[redacted]

20th July 2020

Dear [redacted]

AIRSPACE CHANGE PROPOSAL ACP-2019-58 LLANBEDR AERODROME DANGER AREA – SUMMARY OF DESIGN OPTIONS AND INITIAL APPRAISAL

We will be writing to all stakeholders to thank them for the engagement to date on our Airspace Change Proposal, ACP-2019-58, Llanbedr Aerodrome Danger Area, but further to our email exchange as part of this process, we also wanted to take this opportunity to write to you directly to address the specific issues that you raised in more detail and to assure you that we have taken your concerns into account in developing our proposal.

Firstly, we'd like to recap how the recent engagement fits into the overall Civil Aviation Authority (CAA) CAP161 Airspace Change Process (ACP). We have now completed the development of the design principles and design options under Stages 1 and 2, respectively, and submitted these documents to the CAA for a combined Stage 1 and 2 Gateway Review on 31st July. This will be followed by Stage 3, a full and formal public consultation during Autumn 2020 that will be undertaken in line with the Gunning principles and Government guidance. This may result in a further refinement of the design at Stage 4 before submission to the CAA for a final decision (Stage 5). Implementation at Stage 6 is currently anticipated in Summer 2021 and a final review at Stage 7 will be conducted 12 months later.

The current status of the Llanbedr Danger Area ACP and all of the formal documentation that has been submitted to support the proposal can be accessed via the CAA's online portal:

https://airspacechange.caa.co.uk/PublicProposalArea?pID=193

For reference, the two Danger Area (DA) options are reproduced at Figures 1 and 2 below.

Taking each of your questions in turn:

1. *Design Principles: I notice that your draft design principles have, under the operational category, "Impact on military aircraft training should, where possible, be minimised via operating procedures in line with Flexible Use of Airspace (FUA) principles". How have you used this DP to inform your airspace options? Furthermore, the MOD would hope that your design principles as presented are not shown in priority order. Do you have a priority?*

   This design principle informed our options development and appraisal in the following ways: (*i*) the identification of multiple sub-areas so that we only segregate the minimum amount of airspace required at any given time, (*ii*) the need to update Aerodrome Manual to reflect the change in airspace status and agreed operating procedures, particularly with regard to Notice to Airmen (NOTAM) for activating the DA, and (iii) the need to formalize procedures for coordination with other airspace users via Letters of Agreement (LOA).

The design principles are listed by category in order to aid ease of interpretation and we have given equal weight to technical, safety, environmental and operational principles. There is no requirement within CAP1616 to list the design principles in priority order and no criticalities have yet been raised that would require a priority to be identified, but were that to be the case we would do so in discussion with stakeholders.

2. *Airspace Management: Noting the design principle for the MOD. How do you intend on ensuring FUA in the best possible way? Noting that they will be activated on an "as-and-when-required basis", how often do you propose the areas are activated? And by what means do you propose the airspace will be activated? How will you hand airspace back if the UAS fails to get airborne? The MOD would require an LOA with RAF Valley to ensure that peak Valley operational times are avoided. The MOD would also prefer a DACS over a DAAIS. Furthermore, with the limitations of a FISO, how would you propose to ensure that a UAS remains within the confines of the DA? What is your containment policy?*

   With regard to airspace segregation and FUA, none of the areas of the proposed Llanbedr DA will be permanently active and will be activated by NOTAM via AROps when novel aerospace flying activities are due to take place (and de-activated the same way). Again, we will only segregate the minimum amount of airspace required at any given time. There is a safety advantage in having a permanent Danger Area as opposed to a Temporary Danger Area as it will be published in standard Aeronautical Information Regulation and Control (AIRAC) documentation as well as being promulgated via NOTAM ahead of activation. Snowdonia Aerospace will also work actively with other local airspace users – *e.g.* via the regular RAF Valley Airspace Users Symposium – to raise awareness of Danger Area activities at Llanbedr.

   A Flight Information Service (FIS) will be provided by Snowdonia Aerospace from take-off to landing for all novel aerospace operations within the proposed DA. Llanbedr FIS will also provide a Danger Area Activity Information Service (DAAIS) for all airspace users in the vicinity of the DA. [redacted]

   Containing drones within the Llanbedr DA is the responsibility of the individual drone operator, albeit with advice and support from the DA sponsor. The Danger Area is only one element of a multi-faceted Operating Safety Case (OSC) that any drone operator will need to submit to the CAA for approval before any flight within the DA will be allowed. The OSC will describe where, when and how the drone will operate and will be expected to show that all built-up/sensitive areas will be avoided and that appropriate geo-fencing mechanisms are built into the autopilot to ensure that not only is this achieved, but that the drone will be constrained within the DA at all times. A buffer of at least 500m to the edge of the DA is nominally advised, but this will vary depending upon the speed of the drone and the latency of the command and control loop. The drone will also be expected to have a geolocation transponder that will allow the drone operator, the Llanbedr FISO and any other suitably equipped air traffic to know where the drone is at all times.

   We have made a forecast of future business and anticipate that we will need to activate the Danger Area on approximately 100 days per year, with operations above 2000ft likely only 33% of the time (*i.e.* roughly once every 10 days) relative to a base level of 4000ft for Texan T1 and 5000ft for Hawk T2. Similarly, activation of the DA sub-areas creating a corridor to D201 is likely only 33% of the time and engagement with the MOD Danger Area Airspace Manager has identified no fundamental issues other than a need to provide sufficient notice to allow coordination with MOD test activities. On this basis, it is considered that RDT&E flying within the Llanbedr DA and RAF/MOD training can safely co-exist (as it did very successfully pre-2004 with much higher numbers of aircraft movements) and that any related operational integration issues could be managed via Letters of Agreement.

   Further details on the usage estimates can be found in the formal Stage 2B Options Appraisal document that can be accessed via the online portal.

3. *Airspace Options: (a) Noting that both airspace options are for Danger Areas. Did you consider the acceptability of a Transponder Mandatory Zone or a Radio Mandatory Zone? Or a change in classification of airspace? (b) Whilst more complex, the MOD would prefer the more dynamic Option 2. What UAS have you used to come up with the design? Noted in your design that the areas may be activated between 2000' and 6000' – would you propose to use altitudes between or would it be one or the other? What proportion of the time do you think the airspace will be activated above 3000'? The MOD would require a LOA to ensure any activation above 4000' is deconflicted with Valley GH C (as per the VATAs) operations.*

   The design options have been promulgated as Danger Areas (DA), rather than as Radio or Transponder Mandatory Zones (RMZ/TMZ) in order to be compliant with CAA CAP722 Unmanned Aircraft System Operations in UK Airspace – Guidance & Policy. CAP722 states that "Unless able to comply with the current requirements of the Air Navigation Order (ANO), including the Rules of the Air, Unmanned Aircraft System (UAS/drone) flights which are operated beyond the visual line of sight (BVLOS) of the remote pilot are required to be contained within segregated airspace. The UK uses DAs as the primary method of airspace segregation for UAS operations".

   We have not used any individual UAS/drone specification to drive the DA airspace design because the performance and test and evaluation requirements of all the anticipated future types will vary significantly. Instead we took inputs from multiple different potential users and have sought to balance the requirements for novel aerospace RDT&E, the need for flexible use of airspace (via segmentation), the desire to minimise the number of requests to AROps for Temporary Danger Areas and the need to provide the growing novel aerospace sector with a surety of being able to operate in the UK on a reactive basis. The justification for lateral and vertical dimensions of both DA options has been detailed in the formal Stage 2A Options Development document that can be accessed via the online portal.

   As noted in (2) above, we anticipate operations above 2000ft roughly once every 10 days or so and will only segregate the minimum amount of airspace required at any given time – *i.e.* we would propose to use altitudes between 2000ft and 6000ft as required. Activation above 4000ft is therefore unlikely to cause a significant schedule conflict for RAF/MOD training and we are confident that all coordination and operational integration issues can be managed via LOA.

4. *Procedures: (a) I welcome the fact that you have had a dialogue with the Danger Area Airspace Manager, and that you envisage only activating C and D when accessing D201. I also note that you are considering a LOA with D201 – we would view this as crucial. How would you gather information ensuring that activation protocols were in line with FUA principles? If this is not the case, safe separation against D201 operations would need to be considered. As you are proposing a FISO for your operations, the MOD would like to fully understand how you would propose coordination? (b) How would you ensure lost link procedures remain within the confines of the proposed airspace? As you are only proposing using a FISO are there any more safety barriers you would consider employing?*

   We have had discussions with [redacted] to discuss multiple aspects of coordination for activities in D201 and the Llanbedr DA, relating not only to drones but also to potential Spaceport operations. With regard air traffic management, we see the transfer of control being at the boundary of D201J if the drone is entering the D201 complex and that the details will be formalised within a LOA. NATS agrees with this view.

   [redacted]

Again, as discussed in (2) above, lost link procedures, DA containment and other safety considerations are primarily the responsibility of the individual drone operator and will have to be addressed as part of an Operating Safety Case and be submitted to the CAA for approval before any flight within the DA will be allowed. As DA sponsor we will advise and support as required.

We hope that the above discussion will help assuage the concerns you have about the potential impact on MOD/RAF training and D201 operations. We wish to remain good neighbours and are very happy to continue this dialogue through to a mutually acceptable conclusion that we can enshrine in a LOA.

Yours sincerely

[redacted]

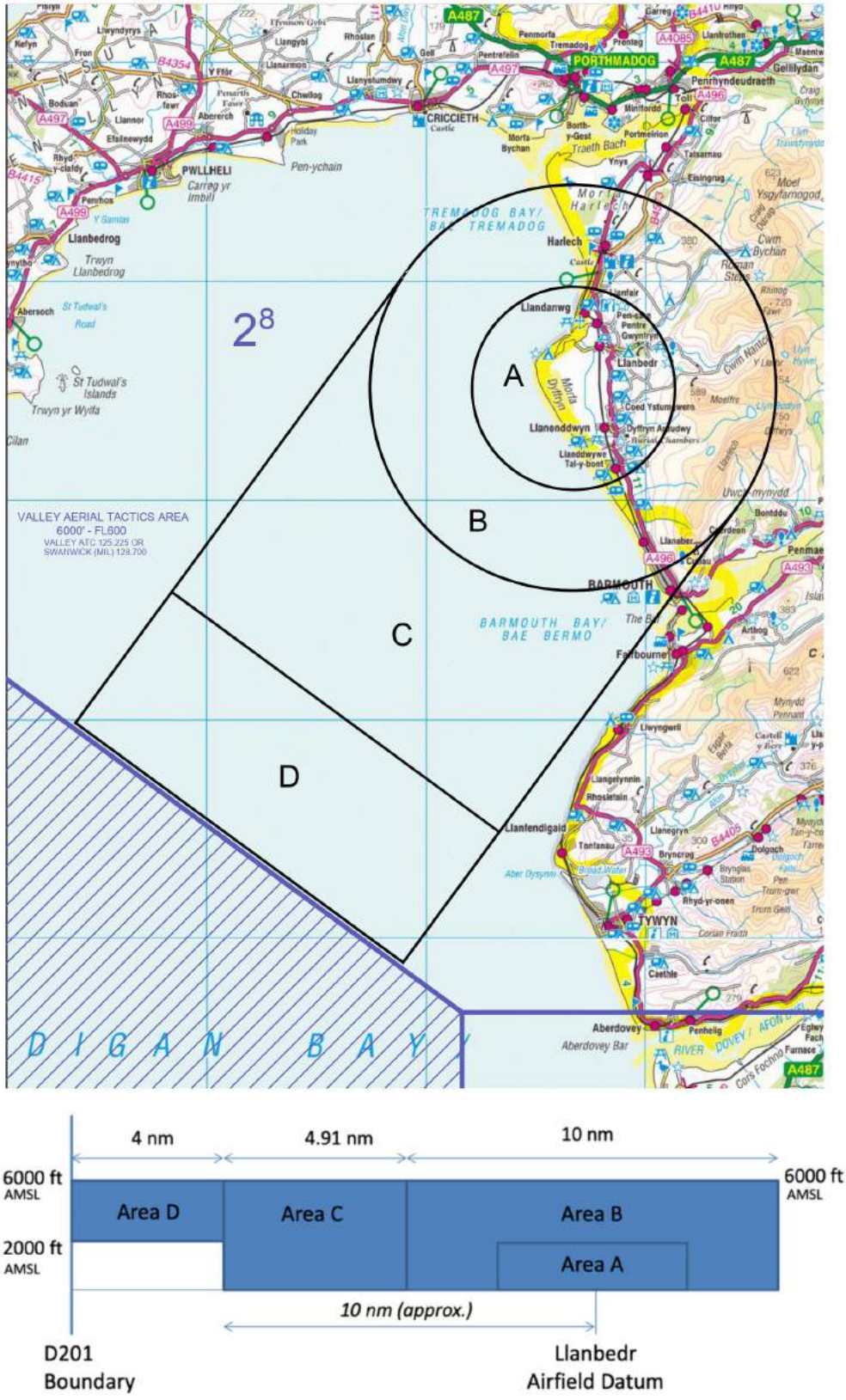

Figure 1 *– Draft airspace design Option #1 for ACP-2019-58, Llanbedr Danger Area (DA)*

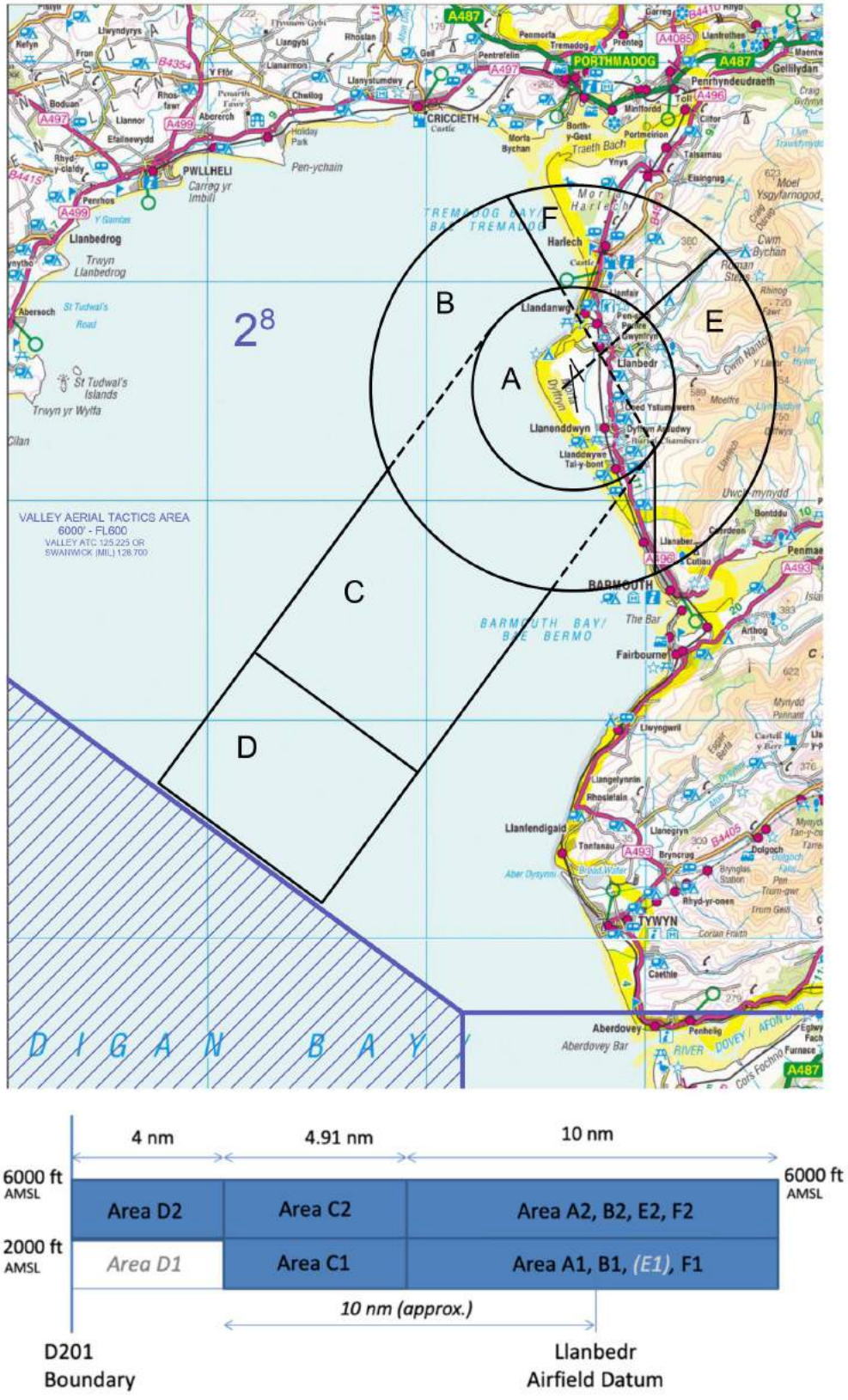

***Figure 2** – Draft airspace design Option #2 for ACP-2019-58, Llanbedr Danger Area (DA)*