

Seagreen Wind Energy Limited

Offshore Wind Farm TMZ

Consultation Document  
4th September - 16th October 2019 (6 weeks)



CAA ref ACP-2019-025

#### Publication history

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#### Authorship

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Reviewed Approved	<b>Wind Turbine Generation Package Manager</b> Seagreen Wind Energy Ltd	16/08/2019

#### References

Ref No	Description	Hyperlinks
1	Seagreen Phase 1 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 Consultation Strategy	<a href="#">link</a>
9	Stage 3 Full Options Appraisal	<a href="#">link</a>
10	Stage 3 Consultation Document (this document)	<a href="#">link</a>

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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 website](#) detailing the progress of this proposal, and the reference table above.
- 1.3 Our stakeholders are considered to be an aviation expert audience; 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, Seagreen Wind Energy Limited (SWEL), referred to in this consultation document as the Developer or the Sponsor.
- 2.2 We intend to develop an offshore wind farm in the North Sea. Wind turbines can interfere with air traffic control radars, so we need to add an airspace structure known as a Transponder Mandatory Zone (TMZ) – for more details see paragraphs 3.3-3.8.
- 2.3 We are consulting in relation to the establishment of the TMZ.

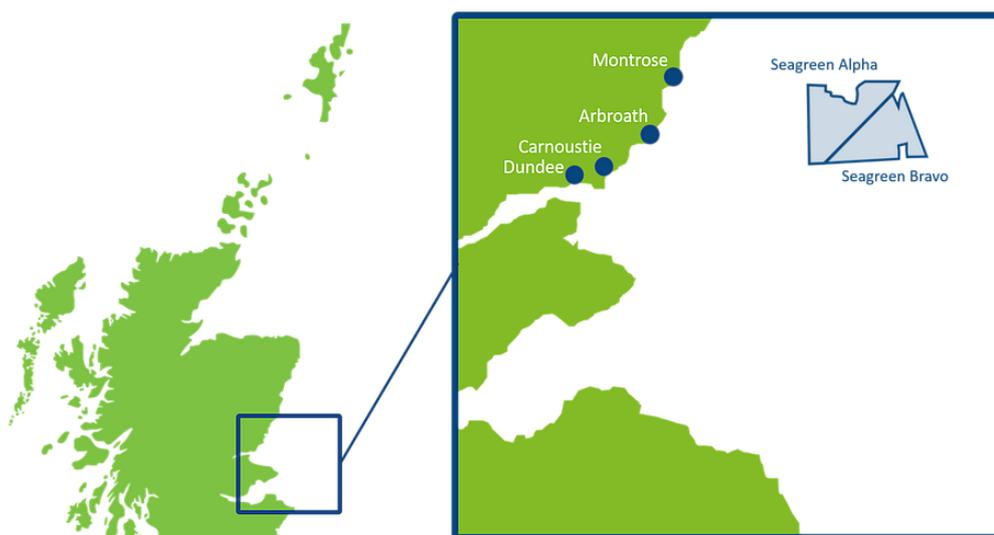


Figure 1 Location and extent of Seagreen windfarm complex

- 2.4 The windfarm is proposed to cover an area of approx. 400km<sup>2</sup>. The proposed airspace change would include this entire area, with an additional 2 nautical mile (nm) buffer. This airspace is Class G uncontrolled, but with air traffic service (ATS) routes nearby (mainly used for Aberdeen Airport arrivals/departures) and a Danger Area located to the east, known as EGD613 (see Section 7)
- 2.5 The purpose of this consultation document is to provide information to you, our stakeholders, to allow you to respond effectively. This document can be read in conjunction with the Consultation Strategy<sup>(ref 8)</sup> and Full Options Appraisal<sup>(ref 9)</sup> which outlines the consultation approach.
- 2.6 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.
- 2.7 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 your feedback and then produce the final design proposal, which may differ from that described in this document.

- 2.8 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.
- 2.9 We contend that the 6 week duration of this consultation is proportionate, due to the location of the proposed changes, the lack of environmental impact from the proposed change, and the key group of aviation professional stakeholders (NATS, MoD and Aberdeen Airport) who have already been engaged before this consultation launched.

### **3. Background – why do we need a TMZ?**

- 3.1 In 2014, Scottish Ministers granted planning consent to us (under Section 36 of the Electricity Act 1989) for the construction and operation of Seagreen Alpha and Seagreen Bravo wind farm sites. Planning was awarded for both sites separately, but at the same time. Alpha and Bravo have now been amalgamated into one site, now known as Seagreen Phase 1.
- 3.2 About 150 turbines are planned on this site. Construction of the wind farms is programmed for early 2021, with the first turbine rotation later that year.
- 3.3 NERL (NATS En Route Ltd) initially objected to the Seagreen offshore wind farm developments, on the basis that the wind turbine generators (WTGs) will be detectable to the Air Traffic Control (ATC) Primary Surveillance Radar (PSR) at Perwinnes. 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 an air traffic controller's ability to identify primary radar aircraft returns and increases the risk of the controller not detecting a conflict between aircraft. Large numbers of turbines could also lead to saturation of the radar processing systems.
- 3.4 Planning was granted, subject to Section 36 Planning Consent Condition 23, which states that no turbine shall be erected until a Primary Radar Mitigation Scheme has been implemented, due to the impact of this development on the Perwinnes PSR.
- 3.5 At this time, there is no proven technical aviation mitigation solution which eliminates the predicted impact of WTGs on PSR.
- 3.6 The proposed mitigation is to deploy Range Azimuth Gating (RAG) on the Perwinnes PSR to remove all primary radar returns in the area of the wind farm, and to establish a TMZ within the blanked volume. This will ensure controllers can see all aircraft in the blanked volume via secondary surveillance radar (SSR) returns, but this is only safely effective if all aircraft in the volume are guaranteed to be operating a transponder.
- 3.7 A TMZ is defined: "...as a volume of airspace where aircraft wishing to enter or fly within the defined area, will be required to have and operate secondary surveillance radar equipment. TMZs are notified for the purpose of ANO 2005 Article 20(2). This equipment must include a pressure altitude reporting transponder capable of operating in Mode A and Mode C and has the capability and functionality prescribed for Mode S Elementary Surveillance. The pilot of an aircraft that wishes to operate in a TMZ without such serviceable transponder equipment may be granted access to the TMZ subject to specific ATC approval."<sup>1</sup>
- 3.8 We need to add a TMZ to the blanked volume of airspace. A TMZ is an airspace structure which must progress through the CAA's airspace change process known as [CAP1616](#).

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<sup>1</sup> DAP Policy for Transponder Mandatory Zones (TMZs), April 2009

## 4. Stakeholders

- 4.1 Stakeholders are third-party groups or individuals interested in an airspace change proposal.
- 4.2 This consultation targets three groups of stakeholders: Key, Major and Other.
- Key stakeholders are those whose responses are essential.
  - Major stakeholders are those whose responses are highly desirable.
  - Other stakeholders are those whose responses are welcomed.
- 4.3 We do not plan to target organisations whose primary interest is environmental, such as noise or local air quality – there would be no change in aviation impact as the proposed changes are all at least 27km/14nm offshore.
- 4.4 The Consultation Strategy document<sup>(ref 8)</sup> details all the stakeholders we have targeted. See Section 15 Annex B: List of Targeted Stakeholders.
- 4.5 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 windfarm.
- 5.2 This windfarm development is considered as a Nationally Significant Infrastructure Project (NSIP) by the UK Government's Business, Energy and Industrial Strategy (BEIS) department. The environmental benefit of the wind farm is expected to produce CO<sub>2</sub> benefits of 2 million tonnes per annum, which will only be realised if the airspace change is implemented and the windfarm can be built.
- 5.3 The objectives of this proposal are to:
- Ensure aviation safety, and no increased risk to Air Traffic Controllers' ability to detect aircraft conflicts; and
  - Meet the planning consent condition for this windfarm 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 D (Section 8) – we prefer this option because it would allow construction and the subsequent benefits.

## 7. Current airspace, the “do nothing” option

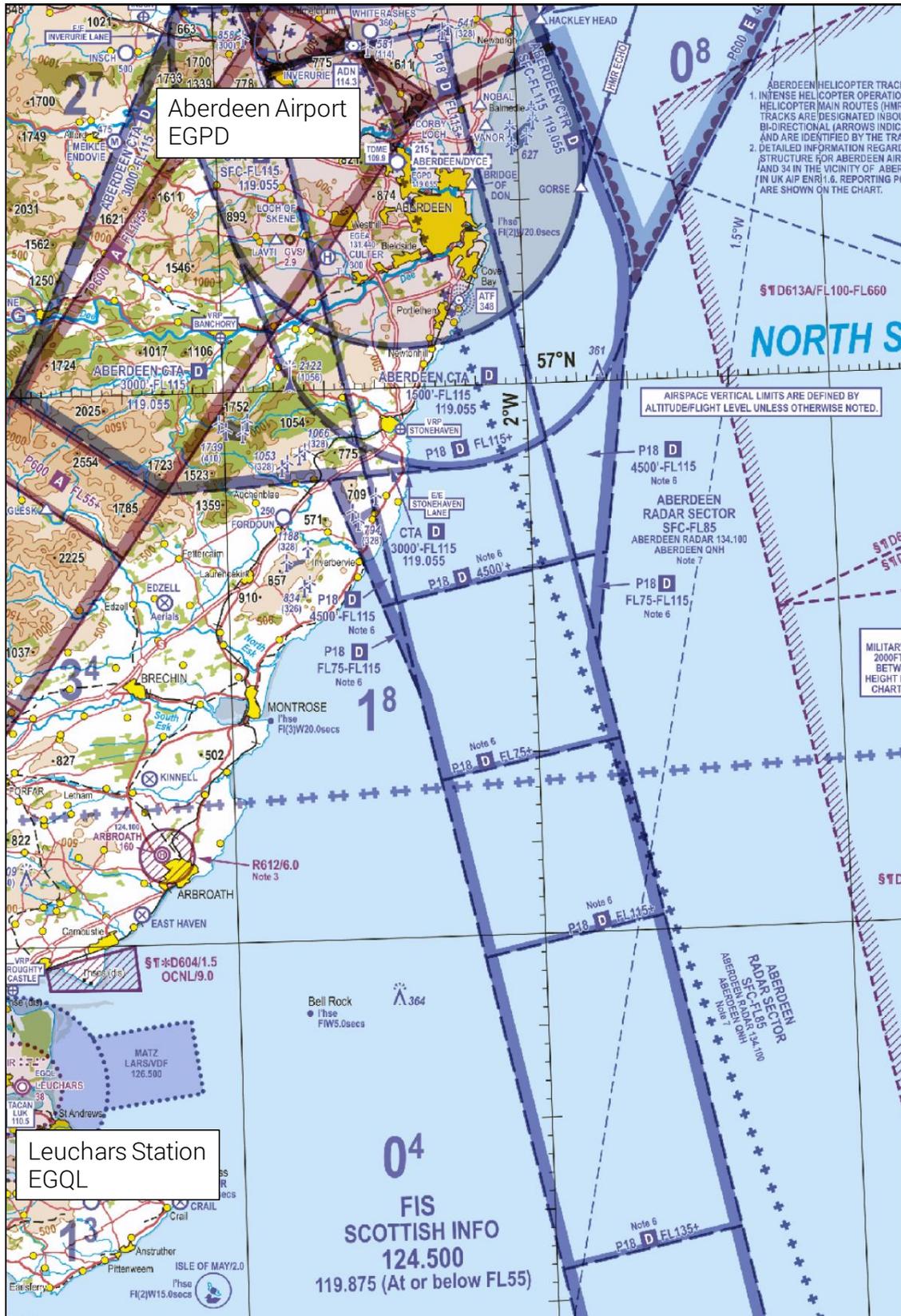


Figure 2 Current airspace arrangements

7.1 This is the current airspace and also the do nothing option.

## 8. Proposed Airspace – TMZ Option D

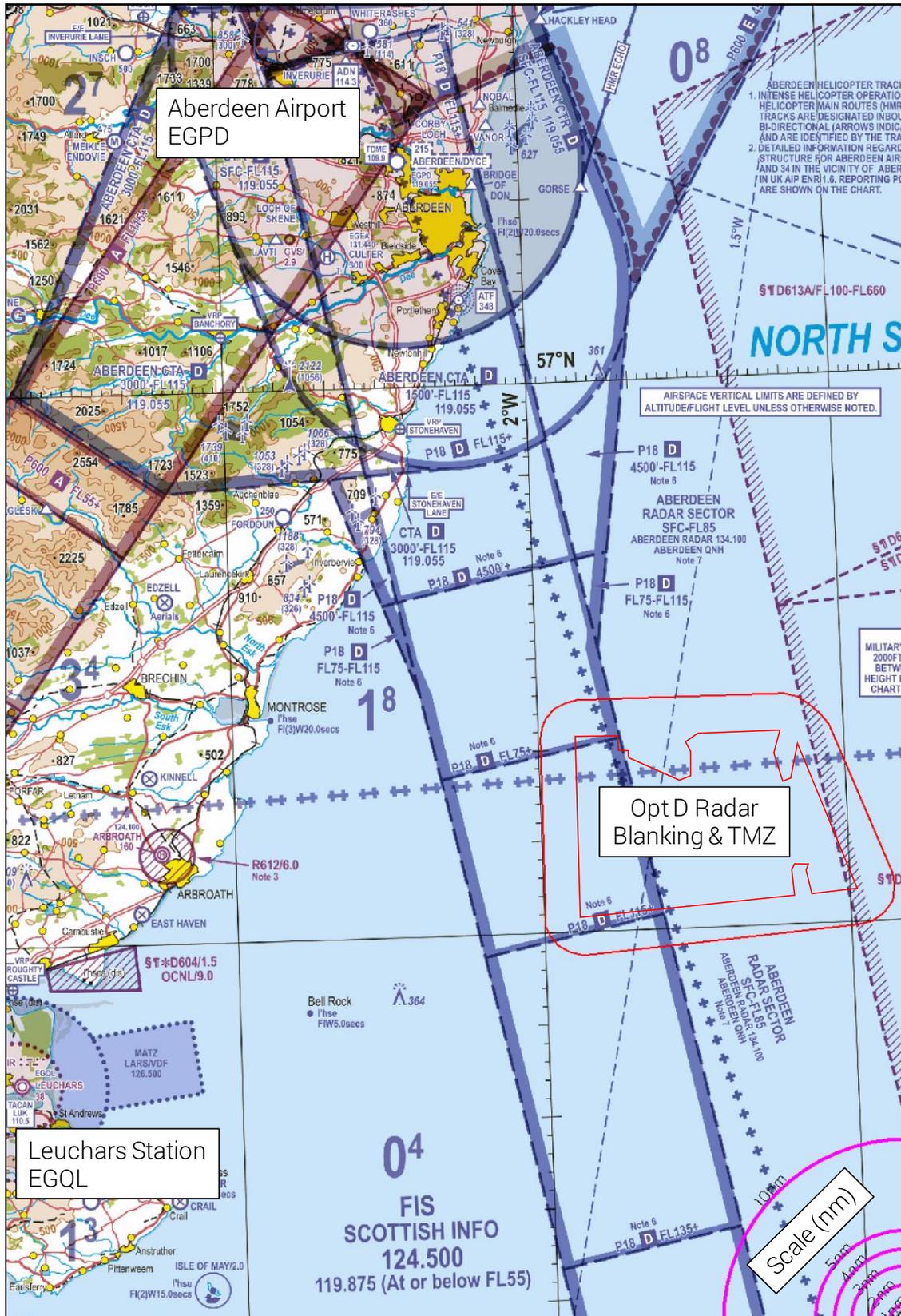


Figure 3 Proposed TMZ Option D (outer shape)

8.1 Radar blanking volume (inner) with Option D TMZ boundary (outer) – surface to FL100.

- 8.2 The proposed windfarm is located 40nm south-southeast of Aberdeen Airport and 32nm east-northeast of Leuchars Station. The western portion sits underneath Airway P18 (Class D, transponder mandatory airspace); the eastern boundary is adjacent to, and underneath, Danger Area D613C.
- 8.3 Its vertical extent would be from the surface to FL100 because all civilian aircraft must operate a transponder from FL100 and above (ref UK AIP ENR 1.6 para 2.2.2.1).
- 8.4 The proposed shape is simplified compared with the inner radar blanking region, with a 2nm smoothed buffer. The buffer is intended to give ATC some delay (and hence time to react) should an infringement occur:
- An example non-transponding infringing aircraft travelling at 200kt will take c.36 seconds from crossing the proposed TMZ perpendicular to the boundary, until it enters the blanked region (and disappears). An air traffic controller monitoring the radar would have that time to notice the aircraft has infringed the TMZ and take appropriate action.
- 8.5 The simplified TMZ boundary shape is advantageous for the simplicity of display to pilots on in-cockpit electronic flight information system (EFIS) displays and ATC operators on radar displays. A simple shape is preferable for Human Factors reasons. This reasoning was used in previous wind farm TMZ mitigations to design the outer TMZ boundary, and has been effective.

## 9. Predicted scale of impacts and benefits of TMZ Option D

For full details see Stage 3 Full Options Appraisal<sup>Ref 9</sup>

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 Full Options Appraisal <sup>Ref 9</sup> contends that a fraction of 1% of GA flights may theoretically be affected, and thus may need to reroute to avoid the TMZ if unable to comply with its conditions.
Air traffic control airspace capacity	None	No expected change to air traffic control sector workload
Aviation safety	Enhanced	Experience from previous windfarm developments has demonstrated that the implementation of radar blanking coupled with an associated TMZ provides effective and safe mitigation against radar issues associated with windfarms

Table 1 Summary of impacts and benefits of TMZ Option D

## 10. How to respond to this consultation

- 10.1 The consultation begins on 4th September and ends on 16th October 2019, a period of 6 weeks.
- 10.2 All our target stakeholders<sup>ref 8</sup> have been emailed a link to the consultation area of the CAA airspace change portal <https://airspacechange.caa.co.uk/PublicProposalArea?plD=161> and we expect the online survey to be the primary method of consultation and response gathering.
- 10.3 The consultation is not limited to the target stakeholders – anyone may respond.
- 10.4 If you need a paper copy of the consultation please write to us at the address below, and include a stamped self-addressed envelope.
- 10.5 If you wish to respond on paper, send your letter recorded delivery to the address below as we do not commit to acknowledging receipt. If you require a reply please enclose a stamped self-addressed envelope.
- 10.6 Postal address:  
Mailbox 11, sub-box W  
Airspace Consultation ref SWEL Seagreen ACP2019-025  
4000 Parkway, Whiteley, Fareham, Hampshire, PO15 7FL
- 10.7 When submitting feedback please provide the following information:
- 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 OBJECTION, 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.
  - Your feedback on the consultation itself.
- 10.8 We have provided a feedback form suitable for handwritten postal responses – see Section 17 Annex D on page 15. This asks exactly 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 send it in attached to a copy of the form in Annex D.
- 10.9 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, uploading FAQs if necessary.
- 10.10 All online responses go direct to the CAA who will moderate submissions. Responses will be publicly visible by being published on the CAA airspace change portal subsequent to submission. You will have the option to anonymise your online response so it is not publicly visible, but you cannot be anonymous to us or the CAA – we will need to see your name and contact details.  
Postal responses will be scanned, redacted and uploaded to the CAA's airspace portal.  
All responses will be visible to the CAA and our consultants managing the consultation on our behalf.
- 10.11 If this proposal does not affect your operation, please respond so. That fact itself is useful data.

## 11. Reversion Statement

- 11.1 We consider this proposal 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 permanently change the airspace structure.
- 11.2 In the unlikely event that there are unforeseen issues caused by this proposal, then short notice changes could be made via NOTAM. For a permanent reversion, the reversal changes would need to be incorporated 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: SWEL ACP 2019-025  
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 and publish a report summarising the findings and how each item might affect the airspace design.
- 13.2 We will consider those findings, determine if the airspace design does need to change in light of the feedback, and publish a second report detailing the amended design (if amendment is merited).
- 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 not before March 2021.

## 14. Annex A: Glossary

ACP:	Airspace Change Proposal
ANO:	Air Navigation Order
ANSP:	Airspace Navigation Service Provider
ATC:	Air Traffic Control
ATS:	Air Traffic Services
Baseline:	'As is' situation against which proposed changes are measured
CAA:	The UK Civil Aviation Authority, the regulator of airspace changes like this
CAP:	Civil Aviation Publication (publications produced by the CAA)
FL:	Flight Level, the altitude reference which aircraft use at higher altitudes using standard pressure setting, essentially units of 100ft, e.g. FL105 is approximately 10,500ft
Mode A:	Aviation transponder interrogation modes are standard formats of pulsed sequences from an interrogating secondary surveillance radar. Mode A – Provides a 4-digit octal identification code for the aircraft, set in the cockpit but assigned by the air traffic controller. Mode 3/A is often combined with Mode C to provide altitude information as well.
Mode C:	Provides the aircraft's pressure altitude and is usually combined with Mode 3/A to provide a combination of a 4-digit octal code and altitude as Mode 3 A/C, often referred to as Mode A & C
Mode S:	Provides multiple information formats to a selective interrogation. Each aircraft is assigned a fixed 24-bit address
NATMAC:	National Air Traffic Management Advisory Committee
PSR:	Primary Surveillance Radar
RAG:	Range Azimuth Gating (Radar Blanking)
SSR:	Secondary Surveillance Radar
WebTAG:	Department of Transport's web-based Transport Analysis Guidance; provides information on the role of transport modelling and appraisal, and templates for analysis (e.g. for Greenhouse gas emissions, and noise).

For further details on PSR, SSR and Radar blanking, please refer to Annex A in Stage 2A Design Options<sup>ref 5</sup>.

## 15. Annex B: List of Targeted Stakeholders

### Key Stakeholders – Air Navigation Service Providers

Aberdeen Airport ATC  
MoD (via Defence Airspace & Air Traffic Management (DAATM))  
NATS

### Major Stakeholders – Aberdeen-based Offshore Helicopter Operators

Babcock (Bond) Helicopters, Bristow Helicopters, CHC Scotia Helicopters, NHV Helicopters

### Other Stakeholders

NATMAC (National Air Traffic Management Advisory Committee). Members of NATMAC not listed here have been engaged, and do not consider themselves stakeholders in this proposal. Also note that we will not engage with individual organisation multiple times, where they exist both as a known stakeholder for this consultation and within NATMAC.

AOA, AOG, AOPA, ARPAS-UK, AEF, BA, BAE Systems, BALPA, Airlines UK, BBGA, BHA, GASCO, GATCO, HCGB, Heavy Airlines, Honourable Company of Air Pilots, LAA, Light Airlines, Low Fares Airlines, PPL/ IR (Europe)

Maritime and Coastguard Agency – contracted to Bristow Helicopters in this area.

Local Airfields:  
EGPN Dundee Airport

## 16. Annex C: Coordinates of proposed Option D TMZ outer boundary

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

Decimal degrees	
Lat(dd)	Long(dd)
56.48009	-1.93934
56.48242	-1.96176
56.48886	-1.98036
56.49813	-1.99316
56.50734	-1.99885
56.51674	-1.99982
56.67782	-1.99759
56.68787	-1.99462
56.69575	-1.98777
56.70393	-1.97402
56.70916	-1.95613
56.71085	-1.93699
56.70982	-1.59516
56.70628	-1.57447
56.69953	-1.55747
56.69026	-1.53691
56.68123	-1.52392
56.54312	-1.43190
56.53211	-1.42827
56.51877	-1.43302
56.50692	-1.44832
56.50043	-1.46792
56.49813	-1.49406

Degrees Minutes Seconds.dec	
Lat(dms)	Long(dms)
56°28'48.316"N	1°56'21.635"W
56°28'56.706"N	1°57'42.338"W
56°29'19.903"N	1°58'49.297"W
56°29'53.266"N	1°59'35.362"W
56°30'26.418"N	1°59'55.875"W
56°31'0.251"N	1°59'59.339"W
56°40'40.162"N	1°59'51.322"W
56°41'16.339"N	1°59'40.636"W
56°41'44.708"N	1°59'15.968"W
56°42'14.164"N	1°58'26.478"W
56°42'32.981"N	1°57'22.075"W
56°42'39.062"N	1°56'13.168"W
56°42'35.348"N	1°35'42.561"W
56°42'22.592"N	1°34'28.108"W
56°41'58.290"N	1°33'26.897"W
56°41'24.944"N	1°32'12.864"W
56°40'52.426"N	1°31'26.112"W
56°32'35.237"N	1°25'54.843"W
56°31'55.589"N	1°25'41.776"W
56°31'7.564"N	1°25'58.881"W
56°30'24.930"N	1°26'53.949"W
56°30'1.552"N	1°28'4.526"W
56°29'53.254"N	1°29'38.623"W

## 17. Annex D: Feedback Form for postal responses

Please print out these pages, write your response and post it to us at the address in Section 10 on page 10.

Your name:			
Your address:			
Postcode:			
Your email address:			
Delete one of the following boxes, as applicable:			
I am responding as a private individual	I am responding on behalf of an organisation My organisation is:  My position in that organisation is:		
All responses will be published online. You may ask for your name to be published, or to be removed. Delete one of the following boxes:			
Publish my name along with my response		Remove my name before publishing my response	
Do you support the changes in this proposal? Tick one option:			
Support	No objection	Ambivalent	Object
<p>What are your reasons for providing this response? Please consider:</p> <ul style="list-style-type: none"> <li>What do you believe will be the impact of the TMZ on your operation?</li> <li>How often do you think these impacts will occur?</li> <li>Do you have any suggested mitigations or design changes you think should be considered?</li> <li>Do you think there may be any unintended consequences of the TMZ?</li> </ul> <p>Please provide evidence. If you wish to supply more documentary evidence than would fit on these pages, enclose it with this form.</p>			
Continues overleaf...			

Reasons/evidence (continued)

Do you have any comments on the consultation content and process itself?

End of document