

# CAA Environmental Assessment

## Temporary Airspace Change Proposals

Title of airspace change proposal	TDA BVLOS demonstration of Cargo UAV within the Orkney Islands
Change sponsor	Windracers Limited
Project reference	ACP-2022-049
Account Manager	[REDACTED]
<p><i>Instructions</i></p> <p>In providing a response for each question, please ensure that the 'status' column is completed using the following options:</p> <ul style="list-style-type: none"> <li>• YES</li> <li>• NO</li> <li>• PARTIALLY</li> <li>• N/A</li> </ul> <p>To aid the decision maker, highlight each question accordingly to illustrate what is:</p> <p>resolved <span style="background-color: #90EE90;">YES</span> not resolved <span style="background-color: #FFD700;">PARTIALLY</span> not compliant <span style="background-color: #FF0000;">NO</span></p>	
<b>1. Introduction</b>	
<p>This Airspace Change Proposal (ACP) is for a temporary change to airspace design to allow Windracers Limited ('the sponsor') to conduct Remotely Piloted Aircraft Systems (RPAS) Beyond Visual Line of Sight (BVLOS) operations to fly between Eday, North Ronaldsay, Papa Westray and Westray aerodromes as part of Phase 1 of a two-phase project designed to demonstrate the use of Unmanned Aircraft Systems (UAS) for delivering on-demand supplies (medical, mail and cargo, logistics for industrial supply chains) to remote communities in the Orkney Islands. Called the Sustainable Aviation Test Environment (SATE) 2 project, it is part funded by the UK Research and Innovation (UKRI) through the Industrial Strategy Challenge Fund and aims to demonstrate the capabilities of new aviation technologies and systems.</p> <p>The proposed operations will be conducted within a Temporary Danger Area (TDA) complex extending from surface (SFC) to 2,500 ft. amsl., with a width</p>	

of 1.73 nm, connecting four aerodromes across the Orkney Islands. This proposed TDA complex consists of two segments areas: TDA B (Eday - North Ronaldsay) and TDA C (Eday – Papa Westray – Westray). The proposed TDAs have been positioned to avoid other airspace structures and both sit within Class G airspace.



*Figure 1: Proposed Temporary Danger Area Structure*

Section 70(2) of the Transport Act 2000 requires the CAA to take account of any guidance on environmental objectives given to it by the Secretary of State (SofS) when carrying out its air navigation functions, namely the Air Navigation Guidance 2017 (ANG 2017). For temporary changes to airspace design, ANG 2017 paragraph 2.13 requires that the CAA consider the sponsor's assessment of the noise impact before a decision on the proposal is made, unless the CAA is satisfied that the specific details of the proposal mean that this is not needed. In addition, ANG 2017 paragraph 2.3 states that in circumstances where a temporary airspace arrangement would affect the distribution of air traffic below 7,000 ft., where practicable, the communities

<p>that may be affected should be informed prior to the change being implemented. The sponsor is therefore also expected to consider the anticipated noise impacts as a result of any consequential changes on other airspace users (i.e., impacts below 7,000 ft.). CAP1616 paragraphs B81-B85 outline the environmental assessment requirements that sponsors of temporary ACPs are required to follow. Due to the short-term nature of temporary changes, there is no requirement for the sponsor to assess longer-term environmental impacts (i.e., CO2, local air quality, tranquillity, biodiversity).</p>		
2. Statement of Need		Yes/No
2.1	Does the Statement of Need include any environmental factors?	NO
	<p>No environmental factors were included in the Statement of Need. The sponsor has indicated that the ACP is part of a project launched by the Sustainable Aviation Test Environment (SATE) consortium which aims to bring together aviation stakeholders in the development of new low carbon aviation technologies and operations in Scotland.</p>	
3. Information conveyed to those affected		Status
3.1	Has the change sponsor adequately provided a justification for the change?	YES
	<p>Yes, the sponsor has justified that as per CAP 722, BVLOS RPAS operations require a certified Detect and Avoid (DAA) system. In its absence, current regulations require RPAS BVLOS flights to be contained within segregated airspace in order to separate from other airspace users. The sponsor has proposed a TDA structure to be established to provide this segregation and conduct their operations.</p>	
3.2	Has the change sponsor adequately confirmed the effective period of the change?	YES
	<p>Yes, the sponsor has stated that the proposed TDA complex will be implemented between 3 June 2024 to 30 August 2024, lasting no more than thirteen weeks. The daily hours of activation would be between 0930 – 1530 Monday to Friday. Exact timings differ day to day according to the following proposed schedule.</p>	

EDAY – NORTH RONALDSAY – WESTRAY – PAPA WESTRAY						
TDA ACTIVATION		Monday	Tuesday	Wednesday	Thursday	Friday
		12:00-14:10	12:10-14:45	11:05-13:20	10:30-13:00	11:05-13:20
EDAY	Dep	12:30	12:40	11:35	11:00	11:35
NORTH RONALDSAY	Arr	12:45		11:50		11:50
NORTH RONALDSAY	Dep	13:20		12:30		12:30
PAPA WESTRAY	Arr		12:55		11:15	
PAPA WESTRAY	Dep		13:35		11:35	
WESTRAY	Arr		13:40		11:40	
WESTRAY	Dep		13:55		12:10	
EDAY	Arr	13:40	14:15	12:50	12:30	12:50

Table 1: ACP-2022-049 Proposed Scheduling

The daily flight schedule is stipulated within the Concept of Operations. The sponsor will promulgate the exact times of activation of the TDAs by NOTAM at least 24 hours in advance of each day of operation. Only those TDA segments required for a flight will be activated to minimise impact to other air users.

3.3	Has the change sponsor provided sufficient details of the frequency of flights?	YES
	The sponsor has provided sufficient details of the frequency of flights. The schedule of flights, within the TDA activation periods, is provided within the 'Concept of Operations – Kirkwall Airport (latest Version 4.2 dated 13/12/2023)'. The timetable indicates that a single RPAS will operate at any one time as per the arrival and departure schedule for each location.	
3.4	Has the change sponsor provided sufficient details of the typical altitudes of operations?	YES
	Yes, the sponsor has stated that the RPAS flights will be operated at a cruising height of 1,000 ft. Above Mean Sea Level (AMSL).	
3.5	Has the change sponsor adequately provided a qualitative description of changes to traffic patterns, illustrated using operational diagrams overlaid on Ordnance Survey maps or similar? <i>The diagrams should be of sufficient detail for those affected to identify where they live in relation of the changes in traffic pattern.</i>	PARTIAL
	The sponsor has provided an adequate qualitative description of the potential changes to traffic patterns as a result of the ACP. Likely	

	<p>impacts are considered to be minimal given the number of mitigation measures proposed.</p> <p>The sponsor states that only those areas of the TDA complex that are required for an RPAS flight will be activated via NOTAM at least 24 hours in advance to minimise impact on other airspace users. A Special Use Airspace Activity Information Service (SUA AIS) will be available from Kirkwall ATC and information about the TDA and UAS Activity will also be available on Kirkwall Information ATIS. Additionally, the RPAS is equipped with an ADS-B in/out capability, Mode-S transponder and navigation, position and strobe LED lights, allowing stakeholders to track its location in real time. The impact of RPAS operations will be monitored throughout the ACP's effective period, with adjustments made to activation periods if necessary.</p> <p>In terms of specific stakeholders, the sponsor has stated that communications will be maintained with Loganair, Kirkwall ATC and other airspace users to deconflict against delays and non-scheduled traffic prior to daily operations. Emergency services will be given priority. The <i>'Concept of Operations for ACP-2022-049 (Version 4.2 dated 13/12/2023)</i> details the sponsor's procedures in the event of an emergency service request to enter either of the TDAs.</p> <p>With regards to the take-off and landing sites at Eday, North Ronaldsay, Papa Westray and Westray aerodromes, these are minor aerodromes with no ATC or ATZ. The aerodromes are managed by the Orkney Island Council on a Prior Permission Required (PPR) basis. The sponsor has engaged with the local authorities and permission and protection has been agreed for the RPAS to access these aerodromes as per the flight schedules during the TDA activation times.</p> <p>Operational diagrams showing the TDA complex within which the RPAS flights would occur have been presented on maps, however, these images are not of sufficient resolution or granularity given the large area encompassed by the proposed TDA, and do not contain sufficient detail to enable affected communities in easily identifying their location in relation to the changes in traffic patterns. The ConOps document (Version 4.2 dated 13/12/2023) provides maps showing the RPAS VLOS range aerodrome circuits and loiter points which are sufficiently detailed, but there are no maps of similar granularity covering the TDA route where it extends over land between aerodromes. A condition has been included requiring the sponsor to provide operational diagrams with sufficient detail to enable affected communities to easily identify their location in relation to the changes in traffic patterns (see Q6.2).</p> <p>The sponsor has not presented the current traffic patterns of other airspace users; however, based on the frequency and duration of TDA activation periods and the mitigation measures proposed, the level of traffic redistribution is likely to be minimal.</p>	
3.6	Has the change sponsor adequately provided typical noise levels at key locations?	PARTIAL
	Yes, the sponsor has provided the typical noise levels for the ULTRA UAS with TD2-002 airframe, a twin petrol engine, fixed wing aircraft of 400 kg maximum take-off weight (MTOW), 10 m wingspan and capable of carrying a payload of 100 kg up to a range of 1,000 km.	



	<p>The sponsor has provided a basic noise assessment (Appendix G, Summary of Stakeholder Engagement v7.0 dated 18/03/2024). The sponsor states that, <i>'a noise measurement exercise carried out under test conditions at Llanbedr Airfield recorded 52.7 dB LAmax for a standard circuit at 850 ft., or 62.7 dB when applying a 10 dB tonal penalty.'</i> The +10 dB tone correction is added to noise exposure levels calculated for multi-rotor UAS to take account of the multiple discrete tones produced as a result of varying rotor speed to maintain RPAS altitude and orientation. However, the UAS proposed for this trial is a monoplane which does not use multiple rotors to allow for vertical take-off/landing or to maintain stability, and therefore the +10 dB noise weighting is not applicable.</p> <p>The sponsor has applied the inverse square law to calculate the altitude necessary for the UAS in cruise phase to meet the 65 dB LASmax threshold as defined in paragraph B88, CAP1616 (v4). The calculation indicates that operation of the UAS at an altitude of more than 652 ft will achieve the LASmax threshold for stakeholders at ground level. The sponsor states that <i>'Planned flights are at 1000ft AMSL and therefore do not require notification of noise levels'</i>, (Appendix G, Summary of Stakeholder Engagement v7.0 dated 18/03/2024).</p> <p>In this case, the ACP proposes activation of the TDA for a period of less than 90 days duration and, as such, the 65 dB LAmax threshold does not apply. For trials of less than 90 days, the requirements for noise assessment are the same as for temporary airspace changes, defined in paragraph B87 (CAP1616 v4) as follows:</p> <p>The following information should be assessed and conveyed to those affected:</p> <ul style="list-style-type: none"> <li>• justification for the change, and confirmation of its effective period</li> <li>• a qualitative description of changes to traffic patterns, illustrated using operational diagrams overlaid on Ordnance Survey maps or similar; diagrams should be of sufficient detail for those affected to identify where they live in relation of the changes in traffic pattern</li> <li>• details of the frequency of flights and typical altitudes</li> <li>• typical noise levels at key locations.</li> </ul> <p>The sponsor has provided information in respect of #1 and #3 but have not provided typical noise levels at key locations or operational diagrams of sufficient detail for stakeholders to identify where they live in relation to the proposes changes in traffic pattern.</p> <p>The sponsor has not provided any noise data for the take-off and landing stages of the flight however, while these noise levels may be higher than those provided for the RPAS cruise phase, all take-offs and landings are scheduled to occur from operating aerodromes within operational hours. Additionally, the sponsor may also be able to fly Visual Line of Sight (VLOS) operations up to a range of 1.5 km horizontal and 1,000 ft. vertical without the need for segregated airspace.</p>	
3.7	Has the information at 3.1 to 3.4 above been adequately conveyed to those affected?	PARTIAL

	<p>The sponsor has engaged with Orkney Island Council and Shetland Island Council as community representatives. The sponsor has indicated that the noise impacts associated with the planned RPAS procedures are minimal as flight departures and arrivals occur at operating aerodromes during operational hours, with cruise phases mainly over sea. The noise levels of the RPAS at typical cruise altitude has been calculated at less than 65dB LAmax, suggesting minimal impacts for community stakeholders. On this basis the sponsor has not informed any communities that may be affected by the change.</p> <p>In order to meet the requirements of paragraph B83 of CAP1616 v.4, a condition has been included requiring the sponsor to produce sufficiently detailed operational diagrams to enable communities to easily identify their location in relation to the changes in traffic patterns and to notify community stakeholders of the proposed airspace change (see Q6.2).</p> <p>The sponsor has undertaken engagement with NatureScot, an executive non-departmental public body of the Scottish Government responsible for the country's natural heritage, especially its natural, genetic and scenic diversity. The organisation raised concerns that the revised operational timetable corresponds with the main breeding season for several bird species which are protected features of the Calf of Eday and Papa Westray (North Hill and Holm) Special Protection Areas (SPAs) and the Mill Loch SSSI, all of which are located within, or in close proximity, to the proposed RPAS routes.</p> <p>NatureScot recommended modification of the flight paths to provide a 500 m buffer for the two SPA sites and a 750m buffer for the SSSI to minimise disturbance to specific bird species during their breeding cycle (consultation feedback dated 21/03/2024. In response, the sponsor confirmed that the route over Papa Westray would be no closer than 650m from the North Hill and Holm SPA and for both the Calf of Eday SPA and Mill Loch SSSI the sponsor suggested that they would increase the proposed flight altitude from 1000 ft to 1500ft and relocate loiter point (A) to two new positions (B1 and C1) further from the Calf of Eday to reduce noise exposure (see F.45 NatureScot in Summary of Stakeholder Engagement V7.0).</p> <p>Further correspondence from NatureScot (08 April 2024) set out a number of measures to assess the impact of the proposed TDA including instigation of a survey to be carried out by the sponsor during the initial flights to capture information on the response of the SPA species to the UAS. The findings of the survey to be assessed in consultation with NatureScot to help to determine the potential impacts of this operation on the SPA qualifying features.</p> <p>It should be noted that due to the short-term nature of temporary changes, there is no requirement in CAP1616 v4 for the sponsor to assess other longer-term environmental impacts (i.e., CO2, local air quality, tranquillity).</p>	
<b>4. Assessment of noise impacts</b>		<b>Status</b>
4.1	Was the detail of the assessment of the noise impact agreed between the change sponsor and the CAA, or determined by the CAA (where there was no agreement)?	NO

	<p><i>The CAA is required to consider the sponsor’s assessment of the noise impact of each proposed temporary change to airspace design before it makes its decision on the proposal, unless it is satisfied that the specific details of the proposal mean that this is not needed. The detail of this assessment should be agreed between the sponsor and the CAA at an early stage of the sponsor’s planning. Assessments may include consideration of both primary and secondary noise metrics. If agreement cannot be reached, the CAA will determine the detail of the assessment.</i></p>	
	<p>The detail of the assessment of the noise impact was not agreed between the change sponsor and the CAA; therefore, the CAA determined the detail of the required noise impact assessment upon receipt of the final submission.</p>	
4.2	<p>Has the assessment of noise impacts identified in Question 4.1 been adequately assessed and presented in the final submission to the CAA?</p>	YES
	<p>The sponsor has presented a noise assessment in the final submission document ‘Appendix G - Summary of Stakeholder Engagement V7.0). The sponsor has provided a basic assessment of the noise impacts associated with the proposed operation for the cruise phase based on test conditions for the specific UAS platform at a reference altitude of 850 ft. The UAS has a cruising altitude of 1000 ft for the majority of the route with an additional vertical separation to 1500ft in response to feedback regarding impacts to breeding birds at designated European protected sites and a SSSI within the proposed TDAs– see Question 3.6 and 3.7 for details.</p> <p>The sponsor has not provided data for typical noise levels at key locations, as required in paragraph B83 in CAP1616 v4, but has calculated that LASmax levels at community stakeholder locations will be below the daytime noise threshold of 65 dB for all cruise phases. The sponsor has not provided noise data specifically for take-off and landing but has presented the argument that the noise impacts are minimal given that these phases are all scheduled to occur from operating aerodromes within operational hours.</p>	
4.3	<p>Summary of anticipated noise impacts from the final proposed temporary airspace change.</p>	
	<p>The sponsor has indicated that the noise levels from the ULTRA UAS are 52.7 dB LAm<sub>ax</sub> for a standard circuit at 850 ft. (51.3 dB LAS<sub>max</sub> at 1000 ft minimum proposed cruise altitude). Consequential noise impacts from other airspace users have been assessed to be minimal given the number of mitigation measures and deconfliction services established between the sponsor and other stakeholders.</p> <p>The sponsor has not identified any key locations newly impacted below 7,000 ft, based on the UAS noise data and flight information submitted (cruising altitude of 1,000 ft. mainly over sea). Typical noise levels at any potential key locations are predicted to be less than 65 dB LAm<sub>ax</sub> but the sponsor has identified a range of community groups who will be contacted to provide information on the trial activities and contact details for feedback.</p> <p>The sponsor has amended some aspects of the planned flight altitude and position of one of the loiter points in response to feedback from NatureScot in respect of protected areas within the TDA and has agreed to undertake a survey to understand the impact of the</p>	



	<p>UAS operations on seabirds. A revision to their Summary of Stakeholder Engagement (version 7.1 06/05/2024) has been submitted detailing the proposed use of an on-board camera to capture video footage to monitor any change to seabird activity.</p> <p>To ensure that the objective of the survey (to monitor any change to seabird activity) is achieved, it is recommended that as a condition of the CAA's decision to approve the airspace change, the sponsor will be required to engage with NatureScot on the findings of the survey to determine the potential impacts of the UAS operation on the SPA qualifying features. The survey outcomes are to be shared with the CAA.</p>	
<p><b>5. Compliance with relevant policy and guidance from Government or the CAA</b></p>		<p><b>Status</b></p>
<p>5.1</p>	<p>Has the change sponsor satisfied all relevant policy and/or guidance, with regards to environmental impacts of the proposed airspace change?</p> <p><i>Notably, has the change sponsor complied with the environmental requirements in:</i></p> <ul style="list-style-type: none"> <li>• <i>CAP1616: Airspace change: Guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic, and on providing airspace information;</i></li> <li>• <i>CAP1616a: Airspace Change: Environmental requirements technical annex;</i></li> <li>• <i>DfT Air Navigation Guidance 2017: Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management.</i></li> </ul> <p>If a change sponsor has not complied with any aspect of those documents, have they provided a rationale and is it reasonable?</p>	<p>PARTIAL</p>
	<p>There are a number of Conditions for the sponsor to address either before or after implementation of the ACP (if approved) – see Question 6.2. Once these Conditions are fulfilled, the sponsor will have satisfied all relevant policy and/or guidance, with regards to environmental impacts of the proposed airspace change.</p>	
<p><b>6. Recommendations/Conditions</b></p>		<p><b>Status</b></p>

6.1	<p>Are there any Recommendations which the change sponsor <b>should try</b> to address either before or after implementation (if approved)? If yes, please list them below.</p> <p><i><b>GUIDANCE NOTE:</b> Recommendations are something that the change sponsor <b>should try</b> to address either before or after implementation, if indeed the airspace change proposal is approved. They may relate to an area in which the change sponsor is reliant upon a third party to actually come to an agreement and consequently they do not carry the same ‘weight’ as a Condition.</i></p>	NO
<p>There are no Recommendations which the sponsor should address either before or after implementation (if approved).</p>		
6.2	<p>Are there any Condition(s) which the change sponsor <b>must fulfil</b> either before or after implementation (if approved)? If yes, please list them below.</p> <p><i><b>GUIDANCE NOTE:</b> Conditions are something that the change sponsor <b>must fulfil</b> either before or after implementation, if indeed the airspace change proposal is approved. If their proposal is approved, change sponsors <b>must</b> observe any condition(s) contained within the regulatory decision; failure to do so <b>will usually</b> result in the approval being revoked.</i></p>	YES
<p>Yes, the sponsor must fulfil the following Conditions either before or after implementation of the ACP (if approved):</p> <ul style="list-style-type: none"> <li>• The sponsor should provide operational diagrams overlaid on Ordnance Survey maps (or similar) having sufficient detail to enable affected communities to easily identify their location in relation to the changes in traffic patterns (CAP1616 para B83).</li> <li>• The sponsor should inform communities that may be affected before a decision is taken by the CAA about the implementation of the ACP and prior to the change being implemented (if approved) (CAP1616 para B82).</li> <li>• The sponsor should also monitor and report to the CAA on complaints associated with the ACP once it has been implemented (if approved).</li> <li>• For the first three (3) days of any RPAS operated by the change sponsor in relation to this ACP which overfly the Calf of Eday Special Protection Area (SPA), the change sponsor is required to undertake a survey to capture information on the response of species within this SPA to the operation of the RPAS (Survey). The Survey must be conducted by an experienced ornithologist from a land-based vantage point survey on the northern shoreline of Eday looking towards the Calf of Eday, or from an on-board video camera capturing footage of the Calf of Eday SPA as each RPAS overflies the SPA. The footage must be of adequate quality and satisfactory resolution to enable identification of species present. The change sponsor must consult with NatureScot regarding the design of the Survey with prior to the commencement of the temporary airspace change, and undertake the Survey in line with any such guidance or advice given by NatureScot. The change sponsor must document the findings of the survey and assess these in consultation with NatureScot and the CAA as soon as reasonably practicable (and no later than five (5) days from the first day of any RPAS operated by the change sponsor in relation to this ACP overflying the Calf of Eday SPA). The CAA may</li> </ul>		

	take appropriate action based on the survey and its findings in its role as competent authority, which may include suspending, varying or revoking the approval for this ACP.
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Environmental assessment sign-off	Name	Signature	Date
Environmental assessment completed by Airspace Regulator (Environment)	██████████	██	16/04/2024
Environmental assessment approved by Manager Airspace Regulation (or alternative delegation of authority)	██████████	██	30/05/2024