

# **Moray Offshore Wind Farm (West) Ltd**

## **Moray West**

### **Gateway documentation:**

#### **Stage 3 Consult**

#### **3A: Consultation Document**

***9<sup>th</sup> November 2020 to 17<sup>th</sup> January 2021 (10 weeks)***



## Authorship

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Reviewed Approved	[REDACTED] - Aviation Consultant	October 2020

## References

Ref No	Description	Hyperlinks
1	Moray Offshore Wind farm (West) Ltd CAA web page –progress through CAP1616	<a href="#">link</a>
2	Stage 1 Assessment Meeting Presentation	<a href="#">link</a>
3	Stage 1 Assessment Meeting Minutes	<a href="#">link</a>
4	Stage 1 Design Principles	<a href="#">link</a>
5	Stage 2 Design Options	<a href="#">link</a>
6	Stage 2 Design Principle Evaluation	<a href="#">link</a>
7	Stage 2 Options Appraisal (Initial) & Safety Assessment	<a href="#">link</a>
8	Stage 3 Full Options Appraisal	<a href="#">Link</a>
9	Stage 3 Consultation Strategy	<a href="#">Link</a>

## Publication history

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## 1. Introduction

- 1.1 This document forms part of the document set required in accordance with the requirements of the CAP1616 airspace change process.
- 1.2 For previous stages of the airspace change process, including the statement of need, design principles and design options, please see the [CAA Webpage](#) detailing the progress of this proposal, and the reference table above.
- 1.3 Our stakeholder audience are considered to be aviation experts; therefore, we will use aviation technical language in this consultation document, in English only.

## 2. Overview: Scope and Purpose of this Consultation

- 2.1 This Airspace Change Proposal (ACP) is sponsored by us, Moray Offshore Wind Farm (West) Limited (MOWWL), referred to in this consultation document as the Developer or the Sponsor.
- 2.2 We intend to develop an offshore wind farm in the Moray Firth (Figure 1). This wind farm will cover an area of approximately 225 km<sup>2</sup>, 22.5 km (12.1 NM) from the Caithness coastline, 24 km (13 NM) from the Aberdeenshire coastline and will contain up to 85 Wind Turbine Generators (WTGs).

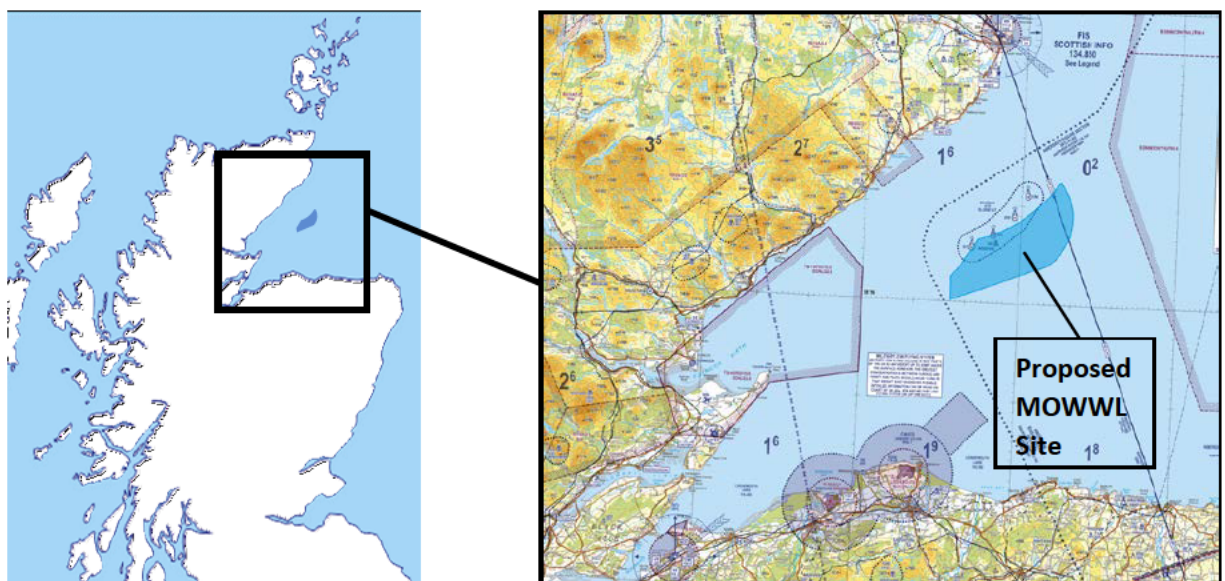
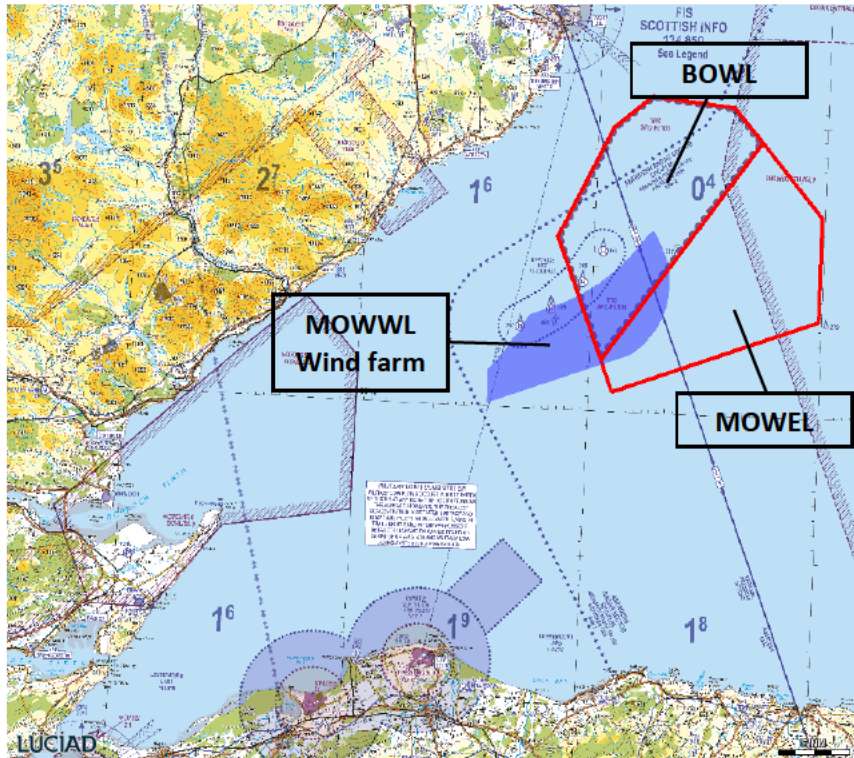


Figure 1: Location of MOWWL Development

- 2.3 WTGs are known to interfere with Air Traffic Control (ATC) radars. This development has been identified as having the potential to impact the Allanshill Primary Surveillance Radar (PSR). As such, a Primary Radar Mitigation Scheme (PRMS) is required to be in place prior to commencement of the key phase of the construction of the wind farm. This is a stipulation of the planning consent that underpins the development.
- 2.4 The MOWWL development is to be built adjacent to the Beatrice Offshore Wind Farm Ltd. (BOWL) and Moray Offshore Wind Farm (East) Ltd (MOWEL) wind farms. These wind farms also required a PRMS to be in place prior to construction.
- 2.5 Previous wind farm developments have explored a variety of options to mitigate the risk, with Range Azimuth Gating (RAG) (known commonly as radar blanking) implemented in previous developments including BOWL and MOWEL, alongside a Transponder Mandatory Zone (TMZ).

- 2.6 The PRMS in place for BOWL (RAG and TMZ implemented March 2018) and MOWEL (RAG and TMZ due to be implemented January 2021) covers an eastern portion of the MOWWL site, shown in Figure 2. As such, a new PRMS will only be required to cover the western portion of the MOWWL site not covered by the MOWEL and BOWL mitigation schemes which will already be in place when MOWWL is constructed.



**Figure 2:** MOWWL site (Blue shape) with MOWEL and BOWL TMZs (Red outline) shown

- 2.7 The PRMS which is proposed to be implemented is RAG blanking of the entire area covered by the MOWWL development, with a complementary TMZ which will incorporate a 2 NM buffer extended to align with the existing and planned TMZs.
- 2.8 We are consulting in relation to the establishment of this new TMZ, within current Class G airspace, to cover the portion of the MOWWL development not covered by the existing BOWL and planned MOWEL TMZs.
- 2.9 The purpose of this consultation document is to provide information to you, our stakeholders, to allow you to respond effectively. This document should be read in conjunction with the Full Options Appraisal (Ref 8) and Consultation Strategy (Ref 9) which outlines the consultation approach.
- 2.10 We are seeking feedback from stakeholders who may be affected by the proposal. Primarily this is likely to be users of the airspace and other aviation stakeholders. Nonetheless, we welcome feedback from any interested parties.
- 2.11 You have the opportunity to provide relevant feedback, which may conflict with that of other stakeholders. After the consultation has ended, we will consider all the feedback received and then produce the final proposed design, which may differ from that described in this document.
- 2.12 You have a crucial role in providing relevant and timely feedback to us, the Sponsor, in the form of your views and opinions on the impact this proposal might have on your operation, and any mitigations you might suggest, supported by evidence where possible.



- 2.13 We contend that the 10-week duration of this consultation is proportionate for this project. This is due to the keenly targeted list of stakeholders, the limited number of aviation stakeholders affected by the proposed change, the geographical location of the proposed wind farm and TMZ as well as the lack of potential impact on non-aviation local stakeholders. This is further justified by the pre-consultation engagement activities we have undertaken with our stakeholders and the relative simplicity of the TMZ proposal itself.

### 3. Background – Why do we need a TMZ?

- 3.1 In 2019, Scottish Ministers granted planning consent to us (under Section 36 of the Electricity Act 1989) for the construction and operation of the MOWWL development.
- 3.2 This development will contain up to 85 WTGs. Construction of the wind farm is programmed to start Q2 2022, with the first turbine rotation Q1 2024.
- 3.3 NATS En-Route Ltd (NERL) initially objected to the MOWWL development, on the basis that the WTGs contained within this development would be detected by the Allanshill PSR. This would cause unacceptable interference through the desensitization of the radar and the creation of 'false' radar returns (known as radar 'clutter'). This could affect Air Traffic Control Officers' (ATCO's) ability to identify primary radar aircraft returns and increases the risk of an ATCO not detecting a conflict between aircraft. Large numbers of turbines could also lead to saturation of the radar processing systems.
- 3.4 Planning consent was awarded, subject to Section 36 Planning Consent Condition 23, see below, due to the impact of this development on the Allanshill PSR.

<b>Condition 23</b>	To mitigate adverse impact to the Allanshill radar and associated air traffic operations	<p>No part of any WTG shall be erected above mean sea level until a Primary Radar Mitigation Scheme ("PRMS") has been submitted to and approved in writing by the Scottish Ministers following consultation with NATS (En Route) Public Limited Company ("NERL"). Commencement of the Development cannot take place until such approval is granted.</p> <p>No blades shall be fitted to any WTG until the technical mitigation measures set out in the approved PRMS have been implemented in accordance with its terms and the Development must thereafter be operated fully in accordance with such approved Primary Radar Mitigation Scheme.</p>
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- 3.5 The proposed PRMS is to deploy RAG on the Allanshill PSR to remove all primary radar returns from the WTGs from the wind farm. However, RAG will also remove primary radar returns from aircraft within the blanked area. To mitigate against this removal of primary radar coverage, it will be necessary to establish a TMZ over the consented wind farm so that only aircraft equipped with a transponder, and hence visible to ATC via secondary radar, will be permitted to overfly the wind farm (RAG blanked area) without first obtaining a clearance from ATC.
- 3.6 A TMZ is defined: "...airspace of defined dimensions wherein the carriage and operation of pressure-altitude reporting transponders is mandatory."<sup>1</sup>
- 3.7 A TMZ is an airspace structure which must progress through the CAA's airspace change process known as [CAP1616](#).

<sup>1</sup> SARG Policy for Radio Mandatory Zones and Transponder mandatory Zones. August 2015.

## 4. Stakeholders

- 4.1 Stakeholders are third-party groups or individuals interested in an ACP.
- 4.2 We do not plan to target organisations whose primary interest is environmental, such as noise or local air quality – there will be no change in aviation impact as the proposed changes are at least 14.8 km/ 8 NM offshore.
- 4.3 The Consultation Strategy document (Ref 9) details all the stakeholders we have targeted. See Annex B.
- 4.4 For details on how to respond to this consultation see Section 10 on page 10.

## 5. Justification and Objectives

- 5.1 The justification for this airspace change is to enable the construction of this wind farm.
- 5.2 The wind farm is expected to provide an environmental benefit by saving of c.1 million tonnes (MT) CO<sub>2</sub> emissions per annum, which will only be realised if the airspace change is implemented and the wind farm built.
- 5.3 The objectives of this proposal are to:
  - Ensure aviation safety, with no increased risk to an ATCO's ability to detect aircraft conflicts; and
  - Meet the planning consent condition for this wind farm development to enable its construction and realise significant environmental benefits by the generation of renewable energy (see para 3.4).

## 6. Options for Consultation

- 6.1 After the previous development stage of the airspace change process (Stage 2), two formal options remained for progression:
  - Do nothing (Section 7) – we do not prefer this option because the planning consent condition would not be met, construction could not start, and the benefits of renewable energy would not be realised.
  - TMZ Option C, **TMZ with 2 NM buffer extended to align with Existing and Planned TMZs**, (Section 8) – we prefer this option as it will allow construction of the wind farm and enabling the subsequent environmental benefits.

## 7. Current Airspace – The “do nothing” Option

- 7.1 The current airspace/ do nothing option is shown in Figure 3.
- 7.2 This option does not meet the planning consent condition 23 and as such the MOWWL development would not be constructed and the subsequent environmental benefits would not be realised. It is included for comparison purposes only.

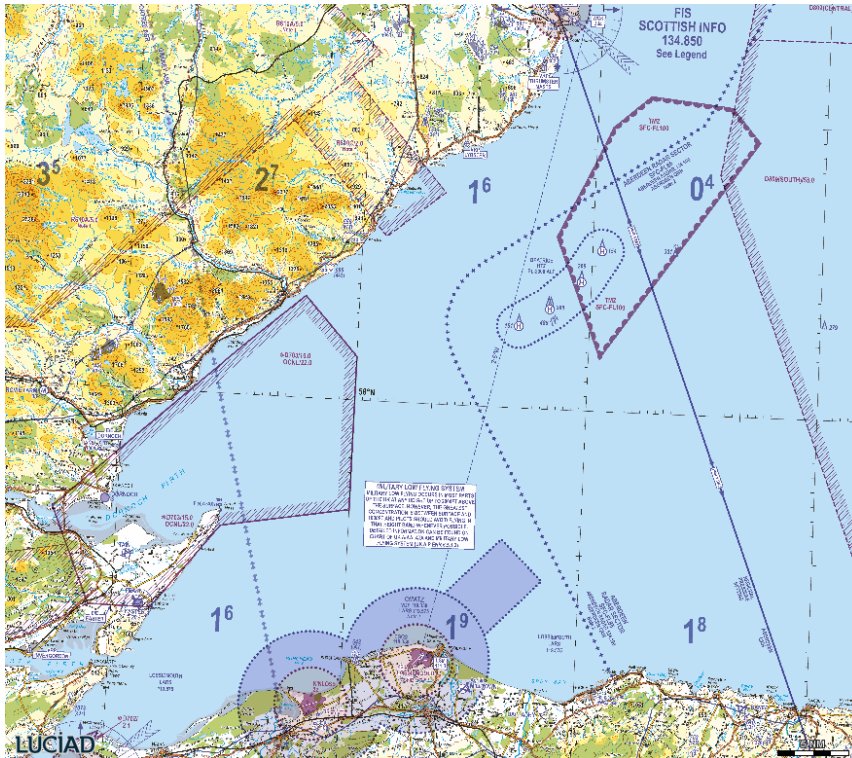
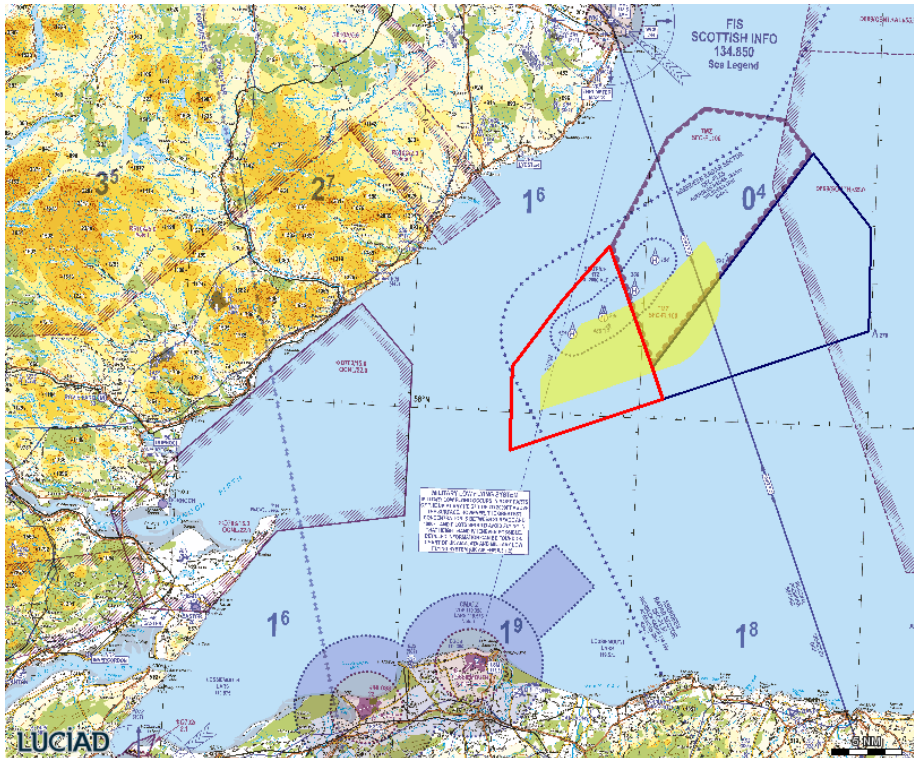


Figure 3: Current airspace within the Moray Firth

## 8. Proposed Airspace – TMZ Option C (Preferred)

- 8.1 The proposed airspace, TMZ Option C, is shown in Figure 4 and is our preferred option. The RAG blanked region is the same as the wind farm (yellow shape) and the proposed TMZ, Surface to FL100, is shown as a red outline.
- 8.2 The coordinates for the proposed TMZ perimeter are listed in Annex C.
- 8.3 The proposed wind farm is located within UK airspace within the Moray Firth. At its closest, the wind farm will be 22.5 km from the Caithness coastline and 24 km from the Aberdeenshire coastline. The Eastern portion will sit underneath Air Traffic Service Route (ATS) route Y904, within an area covered by the existing BOWL and the planned MOWEL TMZs
- 8.4 This area is serviced by the Allanshill (39.1 NM from MOWWL) and Perwinnes (63.5 NM from MOWWL) PSRs. NERL has assessed that the WTGs within the MOWWL development would be detected by the Allanshill PSR causing unacceptable interference and clutter on the ATCOs' radar. Following this objection, planning consent was granted, subject to Section 36 Planning Consent Condition 23, stating that a PRMS for the Allanshill PSR is required prior to construction of the wind farm. No objection was raised in relation to the Perwinnes PSR.
- 8.5 The vertical extent of the TMZ will be from the surface to FL100. Above FL100, all civilian aircraft must operate a transponder (UK AIP ENR 1.6, para 2.2.2.1).





**Figure 4:** Proposed MOWWL TMZ Option C (Red outline). MOWWL Development (RAG blanked area) is shown as a yellow shape.

- 8.6 The proposed shape of the TMZ is simpler than the shape of the inner RAG blanked region and incorporates a buffer zone of at least 2 NM. This buffer has been extended along the northern edge to align the proposed TMZ with the existing BOWL TMZ. The buffer is intended to give ATC warning (and hence time to react) should an infringement of the TMZ occur:
- An example non-transponding infringing aircraft travelling at 200 kt will take c.36 seconds from crossing the proposed TMZ perpendicular to the boundary, until it enters the blanked region (and disappears). An ATCO monitoring the radar would have that time to notice the aircraft has infringed the TMZ and take appropriate action.
- 8.7 The simplified TMZ boundary shape formed when all three, BOWL, MOWEL, and MOWWL, TMZs are combined is advantageous for the simplicity of display to pilots on in-cockpit electronic flight information system (EFIS) displays and ATCOs on radar displays. A simple shape is preferable for Human Factors reasons. This reasoning has been used in previous wind farm TMZ mitigations to design the outer TMZ boundary and found to be effective.
- 8.8 In line with the SARG policy on TMZs, “a pilot wishing to operate in a TMZ without serviceable transponder equipment may be granted access subject to specific arrangements agreed with the TMZ Controlling Authority.”<sup>1</sup>

## 9. Predicted Scale of Impacts and Benefits of TMZ Option C (Preferred)

9.1 For full details, see Stage 3 Full Options Appraisal (Ref 8).

Subject	Scale of Impact/ Benefit	Evidence
Noise	None	No change to flightpaths over inhabited area at low altitudes
Visual Intrusion	None	No change to flightpaths over inhabited area at low altitudes
Local Air Quality	None	No change to flightpaths over inhabited area at low altitudes
Aviation fuel/ CO <sub>2</sub> emissions	Negligible	Evidence presented in the Full Options Appraisal (Ref 8) contends that <1% of GA flights might theoretically be affected, and thus may need to reroute to avoid the TMZ if unable to comply with conditions.
Air Traffic Control airspace capacity	None	No expected change to Air Traffic Control Sector Workload
Aviation Safety	Enhanced	Experience from previous wind farm developments has demonstrated that the implementation of radar blanking coupled with an associated TMZ provides effective and safe mitigation against radar issues associated with wind farms. The risk of infringements is reduced due to the simpler northern boundary.

Table 1: Summary of impacts and benefits of TMZ Option C.

## 10. How to Respond to this Consultation

- 10.1 The consultation began on 9<sup>th</sup> November 2020 and will end on the 17<sup>th</sup> January 2021, a period of 10 weeks.
- 10.2 This consultation is being conducted by us, the developer. The Civil Aviation Authority's (CAAs) Safety and Airspace Regulation Group (SARG) will oversee the consultation and ensure that it adheres to the CAP1616 process and government guidelines.
- 10.3 As most people have internet access, this consultation is primarily being conducted via the CAA online Consultation Portal which can be accessed through the [airspace change portal](#). All stakeholders previously engaged, listed in Annex B, have been emailed a link to the [airspace change portal](#).
- 10.4 The consultation is not limited to the stakeholders listed in Annex B – anyone may respond.
- 10.5 We will not pre-print copies of the consultation document. However, requests for a paper copy received by post will be accommodated. We will supply a paper copy of the consultation document under the following conditions:
- Requests are to be sent in writing to:  
 NATS Airspace Consultation  
 Ref: MOWWL  
 Mailbox 11

4000 Parkway  
Whitely  
Fareham  
Hampshire  
PO15 7FL.

- Requests must be received at least fourteen days before the consultation closes and include a stamped (Large Letter) self-addressed envelope.
  - We cannot accept responsibility for errors in the postal service where requests do not reach us, or our return post does not reach the recipient.
  - Due to the ongoing Covid-19 pandemic and in line with government guidance our staff are currently working from home and there is disruption to company mail deliveries. As such forwarding of any postal responses to the appropriate staff cannot be guaranteed. Hence it is strongly recommended for submissions to be made online.
- 10.6 Written responses are to be received by 17th January 2021. Should the stakeholder require acknowledgment of receipt, we encourage the use of a recorded delivery service, or to enclose a self-addressed envelope stamped with adequate postage for a receipt slip – proof of postage is not proof of delivery and we will be otherwise unable to acknowledge receipt of responses.
- 10.7 We will input all paper responses manually into the CAA online consultation portal.
- 10.8 When submitting your feedback, you will be asked to provide the following:
- Your name and your role if you are responding on behalf of an organisation
  - Your contact details (email, and/ or postal address)
  - A feedback category: SUPPORT NO COMMENT AMBIVALENT OBJECT
  - Your reasons for choosing the category above, your feedback on the impacts of the TMZ on your operation, how often those impacts might occur, any suggested mitigations or design changes you think should be considered, anything you think might be unintended consequences of the TMZ.
- 10.9 We have provided a feedback form suitable for handwritten postal responses – see Annex D on page 16. This asks the same questions as the online survey. Online responses will have the option to upload a supporting document – if you wish to supply more information on paper by post, please attach it to your completed feedback form.
- 10.10 All responses will be analysed, with any common themes extracted and summarised. We will actively monitor the consultation portal and will formally respond back to any queries<sup>2</sup>, uploading Frequently Asked Questions (FAQs) document if necessary.
- 10.11 Please respond even if this proposal does not affect your operation. This is still useful information.

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<sup>2</sup> The portal will not be monitored during the 2-week Christmas break (21<sup>st</sup> December 2020 to 3<sup>rd</sup> January 2021).

## 11. Reversion Statement

- 11.1 MOWWL considers the proposed option to be the 'do minimum' option. A 'Do nothing' option would not provide mitigation against radar clutter. Should the proposal be approved and implemented, it would not be possible to revert to the pre-implementation state without affecting NATS ATC operations. The proposed changes would be considered permanent unless a cost-effective alternative mitigation scheme is developed and proposed.
- 11.2 In the unlikely event that there are unexpected issues caused by this proposal, then short notice changes could be made via NOTAM. For a permanent reversion, the changes would have to be reversed by incorporating this into an appropriate future AIRAC date to align with NATS' engineering updates; of which there are only four a year.

## 12. Compliance with the Airspace Change Process

- 12.1 This proposal is confirmed by the CAA as Level 2B.
- 12.2 If you have questions or comments regarding the conduct of the airspace change process (such as adherence to the CAP1616 process), please contact the CAA:

Airspace Regulation  
Ref: MOWWL ACP 2019-72  
Safety and Airspace Regulation Group  
Aviation House  
South Area  
Gatwick Airport  
RH6 0YR

Form [FCS 1521](#) can be used for this purpose

Note: **These contact details must not be used for your response** to this consultation. If you do so, your response may be delayed or missed out, reducing its effectiveness.

## 13. What Happens Next?

- 13.1 After the consultation period closes, we will analyse the feedback received and publish a report on the CAA Airspace Change Portal (Ref 1) summarising the findings and how each item might affect the airspace design.
- 13.2 We will consider those findings, determine if the airspace design needs to change in light of the feedback, and, if needed, publish a second report detailing the amended design.
- 13.3 Finally we will submit an Airspace Change Proposal to the CAA based on this consultation document and the feedback reports.
- 13.4 The CAA will then study the proposal to decide if it has merit and will publish a decision on its website.
- 13.5 If the CAA approves this proposal, we plan to implement the changes by Q1 2024.

## 14. Annex A: Glossary

ACP	Airspace Change Proposal
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATS	Air Traffic Service
BOWL	Beatrice Offshore Wind Farm Limited
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
DAATM	Defence Airspace Air Traffic Management
DD	Decimal Degrees
DMS	Degrees Minutes Seconds
EFIS	Electronic Flight Information System
HAL	Highlands and Islands Airports Limited
km	kilometre
kt	knots
MOD	Ministry of Defence
MOWEL	Moray Offshore Wind Farm (East) Limited
MOWWL	Moray Offshore Wind Farm (West) Limited
MT	Million Tonnes (metric)
NATMAC	National Air Traffic Management Advisory Committee
NATS	National Air Traffic Service
NERL	NATS En-Route Limited
NM	Nautical Mile
PRMS	Primary Radar Mitigation Scheme
PSR	Primary Surveillance Radar
RAG	Range Azimuth Gating (Radar Blanking)
SARG	Safety and Regulation Group
SSR	Secondary Surveillance Radar
TMZ	Transponder Mandatory Zone
WTG	Wind Turbine Generator

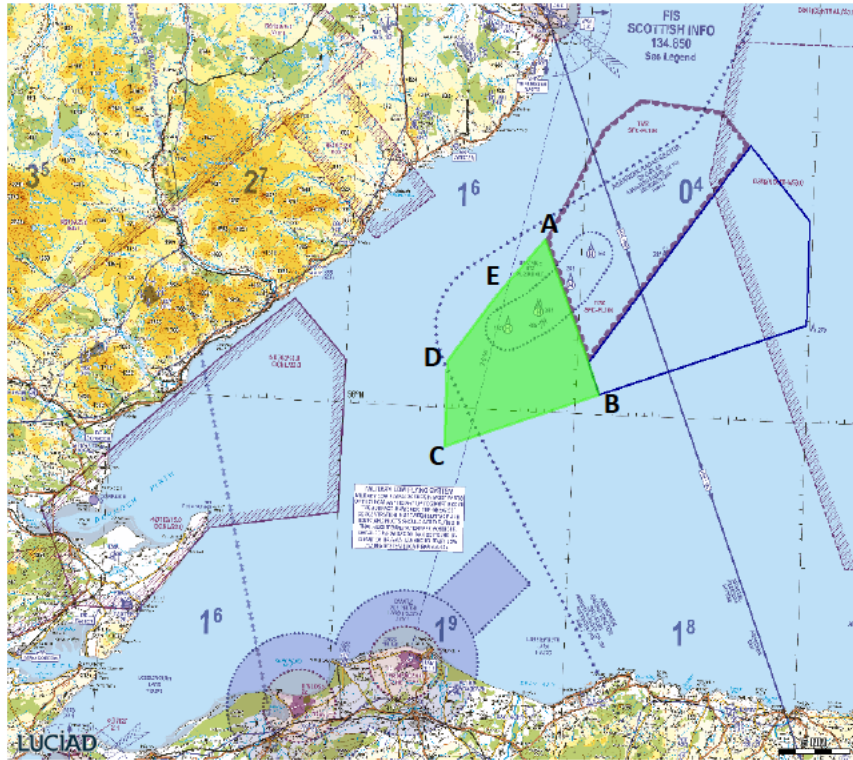


## 15. Annex B: List of Stakeholders

	Stakeholder
NATMAC	Aircraft Owners and Pilots Association (AOPA)
	Airlines UK
	Airport Operators Association (AOA)
	ARPAS - Association of Remotely Piloted Aircraft Systems
	Aviation Environment Federation (AEF)
	BAe Systems
	BBAC - British Balloon & Airship Club
	BHPA - British Hang gliding & Paragliding Association
	BMAA - British Microlight Aircraft Association
	BMFA - British Model Flying Association
	British Sky Diving
	British Airline Pilots Association (BALPA)
	British Business and General Aviation Association (BBGA)
	British Helicopter Association (BHA)
	BGA- British Gliding Association
	GAA- General Aviation Alliance
	Guild of Air Traffic Control Officers (GATCO)
	Heavy Airlines
	Helicopter Club of Great Britain (HCGB)
	Light Aircraft Association (LAA)
	Low Fare Airlines
	MoD DAATM
	PPL/IR (Europe)
	British Airways (BA)
Helicopter Operators	Babcock Helicopters
	Bristow Helicopters
	CHC Scotia
	NHV Helicopters
	Maritime and Coastguard Agency (MCGA)
ATC	Aberdeen ATC
	Highlands and Islands Airports Ltd (HIAL)
	NATS En Route Limited (NERL)
	NATS Prestwick
Airports	AGS Airports Limited, Aberdeen
	Wick Airport
	Inverness Airport

## 16. Annex C: Coordinates of Proposed TMZ Perimeter- Option C (Preferred)

These coordinates are WGS84 presented in decimal degrees (DD) and degrees minutes seconds (DMS). Each row corresponds to the same location.



Point	Decimal Degrees		Degrees° Minutes' Seconds.dec"	
	Latitude (DD)	Longitude (DD)	Latitude (DMS)	Longitude (DMS)
A	58.19801767	-003.08037169	58° 11' 52.86" N	003° 04' 49.34" W
B	58.02297144	-002.94873611	58° 01' 22.70" N	002° 56' 55.45" W
C	57.95568889	-003.27752222	57° 57' 20.48" N	003° 16' 39.08" W
D	58.05353056	-003.28101389	58° 03' 12.71" N	003° 16' 51.65" W
E	58.13360000	-003.17842222	58° 08' 00.96" N	003° 10' 42.32" W



Reasons/evidence (continued)

Do you have any comments on the consultation content?