

ACP-2019-72

## Moray West Offshore Wind Farm

CAP 2232

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## Chapter 1

# Executive Summary

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## Objective of the Proposal

- 1.1. Moray Offshore Windfarm (West) Ltd (MOWWL) has permission to develop an offshore wind farm, known as the Moray West Offshore Wind Farm, which will be located in the Moray Firth approximately 22.5km (12.1 NM) off the Caithness coastline and 24 km (13 NM) off the Aberdeenshire coastline covering an area of approximately 225 km<sup>2</sup>. It will be situated adjacent to the Beatrice and Moray East developments and will contain up to 85 Wind Turbine Generators (WTGs).
- 1.2. It is a well understood consequence of the construction of WTGs that significant interference can be caused to Primary Surveillance Radar (PSR) displays, with the creation and display of 'false' radar returns known as clutter. Where wind farms are built containing a large number of WTGs, the quantity of clutter can also lead to saturation of the processing capability of the PSR. NATS En-Route Ltd (NERL) initially objected to the Moray Offshore West Wind Farm development, on the basis that the WTGs contained within this development would be detected by the Allanshill PSR. As a result, conditions were applied to the planning consent granted<sup>1</sup>, these conditions direct that no WTGs may be erected until a PSR mitigation strategy is agreed and that no blades may be fitted to WTGs until the agreed mitigation strategy has been implemented and in operation.
- 1.3. In this Airspace Change Proposal (ACP), reference ACP-2019-72, MOWWL (the change sponsor) propose the application of Radar Range Azimuth Gating (RAG), more commonly known as radar blanking, to the Allanshill PSR covering the area that will be affected by the WTGs. This will prevent the display of potentially erroneous radar returns, or clutter, caused by the WTGs. However, the blanking will also remove the display of radar returns from aircraft within the same area and therefore this ACP seeks to introduce a Transponder Mandatory Zone (TMZ) covering the blanked area from SFC to FL100. The TMZ is proposed as an extension to the existing Moray Firth TMZ which already incorporates the Beatrice and Moray East wind farms to cover the area of the Moray West wind farm.
- 1.4. This will allow aircraft to be displayed to Air Traffic Control (ATC) using Secondary Surveillance Radar (SSR) returns.
- 1.5. A chart illustrating the extension of the Moray Firth TMZ and proposed blanked area is at Appendix A.

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<sup>1</sup> Para 3.4 of the [Stage 3 Consultation Document](#)

## Summary of the Decision Made

- 1.6. As a result of the Moray Offshore West Wind Farm development the CAA recognises the requirement to introduce radar blanking to the Allanshill PSR and **approves the proposed extension of the Moray firth TMZ** to enable traffic in the Moray West area to remain displayed to ATC through the use of SSR returns. The design of the proposed TMZ is to be as described and illustrated in the Step 4b Airspace Change Proposal document 'Moray West ACP V1.1' published to the CAA Airspace Change Portal on 10 May 2021.
- 1.7. The CAA has set three conditions against its approval of this proposal. The first requires that, prior to implementation of this proposal, MOWWL must provide an Aeronautical Information Publication (AIP) draft update for approval before submission for the relevant Aeronautical Information Regulation and Control (AIRAC) update cycle. The second condition requires MOWWL to have reviewed the current LOA (between Wick Airport and RAF Lossiemouth) to ensure it is current (including details of the extension to the Moray firth TMZ) before the TMZ is implemented. The third condition requires that a Radar Mitigation Scheme Agreement for RAF Lossiemouth must be in place between MOWWL and the MOD before the TMZ is implemented.

## Next Steps

- 1.8. Implementation of the proposed airspace will be notified through a single AIRAC cycle (AIRAC 01/2024) which will become effective on 25 January 2024.
- 1.9. However, the AIRAC cycle and effective date is subject to change and will be reviewed against the build schedule. This review will ensure that the TMZ is implemented at a suitable point in time, rather than be implemented several years before the construction of the wind farms is due to commence (which is expected to begin 2024).
- 1.10. The CAA's Post-Implementation Review (PIR)<sup>2</sup> of the changes approved by the CAA in this decision will commence at least one year after the implementation date. It is a condition of the CAA's approval that the change sponsor captures and collates data throughout the year following implementation of the airspace change, which will be used to inform the PIR.

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<sup>2</sup> PIR is the 7<sup>th</sup> Stage of the CAA's airspace change proposal process as described in [CAP1616](#).

## Chapter 2

# Decision Process and Analysis

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## Chronology of the Proposal Process

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### Statement of Need and Assessment Meeting (Stage 1, Step 1A)

- 2.1 MOWWL submitted a DAP1916 Statement of Need (SoN) on 11 October 2019. An Assessment Meeting (AM) was then held on 02 April 2020 at which MOWWL outlined the background behind the proposal, the current situation, the issue that had been identified and the action that had been taken.
- 2.2 The CAA determined that the proposal was in scope of the CAP1616 ACP process and stated the provisional level of airspace change attributable to the proposal as Level 2B. Minutes of the AM, together with a copy of the slide presentation that was used in the meeting, were published to the Airspace Portal.

### Development of the Design Principles (Stage 1, Step 1B)

- 2.3 MOWWL used a set of appropriate Design Principles (DPs), inspired by those used for similar ACPs under the CAP1616 process, to begin their targeted engagement and development conversation with the stakeholder group. The stakeholder group included key aviation stakeholders, identified as NATS En Route Ltd (NERL), NATS Prestwick, the Ministry of Defence (MOD), Highlands and Islands Airports Ltd (HIAL), AGS Airports Ltd (Aberdeen Airport), Aberdeen ATC, Wick Airport, Inverness Airport and a number of representative groups including offshore helicopter operators, members of the National Air Traffic Management Advisor Committee (NATMAC) and General Aviation (GA) bodies. The original DPs were amended in line with stakeholder feedback and a finalised submission was presented to the CAA and uploaded to the Airspace Portal on the 15 May 2020.

### Define Gateway

- 2.4 The Define Gateway was held on 29 May 2020. The CAA were content that the DPs had been developed through appropriate and effective engagement with stakeholders and that the DPs reflected the requirements of CAP1616. Following the Gateway Assessment, MOWWL updated the DP submission (specifically Table 1: MOWWL Stage 1B Engagement Record and Annex A: Engagement Activity) to include the engagement conducted with neighbouring airports. This updated submission (Version 2.0) was published onto the Airspace Portal on the 01 June 2020.

## Options Development and Appraisal (Stage 2, Step 2a & 2b)

- 2.5 MOWWL contended that, in order to mitigate the effect of WTGs on the Alanshill PSR, radar blanking and the subsequent introduction of a TMZ was the only viable airspace option. To this end, they considered three Design Options, each of which was a variation of the TMZ design. A 'Do Nothing' Option was also included and all four were considered and assessed against the DPs. Whilst options A and B were shown to meet the DPs, Option C: 'TMZ extended to align with existing and planned TMZ boundaries.' was chosen as the preferred Design Option as its simpler geometric shape was seen as advantageous for reasons of utility by the aviation community (Human Factors). The finalised Design Options submission (Version 2.0) and Initial Options Appraisal were uploaded to the Airspace Portal on the 14 August 2020.

## Develop & Assess Gateway

- 2.6 The Develop & Assess Gateway was held on 28 August 2020. The CAA accepted that MOWWL had adhered to the guidance provided in CAP1616 and followed the required process in order to develop suitable Design Options through two-way engagement with stakeholders. The CAA also agreed the rationale used to identify the preferred Design Option to be taken forward in isolation to Stage 3 and that the assigned scaling level remained as Level 2b.

## Consult Gateway (Stage 3)

- 2.7 During the Consult Gateway held on 30 October 2020, the CAA accepted the rationale presented by MOWWL that the consultation period be set at 10 weeks in duration rather than the recognised best practise 12 weeks. The justification provided by MOWWL in the Consultation Strategy highlighted 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. MOWWL further justified the 10-week duration by the pre-consultation engagement activities undertaken with stakeholders and the relative simplicity of the proposal itself.

## CAA Assessment and Decision in Respect of Consultation

- 2.8 The CAA is satisfied that MOWWL applied the fundamental principles of effective consultation before, during and after the consultation period, as follows: targeted the right audience; communicated in a way that suits them; gave them the tools to make informed, valuable contributions to the development of the proposals. In addition, the CAA considers that MOWWL conducted its consultation in accordance with the requirements of CAP1616 and demonstrated the Government's consultation principles and the Gunning principles.



## **Proposal Update and Submission (Stage 4, Step 4A & 4B)**

- 2.9 MOWWL submitted a combined Step 3D (Collate and Review Responses) & Step 4A (Update Design) document to the CAA on 10 February 2021. The Step 4A submission considered the elements of Consultation feedback and concluded that the responses to the consultation did not require a change to the proposed design.
- 2.10 MOWWL submitted a Step 4B (Airspace Change Proposal) to the CAA on the 26 April 2021. The formal Step 4B Airspace Change Proposal submission presented the design proposal known as Option C, 'TMZ with 2 NM buffer extended to align with Existing TMZs', to be considered for implementation as an appropriate mitigation for the impact of the proposed Moray Offshore West Wind Farm WTGs on the Alanshill PSR. Revised submissions of the ACP were presented to the CAA and published to the Portal on 26 April 2021 and 10 May 2021 as v1.0 and v1.1 respectively. These amendments addressed some minor reference mistakes that were identified during the CAA document check procedure. The amendments also incorporated evidence from key stakeholders following requests from the CAA for clarification on the effect of the proposed TMZ.

## **CAA Analysis of the Material Provided**

- 2.11 As a record of the analysis of the Step 4b Airspace Change Proposal formal submission provided by, or on behalf of, MOWWL and relating to this ACP, the CAA has produced the following documentation which will be uploaded to the Portal:
- i) Consultation Assessment
  - ii) Final Options Appraisal Assessment
  - iii) Environmental Assessment
  - iv) Operational Assessment

## Chapter 3

## CAA Consideration of Factors Material to the Decision

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### Explanation of the CAA's Statutory Duties

3.2 The CAA's statutory duties are laid down in Section 70 of the Transport Act 2000. In addition, Commission Implementing Regulation (EU) No 923/2012 dated 26 September 2012 (Standardised European Rules of the Air (SERA)) as retained (and amended in UK domestic law) under the European Union (withdrawal) Act 2018 and the CAA Policy for Radio Mandatory Zones & Transponder Mandatory Zones dated 14 August 2015 are applicable to this proposal.

### Conclusions in Respect of Safety

3.3 The CAA's primary duty is to maintain a high standard of safety in the provision of air traffic services and this takes priority over all other duties.<sup>3</sup> In its consideration of this proposal, the CAA is satisfied that the implementation of the proposed TMZ maintains a high standard of safety:

- i) The proposed TMZ does not alter the classification of the airspace.
- ii) The proposed blanking of the Alanshill PSR will introduce effective suppression of all primary radar clutter associated with the WTGs.
- iii) The proposed TMZ will ensure that all air traffic operating within the area affected by the blanking applied to the Alanshill PSR will remain displayed to Air Traffic Control Operators (ATCOs) through the use of SSR returns.
- iv) The addition of a 2nm buffer surrounding the blanked area provides ATCOs sufficient time to assimilate and react to an infringement of the TMZ by an aircraft not appropriately equipped with a transponder.

### Conclusions in Respect of Efficient Use of Airspace

3.4 The CAA is required to secure the most efficient use of the airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.<sup>4</sup> In its consideration of this proposal, the CAA is satisfied that the implementation of the

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<sup>3</sup> Transport Act 2000, Section 70(1).

<sup>4</sup> Transport Act 2000, Section 70 (2) (a).

proposed TMZ will have a minimal impact on the efficient use of this airspace while maintaining the safe operation of this airspace:

- i) The proposed TMZ will not impact or alter the current operation of the vast majority of users of the airspace within the TMZ.
- ii) Analysis of operations conducted within the vicinity of the proposed TMZ indicate that far less than 1% (0.7%) of air movements are completed by aircraft not appropriately equipped to operate within the proposed TMZ.
- iii) The CAA considers the impact to users not equipped to enter the TMZ is proportionate and acceptable in order to maintain the safe operation of the airspace following the construction of the WTGs.
- iv) The CAA considers the access arrangements for aircraft not transponder equipped to be acceptable to allow those aircraft to enter and transit the TMZ with prior permission from the Controlling Authority.

## Conclusions in Respect of Environmental Objectives

3.5 The CAA is required to take into account the 2017 Guidance to the CAA on Environmental Objectives provided by the Secretary of State. Given that the proposed TMZ is entirely offshore, it is unlikely that there will be any adverse impact to noise, local air quality, biodiversity or tranquillity. Furthermore, as this proposal has been designated as a Level 2B, there is no requirement to carry out an assessment of these environmental impacts<sup>5</sup>. The environmental consideration for this proposal is therefore CO<sub>2</sub> emissions. In this case, MOWWL contested that approximately 0.7% of flights in the area are non-transponder equipped, and therefore may be required to fly additional track miles to deviate around the TMZ, resulting in increased fuel burn and CO<sub>2</sub> emissions. However, the impact upon CO<sub>2</sub> emissions can be considered negligible given the percentage of traffic the sponsor anticipates being impacted by this change. Furthermore, the impact on non-transponder equipped aircraft has the potential to be further mitigated if prior permission is granted to access and transit the TMZ by the TMZ Controlling Authority.

## Conclusions in Respect of Aircraft Operators and Owners

3.6 The CAA is required to take account of the requirements of operators and owners of all classes of aircraft<sup>6</sup>. In its consideration of this proposal the CAA accepts that the vast majority of air traffic will be unaffected by the introduction of the proposed TMZ but also recognises that a small element of the aviation community operates aircraft that are not fitted with transponders. However, the CAA accepts that, as

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<sup>5</sup> CAP1616 Appendix B, page 163: Summary of environmental assessment requirements for Level 2 proposals.

<sup>6</sup> Transport Act 2000, Section 70 (2) (b).

suggested by MOWWL, only a very small proportion of that community would wish to operate in the area covered by the proposed TMZ; such aircraft are more usually operated within gliding distance of the shore for safety reasons, which would locate them well away from the TMZ. However, provision has been made to allow access to non-transponder equipped aircraft to enter and transit the TMZ with prior permission from the Controlling Authority.

### **Conclusions in Respect of the Interests of Any Other Person**

- 3.7 The CAA is required to take account of the interests of any person, other than an aircraft operator or owner, in relation to the use of any particular piece of airspace or the use of airspace in general. Regarding this proposal, which will be implemented approximately 22.5kms offshore, the CAA considers that its impact will not be discernible to other persons.

### **Conclusions in Respect of the Integrated Operation of ATS**

- 3.8 The CAA is required to facilitate the integrated operation of air traffic services provided by, or on behalf of, the Armed Forces of the Crown and other air traffic services<sup>7</sup>. In this respect, MOWWL provided a draft amendment to the existing LoA between Wick Airport and RAF Lossiemouth which details the Controlling Authority and ATS arrangements for the Moray Firth TMZ. Therefore, the CAA is satisfied that the implementation of the proposed TMZ will have no effect on the integrated operation of ATS.

### **Conclusions in Respect of the Interests of National Security**

- 3.9 The CAA is required to take account of the impact that any airspace change proposal may have upon matters of National Security<sup>8</sup>. In this respect, the CAA is satisfied that the implementation of the proposed TMZ will have no effect on National Security.

### **Conclusions in Respect of International Obligations**

- 3.10 The CAA is required to take account of any international obligations entered into by the UK and notified by the Secretary of State. The CAA is satisfied that the proposed implementation of this TMZ has no impact on international obligations.

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<sup>7</sup> Transport Act 2000, Section 70 (2) (e).

<sup>8</sup> Transport Act 2000, Section 70 (2) (f).

## Chapter 4

# CAA's Regulatory Decision

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## General Summary

- 4.2 This ACP seeks to implement a considered and well-designed airspace solution to satisfy the conditions of the planning consent, which will allow the wind farm development to progress, and to enable continued safe air operations in the affected area.
- 4.3 The proposed use of radar blanking on the Alanshill PSR, along with the implementation of an associated TMZ, is entirely appropriate and accords with similar solutions at other wind farms in the UK. The proposed TMZ design is considered the optimum size and shape to meet the safety and operational requirements of the associated Alanshill PSR blanking, whilst having minimal impact on other airspace users.
- 4.4 This extension to the Moray Firth TMZ will incorporate the Moray Offshore West Wind Farm with the existing and planned Beatrice and Moray East wind farms.

## Decision

- 4.5 In considering the formal submission by MOWWL with respect to ACP-2019-72: Moray Offshore West Wind Farm the CAA recognises the requirement to mitigate the negative impact of the planned WTGs through the use of radar blanking to the Alanshill PSR and **APPROVES the proposed extension of the Moray firth TMZ** to enable traffic operating in the Moray West area to remain displayed to ATC through the use of SSR returns.
- 4.6 The design of the TMZ is to be as described and illustrated in the document 'Moray West ACP V1.1' published to the CAA Airspace Change Portal on 10 May 2021.

## Conditions and Recommendations

- 4.7 The planning consent granted to the Moray Offshore West Wind Farm development requires a PSR mitigation strategy to be agreed prior to construction of WTGs and stipulates that the mitigation is to be implemented and in operation prior to erection of the WTGs. MOWWL indicate that construction is due to commence in 2024.
- i) **Condition 1:** Prior to the implementation of the TMZ described, considered and approved within this proposal, MOWWL must confirm the target AIRAC and provide the up-to-date draft AIP amendment to the CAA for approval. The TMZ must be implemented and operational before the erection of any WTGs.

- 4.8 It is noted that the Alanshill PSR mitigation and implementation of the TMZ sought by MOWWL is subject to an LOA and there is a requirement for this to be updated.
- i) **Condition 2:** Prior to the implementation of the TMZ described, considered and approved within this proposal, MOWWL must ensure all relevant LOAs are updated and accepted by the CAA.
- 4.9 During the consultation period, the response from the MOD noted a requirement for Radar Mitigation agreement for RAF Lossiemouth regarding the proposed TMZ.
- i) **Condition 3:** Prior to the implementation of the TMZ described, considered and approved within this proposal, a Radar Mitigation Scheme Agreement must be in place between MOWWL and the MOD. Should such Radar Mitigation Scheme Agreement not be reached this will be considered to constitute a failure to meet the conditions of the planning consent and the CAA's approval of this ACP will be rescinded. Evidence of such agreement must be provided to the CAA prior to implementation of the TMZ.

## Implementation

- 4.10 The revised airspace is planned for AIRAC 01/2024 which becomes effective on 25 January 2024. However, the implementation is subject to the approval conditions in sections 4.7, 4.8 and 4.9 of this document.

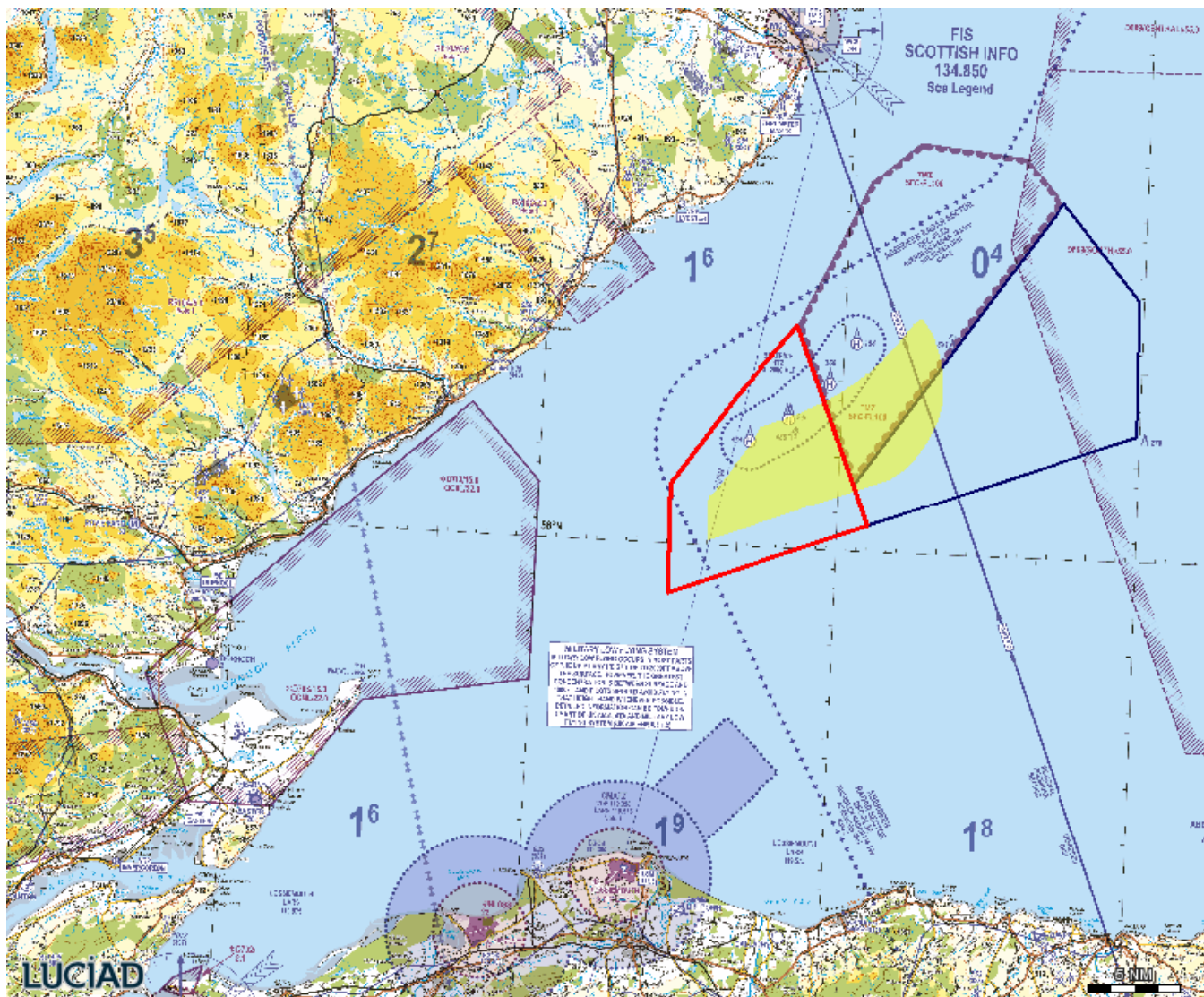
## Post Implementation Review

- 4.11 In accordance with current CAA standard practice, as detailed in CAP1616, a minimum of 12 months after implementation the airspace change will be reviewed to evaluate whether the anticipated impacts and benefits stated are as expected. To enable a thorough and rigorous review, the Sponsor will be required to gather relevant data during the post-implementation period.
- i) **Requirement 1:** MOWWL must make suitable arrangements for collection of the following data for use during the Post-Implementation Review:
- (1) Details of occasions that requests for access to, or transit of, the TMZ by non-transponder equipped aircraft is denied.
  - (2) Details of occasions that requests for access to, or transit of, the TMZ by non-transponder equipped aircraft is approved.
  - (3) Details of occasions a non-transponder equipped aircraft infringes the TMZ, remaining within the 2nm buffer area (PSR return remains displayed).
    - (a) Details regarding the efficacy of any attempted controller intervention.

- (4) Details of occasions a non-transponder equipped aircraft infringes the TMZ and buffer, resulting in it entering the blanked area (PSR return no longer displayed to a controller).
  - (a) Details regarding the efficacy of any attempted controller intervention.
- ii) **Requirement 2:** MOWWL must make suitable arrangements to ensure that related stakeholder and consultee observations (enquiry/complaint data) are collated and available for presentation to the CAA on request and/or during the Post-Implementation Review.

## APPENDIX A

## Chart Showing Extension of Existing Moray Firth TMZ



MOWWL TMZ (red outline).

Moray West development and RAG blanked area (yellow shape).