake effects—reduced surface wind and altered mixing downstream of turbines—may modify nutrient transport and phytoplankton growth in waters beyond the immediate Array Area. While the Applicant's qualitative assessment concludes wake effects are minor [13], this contrasts with numerical modelling of the North Sea, which calculates that large offshore wind farm clusters can alter primary production by up to $\pm 10\%$ and reduce oxygen concentrations across a wider area [14].

Given the UK and Scottish Governments' ambitious net zero and decarbonisation targets [15,16], it is essential that the Applicant undertakes more detailed site-specific and regional research before concluding that impacts on primary production and the broader marine ecosystem are minimal. The pace of offshore wind development has outstripped the capacity of current research, and without robust evidence, the potential ecosystem impacts remain uncertain.

Leading edge erosion of turbine blades

Leading-edge erosion, caused by the impact of raindrops and airborne particles on turbine blade coatings [3], becomes increasingly significant as blade lengths increase and tip speeds rise. With the proposed rotor diameter of 326 m, substantial leading-edge erosion can be expected [17].

This erosion has multiple consequences. Environmentally, it contributes to microplastic shedding, while operationally, it reduces aerodynamic efficiency, shortening the lifespan of a wind turbine blade. Conditions in the northeastern North Sea, with its higher wind and precipitation, accelerate coating degradation, resulting in blade lifetimes approximately 20% shorter than in the southwestern North Sea [17].

Despite these factors, the publicly available planning documents do not include a specific assessment of leading-edge erosion, nor of the associated microplastic pollution, efficiency losses, or reduced turbine lifespan. This represents a gap in the assessment of both environmental and operational impacts.

Pollution by anti-corrosion systems on the metal

Corrosion-protection systems are employed to prevent turbine structures from rusting, and sacrificial anodes or other cathodic protection systems can release highly toxic metals into the marine environment over time [3,18]. This concern is especially significant for floating platforms, whose larger subsurface structures require more extensive protection systems, which may result in higher inputs of trace metals.

However, the EIA does not assess the potential environmental impacts of these materials, nor does it describe any mitigation strategy to minimize metal pollution such as proposed by Watson *et al.* [19]. The absence of this information represents a gap in the environmental assessment, and it is requested that the Applicant provides full details of corrosion-protection methods, anticipated emissions, and strategies to mitigate trace metal impacts before consent is granted.

Underwater infrasound

Infrasound—very low-frequency sound below 20 Hz—behaves fundamentally differently from higher-frequency acoustic noise. In the marine environment, infrasound can propagate over hundreds of kilometres [3], extending well beyond the subsea noise study area defined in the EIA, limited to the area within and up to 75 km from the Site Boundary [20].

Infrasound is known to affect whales and a wide range of other marine organisms, including jellyfish, fish, reptiles, cetaceans, and more. Many of these species rely on infrasound for navigation, foraging, social communication, mate attraction, courtship, and territorial behaviour [3].

However, the EIA considers only conventional acoustic noise in the 20 Hz to 80 kHz range [20] and concludes that impacts on marine mammals and other receptors are of minor adverse significance [4]. Furthermore, acoustic noise from floating wind turbines and mooring systems during operation has been assessed only qualitatively, reflecting the lack of precedent, as no large-scale floating offshore wind farms currently operate anywhere in the world [20]. The potential effects of lower frequency infrasound are not explicitly addressed. This introduces a level of uncertainty that the EIA does not fully quantify.

It is therefore requested that the Applicant undertakes a dedicated assessment of infrasound generation and propagation from large floating offshore wind farms, including its spatial extent beyond the current study area, and evaluate the potential impacts on marine species known to rely on infrasound. Such an assessment should be included to ensure a precautionary and comprehensive evaluation of underwater noise impacts prior to the determination of this application.

Moving underwater shadows

The potential impacts of visual cues from offshore wind turbines on aquatic species remain poorly understood, and the underlying physical processes are not yet well characterised. For example, lensing effects caused by surface water waves enhance, rather than attenuate, the contrast created by turbine blade shadows penetrating the water column, contrary to assumptions applied in current EIAs [3] and repeated within the EIA of the Proposed Development [21].

The Applicant states that “the information presented is sufficient evidence to scope out the impact of shadow flicker on fish and shellfish receptors, with a particular emphasis on diadromous fish”. However, no empirical evidence is provided to demonstrate the absence of effects, and notwithstanding this uncertainty, the Applicant concludes that impacts would be negligible or non-existent [21].

It is therefore requested that the Applicant reconsiders the scoping-out of visual and moving shadow effects on aquatic species, and provide a robust assessment informed by current scientific uncertainty. In the absence of such evidence, a precautionary approach should be adopted to ensure that potential impacts on fish and shellfish receptors are adequately assessed prior to determination.

Changes to coastal waves

The wave model used in the EIA to simulate the impact of the proposed development on wave conditions considers only the blockage effects of fixed subsurface structures [22]. However, the interaction between floating wind turbines and waves is fundamentally different [3,23]. In such systems, wave–structure interactions are more complex and include inertial forces arising from the motion of the floating structures within the water column, which are not captured by fixed-foundation models [24].

Numerical modelling by Deng et al. [24] predicts that, under certain conditions, the side columns of semi-submersible floating turbines can reduce significant wave height by more than 50%, producing a wave wake extending up to 1 km downstream, with associated changes to wave wavelength and direction. In addition, the EIA does not assess potential modifications to surface wind fields caused by the turbines, nor the consequent effects on local and regional wave conditions [22].

These omissions are material, as changes in wave climate could have adverse consequences for recreational activities such as surfing, kayaking, and paddleboarding along the east coast of Orkney, and at locations in Caithness including Sinclair’s Bay, Dunnet Bay, Thurso East, Brimms Head Reef, and Sandside Bay [25]. Whether such impacts would be of only minor significance, as concluded in the EIA [4], has not been demonstrated.

Wave exposure is also a key controlling factor for intertidal and nearshore rocky shore communities, and alterations to wave conditions may have ecological consequences [3]. These potential impacts on coastal habitats and species are not valued in the EIA [4].

It is therefore requested that the Applicant undertakes a revised wave climate assessment that explicitly accounts for floating turbine dynamics. This assessment should evaluate changes to wave height, direction, and wavelength, and consider the potential implications for coastal recreation and wave-dependent marine and intertidal ecosystems, prior to determination of the application.

Wind theft

The potential aerodynamic interactions between the Proposed Development and existing and planned onshore wind farms have not been addressed. It is well established that wind wakes generated by large offshore wind farms can extend over 100 km downstream, resulting in reductions in turbine energy yield of up to several tens of percent [3, 26]. Such effects, often described as ‘wind theft’, may therefore have a material impact on the operational performance of neighbouring wind farms, including the anticipated onshore wind farms Costa Head and Hesta Head, and community wind farm Quanterness on Orkney.

The Applicant’s EIA considers wind wake effects only in relation to physical oceanographic processes, such as stratification, and does not provide a quantitative or robust assessment of potential impacts on neighbouring wind farms [13]. This represents a significant omission, as the potential reduction in power generation and associated economic implications for adjacent projects is a material consideration for the consent process.

Accordingly, the application should be revised to include a full, quantitative assessment of wind wake interactions between the Proposed Development and nearby turbines, including projected reductions in energy yield.

Economic, environmental, and social Impacts

Work on the nearby West of Orkney Wind Farm has been paused due to the prohibitive cost of the power grid connection (among the highest in the north of Scotland) rendering such projects economically uncompetitive compared with those in England [27]. This raises serious concerns about the viability of the Proposed Development, particularly as floating wind remains substantially more expensive than fixed-bottom technology (£216/MWh vs £90/MWh) [28].

Transmission from the Array Area would require major onshore infrastructure, including extensive cable trenches, substations, and 400 kV overhead lines in Caithness. The environmental and social impacts of these works would be significant, causing landscape disruption and affecting local communities [29].

These considerations occur alongside substantial constraint payments already borne by consumers for offshore wind farms in north-east Scotland [3], highlighting wider economic implications.

In light of these factors, it is considered that the cumulative economic, environmental, and social impacts of the Proposed Development deserve further consideration. The application would benefit from a more detailed assessment of onshore infrastructure impacts and economic feasibility before consent is granted.

Mental health

Uninterrupted vistas, expansive open spaces, long views to the horizon, and clear night skies are essential to the health and wellbeing of local communities and visitors, providing well-documented emotional, psychological, and physical benefits, which are amplified when landscapes and seascapes remain unspoilt and tranquil [3]. As it is stated in the EIA that “significant visual effects are likely at open coastal locations closer to the Proposed Development in Orkney” [4], it risks significantly diminishing these qualities for residents and visitors in Orkney.

The associated onshore infrastructure in Caithness causes considerable grief [29]. Close-knit communities are already experiencing severe disruption by the planning process, with serious mental health impacts, as stressed by a neighbour of the proposed substation site [29].

The planning application fails to adequately address how residents' sense of place or connection with their community would be affected. It is therefore requested that the planning authority fully assess the cumulative effects on landscape, seascape, and community wellbeing, and demonstrate how these impacts will be effectively mitigated, before any consent is granted, as this represents a material consideration in the decision-making process.

Concluding remarks

The matters set out above indicate that the publicly available project documentation do not provide a sufficiently comprehensive or precautionary assessment of the Proposed Development. Several potentially significant environmental, physical, social, economic, and security-related impacts are either insufficiently assessed, scoped out without robust evidence, or not addressed at all. In several instances, conclusions of negligible or minor impact are reached despite acknowledged scientific uncertainty and the absence of site-specific quantitative analysis.

Given the scale, novelty, and cumulative nature of the development, and the evolving recognition of the marine environment as a complex and vulnerable system, the information currently available is not adequate to support an informed determination. It is therefore considered that consent should not be granted at this stage. A revised application, supported by targeted and up-to-date assessments addressing the identified gaps and adopting a precautionary approach, should be required before the Proposed Development is taken forward.

Thank you for your attention to this objection.

Kind Regards,

[Redacted]

REFERENCES

1. The Scottish Association for Marine Science (2025). The Ocean Enters the Boardroom Available online: <https://www.sams.ac.uk/news/sams-news-ocean-on-the-board> (Accessed 19 May 2025)
2. Thistle Wind Partners (2024). Ayre Offshore Wind Farm. Offshore Scoping Report. Ref No. TWP-AYR-RPS-OFC-RPT-00031 / FINAL. Available online: https://marine.gov.scot/sites/default/files/ayre_offshore_wind_farm_-_scop0049_-_offshore_scoping_report_-_developer_to_md_lot_redacted.pdf (Accessed 23 Jan 2026).
3. Goddijn-Murphy, L.M. (2026). 10 Things to consider before approving another offshore wind farm: A case study for Highland, Scotland. *Ocean Coast. Manag.* Volume 271, 107956; <https://doi.org/10.1016/j.ocecoaman.2025.107956>
4. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report. Non-Technical Summary, Ref No TWP-AYR-RPS-ENV-RPT-00033. Available online: https://marine.gov.scot/sites/default/files/ayre_offshore_wind_farm_-_section_36_and_marine_licences_application_-_eia_-_non-technical_summary_redacted.pdf (Accessed 23 Jan 2026).
5. BBC News (2025). How serious is the Russian spy ship move? Available online: <https://www.bbc.co.uk/news/articles/c4gpgj6d4e6o>. (Accessed 23 Jan 2026).
6. The Orcadian (2025). Caithness windfarm fault behind Orkney blackout, confirm SSEN. Available online: <https://orcadian.co.uk/caithness-windfarm-fault-behind-orkney-blackout-confirm-ssen/> (Accessed 23 Jan 2026).
7. STV News (2025). Power cuts caused by network fault amid 'wild' Russia speculation. Available online: <https://news.stv.tv/highlands-islands/orkney-and-caithness-power-cuts-caused-by-network-fault-amid-wild-russia-speculation> (Accessed 23 Jan 2026).
8. Shetland News (2025). Damage to vital communication links caused by fishing activity, Faroese cable owner confirms. Available online: <https://www.shetnews.co.uk/2025/11/27/damage-vital-communication-links-caused/> (Accessed 23 Jan 2026).
9. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report Volume 2, Chapter 3: Project Description, Ref No TWP-AYR-RPS-OFE-RPT-00005. Available online: https://marine.gov.scot/sites/default/files/vol_1_-_chapter_3_-_project_description.pdf (Accessed 28 Jan 2026).
10. East Lothian Courier (2015). Port Seton fishermen fear for lives from unexploded bombs. Available online: <https://www.eastlothiancourier.com/news/25054490.port-seton-fishermen-fear-lives-unexploded-bombs/> (Accessed 23 Jan 2026).
11. Sealetters (2025). Save the Phytoplankton. Available online: <https://sealetters.substack.com/p/fight-for-phytoplankton> (Accessed 23 Jan 2026).
12. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report Volume 3, Technical Appendix 7.1: Physical Processes Baseline Environment, Ref No TWP-AYR-RPS-OFE-RPT-00025. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_7.1_-_physical_processes_baseline_environment.pdf (Accessed 28 Jan 2026).
13. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report Volume 2, Chapter 7: Physical Processes, Ref no TWP-AYR-RPS-OFE-RPT-00013. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_7_-_physical_processes.pdf (Accessed 28 Jan 2026).

14. Daewel, U., Akhtar, N., Christiansen, N. *et al.* (2022) Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. *Commun. Earth Environ.*, 3, p. 292; <https://doi.org/10.1038/s43247-022-00625-0>
15. Thistle Wind Partners (2025). Thistle Wind Partners submits onshore plans for pioneering Ayre Offshore Wind Farm. Available online: <https://www.thistlewindpartners.scot/news/thistle-wind-partners-submits-onshore-plans-for-pioneering-ayre-offshore-wind-farm/> (Accessed 28 Jan 2026).
16. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report. Planning Statement TWP-AYR-ERM-OFE-RPT-00009 Available online: https://marine.gov.scot/sites/default/files/offshore_planning_statement_0.pdf (Accessed 28 Jan 2026).
17. TNO (2025). Better damage prediction for offshore wind turbine blades. Available online: <https://www.tno.nl/en/newsroom/2025/03/damage-prediction-wind-turbine-blades/> (Accessed 28 Jan 2026).
18. Sealetters (2025). Wind Farming. Available online: <https://sealetters.substack.com/p/wind-farming> (Accessed 28 Jan 2026).
19. G.J. Watson, G. Banfield, S.C.L. Watson, et al. (2025). Offshore wind energy: assessing trace element inputs and the risks for co-location of aquaculture. *npj Ocean Sustain*, 4, p. 1; <https://doi.org/10.1038/s44183-024-00101-6>
20. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report Volume 3, Technical Appendix 10.4: Subsea Noise Technical Report, Ref No TWP-AYR-RPS-OFE-RPT-00017. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_10.4_-_subsea_noise_technical_report.pdf (Accessed 28 Jan 2026).
21. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report Volume 2, Chapter 9: Fish and Shellfish, Ref No TWP-AYR-RPS-OFE-RPT-00058. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_9_-_fish_and_shellfish.pdf (Accessed 28 Jan 2026).
22. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report Volume 3, Technical Appendix 7.2: Model Design and Validation. Ref No TWP-AYR-RPS-OFE-RPT-00026. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_7.2_-_physical_processes_model_design_and_validation.pdf (Accessed 28 Jan 2026).
23. Sealetters (2025). Are artificial wave pools the future of surfing? Available online: <https://sealetters.substack.com/p/are-artificial-wave-pools-the-future> (Accessed 28 Jan 2026).
24. Deng, S., Yang, S., Chen, S., Chen, D., Yang, X., and Cui, S. (2024). A parameterization scheme for the floating wind farm in a coupled atmosphere–wave model (COAWST v3.7), *Geosci. Model Dev.*, 17, 4891–4909; <https://doi.org/10.5194/gmd-17-4891-2024>
25. Thistle Wind Partners (2025). Ayre Offshore Wind Farm. Offshore EIA Report Volume 2, Chapter 16: Infrastructure and Other Users, Ref No TWP-AYR-RPS-OFE-RPT-00039. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_16_-_infrastructure_and_other_users.pdf (Accessed 28 Jan 2026).
26. Sealetters (2025) Wind Wars. Available online: <https://sealetters.substack.com/p/wind-wars> (Accessed 28 Jan 2026).
27. BBC News (2026). Plans for huge wind farm paused over 'unfair' grid charges. Available online: <https://www.bbc.co.uk/news/articles/c8x919v8g19o> (Accessed 28 Jan 2026).

28. Financial Times (2026). Record UK offshore wind auction boosts plan to decarbonise by 2030. Available online:
<https://archive.is/20260114141724/https://www.ft.com/content/0dd16df2-64b0-407a-bbfd-c939dfabc3f8> (Accessed 28 Jan 2026).
29. Sealetters (2025). A Planning Process Under Strain. Available online:
<https://sealetters.substack.com/p/a-planning-process-under-strain> (Accessed 28 Jan 2026).

h

k

K

2026 - 2 of

4

[Redacted]

Date: 30 January 2026

To: Scottish Ministers (Marine Scotland – Marine Directorate)

MD.MarineRenewables@gov.scot

Subject: Objection to the Planning Application for Ayre OU'shore Wind Farm (OU'shore Works)

Dear Sir / Madam,

I am writing to formally object to the planning application for the Ayre OU'shore Wind Farm.

It is considered that the Environmental Impact Assessment (EIA) fails to fully assess likely significant effects on the marine environment, human health, coastal communities, and infrastructure. As explained in the following sections, key gaps in the assessment, combined with scientific uncertainty and unquantified cumulative impacts, mean that the application cannot yet be determined as compliant with Scottish planning and EIA requirements. Further detailed assessment and mitigation are therefore required before consent can be granted.

The sea as legal entity

The concept of granting legal personhood to the ocean or other natural resources has been the subject of serious academic and policy studies and has already been implemented in various parts of the world. In Scotland, for example, the ocean has been a 'orded representation at the board level of the Scottish Association for Marine Science (SAMS) [1].

These developments illustrate a changing relationship between humans and the marine environment, highlighting that impacts by the Proposed Development considered acceptable today may not align with societal expectations or legal standards for future generations.

Vulnerability to terroristic, militaristic, and criminal attacks

The Proposed Development includes up to 360 km of subsea cables and covers 200 km², located at least 22 km oU'shore [2]. Its remote location and large spatial extent make turbines, cables, and infrastructure potentially vulnerable to criminal, terrorist, or grey-zone activities [3]. While the Applicant states, "such risks are "eU'ectively managed through industry standards, risk assessments, and operational plans" [4], no detailed assessment or evidence is provided, which is a matter of public concern.

Recent reports of the Russian intelligence vessel Yantar operating oU' Scotland, capable of

deploying mini submarines to cut cables or plant sabotage devices, underscore the vulnerability of oU'shore infrastructure [5]. Although SSEN confirmed that recent outages in Orkney and Caithness originated locally [6], worries persist regarding the vulnerability of the Northern Isles' energy and telecoms infrastructure to interference [7,8].

1

Additional concerns include potential rogue communication devices in oU'shore hardware and the use of foreign-manufactured turbine components, including Chinese suppliers such as Mingyang, which MI5 has identified as a security risk [3]. The application provides no information on the origin or security vetting of major hardware, and given the Proposed Development's location within a designated military exercise area, a specific security assessment should be required before consent is granted.

Unexploded ordnance on the seabed

There are hundreds of thousands of items of unexploded ordnance (UXO) in the UK and European waters, creating serious risks to marine users during oU'shore wind development. The EIA considers these hazards only within the Array Site and Export Cable Corridor [9], but does not address the displacement of fishermen into higher-risk areas, as has occurred in the Firth of Forth [10].

The UXO risk assessment should extend beyond the Array Site and Export Cable Corridor to include areas where fishing and other marine activities may be displaced, to fully capture potential hazards to human safety.

Impact on phytoplankton growth and primary production

Phytoplankton play a critical role in oxygen production and oceanic carbon uptake and form the base of the marine food web. While essential, excessive phytoplankton growth can lead to harmful algal blooms [3,11]. OU'shore wind turbines may influence phytoplankton growth in multiple ways, and can both enhance and reduce primary production [3,11].

The Applicant's qualitative assessment suggests that the impact on phytoplankton growth is minimal [12]. However, this assessment appears to consider changes only within the Array Area and does not clearly explain the mechanisms of impact or potential eU'ects further oU'shore.

In particular, wind wake eU'ects—reduced surface wind and altered mixing downstream of turbines—may modify nutrient transport and phytoplankton growth in waters beyond the immediate Array Area. While the Applicant's qualitative assessment concludes wake eU'ects are minor [13], this contrasts with numerical modelling of the North Sea, which calculates that large oU'shore wind farm clusters can alter primary production by up to $\pm 10\%$ and reduce oxygen concentrations across a wider area [14].

Given the UK and Scottish Governments' ambitious net zero and decarbonisation targets [15,16], it is essential that the Applicant undertakes more detailed site-specific and regional research before concluding that impacts on primary production and the broader marine ecosystem are minimal. The pace of oU'shore wind development has outstripped the capacity of current research, and without robust evidence, the potential ecosystem impacts remain uncertain.

Leading edge erosion of turbine blades

Leading-edge erosion, caused by the impact of raindrops and airborne particles on turbine blade coatings [3], becomes increasingly significant as blade lengths increase and tip

speeds rise. With the proposed rotor diameter of 326 m, substantial leading-edge erosion can be expected [17].

2

This erosion has multiple consequences. Environmentally, it contributes to microplastic shedding, while operationally, it reduces aerodynamic efficiency, shortening the lifespan of a wind turbine blade. Conditions in the northeastern North Sea, with its higher wind and precipitation, accelerate coating degradation, resulting in blade lifetimes approximately 20% shorter than in the southwestern North Sea [17].

Despite these factors, the publicly available planning documents do not include a specific assessment of leading-edge erosion, nor of the associated microplastic pollution, efficiency losses, or reduced turbine lifespan. This represents a gap in the assessment of both environmental and operational impacts.

Pollution by anti-corrosion systems on the metal

Corrosion-protection systems are employed to prevent turbine structures from rusting, and sacrificial anodes or other cathodic protection systems can release highly toxic metals into the marine environment over time [3,18]. This concern is especially significant for floating platforms, whose larger subsurface structures require more extensive protection systems, which may result in higher inputs of trace metals.

However, the EIA does not assess the potential environmental impacts of these materials, nor does it describe any mitigation strategy to minimize metal pollution such as proposed by Watson et al. [19]. The absence of this information represents a gap in the environmental assessment, and it is requested that the Applicant provides full details of corrosion-protection methods, anticipated emissions, and strategies to mitigate trace metal impacts before consent is granted.

Underwater infrasound

Infrasound—very low-frequency sound below 20 Hz—behaves fundamentally differently from higher-frequency acoustic noise. In the marine environment, infrasound can propagate over hundreds of kilometres [3], extending well beyond the subsea noise study area defined in the EIA, limited to the area within and up to 75 km from the Site Boundary [20].

Infrasound is known to affect whales and a wide range of other marine organisms, including jellyfish, fish, reptiles, cetaceans, and more. Many of these species rely on infrasound for navigation, foraging, social communication, mate attraction, courtship, and territorial behaviour [3].

However, the EIA considers only conventional acoustic noise in the 20 Hz to 80 kHz range [20] and concludes that impacts on marine mammals and other receptors are of minor adverse significance [4]. Furthermore, acoustic noise from floating wind turbines and mooring systems during operation has been assessed only qualitatively, reflecting the lack of precedent, as no large-scale floating offshore wind farms currently operate anywhere in the world [20]. The potential effects of lower frequency infrasound are not explicitly addressed. This introduces a level of uncertainty that the EIA does not fully quantify.

It is therefore requested that the Applicant undertakes a dedicated assessment of infrasound generation and propagation from large floating offshore wind farms, including

its spatial extent beyond the current study area, and evaluate the potential impacts on marine species known to rely on infrasound. Such an assessment should be included to ensure a precautionary and comprehensive evaluation of underwater noise impacts prior to the determination of this application.

3

Moving underwater shadows

The potential impacts of visual cues from offshore wind turbines on aquatic species remain poorly understood, and the underlying physical processes are not yet well characterised. For example, lensing effects caused by surface water waves enhance, rather than attenuate, the contrast created by turbine blade shadows penetrating the water column, contrary to assumptions applied in current EIAs [3] and repeated within the EIA of the Proposed Development [21].

The Applicant states that “the information presented is sufficient evidence to scope out the impact of shadow flicker on fish and shellfish receptors, with a particular emphasis on diadromous fish”. However, no empirical evidence is provided to demonstrate the absence of effects, and notwithstanding this uncertainty, the Applicant concludes that impacts would be negligible or non-existent [21].

It is therefore requested that the Applicant reconsiders the scoping-out of visual and moving shadow effects on aquatic species, and provide a robust assessment informed by current scientific uncertainty. In the absence of such evidence, a precautionary approach should be adopted to ensure that potential impacts on fish and shellfish receptors are adequately assessed prior to determination.

Changes to coastal waves

The wave model used in the EIA to simulate the impact of the proposed development on wave conditions considers only the blockage effects of fixed subsurface structures [22]. However, the interaction between floating wind turbines and waves is fundamentally different [3,23]. In such systems, wave–structure interactions are more complex and include inertial forces arising from the motion of the floating structures within the water column, which are not captured by fixed foundation models [24].

Numerical modelling by Deng et al. [24] predicts that, under certain conditions, the side columns of semi-submersible floating turbines can reduce significant wave height by more than 50%, producing a wave wake extending up to 1 km downstream, with associated changes to wave wavelength and direction. In addition, the EIA does not assess potential modifications to surface wind fields caused by the turbines, nor the consequent effects on local and regional wave conditions [22].

These omissions are material, as changes in wave climate could have adverse consequences for recreational activities such as surfing, kayaking, and paddleboarding along the east coast of Orkney, and at locations in Caithness including Sinclair’s Bay, Dunnet Bay, Thurso East, Brimms Head Reef, and Sandside Bay [25]. Whether such impacts would be of only minor significance, as concluded in the EIA [4], has not been demonstrated.

Wave exposure is also a key controlling factor for intertidal and nearshore rocky shore communities, and alterations to wave conditions may have ecological consequences [3]. These potential impacts on coastal habitats and species are not valued in the EIA [4].

It is therefore requested that the Applicant undertakes a revised wave climate assessment

that explicitly accounts for floating turbine dynamics. This assessment should evaluate changes to wave height, direction, and wavelength, and consider the potential implications for coastal recreation and wave-dependent marine and intertidal ecosystems, prior to determination of the application.

4

Wind theft

The potential aerodynamic interactions between the Proposed Development and existing and planned onshore wind farms have not been addressed. It is well established that wind wakes generated by large onshore wind farms can extend over 100 km downstream, resulting in reductions in turbine energy yield of up to several tens of percent [3, 26]. Such effects, often described as 'wind theft', may therefore have a material impact on the operational performance of neighbouring wind farms, including the anticipated onshore wind farms Costa Head and Hesta Head, and community wind farm Quanterness on Orkney.

The Applicant's EIA considers wind wake effects only in relation to physical oceanographic processes, such as stratification, and does not provide a quantitative or robust assessment of potential impacts on neighbouring wind farms [13]. This represents a significant omission, as the potential reduction in power generation and associated economic implications for adjacent projects is a material consideration for the consent process.

Accordingly, the application should be revised to include a full, quantitative assessment of wind wake interactions between the Proposed Development and nearby turbines, including projected reductions in energy yield.

Economic, environmental, and social Impacts

Work on the nearby West of Orkney Wind Farm has been paused due to the prohibitive cost of the power grid connection (among the highest in the north of Scotland) rendering such projects economically uncompetitive compared with those in England [27]. This raises serious concerns about the viability of the Proposed Development, particularly as floating wind remains substantially more expensive than fixed-bottom technology (£216/MWh vs £90/MWh) [28].

Transmission from the Array Area would require major onshore infrastructure, including extensive cable trenches, substations, and 400 kV overhead lines in Caithness. The environmental and social impacts of these works would be significant, causing landscape disruption and affecting local communities [29].

These considerations occur alongside substantial constraint payments already borne by consumers for onshore wind farms in north-east Scotland [3], highlighting wider economic implications.

In light of these factors, it is considered that the cumulative economic, environmental, and social impacts of the Proposed Development deserve further consideration. The application would benefit from a more detailed assessment of onshore infrastructure impacts and economic feasibility before consent is granted.

Mental health

Uninterrupted vistas, expansive open spaces, long views to the horizon, and clear night skies are essential to the health and wellbeing of local communities and visitors, providing well-documented emotional, psychological, and physical benefits, which are amplified when landscapes and seascapes remain unspoilt and tranquil [3]. As it is stated in the

EIA that “significant visual effects are likely at open coastal locations closer to the Proposed Development in Orkney” [4], it risks significantly diminishing these qualities for residents and visitors in Orkney.

5

The associated onshore infrastructure in Caithness causes considerable grief [29]. Close-knit communities are already experiencing severe disruption by the planning process, with serious mental health impacts, as stressed by a neighbour of the proposed substation site [29].

The planning application fails to adequately address how residents’ sense of place or connection with their community would be affected. It is therefore requested that the planning authority fully assess the cumulative effects on landscape, seascape, and community wellbeing, and demonstrate how these impacts will be effectively mitigated, before any consent is granted, as this represents a material consideration in the decision-making process.

Concluding remarks

The matters set out above indicate that the publicly available project documentation do not provide a sufficiently comprehensive or precautionary assessment of the Proposed Development. Several potentially significant environmental, physical, social, economic, and security-related impacts are either insufficiently assessed, scoped out without robust evidence, or not addressed at all. In several instances, conclusions of negligible or minor impact are reached despite acknowledged scientific uncertainty and the absence of site-specific quantitative analysis.

Given the scale, novelty, and cumulative nature of the development, and the evolving recognition of the marine environment as a complex and vulnerable system, the information currently available is not adequate to support an informed determination. It is therefore considered that consent should not be granted at this stage. A revised application, supported by targeted and up-to-date assessments addressing the identified gaps and adopting a precautionary approach, should be required before the Proposed Development is taken forward.

Thank you for your attention to this objection.

Kind Regards,

[Redacted]

REFERENCES

1. The Scottish Association for Marine Science (2025). The Ocean Enters the Boardroom Available online: <https://www.sams.ac.uk/news/sams-news-ocean-on-the-board> (Accessed 19 May 2025)
2. Thistle Wind Partners (2024). Ayre OU'shore Wind Farm. OU'shore Scoping Report. Ref No. TWP-AYR-RPS-OFC-RPT-00031 / FINAL. Available online: https://marine.gov.scot/sites/default/files/ayre_oU'shore_wind_farm_-_scop0049_-_oU'shore_scoping_report_-_developer_to_md-lot_redacted.pdf (Accessed 23 Jan 2026).
3. Goddijn-Murphy, L.M. (2026). 10 Things to consider before approving another oU'shore wind farm: A case study for Highland, Scotland. Ocean Coast. Manag. Volume 271, 107956; <https://doi.org/10.1016/j.ocecoaman.2025.107956>
4. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report. Non Technical Summary, Ref No TWP-AYR-RPS-ENV-RPT-00033. Available online: https://marine.gov.scot/sites/default/files/ayre_oU'shore_wind_farm_-_section_36_and_marine_licences_application_-_eia_-_non_technical_summary_redacted.pdf (Accessed 23 Jan 2026).
5. BBC News (2025). How serious is the Russian spy ship move? Available online: <https://www.bbc.co.uk/news/articles/c4gpgj6d4e6o>. (Accessed 23 Jan 2026).
6. The Orcadian (2025). Caithness windfarm fault behind Orkney blackout, confirm SSEN. Available online: <https://orcadian.co.uk/caithness-windfarm-fault-behind-orkney-blackout-confirm-ssen/> (Accessed 23 Jan 2026).
7. STV News (2025). Power cuts caused by network fault amid 'wild' Russia speculation. Available online: https://news.stv.tv/highlands-islands/orkney-and-caithness-power_cuts-caused-by-network-fault-amid-wild-russia-speculation (Accessed 23 Jan 2026).
8. Shetland News (2025). Damage to vital communication links caused by fishing activity, Faroese cable owner confirms. Available online: <https://www.shetnews.co.uk/2025/11/27/damage-vital-communication-links-caused/> (Accessed 23 Jan 2026).
9. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 3: Project Description, Ref No TWP-AYR-RPS-OFE-RPT-00005. Available online: https://marine.gov.scot/sites/default/files/vol_1_-_chapter_3_-_project_description.pdf (Accessed 28 Jan 2026).
10. East Lothian Courier (2015). Port Seton fishermen fear for lives from unexploded bombs. Available online: <https://www.eastlothiancourier.com/news/25054490.port-seton-fishermen-fear-lives-unexploded-bombs/> (Accessed 23 Jan 2026).
11. Sealetters (2025). Save the Phytoplankton. Available online: <https://sealetters.substack.com/p/fight-for-phytoplankton> (Accessed 23 Jan 2026).
12. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 3, Technical Appendix 7.1: Physical Processes Baseline Environment, Ref No TWP-AYR RPS-OFE-RPT-00025. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_7.1_-_physical_processes_baseline_environment.pdf (Accessed 28 Jan 2026).
13. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 7: Physical Processes, Ref no TWP-AYR-RPS-OFE-RPT-00013. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_7_-_physical_processes.pdf (Accessed 28 Jan 2026).

14. Daewel, U., Akhtar, N., Christiansen, N. et al. (2022) OU'shore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. *Commun. Earth Environ.*, 3, p. 292; <https://doi.org/10.1038/s43247-022-00625-0>
15. Thistle Wind Partners (2025). Thistle Wind Partners submits onshore plans for pioneering Ayre OU'shore Wind Farm. Available online: <https://www.thistlewindpartners.scot/news/thistle-wind-partners-submits-onshore-plans-for-pioneering-ayre-ou'shore-wind-farm/> (Accessed 28 Jan 2026).
16. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report. Planning Statement TWP-AYR-ERM-OFE-RPT-00009 Available online: https://marine.gov.scot/sites/default/files/ou'shore_planning_statement_0.pdf (Accessed 28 Jan 2026).
17. TNO (2025). Better damage prediction for oU'shore wind turbine blades. Available online: <https://www.tno.nl/en/newsroom/2025/03/damage-prediction-wind-turbine-blades/> (Accessed 28 Jan 2026).
18. Sealetters (2025). Wind Farming. Available online: <https://sealetters.substack.com/p/wind-farming> (Accessed 28 Jan 2026).
19. G.J. Watson, G. Banfield, S.C.L. Watson, et al. (2025). OU'shore wind energy: assessing trace element inputs and the risks for co-location of aquaculture. *npj Ocean Sustain*, 4, p. 1; <https://doi.org/10.1038/s44183-024-00101-6>
20. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 3, Technical Appendix 10.4: Subsea Noise Technical Report, Ref No TWP-AYR-RPS-OFE RPT-00017. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_10.4_-_subsea_noise_technical_report.pdf (Accessed 28 Jan 2026).
21. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 9: Fish and Shellfish, Ref No TWP-AYR-RPS-OFE-RPT-00058. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_9_-_fish_and_shellfish.pdf (Accessed 28 Jan 2026).
22. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 3, Technical Appendix 7.2: Model Design and Validation. Ref No TWP-AYR-RPS-OFE-RPT 00026. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_7.2_-_physical_processes_model_design_and_validation.pdf (Accessed 28 Jan 2026).
23. Sealetters (2025). Are artificial wave pools the future of surfing? Available online: <https://sealetters.substack.com/p/are-artificial-wave-pools-the-future> (Accessed 28 Jan 2026).
24. Deng, S., Yang, S., Chen, S., Chen, D., Yang, X., and Cui, S. (2024). A parameterization scheme for the floating wind farm in a coupled atmosphere–wave model (COAWST v3.7), *Geosci. Model Dev.*, 17, 4891–4909; <https://doi.org/10.5194/gmd-17-4891-2024>
25. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 16: Infrastructure and Other Users, Ref No TWP-AYR-RPS-OFE-RPT-00039. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_16_-_infrastructure_and_other_users.pdf (Accessed 28 Jan 2026).
26. Sealetters (2025) Wind Wars. Available online: <https://sealetters.substack.com/p/wind-wars> (Accessed 28 Jan 2026).
27. BBC News (2026). Plans for huge wind farm paused over 'unfair' grid charges. Available online: <https://www.bbc.co.uk/news/articles/c8x919v8q19o> (Accessed 28 Jan 2026).

28. Financial Times (2026). Record UK onshore wind auction boosts plan to decarbonise by 2030. Available online: <https://archive.is/20260114141724/https://www.ft.com/content/0dd16df2-64b0-407abbfd-c939dfabc3f8> (Accessed 28 Jan 2026).
29. Sealetters (2025). A Planning Process Under Strain. Available online: <https://sealetters.substack.com/p/a-planning-process-under-strain> (Accessed 28 Jan 2026).

h

k

K

2026 - 3 of

4

[Redacted]

Date: 30 January 2026

To: Scottish Ministers (Marine Scotland – Marine Directorate)

MD.MarineRenewables@gov.scot

Subject: Objection to the Planning Application for Ayre Offshore Wind Farm (Offshore Works)

Dear Sir / Madam,

I am writing to formally object to the planning application for the Ayre Offshore Wind Farm.

It is considered that the Environmental Impact Assessment (EIA) fails to fully assess likely significant effects on the marine environment, human health, coastal communities, and infrastructure. As explained in the following sections, key gaps in the assessment, combined with scientific uncertainty and unquantified cumulative impacts, mean that the application cannot yet be determined as compliant with Scottish planning and EIA requirements. Further detailed assessment and mitigation are therefore required before consent can be granted.

The sea as legal entity

The concept of granting legal personhood to the ocean or other natural resources has been the subject of serious academic and policy studies and has already been implemented in various parts of the world. In Scotland, for example, the ocean has been afforded representation at the board level of the Scottish Association for Marine Science (SAMS) [1].

These developments illustrate a changing relationship between humans and the marine environment, highlighting that impacts by the Proposed Development considered acceptable today may not align with societal expectations or legal standards for future generations.

Vulnerability to terroristic, militaristic, and criminal attacks

The Proposed Development includes up to 360 km of subsea cables and covers 200 km², located at least 22 km offshore [2]. Its remote location and large spatial extent make turbines, cables, and infrastructure potentially vulnerable to criminal, terrorist, or grey-zone activities [3]. While the Applicant states, “such risks are “effectively managed through industry standards, risk assessments, and operational plans” [4], no detailed assessment or evidence is provided, which is a matter of public concern.

Recent reports of the Russian intelligence vessel Yantar operating off Scotland, capable of deploying mini submarines to cut cables or plant sabotage devices, underscore the

vulnerability of offshore infrastructure [5]. Although SSEN confirmed that recent outages in Orkney and Caithness originated locally [6], worries persist regarding the vulnerability of the Northern Isles' energy and telecoms infrastructure to interference [7,8].

1

Additional concerns include potential rogue communication devices in offshore hardware and the use of foreign-manufactured turbine components, including Chinese suppliers such as Mingyang, which MI5 has identified as a security risk [3]. The application provides no information on the origin or security vetting of major hardware, and given the Proposed Development's location within a designated military exercise area, a specific security assessment should be required before consent is granted.

Unexploded ordnance on the seabed

There are hundreds of thousands of items of unexploded ordnance (UXO) in the UK and European waters, creating serious risks to marine users during offshore wind development. The EIA considers these hazards only within the Array Site and Export Cable Corridor [9], but does not address the displacement of fishermen into higher-risk areas, as has occurred in the Firth of Forth [10].

The UXO risk assessment should extend beyond the Array Site and Export Cable Corridor to include areas where fishing and other marine activities may be displaced, to fully capture potential hazards to human safety.

Impact on phytoplankton growth and primary production

Phytoplankton play a critical role in oxygen production and oceanic carbon uptake and form the base of the marine food web. While essential, excessive phytoplankton growth can lead to harmful algal blooms [3,11]. Offshore wind turbines may influence phytoplankton growth in multiple ways, and can both enhance and reduce primary production [3,11].

The Applicant's qualitative assessment suggests that the impact on phytoplankton growth is minimal [12]. However, this assessment appears to consider changes only within the Array Area and does not clearly explain the mechanisms of impact or potential effects further offshore.

In particular, wind wake effects—reduced surface wind and altered mixing downstream of turbines—may modify nutrient transport and phytoplankton growth in waters beyond the immediate Array Area. While the Applicant's qualitative assessment concludes wake effects are minor [13], this contrasts with numerical modelling of the North Sea, which calculates that large offshore wind farm clusters can alter primary production by up to $\pm 10\%$ and reduce oxygen concentrations across a wider area [14].

Given the UK and Scottish Governments' ambitious net zero and decarbonisation targets [15,16], it is essential that the Applicant undertakes more detailed site-specific and regional research before concluding that impacts on primary production and the broader marine ecosystem are minimal. The pace of offshore wind development has outstripped the capacity of current research, and without robust evidence, the potential ecosystem impacts remain uncertain.

Leading edge erosion of turbine blades

Leading-edge erosion, caused by the impact of raindrops and airborne particles on turbine blade coatings [3], becomes increasingly significant as blade lengths increase and tip speeds rise. With the proposed rotor diameter of 326 m, substantial leading-edge erosion

can be expected [17].

2

This erosion has multiple consequences. Environmentally, it contributes to microplastic shedding, while operationally, it reduces aerodynamic efficiency, shortening the lifespan of a wind turbine blade. Conditions in the northeastern North Sea, with its higher wind and precipitation, accelerate coating degradation, resulting in blade lifetimes approximately 20% shorter than in the southwestern North Sea [17].

Despite these factors, the publicly available planning documents do not include a specific assessment of leading-edge erosion, nor of the associated microplastic pollution, efficiency losses, or reduced turbine lifespan. This represents a gap in the assessment of both environmental and operational impacts.

Pollution by anti-corrosion systems on the metal

Corrosion-protection systems are employed to prevent turbine structures from rusting, and sacrificial anodes or other cathodic protection systems can release highly toxic metals into the marine environment over time [3,18]. This concern is especially significant for floating platforms, whose larger subsurface structures require more extensive protection systems, which may result in higher inputs of trace metals.

However, the EIA does not assess the potential environmental impacts of these materials, nor does it describe any mitigation strategy to minimize metal pollution such as proposed by Watson et al. [19]. The absence of this information represents a gap in the environmental assessment, and it is requested that the Applicant provides full details of corrosion-protection methods, anticipated emissions, and strategies to mitigate trace metal impacts before consent is granted.

Underwater infrasound

Infrasound—very low-frequency sound below 20 Hz—behaves fundamentally differently from higher-frequency acoustic noise. In the marine environment, infrasound can propagate over hundreds of kilometres [3], extending well beyond the subsea noise study area defined in the EIA, limited to the area within and up to 75 km from the Site Boundary [20].

Infrasound is known to affect whales and a wide range of other marine organisms, including jellyfish, fish, reptiles, cetaceans, and more. Many of these species rely on infrasound for navigation, foraging, social communication, mate attraction, courtship, and territorial behaviour [3].

However, the EIA considers only conventional acoustic noise in the 20 Hz to 80 kHz range [20] and concludes that impacts on marine mammals and other receptors are of minor adverse significance [4]. Furthermore, acoustic noise from floating wind turbines and mooring systems during operation has been assessed only qualitatively, reflecting the lack of precedent, as no large-scale floating offshore wind farms currently operate anywhere in the world [20]. The potential effects of lower frequency infrasound are not explicitly addressed. This introduces a level of uncertainty that the EIA does not fully quantify.

It is therefore requested that the Applicant undertakes a dedicated assessment of infrasound generation and propagation from large floating offshore wind farms, including its spatial extent beyond the current study area, and evaluate the potential impacts on marine

species known to rely on infrasound. Such an assessment should be included to ensure a precautionary and comprehensive evaluation of underwater noise impacts prior to the determination of this application.

3

Moving underwater shadows

The potential impacts of visual cues from offshore wind turbines on aquatic species remain poorly understood, and the underlying physical processes are not yet well characterised. For example, lensing effects caused by surface water waves enhance, rather than attenuate, the contrast created by turbine blade shadows penetrating the water column, contrary to assumptions applied in current EIAs [3] and repeated within the EIA of the Proposed Development [21].

The Applicant states that “the information presented is sufficient evidence to scope out the impact of shadow flicker on fish and shellfish receptors, with a particular emphasis on diadromous fish”. However, no empirical evidence is provided to demonstrate the absence of effects, and notwithstanding this uncertainty, the Applicant concludes that impacts would be negligible or non-existent [21].

It is therefore requested that the Applicant reconsiders the scoping-out of visual and moving shadow effects on aquatic species, and provide a robust assessment informed by current scientific uncertainty. In the absence of such evidence, a precautionary approach should be adopted to ensure that potential impacts on fish and shellfish receptors are adequately assessed prior to determination.

Changes to coastal waves

The wave model used in the EIA to simulate the impact of the proposed development on wave conditions considers only the blockage effects of fixed subsurface structures [22]. However, the interaction between floating wind turbines and waves is fundamentally different [3,23]. In such systems, wave–structure interactions are more complex and include inertial forces arising from the motion of the floating structures within the water column, which are not captured by fixed foundation models [24].

Numerical modelling by Deng et al. [24] predicts that, under certain conditions, the side columns of semi-submersible floating turbines can reduce significant wave height by more than 50%, producing a wave wake extending up to 1 km downstream, with associated changes to wave wavelength and direction. In addition, the EIA does not assess potential modifications to surface wind fields caused by the turbines, nor the consequent effects on local and regional wave conditions [22].

These omissions are material, as changes in wave climate could have adverse consequences for recreational activities such as surfing, kayaking, and paddleboarding along the east coast of Orkney, and at locations in Caithness including Sinclair’s Bay, Dunnet Bay, Thurso East, Brimms Head Reef, and Sandside Bay [25]. Whether such impacts would be of only minor significance, as concluded in the EIA [4], has not been demonstrated.

Wave exposure is also a key controlling factor for intertidal and nearshore rocky shore communities, and alterations to wave conditions may have ecological consequences [3]. These potential impacts on coastal habitats and species are not valued in the EIA [4].

It is therefore requested that the Applicant undertakes a revised wave climate assessment that explicitly accounts for floating turbine dynamics. This assessment should evaluate

changes to wave height, direction, and wavelength, and consider the potential implications for coastal recreation and wave-dependent marine and intertidal ecosystems, prior to determination of the application.

4

Wind theft

The potential aerodynamic interactions between the Proposed Development and existing and planned onshore wind farms have not been addressed. It is well established that wind wakes generated by large offshore wind farms can extend over 100 km downstream, resulting in reductions in turbine energy yield of up to several tens of percent [3, 26]. Such effects, often described as 'wind theft', may therefore have a material impact on the operational performance of neighbouring wind farms, including the anticipated onshore wind farms Costa Head and Hesta Head, and community wind farm Quanterness on Orkney.

The Applicant's EIA considers wind wake effects only in relation to physical oceanographic processes, such as stratification, and does not provide a quantitative or robust assessment of potential impacts on neighbouring wind farms [13]. This represents a significant omission, as the potential reduction in power generation and associated economic implications for adjacent projects is a material consideration for the consent process.

Accordingly, the application should be revised to include a full, quantitative assessment of wind wake interactions between the Proposed Development and nearby turbines, including projected reductions in energy yield.

Economic, environmental, and social Impacts

Work on the nearby West of Orkney Wind Farm has been paused due to the prohibitive cost of the power grid connection (among the highest in the north of Scotland) rendering such projects economically uncompetitive compared with those in England [27]. This raises serious concerns about the viability of the Proposed Development, particularly as floating wind remains substantially more expensive than fixed-bottom technology (£216/MWh vs £90/MWh) [28].

Transmission from the Array Area would require major onshore infrastructure, including extensive cable trenches, substations, and 400 kV overhead lines in Caithness. The environmental and social impacts of these works would be significant, causing landscape disruption and affecting local communities [29].

These considerations occur alongside substantial constraint payments already borne by consumers for offshore wind farms in north-east Scotland [3], highlighting wider economic implications.

In light of these factors, it is considered that the cumulative economic, environmental, and social impacts of the Proposed Development deserve further consideration. The application would benefit from a more detailed assessment of onshore infrastructure impacts and economic feasibility before consent is granted.

Mental health

Uninterrupted vistas, expansive open spaces, long views to the horizon, and clear night skies are essential to the health and wellbeing of local communities and visitors, providing well-documented emotional, psychological, and physical benefits, which are amplified when landscapes and seascapes remain unspoilt and tranquil [3]. As it is stated in the EIA that "significant visual effects are likely at open coastal locations closer to the Proposed Development in Orkney" [4], it risks significantly diminishing these qualities for residents

and visitors in Orkney.

5

The associated onshore infrastructure in Caithness causes considerable grief [29]. Close-knit communities are already experiencing severe disruption by the planning process, with serious mental health impacts, as stressed by a neighbour of the proposed substation site [29].

The planning application fails to adequately address how residents' sense of place or connection with their community would be affected. It is therefore requested that the planning authority fully assess the cumulative effects on landscape, seascape, and community well-being, and demonstrate how these impacts will be effectively mitigated, before any consent is granted, as this represents a material consideration in the decision-making process.

Concluding remarks

The matters set out above indicate that the publicly available project documentation do not provide a sufficiently comprehensive or precautionary assessment of the Proposed Development. Several potentially significant environmental, physical, social, economic, and security-related impacts are either insufficiently assessed, scoped out without robust evidence, or not addressed at all. In several instances, conclusions of negligible or minor impact are reached despite acknowledged scientific uncertainty and the absence of site-specific quantitative analysis.

Given the scale, novelty, and cumulative nature of the development, and the evolving recognition of the marine environment as a complex and vulnerable system, the information currently available is not adequate to support an informed determination. It is therefore considered that consent should not be granted at this stage. A revised application, supported by targeted and up-to-date assessments addressing the identified gaps and adopting a precautionary approach, should be required before the Proposed Development is taken forward.

Thank you for your attention to this objection.

Kind Regards,

[Redacted]

REFERENCES

1. The Scottish Association for Marine Science (2025). The Ocean Enters the Boardroom Available online: <https://www.sams.ac.uk/news/sams-news-ocean-on-the-board> (Accessed 19 May 2025)
2. Thistle Wind Partners (2024). Ayre OU'shore Wind Farm. OU'shore Scoping Report. Ref No. TWP-AYR-RPS-OFC-RPT-00031 / FINAL. Available online: https://marine.gov.scot/sites/default/files/ayre_oU'shore_wind_farm_-_scop0049_-_oU'shore_scoping_report_-_developer_to_md-lot_redacted.pdf (Accessed 23 Jan 2026).
3. Goddijn-Murphy, L.M. (2026). 10 Things to consider before approving another oU'shore wind farm: A case study for Highland, Scotland. Ocean Coast. Manag. Volume 271, 107956; <https://doi.org/10.1016/j.ocecoaman.2025.107956>
4. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report. Non Technical Summary, Ref No TWP-AYR-RPS-ENV-RPT-00033. Available online: https://marine.gov.scot/sites/default/files/ayre_oU'shore_wind_farm_-_section_36_and_marine_licences_application_-_eia_-_non_technical_summary_redacted.pdf (Accessed 23 Jan 2026).
5. BBC News (2025). How serious is the Russian spy ship move? Available online: <https://www.bbc.co.uk/news/articles/c4gpgj6d4e6o>. (Accessed 23 Jan 2026).
6. The Orcadian (2025). Caithness windfarm fault behind Orkney blackout, confirm SSEN. Available online: <https://orcadian.co.uk/caithness-windfarm-fault-behind-orkney-blackout-confirm-ssen/> (Accessed 23 Jan 2026).
7. STV News (2025). Power cuts caused by network fault amid 'wild' Russia speculation. Available online: https://news.stv.tv/highlands-islands/orkney-and-caithness-power_cuts-caused-by-network-fault-amid-wild-russia-speculation (Accessed 23 Jan 2026).
8. Shetland News (2025). Damage to vital communication links caused by fishing activity, Faroese cable owner confirms. Available online: <https://www.shetnews.co.uk/2025/11/27/damage-vital-communication-links-caused/> (Accessed 23 Jan 2026).
9. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 3: Project Description, Ref No TWP-AYR-RPS-OFE-RPT-00005. Available online: https://marine.gov.scot/sites/default/files/vol_1_-_chapter_3_-_project_description.pdf (Accessed 28 Jan 2026).
10. East Lothian Courier (2015). Port Seton fishermen fear for lives from unexploded bombs. Available online: <https://www.eastlothiancourier.com/news/25054490.port-seton-fishermen-fear-lives-unexploded-bombs/> (Accessed 23 Jan 2026).
11. Sealetters (2025). Save the Phytoplankton. Available online: <https://sealetters.substack.com/p/fight-for-phytoplankton> (Accessed 23 Jan 2026).
12. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 3, Technical Appendix 7.1: Physical Processes Baseline Environment, Ref No TWP-AYR RPS-OFE-RPT-00025. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_7.1_-_physical_processes_baseline_environment.pdf (Accessed 28 Jan 2026).
13. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 7: Physical Processes, Ref no TWP-AYR-RPS-OFE-RPT-00013. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_7_-_physical_processes.pdf (Accessed 28 Jan 2026).

14. Daewel, U., Akhtar, N., Christiansen, N. et al. (2022) OU'shore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. *Commun. Earth Environ.*, 3, p. 292; <https://doi.org/10.1038/s43247-022-00625-0>
15. Thistle Wind Partners (2025). Thistle Wind Partners submits onshore plans for pioneering Ayre OU'shore Wind Farm. Available online: <https://www.thistlewindpartners.scot/news/thistle-wind-partners-submits-onshore-plans-for-pioneering-ayre-ou'shore-wind-farm/> (Accessed 28 Jan 2026).
16. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report. Planning Statement TWP-AYR-ERM-OFE-RPT-00009 Available online: https://marine.gov.scot/sites/default/files/ou'shore_planning_statement_0.pdf (Accessed 28 Jan 2026).
17. TNO (2025). Better damage prediction for oU'shore wind turbine blades. Available online: <https://www.tno.nl/en/newsroom/2025/03/damage-prediction-wind-turbine-blades/> (Accessed 28 Jan 2026).
18. Sealetters (2025). Wind Farming. Available online: <https://sealetters.substack.com/p/wind-farming> (Accessed 28 Jan 2026).
19. G.J. Watson, G. Banfield, S.C.L. Watson, et al. (2025). OU'shore wind energy: assessing trace element inputs and the risks for co-location of aquaculture. *npj Ocean Sustain*, 4, p. 1; <https://doi.org/10.1038/s44183-024-00101-6>
20. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 3, Technical Appendix 10.4: Subsea Noise Technical Report, Ref No TWP-AYR-RPS-OFE RPT-00017. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_10.4_-_subsea_noise_technical_report.pdf (Accessed 28 Jan 2026).
21. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 9: Fish and Shellfish, Ref No TWP-AYR-RPS-OFE-RPT-00058. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_9_-_fish_and_shellfish.pdf (Accessed 28 Jan 2026).
22. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 3, Technical Appendix 7.2: Model Design and Validation. Ref No TWP-AYR-RPS-OFE-RPT 00026. Available online: https://marine.gov.scot/sites/default/files/vol_3_-_technical_appendix_7.2_-_physical_processes_model_design_and_validation.pdf (Accessed 28 Jan 2026).
23. Sealetters (2025). Are artificial wave pools the future of surfing? Available online: <https://sealetters.substack.com/p/are-artificial-wave-pools-the-future> (Accessed 28 Jan 2026).
24. Deng, S., Yang, S., Chen, S., Chen, D., Yang, X., and Cui, S. (2024). A parameterization scheme for the floating wind farm in a coupled atmosphere–wave model (COAWST v3.7), *Geosci. Model Dev.*, 17, 4891–4909; <https://doi.org/10.5194/gmd-17-4891-2024>
25. Thistle Wind Partners (2025). Ayre OU'shore Wind Farm. OU'shore EIA Report Volume 2, Chapter 16: Infrastructure and Other Users, Ref No TWP-AYR-RPS-OFE-RPT-00039. Available online: https://marine.gov.scot/sites/default/files/vol_2_-_chapter_16_-_infrastructure_and_other_users.pdf (Accessed 28 Jan 2026).
26. Sealetters (2025) Wind Wars. Available online: <https://sealetters.substack.com/p/wind-wars> (Accessed 28 Jan 2026).
27. BBC News (2026). Plans for huge wind farm paused over 'unfair' grid charges. Available online: <https://www.bbc.co.uk/news/articles/c8x919v8q19o> (Accessed 28 Jan 2026).

28. Financial Times (2026). Record UK onshore wind auction boosts plan to decarbonise by 2030. Available online: <https://archive.is/20260114141724/https://www.ft.com/content/0dd16df2-64b0-407abbfd-c939dfabc3f8> (Accessed 28 Jan 2026).
29. Sealetters (2025). A Planning Process Under Strain. Available online: <https://sealetters.substack.com/p/a-planning-process-under-strain> (Accessed 28 Jan 2026).

From: [Redacted]
To: [MDedine Renewables](#)
Cc: [Kirsten Watson](#); [Amy Woodward](#); [Rebecca Ross](#); [Toni-marie McGinn](#)
Subject: Re: Ayre Offshore Windfarm
Date: 05 February 2026 16:17:06
Attachments: [image001.png](#)

Good morning

In my professional opinion there is a requirement for a whole redesign now that Fanallan sub station is refused, as of this morning.

I would then, request that the developer is requested to engage specifically with the Moray Firth Partnership, whose operations stretch from Inverness to Wick.

I would be grateful if you could take into account also that the Global Climate Change Week is focussed on Wick.

[Redacted]

I would encourage you to contact the MFP, who your organisation supports in any case.

Kind regards.

[Redacted]

h

k

K

2026 - 4 of

4

From: [Redacted]
To: [MD Marine Renewables](#)
Subject: Subject: Objection to the Planning Application for Ayre Offshore Wind Farm
Date: 30 January 2026 20:26:45

To: Scottish Ministers (Marine Scotland – Marine Directorate)

Objection to the Planning Application for Ayre Offshore Wind Farm

We totally agree with the objection points raised by [Redacted]
objection submitted on 30 January 2026.

In addition to all these points we submit the following further objections -

NPF4 strives for a just transition but this development is an unjust transformation in perpetuity replacing fossil dependence with materials dependence and CO2 emissions with construction emissions.

Planners look at projects in isolation rather than as part of a wider pattern of change. We are altering what feeds us and gives us food security; what shelters and feeds fish and water mammals; promotes biodiversity; sustains rural livelihoods and supports public health for intermittent, low value, minimal variable generation.

Communities know what is best for their area and seas and there is no support for this development here. Democracy means that local voices should be listened to and acted on.

There will be little or no benefit for the onshore community as none of this generation will be for their use yet they will have to endure the destruction of their landscape, noise, air and light pollution for substations and the disruption due to years of construction.

**21% of the population - 14 million are in poverty.
6.8 million are in very deep poverty - the highest proportion since records began 30 years ago.**

This increase can be laid at the door of the renewable energy expansion. CfD of £216 per MWh guaranteed to floating wind for 20 years is the only reason this application is proceeding. This burden of payment is foisted on bill

payers alone. The generation is not available when needed but just at the whim of the weather and when there is wind and no requirement, the curtailment costs add another £2.2 billion this year alone. This is morally wrong and indefensible. It should stop immediately.

The black outs in Iberia should be a lesson to us all.

It is madness to run 2 generation systems - legacy generation and renewables. Renewables are geographically dispersed, low energy density and intermittent electricity generators that will always need 100% back up generation, making them useless.

New windfarms, transmission lines and substations are an ugly scar on the beautiful countryside - the land take is enormous displacing wildlife, destroying eco-systems, adding a financial burden to families already suffering fuel poverty. Pylon lines pose a grave danger to birds, particularly raptors, geese and swans. Generation should be at centres of usage, not in the Orkney seas which then necessitates transmission to the south with its loss of capacity over long distances. Developments in England and Wales could eventually mean that this far away generation is not needed and then the cost and blight of this infrastructure will all have been for nothing.

Please refuse this application

[Redacted]

k

K

h

2026

1

From: [Redacted]
To: [MD Marine Renewables](#)
Subject: Ayre Offshore Wind Farm Objection
Date: 31 January 2026 23:57:42

REPRESENTATION by [Redacted] on 31/01/2026.

Email: [Redacted]

Dear Sir / Madam,

I am writing to formally object to the planning application for the Ayre Offshore Wind Farm.

The Environmental Impact Assessment (EIA) provided fails to adequately evaluate significant effects on the marine environment, human health, coastal communities, and infrastructure. Key gaps, scientific uncertainties, and unquantified cumulative impacts render the application non-compliant with Scottish planning and EIA requirements. Further detailed assessments and mitigation measures are essential before consent can be granted.

The Sea as a Legal Entity

The evolving concept of granting legal personhood to natural resources, including the ocean, as seen in global implementations and Scottish initiatives like representation at the Scottish Association for Marine Science, suggests that current impacts deemed acceptable may not align with future societal or legal standards.

Vulnerability to Terroristic, Militaristic, and Criminal Attacks

The development's remote offshore location, spanning 200 km² with 360 km of subsea cables, exposes it to potential criminal, terrorist, or grey-zone threats. No detailed risk assessment or evidence is provided, despite reports of vulnerabilities such as Russian vessel activities and security risks from foreign-manufactured components. A specific security evaluation is required, especially given its overlap with military exercise areas.

Unexploded Ordnance on the Seabed

The EIA addresses unexploded ordnance (UXO) risks only within the array site and export cable corridor, overlooking hazards in areas where fishing and marine activities may be displaced, posing risks to human safety.

Impact on Phytoplankton Growth and Primary Production

The qualitative assessment minimizes effects on phytoplankton, which underpin marine food webs and carbon uptake, but ignores mechanisms like wind wake effects that could alter production beyond the array area. Site-specific and regional research is needed amid rapid offshore wind expansion.

Leading Edge Erosion of Turbine Blades

With large rotor diameters, leading-edge erosion from environmental factors is likely, leading to microplastic pollution, reduced efficiency, and shorter blade lifespans. This is not assessed in the documents.

Pollution by Anti-Corrosion Systems

Corrosion-protection methods, particularly for floating platforms, may release toxic metals into the marine environment. The EIA omits details on these systems, emissions, or mitigation strategies.

Underwater Infrasound

The assessment focuses on higher-frequency noise, neglecting infrasound below 20 Hz, which propagates far and affects marine species reliant on it for essential behaviors. A dedicated infrasound evaluation is requested, extending beyond the current study area.

Moving Underwater Shadows

Visual cues from turbine shadows, enhanced by wave lensing, are scoped out without empirical evidence, potentially impacting fish and shellfish. A robust reassessment is needed.

Changes to Coastal Waves

The wave model inadequately accounts for floating turbine dynamics, which could significantly alter wave conditions, affecting coastal recreation (e.g., surfing in Orkney and Caithness) and intertidal ecosystems. A revised assessment is required.

Wind Theft

Aerodynamic wakes from the development could reduce energy yields at nearby onshore wind farms, such as Costa Head, Hesta Head, and Quanterness. No quantitative assessment of these interactions is provided.

Economic, Environmental, and Social Impacts

High grid connection costs and the expense of floating wind technology raise viability concerns. Onshore infrastructure, including substations and lines in Caithness, would cause significant environmental and social disruptions, warranting further evaluation.

Impacts on Mental Health

The project risks diminishing unspoilt seascapes and vistas essential for community wellbeing, with significant visual effects in Orkney and Caithness. Cumulative effects on sense of place and mental health are not adequately addressed.

In conclusion, the documentation lacks a comprehensive, precautionary approach to these environmental, social, economic, and security issues.

h
k 4

February 2026

From: [Redacted]
To: [MD Marine Renewables](#)
Cc: [Redact epanning@highland.gov.uk]
Subject: Objection - Ayre Offshore Wind Farm - MS-00011515 / MS-00011516
Date: 04 February 2026 12:35:37
Attachments: [Redacted]

I very strongly object to the proposed **Ayre Offshore Wind Farm**, THC reference number: 25/04779/S36, MS reference numbers: MS-00011515 / MS-00011516.

There is currently no commercially operating floating offshore wind farm anywhere in the world. This is unsurprising, as floating wind remains substantially more expensive (£216/MWh) than fixed-bottom technology (£90/MWh). As a result, there is no past empirical evidence of the impacts of large-scale floating offshore wind farms and no ongoing research in the UK waters (even although the determination processes for Pentland and West of Orkney set out detailed research and monitoring requirements). Despite this, the Ayre applicant, Thistle Wind Partners, has classified almost all assessed impacts of this floating wind farm proposal as minor or insignificant. This is clearly not tenable or acceptable.

For a list of concerns please consult Dr. L.M. Goddijn-Murphy paper '10 Things to consider before approving another offshore wind farm: A case study for Highland, Scotland' published on ScienceDirect (a pdf version is attached).

I also attach the latest available energy statistics for Scotland compiled by [Redacted]. No additional development should be consented before we have a comprehensive plan how and when all the energy generated onshore and offshore in Scotland is to be located, distributed, and used.

This is of critical importance given, for example, the recently announced pause for the West of Orkney offshore wind farm alongside the general lack of progress with other far north wind farms, all creating the strange combination of a sense of uncertainty alongside an increasingly complex cumulative position.

While the grid in Scotland might manage to take the potential generation, the provisions are not in place throughout the UK to bring the electricity to a consumer for years to come, if ever. This renders any new wind farm development useless. In light of this lack of need even the smallest negative impact is not tenable in the planning balance assessment, let alone the massive unpredictable impacts an experimental floating offshore wind farm will have.


I urgently recommend that Ministers should proceed quickly to simply refuse this application.

Sincerely yours,
[Redacted]

[Redacted]



10 Things to consider before approving another offshore wind farm: A case study for Highland, Scotland

Lonneke Goddijn-Murphy 

Environmental Research Institute, University of the Highlands and Islands, Thurso, UK

ABSTRACT

The sea is often seen as an empty and quiet place, and hence, an appealing location for wind farms and related installations. However, the sea is dynamic, there is a wealth of wildlife, and there are different users of the sea who can conflict with each other. Offshore wind farms must go through planning applications in which a range of concerns have to be addressed for each individual wind farm. There are the obvious concerns, such as visual impacts and risks to birds, bats, fish, and sea mammals, but there is a range of other issues in need of attention. This document presents 10 overlooked and underestimated impacts on the health of the natural environment, from the smallest plankton to the great whales, and the human population. It appears that offshore wind farms are being consented before new models and measurements have become available to assess their impact. Also, recent experiences with terroristic, militaristic and criminal attacks on the offshore wind industry, and disputes between offshore wind farm developers have given reason to reflect. All parties involved in the wind industry are seen to be learning as it goes at the rate at which it is deployed on a large scale. Current impact assessments are for each individual wind farm, ignoring cumulative effects of multiple large offshore wind farms. There will be many unforeseen consequences and what is acceptable today, may not be in the not-too-distant future.

1. Introduction

Wind farms require a lot of space due to the small energy density of wind energy and the low efficiency of the transformation of wind energy into electricity (MacKay, 2008). Wind turbines and wind farms are getting ever larger to mitigate these shortcomings, and since the sea is often seen as 'empty' it is an appealing location for offshore wind farms and related installations. The Scottish seas are particularly interesting because the wind is strongest in the north of the UK; several large offshore wind farms are in operation and many more are in the pipeline (Fig. 1). There is a wide range of marine activities and users that can conflict with each other and need to be regulated (Fig. 2). In the planning system for offshore wind farms in Scotland, several groups are involved: the public, who can submit representations (letters of support or objections); local authority planning officers and councillors, when they prepare and agree the council's consultation response to the Scottish Government; and the Marine Directorate, which assesses applications and provides advice (Scottish Borders Council, 2025; UK Government, 2025; The National, 2025). The Scottish Government (Scottish Ministers) has the final say, particularly on larger developments. Highland is by far the largest of all counties in Scotland and receives numerous applications for large offshore wind farms and related infrastructures. This investigation of 10 often underestimated and overlooked issues can help the Highland Council and all other parties involved in new offshore wind energy projects and in policy

development make an informed decision. The selected issues cover a wide range of concerns: the sea as a legal person, vulnerability to terroristic, militaristic, and criminal attacks; unexploded munition on the seabed; phytoplankton; dirty sides to offshore wind turbines; noise and light pollution; changes to the surf; floating offshore wind farms; cumulative impact; and mental health. Though other relevant issues could be addressed, the selected cases sufficiently demonstrate the complexity and scope of the topic.

2. The sea as legal entity

The ocean is the largest space on Earth, covering approximately 70 % of Earth's surface and holding about 97 percent of all the water on Earth. If we take care of the ocean, the ocean will take care of us. But the ocean is not there for us to do with as we please, to dump our waste in, to sustain blue economies, or to remove CO₂ from the atmosphere. There is only one ocean on planet Earth, and it belongs to no one. The ocean should have a voice in decisions that affects its existence. This may sound incredible, but the feasibility of giving the ocean or other natural resources legal personhood is subject of serious studies (United Nations, 2025; Mührel, 2025). The idea has already been put in practice in different parts of the world. New Zealand granted legal personhood to the Whanganui River in 2017 (BBC, 2020) and this year the River Ouse in England has been given its own rights (Time Out, 2025). The Constitutional Court of Ecuador has ruled that the ocean has ocean

E-mail address:

[Redacted]

<https://doi.org/10.1016/j.ocecoaman.2025.107956>

Received 2 July 2025; Received in revised form 10 September 2025; Accepted 30 September 2025

Available online 14 October 2025

0964-5691/© 2025 The Author. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

rights to enhance its legal protection (Ocean Vision Legal, 2025) while in Oban, the Ocean has been given a place at the boardroom of the Scottish Association for Marine Science (SAMS) (The Scottish Association for Marine Science, 2025). These developments show how our relationship with the ocean is changing and that what is acceptable today, may not be in the not-too-distant future.

3. Vulnerability to terroristic, militaristic, and criminal attacks

Bueger & Edmunds (Bueger and Edmunds, 2024) review the technical vulnerabilities of offshore wind farm systems to threats from terrorism, crime and hostile states, including physical and cyber risk scenarios. Hostile states can operate in the so-called “grey zone”, meaning they intend to harm their opponent, especially their infrastructure assets, but don’t go as far as committing an act of war. In the North Sea and Baltic Sea regions, specific concerns are linked to Russia and their plans for acts of sabotage while in the waters around Taiwan as well as those of the South China Sea the Chinese government is frequently accused of grey zone activities (Bueger and Edmunds, 2024). These vulnerabilities are not part of public planning applications for offshore wind farms and related infrastructure in Highland. It is likely that these vulnerabilities have been evaluated and that plans for protection are in place but have not been made public for obvious reasons. In the following, known issues with military- and energy security are described.

3.1. Cable damage

Energy from offshore wind farms is brought ashore through undersea power cables. For the situation in Highland, see the map on the Highland Renewables Database website (Haltiner, 2025). According to this map, electricity generated at sea must travel long distances before it reaches our shores. The estimation that 80 percent of financial losses suffered by offshore wind farms are caused by cable failure (Bueger and Edmunds,

2024) confirms how critical these subsea cables are. An estimated 70 percent of cable failures are caused by damage from shipping, fishing, or boating activities, accidentally or otherwise (Bueger and Edmunds, 2024). Due to their remote and hard to survey locations, cable failures can be subject to crime, terrorism and grey zone activities. The Russian military uses the Main Directorate for Deep Sea Research (GUGI) for deep-sea intelligence gathering, such as mapping the location of offshore wind farms or the points at which cables come ashore, and sabotage operations (BBC, 2025a). GUGI operates deep-diving submarines that can sever cables at great depths but sometimes they are suspected of simply dragging an anchor along the seabed to damage a subsea cable (BBC, 2025a). The Chinese government has recently revealed a deep-sea cable-cutting device capable of severing undersea communication and power cables at depths of up to 4000 m (Asia Times, 2025).

3.2. Cyberattacks

A cyberattack is any intentional effort to steal, expose, alter, disable, or destroy data, applications, or other assets through unauthorized access to a network, computer system or digital device (IBM, 2025). Offshore wind farms are at cyber risk due to the convolution of wind farm components and the numerous suppliers and operators usually involved (Bueger and Edmunds, 2024). A cyberattack could physically damage offshore wind farm turbines, land-based sub stations and under-sea connections, and has the potential to shut down a wind farm network as a whole (Bueger and Edmunds, 2024). In Germany three cyber-attacks led to turbines losing connection with satellites and the corruption of internal IT systems (Knack et al., 2024). Danish wind company, Vestas, faced a ransomware attack in 2021 whereby data retrieved from Vestas’ IT systems were used to extort their customers (Knack et al., 2024). Cyberattacks are happening in the UK, but there is no public available information on this (The Alan Turing Institute, 2024). Cyberattacks on wind farms could also be used to steal privileged technical data. MI5 (the United Kingdom’s Security Service, Military

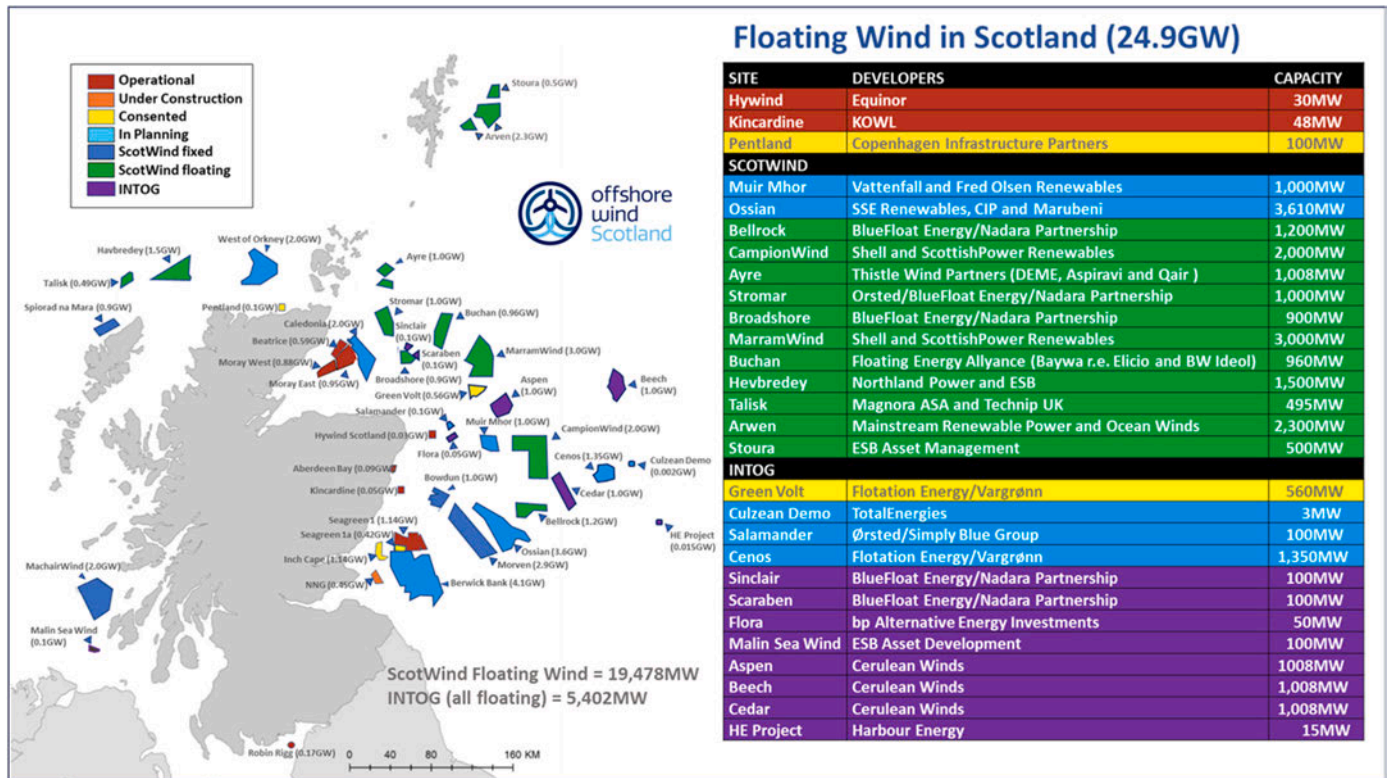


Fig. 1. Offshore wind farms that are in development, under construction, and operational off the Scottish coast; Scotwind and INTOG (Innovation and Targeted Oil and Gas) are areas for lease (Offshore Wind Scotland, 2025a).

Intelligence, Section 5) is concerned with the consented Green Volt offshore wind turbine project to be built off the East Coast of Scotland (Fig. 1) because of their potential Chinese hardware supplier Mingyang (Interesting Engineering, 2025; Financial Times, 2025). Chinese hardware installed at sea could give China access to sensitive information without the UK's knowledge. The Caledonia, Stromar and Ayre wind farm sites are located inside military zones, while West of Orkney, Beatrice, Moray East and Scaraben are adjacent (Figs. 1–2), which raises concerns about the security of the UK's military secrets. Recently, U.S. experts found rogue communication devices in Chinese solar inverters providing a built-in way to physically destroy the grid (Reuters, 2025). In conclusion, all components, suppliers, infrastructure and operators that make an offshore wind farm work need to be continually assessed to guarantee military-as well as energy security.

3.3. Drone attacks and autonomous vessels

According to world leaders in offshore wind electricity producers, AI-equipped drones can perform complex inspections, maintenance, and cargo delivery in offshore wind farms (Vattenfal, 2025; Ørsted, 2024). Flying a drone, also known as unmanned aerial vehicle (UAV), in UK airspace is subject to UK laws, rules and regulations. Drones are controlled by a nearby drone pilot or by an operator at distance in a remote-control centre, possibly in another country and bypassing all UK legislation (Wind Systems Magazine, 2023). Drone attacks on wind farms can cut off electricity supply to the consumer by damaging wind turbines as happened in 2024 when a Russian drone attacked a UK owned wind farm in the Ukraine (National Wind Watch, 2024). Autonomous vessels are also deployed for offshore surveying of wind farms (Ørsted, 2024). According to the Swedish' defence minister, Pål Jonson, both cruise robots and ballistic robots are a big problem if you have offshore wind power (The Guardian, 2024). A Polish study warns for the ease at which an explosive charge can be moved into the region of a wind turbine or submarine cables using either a drone or autonomous vessel (Baltic Wind, 2022).

3.4. Blinding onshore radars

Radar (radio detection and ranging) is used for air traffic, coastal

surveillance, air defence, and weather forecasting/monitoring for civilian and military purposes (Bueger and Edmunds, 2024; Auld et al., 2013). A basic radar system emits electromagnetic energy and measures its reflectance off targets in the radar's line of sight; reflections from other objects such as active wind farms can interfere with the radar signal of the target, creating gaps in the observations (Auld et al., 2013). Sweden cancelled 13 offshore wind farms in the Baltic Sea Wind because they could affect sensors and radars used in Sweden's defence (The Guardian, 2024). The UK Government is concerned about keeping the skies above the UK safe from aerial threats and has funded research projects in innovative future windfarm mitigations for UK Air Defence (UK Government, 2021). While these new technologies are being developed and tested, new offshore wind farm infrastructures need to be managed carefully, especially where military zones and offshore wind farms are co-located (Fig. 2).

3.5. Blue crime

Blue crime is a criminal activity that takes place on, in, or across the sea (Bueger and Edmunds, 2024). Examples of crime at sea are piracy, smuggling of illicit goods, people trafficking, and environmental crimes such as illegal fishing and hazardous waste disposal. Crimes at sea are aided by the difficulty of routine surveillance and increased response times for law enforcement due to their remote locations. Being located at sea, offshore wind farms are vulnerable to theft and vandalism. Offshore wind turbines require more copper (an estimated eight tonnes of copper per megawatt) than onshore wind turbines (about three tonnes of copper per megawatt) because of more copper in further cabling (International Energy Agency, 2022; Coppers Development Association Inc, 2025). The scrap value of copper is the highest of all scrap metals (UK Metals, 2025). Copper theft, whereby highly professional offenders steal copper cabling from inside the wind turbine, is on the rise from onshore wind farms in the UK (International Security Journal, 2025). It is conceivable that these organized crime groups move their attention to remote offshore wind farms. Offshore wind farms could also be put at risk by nearby illegal fishing as it more likely involves destructive methods such as bottom trawling and explosives fishing which could damage cables and other infrastructure (Bueger and Edmunds, 2024). In Scotland, incidents of illegal scallop dredging and prawn trawling to supply a

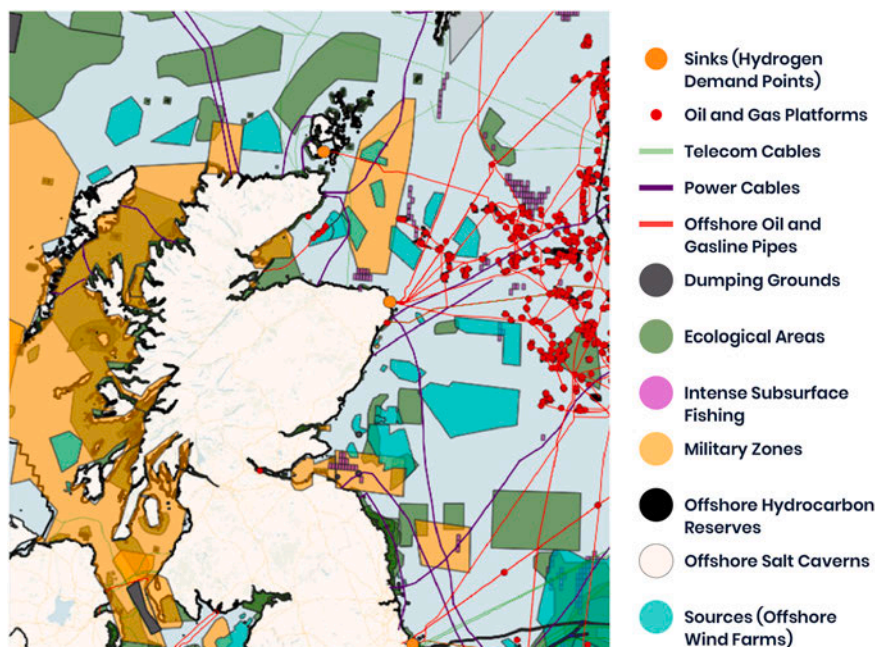


Fig. 2. Map showing many different marine activities and functions, adapted from the North Sea Energy Road Map (North Sea Energy, 2025). The Ecological Areas represent Marine protected areas (MPAs), covering around 37 % of the seas around Scotland (Scottish Government, 2025a).

lucrative black market in seafood have been reported (The Ferret, 2019). Finally, turbines and sub-stations could be used as transshipment points for smuggling operations (Bueger and Edmunds, 2024). The UK Border Force has warned that South American drug gangs are dropping cocaine worth tens of millions of pounds in the sea around the UK to be picked up and brought to shore by smaller boats (BBC, 2025b). Offshore wind turbines and energy islands can be used as transshipment points for smuggling narcotics, as well as small arms, counterfeits and even people trafficking (Bueger and Edmunds, 2024).

4. Unexploded munition on the seabed

Explosives, chemical munitions, bombs, and artillery shells have been dumped during and after the two World Wars, and there are still hundreds of thousands of unexploded ammunitions in European seas and UK waters today (European Commission, 2024; BBC, 2025c). Fig. 3 shows locations of known submerged munition dump sites around the north of Scotland (European Commission, 2025), but there are many more that lie underwater undiscovered. Unexploded munitions on the seabed pose severe threats to marine and human lives during the construction and operation of offshore wind farms. They must be cleared using quiet technologies (less noisy than "high-order" detonations) for wind projects to go ahead (BBC, 2025c). Another concern is wind farms and their cable corridors forcing fishermen further out to sea into danger zones of unexploded bombs, as is happening in the Firth of Forth (East Lothian Courier, 2025). Unexploded munitions on the seabed are all around the Scottish coast (Fig. 3), necessitating surveying for unexploded munitions on and near the locations of large offshore wind farms that are in development, under construction, and operational (Fig. 2).

Areas where offshore power cables make land fall can also be contaminated. On the Caithness coast radioactive contamination has been found in Dounreay believed to have come from military aircraft instruments dumped around the time of the Second World War. This discovery has prevented SSEN (Scottish and Southern Electricity Networks) to progress construction of a substation for the Orkney-Caithness high-voltage electricity cable (The National, 2024). It is also the landfall site of the Pentland Floating Offshore Windfarm (Fig. 2 (Pentland Floating Offshore Windfarm, 2025)). According to the Scottish

Environment Protection Agency, SSEN needs to acquire an Environmental (Scotland) Authorisations Regulations 2018 (EASR) permit to complete the work (BBC, 2024). Other areas in Scotland where there have been similar worries about radioactive pollution due to suspected buried airplanes are Dalgety Bay, Kingsteps Quarry at Nairn, and sand dunes near Kinloss in Moray (BBC, 2024). This problem shows that issues associated with military and maritime security (as described in section 3) can go back as long as 80 years and stay around for another hundreds of years.

5. Phytoplankton

The Amazon rain forest is widely known as the 'lungs of the world' because its trees and plants produce atmospheric oxygen (O₂) and absorb massive amounts of the greenhouse gas carbon dioxide (CO₂) through the process of photosynthesis. Consequently, news about the cutting down of trees in the Amazon rainforest in Brazil leads to public outrage (BBC, 2025d). Phytoplankton in the sea, single-cell organisms that are plants (algae), also photosynthesise, producing an estimated 80 % of the world's oxygen and playing a key role in the ocean uptake of CO₂ (Witman, 2017). The ocean absorbs about a quarter of the atmospheric CO₂ emitted by human activities (Watson et al., 2020). However, when the environment that supports this 'biological pump of carbon' in the sea is threatened on our doorstep we don't hear much about it. Another reason why phytoplankton is extremely important is because phytoplankton is at the bottom of the food chain and essentially the foundation of all life in the sea (Witman, 2017). On the other hand, phytoplankton colonies growing out of control lead to harmful algal blooms (National Oceanic and Atmospheric Administration, 2025). Harmful algal blooms can produce toxins, they can smother underwater life, and decaying algal blooms can suffocate underwater life by consuming all the oxygen in the water. Toxic blooms occur regularly along the east coast as well as other waters around Scotland, with health implications for shellfish, fish, fish eating predators and humans (Kershaw et al., 2021). Toxic blooms are difficult to predict but human activities that disturb ecosystems seem to play a role in the more frequent occurrence and intensity of harmful algal blooms (National Oceanic and Atmospheric Administration, 2025). Phytoplankton growth

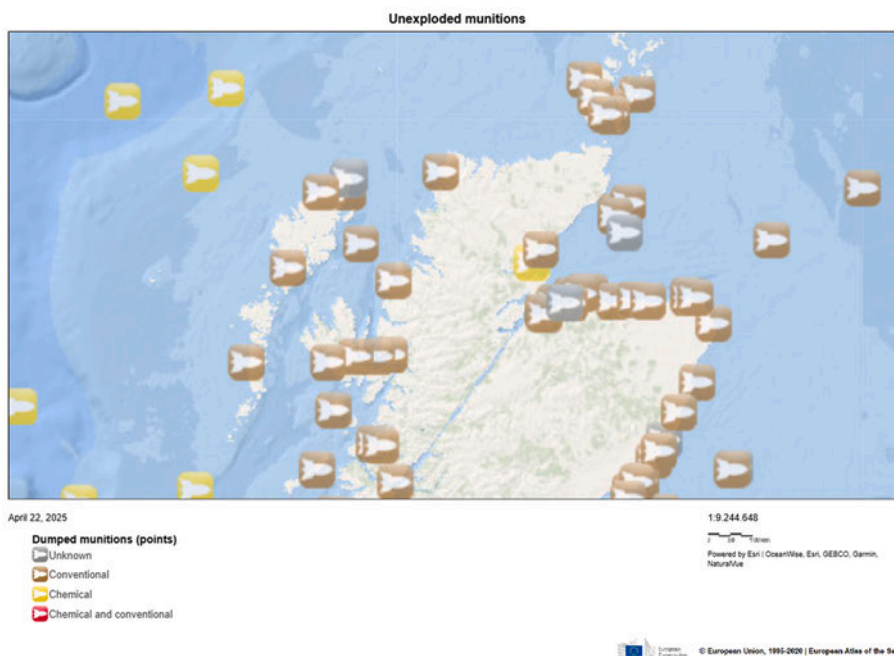


Fig. 3. Unexploded munitions on the seabed available online from the European Atlas of the Seas by EMODnet, Layer: Litter, Dumped munitions (points) (European Commission, 2025).

is controlled by sunlight, CO₂, and nutrients in the water, as well as water temperature and salinity, water depth, wind, and predators grazing on them (National Oceanic and Atmospheric Administration, 2025; NASA Earth Observatory, 2025). In general, when vertical mixing of water layers brings nutrients into the sunlit layers at the sea surface, phytoplankton starts to grow. Phytoplankton growth is seasonal, relating to the presence of sunshine and wind, and depends on the latitude of their location.

Offshore wind turbines can affect phytoplankton growth in several ways: (1) the submerged parts acting as artificial reefs for marine life (ICES, 2025), (2) more mixing of nutrient-arm and nutrient-rich water due to changes in the water flow around offshore wind turbine foundations (Dorrell et al., 2022), and (3) less mixing due to reduced surface wind in the offshore wind farm wake (Daewel et al., 2022; Zampollo et al., 2025). Significant changes were found [e.g., (Dorrell et al., 2022), (Daewel et al., 2022), (Zampollo et al., 2025)], both increases and decreases depending on environmental conditions such as water depth, time of the year, and type of offshore wind turbine. Modelling shows that in wind wakes of large offshore wind farm clusters in the North Sea can change primary production up to $\pm 10\%$ (Daewel et al., 2022). Many scientific studies have necessarily focussed on examining the influence of a single specific factor. In the future we need to look at the cumulative impact of large offshore wind farms on all combined atmospheric, hydrodynamic, biogeochemical and ecosystem processes that control phytoplankton growth (ICES, 2025; Daewel et al., 2022). At present, phytoplankton are not routinely evaluated in the environmental impact assessment of a planned offshore wind farm (Scottish Government, 2019) and does not appear on the list of 35 marine pressures within the Feature Activity Sensitivity Tool (FeAST) used by Marine Scotland (NatureScot, 2025). At the higher level of strategic research programs, however, the consequences of large upscaling of offshore wind on phytoplankton are evaluated [e.g., (ICES, 2025), (Deltares, 2021)]. Progress would be demonstrated if insights gained were systematically incorporated into planning applications.

6. Dirty sides to offshore wind turbines

Toxins are persistently released by offshore wind turbines both above and below the sea surface. Offshore wind turbines possibly emit over 200 contaminants into the environment, with coatings accounting for the majority of substances, followed by anti corrosion systems on the metal, and oil and grease for operation (Hengstmann et al., 2025), as described in more detail in respective sub sections 6.1 to 6.3 below. Marine toxins and litter are not confined to one location as they are easily moved around by dynamic processes in the sea such as, currents, waves, tides, and the mixing of oceanic waters with shelf sea waters (van Sebille et al., 2020). MPAs are designed to protect Scotland's seas, marine life and habitats from damage caused by human activities (Scottish Government, 2025a). It is therefore a concern to locate large offshore wind farms near MPAs (Fig. 2); for example the planned West of Orkney Wind Farm is enclosed by MPAs on three sides while peak tidal flows move water back and forth at top speeds that exceed 1 m/s (ABPmer, 2025). The pollution is not only a local and regional problem as large-scale ocean flow can transport durable pollution, such as plastics, over large distances on a global scale (van Sebille et al., 2020). Snapping turbine blades or turbine fires occasionally launch litter into the ocean (ICES, 2025; Reuters, 2024a; WorkBoat, 2024). One offshore wind turbine can contain up to 1400 L of various oils (LAIER, 2025) that could be discharged in a catastrophic natural event or accident (WorkBoat, 2024; Gunter, 2014). However, in the following sections the focus is on the often overlooked continuous direct pollution from offshore wind turbines. The Marine Directorate does not mention direct pollution by offshore wind turbines in the strategic environmental assessment for offshore wind energy (Scottish Government, 2019).

6.1. Microplastics pollution from leading edge erosion

Offshore wind farms shed paint particles from offshore structures and plastic particles from the rotor blades of turbines (Hengstmann et al., 2025). Repeated impacts by raindrops and other substances in the atmosphere ultimately lead to coating cracking, debonding of layers, cracks in composite, and surface roughening of the wind turbine blades (Mishnaevsky et al., 2021). It has been subject of many studies for the wind energy industry because surface erosion roughens the leading edge of wind turbine blades, reducing efficiency as they become less aerodynamic. This so-called 'leading edge erosion' becomes increasingly problematic as blades grow longer and tip speeds increase and hence the impacts. In the process of leading-edge erosion, plastic particles are released into the environment about which research is only just emerging. A preliminary estimate of the plastic mass loss for offshore wind turbines is 80–1000 g/year per blade (Mishnaevsky et al., 2024). Recent research of offshore wind turbines in the North Sea shows that a substantial part of leading edge erosion happens within just 12 h of the year during specific rain and wind events and there are regional differences (TNO, 2025). The combination of more wind and rain in the northeastern part of the North Sea leads to more damage of the protective coatings on the blades, so that they last about 20 % less long than in the southwestern part (TNO, 2025). Seeing that the west coast of northern Scotland is more exposed to the rain-bearing westerly winds during winter storms than the east coast (Met Office, 2025), leading edge erosion is expected to be worse in wind farms near the Western Isles and west of Orkney than in the North Sea (Fig. 1).

6.2. Pollution from anti corrosion systems on the metal

The underwater zone of an offshore wind turbine needs protection from metal corrosion (rusting). Corrosion-protection systems are used to protect turbines from rusting which can release metals into the ocean over time (Hengstmann et al., 2025; University of Portsmouth, 2025; Watson et al., 2025). Of particular concern is the method of galvanic anode cathodic protection (GACP) of underwater metal, with substantial amounts of anode (aluminium or zinc) dissolving for decades (Watson et al., 2025). Metal inputs released from operational offshore wind farms and their ecotoxicological risks are under assessed, probably because this is a new area of research. A recent study estimates annual inputs of metals from current European wind farms to be substantial (3219 tonnes of aluminum, 1148 tonnes of zinc, and 1.9 tonnes of indium) (University of Portsmouth, 2025; Watson et al., 2025). Watson et al. (2025) advice against co-locating aquaculture with offshore wind farms without taking measurements to mitigate their metal pollution because metals in water accumulate in kelp and the tissues of oysters and mussels. While artificial reef effects and the sanctuary inside for fish from fisheries are often mentioned as positive side effects of offshore wind farms, this research warns for health risks. Inside or near an offshore wind farm, fish residing there may be adversely affected, and oysters and mussels grown there may pose a risk to human health (Watson et al., 2025). Watson et al. (2025) provide a road map for industry and regulators for implementing key policy to minimise these risks.

6.3. Oil and grease leakages

Wind turbines use oils in lubrication, hydraulics and gear boxes, which requires regular manual servicing. As soon as turbines start to leak oil, immediate action must be taken as it can lead to more serious failures and even turbine collapse (LAIER, 2025). Oil leakages are therefore a great concern of the offshore wind industry and the harsh environment and the remoteness of wind turbines at sea makes servicing very difficult. Oil leaks damage the environment, and at sea, a small amount of oil carrying all sorts of chemical compounds (Hengstmann et al., 2025) can spread over a large area. There are large knowledge gaps in the composition of the oils and their environmental impacts, but

awareness is growing, and research has started to come out (e.g. (Hengstmann et al., 2025)).

7. Noise and light pollution

7.1. Noise pollution

It is well recognized that underwater noise from piledriving during the construction of offshore wind farms can harm fish and sea mammals (Ouro et al., 2024). This is often deemed acceptable as it is a temporary disturbance. Although low frequency sound and vibrations of onshore operating wind turbines are known to trouble human neighbours (Flemmer and Flemmer, 2023), the impact of long-term noise from operating offshore wind farms on marine life has been studied less. According to Tougaard et al. (Tougaard et al., 2020), the noise of an individual turbine is below ambient levels unless it is closer than a few kilometers. The underwater sound scape depends on the type of wind turbine; it is different in level and character coming from floating wind turbines for which it can exceed ambient levels at distances as far as 4 km (Harris et al., 2025). However, these studies are based on acoustic measurements at small test sites and do not cover infrasound. The frequency of infrasound is lower than 20 Hz and well below the human hearing but people living near an onshore wind farm can become sensitive to infrasound and suffer from chronic noise stress (Flemmer and Flemmer, 2023). Infrasound behaves very differently from audible sound, for example, the very long wavelengths of infrasound do not interact with small objects and fades very little with distance (Flemmer and Flemmer, 2023). Infrasound produced by offshore wind turbines can travel underwater as far as 100 km (Duarte et al., 2021). Natural sources of infrasound in the sea include ocean waves, thunder and sound produced by large animals such as baleen whales who can communicate across ocean basins to make reproductive and social calls (Flemmer and Flemmer, 2023; Duarte et al., 2021). Less well studied marine animals that can perceive infrasound of operating offshore wind turbines are invertebrates such as jellyfish, fishes, reptiles, and cetaceans, which they use for navigating, foraging, socializing, attracting mates, courting, and defending territory (Duarte et al., 2021).

7.2. Light pollution

As part of the planning application of an offshore wind farm, impacts on seascape are envisioned for the human observer (Scottish Government, 2019). The consequences of introduction of light and shading for marine species and communities should also be assessed (NatureScot, 2025). After dark, offshore wind turbines and related vessels and infrastructure are lit up during the construction as well as operation of the offshore wind farm. Marine light pollution at night illuminates marine ecosystems up to 100 times brighter than the light of the full moon at night which has various environmental impacts because marine organisms, from the smallest plankton to great whales, are very light sensitive during every stage of their lives (GOALANN, 2025). Light flicker from offshore wind turbines is not routinely assessed in offshore planning applications and neither are visual impacts on marine life (Scottish Government, 2019; NatureScot, 2025). For many aquatic species vision is important for detecting prey, predators and each other, but the potential impacts of visual cues from offshore wind turbines have not been investigated and are unknown at present (Williamson et al., 2024). Visual cues such as moving wind turbine blades as seen from below the water surface and moving underwater shadows of the wind turbine blades may be perceived as overhead predators and act as a barrier (Williamson et al., 2024). This could interfere with the return migration of wild Atlantic salmon in the northern coastal waters of Scotland (Williamson et al., 2024; Malcolm et al., 2010). This iconic species is already suffering as it is estimated that the total number of salmon returning to Scottish rivers has declined from around 1 million to 400,000 since the 1970s (Middlemas and Hanson, 2024). The planning

application for the Tormsdale onshore wind farm near Thurso River and its tributary, where Atlantic Salmon reside, includes an evaluation of shadow cast by the turbines over the water (ERM, 2025). It is acknowledged that salmon parr younger than one year favouring the water of shallow riffles could be exposed to 'shadow flicker'. However, they state that this has no impact as "natural 'flicker light' produced by the lens effect of water surface ripple/wave (Fig. 4a) will obscure the penetration and definition of shadow cast underwater". This statement is not correct. As seen from beneath the surface, the refracted glitter is confined to a smaller angle and is of the order of 1000 times more intense than the reflected glitter (Cox and Munk, 1956). Due to the lens action of the individual waves, the flashes can attain extremely high levels for the upwardly directed eye (Cox and Munk, 1956). Lens action of the water waves makes the contrast with shadows on the water surface (where sun glitter does not occur) more effectual instead of less (Fig. 4b). The potential impact can therefore not be considered low and insignificant and should be included in future environmental impact assessments.

8. Changes to the surf

There are many studies on the impact of ocean currents and waves on offshore wind farms to improve their design and layouts, but not the other way around. Gautier et al. (2025) have assessed the effect of large offshore wind farms on North Sea waves, currents and tides. They use hydrodynamic models in which offshore wind turbines are represented by fixed monopiles of a diameter of up to 12 m. The impact on passing swells is expected to be negligible because 12 m is small compared to the swells' wavelengths (distance between two following wave peaks). They find that the most significant influence of an offshore wind farm is by changing the wind speed at the sea surface leading to changes in wave growth, and this is the only influence modelled in their wave computations. Although they confirm small changes inside and in the vicinity of the offshore wind farms in general, they advise linking their study with shipping safety because the effects can be significantly larger for individual instances. A marine physical and coastal processes assessment evaluation as part of the application for the West of Orkney Wind Farm, consisting of 125 wind turbines fixed to the seabed, predicts no change in the wave climate near the coast and it is concluded that the West of Orkney Wind Farm poses no risk to the Pentland Offshore Wind Farm and nearby surfing beaches (West of Orkney Windfarm, 2023a). They use a wave model to predict the blockage effect of the monopile foundations on passing waves and do not mention the influence of changing wind speed at the sea which may help explain the low impact (West of Orkney Windfarm, 2023b).

Unlike for a fixed monopile, for a floating offshore wind turbine, the diameter of the cylinder cannot be neglected compared to the wavelength as the wave forces become more complex and inertial forces (forces due to the movement of the floating structure in the water) need to be accounted for (Deng et al., 2024). A semisubmersible wind turbine uses a floating platform, usually three connected columns, that is partly submerged and anchored to the seabed. Deng et al. (2024) calculate that under certain conditions, the side columns of semisubmersible floating turbines can reduce the significant wave height by more than half, with a 1 km long wave wake occurring. The wavelength and direction are also changed. This means that the consented Pentland Offshore Wind Farm, consisting of six massive floating wind turbines (reaching up to almost 300 m above the sea with blades 250 m across; for reference, a football pitch is 105 m long) located only 7.5 km off the coast of Dounreay in Caithness (Fig. 1) may have serious consequences for a popular surf spot in Sandside Bay (Surflife, 2025). It is likely that incoming swells will be attenuated and disrupted by the floating wind turbines as the floating turbines in the Pentland Offshore Wind Farm are semisubmersible (Pentland floating offshore wind farm, 2022). This is ignored in its Environmental Impact Assessment Report which simply states "... floating offshore wind farm structure would be expected to have a much

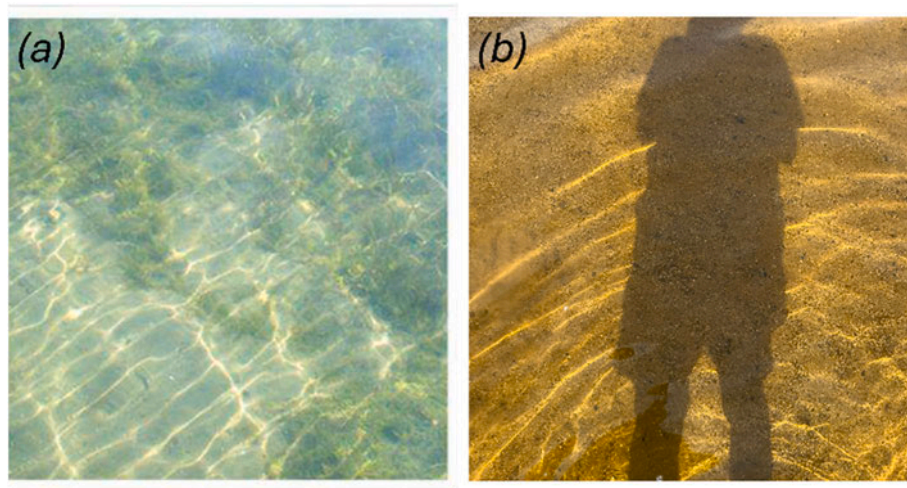


Fig. 4. (a) from Tormsdale wind farm application, Image 4.1 Natural 'flicker light' produced by the lens effect of a moving water (image caption in application) (ERM, 2025), and (b) photo showing how refracted glitter in fact enhances the contrast of the underwater shadow.

lesser blockage effect on tidal flows and waves than a fixed foundation structure ...” (Pentland floating offshore wind farm, 2022), contradicting the latest research (Deng et al., 2024).

Water sport activities improve connectedness to the natural environment as well as physical and mental wellbeing. Surfing ocean waves is particularly effective as it is both immersive in terms of contact with the natural environment and physically demanding, as demonstrated by a surfing programme for vulnerable young people (Hignett et al., 2018). Surfing is also a growing industry in Scotland. Surfing is therefore recognized as something that could be affected by marine plans and policies (Scottish Government, 2019). Sandside Bay has been used as a back-up location for national surfing championships when strong westerly winds made Thurso East unsurfable. Sandside Bay needs a big swell to wrap in, so the interruption to incoming waves puts this surfing location at risk. Other nearby surf locations popular with locals and visitors that could be affected are Strathy, Melvich, and Brims Ness (Surflife, 2025).

In FeAST, local wave exposure changes are listed as one of the marine pressures on habitats in (NatureScot, 2025) as communities of animals and plants on rocky shores also depend on waves arriving at the coast (Scottish Government, 2020). The shores that are most exposed are the Atlantic swells receiving west coast on the outer coasts of the Hebrides, the North Coast, and Orkney (Scottish Government, 2020); their ecosystems are threatened by the planned large floating offshore wind farms blocking the waves they need to thrive (Fig. 1). More on floating wind farms in the next section 9.

9. Rapid expansion of floating offshore wind farms

Offshore floating wind turbines are a novel wind power technology that was thought to be unachievable only 10 years ago. Floating offshore wind farms make it possible to move from nearshore to deeper waters of water depths greater than 50 m, and many are in development (Fig. 1). However, floating wind turbines are expensive and there are no floating offshore wind farms operating at a commercial scale yet anywhere in the world. The Pentland Offshore Wind Farm is a trial site near the Caithness coast. The site is near a location where a commercial scale (50 MW) wave energy farm was planned due to high wave power in the area (since stopped due to liquidation of the developer) (Goddijn-Murphy et al., 2015). In addition to big waves, strong tidal currents (peak flows of over 1 m/s) run back and forth along the coast (ABPmer, 2025), which will put the floating turbine designs to the test of extreme dynamic loads.

Like fixed wind turbines, floating offshore wind turbines have potential negative as well as positive effects on their marine environment,

but they are mostly presumed given the newness of the technology (Harris et al., 2025; Farr et al., 2021). As explained in section 8, the assumption of reduced impact on waves contradicts the results of a new wave model specifically designed for a floating wind farm (Deng et al., 2024). So far, artificial reef effects have been observed such as colonisation of the underwater structures, but the expected consistent increase of fish biomass across to the sites has not been proven (Harris et al., 2025). There is a risk of non-indigenous species spreading through turbine transport between ports and wind farms (ICES, 2025). Enhanced mixing by floating offshore turbines in deeper waters may have consequences for the distribution of nutrients, and hence phytoplankton growth (section 5). Floating platforms may also lead to much higher inputs of trace metals as the subsurface structures are generally larger requiring more galvanic anode cathodic protection (Watson et al., 2025) (section 6.2). Many knowledge gaps remain regarding potential environmental impacts such as, entanglement of marine mammals, perception of dynamic mooring noises, obstruction of migration routes, changes to atmospheric and oceanic dynamics, and changes to water quality (Harris et al., 2025; Farr et al., 2021).

Currently only two small floating offshore wind farms are in operation in operation in Scotland off the Aberdeen coast, Hywind and Kin-cardine (Fig. 1). Given the novelty there are very few observations of the impacts of offshore floating wind (and certainly not multiple large floating wind farms) (Fig. 1). According to Farr et al. (2021), developers adopting appropriate mitigation strategies and best-practice protocols could lower the risks of a lot of potential effects of floating offshore wind farm. They emphasise that future empirical studies and monitoring of the environmental impacts of deepwater, floating offshore wind farms are essential.

10. Cumulative impacts of many large offshore wind farms

10.1. Supersizing of wind turbines and offshore wind farms

Wind turbines are getting bigger all the time. Bigger wind turbines deliver financial economies of scale, but they don't greatly increase the total power per unit area because they must be spaced further apart (MacKay, 2008). Most environmental impacts described above increase with turbine size. The number of wind turbines in offshore wind farms are increasing as well while there are still many unanswered questions around their cumulative environmental impact (Harris et al., 2025; BBC, 2021). The size of a wind farm in Fig. 1 is expressed in peak capacity; the actual average power is about 30 % of the peak power as the turbines don't run at peak output all the time (MacKay, 2008). In more

representative turbine numbers, the planned West of Orkney Wind Farm comprises of 125 wind turbines, the operating Moray West 60, Moray East 100, Beatrice 84 plus many more are in development (Fig. 1). North Sea countries have pledged to build 8000 offshore wind turbines by 2030 (more than three times currently installed) and at least a staggering 20,000 by 2050 (North Sea Energy, 2025; Reuters, 2024b). Other future offshore infrastructures are offshore energy islands, solar farms, and carbon capture installations. This comes on top of extensive existing economic activities at sea, such as fisheries, shipping, and oil and gas (North Sea Energy, 2025; Paolo et al., 2024). It is difficult to keep up to date with the offshore wind developments. The map of major energy related planning applications made available by the Highland Council (The Highland Council, 2025) does not show the area covered by the wind farms nor offshore substation platforms, inter-array cables, export cables and associated infrastructure; applications at consultation stages are absent. The Highland Renewables Database gives a more complete picture (Haltiner, 2025). Fig. 2 shows offshore wind farms at different stages including those in the pipeline including subsea power cables; if all these opportunities are realised their cumulative impact will be unprecedented.

10.2. Collision risk with marine traffic

Not only are offshore wind turbines and wind farms getting bigger, shipping with ever-larger vessels is on the increase as well (Dutch Safety Board, 2024). The North Sea is a particular busy place but the risk for shipping is not properly understood (Dutch Safety Board, 2024). Ultra large container ships can get in trouble in no more than a strong breeze (6 Beaufort), and if they want to move away from danger there may not be enough room to make a complete turn if wind turbines are nearby. A 3.5 km distance between a 400-m-long ship and a wind farm, currently considered safe, may not always be enough (Dutch Safety Board, 2024). Also, the existing emergency response towing vessels cannot always assist in hazardous conditions (Dutch Safety Board, 2024). In early 2022, the Maltese bulk carrier Julietta D drifted towards the Dutch coast in a winter storm. It collided with a tanker and then with two structures of a wind farm under construction (Dutch Safety Board, 2024; Captain's Mode, 2025). The incident triggered an investigation by the Dutch Safety Board resulting in a report 'Compromise on room to Manoeuvre' (Dutch Safety Board, 2024). According to this report, "It is highly likely that – with an improved understanding of the risks – the installation of fixed objects in the North Sea will in some cases prove incompatible with the goal of shipping safety. In such cases, the zoning plans will need to be revised, ...". The findings and recommendations in the report should apply to the risks of industrious shipping traffic around offshore wind farms in Scotland, in the North Sea as well as through the Pentland Firth and the Minches where many transatlantic ships pass without stopping at a Scottish port (Scottish Government, 2011).

10.3. Wind theft

As offshore wind farms and turbines are getting bigger and more numerous, wind wakes from offshore wind farms can reduce the power generated by neighbouring farms (Platis et al., 2018). The wind wake describes how a wind turbine extracting energy from the incoming wind, leaves lower energy behind in its 'wake'. The wake can be 50 km long and reduce the yield of turbines in the wake by tens of percents (BBC, 2025e). We can identify several clusters of offshore wind projects crammed together in Scotland and Highland, where wind theft by neighbouring developments could result in disputes (Fig. 1). Iberdrola, Ørsted and RWE are among the developers already involved in wake effect disputes at 20 GW of UK offshore wind projects (Tamarindo, 2025). The UK Government is now backing research to find out how to solve wake disputes between different offshore wind developers in the planning system (Tamarindo, 2025). This needs to be resolved as profit loss and financial uncertainty could result in higher costs for the energy

consumers. However, the Strategic Investment Model (SIM) Milestone Map made available by Offshore Wind Scotland and showing the sites of the ScotWind and INTOG leasing rounds (Offshore Wind Scotland, 2025b) does not show the large offshore wind farms already in operation (Beatrice 84 turbines, and Moray East 100 turbines), and under construction (Moray West 60 turbines). Hence, this map tool does not account for potential wake disputes between the different developers, for example between those of Beatrice, Moray East and Caledonia (Fig. 1).

10.4. Limits of the transmission grid

When there is too much wind for the transmission system to cope with the flow of electricity, the energy producer receives constraints payments for reducing output (paid for by the consumer). Concerns have been raised over Moray East offshore windfarm, situated off the north-east coast of Scotland between the Beatrice and Moray West wind farms (Fig. 1), about over-charging millions of pounds for switching off wind turbines. Reportedly, the owners of Moray East were paid £100m from September 2021 to September 2023 (Telegraph, 2025). Ofgem, the energy regulator for Great Britain who works to protect energy consumers, especially vulnerable people, has launched an inquiry into the owner of Moray East to investigate these concerns (Ofgem, 2025). The West of Orkney Wind Farm and Pentland Offshore Wind Farm will rely on new massive cable trenches across Caithness, new massive substations near Spittal, plus a new subsea cable south with more cable trenches across Caithness and the hugely controversial proposed 400 kV Spittal - Beaulieu super pylon line (Haltiner, 2025), which has upset many affected locals (The Inverness Courier, 2023, 2025).

10.5. Habitats

Old research may suggest that habitat loss from offshore wind farms is not harmful because species that avoid the site, seabirds for example, can relocate (Factor This, 2013; The Guardian, 2011). However, if all the planned Offshore Wind Scotland projects are successful, seabirds for example will be squeezed out with nowhere to go (Fig. 1). It has also been suggested that offshore wind turbine foundations provide new habitats for seabed organisms like seaweed, mussels, crabs, oysters, and reef fish, while certain species can also find shelter inside wind farms [e.g., (Harris et al., 2025), (Farr et al., 2021), (Russell et al., 2021)]. Fish that reside in offshore wind farms can attract seals and other predators, the ecological consequences of which depend on whether such reefs produce prey or just concentrate prey (Russell et al., 2021). Counting selected species, such as mussels, seabirds, sea mammals, or fish, is not sufficient in an ecological survey of offshore wind farms. We need to evaluate the whole ecosystem, from the smallest plankton to the largest top predators, not only at the level of a single offshore wind turbine or wind farm, but also the cumulative impact of very large and multiple offshore wind farms [e.g., (ICES, 2025), (Isaksson et al., 2025)], and even of other marine industrial activities (Fig. 2).

11. Mental health

The residents and visitors of the Highland area have seen an unprecedented increase in wind farms and related structures in recent years and many more are planned (The Highland Council, 2025; Haltiner, 2025). It is hard to find a location where a wind turbine cannot be seen, and one of the last unspoiled views are those of the open ocean. The horizon of the east coast is already heavily impacted by large offshore wind farms in the North Sea, and the north coast is under threat (Fig. 1). Big vistas, wide open spaces, long views, horizon lines, and a star-stuffed night sky matter to the health of the human soul (Psychology Today, 2023). Connecting with nature has emotional, psychological and physical benefits and the more unspoiled and serene the better (Mental Health Foundation, 2025). According to the Mental Health Foundation (2025), people noticing nature is a key factor in supporting their

wellbeing. Exposure to 'blue space' (aquatic environment) has its own unique health and well-being benefits (Mental Health Foundation, 2025; White et al., 2020). Higher levels of perceived biodiversity in the blue space result in reduction of perceived stress (White et al., 2020). This echoes research by Methorst (2024) that proves that the presence of many different bird species in a person's area of residence benefits mental health, especially of those with lower socioeconomic status. Hence, if seabirds unable to make their home around the Scottish coast and stay away, not only biodiversity conservation suffers but precious public mental health as well.

12. Conclusion

The 10 things described in this paper can inform the different parties that are involved in the planning system for offshore wind farms about commonly overlooked issues. It uses Highland County in Scotland to illustrate these things, but they are relevant anywhere. The public can use this information in writing representations. Councillors need to understand the wide range of questions about large offshore wind farms when they vote on the council's response to the Scottish Government. The Scottish Government, who has the final say in planning applications for large offshore wind farms, also has the power to address concerns about large offshore wind farms in strategic research programmes and policies. The Scottish Government currently looks to a more flexible and pragmatic approach to environmental compensation (Scottish Government, 2025b), which may lead to unforeseeable consequences. More time is needed for monitoring programmes that measure the consequences of large offshore wind farms as to date studies of their impacts are mostly theoretical due to their novelty. The complexity of the impacts of large offshore wind farms has necessitated most scientific studies to single out the influence of a single specific factor. In the future, we need to look at the cumulative impact of large offshore wind farms on all combined atmospheric, hydrodynamic, biogeochemical and ecosystem processes. Ensuring that research outputs, including advanced modelling approaches and empirical datasets, are systematically integrated into environmental impact assessments of offshore wind farms is of critical importance.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

I would like to thank both anonymous reviewers for their helpful comments that led to considerable improvement of the article.

Data availability

No data was used for the research described in the article.

References

- ABPmer, 2025. UK renewables atlas. Available online: <http://www.renewables-atlas.info/>. (Accessed 7 May 2025).
- Asia Times, 2025. China Brandishes Cutter for Snipping deep-sea Cables. Asia Times news item by Gabriel Honrada, 26 March 2025. Available online: <https://asiatimes.com/2025/03/china-brandishes-cutter-for-snipping-deep-sea-cables/>. (Accessed 18 August 2025).
- Auld, T., McHenry, M.P., Whale, J., 2013. US military, airspace, and meteorological radar system impacts from utility class wind turbines: implications for renewable energy targets and the wind industry. *Renew. Energy* 55. <https://doi.org/10.1016/j.renene.2012.12.008>.
- Baltic Wind, 2022. Polish offshore farms to be secured against terrorist attacks. Available online: <https://balticwind.eu/polish-offshore-farms-to-be-secured-against-terrorist-attacks/>. (Accessed 11 April 2025).
- BBC, 2020. The New Zealand River that Became a Legal Person - BBC Travel. Story by Kate Evans, 20 March 2020. Available online: <https://www.bbc.co.uk/travel/article/20200319-the-new-zealand-river-that-became-a-legal-person>. (Accessed 16 May 2025).
- BBC, 2021. Why giant turbines are pushing the limits of possibility. Available on: <https://www.bbc.co.uk/news/business-58704792>. (Accessed 12 May 2025).
- BBC, 2024. WW2 radiation affects Orkney- caithness power project work. Available online: <https://www.bbc.co.uk/news/articles/c5yg47eryleo>. (Accessed 19 August 2025).
- BBC, 2025a. Putin's secret weapon: the threat to the UK lurking on our sea beds. BBC news item by BBC Security Correspondent Frank Gardner, Harriet Whitehead and the Visual Journalism Team, 20 Feb 2025. Available online: <https://www.bbc.co.uk/news/resources/idt-3036d1db-da99-49b3-9d64-272472095d4a>. (Accessed 8 April 2025).
- BBC, 2025b. Cocaine being dropped at sea for UK drug gangs to collect. Available online: <https://www.bbc.co.uk/news/articles/crknv0nyp2o>. (Accessed 23 April 2025).
- BBC, 2025c. Offshore wind firms told WWII bomb disposals must be less noisy. Available online: <https://www.bbc.co.uk/news/articles/c1dgrvww3qeo>. (Accessed 22 April 2025).
- BBC, 2025d. Amazon forest cut down to build highway for COP climate summit. Available online: <https://www.bbc.co.uk/news/articles/c9vy191rgn1o>. (Accessed 25 April 2025).
- BBC, 2025e. 'Wind theft': the mysterious effect plaguing wind farms. Available online: <https://www.bbc.co.uk/future/article/20250506-renewable-energys-trouble-with-wind-theft>. (Accessed 13 May 2025).
- Bueger, C., Edmunds, T., 2024. Maritime security and the wind: threats and risks to offshore renewable energy infrastructure. *Ocean Yearbk.* 38 (1), 433–458. <https://doi.org/10.1163/22116001-03801017>.
- Captain's Mode, 2025. Bulk carrier julietta D abandoned, collides with tanker & platforms. Available online: <https://www.captainsmode.com/bulk-carrier-abandoned-collides-with-tanker-and-platforms-in-bad-weather/>. (Accessed 12 May 2025).
- Coppers Development Association Inc, 2025. Renewables. Available online: <https://www.copper.org/environment/sustainable-energy/renewables/>. (Accessed 23 April 2025).
- Cox, C., Munk, W., 1956. Slopes of the Sea Surface Deduced from Photographs of Sun Glitter. *Bulletin of the Scripps Institution of Oceanography*. <https://escholarship.org/uc/item/1p202179>.
- Daewel, U., Akhtar, N., Christiansen, N., et al., 2022. Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. *Commun. Earth Environ.* 3, 292. <https://doi.org/10.1038/s43247-022-00625-0>.
- Deltares, 2021. Ecosystem effect of upscaling large offshore wind in the North Sea – synthesis report, 11203731-004-ZKS-0010 22 April 2021. Available online: <https://noodzeeloket.nl/en/>. (Accessed 21 August 2025).
- Deng, S., Yang, S., Chen, S., Chen, D., Yang, X., Cui, S., 2024. A parameterization scheme for the floating wind farm in a coupled atmosphere–wave model (COAWST v3.7). *Geosci. Model Dev. (GMD)* 17, 4891–4909. <https://doi.org/10.5194/gmd-17-4891-2024>.
- Dorrell, R.M., Lloyd, C.J., Lincoln, B.J., Rippeth, T.P., Taylor, J.R., Caulfield, C.C.P., Sharples, J., Polton, J.A., Scannell, B.D., Greaves, D.M., Hall, R.A., Simpson, J.H., 2022. Anthropogenic mixing in seasonally stratified Shelf Seas by offshore wind farm infrastructure. *Front. Mar. Sci.* 9, 830927. <https://doi.org/10.3389/fmars.2022.830927>.
- Duarte, Carlos M., et al., 2021. The soundscape of the Anthropocene ocean. *Science* 371, eaba4658. <https://doi.org/10.1126/science.aba4658>.
- Dutch Safety Board, 2024. Compromise on room to Manoeuvre. Available online: <https://onderzoeksraad.nl/en/onderzoek/intensified-use-north-sea/>. (Accessed 12 May 2025).
- East Lothian Courier, 2025. Port Seton fishermen fear for lives from unexploded bombs. Available online: <https://www.eastlothiancourier.com/news/25054490.port-seton-fishermen-fear-lives-unexploded-bombs/>. (Accessed 22 April 2025).
- ERM, 2025. Tormsdale wind farm. Technical appendix A8.1: shadow cast by turbines and potential impacts on Atlantic salmon project no.: 0669543. Available online: <https://www.dpea.scotland.gov.uk/Document.aspx?id=1102908> (Accessed 21 July 2025).
- European Commission, 2024. Revolutionising our fight against pollution: two new EU projects against world wars' underwater unexploded ammunitions. Available online: https://oceans-and-fisheries.ec.europa.eu/news/revolutionising-our-fight-against-pollution-two-new-eu-projects-against-world-wars-underwater-2024-11-13_en. (Accessed 22 April 2025).
- European Commission, 2025. European atlas of the seas. Available online: https://ec.europa.eu/maritimeaffairs/atlas/maritime_atlas/. (Accessed 22 April 2025).
- Factor This, 2013. Marine life unhindered by offshore wind farm, study says. Available online: <https://www.factorthis.com/wind-power/offshore/offshore-wind-farm-lack-of-significant-impact-on-marine-life-study-finds/>. (Accessed 13 May 2025).
- Farr, H., Ruttenberg, B., Walter, R.K., Wang, Y.-H., Crow White, C., 2021. Potential environmental effects of deepwater floating offshore wind energy facilities. *Ocean Coast Manag.* 207, 105611. <https://doi.org/10.1016/j.ocecoaman.2021.105611>.

- Financial Times, 2025. MI5 investigates use of Chinese green technology in UK. Available online: <https://www.ft.com/content/534eef36-d9ad-4a03-afa1-f87ab03a9b18>. (Accessed 19 August 2025).
- Flemmer, C., Flemmer, R., 2023. Wind turbine infrasound: phenomenology and effect on people. *Sustain. Cities Soc.* 89, 104308. <https://doi.org/10.1016/j.scs.2022.104308>.
- Gautier, C., Emmanouil, A., Leummens, L., 2025. Report deltares. First steps to assess how offshore wind farms affect waves and currents 11210382-001-HYE-0001, 22 January 2025. Available online: <https://www.deltares.nl/en/expertise/publications/first-steps-to-assess-how-offshore-wind-farms-affect-waves-and-currents-offshore-wind-energy-shipping-safety-monitoring-and-research-programme-moswoz>. (Accessed 6 May 2025).
- GOALANN, 2025. The global ocean artificial light at night network. Available online: <https://goalann.org/>. (Accessed 5 May 2025).
- Goddijn-Murphy, L., Martín Míguez, B., McIlvenny, J., Gleizon, P., 2015. Wave energy resource assessment with AltiKa satellite altimetry: a case study at a wave energy site. *Geophys. Res. Lett.* 42 (13), 5452–5459. <https://doi.org/10.1002/2015GL064490>.
- Gunter, C.D.R.T., 2014. Potential impacts from a worst case discharge from an United States offshore wind farm. In: 2014 INTERNATIONAL OIL SPILL CONFERENCE, 299032. Available online: <https://tethys.pnnl.gov/sites/default/files/publications/Gunter%202014.pdf>. (Accessed 22 May 2025).
- Haltiner, K., 2025. Highland renewables database. Maintained by Kathrin Haltiner. Available online: <https://www.highlandrenewablesdatabase.org/map.html>. (Accessed 19 May 2025).
- Harris, Caitlin B., Benjamins, Steven, Scott, Beth, Williamson, Benjamin J., 2025. Ecological impacts of floating offshore wind on marine mammals and associated trophic interactions: current evidence and knowledge gaps. *Environ. Res. Lett.* 218, 118059. <https://doi.org/10.1016/j.marpolbul.2025.118059>.
- Hengstmann, E., Zapata Corella, P., Alter, K., Belzunze-Segarra, M.J., Booth, A.M., Castro-Jiménez, J., Czerner, N., et al., 2025. Chemical emissions from offshore wind farms: from identification to challenges in impact assessment and regulation. *Mar. Pollut. Bull.* 215, 117915. <https://doi.org/10.1016/j.marpolbul.2025.117915>.
- Hignett, A., White, M.P., Pahl, S., Jenkin, R., Froy, M.L., 2018. Evaluation of a surfing programme designed to increase personal well-being and connectedness to the natural environment among 'at risk' young people. *J. Adventure Educ. Outdoor Learn.* 18 (1), 53–69. <https://doi.org/10.1080/14729679.2017.132682>.
- IBM, 2025. What Is a Cyberattack? IBM. Available online: <https://www.ibm.com/think/topics/cyber-attack>. (Accessed 9 April 2025).
- ICES, 2025. Workshop to compile evidence on the impacts of offshore renewable energy on fisheries and marine ecosystems (WKCOMPARE). ICES Scientific Reports 7 (45), 283. <https://doi.org/10.17895/ices.pub.28759259>.
- Interesting Engineering, 2025. China's 'spy' wind turbine tech probed by MI5 for energy espionage. Available online: <https://interestingengineering.com/energy/uk-probe-chinas-wind-turbine-tech>. (Accessed 9 April 2025).
- International Energy Agency, 2022. The role of critical minerals in clean energy transitions. World Energy Outlook Special Report (Revised version, March 2022). Available online: <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions>. (Accessed 23 April 2025).
- International Security Journal, 2025. Detertech says UK wind farms at risk of copper cabling theft. Available online: <https://internationalsecurityjournal.com/deterte-ch-uk-wind-farms-theft/>. (Accessed 16 May 2025).
- Isaksson, N., Scott, B.E., Hunt, G.L., Benninghaus, E., Declerck, M., Gormley, K., Harris, C., Sjostrand, S., Trifonova, N.I., Waggitt, J.J., Wihsgott, J.U., Williams, C., Zampollo, A., Williamson, B.J., 2025. A paradigm for understanding whole ecosystem effects of offshore wind farms in shelf seas. *ICES JMS* 82 (3), fsad194. <https://doi.org/10.1093/icesjms/fsad194>. March 2025.
- Kershaw, J.L., Jensen, S.-K., McConnell, B., Fraser, S., Cummings, C., Lacaze, J.-P., Hermann, G., Bresnan, E., Dean, K.J., Turner, A.D., Davidson, K., Hall, A.J., 2021. Toxins from harmful algae in fish from Scottish coastal waters. *Harmful Algae* 105, 102068. <https://doi.org/10.1016/j.hal.2021.102068>.
- Knack, A., Syn, Y.K.H., Kimberly Tam, K., 2024. Enhancing the cyber resilience of offshore wind. CETaS Research Reports (June 2024). Available online: https://cetas.turing.ac.uk/sites/default/files/2024-06/cetas_research_report_-_enhancing_the_cyber_resilience_of_offshore_wind.pdf. (Accessed 21 May 2025).
- LAIIER, 2025. Oil leaks in wind turbines. The Dirty Side to Clean Energy. Available online: <https://www.laiier.io/use-cases/wind-turbine-oil-leaks>. (Accessed 23 May 2025).
- MacKay, D.J.C., 2008. Sustainable Energy – without the Hot Air. UIT Cambridge. ISBN 978-0-9544529-3-3. Available online: www.withouthotair.com. (Accessed 9 April 2015).
- Malcolm, I.A., Godfrey, J., Youngson, A.F., 2010. Review of migratory routes and behaviour of Atlantic salmon, sea trout and European eel in Scotland's coastal environment: implications for the development of marine renewables. *Scottish Marine and Freshwater Science* 1 (14), 72. <https://doi.org/10.7489/1459-1>. Edinburgh: Scottish Government.
- Mental Health Foundation, 2025. Nature: how connecting with nature benefits our mental health. Available online: <https://www.mentalhealth.org.uk/our-work/research/nature-how-connecting-nature-benefits-our-mental-health#paragraph-18326>. (Accessed 14 May 2025).
- Met Office, 2025. Northern Scotland: climate. Available online: <https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about-weather/regional-climates/northern-scotland-climate-met-office.pdf>. (Accessed 29 April 2025).
- Methorst, J., 2024. Positive relationship between bird diversity and human mental health: an analysis of repeated cross-sectional data. *Lancet Planet. Health* 8 (5), e285–e296.
- Middlemas, S.J., Hanson, N., 2024. The Status of Salmon in Scotland. Scottish Government. <https://doi.org/10.7489/12523-1>. Marine Directorate data.
- Mishnaevsky, L., Bay Hasager, C., Bak, C., Tilg, A.-M., Bech, J.I., Rad, S.D., Faester, S., 2021. Leading edge erosion of wind turbine blades: understanding, prevention and protection. *Renew. Energy* 169, 953–969. <https://doi.org/10.1016/j.renene.2021.01.044>.
- Mishnaevsky Jr., L., Tempelis, A., Belahuray, Y., Johansen, N.F.-J., 2024. Microplastics emission from eroding wind turbine blades: preliminary estimations of volume. *Energies* 17, 6260. <https://doi.org/10.3390/en17246260>.
- Mührel, J., 2025. Ocean rights – challenges and prospects. *Goettingen Journal of International Law*. <https://doi.org/10.59609/1868-1581-2293> (Pre-Published Article).
- NASA Earth Observatory, 2025. What are phytoplankton? Available on: <https://earthobservatory.nasa.gov/features/Phytoplankton>. (Accessed 20 August 2025).
- National Oceanic and Atmospheric Administration, 2025. What is a harmful algal bloom? Available online: <https://www.noaa.gov/what-is-harmful-algal-bloom>. (Accessed 28 April 2025).
- National Wind Watch, 2024. Wind turbines destroyed in Ukraine by drone and gusting wind. Available online: <https://www.wind-watch.org/news/2024/01/09/wind-turbines-destroyed-in-ukraine-by-drone-and-gusting-wind/>. (Accessed 14 April 2025).
- NatureScot, 2025. Feature activity sensitivity tool – list of pressures. Available online: <https://www.nature.scot/doc/feature-activity-sensitivity-tool-list-priorities>. (Accessed 20 August 2025).
- North Sea Energy, 2025. Use of space – north sea energy. Available online: <https://northseenergyroadmap.nl/use-of-space>. (Accessed 16 May 2025).
- Ocean Vision Legal, 2025. Ocean Rights in Action: Insights from Ecuador's Constitutional Court on the Practical Applications of Rights of Nature in Ocean Governance. Blog by Michelle Bender, 21 Jan 2025. Available online: <https://www.oceanvisionlegal.com/post/oceanrights-ecuador>. (Accessed 19 May 2025).
- Offshore Wind Scotland, 2025a. Floating Wind Projects in Scotland. Offshore Wind Scotland. Available online: <https://www.offshorewindscotland.org.uk/the-offshore-wind-market-in-scotland/floating-wind-in-scotland/>. (Accessed 12 May 2025).
- Offshore Wind Scotland, 2025b. Strategic investment model (SIM) milestone map. Available online: <https://www.offshorewindscotland.org.uk/sim-milestone-map/>. (Accessed 14 May 2025).
- Ofgem, 2025. Investigation into moray offshore windfarm (east) limited's compliance with the TCLC. Available online: <https://www.ofgem.gov.uk/publications/investigation-moray-offshore-windfarm-east-limiteds-compliance-tclc>. (Accessed 22 April 2025).
- Ørsted, 2024. Ørsted launches world's first heavy-lift cargo drone operations at borssele 1&2 offshore wind farm. Available online: <https://orsted.com/en/media/news/2024/08/orsted-launches-worlds-first-heavy-lift-cargo-dron-13977050>. (Accessed 11 April 2025).
- Ouro, P., Fernandez, R., Armstrong, A., Brooks, B., Burton, R.R., Folkard, A., Ilic, S., Parkes, B., Schultz, D.M., Stallard, T., 2024. Environmental impacts from large-scale offshore renewable-energy deployment. *Environ. Res. Lett.* 19, 063001. <https://doi.org/10.1088/1748-9326/ad4c7d>.
- Paolo, F.S., Kroodsmas, D., Raynor, J., et al., 2024. Satellite mapping reveals extensive industrial activity at sea. *Nature* 625, 85–91. <https://doi.org/10.1038/s41586-023-06825-8>.
- Pentland floating offshore wind farm, 2022. Volume 2: offshore EIAR chapter 7: marine physical processes, GBPNTD-ENV-XOD-RP-00003. Available on: <https://pentlandfloatingwind.com/wp-content/uploads/2022/08/GBPNTD-ENV-XOD-RP-00003-Chapter-7-Marine-Physical-Processes.pdf>. (Accessed 7 May 2025).
- Pentland Floating Offshore Windfarm, 2025. 43. Pentland floating offshore windfarm. Available online: <https://pentlandfloatingwind.com/>. (Accessed 20 May 2025).
- Platis, A., Siedersleben, S., Bange, J., et al., 2018. First in situ evidence of wakes in the far field behind offshore wind farms. *Sci. Rep.* 8, 2163. <https://doi.org/10.1038/s41598-018-20389-y>.
- Psychology Today, 2023. The value of looking at long-distance views. Available online: <https://www.psychologytoday.com/us/blog/passion/202310/the-value-of-looking-at-long-distance-views>. (Accessed 14 May 2025).
- Reuters, 2024a. GE vernova falls after turbine blade failure at offshore UK wind farm. Available online: <https://www.reuters.com/business/energy/ge-vernova-falls-after-turbine-blade-failure-offshore-uk-wind-farm-2024-08-23/>. (Accessed 9 May 2025).
- Reuters, 2024b. Europe struggling to meet offshore wind targets, industry heads and lawmakers say. Available online: <https://www.reuters.com/business/energy/europe-struggling-meet-offshore-wind-targets-industry-heads-lawmakers-say-2024-10-24/>. (Accessed 23 May 2025).
- Reuters, 2025. Rogue communication devices found in Chinese solar power. Available online: <https://www.reuters.com/sustainability/climate-energy/ghost-machine-rogue-communication-devices-found-chinese-inverters-2025-05-14/>. (Accessed 19 May 2025).
- Russell, D.J.F., Brasseur, S.M.J.M., Thompson, D., Matthiopoulos, J., Moss, S.E.W., McConnell, B., et al., 2021. Marine mammals trace anthropogenic structures at sea. *Curr. Biol.* 24 (14), R638–R639. <https://www.cell.com/current-biology/fulltext/S0960-9822%2814%2900749-0>.
- Scottish Borders Council, 2025. Understanding section 36 applications, windfarms. Available online: <https://www.scotborders.gov.uk/planning-building-1/windfarms>. (Accessed 8 September 2025).
- Scottish Government, 2011. MARITIME TRANSPORT (PORTS AND SHIPPING) - Scotland's Marine Atlas: Information for the National Marine Plan. Publication - Strategy/plan, 16 March 2011. Available online: <https://www.gov.scot/publications/scotlands-marine-atlas-information-national-marine-plan/pages/53/>. (Accessed 12 May 2025).

- Scottish Government, 2019. 4 environmental baseline - offshore wind energy - draft sectoral marine plan: strategic environmental assessment. Available online: <https://www.gov.scot/publications/draft-sectoral-marine-plan-offshore-wind-energy-strategic-environmental-assessment/pages/>. (Accessed 20 August 2025).
- Scottish Government, 2020. Case study: intertidal rock – scotland’s marine assessment 2020. Available online: <https://marine.gov.scot/sma/assessment/case-study-intertidal-rock/>. (Accessed 19 May 2025).
- Scottish Government, 2025a. Marine protected areas (MPAs) – marine environment – gov.scot. Available online: <https://www.gov.scot/policies/marine-environment/marine-protected-areas/>. (Accessed 2 May 2025).
- Scottish Government, 2025b. Strategic compensation policy for offshore wind. Available online: <https://consult.gov.scot/offshore-wind-directorate/strategic-compensation-for-offshore-wind/>. (Accessed 8 September 2025).
- Surflin, 2025. Sandside Bay surf report and surf forecast. Available online: <https://www.surflin.com/surf-report/sandside-bay/5842041f4e65fad6a7708cae>. (Accessed 6 May 2025).
- Tamarindo, 2025. UK seeks solutions for 20GW wake effect disputes. Available online: <https://tamarindo.global/insight/analysis/uk-seeks-solutions-for-20gw-wake-effect-disputes/>. (Accessed 13 May 2025).
- Telegraph, 2025. Wind farm ‘charged households £100m to switch off turbines’. Available online: <https://www.telegraph.co.uk/business/2025/04/17/wind-farm-investigated-charging-households-100m/>. (Accessed 22 April 2025).
- The Alan Turing Institute, 2024. The UK’s offshore wind needs urgent protection from cyberattacks. Available online: <https://www.turing.ac.uk/news/uks-offshore-wind-needs-urgent-protection-cyberattacks>. (Accessed 9 April 2025).
- The Ferret, 2019. Illegal fishing claims after 112 boats seen in Scotland’s protected waters. Available online: <https://theferret.scot/illegal-fishing-scallop-dredging/>. (Accessed 23 April 2025).
- The Guardian, 2011. Offshore wind farms are good for wildlife. say. Available online: <https://www.theguardian.com/environment/2011/aug/11/offshore-wind-farms-good-wildlife>. (Accessed 13 May 2025).
- The Guardian, 2024. Sweden scraps plans for 13 offshore windfarms over Russia security fears. Available online: <https://www.theguardian.com/world/2024/nov/04/sweden-scraps-plans-for-13-offshore-windfarms-over-russia-security-fears>. (Accessed 9 May 2025).
- The Highland Council, 2025. Major energy related planning applications. Available online: <https://experience.arcgis.com/experience/2928bb39f0dd4ab68f1b3a8988861af5>. (Accessed 12 May 2025).
- The Inverness Courier, 2023. EXPLAINED: why are highland communities protesting about super-pylons? Available online: <https://www.inverness-courier.co.uk/news/explained-why-are-highland-communities-protesting-about-sup-310485/>. (Accessed 21 May 2025).
- The Inverness Courier, 2025. Highland super-pylon line ‘investigative’ work by Scottish and Southern Energy Networks (SSEN) continues between Spittal, Beaully and Peterhead prior to Scottish ministers’ project approval. Available online: <https://www.inverness-courier.co.uk/news/ssen-investigative-work-continues-along-controversial-high-381084/>. (Accessed 21 May 2025).
- The National, 2024. Radioactive contamination stops SSEN highlands project. Available online: <https://www.thenational.scot/news/24792808.radioactive-contamination-stops-ssn-highlands-project/>. (Accessed 9 May 2025).
- The National, 2025. Scottish highland offshore windfarm approved despite objections. Available online: <https://www.thenational.scot/news/25002452.scottish-highland-offshore-windfarm-approved-despite-objections/>. (Accessed 8 September 2025).
- The Scottish Association for Marine Science, 2025. News - the Ocean Enters the Boardroom - the Scottish Association for Marine Science. News item by Euan Paterson, 9 Jan 2025. Available online: <https://www.sams.ac.uk/news/sams-news-ocean-on-the-board>. (Accessed 19 May 2025).
- Time Out, 2025. The River Ouse Is Officially the First River in England with Legal Rights. News item by Amy Houghton, 3 March 2025. Available online: <https://www.timeout.com/uk/news/the-first-river-in-england-to-have-official-legal-rights-030325>. (Accessed 16 May 2025).
- TNO, 2025. Better damage prediction for offshore wind turbine blades. Available online: <https://www.tno.nl/en/newsroom/2025/03/damage-prediction-wind-turbine-blades/>. (Accessed 2 May 2025).
- Tougaard, J., Hermannsen, L., Peter, T., Madsen, P.T., 2020. How loud is the underwater noise from operating offshore wind turbines? J. Acoust. Soc. Am. 148, 2885–2893. <https://doi.org/10.1121/10.0002453>.
- UK Government, 2021. £3.8 million in contracts awarded to mitigate the radar risk of windfarms. Available online: <https://www.gov.uk/government/news/38-million-in-contracts-awarded-to-mitigate-the-radar-risk-of-windfarms>. (Accessed 14 April 2025).
- UK Government, 2025. Consents and planning applications for national energy infrastructure projects. Available online: <https://www.gov.uk/guidance/consents-and-planning-applications-for-national-energy-infrastructure-projects>. (Accessed 8 September 2025).
- UK Metals, 2025. Today’s scrap metal prices from UK metals. Available online: <https://www.ukmetals.co.uk/scrap-metal-prices/>. (Accessed 23 April 2025).
- United Nations, 2025. The Rights of the Pacific Ocean as a Legal Entity: a Science Based Feasibility Study. Department of Economic and Social Affairs. Available online: <https://sdgs.un.org/partnerships/rights-pacific-ocean-legal-entity-science-based-feasibility-study>. (Accessed 19 May 2025).
- University of Portsmouth, 2025. Offshore wind farms could cause significant ecosystem, economic and human health risks. Available online: <https://www.port.ac.uk/news-events-and-blogs/news/offshore-wind-farms-could-cause-significant-ecosystem-economic-and-human-health-risks>. (Accessed 2 May 2025).
- van Sebille, E., Aliani, S., Law, K.L., Maximenko, N., Alsina, J., Bagaev, A., Bergmann, M., Chapron, B., Chubarenko, I., Cozar, A., Delandmeter, P., Egger, M., Fox-Kemper, B., Shungudzemwoyo, P.G., Goddijn-Murphy, et al., 2020. The physical oceanography of the transport of floating marine debris. Environ. Res. Lett. 15, 023003. <https://doi.org/10.1088/1748-9326/ab6d7d>.
- Vattenfall, 2025. Intelligent drones increase offshore wind efficiency. Available online: <https://group.vattenfall.com/press-and-media/newsroom/2025/intelligent-drones-increase-offshore-wind-efficiency/>. (Accessed 11 April 2025).
- Watson, A.J., Schuster, U., Shutler, J.D., Holding, T., Ashton, I.G.C., Landschützer, P., Woolf, D.K., Goddijn-Murphy, L., 2020. Revised estimates of ocean-atmosphere CO₂ flux are consistent with ocean carbon inventory. Nat. Commun. 11 (1), 4422. <https://doi.org/10.1038/s41467-020-18203-3>.
- Watson, G.J., Banfield, G., Watson, S.C.L., et al., 2025. Offshore wind energy: assessing trace element inputs and the risks for co-location of aquaculture. npj Ocean Sustain 4, 1. <https://doi.org/10.1038/s44183-024-00101-6>.
- West of Orkney Windfarm, 2023a. Onshore EIA Report, vol. 1. Chapter 18 –Offshore EIA Summary. L-100632-S06-A-ESIA-018. Available online: https://www.westoforkney.com/application/files/7816/9822/6718/West_of_Orkney_Windfarm_Onshore_EIA_Report_-_Chapter_18_-_Offshore_EIA_Summary.pdf. (Accessed 22 August 2025).
- West of Orkney Windfarm, 2023b. Offshore EIA report volume 2, supporting study 3: marine physical and coastal processes supporting study. L-100632-S05-A-REPT-007. Available online: https://marine.gov.scot/sites/default/files/supporting_study_3_-_marine_physical_and_coastal_processes_supporting_study.pdf. (Accessed 22 August 2025).
- White, M.P., Elliott, L.R., Gascon, M., Roberts, B., Fleming, L.E., 2020. Blue space, health and well-being: a narrative overview and synthesis of potential benefits. Environ. Res. 191, 110169. <https://doi.org/10.1016/j.envres.2020.110169>.
- Williamson, B.J., Goddijn-Murphy, L., McIlvenny, J., Youngson, A., 2024. Potential exposure of aquatic organisms to dynamic visual cues originating from aerial wind turbine blades. Fishes 9, 482. <https://doi.org/10.3390/fishes9120482>.
- Wind Systems Magazine, 2023. Protecting assets against new. Available online: <https://www.windsystemsmag.com/protecting-assets-against-new-threats/>. (Accessed 14 April 2025).
- Witman, S., 2017. World’s Biggest Oxygen Producers Living in Swirling Ocean Waters, vol. 98. Eos. <https://doi.org/10.1029/2017EO081067>.
- WorkBoat, 2024. Offshore wind’s first ‘spill’. Available online: <https://www.workboat.com/viewpoints/offshore-wind-s-first-spill>. (Accessed 22 May 2025).
- Zampollo, A., R O’Hara Murray, R., Gallego, A., Scott, B., 2025. Does the oceanographic response to wind farm wind-wakes affect the spring phytoplankton bloom? Prog. Oceanogr. 237, 103512. <https://doi.org/10.1016/j.poccean.2025.103512>.

Q3 2025 Energy Statistics

1. The 2025 Q3 Energy Statistics were published by the Scottish Government in December 2025. (An aside – the statistics note that total electricity consumption in Scotland in 2024 was 26.6% lower than the 2005-07 baseline and down 0.5% from 2023, so there is increasing generation capacity at a time of falling use).
2. The principal key figures are summarized below alongside demand figures from NESO:

Demand

NESO, in the Ten Year Electricity Statement, confirms the following for Scotland:

- Current peak demand – just over 4 GW
- 2030 peak demand – 5 GW
- 2050 peak – between 8.5 GW and 11 GW

Current Supply Capacity

- Total current generating capacity – 17.8 GW
- Of which
 - Offshore wind generating capacity – 4.3 GW
 - Onshore wind generating capacity – 10.4 GW
 - Other onshore generating capacity – 3.0 GW

Total Pipeline

- Total as at June 2025 – 1,174 projects in the planning pipeline – 83.0 GW
- Of which:
 - 709 generation projects – 39.5 GW
 - 406 storage projects – 39.5 GW
 - 59 other projects – 3.6 GW

Pipeline – Generation

- Offshore wind
 - Applications – 8.6 GW
 - Awaiting construction – 7.9 GW
 - Under construction – 1.2 GW
- Onshore wind
 - Applications – 10.5 GW
 - Awaiting construction – 5.6 GW
 - Under construction – 2.0 GW
- Other onshore technologies
 - Applications – 1.4 GW
 - Awaiting construction – 1.6 GW
 - Under construction – 0.2 GW

Pipeline – Storage

- Batteries
 - Applications – 10.1 GW
 - Awaiting construction – 18.2 GW
 - Under construction – 2.7 GW
- Pumped Hydro Storage
 - Applications – 4.2 GW
 - Awaiting construction – 4.8 GW
 - Under construction – 0.0GW

3. Adding the current operational supply capacity (17.8 GW) to the onshore plus offshore wind under construction (3.2 GW) and the onshore plus offshore wind awaiting construction (13.5 GW) gives a total of 34.5 GW. Live onshore plus offshore wind applications add in another 19.1 GW giving an overall total of 53.6 GW. Whilst changes to the way the figures are presented makes quarterly comparisons slightly difficult, these figures continue to show that the official energy statistics are now recognizing the clear potential for excessive generation provision when the 53.6 GW figure is compared with the current Scottish peak winter demand of 4.6GW (the annual average is 3.6GW) and the NESO predicted peak future 2050 Scottish demand

figure of between 8.5GW and 11GW (noting that the latest NESO Ten Year Electricity Statement states that peak demand in Scotland will still be under 5GW in 2030).

4. This conclusion becomes even more pronounced if the likely future outputs from all of the ScotWind offshore leases are also included (noting that the January 2026 Offshore Wind Policy Statement seeks up to 40GW of “new offshore capacity by 2040), leading to a total potential generation capacity of over 70GW, just under 7 times the NESO predicted peak future 2050 Scottish demand figure of between 8.5GW and 11GW.
5. The conclusion that can be reached is that, having regard to the fact that in terms of the Clean Power Action Plan, Scotland already has sufficient renewable energy for its own consumption, although boundary constraints may prevent renewable energy reaching all consumers, and only relies on fossil fuels (imports) when wind energy is not available. Therefore, there is absolutely no need for any new onshore wind farms to be consented to meet the public interest and policy aspects of either future demand for electricity or the securing of a net zero outcome as there is sufficient existing generation and transmission capacity.
6. In summary, the predicted high levels of renewable electricity generation in Scotland, combined with the modest (and reducing) levels of consumption and the current sets of constraints severely limiting capacity to transfer electricity south, especially when much of the generation is in the far north of Scotland (the Scotland to England exports are currently limited to 6.7GW at boundary B6, if everything is operational), means that already significant amounts of electricity that is produced in Scotland cannot be used. Such generation is, therefore, frequently turned off and curtailed. To expand the grid infrastructure within Scotland or to consent more wind farms will only encourage an increase in generating capacity and that additional generating capacity will simply exacerbate the current curtailment rates and increase the amount of constraints payments whilst contributing nothing to achieving net zero targets.

[Redacted]

Updated 2nd February 2026

h
k 6

February 2026

From: [Redacted]
To: [MD Marine Renewables](#)
Subject: Re: Ayre Offshore Wind Farm Objection
Date: 06 February 2026 23:01:30

REPRESENTATION by [Redacted] on 06/02/2026.

Dear Sir / Madam,

I am writing to formally object to the planning application for the Ayre Offshore Wind Farm.

The Environmental Impact Assessment (EIA) provided fails to adequately evaluate significant effects on the marine environment, human health, coastal communities, and infrastructure. Key gaps, scientific uncertainties, and unquantified cumulative impacts render the application non-compliant with Scottish planning and EIA requirements. Further detailed assessments and mitigation measures are essential before consent can be granted.

The Sea as a Legal Entity

The evolving concept of granting legal personhood to natural resources, including the ocean, as seen in global implementations and Scottish initiatives like representation at the Scottish Association for Marine Science, suggests that current impacts deemed acceptable may not align with future societal or legal standards.

Vulnerability to Terroristic, Militaristic, and Criminal Attacks

The development's remote offshore location, spanning 200 km² with 360 km of subsea cables, exposes it to potential criminal, terrorist, or grey-zone threats. No detailed risk assessment or evidence is provided, despite reports of vulnerabilities such as Russian vessel activities and security risks from foreign-manufactured components. A specific security evaluation is required, especially given its overlap with military exercise areas.

Unexploded Ordnance on the Seabed

The EIA addresses unexploded ordnance (UXO) risks only within the array site and export cable corridor, overlooking hazards in areas where fishing and marine activities may be displaced, posing risks to human safety.

Impact on Phytoplankton Growth and Primary Production

The qualitative assessment minimizes effects on phytoplankton, which underpin marine food webs and carbon uptake, but ignores mechanisms like wind wake effects that could alter production beyond the array area. Site-specific and regional research is needed amid rapid offshore wind expansion.

Leading Edge Erosion of Turbine Blades

With large rotor diameters, leading-edge erosion from environmental factors is likely, leading to microplastic pollution, reduced efficiency, and shorter blade lifespans. This is not assessed in the documents.

Pollution by Anti-Corrosion Systems

Corrosion-protection methods, particularly for floating platforms, may release toxic metals into the marine environment. The EIA omits details on these systems, emissions, or mitigation strategies.

Underwater Infrasound

The assessment focuses on higher-frequency noise, neglecting infrasound below 20 Hz, which propagates far and affects marine species reliant on it for essential behaviors. A dedicated infrasound evaluation is requested, extending beyond the current study area.

Moving Underwater Shadows

Visual cues from turbine shadows, enhanced by wave lensing, are scoped out without empirical evidence, potentially impacting fish and shellfish. A robust reassessment is needed.

Changes to Coastal Waves

The wave model inadequately accounts for floating turbine dynamics, which could significantly alter wave conditions, affecting coastal recreation (e.g., surfing in Orkney and Caithness) and intertidal ecosystems. A revised assessment is required.

Wind Theft

Aerodynamic wakes from the development could reduce energy yields at nearby onshore wind farms, such as Costa Head, Hesta Head, and Quanterness. No quantitative assessment of these interactions is provided.

Economic, Environmental, and Social Impacts

High grid connection costs and the expense of floating wind technology raise viability concerns. Onshore infrastructure, including substations and lines in Caithness, would cause significant environmental and social disruptions, warranting further evaluation.

Impacts on Mental Health

The project risks diminishing unspoilt seascapes and vistas essential for community wellbeing, with significant visual effects in Orkney and Caithness. Cumulative effects on sense of place and mental health are not adequately addressed.

In conclusion, the documentation lacks a comprehensive, precautionary approach to these environmental, social, economic, and security issues.

Thankyou

[Redacted]

h
k 8

February 2026

From: [Redact
To: [MD Marine Renewables](#)
Subject: Marine Scotland Reference number: MS-00011515 / MS-00011516 - Ayre Offshore Wind Farm
Date: 08 February 2026 18:18:13

Marine Scotland Reference number: MS-00011515 / MS-00011516
Highland Council reference number: 25/04779/S36

I write with an **OBJECTION** to the above application reference.

This is not the first offshore wind farm planned off the coast of Orkney and its power being brought on land to Caithness. This project includes up to 67 floating turbines with a tip height of 356m, impacting Orkney landscape and seascape with visibility from the Caithness coastline. At a consultation I asked regarding visibility of the turbines from Caithness, I was told they would not be visible from the Caithness coastline, yet at a follow up consultation it was easily visible in viewpoint visualisations shown, an example of this is Sinclair Castle Girnigoe which is a historical landmark, from which these will be seen.

Is there even a commercial precedent for floating wind farms of this scale, making it a big risk. It is my understanding that floating technology is substantially more expensive, compared to fixed-bottom, raising concerns about economic viability and energy costs, when we are constantly being nailed by these rising costs through our energy bills already!

This project especially in the longer term will create few, if any, jobs for local residents.

This project also creates fears of negative impacts on marine life and the local habitat. The county of Caithness has been 'land raped' for this barrage of applications, affecting not only our sea life but also the land where it comes ashore and is then trailed through our county to reach their proposed substation. This substation addition will yet again impact a rural area that is being flooded by massive infrastructure cumulating an industrial lifestyle to the residents of this area, who are already being emotionally and mentally affected by the destruction of their rural lives.

The associated onshore infrastructure (cable trenches etc) as far as I'm concerned are unnecessary, if this power is deemed essential, it's not for Caithness as we produce far more than is required, it's for other areas of the UK, the electricity produced should be sent south offshore directly to where it is required, or even produced and distributed where it's required.... and that's not here!

Thistle Wind Partners has also classified most assessed impacts as "minor" or "insignificant," which is not a realistic assessment on such a large-scale project.

Please **OBJECT** to this application.

Regards

[Redacted]

h
k 9

February 2026

From: [Redact
To: [MD Marine Renewables](#)
Subject: MS-00011515/6 - Ayre Offshore Wind Farm
Date: 09 February 2026 09:20:45

Marine Scotland Reference number: MS-00011515 / MS-00011516

Highland Council reference number: 25/04779/S36

I write to OBJECT to the above application as I don't believe it should be reviewed in isolation. It should be considered along with application 25/02964/PIP (Onshore element), due to the huge impact to large section of the East of Caithness AND construction of yet another Substation, in an already saturated community. Please no more, I encourage you to refuse this application.

Kind regards

[Redacted]

Royal Society for the Protection of Birds Scotland



Amy Woodward
Consenting and Licensing Casework Manager
Licensing Operations Team – Marine Directorate
Scottish Government
Victoria Quay
Edinburgh
EH6 6QQ

By email: MD.MarineRenewables@gov.scot

5th March 2026

Dear Amy

APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1989 AND MARINE LICENCES UNDER PART 4 OF THE MARINE AND COASTAL ACCESS ACT 2009 TO CONSTRUCT AND OPERATE AYRE OFFSHORE WIND FARM, APPROXIMATELY 22 KM FROM ORKNEY

Thank you for consulting RSPB Scotland on the above application to construct and operate an offshore windfarm, near Orkney, and for agreeing to an extension of time in which to submit our response.

RSPB Scotland recognises that climate change is the greatest long-term threat to nature and people, and we fully support the need to build more clean energy, including offshore wind. However, any development, including off-shore wind, must be carefully sited, designed and deployed to ensure that there are not unacceptable impacts on nature.

General Comments

It must be recognised by MD-LOT in their recommendation to Ministers that models are simplified versions of reality. They do not fully capture the nuances of our dynamic natural environment, the complex behaviours of seabirds or the interlinkages between the two. Models are not complete evaluations of the possible risks windfarms poses to seabirds. This fact, combined with the sensitivity of seabird populations to small changes in adult mortality, and the requirements of the Habitats Regulations, emphasises the requirement to take a precautionary approach when assessing all possible impacts of the proposed development.

There are numerous seabird colonies in the vicinity of the site many of which are designated as Special Protected Areas (SPA) due to supporting one or more rare, threatened, or vulnerable bird species as listed in Annex I of the Birds Directive or

RSPB Scotland
2 Lochside View
Edinburgh Park
Edinburgh
EH12 9DH

Tel: 0131 317 4100
f @RSPBScotland
@ @RSPBScotland
rspb.org.uk/Scotland



The RSPB is part of BirdLife International, a network of passionate organisations, working together to save nature across the world.

regularly occurring migratory species. There are legal obligations under the Habitats Regulations which aim to protect these internationally important sites, by protecting them from a number of impacts, including avoiding disturbance to and deterioration of those sites and their species. Due to the nature and location of the proposal there are likely significant effects on a number of European Sites. Therefore, the competent Authority is required by Habitat Regulations to undertake an Appropriate Assessment of the effects of the proposal on the SPAs and its species in light of the sites' conservation objectives.

Seabirds are relatively long-lived, tend to breed later and have fewer young than other birds and, as a result, their populations are sensitive to even the smallest increases in adult mortality. Their survival and productivity rates can be impacted by offshore windfarms directly (i.e. collision) and indirectly (e.g. displacement from foraging areas and additional energy expenditure required to avoid and due to additional flying distances to alternative foraging areas). They are also already under severe pressure. In Scotland, the number of breeding seabirds has declined by 49% since the 1980s, according to the Scottish biodiversity indicator¹. Kittiwake and Puffin are red listed in as Birds of Conservation Concern while Northern Gannet, Razorbill and Guillemot are amber listed. In addition, in 2019 they were assessed as moving away from target to achieve Good Environmental Status².

RSPB Scotland welcomes the Applicant's recognition of potential for Adverse Effects on Site Integrity (AEoSI) for eight European sites (in relation to three species) arising from the project in combination with other North Sea wind farms. RSPB Scotland **objects** to the Application due to predicted in-combination effects, resulting in adverse effects on the site integrity of the following SPAs and qualifying species:

- Black-legged Kittiwake at the following SPAs:
 - Buchan Ness to Collieston Coast SPA
 - East Caithness Cliffs SPA
 - Flamborough and Filey Coast SPA
 - Fowlsheugh SPA
 - North Caithness Cliffs SPA
 - Troup, Pennan and Lion's Head SPA
 - West Westray SPA
- Razorbill at the following SPAs:
 - East Caithness SPA
 - Flamborough and Filey Coast SPA
 - North Caithness Cliffs SPA
 - Troup, Pennan and Lion's Head SPA
- Guillemot at the following SPAs
 - East Caithness SPA
 - Sule Skerry and Sula Stack
 - Northern Gannet at the following SPA:
 - Forth Islands SPA

The RSPB are also unable to reach conclusions of the significance of impacts on the Kittiwake and Guillemot features of the Copinsay SPA, due to its proximity to the development and the unfavourable status of these populations.

¹ [The Marine Strategy Regulations 2010 \(legislation.gov.uk\)](https://www.legislation.gov.uk)

² [Scottish Biodiversity Indicator – The Numbers and Breeding Success of Seabirds \(1986 to 2019\)](#)

Our detailed response is set out in Appendix 1 of this letter. RSPB Scotland does not object to the wind farm in isolation, However, does object due to the in-combination effects with other North Sea wind farms. For instance, the proposal is predicted to result in the annual population growth rate of Razorbill at the Troup, Pennan and Lion's Head SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.995 and 0.998. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 84.8 and 92.9% of what it would have been in the absence of the development. As another example the annual population growth rate of Kittiwake at the West Westray SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.985 and 0.989. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 61.6 and 71.2% of what it would have been in the absence of the development.

Due to the proposed development's predicted AEOI on several SPAs, and inability to conclude no adverse effects on site integrity for one other, further tests apply after the appropriate assessment has been undertaken. Under the Habitats Regulations, a project which cannot conclude that there would be no adverse impacts on the site integrity of European protected sites cannot be permitted unless it can be demonstrated there are no lesser damaging alternative solutions, there are imperative reasons of overriding public interest (IROPI) for the project to go ahead, and then compensation measures are required to maintain the coherence of the UK/National Sites Network. European sites are the most important sites for wildlife and as such it is right that maintaining them in favourable conservation status and protecting them from development carries a high weight in decision making.

While recognising that the Application site is identified as a suitable site for development (NE2) in the Sectoral Marine Plan for Offshore Wind Energy, it is clear from the Derogation Case put forward by the Applicant that the Scottish Government must ensure the requirements of Regulations 29 and 6 of the Offshore Habitats Regulations³ are passed before consent can be granted for the proposed development.

The Scottish Government may be unable to identify suitable alternative solutions to the Application if renewable energy climate-related targets are to be achieved, and it may determine that the development must be consented for Imperative Reasons of Overriding Public Interest. But it is vital the Scottish Government undertakes the most rigorous assessment of the suitability and efficacy of the compensation measures proposed and requires rigorous application of any agreed compensation in the interests of ensuring the overall coherence of the UK Sites Network (Natura 2000 Network). Nothing less would be acceptable.

RSPB Scotland acknowledges the proposed compensation put forward by the applicant and submitted with the Application, comprising:

- i. Predator Control (rats and mink)
- ii. Seabird Bycatch Reduction

Commentary on, and analysis of these proposed compensation measures is attached to this letter as an Appendix 2. In summary, it is RSPB Scotland's clear opinion that these compensation measures are not appropriate at this point in time. This is largely based upon the generic nature of the proposals. We have several concerns about the predator control measures, again because of the generic, largely desk-based research nature of

³ <https://www.legislation.gov.uk/ukxi/2017/1013/contents>

the proposals. Given the lack of detail, we are not assured Seabird Bycatch Reduction can compensate for the possible harm arising from the application, but should it be pursued, it should first be considered for Scottish waters.

We would strongly recommend that the developer utilises the strategic approach to compensation through the Marine Recovery Fund when this becomes available. If project-based measures continue to be pursued, then a much greater level of detail and certainty around exactly what the measures are and where they would be carried out is critically required to demonstrate their efficacy and quantitative suitability as compensation under the Habitat Regulation tests. We have very limited capacity to engage in project level measures given the number of proposals asking similar questions and seeking similar solutions at the same places. However, the developer must improve the proposed compensation measures to ensure that they are as effective ecologically, financially and legally, and are as close as possible to the affected colonies, thus ensuring the coherence the UK Sites Network.

Summary

RSPB Scotland does not object to the proposed Development in isolation. However, due to significant and unacceptable impacts resulting from the recently approved Berwick Bank windfarm, for which we believe it is not possible to find an adequate degree of compensation, the in-combination effects of the Proposed Development together with Berwick Bank and other North Sea offshore wind farms would be unacceptable and we are therefore in a position where we have to object to the in-combination impacts of the Proposed Development. In addition, we object to the proposal on the basis that the compensation measures as they stand are not sufficiently well developed and that too great a reliance is placed upon these issues being designed and detailed post decision by using a condition on any consent. It is our expert opinion that significant further work is required on the compensation proposals before any consent could be issued.

Should you require any further information or clarification, please do not hesitate to get in contact.

Yours sincerely

[Redacted]

Andrew Tait
Senior Conservation Planner, RSPB Scotland

Appendix 1 Ornithological assessment
Appendix 2 Commentary on compensation measures

Appendix 1

Ayre Offshore Windfarm Application

Detailed Response by the Royal Society for the Protection of Birds

Introduction

1. This appendix sets out the steps for the habitat regulations with the legal steps that must be taken, together with the wider legal context and the policy landscape for offshore wind development. This is followed by a summary of the most relevant seabird colonies and their current status.

Offshore ornithology assessment

2. RSPB Scotland recognise that the Applicant invested a great amount of time and resource into the ornithological re-assessment process and wish to formally express that we welcome and appreciate this work.
3. We consider the approach advised by NatureScot and detailed in their online guidance to be the best reflection of the likely impact of the proposed OWF development.
4. As set out in Searle et al (2023a)¹, assessing impacts of offshore windfarms and other renewables developments is inherently uncertain. This uncertainty is propagated throughout the impact assessments, as there are not only direct impacts, but ecosystem wide impacts that can change, for example, the abundance and availability of prey. Multiple data sources and modelling techniques are used to capture a simplified version of reality. They do not fully capture the complexity of seabird behavioural or demographic processes in an inherently dynamic marine environment.
5. It is therefore vital that the precautionary approach required by the Habitats Regulations is taken. This means if scientific data is incomplete or hard to get and it is not possible to complete a full evaluation of all possible or potential risks an activity/development may cause, account should be taken of all possible harm. Potential harm should not be dismissed due to the lack of scientific data.
6. Importantly, the precautionary principle requires the Applicant to demonstrate with scientific certainty that something would not be harmful. The concept of something being overly precautionary dismisses the inherent uncertainty in modelling and overlooks the simplistic version of reality that the modelling captures.
7. Not recognising these uncertainties risks poorly informed decisions being made. Furthermore, an underestimation of impacts will have repercussions when consenting later offshore wind development. If a precautionary approach is taken from the beginning, the likelihood of irreversible damage occurring is reduced even whilst our knowledge base is incomplete and modelling improves.

The Habitats Regulations

8. The Habitats Regulations seek to conserve particular habitats and species across the UK. The overall aim of these Regulations is to ensure the long-term survival of viable populations of the UK's most valuable and threatened species and habitats, throughout their natural range and to maintain and promote biodiversity.

9. These Regulations relevant to this application are:
- 9.1. *The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)* (“the 1994 Regulations”) - applies on land in Scotland, and in Scottish inshore waters (the area of sea adjacent to Scotland from 0 to 12 nautical miles);
 - 9.2. *The Conservation of Habitats and Species Regulations 2017* -applies to specific reserved and devolved activities on land in Scotland, and in Scottish inshore waters, including for consents under sections 36 and 37 of the Electricity Act 1989; and
 - 9.3. *The Conservation of Offshore Marine Habitats and Species Regulations 2017* -applies to all UK offshore waters (the area of sea beyond 12 nautical miles).
10. These are referred to as “the Habitats Regulations” in this submission.
11. In Scotland, 162 Special Protection Areas (SPAs) have been classified. These have been specifically identified and protected due to supporting one or more rare, threatened, or vulnerable bird species as listed in Annex I of the Birds Directive, or regularly occurring migratory species.
12. Although the UK has withdrawn from the EU, the aims and objectives (as set out in the Habitats and Birds Directives recitals/preambles) remains relevant and important as discussed below. SPAs are protected in Scotland and the rest of the UK, and the standard of protection and requirements has not changed.
13. There have however been some changes to terminology and process due to Brexit. Of relevance to this submission is that the EU-wide network of SPAs and SACs known as “Natura 2000” Network post Brexit, no longer is of legal relevance. However, the UK-wide network of protected sites is, and is referred to as the “UK site network”. In addition, references in the Habitats Regulations to the “coherence of Natura 2000” must now be read as references to the coherence of the UK/National site network.
14. Using *the Conservation of Habitats and Species Regulations 2017* (since all Habitats Regulations have identical requirements), the Regulations set out the sequence of steps to be taken by the competent authority (here the Scottish Ministers) when considering authorisation for a project that may have an impact on a European site and its species before deciding to authorise that project. These are as follows:
- Step 1: consider whether the project is directly connected with or necessary to the management of the SPA and its species (regulation 63(1)). If not –
 - Step 2: consider, on a precautionary basis, whether the project is likely to have a significant effect on the SPA and its species, either alone or in combination with other plans or projects (the Likely Significance Test) (regulation 63(1)).
 - Step 3: make an appropriate assessment of the implications for the SPA and its species in view of its conservation objectives. There is no requirement or ability at this stage to consider extraneous (non-conservation e.g. economics, renewable targets, public safety etc) matters in the appropriate assessment (regulation 63(1)).
 - Step 4: consider whether it can be ascertained that the project will not, alone or in combination with other plans or projects, adversely affect the integrity of the SPA and its species, having regard to the manner in which it is proposed to be carried out, and any conditions or restrictions subject to which that authorisation might be given (the Integrity Test) (regulation 63(6)).

- Step 5: In light of the conclusions of the assessment, the competent authority shall agree to the project only after having ascertained that it will not adversely affect the integrity of the SPA, alone or in combination with other plans or projects (regulation 63(5)).
 - Step 6: only if the competent authority is satisfied that, there being no alternative solutions and the plan or project must be carried out for imperative reasons of overriding public interest (which, subject to regulation 64(2)), may be of a social or economic nature), they may agree to the plan or project notwithstanding a negative assessment of the implications for the European site (regulation 64(1)).
 - Step 7: in the event of the no alternative solutions and imperative reasons of overriding public interest tests being satisfied, the Scottish Ministers must secure that any necessary compensatory measures are taken to ensure that the overall coherence of the Natura 2000 network is protected (regulation 68).
15. It is important to add that in addition to the requirements set out above, in relation to both inshore area and the offshore marine area, any competent authority must exercise its functions so as to secure compliance with the requirements of the Habitats Directive and the Birds Directive; and in particular to take such steps as it considers appropriate to secure the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds, having regard to the requirements of Article 2 of the Birds Directive.⁷ And for offshore SPAs regulation 26, Offshore Regulations requires competent authorities to exercise their functions (as far as possible) to secure steps to avoid the disturbance of species and the deterioration of habitats or habitats of species within those sites.

Appropriate assessment

16. As part of the assessment requirements, regulation 63, Habitats Regulations (regulation 28, Offshore Regulations) require the application of the precautionary principle. Meaning that if it cannot be excluded, on the basis of objective scientific information, that it is likely to have a significant effect on a SPA and its species, an appropriate assessment will be required: see *Waddenzee*¹.
17. Following that appropriate assessment, a project may only be granted consent if the competent authority is convinced that it will not have an adverse effect on the integrity of the European site(s) and their species of concern, having applied the precautionary principle and taken account of the conservation objectives for those sites and their habitats and species. *Waddenzee* confirmed that where doubt remains as to the absence of adverse effects on the integrity of the site, approval should be refused (subject to the considerations of alternative solutions, imperative reasons of overriding public interest and the provision of compensatory measures as set out in regulations 64 & 68).
18. An appropriate assessment requires all aspects of the project which could affect the site, its species and its conservation objectives to be identified in the light of the best scientific knowledge in the field. The competent authority,

“taking account of the conclusions of the appropriate assessment of the implications...for the site concerned, in the light of the conservation objectives, are to authorise such activity only if they have made certain that it will not adversely affect the integrity of the site. That is the case where no reasonable scientific doubt remains as to the absence of such effects”.

¹ CJEU Case-127/02; [2004] ECR-7405 at [45]

19. Integrity of the SPA should be considered as the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is classified. A site can be described as having a high degree of integrity where the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained, and a minimum of external management support is required. When looking at the 'integrity of the site', it is therefore important to take into account a range of factors, including the possibility of effects manifesting themselves in the short, medium and long-term.
20. As is clear from the requirements of the Habitats and Offshore Regulations, the assessment of integrity is to be considered by reference to the impact of the project alone and in-combination with other plans and projects, taking account of the site(s) conservation objectives. As clearly set out in *Waddenzee*, para 61:

*“61 In view of the foregoing, the answer to the fourth question must be that, under Article 6(3) of the Habitats Directive, **an appropriate assessment of the implications for the site concerned of the plan or project implies that, prior to its approval, all the aspects of the plan or project which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives must be identified in the light of the best scientific knowledge in the field.** The competent national authorities, taking account of the appropriate assessment of the implications of mechanical cockle fishing for the site concerned in the light of the site's conservation objectives, are to authorise such an activity only if they have made certain that it will not adversely affect the integrity of that site. That is the case where no reasonable scientific doubt remains as to the absence of such effects.”* (emphasis added)

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017

21. These EIA requirements state that consent cannot be granted for Environmental Impact Assessment (EIA) development unless the decision-maker has taken into account environmental information including an environmental statement which describes the significant effects, including cumulative effects, of the development on the environment. This will include effects on all wild bird species whether SPA species or not.
22. Offshore wind farms have the potential to impact on birds through collision with rotating blades, direct habitat loss, disturbance from construction activities, displacement during the operational phase (resulting in loss of foraging/roosting area) and impact on bird flight lines (i.e. barrier effect) and associated increased energy use by birds for commuting flights between roosting and foraging areas. These additional potential impacts must be taken into account.

The UK Marine Strategy Regulations and Good Environmental Status

23. Also of relevance to achieving sustainable development in our seas is the Marine Strategy Framework Directive². This was developed in response to concerns that although existing legislation protected the sea from some specific impacts, it was sectoral and fragmented. To overcome this, the directive seeks to reduce impacts on marine waters regardless of where impacts occur by applying an ecosystem approach.
24. Applying an ecosystem approach is important. Our natural environment is complicated, and the outcome of an impact may manifest elsewhere. It also feeds into the concept of sustainable

² EU Council Directive 2008/56/EC

development and the vision for clean, healthy, safe, productive, and diverse seas; managed to meet the long-term needs of nature and people as set out Scotland's National Marine Plan.

25. The Marine Strategy Framework Directive was transposed into UK law by the Marine Strategy Regulations 2010. It requires the UK to put in place the necessary management measures to achieve 'Good Environmental Status' (GES) in UK seas by 2020. This involves protecting the marine environment, preventing its deterioration, and restoring it where practical alongside using marine resources sustainably. As with the Habitats Regulations, although the UK has withdrawn from the EU, the legislative requirement for GES remains in place.
26. Governments of the UK have collectively failed to meet 11 out of the 15 indicators of Good Environmental Status (GES) for our seas with the marine bird indicator moving away from target. For breeding seabirds, more species, especially surface feeders who depend on small fish at the surface (35% in the Greater North Sea), are now experiencing frequent, widespread breeding failures. The reduced availability of small fish is largely responsible for these declines and impacts on breeding success.

Section summary

27. Taken together, there is a clear legal and policy requirement to protect the marine environment and deliver sustainable development. The UK Marine Strategy is clear in its aims of improving the state of the marine environment through taking a large scale, holistic approach. Therefore, proposals which further impact the ability of the UK to achieve GES should be considered carefully. The ability of an application to comply with the vital requirements of the Habitats Regulations which seek the long-term survival of viable populations of Europe's most valuable and threatened species and habitats, must also be scrutinised and considered in detail.

Policy Position

28. In accordance with the requirements of the Marine (Scotland) Act 2010 when considering an application and making a recommendation to Ministers, MD-LOT must consider the extent to which the proposed activity accords with any marine plan for an area and the impact that it would have on the environment, human health, and other legitimate users of the sea as well as other matters considered relevant.
29. Scotland's National Marine Plan (NMP) (adopted 2015) sets out the strategic policies for sustainable development in both the Scotland inshore region (0 to 12 nautical miles) and within the Scottish Offshore region (12 to 200 nautical miles).
30. A core aim of marine planning, as set out by the NMP, is to manage human impact on the marine environment. The plan therefore seeks to put the marine environment at the heart of the planning process and adopt the principles of sustainable development. The environmental, social, and economic policies of the plan are intended to be complementary with one another as elements of sustainability.
31. Through policy GEN 9 (Natural Heritage), the NMP requires that development and use of the marine environment complies with legal requirements for protected areas and protected species, not result in significant impact on the national status of priority marine features, and protect, and where appropriate, enhance the health of the marine area. It also encourages a strategic approach to mitigation of potential and cumulative impacts, stating that these form an integral part of marine planning and decision making.

32. Renewables specific policies within the NMP direct commercial scale development to the plan options areas (as identified in the Sectoral Marine Plan) and require applications to demonstrate compliance with the Environmental Impact Assessment (EIA) and Habitat Regulations Appraisal (HRA) legislative requirements.
33. Since the adoption of the NMP, Scottish Government have further recognised that net zero and energy goals will have impacts on the environment, specifically marine biodiversity, as well as other users of sea. In particular, the draft Energy Strategy and Just Transition Plan (2023), recognises the potential impacts on biodiversity arising from the major expansion in offshore wind. It contains a commitment to work in a way that recognises this reality and ensures appropriate protection of the natural environment as part of a joined-up approach to tackling the climate and nature crisis.
34. This follows the approach of the National Planning Framework 4 which, in policy 1 clearly sets the expectation that significant weight will be given to the global climate and nature crises when considering all development proposals. Although this document is not directly applicable to marine development, it is applicable to onshore elements and RSPB Scotland believe it is a relevant consideration, albeit one with limited weight, for development offshore. Although in early stages of development, RSPB Scotland understands that consideration is being given as to how National Marine Plan 2 can follow the approach in NPF4.

Ornithological interest of the Application site

35. The UK is of outstanding international importance for its breeding seabirds and wintering marine birds. As with all Annex I and regularly migratory species, the UK has a particular responsibility under the Birds Directive to secure their conservation.
36. Seabirds are relatively long-lived, and as a result, their populations are sensitive to small increases in adult mortality. Their survival and productivity rates can be impacted by offshore windfarms directly (i.e. collision) and indirectly (e.g. displacement from foraging areas, additional energy expenditure, potential impacts on forage fish and wider ecosystem impacts such as changes in stratification).
37. The probability of seabirds being impacted by an application relates to whether they are likely to be in the area of the development, and their behaviour in the vicinity of the development. This will depend on a number of factors, including the application's proximity to seabird colonies, the species within those colonies, the species behaviours (including their foraging range, food preferences and flight behaviour), the attraction of the application array itself as a foraging area, and the attraction of areas beyond the application array for foraging (which would require birds to transition through the development array or detour around it).

Species of interest

38. The **key species of interest in relation to the application** are Black-legged Kittiwake (*Rissa tridactyla*), Northern Gannet (*Morus bassanus*), Common Guillemot (*Uria aalge*), Atlantic Puffin (*Fratercula artica*) Manx Shearwater (*Puffinus puffinus*), European Storm-petrel (*Hydrobates pelagicus*) and Leach's Storm-petrel (*Hydrobates leucorhous*).
39. A summary of their population status within the Britain, Isle of Man and Channel Islands is provided in Table 1 below.

Species	% World Population	UK Colony Trends 1986 to 2021
Black-legged Kittiwake	5.3	Declining
Northern Gannet	59.1	Mostly increasing but a few declining colonies (<i>N.B. Gannets were badly impacted by HPAI in 2021-22</i>)
Guillemot	6.2	Some colonies increasing but many declining
Atlantic Puffin	3.3-3.9	Declining
Manx Shearwater	81.0	Increasing
European Storm-petrel	6.8	Increasing
Leach's Storm-petrel	0.1	Declining

Table 1

Northern Gannet

40. Northern Gannet are endemic to the North Atlantic although the majority breed in Britain and Ireland. They tend to breed on offshore islands and stacks. Gannets are typically long-lived seabirds, living to an average age of 17 years and not breeding until the age of 5 years. During the breeding season, adults will take it in turn to incubate the single egg for approximately 42-46 days with the chick fledging unaccompanied by its parents after approximately 90 days. Some colonies, such as that on the Bass Rock in the Firth of Forth – the largest Gannetry in the world - are particularly large and conspicuous. Gannet can catch fish at depths of 20 metres but also feed from the surface on small shoaling fish such as sandeel.
41. During the breeding season Gannets are central-place foragers meaning they are constrained to return to the nest after foraging to maintain territories and raise their young. Foraging trip durations are dependent on colony size with birds from larger colonies making longer foraging trips (both in distance and duration).
42. Gannet were particularly badly impacted by Highly Pathogenic Avian Influenza (HPAI) during the 2022 breeding season with large numbers of deaths reported. On the Bass Rock a catastrophic breeding failure was reported which is likely to vastly impact their future population numbers and the robustness of those populations to additional mortality.
43. They are amber listed in the Birds of Conservation Concern.
44. Northern Gannet have been assessed as having a high vulnerability to collisions with rotating turbine blades (Furness *et al.*, 2013, Wade *et al.*, 2016), partly due to their flight altitude and manoeuvrability. Breeding Gannets tracked with GPS from Helgoland in the eastern North Sea travelled around and through operational wind farms.
45. There is a need to assess the possible impacts to Gannets throughout the year as behavioural constraints change; starting when they arrive back at the colony for the breeding season until they leave on migration, and then throughout the winter. During autumn and winter potential interaction with turbines will not be limited to birds from the closest breeding colony but birds from across the breeding range as they disperse and travel south.
46. There is consistent evidence of wind farm avoidance by non-breeding Gannets and Gannets on migration. But little is known about the behavioural responses of breeding Gannets to offshore turbines resulting from a lack of operational turbines within foraging range of breeding colonies.

Black-legged Kittiwake

47. Black-legged Kittiwake are members of the gull family. They tend to nest on vertical rocky-sea cliffs and during the breeding season feed on energy rich pelagic shoaling fish, such as sandeel, sprat and juvenile herring. Kittiwakes are surface feeders and are highly dependent on sandeels in the breeding season, as such they are particularly vulnerable to food shortage. During the breeding season Kittiwakes are central-place foragers meaning they are constrained to return to the nest after foraging to maintain territories and raise their young. When not in attendance at the nest or away on a foraging trip, Kittiwakes use the sea below the cliffs for maintenance behaviours such as loafing (spending time on the water to preen or rest, not related to feeding), preening and bathing. During the breeding season the highest densities of Kittiwakes at sea are within 1km of the colony.
48. Kittiwake are red listed in the Birds of Conservation Concern and on the OSPAR list of threatened and/or declining species and have been assessed by the IUCN as vulnerable to global extinction. They are particularly susceptible to collision risk but are also vulnerable to distributional changes as a result of the presence of turbines.

Common Guillemot

49. Common Guillemot are member of the auk family along with Puffin and Razorbill. They typically form highly dense colonies and lay a single egg (without a nest) on a cliff, narrow ledges, or other inaccessible areas. They tend to eat fish and crustaceans. Guillemots are typically long-lived seabirds, living to an average age of 23 years and not breeding until the age of 5 years. Breeding success is highest where birds are most tightly packed. Adults will incubate the egg for 28-37 days, fledging then taking place when the chick is ~3 weeks old. The chick will then complete its growth at sea accompanied by its male parent.
50. The response of Guillemots to offshore wind farms is mixed although there is a paucity of data for breeding birds. Non-breeding birds have been shown to avoid offshore wind farms, as have breeding birds in the southern North Sea, whereas in the Irish Sea, Guillemots have shown no changes in abundance post construction and at another site, increased in abundance. More recent work has suggested that there may be some habituation over time to the presence of wind farms.
51. While details are still emerging, the 2024 breeding season for Guillemot appears to be extremely poor, with large number of nest sites vacant, birds present but not laying eggs and high degree of breeding asynchronicity. The causes of this are likely to be multifactorial, and may include HPAI, high water temperatures and resultant poor body conditions. The long term, population scale consequences are unclear, but may be severe. As a result, an extremely high level of precaution should be applied in considering the impacts arising from any offshore development on this species.
52. They are amber listed in the Birds of Conservation Concern.

Puffin

53. Puffin are one of the most iconic seabird species around Scotland with their brightly coloured beaks during the breeding season. They tend to nest in burrows and so are susceptible to mammalian predators. There is some evidence their diet changes seasonally but during the breeding season, they typically feed on shoaling fish such as sandeel, sprat and herring which they catch by underwater pursuit.

54. They are vulnerable to displacement which can lead to a loss of feeding grounds and excess energy expenditure as they take less direct routes to reach alternative prey sources.
55. Puffin are red listed in the Birds of Conservation Concern and have been assessed by the IUCN as vulnerable to global extinction.

Manx Shearwater

56. This medium-sized sooty black and white seabird is a skilful navigator of the open ocean, but rarely seen on land. Manx shearwaters are long-lived birds that typically glide on stiff wings low over the sea surface. They are nocturnal at their breeding colonies, which are often located in steep and inaccessible terrain at a few dozen localities, mostly located on our western seaboard.
57. Outside of the breeding season, these migratory birds winter in the South Atlantic, predominantly off Brazil and Argentina.
58. The birds are amber listed as a UK bird of conservation concern.

European Storm-petrel

59. This small petrel, not much larger than a House Martin and very similar in appearance, is extremely pelagic, spending most of its life at sea.
60. The Storm Petrel only comes to land during the summer months, making its breeding attempts on offshore islands and a few isolated headlands. Although it has an estimated breeding population in the UK of around 30,000 pairs, this is an extremely difficult species to see during the breeding season, only coming to land during the hours of darkness often staying at sea on bright moonlit nights.
61. Several Storm Petrel breeding colonies have been the subject of detailed study, with ringing data demonstrating that this is a long-lived bird, with some individuals living for over 30 years.
62. This is the most marine of our breeding birds and a difficult species to see, visiting its underground nests at night and spending the rest of the time at sea.
63. The birds are amber listed as a UK bird of conservation concern.

Leach's storm-petrel

64. Leach's Petrel has a more restricted breeding distribution within Britain & Ireland than the more familiar Storm Petrel, its colonies all located within 70 km of the Atlantic continental shelf. While significant numbers breed at colonies on remote islands far off the coasts of Scotland and Ireland, our population is small compared to those off North America.
65. As with other burrow-nesting seabirds, the species faces a threat from mammalian predators inadvertently introduced to islands. Leach's Petrels may also be taken by avian predators, which is one reason for their nocturnal habits at breeding sites.
66. The birds are red listed as a bird of UK conservation concern.

Proximity of seabird colonies

67. The application array location is close to several SPAs with qualifying features within foraging range of the application array area. This includes the East Caithness Cliffs SPA, North Caithness Cliffs SPA, Outer Firth of Forth and St Andrews Bay Complex SPA, the Forth Islands SPA, Fowlsheugh SPA and St Abb's Head to Fast Castle SPA, Flannan Isles, Foula, North Rona and Sgula

Sgeir, St Kilda, Sule, Skerry and Sule Stack, Auskerry, Mousa, Priest Islands (Summer Isles), Seas of St Kilda, St Kilda, Treshnish Isles, Copeland Islands, Aberdaron Coast and Bardsey Island, Irish Sea Front, Rum, Skomer, Skolkholm and seas off Pembrokeshire.

68. As SPAs, these sites are subject to general duties to protect, conserve and restore the designated features of the site to meet their conservation objectives, to prevent deterioration of the site's habitats and to prevent significant disturbance to the sites. If an application might impact a qualifying feature, as set out in Chapter 1, assessment in accordance with the Habitats Regulations is required.

Forth Islands SPA

69. The Forth Islands SPA consists of a series of islands in the Firth of Forth. The islands of Inchmickery, Isle of May, Fidra, The Lamb, Craigeith and Bass Rock were classified in 1990 and an extension to the site, consisting of Long Craig, was classified in 2004.

70. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- Migratory species including:
 - **Northern Gannet**, representing 8.2% of world's biogeographical population and 13.6% of the Great Britain population); and
 - **Atlantic Puffin**, (representing 1.5% of the total F.a.grabae biogeographic population and 3.1% of the Great Britain population).
- In excess of 20,000 individual seabirds during the breeding season including, in addition to Northern Gannet and Atlantic Puffin:
 - **Razorbill** representing 1.4% of the Great Britain population;
 - **Common Guillemot** representing 2.2% of the Great Britain population; and
 - **Black-legged Kittiwake** representing 1.7% of the Great Britain population.

71. The conservation objectives for the Forth Islands SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

Fowlsheugh SPA

72. Fowlsheugh SPA is a stretch of sheer cliffs on the east coast of Aberdeenshire plus a two-kilometre extension into the marine environment. The cliffs were designated in 1992 and the marine extension in 2009.

73. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- Migratory species including:
 - **Common Guillemot** representing 5% of the Great Britain population; and

- **Black-legged Kittiwake** representing 7.5% of the Great Britain population.
- In excess of 20,000 individual seabirds during the breeding season including:
 - **Razorbill** representing 3.9% of the Great Britain population.

74. The conservation objectives for the Fowlsheugh SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

St Abb's Head to Fast Castle SPA

75. St Abb's Head to Fast Castle SPA comprises an area of sea cliffs and 1km marine extension stretching over 10km along the Berwickshire Coast. The cliffs were designated in 1997 and the marine extension in 2009.

76. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- In excess of 20,000 individual seabirds during the breeding season including:
 - **Razorbill** representing 1% of the Great Britain population;
 - **Common Guillemot** representing 3% of the Great Britain population; and
 - **Black-legged Kittiwake** representing 4% of the Great Britain population.

77. The conservation objectives for the St Abb's Head to Fast Castle SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

East Caithness Cliffs

78. The East Caithness Cliffs SPA includes most of the sea-cliff areas between Wick and Helmsdale on the north-east coast of the Scottish mainland and includes an approximate 2km seaward extension. It was designated in 1996 and the marine extension in 2009.

79. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- In excess of 20,000 individual seabirds during the breeding season including:
 - **Razorbill** representing 2% of the Great Britain population;

- o **Common Guillemot** representing 3% of the Great Britain population; and
- o **Black-legged Kittiwake** representing 1% of the Great Britain population.

80. The conservation objectives for the East Caithness Cliffs SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

North Caithness Cliffs

81. The North Caithness Cliffs SPA includes sea-cliffs and islands at the north coast of the Scottish mainland. It includes a seaward extension that extends approximately 2km into the marine environment to include the seabed, water column and surface. It was designated in 1996 and the marine extension in 2009.

82. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- In excess of 20,000 individual seabirds during the breeding season including:
 - o **Razorbill** representing 3% of the Great Britain population;
 - o **Common Guillemot** representing 4% of the Great Britain population; and
 - o **Black-legged Kittiwake** representing 3% of the Great Britain population.

83. The conservation objectives for the North Caithness Cliffs SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

Troup, Pennan and Lion’s Heads

84. The Troup, Pennan and Lion’s Heads SPA is a 9km stretch of sea cliffs along the Aberdeenshire coast in Scotland. It includes a seaward extension that extends approximately 2km into the marine environment to include the seabed, water column and surface. It was designated in 1997 and the marine extension in 2009.

85. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- In excess of 20,000 individual seabirds during the breeding season including:

- o **Black-legged Kittiwake** representing 6% of the Great Britain population;
- o **Common Guillemot** representing 4% of the Great Britain population.

86. The conservation objectives for the Troup, Pennan and Lion's Heads SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

Buchan Ness to Collieston Coast

87. The Buchan Ness to Collieston Coast SPA is a stretch of south-east facing cliff in Aberdeenshire, Scotland. It includes a seaward extension that extends approximately 2km into the marine environment to include the seabed, water column and surface. It was designated in 1998 and the marine extension in 2009.

88. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- In excess of 20,000 individual seabirds during the breeding season including:
 - o **Common Guillemot** representing 1% of the Great Britain population; and
 - o **Black-legged Kittiwake** representing 6% of the Great Britain population.

89. The conservation objectives for the Buchan Ness to Collieston Coast SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

Farne Islands

90. The Farne Islands SPA is a group of low-lying islands 2-6km off the coast of Northumberland in north-east England. It includes a seaward extension that extends approximately 2km into the marine environment to include the seabed, water column and surface. It was designated in 1996 and the marine extension in 2009.

91. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- In excess of 20,000 individual seabirds during the breeding season including:
 - o **Common Guillemot** representing 2% of the biogeographic population; and

- o Seabird assemblage including Black-legged Kittiwake.

92. The conservation objectives for the North Caithness Cliffs SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

Flamborough and Filey Coast SPA

93. The Flamborough and Filey Coast SPA is a stretch of cliffs running along the Yorkshire coast. It includes a seaward extension that extends approximately 2km into the marine environment to include the seabed, water column and surface. The Flamborough Head and Bempton Cliffs SPA was originally designated in 1993 for its internationally important colony of Kittiwakes. In 2016, the protected area was extended and renamed as the Flamborough and Filey Coast SPA. This extension provided specific protection to another three species, the overall seabird assemblage, and the terrestrial cliff environment of Filey Brigg. The revised SPA also protects the inshore waters around the seabird breeding cliffs, from mean low water to 2km offshore.

94. It qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- In excess of 20,000 individual breeding seabirds and more than 1% of the biogeographical population of four regularly occurring migratory species;
 - o **Black-legged Kittiwake** (2% North Atlantic);
 - o **Northern Gannet** (2.6% North Atlantic);
 - o **Common Guillemot** (15.6% North Atlantic);
 - o **Razorbill** (2.3% North Atlantic); and
 - o **Seabird assemblage** including over 2,000 individual **Northern Fulmar**

95. The conservation objectives for the Flamborough and Filey Coast SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

Hoy SPA

96. Hoy is a mountainous island at the south-western end of the Orkney archipelago. Hoy SPA covers the northern and western two-thirds of Hoy island, which is formed of Old Red Sandstone and contains Orkney's highest hills, and adjacent coastal waters. The SPA supports an extremely diverse mixture of mire, heath and alpine vegetation and Britain's most northerly native woodland. These upland areas and the high sea cliffs at the coast support an important assemblage of moorland breeding birds and breeding seabirds.

97. It was designated in December 2000 with a marine extension on 25 September 2009 and qualifies under Article 4(2) of the Birds Directive by regularly supporting 120,000 seabirds including nationally important populations of the following species:

- **Atlantic puffin** (3,500 pairs, 0.7% of the GB population);
- **Black-Legged Kittiwake** (3,000 pairs, 0.6% of the GB population);
- **Arctic Skua** (59 pairs, 2% of the GB population);
- **Northern Fulmar** (35,000 pairs, 6% of the GB population);
- **Great Black-Backed Gull** (570 pairs, 3% of the GB population);
- **Common Guillemot** (13,400 pairs, 2% of the GB population).

98. The conservation objectives for Hoy SPA are:

"To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species"*

Rousay

99. Rousay is an island off the north-east of Orkney. The SPA consists of sea cliffs and areas of maritime heath and grassland in the northwest and northeast of the island.

100. It was designated in February 2000 with a marine extension in 2009 and qualifies under article 4(1) and 4(2) of the Birds Directive by regularly supporting 30,000 seabirds including nationally important populations of the following species:

- **Arctic Tern** (790 pairs, 2% of the GB population),
- **Arctic Skua** (130 pairs; 4% of the GB population),
- **Black-legged Kittiwake** (4,900 pairs; 1% of the GB population),
- **Common Guillemot** (10,600 individuals, 1% of the GB population),
- **Northern Fulmar** (1,240 pairs, 0.2% of GB population).

101. The conservation objectives for Rousay SPA are:

“To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species”*

Proximity of Marine Protected Areas

Outer Firth of Forth and St Andrews Bay Complex SPA

102. The Outer Firth of Forth and St Andrews Bay Complex SPA is a large estuarine and marine site consisting of the adjacent Firth of Forth and Tay. It attracts one of the largest and most diverse marine bird concentrations in Scotland. It complements adjacent SPAs including the Forth Islands SPA.

103. It was designated in 2020 and qualifies under Article 4(2) of the Birds Directive due to the regular presence of:

- Migratory species including:
 - **Northern Gannet** (*Morus bassanus*), representing 1.4% of biogeographical population and 2.7% of the Great Britain population.
- In excess of 20,000 individual seabirds during the breeding season including:
 - **Atlantic Puffin** (*Fratercula arctica*) representing 5.3% of the Great Britain population,
 - **Black-legged Kittiwake** (*Rissa tridactyla*) representing 1.6% of the Great Britain population and;
 - More than 2,000 individual **Common Guillemots** (*Uria aalge*).
- In excess of 20,000 individual seabirds during the non-breeding season including more than 2,000 individual **Common Guillemot**, **Black-legged Kittiwake**, and **Razorbill** (*Alca torda*).

104. The draft conservation objectives for the Outer Firth of Forth and St Andrews Bay Complex SPA are:

“To ensure that the qualifying features of the Outer Firth of Forth and St Andrews Bay Complex SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status.

To ensure that the integrity of the Outer Firth of Forth and St Andrews Bay Complex SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:

- *The populations of qualifying features are viable components of the site.*
- *The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species.*

- *The supporting habitats and processes relevant to the qualifying features and their prey/food resources are maintained, or where appropriate restored, at the Outer Firth of Forth and St Andrews Bay Complex SPA.”*

105. Black-legged Kittiwake and other species are considered to be in an unfavourable condition and therefore there is an overarching ‘restore’ objective for the site. Should plans or projects compromise the ability of the unfavourable qualifying features to recover (e.g. result in a further decline or accelerate the rate of decline, or prevent a recovery from occurring), then the Outer Firth of Forth and St Andrews Bay Complex SPA will not make an appropriate contribution to achieving Favourable Conservation Status (FCS) across the Atlantic Biogeographic Region.

Specific comments on RIAA

106. The RIAA provides screening and impact apportioning for nine species of breeding seabird; Arctic tern, black-legged kittiwake, herring gull, great black-backed gull, Atlantic puffin, razorbill, common guillemot, northern fulmar and northern gannet. From these, greater black-backed gull were determined to not reach the threshold of either the 0.02 or 0.2 percentage point thresholds for development alone or in-combination assessment.

107. Using Population Viability Analysis and NatureScot’s preferred assessment rates, the document concludes that several seabird species face potential population-level impacts that would prevent the achievement of conservation objectives, with kittiwake being the most frequently affected feature across sites, alongside significant concerns for guillemot, razorbill, puffin and gannet. These occur at nine SPAs along the north and east coast Scottish and English coast.

108. The key finding is that Adverse Effects on Integrity (AEOI) cannot be ruled out for multiple SPAs, primarily through in-combination impacts rather than the array alone.

109. **Table 2.** Summary of focal species counterfactual of population size (CPS) and associated confidence intervals (CI) for Special Protection Areas (SPAs) identified during scoping. CPS relate to NatureScot “High” Impact Scenario in combination with consented developments and relate to combined collision and displacement impacts on kittiwake and gannet populations and displacement impacts on guillemot and razorbill populations, after 30 years

SPA	Species	CPS	CI	Table ¹
Buchan Ness to Collieston Coast	Kittiwake	0.800	0.770 – 0.831	3.9
East Caithness Cliffs	Kittiwake	0.720	0.700 – 0.739	3.9
	Guillemot	0.730	0.724 – 0.736	3.17
	Razorbill	0.766	0.748 – 0.785	3.21
Flamborough and Filey Coast	Kittiwake	0.773	0.757 – 0.788	3.9
	Razorbill	0.704	0.684 – 0.723	3.21
Forth Islands	Gannet	0.789	0.778 – 0.800	3.3
Fowlsheugh	Kittiwake	0.716	0.690 – 0.740	3.9
North Caithness Cliffs	Kittiwake	0.769	0.726 – 0.813	3.9
	Razorbill	0.832	0.777 – 0.889	3.21
	Puffin	0.709	0.610 – 0.831	3.23
Sule Skerry and Sula Stack	Guillemot ²	0.685	0.665 – 0.706	3.17
Troup, Pennan and Lion’s Head	Kittiwake	0.792	0.760 – 0.825	3.9

	Razorbill	0.848	0.797 – 0.899	3.21
West Westray	Kittiwake	0.616	0.569 – 0.669	3.9

1. Table reference RIAA Part 3 Appendix 3B

2. No connectivity between BB and the relevant Guillemot SPAs, so BB not included

Copinsay

- 110. Copinsay is a SSSI with guillemot, kittiwake and breeding seabird colonies listed as features. It is also a SPA for breeding fulmar, great black-backed gull, guillemot and kittiwake.
- 111. The island is 28 km from the proposed development, well within the foraging range of many seabird species, and so Ayre is the likely key driver of any impact over other in combination impacts.
- 112. The seabird assemblage, breeding kittiwake, great black-backed gull and guillemot are all in unfavourable condition. Only Fulmar are listed as favourable status. All species are either amber or red listed.
- 113. The RIAA reports a CPS of 0.910 (0.798-1.040) for kittiwake and 0.900 (0.882-0.919) for guillemot using the NatureScot High Impact Scenario guidance. Given the conservation status of the features, we are concerned by the additional pressure a reduction in population size of 9 or 10% would have.
- 114. We are therefore unable to reach conclusions of significance for the Copinsay SPA.

SPA impacts

- 115. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Kittiwake at the Buchan Ness to Collieston SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.993 and 0.998. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 80.0 and 84.6% of what it would have been in the absence of the development.
- 116. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Kittiwake at the East Caithness Cliffs SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.989 and 0.993. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 72.0 and 80.2% of what it would have been in the absence of the development.
- 117. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are

predicted to result in the annual population growth rate of Guillemot at the East Caithness Cliffs SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.990 and 0.995. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 73.0 and 85.0% of what it would have been in the absence of the development.

118. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Razorbill at the East Caithness Cliffs SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.991 and 0.996. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 76.6 and 87.9% of what it would have been in the absence of the development.
119. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Kittiwake at the Flamborough and Filey Coast SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.992 and 0.993. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 77.3 and 79.4% of what it would have been in the absence of the development.
120. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Razorbill at the Flamborough and Filey Coast SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.989 and 0.994. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 70.4 and 83.2% of what it would have been in the absence of the development.
121. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Gannet at the Forth Islands SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.992 and 0.995. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 78.9 and 84.8% of what it would have been in the absence of the development.
122. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Kittiwake at the

Fowlsheugh SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.989 and 0.992. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 71.6 and 77.7% of what it would have been in the absence of the development.

123. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Kittiwake at the North Caithness Cliffs SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.992 and 0.994. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 76.9 and 82.5% of what it would have been in the absence of the development.
124. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Razorbill at the North Caithness Cliffs SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.994 and 0.997. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 83.2 and 92.3% of what it would have been in the absence of the development.
125. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Puffin at the North Caithness Cliffs SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.989 and 0.993. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 70.9 and 81.2% of what it would have been in the absence of the development.
126. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Guillemot at the Sule Skerry and Sula Stack SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.988 and 0.993. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 68.5 and 79.8% of what it would have been in the absence of the development.
127. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Kittiwake at the Troup, Pennan and Lion's Head SPA declining with a ratio of impacted to unimpacted population growth

rate of between 0.993 and 0.995. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 79.2 and 84.7% of what it would have been in the absence of the development.

128. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Razorbill at the Troup, Pennan and Lion's Head SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.995 and 0.998. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 84.8 and 92.9% of what it would have been in the absence of the development.
129. Within the range of likely mortalities derived using the methods advocated by NatureScot, Marine Scotland Science and the RSPB during scoping, the impacts arising from distributional change and collision mortality associated with Ayre Offshore Wind Farm in combination with other North Sea wind farms are predicted to result in the annual population growth rate of Kittiwake at the West Westray SPA declining with a ratio of impacted to unimpacted population growth rate of between 0.985 and 0.989. This means that after the 30-year lifetime of Ayre Offshore Wind Farm, the population size of the SPA is expected to be between 61.6 and 71.2% of what it would have been in the absence of the development.

Appendix 2

RSPB Scotland commentary on the Applicant's proposed compensation measures

1. RSPB Scotland approach to evaluating compensation measures

Introduction

1.1. In short - it is vital that details and evidence are provided to enable confidence ecologically, financially and legally, in the compensation proposals and such information must be available for review by all Interested parties. This section sets out RSPB Scotland's approach to evaluating compensation measures. It includes our general approach to assessing compensation proposals and the level of detail we consider is required in order to evaluate compensation proposals as part of the Application's determination, before drawing out some general issues raised by the Applicant's proposals. We have set it out under the following headings:

- RSPB Scotland's approach to assessing compensation proposals;
- What level of detail is required on proposed compensation measures?
- Generic issues raised by the Applicant's compensation proposals:
 - Lack of specific proposals and locations for compensation measures
 - Scale of compensation
 - Lead-in times for compensation
 - Lifetime of compensation in relation to damage
 - Environmental assessment of the proposed compensation measures.

RSPB Scotland's approach to assessing compensation proposals

1.2. Set out below is the key criteria and requirements from the EC guidance¹ on compensatory measures, along with additional commentary based on RSPB Scotland's experience of the principles that should be applied when assessing compensatory measures.

¹ EC (2018) Managing Natura 2000 sites – The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (21/11/18) C(2018) 7621 final

EC criteria	EC guidance summary (emphasis added)	RSPB Scotland additional commentary
Targeted	<p>Measures should be the most appropriate to the impact predicted and focused on objectives and targets addressing the Natura 2000 elements affected.</p> <p>Must refer to structural and functional aspects of site integrity and habitats/species affected.</p> <p>Must consist of ecological measures: payments to individuals/funds are not appropriate.</p>	<p>Clear objectives and success criteria must be established for the compensation measures.</p> <p>Must address the ecological functions and processes required by impacted species/habitat. Requires shared understanding and agreement on what the impacts are i.e. need to agree nature, magnitude including that they will continue for as long as the project's impacts. This includes the time likely to be required for the SPAs to recover from those impacts in the case of proposals that are in place for a specified time period.</p> <p>This is in order to define objectives for compensation measures and to set out the success criteria to determine whether those objectives have been/are being achieved.</p>
Effective	<p>Based on best scientific knowledge available alongside specific investigations for the location where the measures will be implemented. Must be feasible and operational in reinstating the conditions needed to ensure the overall coherence of the Natura 2000 network.</p> <p>Measures where no reasonable guarantee of success should not be considered. The likely success of the compensation scheme should influence final approval of the plan or project in line with the prevention principle.</p> <p>The most effective option, with the greatest chance of success, must be chosen.</p> <p>Detailed monitoring required to ensure long-term effectiveness with remediation provisions if shown to be less effective.</p>	<p>Scientific evaluation of proposed measures must be carried out before consent is granted to avoid agreeing to measures that is/are not effective or technically feasible. This should include appropriate baseline survey and assessment.</p> <p>Compensation must address the impacted SPAs features to ensure overall coherence of the network for that feature is maintained. Substitution is not acceptable.</p> <p>Must be clearly defined timescales for delivery and measuring success (See success criteria under Targeted above).</p> <p>Monitoring must directly relate to the target species and the relevant ecological functions and processes.</p> <p>The compensation measures should be provided in perpetuity in line with obligations to ensure the overall coherence of the UK Site Network is maintained.</p> <p>Where it is not possible to devise compensatory measures to offset the adverse effects on site integrity, the project should not proceed.</p>
Technical feasibility	<p>Design must follow scientific criteria and evaluation in line with best scientific knowledge and take into account the specific requirements of the ecological features to be reinstated.</p>	<p>See Effective above.</p>
Extent	<p>Extent required directly related to:</p>	<p>Based on an assessment of the necessary ecological requirements to restore species' populations and the related habitat structure and functions identified in the compensation objectives. Determining the minimum</p>

EC criteria	EC guidance summary (emphasis added)	RSPB Scotland additional commentary
	<ul style="list-style-type: none"> - the quantitative and qualitative aspects inherent to the elements of integrity likely to be impaired - estimated effectiveness of the measure(s) <p>Therefore, ratios best set on a case-by-case basis. Ratios should generally be well above 1:1. Ratios of 1:1 or below only considered when shown measures will be fully effective in reinstating structure and functionality in a short period of time.</p>	<p>appropriate quantity will require an understanding of the quality of the compensation measures and how effective they will be in reinstating the required structures and functions. Any identified uncertainty in success should be factored in to increased ratios.</p> <p>Ratios need to be used where they make ecological sense and will help secure a successful outcome by providing more of something. Simply multiplying capacity to address uncertainty risks giving a false level of confidence.</p> <p>If there is no reasonable guarantee of success that measure should not be considered (see Effective under EC criteria).</p>
Location	<p>Located in areas where they will be most effective in maintaining overall coherence of the Natura 2000 network.</p> <p>Pre-conditions to be met include:</p> <ul style="list-style-type: none"> - must be within same range/ migration route/wintering areas for bird species and provide functions comparable those justifying selection of original site esp. geographical distribution; - must have/be able to develop the ecological structure and functions required by the relevant species (or habitat) - must not jeopardise integrity of any other Natura 2000 site. <p>Spatial search hierarchy starting as close as possible to the impacted Natura 2000 site and working out from there.</p>	<p>While the preference is for compensation measures as geographically close to the location of the damage, it is important to consider whether or not the compensation measures will be subject to pressures impacting their efficacy in that location e.g. prey availability, disturbance, and/or other impacts from the same or similar developments such as collision risk or displacement due to offshore wind farms.</p> <p>Therefore, compensation measures should be located so as to maximise proximity while minimising external pressures that may reduce likelihood of success.</p> <p>Compensation measures proposed to benefit SPA features must not result in damage to the integrity of any other SPA, SAC or Ramsar site and their features.</p>
Timing	<p>Case by case approach but must provide continuity in the ecological processes essential to maintain the structure and functions that contribute to the Natura 2000 network coherence.</p> <p>Requires tight co-ordination between implementation of the plan or project and the compensation measures.</p> <p>Factors to consider include:</p> <ul style="list-style-type: none"> - no irreversible damage to the site before compensation in place 	<p>Compensation measures should be fully functional before any damage occurs to ensure the overall coherence of the UK Site Network is protected. This requires careful alignment of the timelines for implementing the plan or project and the compensation measures.</p> <p>Suggested time lags in delivering fully functional compensation will need to be carefully considered and can only be accepted where this will not compromise the continuity of essential ecological processes,</p> <p>Any effect of delay should be factored into the design and additional compensation measures provided (see also Extent above).</p>

EC criteria	EC guidance summary (emphasis added)	RSPB Scotland additional commentary
	<ul style="list-style-type: none"> - compensation operational at the time damage occurs. If not possible, over-compensation required - time lags only admissible if will not compromise objective of “no net loss” to coherence of Natura 2000 network; - May be possible to scale down in time depending on whether the negative effects are expected to arise in short, medium or long term. <p>All technical, legal or financial provisions must be completed before plan or project implementation starts to prevent unforeseen delays that compromise effective compensation measures.</p>	
Long-term implementation	Legal and financial security required for long-term implementation and for protection, monitoring and maintenance of sites to be secured before impacts occur.	<p>Legal rights to secure and implement the compensation measures must be in place prior to consent being granted.</p> <p>And robust financial guarantees are required to fund implementation, monitoring and any necessary remediation measures.</p>

Table 1: Criteria for designing compensatory measures

Predator Rat/Mink Control

- 1.3. While we are supportive in principle of mink/rat control measures, RSPB Scotland require further details to determine whether it is acceptable to be used as a compensation measure for seabirds. Results from a number of studies have shown varying effects of mink control on seabirds. In the Scottish West Coast, terns have shown higher breeding success at controlled sites, compared to uncontrolled sites (Ratcliffe et al., 2006²; Ratcliffe et al., 2008³). In the Archipelago National Park, Finland, Mink have been controlled since the 1990s. The effect it has had on biodiversity has been substantial, with many seabirds, land birds, and water birds having benefited from it (Nordstrom et al., 2003; Banks et al., 2008). Of the seabirds at this site, Great Black-backed Gulls have not shown signs of change since the control, Razorbills have recolonised the sites, and Arctic Skuas, Arctic Terns and Common Gulls have increased their breeding success.
- 1.4. While we acknowledge there is good evidence of the removal of mink increasing local populations of razorbill, we also agree with the applicant that “Examples of mink predation of razorbill are limited by both the difficulty in accessing or even observing razorbill nesting locations” We also request that further information of the types of colonies where mink predation has been a problem is required such as the nature of the habitat in which Razorbill

² Ratcliffe, N., Houghton, D., Mayo, A., Smith, T., Scott, M., 2006. The breeding biology of terns on the western isles in relation to mink eradication. *Atlantic Seabirds* 8, 127-135

³ Ratcliffe, N., Craik, C., Helyar, A., Roy, S., Scott, M., 2008. Modelling the benefits of American Mink *Mustela vison* management options for terns in west Scotland. *Ibis* 150, 114-121

nesting. For example, Nordström and Korpimäki, 2004⁴ describe mink as having a negative effect on Razorbill population on small Baltic islands and mink removal having positive effect on these populations (Nordström et al., 2003)⁵ However, these were very low lying islands with the auks nesting under relatively accessible boulders. It would be expected for the situation with cliff nesting, and much less accessible, Razorbill to be rather different.

- 1.5. For any mink management (eradication or control) measure to work, the RSPB notes there needs to be evidence of:
 - Mink predation of the species required to benefit from the measure (Kittiwake, Razorbill and, preferably, Guillemot); and that:
 - The predation is having a detrimental effect on the target colony e.g. evidence of reduced breeding productivity; and
 - Evidence that the proposed measure can be successfully implemented and maintained in practical terms; and
 - That the species targeted to benefit will respond positively to the measure implemented.
- 1.6. While mink predation on seabirds can be extensive, it can also take the form of isolated incidents that can be unpredictable, both in terms of magnitude and of timing of occurrence. This adds considerable uncertainty to outcome predictions of implementation of the measure and as such there would need to be a rigorous monitoring programme in place as an important component of the measure. Any compensation must also take account of other mammalian predators that may be present in addition to the target species. Further to this, for this measure to be acceptable as compensation there would also need to be a detailed adaptive management plan in place detailing how this measure would be implemented, monitored and the triggers for adapting the measures when necessary. While predator control is welcomed more detail is required and we will look forward to seeing any further detail provided.

Seabird Bycatch Reduction

- 1.7. In addition to the concerns expressed above about the proposed approach to providing compensation through Mink Control, RSPB Scotland has a number of concerns about the proposed approach to providing compensation through seabird (Razorbill and Northern Gannet) bycatch reduction.
- 1.8. It is recognised that bycatch (the incidental capture of non-target species in fishing activity) is one of the leading drivers of seabird population declines (Dias et al, 2019), with thousands of seabirds killed through bycatch every year in the UK (Northridge et al, 2020) and therefore it is vital reduction measures are brought forward. However, due to low levels of direct monitoring on vessels, the true levels of seabird mortality in fishing gear are likely to be underestimated.
- 1.9. In the UK, high risk gear types for seabird bycatch include longlines and gillnets. While best practice mitigation measures exist for some gear types like longlines, effective measures for gillnets are yet to be established and require further research, e.g., spatial/temporal measures, above-water deterrents (looming eye buoys and predator-shaped kites) and gear-switching.

⁴ Nordström, M., & Korpimäki, E. (2004). Effects of island isolation and feral mink removal on bird communities on small islands in the Baltic Sea. *Journal of Animal Ecology*, 73(3), 424-433

⁵ Nordström, M., Högmänder, J., Laine, J., Nummelin, J., Laanetu, N., & Korpimäki, E. (2003). Effects of feral mink removal on seabirds, waders and passerines on small islands in the Baltic Sea. *Biological Conservation*, 109(3), 359-368.

1.10. RSPB Scotland notes Table 3.4 in the Appendix 2 Compensation Plan Derogation Case, but disagrees with the summary conclusion therein that seabird bycatch reduction should be pursued as compensation measures. We believe seabird bycatch reduction should be being done as part of the Scottish Government's seabird protection and conservation duties. Whilst it may be possible for some bycatch measures to be strategic compensation in the future, we have grave concerns about such measures being suggested for project level compensation as here. Even if deemed acceptable, RSPB Scotland object to such measures being taken in Portugal.

Summary of pre-requisites to assess a bycatch reduction proposal

1.11. To determine if the Applicant's proposed bycatch measures are feasible and effective, we consider it helpful to assess their proposals against the ACAP Best Practice Seabird Bycatch Mitigation Criteria and Definition⁶, which are outlined below. ACAP is a formal agreement under the Convention on the Conservation of Migratory Species of Wild Animals (known as CMS), to which the UK is one of 13 global Parties. The Seabird Bycatch Working Group of ACAP comprises representatives from these Parties, alongside invited experts with technical expertise. As such, it is the most widely recognised and credible forum for assessing and determining best practice seabird bycatch mitigation techniques.

- Individual fishing technologies and techniques should be selected from those shown by experimental research to significantly reduce the rate of seabird incidental mortality⁷ to the lowest achievable levels. Experimental research yields definitive results when performance of candidate mitigation technologies is compared to a control (no deterrent), or to status quo in the fishery. When testing relative performance of mitigation approaches, analysis of fishery observer data can be plagued with a myriad of confounding factors. Where a significant relationship is demonstrated between seabird behaviour and seabird mortality in a particular system or seabird assemblage, significant reductions in seabird behaviours, such as the rate of seabirds attacking baited hooks, can serve as a proxy for reduced seabird mortality. Ideally, where simultaneous use of fishing technologies and practices is recommended as best practice, research should demonstrate significantly improved performance of the combined measures.
- Fishing technologies and techniques, or a combination thereof, should have clear and proven specifications and minimum performance standards for their deployment and use. Examples would include: specific bird scaring line designs (lengths, streamer length and materials; etc.), number and deployment specifications (such as aerial extent and timing of deployment); night fishing defined by the time between the end of nautical dusk and start of nautical dawn; and, line weighting configurations specifying mass and placement of weights or weighted sections.
- Fishing technologies and techniques should be demonstrated to be practical, cost effective and widely available. Commercial fishing operators are likely to select for seabird bycatch reduction measures and devices that meet these criteria including practical aspects concerning safe fishing practices at sea.

⁶ ACAP (2021) ACAP Review of mitigation measures and Best Practice Advice for Reducing the Impact of Pelagic Longline Fisheries on Seabirds. In: ACAP - Twelfth Meeting of the Advisory Committee. Online

⁷ This may be determined by either a direct reduction in seabird mortality or by reduction in seabird attack rates, as a proxy

- Fishing technologies and techniques should, to the extent practicable, maintain catch rates of target species. This approach should increase the likelihood of acceptance and compliance by fishers.
 - Fishing technologies and techniques should, to the extent practicable, not increase the bycatch of other taxa. For example, measures that increase the likelihood of catching other protected species such as sea turtles, sharks and marine mammals, should not be considered best practice (or only so in exceptional circumstances).
 - Minimum performance standards and methods of ensuring compliance should be provided for fishing technologies and techniques, and clearly specified in fishery regulations. Relatively simple methods to check compliance should include, but not be limited to, port inspections of branch lines to determine compliance with branch line weighting, determination of the presence of davits (tori poles) to support bird scaring lines, and inspections of bird scaring lines for conformance with design requirements. Compliance monitoring and reporting should be a high priority for enforcement authorities.
- 1.12. Despite these concerns should such measures be taken forward as compensation for this Application it is vital bycatch reduction measures for Razorbill and Northern Gannet first are considered within Scottish waters to ensure such measures are more closely aligned with potential effects to our resident seabird populations due to this Application. Therefore, the bycatch reduction measure referenced in Table 3.4 in the Appendix 2 Compensation Plan Derogation Case should only be progressed in Scottish waters but once more direct and more efficient measures have been considered and only if those measures are not possible legally, financially or ecologically.
- 1.13. As set out in detail above, it is vital as set out in detail above that any harm (or potential harm) caused by developments are “compensated”. That compensation must not only be targeted at the protected sites and species to be potentially harmed but also as close as possible to that harm and crucially fulfilment of the requirement to protect the integrity and coherence of the **UK** International Sites’ network. Therefore UK measures must be prioritised.
- 1.14. If measures are not possible close to the harm, it becomes even more vital that the measures have connectivity to the SPA species UK populations impacted upon. It is not clear at this stage where the measures proposed would be implemented and this is critical in terms of our response. It appears to be the case that both in relation to bycatch reduction and predator eradication that the applicant is seeking a compensation condition, assumed to be on similar lines to that used in the Berwick Bank case. However, we would expect a greater level of detail to be provided at this stage to convince us that the compensation measures can be sufficient in quantitative terms and are appropriate in terms of location. For instance, we are aware that the compensation options for Dogger Bank South in English waters have gone as far as providing specific letters of comfort from landowners that they will allow access for measures to be carried out. It may be the case that a strategic approach through the Marine Recovery Fund becomes a viable option for the project. However, this is not the case at the moment, and we are aware that recently the Scottish Government has been encouraging developers to continue to pursue project-based measures that we assume they later be captured by the strategic approach.

- 1.15. When the Energy Act 2023 strategic compensation is up and running, it is wholly possible that bycatch could be a measure to be considered in the future due to additional possibility that Act enables, meaning bycatch could be considered as an option for strategic compensation as part of the fulfilment of objectives of the Fisheries Act 2020, which include minimising and, where possible, eliminating incidental catches of sensitive species, including seabirds and addressing bycatch in respect of achieving Good Environmental Status (GES) for descriptor Birds (D1, D4), through being a signatory, for example, to the Joint Fisheries Statement. Key target fisheries operating within UK waters are likely to also include non-UK registered vessels. For bycatch mitigation to realise the most benefit, all vessels will need to be targeted. Therefore, any measures developed will need to target all vessels operating in UK/Scottish waters (depending on the target region).
- 1.16. RSPB Scotland expects that all trials for bycatch mitigation measures should be accompanied by Remote Electronic Monitoring (REM) with cameras onboard all vessels, to allow for robust testing to determine effective application of the mitigation as well as the ecological impact. To withstand peer review scrutiny, standards will need to be agreed on data transparency, data analysis, and presentation of data and results.

2. Conclusions

- 2.1. Noting the comments above the submission of, and consultation on additional information is required to ensure that full consideration of legally, ecologically and financially appropriate and possible Compensation measures relating to the SPAs and their species that will and or may be affected by the Application and only if these are not feasible should alternative solutions be considered. The current level of detail is generic in nature and while referring to the National Site Network no locations are provided for those measures proposed. Consequently, RSPB Scotland objects to the compensation proposals as they currently stand.
- 2.2. RSPB Scotland would welcome further detail on the measures proposed so that an assessment can be made of their efficacy and quantity as well as the geographic relation with the impacts that are predicted to occur. We would also recommend that the developer utilises strategic compensation through the Marine Recovery Fund, particularly given the early stage that the measure appear to be at.

Royal Yachting
Association
Scotland

From: [Pauline McGrow](#)
To: [MD Marine Renewables](#)
Subject: RE: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026
Date: 24 December 2025 09:34:13
Attachments: [image002.png](#)
[image003.png](#)

Hi Amy,

I write to inform you that RYA Scotland has no objections to this application.

Kind Regards

Pauline

Pauline McGrow
Business Support Lead

Royal Yachting Association Scotland

T: [Redacted]

E: [Redacted]



Protecting your personal information is important to us, view our full Privacy Statement [here](#)

Sanday Community Council

From: [sandaycc clerk](#)
To: [MD Marine Renewables](#)
Subject: Re: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA
Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026
Date: 09 February 2026 16:02:09
Attachments: [image001.png](#)

Hello Amy,

Yes sorry, there were no comments.

Kind regards

Gail

Clerk to Sanday Community Council

**Scottish
Environment
Protection Agency**

From: [Planning.North](#)
To: [MD Marine Renewables](#)
Cc: [Amy Woodward](#)
Subject: PCS-20007543 SEPA Response to MS-00011515 / MS-00011516
Date: 16 December 2025 11:42:54
Attachments: [image.png](#)

To Whom It May Concern,

Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017
MS-00011515 / MS-00011516 - Ayre offshore wind farm marine licence
consultation, land 1500M east of Old Free Church Manse, Bower

Thank you for the above consultation. Based on the information provided, it appears that this application falls below the thresholds that SEPA provide site specific advice. Please refer to our standing advice and other guidance, which is available on our [website](#). Please also refer to our SEPA standing advice for the Department for Business, Energy and Industrial Strategy and Marine Scotland on marine consultations available [here](#). (You may also wish to view our consultation response to Highland Council on terrestrial planning matters, via their online portal [Simple Search](#), planning reference 25/02964/PIP.)

If there is a significant site-specific issue, not addressed by our guidance or other information provided on our website that you would want our advice on, then please reconsult us highlighting the issue in question and we will try our best to assist.

from
Nina Caudrey
Senior Planning Officer



For the future of our environment

Disclaimer

The information contained in this email and any attachments may be confidential and is intended solely for the use of the intended recipients. Access, copying or re-use of the information in it by any other is not authorised. If you are not the intended recipient, please notify us immediately by return email to postmaster@sepa.org.uk. Registered office: SEPA, Angus Smith Building, 6 Parklands Avenue, Eurocentral, Holytown, North Lanarkshire, ML1 4WQ. Communications with SEPA may be monitored or recorded or released in order to secure the effective operation of the system and for other lawful purposes.

Dh'fhaodadh gum bi am fiosrachadh sa phost-d seo agus ceanglachan sam bith a tha na chois diomhair, agus cha bu chòir am fiosrachadh a bhith air a chleachdadh le neach sam bith ach an

luchd-faighinn a bha còir am fiosrachadh fhaighinn. Chan fhaod neach sam bith eile cothrom fhaighinn air an fhiosrachadh a tha sa phost-d no a tha an cois a' phuist-d, chan fhaod iad lethbhreac a dhèanamh dheth no a chleachdadh arithist. Mura h-ann dhuibhse a tha am post-d seo, feuch gun inns sibh dhuinn sa bhad le bhith cur post-d gu postmaster@sepa.org.uk. Togalach Aonghais Mhic a' Ghobhainn, 6 Craobhruid Parklands, Eurocentral, Baile a' Chuilinn, Siorrachd Lannraig a Tuath, ML1 4WQ. Faodar conaltradh còmhla ri SEPA a sgrùdadh no a chlàradh no a sgaoileadh gus obrachadh èifeachdach an t-siostaim a ghlèidheadh agus airson adhbharan laghail eile.

Scottish Fishermen's Federation



Our Ref: OB- MS-00011515 and MS-00011516– Ayre OWF EIA/0026/001

Your Ref: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Application

20th February 2026

Marine Directorate – Licensing Operations Team
Scottish Government
E-mail: MD.MarineRenewables@gov.scot

Scottish Fishermen's Federation
24 Rubislaw Terrace
Aberdeen, AB10 1XE
Scotland UK

T: +44 (0) 1224 646944
E: sff@sff.co.uk

www.sff.co.uk

SFF Response to MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Application

On behalf of the Scottish Fishermen's Federation (SFF), I write in response to the statutory consultation on the Section 36 Consent and associated Marine Licence Applications submitted by Ayre Offshore Wind Farm Limited, pursuant to the Electricity Act 1989, the Marine (Scotland) Act 2010, and the relevant Environmental Impact Assessment Regulations.

The SFF represents the 450 plus fishing vessels through its constituent associations, including the Anglo Scottish Fishermen's Association, Fife Fishermen's Association, Fishing Vessel Agents and Owners Association, Mallaig & North West Fishermen's Association, Orkney Fisheries Association, Scottish Pelagic Fishermen's Association, the Scottish White Fish Producer's Association and Shetland Fishermen's Association. The Chair of the North East Coast Regional Inshore Fisheries Group (NECRIFG) has been consulted and is in agreement with the content of this response.

Following a review of the submitted application and supporting documentation, SFF concludes that key aspects necessary to assess fishing interactions are not yet demonstrated. Several mitigations are deferred to post-consent plans without binding specifications. We therefore request further information prior to determination and set out conditions that would be necessary should Ministers be minded granting consent.

Policy & Legislation¹

¹ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 1, Chapter 2: Policy and Legislation. TWP-AYR-RPS-OFE-RPT-00004, November 2025

Members:

Anglo Scottish Fishermen's Association · Fife Fishermen's Association · Fishing Vessel Agents & Owners Association (Scotland) Ltd · Mallaig & North-West Fishermen's Association Ltd · Orkney Fisheries Association · Scottish Pelagic Fishermen's Association Ltd · The Scottish White Fish Producers' Association Ltd · Shetland Fishermen's Association

VAT Reg No: 605 096 748

SFF welcomes the comprehensive summary of the policy and legislative context, including recognition through the NMP2 Planning Position Statement of stakeholder concerns about cumulative impacts on fishing and displacement. However, Chapter 2 does not yet demonstrate how these policy frameworks have constrained or shaped project decisions that affect commercial fisheries. Nor does it provide an impact-aware justification for the envisaged use of Section 36A and Safety Zone powers in a floating array to minimise practical access loss for fishing vessels. Instead, it cross references topic chapters or generic mitigation schedules, which does not constitute a policy-to-design justification for minimising displacement or safeguarding fishing access. SFF requests a concise 'Policy-to-Design Mapping Addendum' that sets out, for each relevant policy (NMP/draft NMP2, SMP NE2, Orkney draft RMP Sector Policy 1), the specific design choices made to minimise displacement and safeguard access for fishing.

Chapter 2 correctly references the Marine Strategy Framework Directive (MSFD) and Good Environmental Status (GES) obligations. However, it does not reference international frameworks such as the United Nations Convention on the Law of the Sea (UNCLOS)² (due-regard/compatibility with other lawful uses) or the United Nations Convention on the Law of the Sea (ICESCR)³ (protection of livelihoods/means of subsistence). For completeness of the legal context, SFF invites the Applicant to acknowledge UNCLOS due-regard principles for other lawful uses (incl. commercial fisheries) and to explain, at a high level, how array layout, mooring spreads, cable protection and Safety Zones have been selected to be compatible with such uses.

Project Description⁴

The Project Design Envelope (PDE) described in Chapter 3 includes floating foundations, extensive mooring systems, anchoring infrastructure and dynamic cable arrangements, all of which substantially increase the real operational footprint beyond the stated 200 km² array boundary area⁵. PDE confirms that each floating foundation may move horizontally by up to 150 m, as defined by the "maximum excursion limit"⁶. At the same time, the PDE allows for mooring radii of up to 1,000 m per turbine⁷, with 6–9 mooring lines per foundation⁸ and up to 8,775 m of mooring line lying on the seabed per turbine during normal operation⁹. Although the document lists the 150 m excursion limit, this parameter is not translated into any spatial assessment or mapping. When combined with the 1,000 m mooring radii, the excursion limit materially increases the operational footprint of each floating foundation. Without visualisation or analysis of these combined spatial effects, the EIA does not present the true area that will be functionally inaccessible to fishing activity. These dynamic elements including turbine movement, mooring-line tightening/lifting, and shifting of cable touchdown points create a highly complex and hazardous obstruction field for trawling and static gear sectors. A dedicated spatial depiction of the full operational footprint is therefore required within the Project Description to enable accurate downstream impact assessment.

Chapter 3 also presents extremely large, predicted footprints of rock armour, concrete mattresses and cable protection systems across both the Array Area and Export Cable Corridor. The PDE allows:

- Up to 50% of inter-array cable lengths to require external protection, creating up to 778,500 m² of protection within the array area¹⁰.
- Up to 270,000 m² of protection for interconnector cables¹¹.

² UNCLOS: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

³ ICESCR: <https://www.ohchr.org/en/instruments-mechanisms/instruments/international-covenant-economic-social-and-cultural-rights>

⁴ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 1, Chapter 3: Project Description. TWP-AYR-RPS-OFE-RPT-00005, November 2025

⁵ Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), section 3.1.14; Figure 3.1: Proposed Development Site Boundary

⁶ Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), Table 3.3: PDE for Floating Foundations

⁷ Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), Table 3.4: PDE for Mooring Systems

⁸ Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), Table 3.6: PDE for Anchoring Options 1, 2 and 3

⁹ Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), Section 3.3.23 and Table 3.4: PDE for Mooring Systems

¹⁰ Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), Section 3.3.55–3.3.60, Table 3.13: PDE for External Cable Protection for IACs and Interconnector Cables

¹¹ Ibid

- Up to 1,620,000 m² of cable protection along the Export Cable Corridor¹².
- Up to 180,000 m³ of rock or mattress material for cable crossings¹³.

This level of hard-substrate introduction in a predominantly sedimentary region, as described in Sections 3.1.16–3.1.18, will substantially alter benthic habitats. It will also permanently restrict demersal trawling, scallop dredging, and static gear (potting) activity across broad areas of seabed. Despite this, Chapter 3 does not provide justification for why such high protection volumes are required, nor does it assess feasible alternatives such as deeper burial or re-routing to minimize rock placement. This represents a significant gap in the EIA.

Chapter 3 also sets a minimum target burial depth of 1.5 m for all cable types, inter-array, interconnector, and export cables subject to a Cable Burial Risk Assessment (CBRA). However, the same chapter identifies extensive areas of highly mobile sediments, including:

- Sandwaves exceeding 7 m in height¹⁴, and
- Migration rates of up to ~5 m per year¹⁵.

Despite this, the EIA does not consider deeper burial depths, does not outline any strategy to maintain burial integrity in mobile sandwave fields, and does not commit to re-burial obligations should cables become exposed during operation. This is a material omission because the combination of shallow burial and highly mobile seabed morphology significantly increases the likelihood of long-term cable exposure. Such exposure would necessitate further cable protection, further increasing the operational exclusion for fishing activity.

To achieve the minimum burial depth in mobile sediment areas, Chapter 3 proposes sand wave clearance totalling up to 1,200,035 m³ of sediment along the Export Cable Corridor (Table 3.22).

This represents a very large-scale seabed alteration operation with significant ecological implications. It also strongly suggests that the proposed 1.5 m burial depth is not compatible with natural sediment dynamics. Despite this, the EIA does not evaluate:

- Whether deeper burial could reduce the need for large-scale clearance,
- Whether alternative cable routing away from migrating sand waves was considered,
- Whether a re-burial obligation will be enforced if cables become exposed due to sediment movement including the risk that re-exposure could create snagging hazards for fishing gear and associated safety concerns, as well as increasing the likelihood of cable damage.

This lack of assessment and absence of mitigation planning is a significant gap, especially in an area where natural sediment mobility is explicitly recognised in the EIA. In light of the documented sand wave heights and migration rates in the Export Cable Corridor, and the Applicant's continued reliance on a uniform 1.5 m burial target, SFF requests that the Applicant provide and that MD-LOT require prior to determination (a) a burial-first cable design demonstrating that target burial depths are resilient to sand wave migration over the full operational life; (b) a quantified alternatives appraisal identifying where deeper burial and/or micro-routing around active bedforms would avoid the need for external protection; and (c) a binding re-burial obligation, supported by defined inspection frequencies and exposure-trigger thresholds, to ensure that any post-installation cable exposure is rectified through re-burial rather than defaulting to rock placement. These measures are necessary to prevent large-scale, long-term external protection that would permanently exclude trawl, seine, and dredge activity from significant areas of the seabed.

¹² Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), Section 3.4 – Offshore Transmission Assets, Table 3.18: PDE for the External Cable Protection for the Offshore Export Cables

¹³ Ibid, Table 3.19: PDE for Cable Crossing for the Offshore Export Cables

¹⁴ Ayre OWF EIA, Vol.1 Ch.3 (TWP-AYR-RPS-OFE-RPT-00005), Section 3.5 — Site Preparation Activities, section 3.5.12

¹⁵ Ibid

EIA Methodology¹⁶

SFF remains concerned that the current approach does not adequately capture the real-world effects of offshore wind development on commercial fisheries. Several structural elements of the methodology risk systematically underestimating impacts, particularly in relation to cumulative displacement, safety risk, receptor sensitivity, and the treatment of residual effects.

The methodology states that impacts assessed as "negligible" will not be carried forward into cumulative effects assessment and may be excluded entirely from further analysis. The document explicitly adopts an approach where "negligible magnitude will always lead to minor or less significance" and such receptors/effects "will not be considered further" in cumulative analyses¹⁷.

However, NatureScot has already advised that negligible-alone effects may still contribute to significant cumulative impacts, particularly for spatially dispersed receptors such as commercial fisheries, where numerous small exclusions contribute to regional-scale loss of access¹⁸.

Commercial fisheries experience cumulative pressure through many individually small displacements that add up to significant regional impacts. Excluding negligible effects removes a major pathway through which real cumulative disruption occurs. SFF requests a firm binding commitment in the methodology that all fisheries relevant effects, including negligible project-alone effects, must be screened for cumulative significance, consistent with NatureScot advice.

Chapter 4 also applies generic ecological definitions for receptor sensitivity (negligible–very high), including criteria such as ecological rarity and potential recoverability¹⁹. These criteria are designed for ecological receptors and are not appropriate for commercial fisheries. Using ecological sensitivity metrics risks incorrectly classifying fishing receptors as "low" or "negligible sensitivity", which would distort significance ratings and reduce the visibility of impacts in the EIA decision framework. SFF requests adoption of fisheries specific-specific sensitivity criteria incorporating:

- economic dependency,
- alternative grounds availability,
- seasonal constraints,
- investment in gears (the substantial capital tied up in specific gear types, which limits operational flexibility and increases sensitivity to displacement)
- safety implications,
- cultural significance.

The EIA adopts a Design Envelope (PDE) and Maximum Design Scenario (MDS) approach where each topic determines its own worst case²⁰. However, the true fisheries worst case is not assessed as a single combined scenario. Instead, worst cases are defined separately across topics like maximum turbine number, maximum seabed footprint, maximum cable protection, meaning the combined displacement pressure experienced by fishing vessels is never evaluated holistically. For fisheries, the real worst case is the combined effect of:

- maximum mooring / anchor footprint
- maximum area of cable protection and rock placement
- lowest feasible cable burial depths
- highest construction vessel density
- most restrictive safety buffers

¹⁶ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 1, Chapter 4: Environmental Impact Assessment Methodology. TWP-AYR-RPS-OFE-RPT-00008, November 2025

¹⁷ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.7.18 and Table 4.9: Assessment of Significance, Showing the Combinations of Receptor Sensitivity and Magnitude of Impact

¹⁸ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.3 Consultation, Table 4.2: Summary of Key Consultation Issues

¹⁹ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.7.10–4.7.14 and Table 4.7: Definition of Terms Relevant to Defining the Sensitivity of a Receptor

²⁰ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.5.9–4.5.14

- most disruptive sequencing of survey and construction activities

SFF requests that the Applicant provide a Fisheries specific MDS, combining all parameters that could reasonably cause the greatest displacement, navigational risk, or gear conflict. This combined scenario must then be used to assess project-alone and cumulative displacement.

Additionally, NatureScot reminded the Applicant that plans are not mitigation, and that mitigation requires specific, committed measures rather than commitments to future document preparation²¹. Despite this, Chapter 4 repeatedly categorises future plans (Cable Plan, CBRA, EMP, etc.) as “embedded mitigation”. These plans cannot be treated as mitigation unless their contents are known, binding, and enforceable. Deferring key measures post-consent substantially undermines stakeholder involvement and weakens the robustness of the EIA.

Residual effects are considered “significant” only when moderate or major. “Minor” residual effects are deemed not significant by definition²². Even “minor” residual effects such as ongoing snagging risk, gear damage potential, loss of access, or navigational squeeze can have major economic and safety consequences for individual vessels and fleets. SFF request

- Fisheries receptors should be treated as high-sensitivity receptors within the significance matrix.
- “Minor” residual effects affecting fisheries must require additional justification, not be dismissed automatically.
- A fisheries-specific residual effects interpretation framework is needed.

Chapter 4 also provides inter-related effects examples for marine mammals but none for fisheries that are affected by interacting pathways such as:

- displacement + safety risk,
- cable protection + snagging hazard,
- vessel density + navigation restriction,
- survey noise + reduced opportunity.

SFF would welcome inclusion of fisheries-specific inter-related effects pathways to ensure cumulative interaction of pressures is properly assessed.

Additionally, Chapter 4 states that the assessment draws on older OWF datasets (Beatrice, Moray, EMEC) and publicly available data²³. SFF is concerned that these datasets may not capture current fleet patterns, increased inshore pressure, emerging Orkney fishing trends, small vessel activity without VMS.

Monitoring limited to “Significant” Effects is inadequate for fisheries. SFF is concerned that monitoring is required only where significant adverse effects occur which is inadequate for Fisheries²⁴.

“Recommendations for any monitoring should be based on sound scientific principles and are only required for significant adverse effects.”

Key fisheries issues like snagging incidents, cable exposure, gear loss must be monitored before effects become significant. SFF Request mandatory fisheries specific monitoring of displacement, gear interaction, and cable exposure, regardless of predicted significance.

Chapter 4 also defines transboundary effects solely in terms of impacts on European Economic Area (EEA) States²⁵. This approach misses operational transboundary issues relevant to fisheries such as mobile fleets that move between ICES areas, Orkney/Mainland grounds, and seasonally across regional boundaries which require consideration irrespective of political jurisdiction.

²¹ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.3 Consultation, Table 4.2 (NatureScot)

²² Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.7.20

²³ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.5.5

²⁴ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.10.1

²⁵ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.11.1

SFF is concerned that Chapter 4 repeatedly confirms that key elements of the assessment including sensitivity classification, magnitude of impact, and final significance are determined through professional judgement²⁶, rather than transparent, receptor specific criteria.

Section 4.2.6 states that the assessment methodology relies explicitly on “professional judgement” alongside guidance and legislation, making it clear this is a foundational element of the method.

“The assessment of effects methodology... draws upon relevant legislation, policy, guidance, professional judgement and industry standards...”

Section 4.7.17 goes further, stating that where significance falls into a range (Minor–Moderate), “the final significance is based upon the topic expert’s professional judgement.” This grants broad discretion to the assessor to choose significance levels without defined, repeatable criteria.

“Where a range is suggested for the significance of effect... the final significance is based upon the topic expert’s professional judgement as to which outcome delineates the most likely effect...”

SFF request clear, fisheries specific criteria and fully documented assumptions to avoid bias in classification.

Consultation & Engagement²⁷

While the Applicant has provided an extensive record of meetings, Chapter 5 does not demonstrate that consultation with the commercial fishing industry has been meaningful, transparent, or effective in shaping project design or mitigation measures.

Although Chapter 5 repeatedly describes consultation as “thorough” and “ongoing”, there is no evidence that feedback from the fishing industry influenced any material aspect of the project design, routing, timing, or mitigation. The chapter restates the Gunning Principles notably that consultation must be meaningful, allow for intelligent consideration, and that feedback must be conscientiously taken into account²⁸ yet it provides no examples of such influence. SFF requests that the Applicant provide evidence demonstrating which parts of project design (array layout, cable routing, burial strategy, vessel management) were altered as a result of fishing industry input.

Chapter 5 presents a polished record of engagement but omits all disagreements, contested issues, or unresolved concerns. This is inconsistent with the consultation principles of “Transparency” and “Accountability”²⁹. The absence of transparent reporting undermines confidence in the consultation process. Stakeholder concerns cannot be considered “addressed” simply because they have been recorded in a consultation log.

The Export Cable Corridor (ECC) is repeatedly acknowledged as a key area of concern³⁰ with stakeholders highlighting issues around access, temporary exclusions, and data sufficiency. However, Chapter 5 provides no details of concerns raised. Given that cable corridors represent one of the most significant long-term sources of fishing displacement, this omission is material.

Physical Processes³¹

Chapter 7 concludes that all effects are “not significant” in EIA terms, the analysis raises substantial concerns for the fishing industry relating to seabed integrity, access, long-term habitat disturbance, operational safety,

²⁶ Ayre OWF EIA, Vol.1 Ch.4 (TWP-AYR-RPS-OFE-RPT-00008), Section 4.2.6, Section 4.5, Section 4.7.13–4.7.15, Section 4.7.17

²⁷ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 1, Chapter 5: Consultation and Engagement. TWP-AYR-RPS-ENV-RPT-00031, November 2025

²⁸ Ayre OWF EIA, Vol.1 Ch.5 (TWP-AYR-RPS-ENV-RPT-00031), Table 5.4: Meaningful, Transparent, Accountable principles

²⁹ Ibid

³⁰ Ayre OWF EIA, Vol.1 Ch.5 (TWP-AYR-RPS-ENV-RPT-00031), Table 5.6

³¹ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 2, Chapter 7: Physical Processes. TWP-AYR-RPS-OFE-RPT-00013, November 2025

and the cumulative impact of major seabed alteration works³². Across multiple assessment sections, the EIA frames sediment and morphology change as “pathways, not receptors”³³ and therefore excludes fishing as a receptor of physical process change. This omission results in a systematic underestimation of impacts on commercial fisheries.

Suspended sediment plumes are treated as “Not Significant”³⁴ despite Fisheries relevant risks. The EIA acknowledges that construction activities (drilling, dredging, mass-flow excavation, jetting, sandwave clearance, and HDD punch-out) will generate very high near-source SSC (up to “millions of mg/l”), that plumes can travel 5–16 km on spring tides, and that advection can carry plumes into the Noss Head MPA under certain tidal states³⁵. It then concludes these effects are “not significant” because concentrations dissipate over time³⁶. This conclusion is methodologically flawed. Where the chapter accepts substantial plume generation and MPA interaction, it must carry that analysis through to fisheries receptors, not stop at physical dispersion metrics.

Long-term morphological change is downplayed despite multi-year recovery times. The EIA acknowledges that sand wave clearance and associated seabed preparation works may require 5–10 years to recover within the Export Cable Corridor, and more than 10 years in parts of the Array Area where sediment transport rates are low³⁷. These recovery durations are explicitly recognised in Chapter 7. Despite this, the assessment classifies the resulting morphological change as “negligible”, on the basis that sediments will “eventually” re-establish and natural processes will infill disturbed areas over time³⁸. From a fisheries perspective, these changes are neither negligible nor short-term. These are operationally meaningful impacts that extend across multiple fishing seasons and stock cycles. SFF therefore considers it inappropriate for the EIA to treat multi-year morphological disturbance as environmentally insignificant simply because recovery is theoretically possible in the long term. Where morphological change persists for many years or decades as acknowledged by the Applicant the effect should be assessed as significant to fisheries, even if it is not classified as significant for designated geomorphological features. The current approach materially underestimates risk and does not reflect the practical realities of fishing operations, or the duration of disruption fisheries will experience.

Mooring line sweep and anchor scour are treated as insignificant morphological features. Chapter 7 describes seabed disturbance from mooring systems sweep zones up to ~30 m wide that create local berms, depressions, and disturbed patches³⁹ but then downplays the risk on the basis that the seabed will “equilibrate” over time⁴⁰. This reasoning is inappropriate for commercial fisheries. Recurrent movement of moorings and seasonal re-working of sediments can produce unpredictable, shifting roughness and discrete hazard patches on tow paths, with material snagging and safety risks for trawl and static gear operations. Because fisheries use is not treated as a receptor, these changes are not captured as significant even where they plainly constitute operational hazards. SFF considers this a material underassessment. Mooring related scour and sweep must be evaluated as fisheries hazards, not merely as morphological anomalies.

Benthic Ecology⁴¹

³² Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Table 7.12

³³ Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Section 7.8.3, Section 7.10.10, Section 7.10.35-36, Section 7.10.42-43, 7.10.49

³⁴ Ibid and Table 7.23 / 7.24

³⁵ Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Section 7.10.14–21

³⁶ Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Sections 7.10.19–21, Section 7.10.10, 7.10.36, 7.10.43, Tables 7.23 & 7.24

³⁷ Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Section 7.10

³⁸ Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Section 7.10.63, 7.10.55–7.10.58, 7.10.77

³⁹ Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Section 7.10.39–7.10.40

⁴⁰ Ayre OWF EIA, Vol.2 Ch.7 (TWP-AYR-RPS-OFE-RPT-00013), Section 7.7

⁴¹ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 2, Chapter 8: Benthic Ecology. TWP-AYR-RPS-OFE-RPT-00015, November 2025

The seabed footprint and scale of disturbance are significantly understated. Chapter 8 anticipates 18,000,341.5 m² of temporary seabed disturbance during construction representing 4.64% of the entire Site Boundary and a further 3,042,840 m² of long-term habitat loss (0.78%)⁴². Despite these footprints, the chapter repeatedly classifies effects as “low magnitude” and “Minor adverse / Not significant” but only through a benthic ecology lens⁴³. It does not evaluate operational loss of fishable grounds, displacement, or gear compatibility with the permanently hardened seabed that is framed here as long-term habitat alteration or disturbance⁴⁴. The chapter’s “recovery within months to years” narrative is based on ecological recolonisation literature and does not equate to restored fishability (safe gear passage, no-s snag conditions)⁴⁵. Chapter 8 explicitly acknowledges significant limitations in baseline data including incomplete geophysical coverage, extrapolated seabed mapping, approximate biotope boundaries, and heterogeneous seabed conditions⁴⁶. These uncertainties are not taken into precautionary impact evaluations or significance conclusions. Instead, the chapter concludes all effects are ‘low magnitude’ and ‘Minor adverse,’ without regard for the risks these uncertainties pose to commercial fisheries.

Cumulative impacts have been minimised against clear precautionary advice. Both the Marine Directorate and key statutory consultees including NatureScot and SFF in its role as a statutory consultee for the marine licence elements of this application advised that impacts which appear negligible alone particularly EMF, benthic disturbance, and INNS may become significant cumulatively⁴⁷. Chapter 8 records this advice but does not reflect it in the final impact significance, which still concludes all cumulative effects as “Minor adverse” or “Not significant.” SFF therefore does not agree that benthic ecology impacts are “Minor adverse” when viewed through a fisheries perspective. In the region that supports high value shellfish fisheries, the dismissal of EMF risks lacks credibility and fails to meet the precautionary standard expected by stakeholders and regulators.

Fish & Shellfish Ecology⁴⁸

SFF does not agree that the impacts on fish and shellfish ecology are “Minor” or “Not significant.” Chapter 9 recognises that the Site Boundary directly overlaps herring spawning grounds (undetermined intensity) and sandeel spawning and nursery grounds (low intensity), both of which are substrate-specific and highly sensitive to disturbance⁴⁹. It also records regulator and key stakeholder advice to treat EMF and cumulative effects precautionarily, yet it repeatedly concludes “not significant” based on wide-area ecological frames⁵⁰. The assessment underweights local, fishery-relevant risk to spawning/nursery habitats. Overly large study area masks local fishing impact. Chapter 9 uses a 100 km study buffer⁵¹ which is valid ecologically but inappropriate for representing the localised, high-value fishing grounds that exist within the Site Boundary and Export Cable Corridor. This largescale framing means localised impacts are treated as negligible at the regional scale, even though they are material for fisheries.

The monitoring is deferred to post-consent. It is acknowledged that other statutory consultees (DSFB and FMS) repeatedly requested pre-construction tracking and monitoring of salmon and sea trout migration through the Pentland Firth corridor⁵². The applicant responds that monitoring is not yet confirmed and will rely on future ScotMER programmes⁵³. This approach defers the resolution of key uncertainties until after consent is granted.

⁴² Ayre OWF EIA, Vol.2 Ch.8 (TWP-AYR-RPS-OFE-RPT-00015), Section 8.10 and Table 8.11 – Maximum Design Scenario

⁴³ Ayre OWF EIA, Vol.2 Ch.8 (TWP-AYR-RPS-OFE-RPT-00015), Section 8.10.12, 8.10.17, 8.10.29–8.10.33, Table 8.11, Tables 8.15–8.16

⁴⁴ Ayre OWF EIA, Vol.2 Ch.8 (TWP-AYR-RPS-OFE-RPT-00015), Table 8.11

⁴⁵ Ayre OWF EIA, Vol.2 Ch.8 (TWP-AYR-RPS-OFE-RPT-00015), Section 8.10.7– 8.10.12, 8.10.17, 8.10.29–8.10.33

⁴⁶ Ayre OWF EIA, Vol.2 Ch.8 (TWP-AYR-RPS-OFE-RPT-00015), Section 8.6.40–8.6.41

⁴⁷ Ayre OWF EIA, Vol.2 Ch.8 (TWP-AYR-RPS-OFE-RPT-00015), Table 8.6

⁴⁸ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 2, Chapter 9: Fish and Shellfish. TWP-AYR-RPS-OFE-RPT-00058, November 2025

⁴⁹ Ayre OWF EIA, Vol.2 Ch.9 (TWP-AYR-RPS-OFE-RPT-00058), Section 9.6.11–9.6.16; Tables 9.10–9.11; Figs 9.2–9.3

⁵⁰ Ayre OWF EIA, Vol.2 Ch.9 (TWP-AYR-RPS-OFE-RPT-00058), Table 9.7, Section 9.12

⁵¹ Ayre OWF EIA, Vol.2 Ch.9 (TWP-AYR-RPS-OFE-RPT-00058), Section 9.2.1–9.2.2

⁵² Ayre OWF EIA, Vol.2 Ch.9 (TWP-AYR-RPS-OFE-RPT-00058), Table 9.7

⁵³ Ayre OWF EIA, Vol.2 Ch.9 (TWP-AYR-RPS-OFE-RPT-00058), Section 9.7–9.9

Herring and sandeel safeguards rely on “no significant effect” rather than mitigation. Chapter 9 references ICES advice that: “No activities on spawning habitats should be allowed unless the effects have been assessed and shown not to be detrimental.” The applicant argues that because the EIA says impacts are “not significant,” the project complies with ICES advice⁵⁴. This is a circular argument relying on the EIA itself instead of providing independent safeguards.

Commercial Fisheries⁵⁵

Chapter 13 acknowledges that the floating array with catenary moorings with radius up to 800 m will practically exclude mobile gears for the 5-year construction and 30-year operational phases. Mooring footprints alone encompass up to 67% of the 200 km² Array Area creating long-term displacement of demersal trawl and seine fisheries⁵⁶.

The EIA identifies Moderate adverse (significant) effects for demersal seine/trawl in all phases and Moderate cumulative effects for demersal and dredge fleets across phases⁵⁷. Despite this, the chapter subsequently reduces residual significance to Minor through reliance on a time limited Fisheries Fund and Disruption Agreements⁵⁸. These mechanisms, however, provide only financial redress and do not restore access to fishing grounds. For this reason, the SFF does not accept the reduction in significance. The Moderate significance should be maintained unless the applicant proves fishery operability in the final layout.

The chapter’s use of ICES rectangle averaging further understates the scale of impact. Array-relevant landings are derived by applying a simple 6.2% spatial overlap metric to the value of landings in ICES rectangle 46E7, on the assumption of an even distribution of effort⁵⁹. Yet the same chapter recognises that the eastern edge of the northern Array constitutes a known demersal seine lane, used during particular weather windows and supported by confidential SFF plotter data⁶⁰. Treating these locally important grounds as statistically equivalent to the remainder of the rectangle dilutes the true magnitude of impact. The magnitude should be recalculated to replace ICES averaging.

SFF further notes that Chapter 13 does not fully reflect the operational significance of the demersal seine fishery within the Array Area. This ground is routinely used during periods of westerly winds, when the proximity of the Orkney mainland provides lee conditions and uniquely sheltered fishing opportunities that cannot be replicated elsewhere. Due to VMS anonymity thresholds, where data cannot be shown for fewer than five vessels, seine-net activity in this area is likely under-represented despite its importance. In practice, seine vessels require substantial operational space typically around 1.8 nm (3.33 km) in length and 1.5 nm (2.77 km) in width to safely shoot and haul gear. Once the floating array and mooring system is installed, these vessels will be entirely excluded from the site for the full 30-year operational lifespan. This represents a permanent loss of access that is not adequately reflected in the significance conclusions and must be reassessed accordingly.

The Maximum Design Scenario (MDS) permits up to 180 km of mechanical cable protection along the Export Cable Corridor, with a footprint of approximately 1.62 million m² and physical profiles reaching two metres in height and nine metres in width. A further 778,500 m² of mechanical protection is anticipated on inter-array cables⁶¹. The EIA itself notes that scallop dredge activity will not resume over protected sections, and that snagging risk persists for trawls wherever burial is not achieved⁶². Chapter 13 sets no binding design limits on the volume, height or width of cable protection, nor does it specify any formal acceptance testing

⁵⁴ Table 9.7

⁵⁵ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 2, Chapter 13: Commercial Fisheries. TWP-AYR-RPS-OFE-RPT-00031, November 2025

⁵⁶ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Table 13.8, Section 13.9.30–13.9.31

⁵⁷ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Section 13.9.21, 13.9.34, 13.9.42

⁵⁸ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Section 13.9.28, 13.9.40, 13.9.48

⁵⁹ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Section 13.9.7 - 8

⁶⁰ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Section 13.9.8

⁶¹ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Table 13.8

⁶² Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Section 13.9.58–13.9.60, 13.9.46, Table 13.8

such as over-trawl trials to verify fishability and gear-clearance safety. Without such safeguards, long-term exclusion of valuable fishing grounds becomes inevitable. A burial-first design commitment, the avoidance of mattresses in recognised fishing corridors, and the implementation of gear-clearance trials are therefore essential.

The EIA recognises consistent scallop dredge overlap along the Corridor (especially around the 12 nm line) and notes dredging will not resume on protected sections. Despite this the magnitude is still reported as Low and the mitigation leans on construction only Disruption Agreements⁶³. This understates the O&M phase impact, where protected ribbons function as long-term closures.

Disruption Agreements are framed for construction in the Corridor; Array-wide long-term exclusion is shifted to a 7-year (5 + 2) Fisheries Fund concept, while O&M lasts 30 years⁶⁴. Long-term exclusion is therefore not matched by long-term compensation, and the chapter rejects association-level claims despite relying on a fleet-level assessment of significance. A compensation framework that is fit for a thirty-year exclusion must provide for sustained, vessel-level support over the full operational duration, alongside an adaptation fund that reflects the collective nature of the fleets affected.

Finally, the treatment of wet-storage and boulder relocation activities does not provide the level of precision required to safeguard fishing operations. Although the chapter commits to notifying fishers of relocated boulders or wet-storage infrastructure, it does not specify the coordinate format, precision, notification lead-time, or requirements for post-operation clearance. These details are critical for managing snag risk. All locations should be issued in WGS84 (DDD.MM.mmm format), with at least fourteen days' notice through Notices to Mariners and Kingfisher updates, supported by digitally compatible, plotter-ready files to allow direct upload to fishing-vessel navigation systems. A dropped-object registry, coupled with swept-path verification and publication of clearance results, should be formalised, along with a 24/7 guard vessel communications protocol for all wet-storage movements.

Shipping & Navigation⁶⁵

Chapter 14 presents an extensive assessment of navigational issues, but its treatment of commercial fishing vessels is incomplete and does not reflect the operational realities of mobile gear fisheries. Several assumptions underpinning the assessment are questionable, internally inconsistent, or unsupported by the evidence presented in the chapter. As a result, the conclusions underestimate the risks to fishing vessels and the severity of displacement effects.

Throughout Chapter 14, commercial fishing vessels are repeatedly assessed under the umbrella of “small vessels,” including in Impact on small vessel activity (fishing/recreational)⁶⁶. This categorisation fails to recognise the fundamentally different operational characteristics of fishing vessels, particularly those deploying demersal trawl, seine or dredge gear. The manoeuvring constraints, tow lengths, turning arcs, and seabed dependency of these fleets are not comparable to recreational yachts or small craft, and an assessment based on those assumptions does not provide a credible understanding of risk. The chapter therefore does not meaningfully assess the consequences of the proposed development for fishing operations.

The chapter repeatedly asserts that fishing vessels can “make a small adjustment to their route” with “adequate surrounding sea room”⁶⁷. These conclusions treat fishing vessels as simple point-to-point transiting craft and do not address the constraints of towed gear operations, which require long, straight tows with wide turning radii and clean seabed. No assessment is made of whether alternative grounds outside the Array are physically suitable or safe for demersal gears. Accordingly, the conclusion that deviation represents only a “minor” impact is based on assumptions that do not apply to commercial fishing.

⁶³ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Section 13.9.60

⁶⁴ Ayre OWF EIA, Vol.2 Ch.13 (TWP-AYR-RPS-OFE-RPT-00031), Section 13.8.3–13.8.8, 13.9.27

⁶⁵ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 2, Chapter 14: Shipping and Navigation. TWP-AYR-RPS-OFE-RPT-00033, November 2025

⁶⁶ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.41–14.10.43

⁶⁷ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.34–14.10.37; 14.10.41–14.10.43; 14.10.48

Chapter 14 acknowledges that floating foundations with catenary moorings and dynamic inter-array cables create snagging hazards for fishing gear⁶⁸. It also acknowledges that snagging a cable can result in loss of gear, vessel damage, or in a worst-case scenario, vessel loss and fatalities⁶⁹. However, these risks are ultimately assessed as “Low” magnitude⁷⁰ and “Minor” significance⁷¹. The primary risk controls cited charting, Notices to Mariners, safety zones and standard ERCoP procedures are communications measures, not mitigations that physically remove or reduce the snagging hazard. The downrating of significance therefore does not reflect the hazard profile acknowledged in the document.

The deviation assessment (Impact 2) treats all interactions as simple route adjustments and concludes that vessel deviation is “minor” because commercial traffic density is low⁷². However, no equivalent assessment is undertaken for fishing operations that rely on towing gear across the seabed. There is no quantification of increased fuel use and steaming time or loss of access to tow paths or traditional fishing corridors;

These omissions stand in contrast to the National Marine Plan (Transport 6), which requires consideration of the efficiency, fuel cost, emissions and frequency impacts of route displacement. Chapter 14 does not meet this requirement in relation to fishing vessels.

While Chapter 14 acknowledges that fishing activity exists in proximity to the Array Area⁷³, it does not assess the consequences of displacing mobile gear fleets into narrower grounds already used by other gears. There is no examination of:

- conflict between displaced fleets (mobile vs static),
- concentration of effort in reduced grounds,
- knock-on displacement into sensitive or unsuitable areas,
- cumulative pressures created by other nearby offshore projects.

This omission is material, as spatial squeeze is a primary socioeconomic and safety impact for fisheries and must be assessed explicitly.

Several impact assessments cite COLREGS-compliant vessel behaviour as a basis for concluding that impacts are low or manageable⁷⁴. This assumption does not reflect fishing-specific risks. COLREGS regulate collision avoidance between navigating vessels. Using COLREGS as a justification for down-rating impacts on fishing vessels is inappropriate and does not address the operational hazards documented in the chapter.

Infrastructure and Other Users⁷⁵

SFF notes that Chapter 16 acknowledges the Shetland HVDC link and states that it “crosses through the Array Area,” with the Applicant intending to put commercial crossing (and proximity) agreements in place with the asset owner to manage construction and operations safely. However, Chapter 16 treats this as a developer-to-developer coordination matter and does not assess the implications of the Shetland HVDC link for commercial fisheries. In particular, while the chapter identifies temporary Safety Zones/advisory passing distances around works and lists the Shetland HVDC as a Tier-2 project for cumulative context, it contains no fisheries-focused analysis of how the presence of this existing subsea power cable within the Ayre Array Area interacts with floating-array moorings and cable systems to contribute to spatial squeeze, displacement or gear-interaction risk. SFF therefore requests that the cumulative displacement analysis be updated to treat the Shetland HVDC link as a fisheries-relevant spatial constraint and to assess the functional interaction

⁶⁸ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.2–14.10.7; 14.10.14–14.10.18

⁶⁹ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.9; 14.10.19; 14.10.24

⁷⁰ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.8; 14.10.18; 14.10.23

⁷¹ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.11; 14.10.21; 14.10.25

⁷² Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.30–14.10.33; 14.10.40

⁷³ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.6

⁷⁴ Ayre OWF EIA, Vol.2 Ch.14 (TWP-AYR-RPS-OFE-RPT-00033), Section 14.10.9; 14.10.19; 14.10.34

⁷⁵ Ayre Offshore Wind Farm Ltd. Offshore Environmental Impact Assessment Report – Volume 2, Chapter 16: Infrastructure and Other Users. TWP-AYR-RPS-OFE-RPT-00039, November 2025

between that existing cable corridor and the proposed array infrastructure, rather than limiting consideration to cable-owner crossing arrangements alone.

Habitats Regulations Compensation: Seabird Bycatch Reduction Proposal

SFF notes that the Applicant's Derogation Case⁷⁶ and Compensation Roadmap⁷⁷ propose 'Seabird Bycatch Reduction' as a compensatory measure to offset gannet impacts from the Ayre Offshore Wind Farm. This measure relies on the modification of commercial fishing practices, trials of bycatch reduction gear, and ongoing monitoring on fishing vessels, as described in Sections 7.1–7.6 of the Compensation Roadmap. The Scottish fishing industry must not be used as the mechanism to compensate for environmental impacts created by offshore wind development. SFF therefore strongly objects to any compensatory measures under the Habitats Regulations that would:

- impose restrictions, operational changes, or gear obligations on fishing vessels,
- require Scottish fishers to participate in trials or monitoring programmes,
- reduce profitability, efficiency, or safety of fishing operations,
- or otherwise shift the burden of OWF environmental impacts onto the fishing sector.

SFF can only support fishery neutral compensation measures that do not displace, constrain, or regulate commercial fisheries. Until it is demonstrated beyond doubt that no aspect of the proposed Bycatch Reduction measure will involve Scottish fisheries, SFF must maintain a firm objection to this component of the compensation package.

Fisheries Mitigation, Monitoring and Communication Plan (FMMCP)⁷⁸

The FMMCP acknowledges that SFF and its constituent associations have withdrawn from FLOWW. Despite this, FLOWW remains the primary foundation for:

- liaison
- mitigation
- disruption agreements
- dispute resolution
- contractor procedures
- communications frameworks

The FMMCP also states that up to 67 turbines may use either floating or fixed foundations. This unresolved design choice materially affects fisheries risk for example, floating foundations introduce extensive mooring footprints and dynamic cables, while fixed foundations present different clearance and snagging profiles. The FMMCP does not explain how fisheries mitigation, coexistence assumptions, or interaction procedures would differ between these design scenarios, making it unclear what mitigation is actually being proposed. A design dependent plan must set out the consequences for each option, not defer clarity to post-consent stages.

Given SFF's formal withdrawal, reliance on FLOWW is not acceptable. The FLOWW best practice guidance has no legal weight. Its use cannot be considered compliance with Scottish policy requirements, nor can it be relied upon as evidence that impacts are mitigated "as far as practicable". Reliance on FLOWW undermines the effectiveness and credibility of the FMMCP. The EIA Regulations require mitigation to be effective, realistic, evidence-based, capable of reducing significant effects. If the primary mitigation framework is one that the affected key stakeholder refuses to recognise, and which is not endorsed by Scottish policy makers, then decision-makers cannot rely on the FMMCP as evidence that impacts have been acceptably mitigated, and the FMMCP becomes procedurally inadequate for consent determination.

⁷⁶ Ayre Offshore Wind Farm, Habitats Regulations Appraisal: Applicant's Case for Derogation TWP-AYR-PIN-CON-RPT-00001 November 2025

⁷⁷ Ayre Offshore Wind Farm, Compensation Roadmap TWP-AYR-NIRAS-CON-RPT-00001 November 2025

⁷⁸ Ayre Offshore Wind Farm, Offshore EIA Report, Volume 4, Appendix 28: Fisheries Mitigation, Monitoring and Communication Plan (TWP-AYR-RPS-OFE-RPT-00074), November 2025.

The FMMCP lists additional “guidance” such as the U.S. BOEM draft guidance (2022). This document is not applicable to Scottish floating wind development nor relevant to Scottish fisheries management frameworks, and its inclusion adds no practical value to the FMMCP. If guidance is to be cited, it should be limited to Scottish-relevant frameworks and current Scottish Government advice (e.g., fisheries-monitoring good-practice guidance, Aug 2025).

The proposed disruption and gear loss claims process rests wholly with the developer. There is:

- no independent arbitration mechanism
- no clearly defined timelines for responses or payment
- no transparent evidence pathway
- no neutral oversight mechanism
- broad discretion for the developer to reject claims.

Such a structure is unlikely to command trust or confidence from affected vessels. A neutral, independent dispute-resolution mechanism must be introduced.

The FMMCP objective to “set out procedures... for gear relocation or removal” is ambiguous. It is unclear whether this includes compensation for displacement of mobile gear from the Array Area or Export Cable Corridor during construction or O&M. If compensation is intended, this must be stated explicitly together with triggers, evidence requirements and timescales; if not, the plan fails to address a central fisheries-impact pathway.

Under the FMMCP, the FLO and OFLO are individuals appointed and paid by the developer or its contractors. A liaison structure where the liaison staff are directly employed by those whose activities they are expected to monitor or challenge presents a clear conflict of interest. For avoidance of doubt, the concern raised here relates specifically to FLO/OFLO roles directly appointed and paid by developers or their contractors. This does not apply to OFLO services provided via SFF Services, which operate under recognised professional standards. If impartiality is to be strengthened, a feasible alternative would be a neutral or independently overseen appointment route (for example via MD-LOT or an agreed governance body), ensuring independence while retaining established liaison functions.

The FLO/OFLO roles must be independent of project contractors. Their primary duty must be to ensure accurate, impartial communication and fishing-sector representation not to protect the developer’s position. A contractor-employed FLO cannot provide the neutrality required in situations relating to conflict, access, or compensation.

The FMMCP presents “co-existence” as an overarching principle yet provides no evidence that co-existence is feasible within a floating array where mooring spreads, anchor patterns, dynamic cables and safety zones typically preclude trawl, seine and dredge gears. Promising to “explore” coexistence does not constitute mitigation. Unless the Developer can identify specific, obstacle-free areas and operational protocols that maintain safe access for the fleets currently active in the area, the FMMCP should acknowledge that co-existence cannot be delivered in practice.

The FMMCP allows OFLOs to be placed on guard vessels rather than the construction/survey vessels where core activity occurs. This contradicts long-accepted industry practice (including OEUK guidance), which states that fisheries liaison staff must be placed on the vessel undertaking the activity. The FMMCP must commit that OFLOs will be placed on the construction/survey vessel except where demonstrably impossible.

The FMMCP states that information will be provided “within a timely manner and in an accessible format”. However, “accessible format” is undefined. SFF requires:

- plotter-compatible formats
- GIS shapefiles
- precise coordinates for all structures, moorings, boulder relocations, cable exposures, dropped objects, UXO clearance footprints, exclusion areas communications.

Without this, information cannot be operationally useful.

Fishing specific risk must be explicitly included in notices. Sections 3.5.11–3.5.12 and Table 5.2 describe communications focused on navigational risk only. This is insufficient. Fishing fleets require detailed information on fishing-specific risks. All notices must explicitly reference fishing-specific risks, not purely maritime navigation assessments.

The mitigation measures in Chapter 3 are presented in generic terms and do not differentiate between the distinct operational requirements of trawl, seine, dredge and static-gear fisheries active in the area. Floating-wind interaction pathways differ markedly between gear types; effective mitigation must therefore be fishery-specific, with clear commitments rather than broad statements of intent.

ECC vs Array consistency. The Plan restricts Disruption Agreements to temporary construction-phase disruption in the ECC (Section 3.4), despite the FMMCP itself identifying significant residual effects for mobile gears within the Array (Section 3.6.1). This internal inconsistency requires correction: either Array-area disruption must be covered, or a robust justification must be provided.

Good Practice Measures governance. Section 3.5 requires clarification on who is responsible for monitoring compliance and what happens in cases of non-compliance, as the current draft provides no monitoring, governance or enforcement structure. MD-LOT guidance expects plan commitments to be clear on what will be implemented and when, with decision rules defined; where clarity is lacking, plans may not be approved.

Burial-first and data provision. Section 3.5.3 recognises SFF's preference for rock placement where burial is not feasible. The FMMCP should commit to a clear burial-first hierarchy, avoid mattresses and grout bags in open water due to snagging risk, and ensure all as-laid cable positions and protection deposits are issued in GIS and plotter-compatible formats suitable for timely distribution via established industry information channels such as Notice to Mariners and KIS-ORCA. KIS-ORCA is the accepted industry mechanism for distributing final as-laid cable positions, but it is updated infrequently (once per year). Therefore, developers should additionally provide early stage, pre-installation route information in neutral, transferable digital formats that can be integrated into fishing vessel plotter systems to support early awareness and safe operational planning.

Safety zones. The FMMCP should specify the maximum number of concurrent safety zones and commit to rolling, works-aligned implementation to minimise unnecessary exclusion, with forward scheduling issued via NtM/Kingfisher channels and consistent vessel-liaison coverage during construction and relevant O&M activities.

Marking and charting. Marking arrangements should ensure high visibility, including the use of AIS-equipped buoys where appropriate and agreed with NLB/MCA.

Dropped objects. Sections 3.5.11–3.5.12 refer solely to navigational risk. Fishing risk, including snagging and gear loss, must be explicitly included in notification and recovery commitments.

Verification of fishability. For cable protection placed on the seabed, SFF requests review of MBES as-laid data prior to any over-trawl verification. Over-trawl sweeps remain the only reliable method for confirming that areas are safe to resume fishing.

Reducing gear conflict. Proactive measures to reduce gear conflict—such as collaborative identification of gear-setting areas and practical real-time communication tools—should be explored within the FMMCP framework.

ECC effects. Section 3.6.2 concludes there are no significant effects in the ECC; however, where rock placement is required along scallop grounds or crossing points, long-term operational-phase effects may arise and should be reassessed.

Adequacy of additional measures. The Additional Mitigation Measures proposed in Section 3.6 are non-binding, short-term, and rely on post-consent design decisions, making them insufficient to mitigate the acknowledged long-term exclusion of mobile gears from the Array Area.

Fisheries Fund

As set out earlier in the Commercial Fisheries chapter, SFF does not consider a time-limited (7-year) Fisheries Fund to be compatible with the 30-year operational displacement anticipated within the Array Area. Within the FMMCP context, this concern remains unchanged. An effective plan must provide for compensation across the survey, construction, O&M and decommissioning phases, with provisions that extend to long-term or permanent displacement, reflect quota loss and community-level impacts, and apply consistently to both mobile and static gear sectors.

In addition to the governance issues previously identified, the FMMCP must also set out clear governance arrangements for any fund, including administration, eligibility, decision-making criteria and transparency measures. SFF maintains that a locally controlled governance model, such as that used for the West Coast Community Benefit Fund, offers a more credible and trusted approach than developer-led administration.

Broader Support Proposals

As already noted earlier in this response and within the FMMCP evaluation itself, research programmes, stock-enhancement initiatives, MSC certification and gear-innovation projects do not constitute mitigation for the loss of physical fishing space. These are general industry-support initiatives and cannot offset the exclusion of seine, trawl or dredge fleets from operational areas.

Similarly, SFF reiterates that gear-adaptation proposals are not feasible mitigation measures for affected mobile fleets. Given vessel size, operational methods and fleet characteristics, adaptation of demersal seine, otter trawl, pelagic or scallop dredge gear to operate within a floating-wind array is not realistic, and affected fleets should not be expected to alter their businesses to accommodate another sector.

Co-existence deferral. The FMMCP frames co-existence as “exploratory” and defers all meaningful decisions to the post-consent DSLP, which offers no binding or pre-consent mitigation commitment.

Fish-stock monitoring if piling occurs. Section 3.6.8 acknowledges a moderate adverse effect on herring if piling is required; however, the FMMCP does not propose any fish-stock monitoring. If piling forms part of the final design, a fish-stock monitoring programme should be included, developed with stakeholder input, and secured through the Piling Strategy referenced in Sections 3.6.9–3.6.10.

Monitoring duration and scope. The FMMCP proposes only three years of pre-construction monitoring (Section 4.1.4) and provides no clarity on monitoring during the operational lifetime of the development. Given the potential for long-term displacement and changes in fishing activity, monitoring commitments should extend into the O&M period and be developed in line with relevant Scottish Government good-practice guidance.

SOPs governance. The FMMCP commits to SOPs to minimise interactions with fishing vessels (Section 5.2.2) but does not identify who will monitor compliance or what actions will apply in the event of non-compliance. Clarity on governance and oversight is required; MD-LOT guidance anticipates clear, approvable commitments.

Commercial Fisheries Working Group (CFWG). Participation in a CFWG should not be conditional upon the group being “established and active” (Table 5.2). A standing CFWG should be assumed as part of routine project governance.

Guard vessels. The statement that guard vessels “may” be present during construction or O&M is weak given the navigational and fishing-safety risks identified in the EIA. The FMMCP should commit to appropriate guard-vessel coverage where activities create foreseeable risks to fishing vessels.

Closing statement

In summary, the SFF considers that the Ayre Offshore Wind Farm application, as currently presented, does not provide the evidence, safeguards or fisheries-appropriate mitigation necessary for Ministers to conclude that the project's impacts have been adequately assessed or acceptably reduced. Core elements of the assessment remain incomplete; key assumptions are unsupported; and material dependencies have been deferred to post-consent plans without binding commitments.

Long-term loss of access to important fishing grounds has not been mitigated, the operational footprint of the floating array is not yet transparently defined, and the proposed Fisheries Mitigation, Monitoring and Communication Plan relies on non-statutory FLOWW guidance that the Scottish industry does not recognise. As a result, the current mitigation package cannot be relied upon under the EIA Regulations as effective, realistic or evidence-based.

Unless the applicant provides the necessary information, revises the assessment in line with Scottish policy, and secures fisheries-specific, enforceable mitigation measures, the SFF's position is that the application is not capable of supporting a lawful determination. In those circumstances SFF would maintain its objection.

For and on behalf of the Scottish Fishermen's Federation
[Redacted]

Oliwia Biros
Offshore Consents Assessments Manager
Scottish Fishermen's Federation

Transport Scotland

From: [George Smith](#)
To: [MD Marine Renewables](#)
Cc: [LOGAN Lesley](#); [DEVENNY Alan](#); [Andrew Erskine](#)
Subject: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026
Date: 23 January 2026 12:47:37
Attachments: [image001.png](#)

FAO: Amy Woodward

Amy

Thank you for the opportunity to comment on the Environmental Impact Assessment Report (EIAR) prepared in support of the proposed 67 turbine Ayre Offshore Wind Farm, located approximately 22km from the Orkney eastern coast. Transport Scotland was consulted on the Scoping Report for this application and provided comment in our letter dated 26th August 2024. In this, we noted that the application was for the Offshore elements only, and this would be supported by a separate Onshore EIAR and associated planning documents. We noted that Transport Scotland would expect to be consulted upon the Onshore application and, consequently, we confirmed that we had no comment to make on the Offshore element of the project.

I can confirm that Transport Scotland was consulted on the construction of the Onshore Transmission Infrastructure application by The Highland Council and provided a TR/NPA/2 response on 1st September 2025. I can, therefore, confirm that we have no further comment to make on the Offshore EIAR.

Kind regards,

George Smith
Development Management
Network Operations
Roads Delivery and Operations Directorate

transport.gov.scot

Transport Scotland 5th Floor 177 Bothwell Street Glasgow G2 7ER



UK Chamber of Shipping

From: [Redacted]
To: [MD Marine Renewables](#)
Cc: [Amy Woodward](#); [Toni-marie Mcginn](#); [Kirsten Watson](#); [Rebecca Ross](#)
Subject: RE: MS-00011515 and MS-00011516– Ayre Offshore Wind Farm Limited – Ayre Offshore Wind Farm – EIA Section 36 consent and Marine Licence Applications - Consultation – Response Required by 8 February 2026
Date: 09 February 2026 15:46:33
Attachments: [image001.png](#)

Dear Amy,

Thank you for the email to the Chamber of Shipping. The Chamber confirms a nil return in relation to Ayre OWF.

Kind regards,

Robert

Robert Merrylees

Policy Director (Shipping Industry & Research)

UK Chamber of Shipping

30 Park Street, London, SE1 9EQ

[Redacted]

www.ukchamberofshipping.com

Please consider the environment before printing this email.

The information contained in this communication, and any attachments, may be confidential and / or privileged. It is intended only for the use of the named recipient. If you are not the intended recipient, please contact us on 020 7417 2800. In such an event, you should not access any attachments, nor should you disclose the contents of this communication or any attachments to any other person, nor copy, print, store or use the same in any manner whatsoever. Thank you for your cooperation.