RSP | Manston Airport

# Manston Airport ACP (ACP-2018-75)

## Full Options Appraisal

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# 1. Introduction

## 1.1 About this Document

This document contains the full options appraisal of the Manston Airport Airspace Change Proposal (ACP) and is a formal deliverable for Stage 3 of the CAA CAP1616 process.

This report has been prepared by Sagentia Aviation with support from Environmental Resources Management Limited (ERM) in compiling the environmental aspects of the full options appraisal and Mitchell Environmental Limited in undertaking air noise modelling.

## 1.2 Introduction

Manston airport is a disused airport on the Isle of Thanet in Kent. It has one of the longest and widest runways in the UK, comparable to other international airports making it a valuable infrastructure asset. RiverOak Strategic Partners (RSP) is proposing to secure the future of this valuable national asset by redeveloping and reopening it as a successful hub for international air freight which also offers passenger travel, executive travel and aircraft engineering services. The airport would be comprehensively rebuilt and upgraded, including the provision of extensive cargo aircraft stands.

The proposed development has been subject to a Development Consent Order (DCO) application submitted by RSP to the government Planning Inspectorate (PINS) in July 2019. In August 2019, PINS announced its decision to accept the application for examination as a Nationally Significant Infrastructure Project (NSIP). RSP's Development Consent Order for the redevelopment of Manston Airport was approved by the UK Government in August 2022. Work is now underway on the detailed planning work necessary prior to the reopening of the airport.

In addition to the DCO, to gain authorisation to operate Manston Airport, RSP will need to secure a range of specialist aviation approvals and permissions from the Civil Aviation Authority (CAA). RSP will need to submit an application to the CAA to establish the airspace and procedures required to enable safe and efficient operations to and from the airport in accordance with the Civil Aviation Publication (CAP) 1616 – Airspace Change Process and its associated guidance documents. The CAA will ensure that any airspace and aviation proposals put forward by RSP are compliant with national, international and global aviation regulations and the DCO approval would guide the airspace proposal.

This document relates only to the CAA CAP1616 process and the proposal to introduce the airspace and Instrument Flight Procedures (IFPs) required to enable safe and efficient operations to and from the airport. IFP is a term used to describe the published profiles aircraft fly over the ground, both in plan and elevation view when arriving at and departing from an airport.

# 2. Assessment Criteria and Methodology

## 2.1 CAP1616 Options Appraisal Requirements

The options appraisal process is carried out in accordance with the guidance in CAP1616i - Environmental Assessment Requirements and Guidance for Airspace Change Proposals, and in conjunction with The Green Book[1] and the Department of Transport's (DfT) TAG[2] workbook, which constitute best practice in options appraisal.

Options appraisal is used as a tool throughout the CAP1616 process to help refine the options from an initial longlist, down to a short list and a final set of preferred options. The process is iterative, with an initial options appraisal being used to whittle down the longlist in Stage 2; a full options appraisal (this document) of the shortlist takes place in Stage 3 for consultation; and the final options appraisal will support the final submission of the ACP application to the CAA at the end of Stage 4.

The options appraisals build the evidence base as the proposal matures. This iterative process ensures that the detail of the design options matures in line with the proposal, and that a reasonable evidence base is made available to all stakeholders early on and increasingly throughout the process.

## 2.2 Assessment Criteria

The options appraisals deliver clear and comparable evidence about a range of factors, so that, for a given proposal, different airspace design options can be compared and assessed on a similar basis. Change sponsors are required to use the list of criteria shown below in Table 2-1 in their options appraisals. Assessments of the potential costs/ benefits against each of the criteria in this table provide the information necessary to make comparisons between each of the design options and provide the basis on which the preferred airspace change alternative(s) can be assessed.

| Affected Group | Impact | Level | Description for Full OA |
|---|---|---|---|
| **Communities** | Noise | Quantified and monetised | Noise exposure contours above 51 dB $LA_{eq,16h}$ daytime and 45 dB $LA_{eq,8h}$ night-time and evaluated by Department for Transport's transport analysis guidance (TAG) for impacts on health and quality of life. The costs and benefits derived from this analysis must be imported into the options appraisal.<br>• Number above contours: N65 for daytime and N60 for night-time noise.<br>• Overflight contours.<br>• Operational diagrams.<br>• Other noise metrics if relevant. |
| **Communities** | Local Air Quality | Quantified and monetised | Explicit consideration of and evaluated by Department for Transport's transport analysis guidance (TAG) where necessary. The costs and benefits derived from this analysis must be imported into the options appraisal. |
| **Wider Society** | Greenhouse Gas Emissions | Quantified and monetised | Annual $CO_2e$ totals and evaluated by Department for Transport's transport analysis guidance (TAG). The costs and benefits derived from this analysis must be imported into the options appraisal. |

**Continued overleaf**

[1] The Green Book: Appraisal and Evaluation in Central Government; https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government

[2] DfT transport analysis guidance TAG: https://www.gov.uk/guidance/transport-analysis-guidance-tag

| Affected Group | Impact | Level | Description for Full OA |
|---|---|---|---|
| **Wider Society** | Tranquillity | Qualitative, and where possible, quantified | Explicit consideration of impacts on locally identified tranquillity areas, and assessment using operational diagrams or overflight contours. |
| **Wider Society** | Biodiversity | Qualitative, and where possible, quantified | Explicit consideration of impacts on locally identified biodiversity areas, and assessment using operational diagrams or overflight contours. |
| **Wider Society** | Capacity and resilience | Quantified and monetised | Change sponsors should qualitatively assess the effect of the proposal on the overall UK infrastructure. Dependent upon the scope of the proposed change, the CAA may require quantitative methodologies that allows monetisation of the impact, including impact on air passengers' time. |
| **General Aviation** | Access | Quantified and monetised | Change sponsors should qualitatively assess the effect of the proposal on the overall UK infrastructure. Dependent upon the scope of the proposed change the CAA may require quantitative methodologies that allows monetisation of the impact. |
| **General Aviation / commercial airlines** | Economic impact from increased effective capacity | Quantified | Forecast change in air transport movements and estimated passenger numbers or cargo tonnage carried. |
| **General Aviation / commercial airlines** | Fuel burn | Quantified and monetised | Fuel costs and the relative efficiency of aircraft are readily obtainable from market data. Change sponsors must quantify and monetise these costs based on its assumptions of the fleets in operation. |
| **Commercial airlines** | Training costs | Quantified and monetised | Where a proposal would lead to a need for retraining, this should be quantified and monetised. |
| **Commercial airlines** | Other costs | Qualitative, and where possible, quantified and monetised | Where there are likely to be other costs imposed on commercial aviation, these should be described. Where these costs are quantifiable, an assessment should be made. |
| **Airport / Air navigation service provider** | Infrastructure costs | Quantified and monetised | Where the proposal requires a change in the infrastructure, this should be monetised. |
| **Airport / ANSP** | Operational costs | Quantified and monetised | Where a proposal will lead to changes in operational costs, these should be monetised. |
| **Airport / ANSP** | Deployment costs | Quantified and monetised | Where a proposal would lead to a need for retraining and other deployment costs, this should be quantified and monetised. |
| **Airport / ANSP** | Other costs | Qualitative, and where possible, quantified and monetised | Where there are likely to be other costs imposed on airports/air navigation service provider, these should be described. Where these costs are quantifiable, an assessment should be made. |

Table 2-1 – Assessment Criteria for Level 1 Change

## 2.3. Full Options Appraisal: CAP 1616 Requirements and Metrics

### 2.3.1 Overview

The full options appraisal requires an assessment against the costs and benefits contained in Table 2-1 above, building on the analysis completed in the initial options appraisal. A number of qualitative, quantitative and monetised measures need to be produced, requiring a range of environmental assessments and metrics; these are described in more detail below.

### 2.3.2 Scope

The ACP is now in Stage 3, and this requires reporting of the effects of changing the airspace. In a meeting with the CAA case officers on 3rd June 2025 and subsequent correspondence it was agreed that because Manston Airport has not had aircraft operating since 2014 it is not possible to assess the potential impact as outlined in Table 2-1 from a relevant baseline and subsequently strictly in accordance with CAP1616 modelling and quantification of potential effects required for the first and 10th year of operation.

A Development Consent Order was granted for the development of the airport. It includes a number of requirements to limit and manage the operation of the airport. The current proposals to operate the airport have been developed to meet these requirements, for example the numbers of flights at different times of the day. Compliance with the DCO requirements will be demonstrated to the local planning authority, not the CAA, so is not the subject of this report.

### 2.3.3 CAA Requirements

This ACP will follow the latest (October 2023) CAP1616 guidance with the assessment following CAP1616i, November 2023. This ACP is unusual in that there is no operating airport at Manston with no air traffic or current flight paths to change. Nonetheless, the CAP1616i methodology will be followed. The environmental assessment initially focusses on the flight paths, and associated change in noise where CAP1616i gives detailed requirements for the noise metrics to be modelled and reported; $L_{eq\ 16\ hr}$ day, $L_{eq,8hr}$ night, N65 Day and N60 Night and includes overflight contours to be modelled and reported, and the potential impact on local air quality, greenhouse gases, local tranquillity, and local biodiversity.

### 2.3.4 Full Options Appraisal (FOA) Evidence Capture

Consistent with the requirements of CAP 1616f, the initial options appraisal must be developed into a detailed quantified and monetised assessment. Change sponsors must conduct a full options appraisal of each of the design options which it intends to consult/engage on using the metrics and level of analysis as detailed in. These metrics include the assessment of the environmental impacts of the proposed change.

Data for the modelling was based on the original information provided for the DCO process and has since been updated to reflect changes since the DCO analysis was conducted. The RSP Business Model for the airport has been reviewed and updated since Stage 2 and changes to the number of flights and aircraft types expected to operate at the airport have been incorporated into the modelling. As there is no airport currently operating at Manston, Operational Diagrams depict the expected average number of daily movements utilising each of the departure and approach procedures. A comprehensive analysis was conducted as part of the DCO process and the data for the FOA has been drawn from the DCO data and updated in accordance with the current Business Model update for the airport. No evidence gaps were identified during the compilation of the initial options appraisal during Stage 2. Therefore, there are no evidence gaps to address during the FOA.

### 2.3.5 Tools and Software

The calculation of noise contours, fuel burn and emissions have been performed by Environmental Resource Management and Mitchell Environmental Ltd using the Aviation Environmental Design Tool (AEDT) version 3g[3] that is used in the USA and widely around the world including in the UK. The noise modelling was carried out in line with the Category E requirements of CAP 2091.

The model calculates the emission and propagation of noise from arriving and departing air traffic. The noise exposure metric used is the Equivalent Continuous Sound Level (LAeq), and in particular $LA_{eq,16h}$ (07:00–23:00 local time) and $LA_{eq,8h}$ (23:00–07:00 local time), which is calculated over the 92-day summer period from 16 June to 15 September. Both Options A and B have been modelled independently for both noise and overflights.

Noise exposure is depicted in the form of noise contours, i.e. lines joining places of constant LAeq. Noise exposure is assessed above the Lowest Observed Adverse Effect Level (LOAEL), 51 dB $LA_{eq,16h}$ daytime and 45 dB $LA_{eq,8h}$ night-time, as defined in the Government's Airspace and Noise Policy. Day time $LA_{eq,16h}$ contours are plotted from 51 dB to 72 dB, in 3 dB steps, and night-time $LA_{eq,8h}$ contours are plotted from 45 dB to 72 dB, in 3 dB steps.

Day and night contours using the supplementary noise metrics N65 16-hour and N60 8-hour respectively have also been produced. N65 and N60 contours indicate the number of aircraft noise events exceeding a maximum sound level ($LA_{max}$) of 65 and 60 dB respectively at a given location.

Overflight contours are a means of defining and portraying the pattern and dispersion of aircraft below 7,000 feet, and the frequency that they occur. They are based upon a perception of overflight – they do not illustrate noise impacts. The CAA publication CAP 1498 presents a definition of overflight based on the angle of elevation between a person on the ground and an aircraft in the sky, suggesting two elevation angles, 60° and 48.5°. CAP 1616 states that change sponsors must use a 48.5° angle to represent overflight. Day and night overflight contours have been produced that indicate the number of daily overflight events at each location.

Forecast summer day and night contours for 2029 and 2038 have been produced for the Manston Airport ACP using the $LA_{eq,16h}$, $LA_{eq,8h}$, N65 and N60 metrics and using the same modelling assumptions and data for each assessment. Overflight contours were also produced using the same proposed departure, and approach tracks as supplied for the noise assessment. The modelling assumptions and data for the overflight contours are consistent with those used for the $LA_{eq}$ contours. Traffic forecasts, provided by RSP, have estimated 5,950 annual CAT movements in 2029 (Year 1) and 26,468 annual CAT movements in 2038 (Year 10). Also, an additional 5,840 non-CAT movements in Year 1, rising to 10,220 non-CAT movements in Year 10 have been included in the annual movements data.

The modelling used busy day forecast schedules for 2029 and 2038 provided by RSP. The 2029 and 2038 aircraft traffic totals for the average summer 16-hour day and 8-hour night periods are summarised in Table 2-2 below:

[3] Aviation Environmental Design Tool (AEDT) Version 3g, https://aedt.faa.gov/3g_information.aspx

| | Movement Type | 2029 | 2038 |
|---|---|---|---|
| **Day** | Freight Movements | 16.3 | 47.0 |
| | Passenger Movements | 0 | 25.3 |
| | Commercial Visual Circuits | 0 | 12 |
| | GA Visual Circuits | 16 | 16 |
| | **Total Movements** | 32.3 | 100.3 |
| **Night** | Freight Movements | 0 | 0 |
| | Passenger Movements | 0 | 4.6 |
| | Commercial Visual Circuits | 0 | 0 |
| | GA Visual Circuits | 0 | 0 |
| | **Total Movements** | 0 | 4.6 |
| **Total** | **Daily Movements** | 32.3 | 104.9 |

Table 2-2 – Forecast 2029 and 2038 Movements

In this table a departure and arrival movement (i.e. 2) make up each complete circuit flown.

The daytime contours were modelled assuming the runway modal split between easterly and westerly operations across the year as 70% westerly and 30% easterly for both day and night time, based on the analysis of historical weather data.

### 2.3.6 Flight Paths

#### 2.3.6.1 Flight Tracks

Figure 2-1 shows the departure and arrivals track centrelines


Figure 2-1 - Flight Track Centrelines

Esri. (2026). World Street Map

This depicts the proposed airspace as follows.

Departures from Runway 28 will all turn north to route over the sea as soon as possible to minimise overflying land and populations any more than necessary, dispersing around the track centreline as simulated by the 6 sub-tracks shown in Figure 2 2. The 6 sub-tracks are closely packed when viewed at this scale as discussed further below.

Departures from Runway 10 will fly straight and then when over the sea turn onto one of three directions and disperse around each of three track centrelines, as simulated by the 6 sub-tracks in Figure 2 2.

Arrivals to Runway 10 will approach from one of two directions, dispersed around each track centreline as simulated by the 6 sub-tracks in Figure 2 3. Arrivals from each of these two directions will converge to a 4000 ft Initial Approach Fix (IAF) after which they will fly PBN or ILS approaches descending to the runway.

Arrivals to Runway 28 will approach from one of three directions, dispersed around each track centreline as simulated by the 6 sub-tracks in Figure 2 3. Arrivals from each of these three directions will converge to a 4000 ft Initial Approach Fix (IAF) after which they will fly PBN or ILS approaches descending to the runway.

Air Transport Movements (ATMs) will operate on the arrivals and departures routes described above. In addition, two types of circuits will be provided for training and other use in the longer term, as shown by the red visual circuit tracks in Figure 2 4 and described as follows. For larger commercial aircraft visual circuits are expected to operate at a height of 2,000 ft to the south of the airport, making southernly turns on departure about 6 km from the airport onto downwind legs 4–5 km from the airport before making turns to approach about 3 km from the airport. These relatively late approach turns were developed to minimise overflight in Ramsgate to the East and also at properties to the West.

For smaller light aircraft General Aviation, a smaller visual circuit is expected to operate at a height of 1,000 ft and above and has been modelled at 1,000 ft. It will be located to the south of the runway as shown by the purple visual circuit tracks in Figure 2 4 following a common route, only reversed from each direction of runway use. This route was adjusted to avoid overflying properties in Minster.

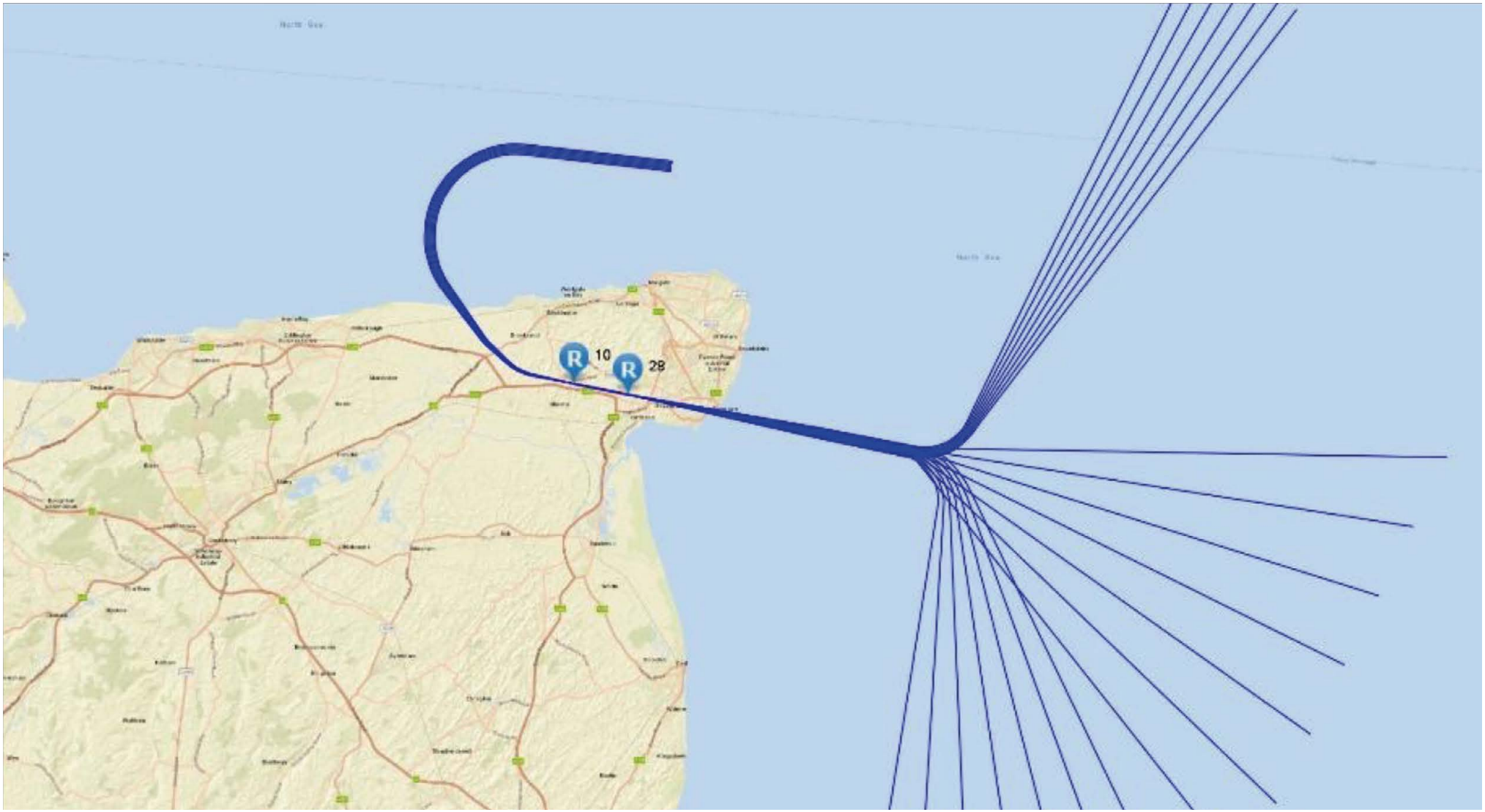


Figure 2-2 - Departure Flight Path Sub-Tracks

Esri. (2026). World Street Map

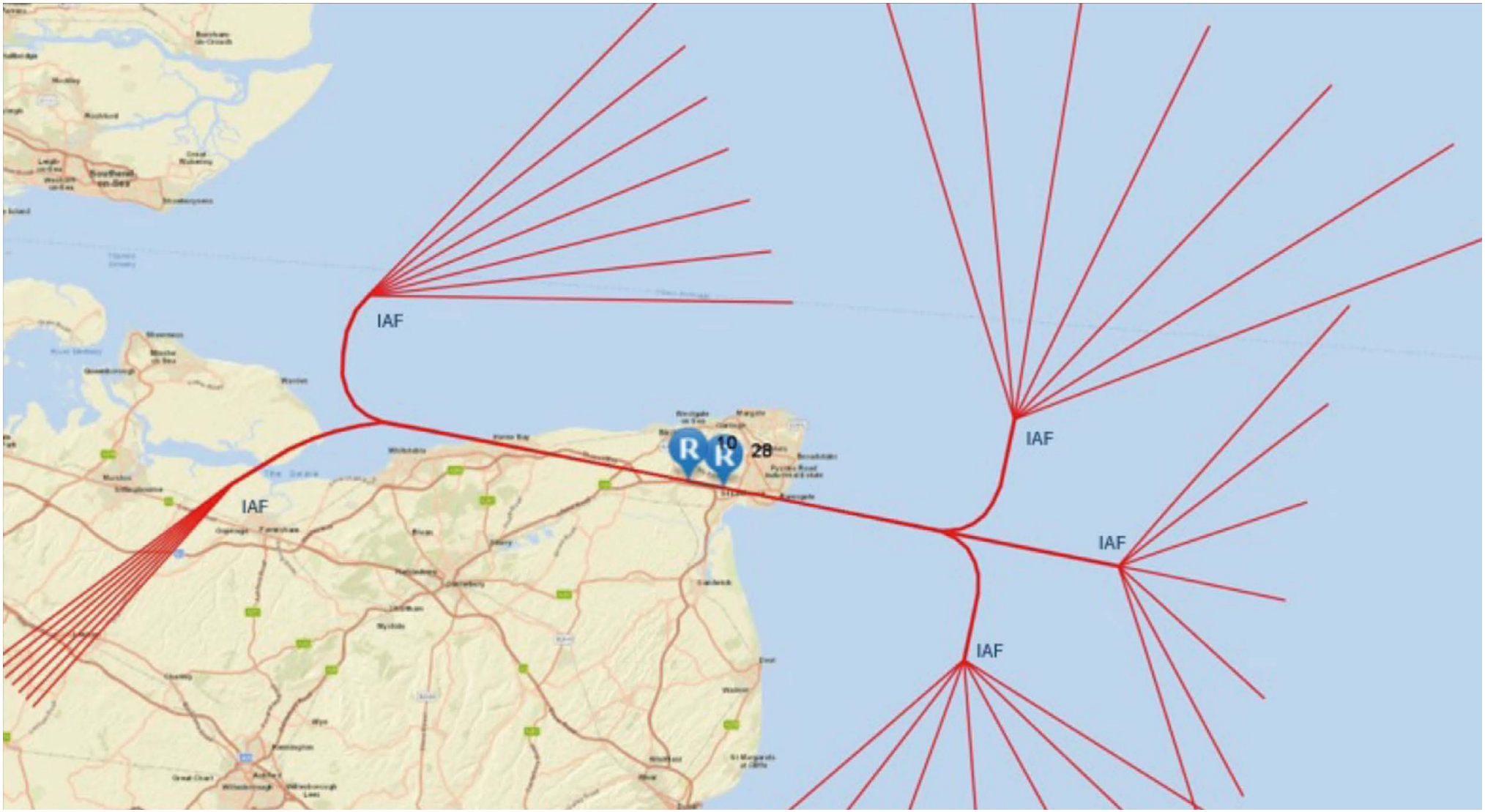


Figure 2-3 - Arrivals Flight Path Sub-Tracks

Esri. (2026). World Street Map


Figure 2-4 - Commercial and General Aviation Visual Circuits Tracks

Esri. (2026). World Street Map

The allocation of aircraft operations to each route has been based on the destinations to be served, and in the case of arrivals to Runway 10 avoiding conflict with the London Terminal Manoeuvring Area (TMA). Referring to the route names in Figure 2 1, the allocation of aircraft operations is outlined below:

On easterly operations when Runway 10 is in use, the splits are expected to be:

- Arrivals:
    - RW10ARR-N 80%
    - RW10ARR-S 20%

- Departures:
    - RW10DEP-C 40%
    - RW10DEP-S 40%
    - RW10DEP-N 20%

On westerly operations when Runway 28 is in use, the splits are expected to be:

- Arrivals:
    - RW28ARR-S 40%
    - RW28ARR-C 40%
    - RW28ARR-N 20%
- Departures:
    - RW28DEP-N 100%

**2.3.6.2 Dispersion**

To simulate the natural spread of aircraft around a stated flight path due to wind conditions, pilot behaviour etc, aircraft noise models disperse the flight tracks across a series of sub-tracks, as illustrated in Figure 2 2 and Figure 2 3. CAP 1616i refers to guidance in ECAC Doc 29, Report on Standard Method of Computing Noise Contours around Civil Airports, the most recent edition of which is 4th edition, 2016. Section 3.4.2 of Volume 2 gives guidance on lateral dispersion, including the recommendation to use at least 6 sub-tracks, which has been followed. The proportion of flights on a route assigned to each sub-track follows the ECAC guidance as follows:

- track centreline – 28.2%.
- first sub-track each side of centreline – 22.2%.
- second sub-track each side – 10.6
- third (outermost) sub-track each side – 3.1%

Section 3.4.2 of Volume 2 also suggests Standard Deviations for the normal distribution of flights across these tracks if radar data of actual tracks flows is not available, as is the case here. However, the guidance is 9 years old and the ATC system to be developed at Manston for the future will use the latest technology including Performance-Based Navigation (PBN), not accounted for in the ECAC guidance. So instead, track dispersion data was drawn from operations at Gatwick Airport. For departures, the PBN dispersion function was taken from the Seaford Standard Instrument Departure route which includes a 90-degree turn. PBN arrivals procedures are not currently flown routinely at all UK airports and have only recently been implemented within the UK, so there is a lack of data relating to dispersion of routes flown. PBN approaches are proposed from the Initial Arrival Fix (IAF) waypoints discussed above to each runway. Gatwick Airport trialled PBN arrivals in its Reduced Night Noise Trial in 2024, so dispersion functions for the relevant final stages of arrivals were taken from that trial. The trial showed very good track-keeping, for example at distances of about 30 km from the airport, (equivalent to where the Initial Approach Fix (IAF) waypoints will be at Manston) all aircraft were within 70 m from the PBN centre line. Beyond the IAF waypoints aircraft are spread using a normal distribution across each of the arrivals swathes discussed above and seen in Figure 2 3.

### 2.3.6.3 Flight Profiles

The AEDT model computes the vertical profiles of each aircraft type consistent with the aircraft's standard operating procedures within the model's database, taking account of the aircraft's weight and the meteorological conditions. The model has been calibrated to some extent by providing aircraft weight in the form of the Stage Length for departures (see below) and local meteorological conditions as given above.

CAA guidance (see Section 2.3.3) requires no further calibration of the AEDT standard profiles. However, because PBN arrivals procedures have been developed for Manston, some arrivals profiles have been edited to ensure all aircraft pass the Initial Arrivals Fix (IAF) at or above 4,000 ft and the Final Arrivals Fix (FAF) at 3,000 ft (Option B in this report), before descending at 3 degrees to the runway threshold.

Figure 2 5 shows the approach profiles of each aircraft type.

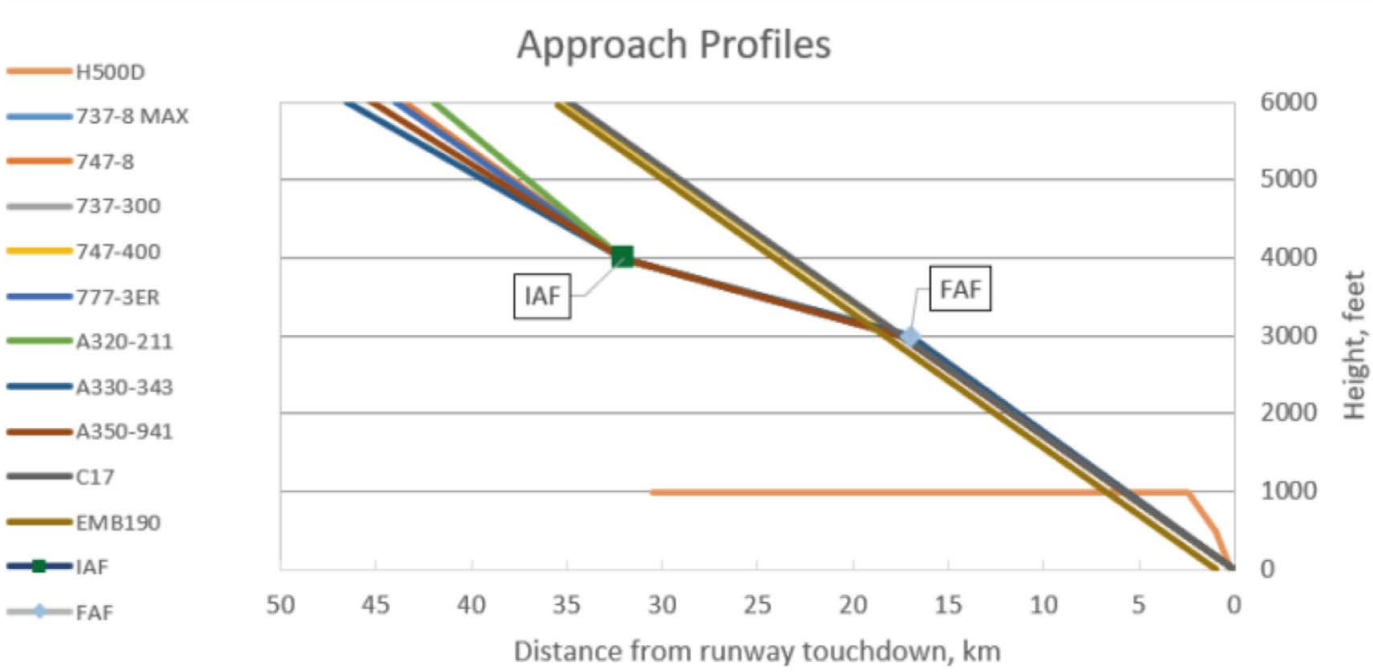


Figure 2-6 - Aircraft Approach Profiles

It can be seen that a few aircraft types (B737-300, B747-400, C17 and EMB 190) are modelled as flying perfect Continuous Descent Approached (CDA) at 3 degrees all the way from 6,000 ft to the runway threshold. But most aircraft types join this angle at the Final Approach Fix at 3,000 ft after flying via the Initial Approach Fix at 4,000 ft.

A Final Approach Fix Option is included in the Stage 3 submission that would lower the FAF to Runway 10 from 3,000 ft to 2,500 ft (Option A in this report) and move it proportionately nearer the airport from about 17 km to 15 km. The Initial Approach Fix would stay at 4,000 ft but also be moved nearer the airport from about 32 to 29 km. The effect of this option would be to slightly increase aircraft heights around the 30 km zone over the sea and to slightly lower them in the 15–17 km zone in the sea beyond Herne Bay. To test if this could increase noise levels in the Herne Bay area the relevant aircraft approach profiles to Runway 10 were modified, as shown in Figure 2-6.

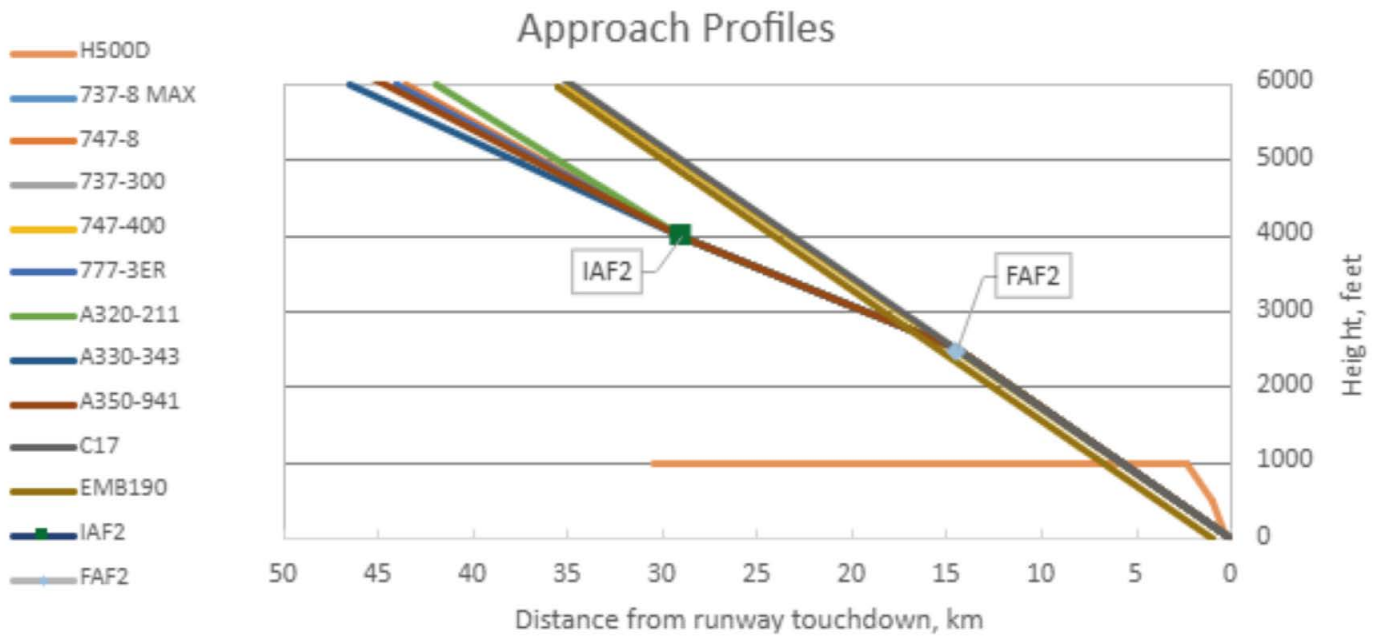


Figure 2-7 - Aircraft Approach Profiles FAF2 Option

For departures, standard AEDT departure profiles are assumed, as shown in Figure 2-7. This presumes there are no instructions to hold aircraft down.

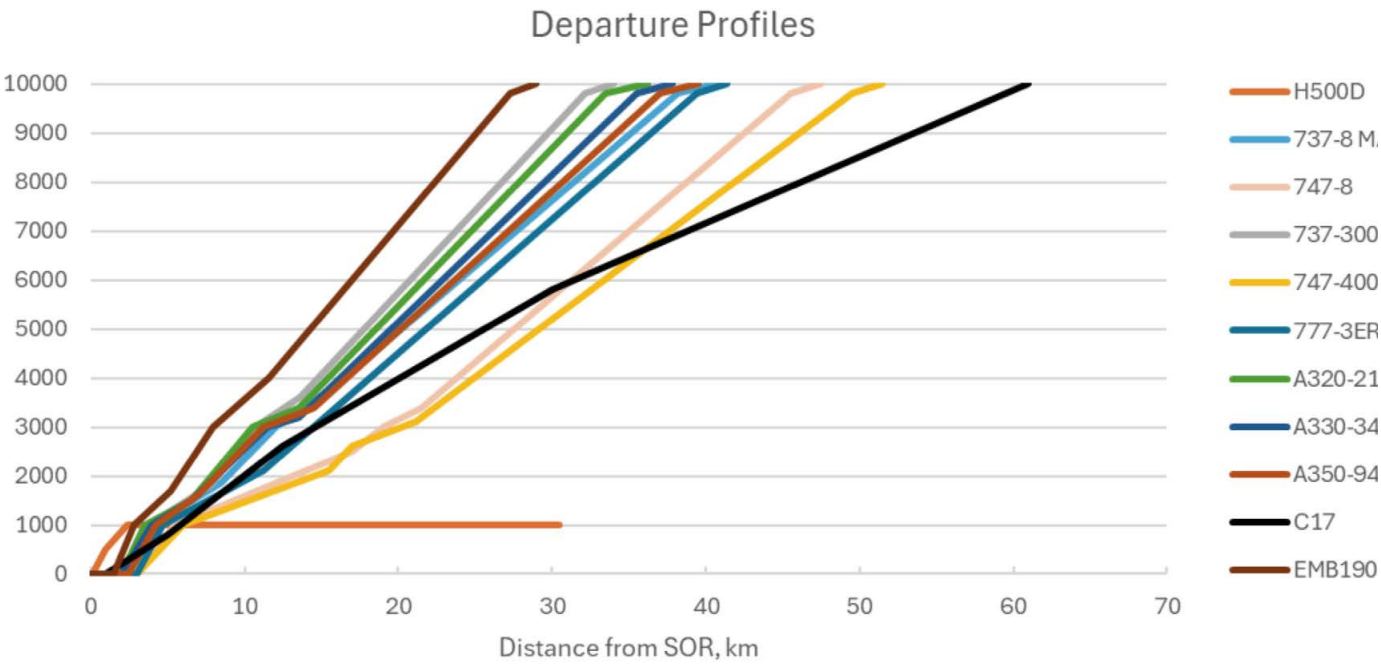


Figure 2-8 - Aircraft Departure Profiles

The slowest fixed-wing climbers are Boeing 747s. The Hughes OH-6 Cayuse helicopter is modelled at climbing rapidly to 1,000 ft, note these are expected to be only occasional military visitors to the airport (assumed to be 1 every 20 days, see below).

### 2.3.7 Calculating Mass of Fuel Burn and Greenhouse Gas Emissions

Change sponsors must consider and demonstrate how the design and operation of the design options will impact greenhouse gas emissions. As described in Section 2.3.4, Greenhouse gas emissions calculated using the AEDT, to estimate total annual fuel burn and mass of carbon dioxide equivalent (CO2e) emissions in metric tonnes, for the same scenarios as the noise model.

The GHG assessment is based on the same inputs as the noise model, i.e. numbers of aircraft, types of aircraft, flight path routings, and vertical profiles, as simulated in the AEDT noise model described in Section 2.3.4. For each aircraft type, both commercial and general aviation, AEDT's database is accessed to estimate emissions along each flight path used in the model to simulate aircraft operations to and from the airport to heights of 10,000 ft. As for the noise model aircraft operations are summed assuming a 70/30% split between runway 28 and runway 10, for an average summer day for both and night time.

The impacts of greenhouse gas emissions have been monetised as an annual cost over the 10-year appraisal period, and the output is the net present value of the change in greenhouse emissions. All greenhouse gas emissions have been presented in tCO2e, split by traded sector and non-traded sector[4].

At this stage of the ACP, it is unclear the exact number of domestic and international flights, therefore as a worst case, 15% has been assumed for domestic flights which equates to a lower net present value (higher predicted increase in emissions); however, in reality this number is likely to be significantly less.

The results for the greenhouse gas modelling can be found in the relevant section for each scenario (Sections 5–4) and a comparison of each option against the Baseline can be found in Section 5.

### 2.3.8 Other Impact Assessments

CAP 1616i also requires an assessment of the effect of each option compared to the Baseline in terms of the following impacts:

**Air Quality:** Change sponsors must produce information on and monetise local air quality impacts only where there is the possibility of pollutants breaching legal limits and target values following the implementation of an airspace change proposal (or worsening an existing breach of legal limits and target values). It is deemed that this is only likely to become a possibility where:

- there is likely to be a change in aviation emissions (by volume or location) below 1,000 ft above aerodrome level (aal); and
- the location of the emissions is within or adjacent to a designated Air Quality Management Area (AQMA).

Given there are no AQMAs in the vicinity of the airport or its flight paths, no assessment of the impact on local air quality is required, which is detailed in Appendix C.

**Tranquillity:** The consideration of impacts upon tranquillity for airspace change proposals is with specific reference to National Parks, Areas of Outstanding Natural Beauty (AONB), plus any local 'tranquil' areas that have been identified through community engagement and are subsequently reflected within an airspace change proposal's design principles.

An assessment of the impact on tranquillity of each option compared to the baseline can be found in Appendix D.

[4] Traded emissions capture those that come from installations covered by the UK Emissions Trading Scheme (ETS), whereas non-traded emissions are those which do not fall within scope of the UK ETS. Currently, the UK ETS covers power generation, energy-intensive industries, and domestic aviation.

**Biodiversity:** Biodiversity can be taken to mean "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".

Change sponsors must include the potential biodiversity implications associated with design options under consideration. Biodiversity receptors include locally identified biodiversity receptors and European sites such as:

• Special Areas of Conservation (SAC) and possible SACs

• Special Protection Areas (SPA) and potential SPAs

• Ramsar sites (wetlands of international importance) and proposed Ramsar sites

• Compensatory habitats (areas secured to compensate for damage to SACs, SPAs and Ramsar sites)

The consideration of biodiversity is outlined in more detail in Appendix E.

Change sponsors must consider a habitats regulations assessment as part of full options appraisal. The overall aim should be to eliminate as many adverse effects on European sites as practicable, prior to the CAA's consideration of the final proposal at Stage 5.

In order to ascertain whether an airspace change proposal is likely to have a significant effect on a European site (and therefore whether an appropriate assessment of the potential adverse effects of the proposal on that site is needed), change sponsors must undertake a screening exercise. RSP have conducted this early screening exercise and the answers in the early screening criteria form can be found in Appendix E.

# 3. Current Day Impact – Baseline Scenario

## 3.1 Overview

In accordance with CAP 1616 Edition 5, change sponsors must develop a baseline scenario for all airspace change proposals, which will be the future scenario without the airspace change. This will need to assume the current-day airspace situation as it provides a clear description of the current aviation activity and associated impacts and sets the context for all stages of the airspace change process.

The current-day scenario should include a description of the current airspace design (today's airspace structure, flight procedures and flight behaviours/patterns) and a description of the current prevailing air traffic situation and an indication of estimated forecast traffic growth over a period of 10 years from the intended year of implementation.

In accordance with CAP 1616, a baseline will be required for all environmental assessments. This will allow the change sponsor to conduct an assessment to understand the current impacts so that a comparison can be made with the impacts of the options.

## 3.2 Manston Airport Baseline Scenario

In the case of Manston Airport, the current-day scenario represents the current situation where there is no airport at Manston and no associated air traffic. There is no direct impact associated with this scenario.

# 4. Full Options Appraisal – Option A Compared to Baseline

## 4.1 Introduction

This section of the report presents the full options appraisal for Option A and presents a summary of the results. The complete analysis including associated cumulative estimates of the areas, populations, households and noise sensitive buildings is contained in Appendix A of this report.

As described in Section 2.3.5.3 a Final Approach Fix Option is lowering the FAF to Runway 10 from 3,000 ft to 2,500 ft and move it proportionately nearer the airport from about 17 km to 15 km whilst moving the Initial Approach Fix nearer the airport from about 32 to 29 km. This Option (A) has been presented as the FAF2 option in this report, whilst the option with a FAF of 3000 ft has been presented as Option B.

Given there is no difference in $LA_{eq,16hr}$, $LA_{eq,8hr}$, and overflights between the two scenarios, the daytime Number Above 65 (N65) contours for both the core option and the FAF2 option in the tenth year of operation 2038 are presented below in Figure 4 1 to show the subtle difference in the Herne Bay area. All other figures are presented in Section 5.

| Group | Notes | Quantitative noise assessment results compared to Baseline | Assessment result |
|---|---|---|---|
| **Communities** | Noise | Individuals experiencing increased daytime noise in forecast year: 2038 | 26,224 |
| **Communities** | Noise | Individuals experiencing reduced daytime noise in forecast year: 2038 | 0 |
| **Communities** | Noise | Individuals experiencing increased night-time noise in forecast year: 2038 | 2,055 |
| **Communities** | Noise | Individuals experiencing reduced night-time noise in forecast year: 2038 | 0 |
| **Communities** | Noise | Net Present Value of change in noise | -£20,843,003[5] |

[5] Note, the noise appraisal assumes a no airport baseline with default baseline noise levels < $L_{eq\ 16\ hr}$ 51 dB and $L_{eq,8\ hr}$ night 45 dB which is unrealistic because other noise sources such as road traffic are above this in the majority of areas. Therefore, noise increases will not be as large as assumed at the majority of locations, so the estimated total cost is substantially over-stated. WebTAG is a tool developed for comparing options against options not against a zero baseline.

| Group | Other Impact | Assessment compared to Baseline | Assessment result |
|---|---|---|---|
| **Communities** | Air Quality | No change versus Baseline as no AQMAs in vicinity of proposed routings. | No change |
| **Wider Society** | Greenhouse Gas impact. Negative figure = decrease versus Baseline | Change in $CO_2$ Equivalent emissions over 10-year appraisal period (tonnes) | 113,034 |
| | | Change in annual $CO_2$ Equivalent emissions in opening year (tonnes) | 37,164 |
| | Greenhouse Gas $CO_2e$: positive figures are a benefit; negative are a cost to society | Overall Assessment NPV $CO_2$ Equivalent emissions | -£194,968,305 |
| | | NPV of traded sector $CO_2$ Equivalent emissions | -£21,389,616 |
| **Wider Society** | Tranquillity | The nominal track for Option A overflies a small section in the centre of the Kent Downs AONB between Lenham and Brogdal for aircraft below 7000 ft. It has been calculated that 2.17 flights would overfly the area.<br>The area is some distance from the project site and is very unlikely any impacts on tranquillity from increased overflying would be sufficiently significant to meet criteria. | No change |
| **Wider Society** | Biodiversity | There are 29 sites within 18 km of the Manston runway ends. Of those 29, 15 are identified to be overflown by Option A, coming to 90.93 operations (<7,000 ft) from 2038 that overfly the designations. This includes, one local nature reserve, two national nature reserves, one Ramsar site, three sites of specific scientific interest, four special areas of conservation, two special protection areas, and two marine conservation zones. For the purposes of this ASC, when comparing a to a baseline of no operations, it can be highlighted that the option would have a very minor negative change to the extent that significant negative impacts would not be expected.<br>** The above conclusion is borne out in the DCO application where an appropriate assessment was undertaken as part of the habitats regulations appraisal, which concluded that the Secretary of State for Transport confirmed that the proposed Development would not result in any adverse effects on the integrity of any of the adjacent designated European sites, either alone or in combination with other plans and that all necessary mitigation measures are secured within the Development Consent Order (DCO), and Natural England supports the conclusions. In the case of Option A, this presents no change from the consented development and would therefore in reality result in no change on the integrity of European sites.* | Negative* |

| Group | Other Impact | Assessment compared to Baseline | Assessment result |
|---|---|---|---|
| **Wider Society** | Capacity and resilience | The procedures have been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This enables increased capacity, efficiency and resilience. | Benefit |
| **General Aviation (GA)** | Access | The introduction of an ATZ will have an impact on GA access. If this option is taken forward, GA pilots would be required to contact ATC and request permission to enter the ATZ. Manston ATC will facilitate access to airspace for all users, regardless of the airspace classification, unless for overriding operational safety issues. Access will not routinely be denied but some airspace users may be unwilling or unable to operate in the airspace due to the lack of the necessary equipment (radio or transponder). This is expected to be more of an impact than the current situation. | Negative |
| **GA / commercial airlines** | Economic impact from increased effective capacity | The introduction of procedures will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements. The economic impact of an ATZ will be realised as movements will be handled in a more efficient way, increasing effective capacity at the airport. | Benefit |
| **GA / commercial airlines** | Fuel burn | Change in annual fuel burn in opening year versus Baseline (tonnes) | 11,779 |
| | | Change in annual fuel burn in forecast year versus Baseline (tonnes) | 35,827 |
| **Commercial airlines** | Training costs | No additional training costs anticipated. | No change |
| **Airport / ANSP** | Other costs | Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be small and not significant. | No significant change |
| **Airport / ANSP** | Infrastructure Costs | There will be no additional infrastructure costs associated with the introduction of procedures and airspace. | No change |
| **Airport / ANSP** | Operational costs | The operational costs associated with implementing procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of procedures is very low, requiring maintenance of the procedure on a five yearly basis. | No significant change |
| **Airport / ANSP** | Deployment costs | There may be some additional air traffic controller training specifically associated with the implementation of approved procedures; however, this training will form part of the training required to establish Air Traffic Control at the airport as part of the airport development. | No change |

Table 4-1 – Options Appraisal of Option A

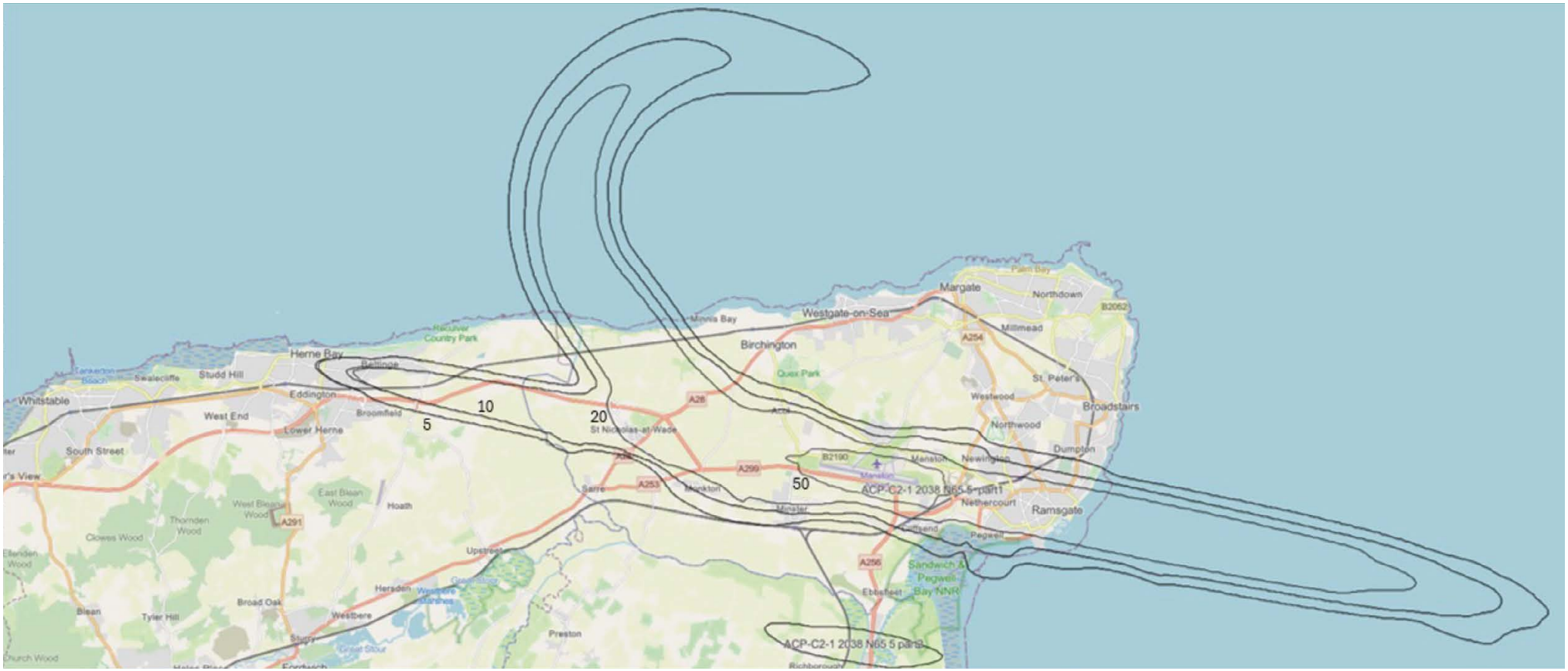


Figure 4-1 - Options A and Option B 2038 N65 Day Noise Contours

# 5. Full Options Appraisal – Option B Compared to Baseline

## 5.1 Introduction

This section of the report presents the full options appraisal for Option B and presents a summary of the results. The complete analysis of Option B, including the $LA_{eq,16hr}$, $LA_{eq,8hr}$, N65, overflight contours and the associated cumulative estimates of the areas, populations, households and noise sensitive buildings is contained in Appendix A of this report.

When comparing against the Baseline, the numbers can be taken at value, given the base case is no operation.

## 5.2 Option B

| Group | Notes | Quantitative noise assessment results compared to Baseline | Assessment result |
|---|---|---|---|
| **Communities** | Noise | Individuals experiencing increased daytime noise in forecast year: 2038 | 26224 |
| **Communities** | Noise | Individuals experiencing reduced daytime noise in forecast year: 2038 | 0 |
| **Communities** | Noise | Individuals experiencing increased night-time noise in forecast year: 2038 | 2055 |
| **Communities** | Noise | Individuals experiencing reduced night-time noise in forecast year: 2038 | 0 |
| **Communities** | Noise | Net Present Value of change in noise | -£20,843,003[6] |

| Group | Other Impact | Assessment compared to Baseline | Assessment result |
|---|---|---|---|
| **Communities** | Air Quality | No change versus baseline as no AQMAs in vicinity of proposed routings. | No Change |
| **Wider Society** | Greenhouse Gas impact. Negative figure = decrease versus Baseline | Change in $CO_2$ Equivalent emissions over 10-year appraisal period (tonnes) | 117,215 |
| | | Change in annual $CO_2$ Equivalent emissions in opening year (tonnes) | 37,296 |
| | Greenhouse Gas $CO_2e$: positive figures are a benefit; negative are a cost to society | Overall Assessment NPV $CO_2$ Equivalent emissions | -£200,469,352 |
| | | NPV of traded sector $CO_2$ Equivalent emissions | -£21,985,072 |
| **Wider Society** | Tranquillity | The nominal track for Option B is the same as Option A (i.e. 2.17 flights would overfly the area) overflying the Kent Downs AONB and is therefore also very unlikely any impacts on tranquillity from increased overflying would be sufficiently significant to meet criteria. | No Change |

**Continued overleaf**

[6] Note, the noise appraisal assumes a no airport baseline with default baseline noise levels < $L_{eq\ 16\ hr}$ 51 dB and $L_{eq,8\ hr}$ night 45 dB which is unrealistic because other noise sources such as road traffic are above this in the majority of areas. Therefore, noise increases will not be as large as assumed at the majority of locations, so the estimated total cost is substantially over-stated. WebTAG is a tool developed for comparing options against options not against a zero baseline.

| Group | Other Impact | Assessment compared to Baseline | Assessment result |
|---|---|---|---|
| **Wider Society** | Biodiversity | There are 29 sites within 18 km of the Manston runway ends. Of those 29, 15 are identified to be overflown by Option B (same as Option A) i.e. 90.93 operations (<7,000 ft) from 2038 that overfly the designations. As for the assessment of Option A as part of this ASC, when comparing a to a baseline of no operations, it can be highlighted that the option would have a very minor negative change to the extent that significant negative effects should not be expected.<br>**The above conclusion is borne out in the DCO application where an appropriate assessment was undertaken as part of the habitats regulations appraisal, which concluded that the Secretary of State for Transport confirmed that the proposed Development would not result in any adverse effects on the integrity of any of the adjacent designated European sites, either alone or in combination with other plans and that all necessary mitigation measures are secured within the Development Consent Order (DCO), and Natural England supports the conclusions. In the case of Option A, this presents no change from the consented development and would therefore in reality have no change on the integrity of European sites.* | Negative* |
| **Wider Society** | Capacity and resilience | The procedures have been designed in consultation with NATS and the FASI-S programme, in accordance with the UK Airspace Modernisation Strategy. This enables increased capacity, efficiency and resilience. | Benefit |
| **General Aviation (GA)** | Access | The introduction of an ATZ will have an impact on GA access. If this option is taken forward, GA pilots would be required to contact ATC and request permission to enter the ATZ. Manston ATC will facilitate access to airspace for all users, regardless of the airspace classification, unless for overriding operational safety issues. Access will not routinely be denied but some airspace users may be unwilling or unable to operate in the airspace due to the lack of the necessary equipment (radio or transponder). This is expected to be more of an impact than the current situation. | Negative |
| **GA / commercial airlines** | Economic impact from increased effective capacity | The introduction of procedures will contribute to the delivery of associated benefits including increased effective capacity which is predicted to have direct and indirect economic benefits associated with an increase in both air transport and GA movements. The economic impact of an ATZ will be realised as movements will be handled in a more efficient way, increasing effective capacity at the airport. | Benefit |

**Continued overleaf**

| Group | Other Impact | Assessment compared to Baseline | Assessment result |
|---|---|---|---|
| **GA / commercial airlines** | Fuel burn | Change in annual fuel burn in opening year versus Baseline (tonnes) | 11,821 |
| | | Change in annual fuel burn in forecast year versus Baseline (tonnes) | 37,151 |
| **Commercial airlines** | Training costs | There will be no additional training costs required for commercial operators with the implementation of procedures and airspace. | No change |
| **Airport / ANSP** | Other costs | Other costs to operators may include updates to aircraft Flight Management Systems (FMS) and navigation databases. Any additional costs are likely to be small and not significant. | No significant change |
| **Airport / ANSP** | Infrastructure costs | There will be no additional infrastructure costs associated with the introduction of procedures and airspace. | No change |
| **Airport / ANSP** | Operational costs | The operational costs associated with implementing procedures relate to IFP design, validation (ground and airborne), safety assessment, airspace change and consultation, certification and publication. Once implemented, the costs of ownership of procedures is very low, requiring maintenance of the procedure on a five yearly basis. | No significant change |
| **Airport / ANSP** | Deployment costs | There may be some additional air traffic controller training specifically associated with the implementation of approved procedures; however, this training will form part of the training required to establish Air Traffic Control at the airport as part of the airport development. | No change |

Table 5-1 – Full Options Appraisal of Option B

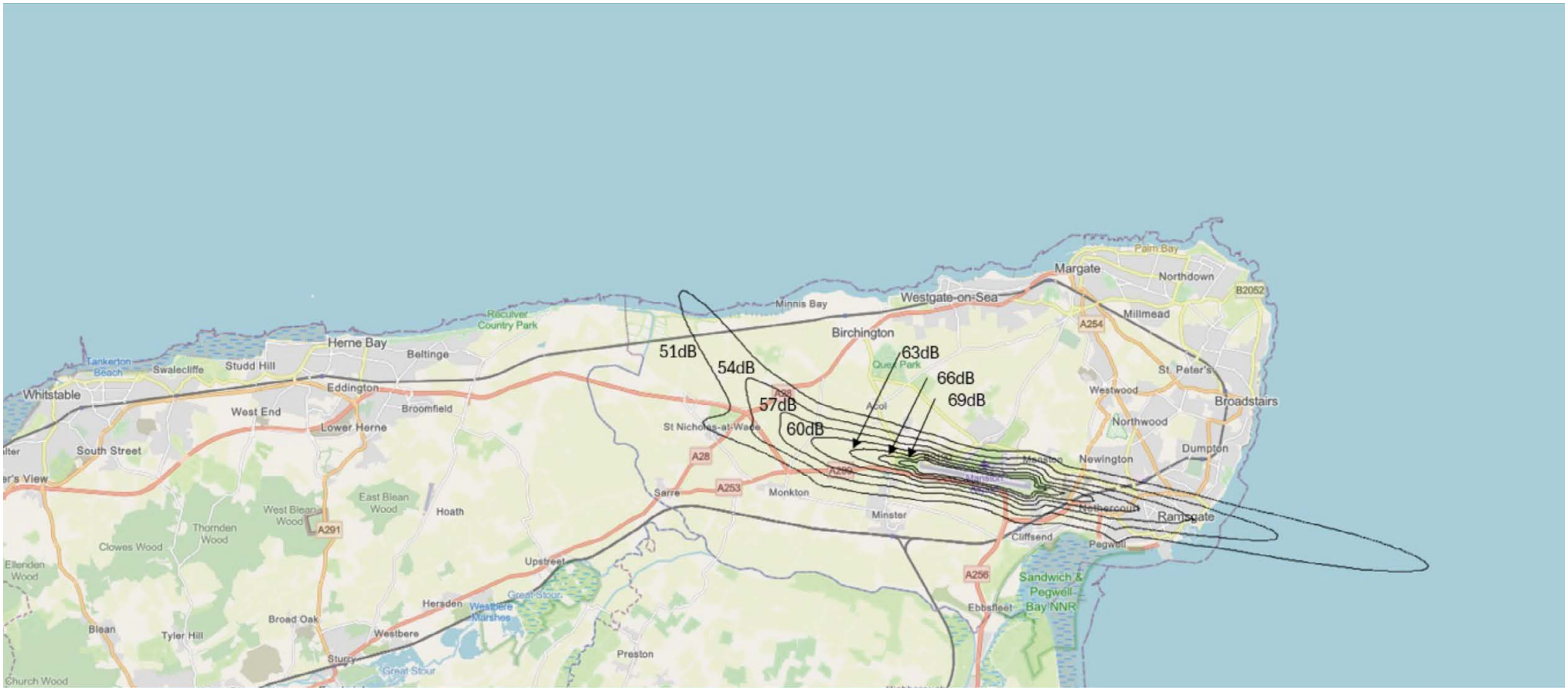


Figure 5-1 - Option B 2038 16hr Noise Contours above 51dB(A) $LA_{eq\ 16hr}$

Esri. (2026). World Street Map


Figure 5-2 - Option B 2038 8hr Noise Contours above 45dB(A) $LA_{eq\ 8hr}$

Esri. (2026). World Street Map


Figure 5-3 - Option B 2038 Summer Day N65 Contours

Esri. (2026). World Street Map


Figure 5-4 - Option B 2038 Overflights 5, 10, 20, 50

Esri. (2026). World Street Map

# 6. Comparing Options Compared to Baseline

## 6.1 Noise: NPV of Impacts

Table 6-1 presents the TAG noise assessment results in terms of Net Present Value (NPV) using 2023 prices of a range of impacts. The monetised results represent the annual cost over the 10-year appraisal period, and the output is the net present value of the change in noise exposure. A positive £ figure indicates a positive benefit, i.e. a reduction in noise-related adverse health impacts.

Given in this case the $L_{eq}$ contours are the same for both options, both WebTAG output values are also the same.

| Impact | A | B |
|---|---|---|
| Sleep disturbance | -£355,157 | -£355,157 |
| Amenity | -£14,539,029 | -£14,539,029 |
| AMI[7] | -£95,670 | -£95,670 |
| Stroke | -£2,333,407 | -£2,333,407 |
| Dementia | -£3,519,740 | -£3,519,740 |
| **Total Change in Noise** | **-£20,843,003** | **-£20,843,003** |

Table 6-1 – NPV of Noise Impact

## 6.2 Noise: Quantitative population exposure to change in noise

Table 6-2 presents the quantitative assessment of the number of individuals experiencing either an increase of or a decrease in noise levels for each of the options.

As Table 6-2 compares data for increased noise with that of reduced noise, a higher value does not necessarily equate to positive outcome.

The overall change row for both day and night represents the combined impact against the baseline. The negative figures highlighted in red represent a negative impact against the baseline; this is not unexpected since the baseline represents the current-day scenario where there is no airport and no associated air traffic and therefore no noise impact associated with it.

As above, in this case the $L_{eq}$ contours are the same for both options, both WebTAG output values are also the same.

| Quantitative Change | A | B |
|---|---|---|
| Increased day noise | 26224 | 26224 |
| Reduced day noise | 0 | 0 |
| Overall day change | -26224 | -26224 |
| Increased night noise | 2055 | 2055 |
| Reduced night noise | 0 | 0 |
| Overall night change | -2055 | -2055 |

Table 6-2 – Quantitative Assessment of Population Exposure to Change in Noise Levels

[7] AMI = Acute Myocardial Infarction (Heart Attack)

## 6.3 Population by dB(A) LAeq16hr level

The number of people deemed to be exposed to daytime noise in each dBA level from 51 dB(A) in 3 dB increments up to 72 dB(A) has been determined during the environmental assessment. These figures can be seen in Appendices A to B of this report which contains all of the results of the TAG analysis used throughout the full options appraisal process.

## 6.4 Population by dBA $LA_{eq8hr}$ level

The number of people deemed to be exposed to night-time noise in each dBA level from 45 dB(A) in 3 dB increments up to 72 dB(A) has been determined during the environmental assessment. These figures can also be seen in Appendices A to B of this report which contains all of the results of the TAG analysis used throughout the full options appraisal process.

## 6.5 Fuel and $CO_2$

The mass fuel burn results (in tonnes) are summarised in Table 6-3. The differences calculated for future year scenarios are relative to the corresponding Baseline scenario. Positive numbers mean that more fuel is burned. As such, the option with the most optimal item in both 2029 and 2038 has been highlighted green and the least optimal has been highlighted red.

| Scenario | | Total Fuel Burn (tonnes) | Difference in Fuel Burn (tonnes) |
|---|---|---|---|
| 2029* | Baseline | 0 | 2029 Reference Scenario |
| | Option A | 11,779 | +11,779 |
| | Option B | 11,821 | + 11,821 |
| | | | |
| 2038 | Baseline | 0 | 2038 Reference Scenario |
| | Option A | 35,827 | +35,827 |
| | Option B | 37,151 | +37,151 |

Table 6-3 - Mass Fuel Burn Results

The tonnes $CO_2e$ results are summarised in Table 6-4.

| Scenario | | Total $CO_2$ (tonnes) | Traded $CO_2$ (tonnes) | Non-Traded $CO_2$(tonnes) |
|---|---|---|---|---|
| 2029* | Baseline | 0 | 0 | 0 |
| | Option A | 37,164 | 5,575 | 31,590 |
| | Option B | 37,296 | 5,594 | 31,701 |
| | | | | |
| 2038 | Baseline | 0 | 0 | 0 |
| | Option A | 113,034 | 16,955 | 96,079 |
| | Option B | 117,215 | 17,582 | 99,632 |

Table 6-4 - Tonnes $CO_2e$ Results

Fuel burn and $CO_2e$ figures have been presented to the nearest tonne to enable meaningful comparisons between options. However, due to the various assumptions made and the inherent uncertainties in the modelling process, the absolute values of fuel burn and $CO_2e$ should only be treated as estimates.

## 6.6 Financial Impacts

The Overall Assessment Score in each case and the Quantitative Assessment (which shows the result of the NPV[8] of traded sector CO2 equivalent emissions (tCO2e) in GBP (£) are the results of this assessment summarised for each option in the figure below using the most up to date TAG: environmental impacts worksheet for greenhouse gases (2025).

The monetised results represent the annual cost over the 10-year appraisal period, and the output is the net present value of the change in greenhouse gas emissions. A positive figure indicates a benefit to society versus the Baseline.

A monetised figure of fuel burn for each of the assessment years has also been provided. This is calculated using a current estimate of fuel cost per tonne multiplied against the output in tonnes of fuel burnt from the modelling for each assessment year.

| TAG Assessment | A | B |
|---|---|---|
| **NPV $CO_2$ Equivalent ($CO_2e$) Emissions (£)** | -£194,968,305 | -£200,469,352 |
| **Change in $CO_2e$ Emissions over 10-year Appraisal Period (tonnes)** | 750,991 | 772,551 |
| **– Of Which Traded** | 112,649 | 115,883 |
| **Change in $CO_2e$ Emissions in Opening Year (tonnes)** | 37,164 | 37,296 |
| **NPV of Traded Sector $CO_2$ Equivalent ($CO_2e$) Emissions of Proposal (£)** | -£21,389,616 | -£21,985,072 |
| **Fuel Burn 2029[9]** | -£13,428,416 | -£13,475,468 |
| **Fuel Burn 2038** | -£40,842,788 | -£42,352,559 |

Table 6-5 - Financial Impacts of Greenhouse Gases for Proposed Options

[8] Net Present Value.

[9] Based on a price of £1,140 per tonne. This price is an estimate and will fluctuate based on the cost of oil, currency exchange rates (oil price is based on US Dollars per barrel) and the retail price charged by suppliers/airports. The price of Jet Fuel is only included in this calculation. Although the fuel for GA aircraft is more expensive, the amount of fuel used by GA in these calculations is small in comparison to Jet Fuel, so has not been included. Source: GB JP54, JET A1 price in United Kingdom 85.5 bbl/$ [05.12.2025]

## 6.7 Overflight Assessment

We have carried out an overflight assessment to determine the number of people perceived to be overflown by aircraft in the different options. This is not a measure of noise but a demonstration of the pattern and dispersal of traffic i.e. a perception of overflight.

The full overflight contour diagrams and tables of results have been included in Appendices A to B for each option.

| 2029 – Population | | |
|---|---|---|
| **TAG Assessment** | **A** | **B** |
| **>5** | 7,500 | 7,500 |
| **>10** | 800 | 800 |
| **>20** | 0 | 0 |
| **>50** | 0 | 0 |

Table 6-6 - 2029 Overflight Assessment

| 2038 – Population | | |
|---|---|---|
| **Overflights** | **A** | **B** |
| **>5** | 43,100 | 43,100 |
| **>10** | 40,000 | 40,000 |
| **>20** | 7,500 | 7,500 |
| **>50** | 550 | 550 |

Table 6-7 - 2038 Overflight Assessment

# 7. Monetised Evaluation

## 7.1 Comparison of Quantitative Data

Table 7-1 below summarises the quantified data for each of the ACP options compared to the Baseline scenario (which in this case is no operation). These results have been determined from the environmental modelling, together with the analysis of each option contained in Sections 5–4 above. A positive figure indicates a net benefit to society versus the Baseline.

| | Change from Baseline | |
|---|---|---|
| **Impact** | **A** | **B** |
| **NPV of Change in Noise** | -£20,843,003 | -£20,843,003 |
| **NPV of CO2 Equivalent emissions** | -£194,968,305 | -£200,469,352 |
| **NPV of traded sector CO2 Equivalent emissions** | -£21,389,616 | -£21,985,072 |
| **Fuel Burn 2029**[10] | -£13,428,416 | -£13,475,468 |
| **Fuel Burn 2038** | -£40,842,788 | -£42,352,559 |
| **Local Air Quality** | £0 | £0 |
| **Tranquillity** | £0 | £0 |
| **Biodiversity** | £0 | £0 |
| **Economic impact from increased effective capacity** | £0 | £0 |

Table 7-1 - Quantitative Cost Comparison to Baseline

[10] Based on a price of £1,140 per tonne. This price is an estimate and will fluctuate based on the cost of oil, currency exchange rates (oil price is based on US Dollars per barrel) and the retail price charged by suppliers/airports. The price of Jet Fuel is only included in this calculation. Although the fuel for GA aircraft is more expensive, the amount of fuel used by GA in these calculations is small in comparison to Jet Fuel, so has not been included. Source: GB JP54, JET A1 price in United Kingdom 85.5 bbl/$ [05.12.2025]

# 8.1 Options Taken Forward to Consultation

Based on the analysis conducted in this Full Options Appraisal, Option A is deemed the preferred option because it is anticipated to have the lowest potential environmental effects. It provides slightly lower Net Present Value of changes in CO2e equivalent Emissions and fuel burn.

Operationally, there is minimal difference between the options. Option A has been selected as the preferred option as the 2,500ft FAF and approach would ensure that the Manston inbound aircraft to runway 10 would remain further away from the existing Southend Airport Controlled Airspace. Whereas Option B could impact on Southend Airport procedures.

# Appendix A – Option A Environmental Modelling Results

## A.1 Year 1 (2029) $LA_{eq}$ 16hr

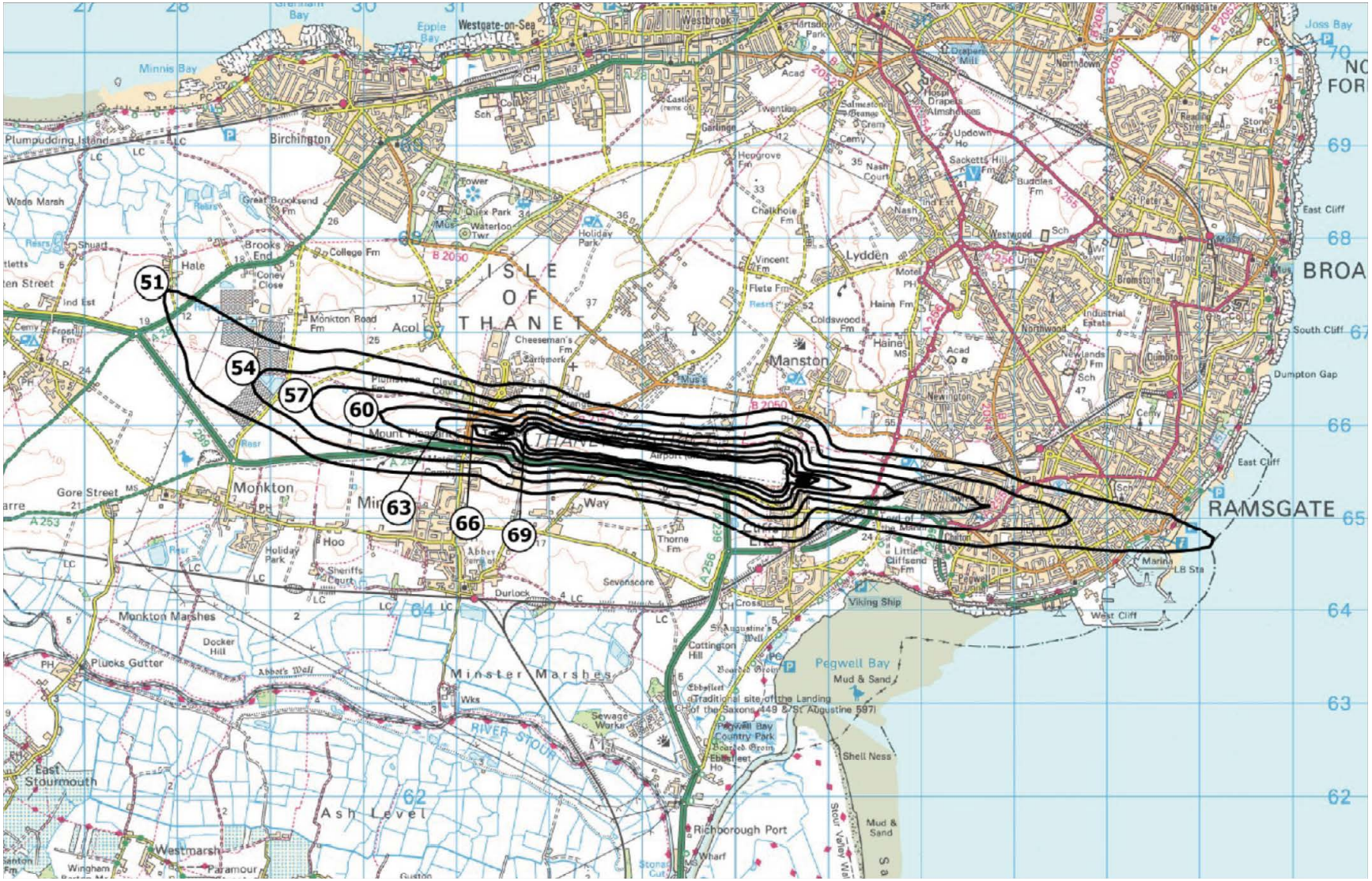


Figure 8-1 - Year 1 (2029) Noise Contour 51dB(A) $LA_{eq}$ 16hr

| $LA_{eq,16h}$ dB | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >51 | 10.4 | 13,000 | 1 | 0 | 2 | 7 |
| >54 | 6.1 | 4,800 | 0 | 0 | 0 | 2 |
| >57 | 3.7 | 1,200 | 0 | 0 | 0 | 0 |
| >60 | 2.1 | 100 | 0 | 0 | 0 | 0 |
| >63 | 1.3 | 0 | 0 | 0 | 0 | 0 |
| >66 | 0.8 | 0 | 0 | 0 | 0 | 0 |
| >69 | 0.5 | 0 | 0 | 0 | 0 | 0 |

## A.2 Year 10 (2038) $LA_{eq}$ 16hr

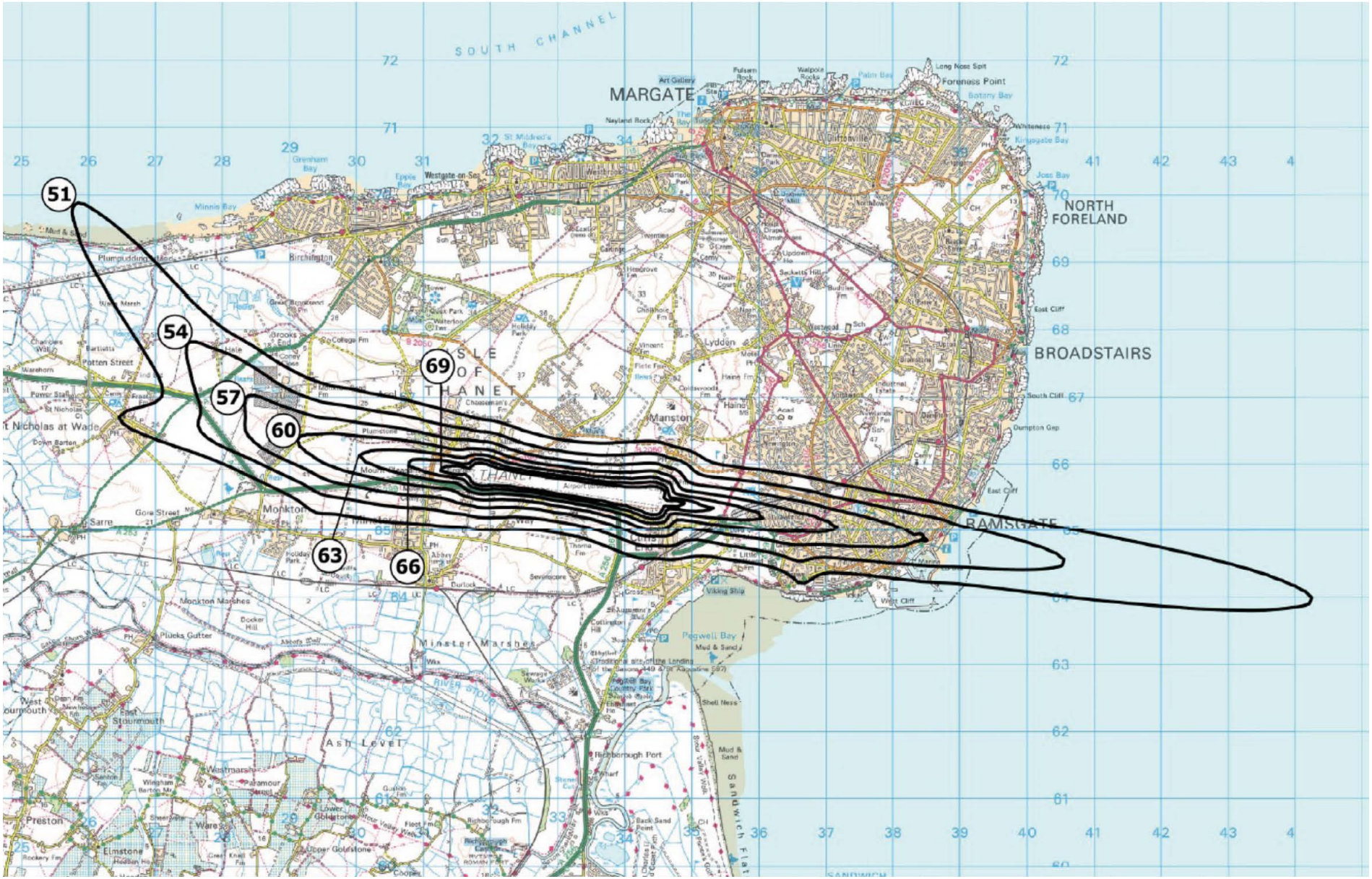


Figure 8-2 - Year 10 (2038) Noise Contour 51dB(A) $LA_{eq}$ 16hr

| $LA_{eq,16h}$ dB | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >51 | 25.8 | 26,200 | 5 | 0 | 8 | 16 |
| >54 | 13.9 | 18,500 | 3 | 0 | 7 | 12 |
| >57 | 7.88 | 9,600 | 2 | 0 | 0 | 6 |
| >60 | 4.42 | 2,200 | 0 | 0 | 0 | 1 |
| >63 | 2.4 | 300 | 0 | 0 | 0 | 0 |
| >66 | 1.38 | 0 | 0 | 0 | 0 | 0 |
| >69 | 0.85 | 0 | 0 | 0 | 0 | 0 |

## A.3 Year 10 (2038) $LA_{eq}$ 8hr

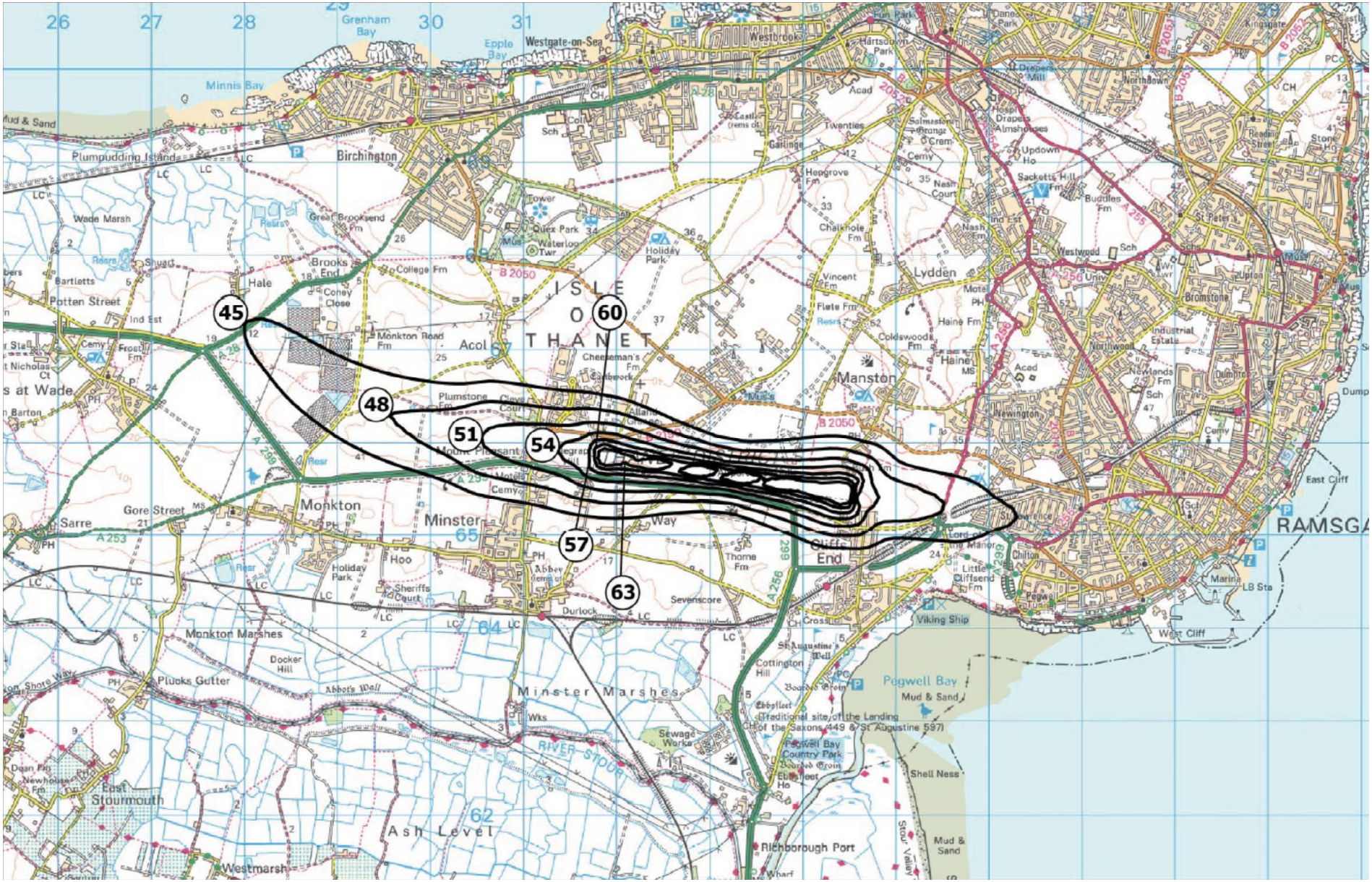


Figure 8-3 - Year 10 (2038) Noise Contour 45dB(A) $LA_{eq}$ 8hr

| $LA_{eq,16h}$ dB | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >45 | 8.0 | 2,000 | 0 | 0 | 0 | 3 |
| >48 | 4.1 | 400 | 0 | 0 | 0 | 1 |
| >51 | 2.3 | 100 | 0 | 0 | 0 | 0 |
| >54 | 1.3 | 0 | 0 | 0 | 0 | 0 |
| >57 | 0.8 | 0 | 0 | 0 | 0 | 0 |
| >60 | 0.5 | 0 | 0 | 0 | 0 | 0 |
| >63 | 0.3 | 0 | 0 | 0 | 0 | 0 |

## A.4 Year 1 (2029) Projected Day Operations, events exceeding 65 dB(A) (N65)

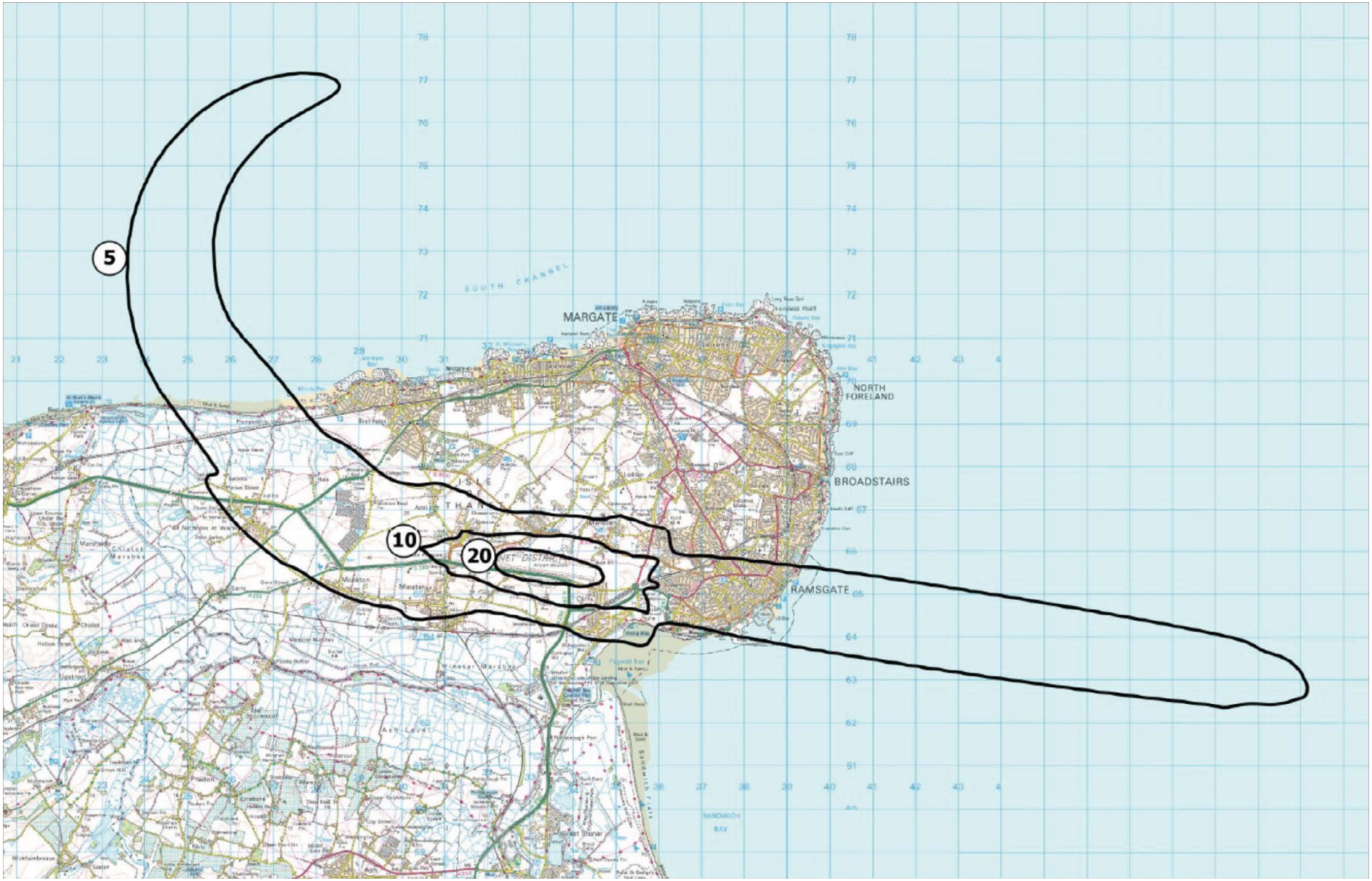


Figure 8-4 - Year 1 (2029) Projected Day Operations, events exceeding 65 dB(A) (N65)

| N65 | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >5 | 76.0 | 35,000 | 13 | 0 | 12 | 22 |
| >10 | 6.5 | 1,600 | 0 | 0 | 0 | 2 |
| >20 | 1.5 | 0 | 0 | 0 | 0 | 0 |

## A.5 Year 10 (2038) Projected Day Operations, events exceeding 65 dB(A) (N65)

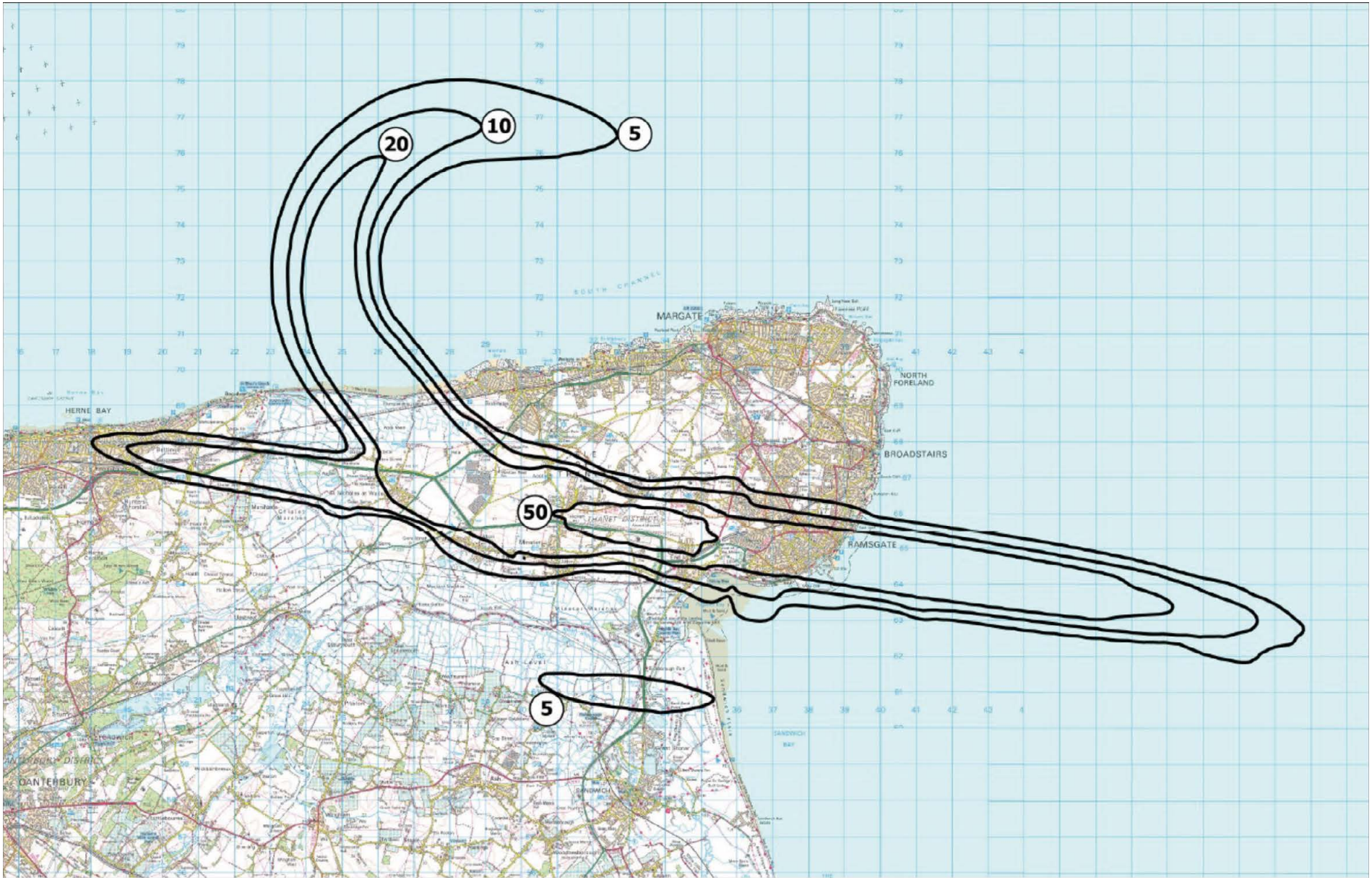


Figure 8-5 - Year 10 (2038) Projected Day Operations, events exceeding 65 dB(A) (N65)

| N65 | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >5 | 126.4 | 56,600 | 14 | 1 | 17 | 32 |
| >10 | 85.4 | 44,000 | 13 | 1 | 13 | 25 |
| >20 | 51.4 | 30,400 | 8 | 0 | 8 | 16 |
| >50 | 4.1 | 800 | 0 | 0 | 0 | 0 |

Overflights:

| Daily Events | Population Count - 2029 | Population Count - 2038 |
|---|---|---|
| 5 | 7,500 | 43,100 |
| 10 | 800 | 40,000 |
| 20 | 0 | 7,500 |
| 50 | 0 | 550 |

## A.6 Overflights – Combination A & Combination B

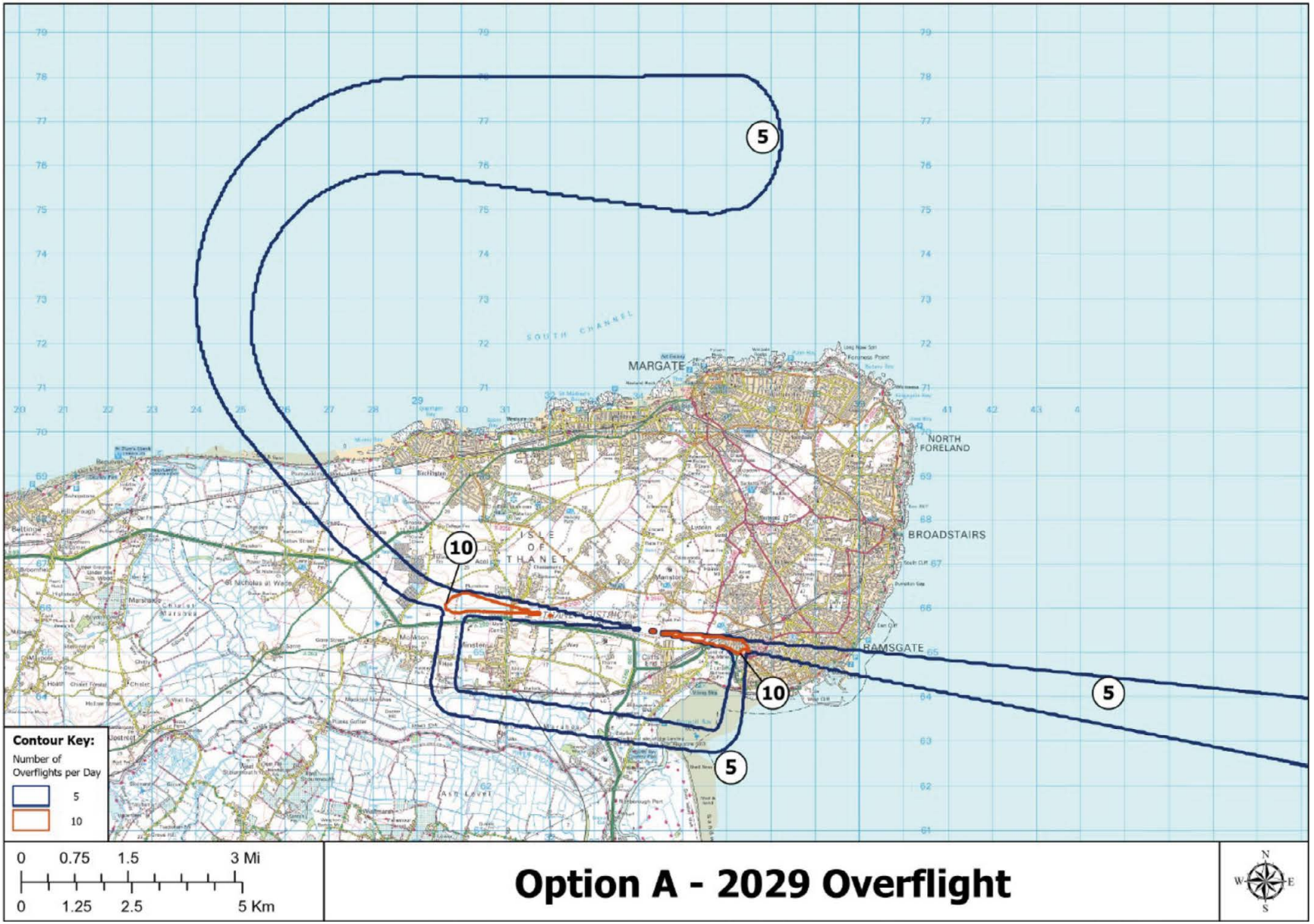


Figure 8-6 - Year 1 (2029) Overflights – Combination A & Combination B

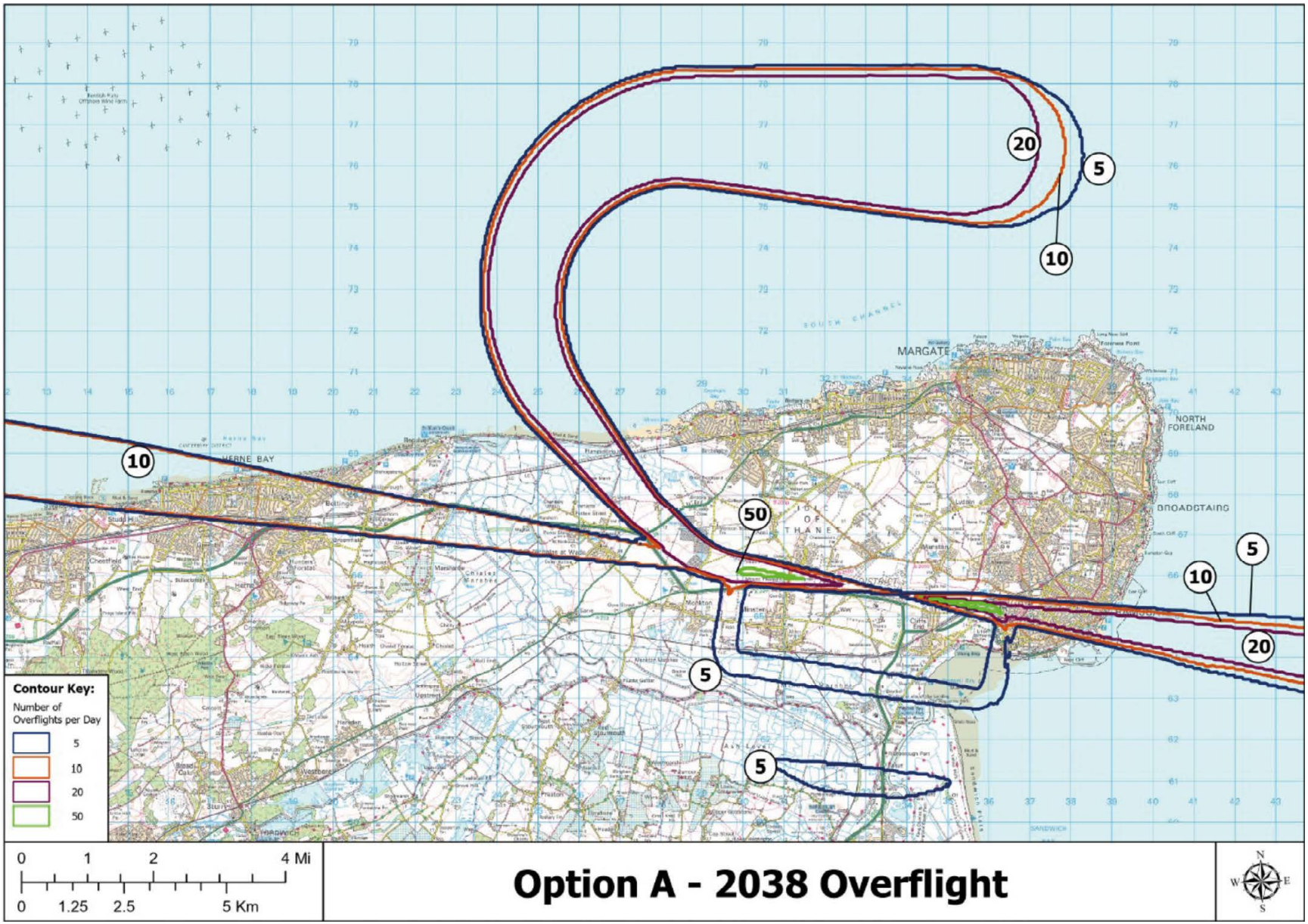


Figure 8-7 - Year 10 (2038) Overflights – Combination A & Combination B

# Appendix B – Option B Environmental Modelling Results

## B.1 Year 1 (2029) Noise $LA_{eq}$ 16hr

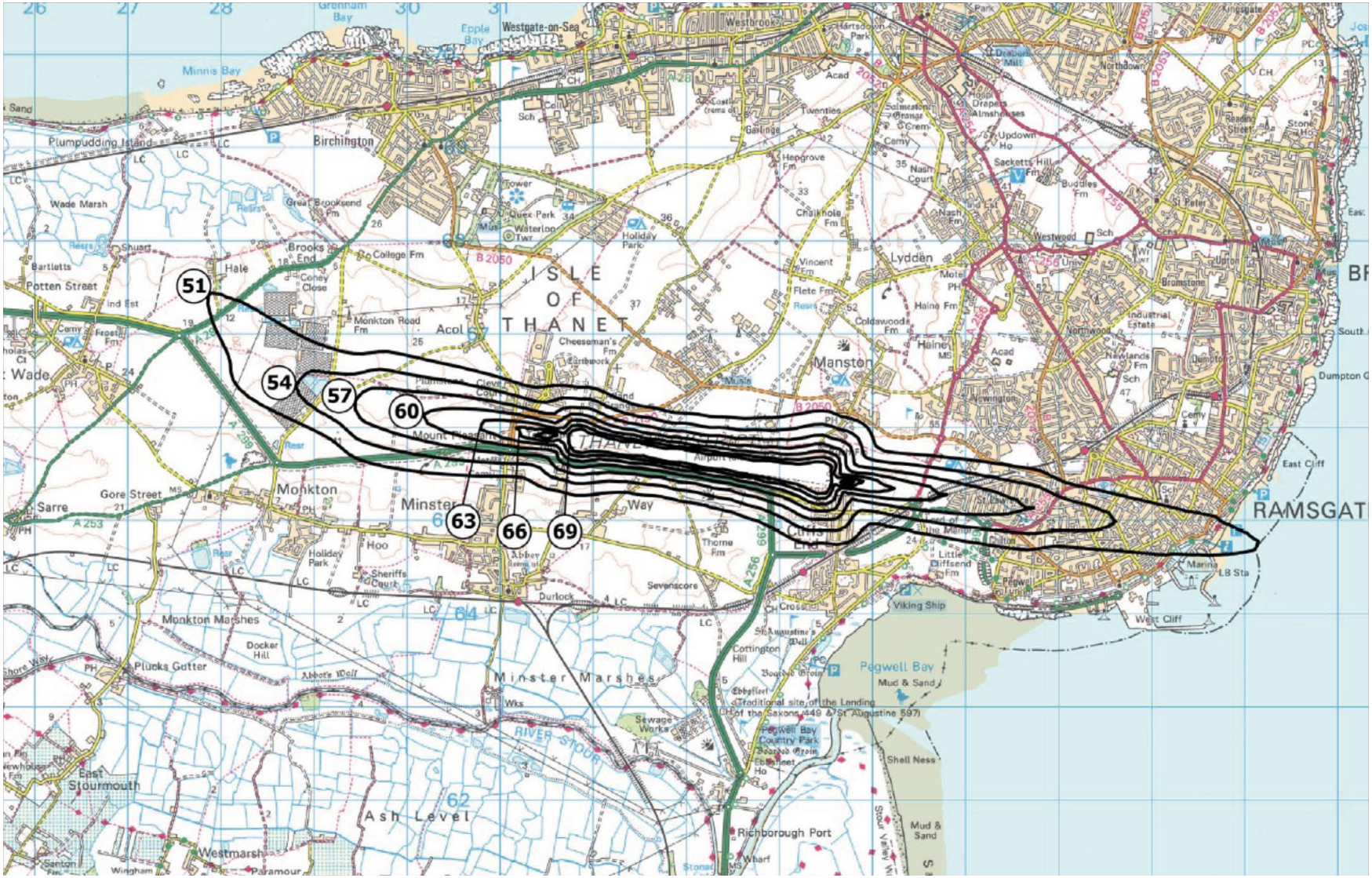


Figure 8-8 - Year 1 (2029) Noise Contour 51dB(A) $LA_{eq}$ 16hr

| $LA_{eq,16h}$ dB | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >51 | 10.4 | 13,000 | 1 | 0 | 2 | 7 |
| >54 | 6.1 | 4,800 | 0 | 0 | 0 | 2 |
| >57 | 3.7 | 1,200 | 0 | 0 | 0 | 0 |
| >60 | 2.1 | 100 | 0 | 0 | 0 | 0 |
| >63 | 1.3 | 0 | 0 | 0 | 0 | 0 |
| >66 | 0.8 | 0 | 0 | 0 | 0 | 0 |
| >69 | 0.5 | 0 | 0 | 0 | 0 | 0 |

## B.2 Year 10 (2038) $LA_{eq}$ 16hr

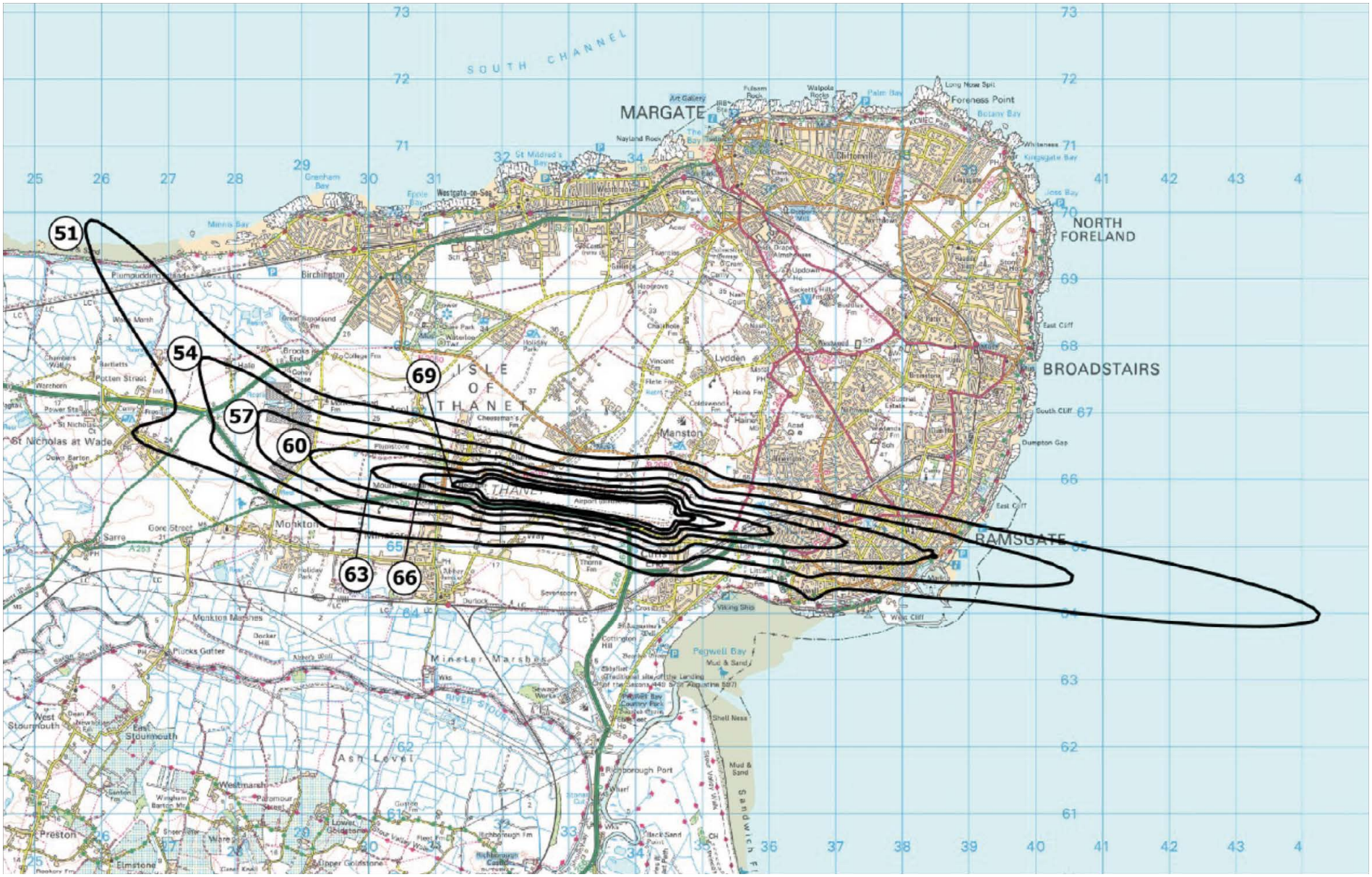


Figure 8-9 - Year 10 (2038) Noise Contour 51 dB(A) $LA_{eq}$ 16hr

| $LA_{eq,16h}$ dB | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >51 | 25.8 | 26,200 | 5 | 0 | 8 | 16 |
| >54 | 13.9 | 18,500 | 3 | 0 | 7 | 12 |
| >57 | 7.88 | 9,600 | 1 | 0 | 0 | 6 |
| >60 | 4.42 | 2,200 | 0 | 0 | 0 | 1 |
| >63 | 2.4 | 300 | 0 | 0 | 0 | 0 |
| >66 | 1.38 | 0 | 0 | 0 | 0 | 0 |
| >69 | 0.85 | 0 | 0 | 0 | 0 | 0 |

## B.3 Year 10 (2038) $LA_{eq}$ 8hr

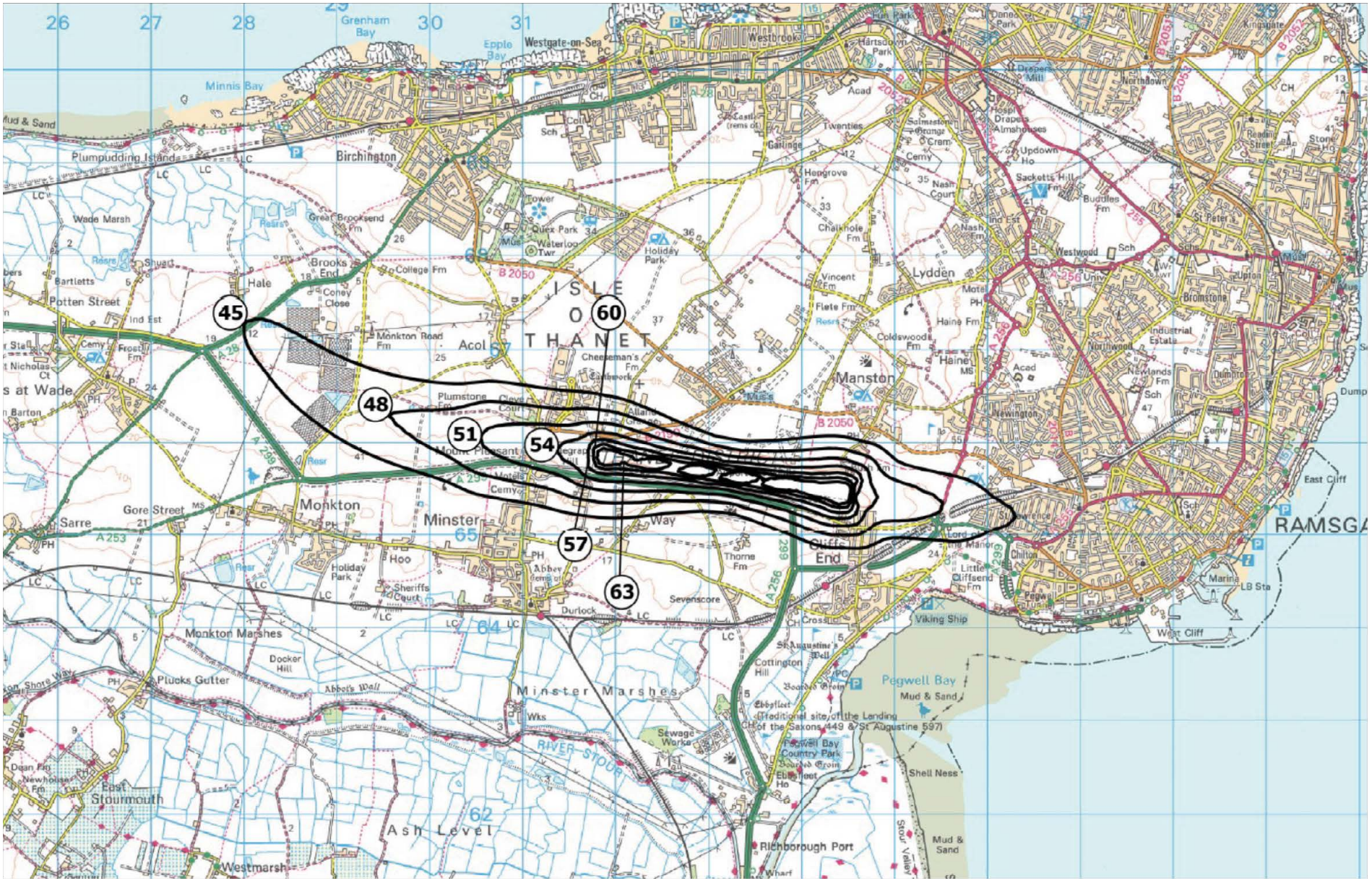


Figure 8-10 - Year 10 (2038) Noise Contour 45dB(A) $LA_{eq}$ 8hr

| $LA_{eq,16h}$ dB | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >45 | 8.0 | 2,000 | 0 | 0 | 0 | 3 |
| >48 | 4.1 | 400 | 0 | 0 | 0 | 1 |
| >51 | 2.3 | 100 | 0 | 0 | 0 | 0 |
| >54 | 1.3 | 0 | 0 | 0 | 0 | 0 |
| >57 | 0.8 | 0 | 0 | 0 | 0 | 0 |
| >60 | 0.5 | 0 | 0 | 0 | 0 | 0 |
| >63 | 0.3 | 0 | 0 | 0 | 0 | 0 |

## B.4 Year 1 (2029) Projected Day Operations, events exceeding 65 dB(A) (N65)

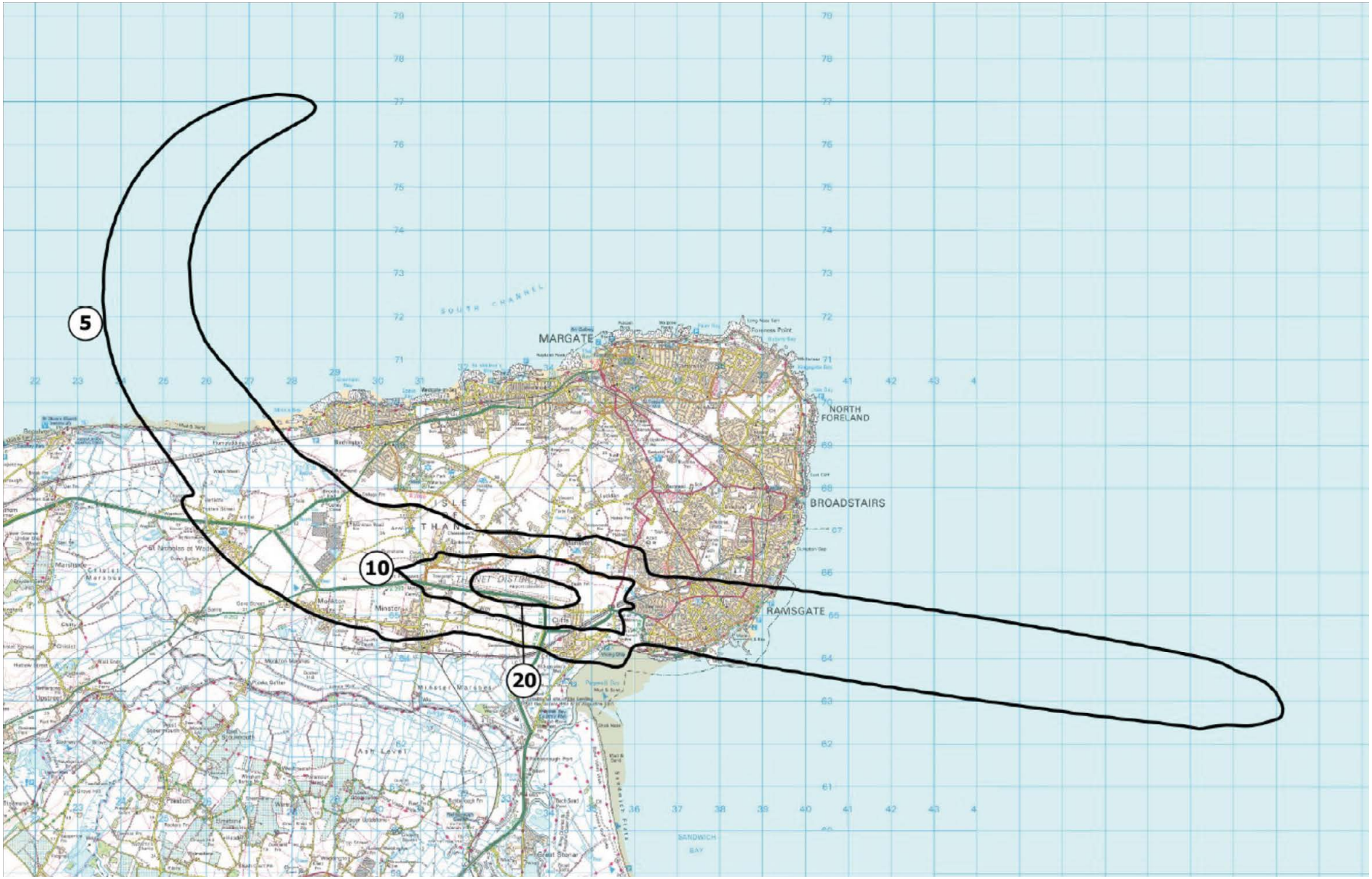


Figure 8-11 - Year 1 (2029) Projected Day Operations, events exceeding 65 dB(A) (N65)

| N65 | Area ($km^2$) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >5 | 76.0 | 35,000 | 13 | 0 | 12 | 22 |
| >10 | 6.5 | 1,600 | 0 | 0 | 0 | 2 |
| >20 | 1.5 | 0 | 0 | 0 | 0 | 0 |

## B.5 Year 10 (2038) Projected Day Operations, events exceeding 65 dB(A) (N65)

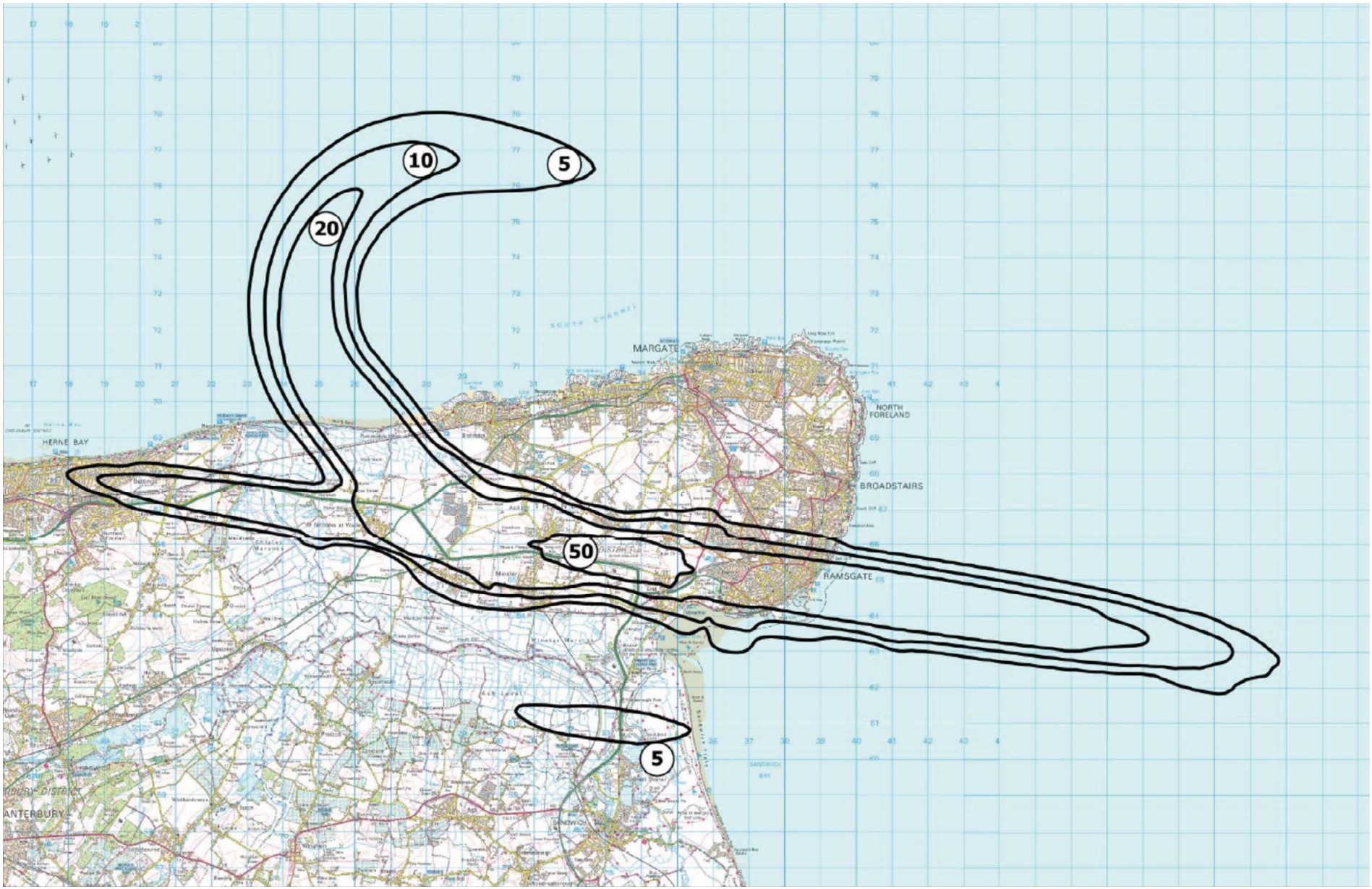


Figure 8-12 - Year 10 (2038) Projected Day Operations, events exceeding 65 dB(A) (N65)

| N65 | Area (km²) | Population | Community Buildings | Hospitals | Schools | Places of Worship |
|---|---|---|---|---|---|---|
| >5 | 126.4 | 57,000 | 14 | 1 | 17 | 32 |
| >10 | 85.4 | 44,300 | 13 | 1 | 13 | 25 |
| >20 | 51.4 | 30,400 | 7 | 0 | 8 | 16 |
| >50 | 4.1 | 800 | 0 | 0 | 0 | 0 |

Overflights:

| Daily Events | Population Count - 2029 | Population Count - 2038 |
|---|---|---|
| 5 | 7,500 | 43,100 |
| 10 | 800 | 40,000 |
| 20 | 0 | 7,500 |
| 50 | 0 | 550 |

## B.6 Overflights – Combination A & Combination B

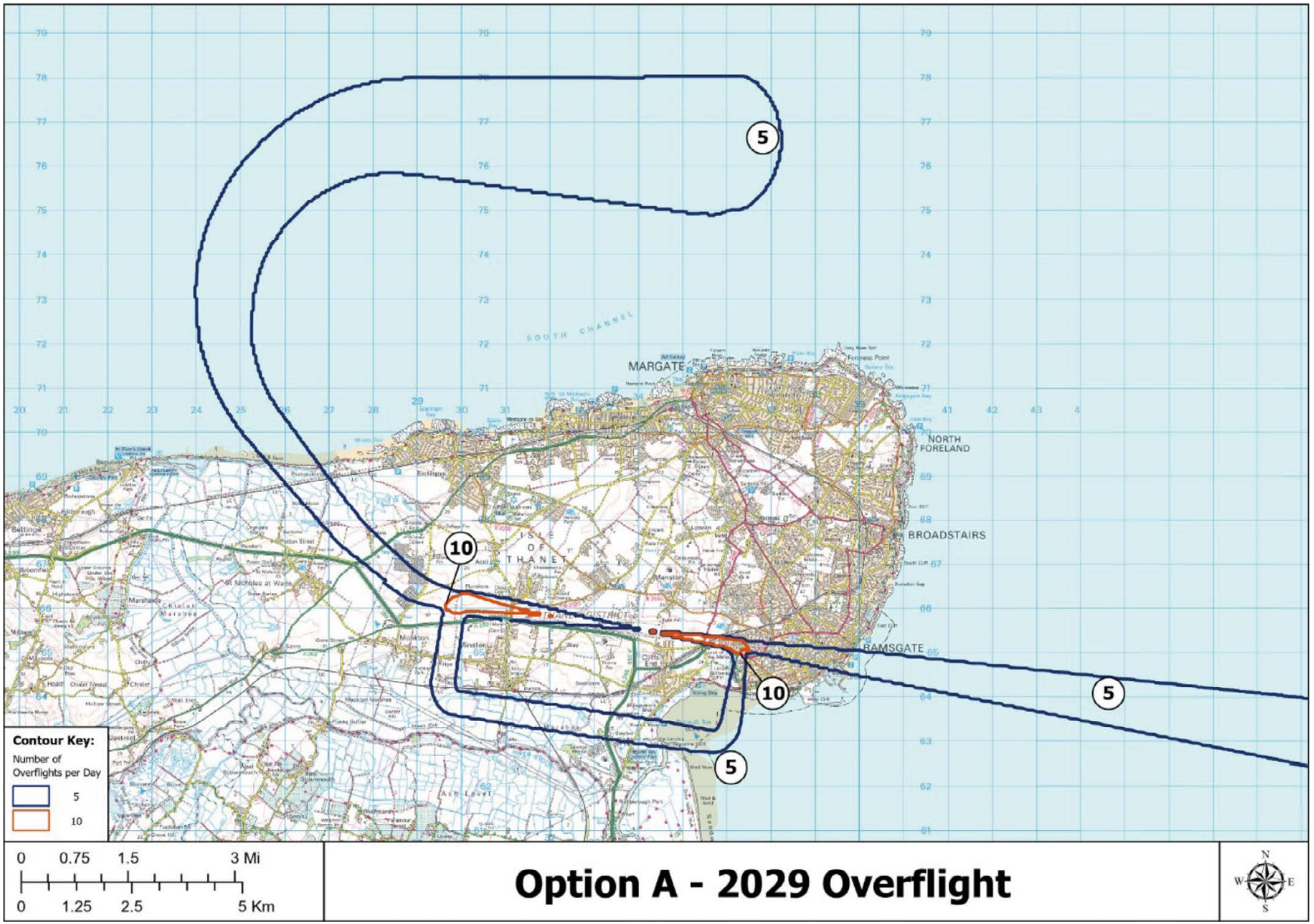


Figure 8-13 - Year 1 (2029) Overflights – Combination A & Combination B

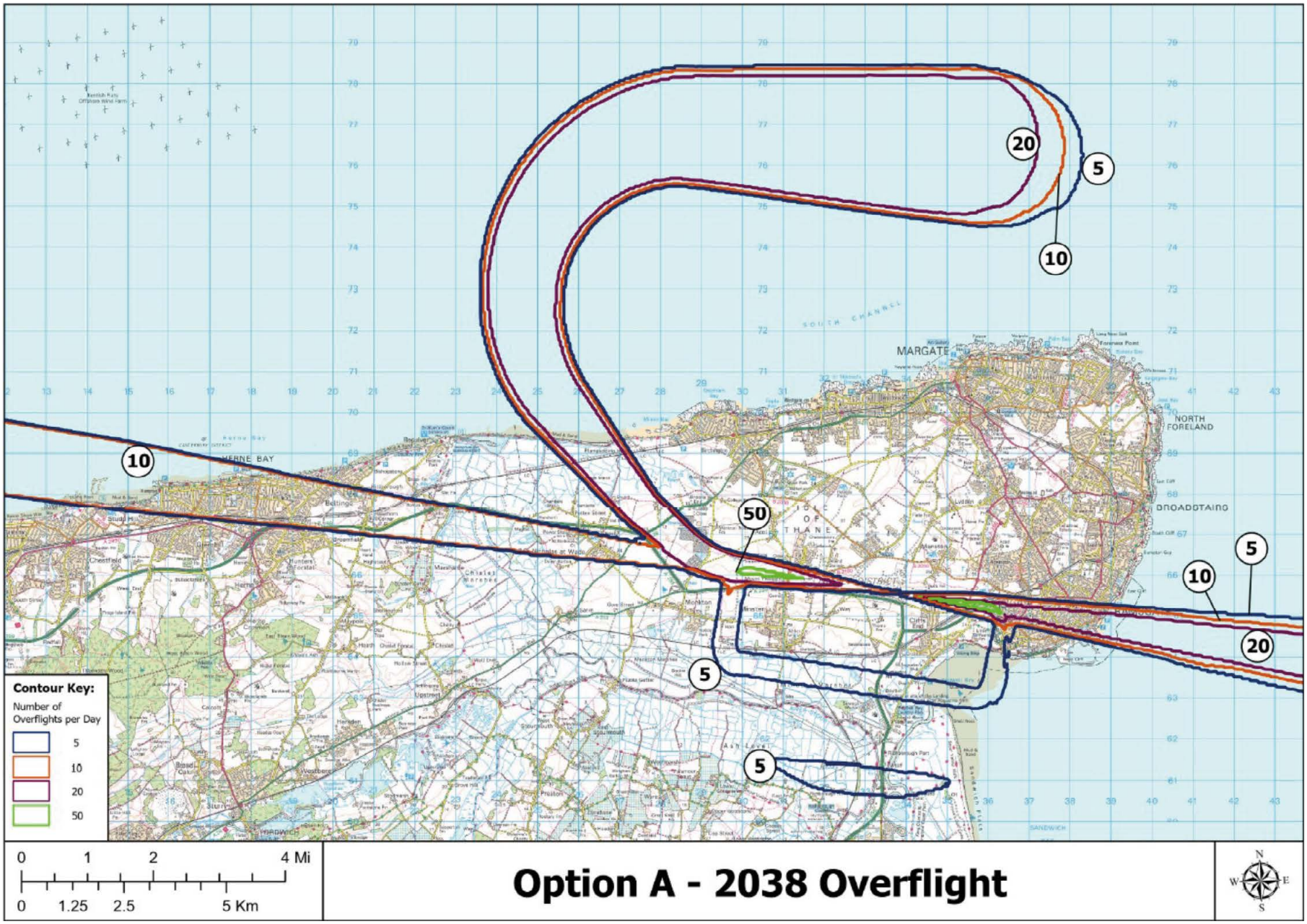


Figure 8-14 - Year 10 (2038) Overflights – Combination A & Combination B

# Appendix C – Local Air Quality

## C.1 Overview

The new updated CAP 1616 v5, and specifically CAP 1616i Chapter 7, requires a change sponsor to ensure that an airspace change proposal minimises local air quality emissions and ensures that the UK complies with its international obligations on air quality by, for example:

- minimising the impact on the overall air quality pollution levels in the local area.
- complying with national air quality objectives and air quality standards, including limit and target values in the UK Air Quality Strategy.

## C.2 Air Quality Management Areas

CAP 1616 requires change sponsors to consider the impact of proposed changes on Air Quality Management Areas (AQMAs). AQMAs are areas within which local authorities are required to measure, review, and assess the impact of air quality on people's health and the environment; most are associated with road traffic emissions.

It is stated that change sponsors must provide and monetise AQ impacts where:

- *"there is likely to be a change in aviation emissions (by volume or location) below 1,000 feet AAL, and*
- *"the location of the emissions is within or adjacent to a designated Air Quality Management Area (AQMA)."*

It is then advised that is both conditions are met, appropriate AQ assessment including modelling must be undertaken using a validated model.

However, with reference to Manston Airport, there are no applicable AQMAs in the area, therefore, no **further assessment** has been undertaken.

# Appendix D – Tranquillity

## D.1 Overview

CAP 1616i – Environmental Assessment Requirements and Guidance for Airspace Change Proposals, Chapter 8 states that the consideration of impacts upon tranquillity for airspace change proposals is with specific reference to National Parks, Areas of Outstanding Natural Beauty (AONB), plus any local 'tranquil' areas that are identified through community engagement.

These are designated areas with specific statutory purposes to ensure their continued protection in relation to landscape and scenic beauty. Change sponsors must have regard to these statutory purposes when developing airspace change proposals and are encouraged, where it is practical, to avoid overflight of tranquillity receptors below 7,000 feet. This does not preclude either a designated Quiet Area (or any other local area that has similar characteristics) from being identified via community engagement during the early development of design options. It is important that local circumstances, including community feedback on specific areas that should be avoided, are taken into account where possible.

Change sponsors must show how they have considered and taken account of these impacts by using operational diagrams or overflight contours to identify any tranquillity receptors overflown below 7,000 feet. An assessment is also required for the opening year and across the forecast period (normally 10 years).

## D.2 Areas of Tranquillity

### D.2.1 National Parks

There are no national parks in the vicinity of Manston airport.

### D.2.2 Areas of Outstanding Natural Beauty

Manston airport is located in close proximity to the Kent Downs AONB, as shown in Figure 8 15 below. There is no difference between the two options in terms of flight pathing so the assessment when compared to baseline is the same. Although Manston airport itself is outside the boundary of any AONB, aircraft forecast to arrive to the airport in both options will fly over the AONB at altitudes just below 7000 ft in sections which is show below in Figure 8 15.

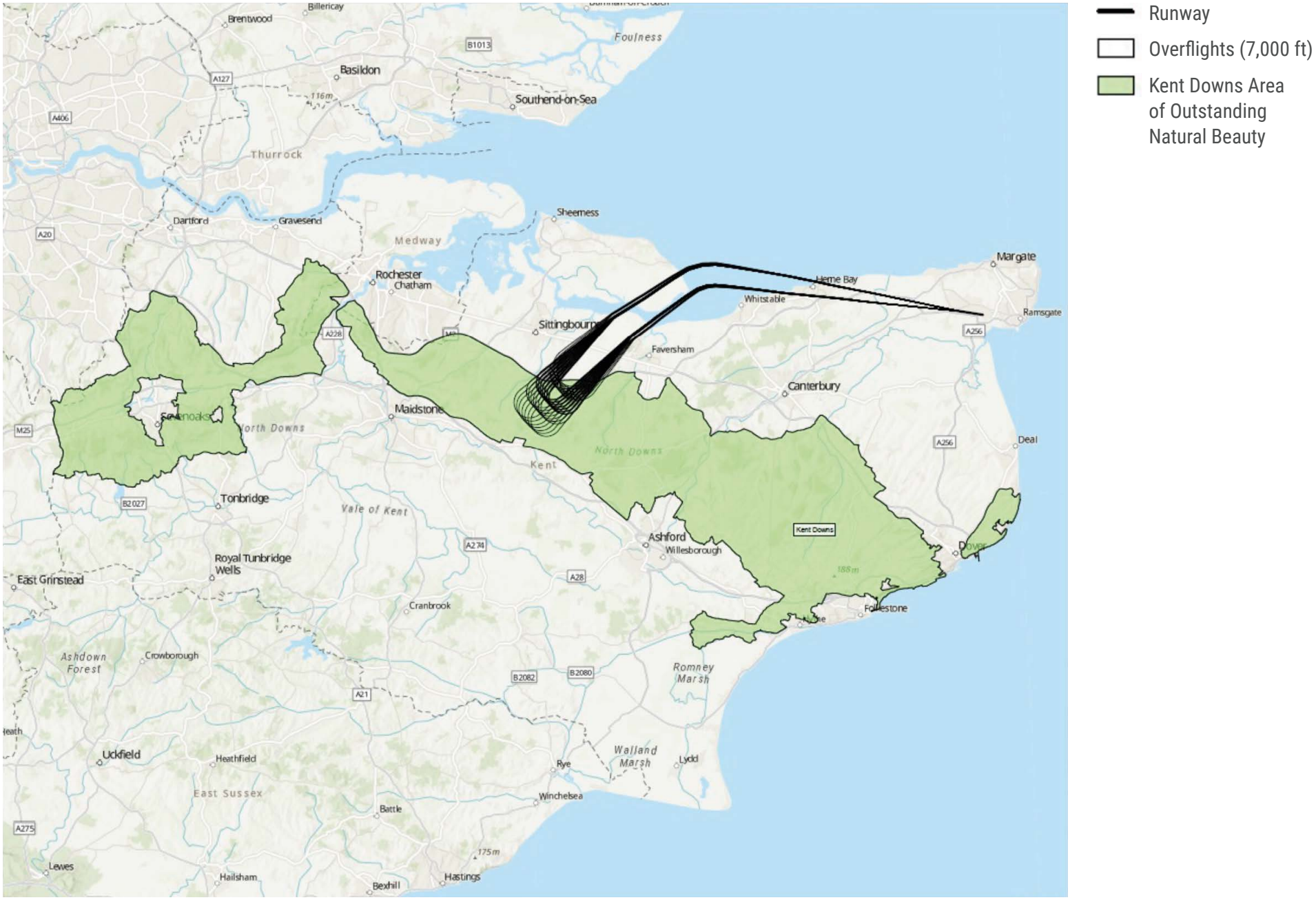


Figure 8-15 - 2038 Overflights (<7,000 ft) Intersecting Kent Downs Area of Outstanding Natural Beauty

## D.2.3 Impact on National Landscapes

As described above, there is no difference between the two options in terms of flight pathing. Figure 8 15 above shows the nominal track for both options (as they are the same) overlaid on the extent of the Kent Downs. The nominal track for overflies a central section of the Kent Downs National Landscape. Aircraft will be just below 7000 ft whilst overflying the western of the Kent Downs National Landscape. It has been calculated that there are 2.17 operations (<7,000 ft) from the 2038 forecast that overfly the Kent Downs AONB on an average summer day. 2038 has been chosen as a comparison as the year 10 years after opening has far more operations than the year of opening.

Based on the number of overflights and distance of the proposal site from the Kent Downs Area of Outstanding Natural Beauty (AONB) any impacts on tranquillity from increased overflying would be not sufficiently significant to meet its any form of significance following specific landscape criteria.

# Appendix E – Biodiversity

## E.1 Overview

Within CAP 1616 (Fifth Edition), and specifically CAP 1616i Environmental Assessment Requirements and Guidance for Airspace Change Proposals, Chapter 9, the guidance outlines that the change sponsor is required to a biodiversity assessment and complete a habitats regulations assessment (HRA) early screening following stated criteria. The screening focusses on how the proposed changes will alter the proximity and volume of air traffic on important biodiversity sites of European significance. Depending upon the outcome of this screening, it may be then necessary for a full habitats regulation assessment to be undertaken.

Cap 1616i, Pg 33 describes that all changes below 7,000 feet should take into account local circumstances in the development of airspace, and use operational diagrams or overflight contours to identify any biodiversity receptors overflown below 7,000 feet and within 18 kilometres of each a runway end.

Table 8-1 below outlines the local designated site within 18 km of the runway.

| Term | Site Name |
|---|---|
| **Local Nature Reserve** | Bishopstone Cliffs |
| **Local Nature Reserve** | Curtis Wood |
| **Local Nature Reserve** | Prince's Beachlands |
| **National Nature Reserve** | Sandwich & Pegwell Bay |
| **National Nature Reserve** | Blean Woods |
| **National Nature Reserve** | Stodmarsh |
| **Ramsar** | Thanet Coast & Sandwich Bay |
| **Ramsar** | Stodmarsh |
| **Site of Special Scientific Interest** | West Blean and Thornden Woods |
| **Site of Special Scientific Interest** | East Blean Woods |
| **Site of Special Scientific Interest** | Chequer's Wood and Old Park |
| **Site of Special Scientific Interest** | Ileden and Oxenden Woods |
| **Site of Special Scientific Interest** | Preston Marshes |
| **Site of Special Scientific Interest** | Sandwich Bay to Hacklinge Marshes |
| **Site of Special Scientific Interest** | Sturry Pit |
| **Site of Special Scientific Interest** | Thanet Coast |
| **Site of Special Scientific Interest** | Stodmarsh |
| **Special Area of Conservation** | Thanet Coast |
| **Special Area of Conservation** | Tankerton Slopes and Swalecliffe |

**Continued overleaf**

| Term | Site Name |
|---|---|
| **Special Area of Conservation** | Sandwich Bay |
| **Special Area of Conservation** | Stodmarsh |
| **Special Area of Conservation** | Blean Complex |
| **Special Area of Conservation** | Margate and Long Sands |
| **Special Protection Area** | Outer Thames Estuary |
| **Special Protection Area** | Thanet Coast & Sandwich Bay |
| **Special Protection Area** | Stodmarsh |
| **Marine Conservation Zone** | Thanet Coast |
| **Marine Conservation Zone** | Dover to Deal |
| **Marine Conservation Zone** | Goodwin Sands |

Table 8-1 - Designated Sites within 18 km of Each Runway End

Figure 8 16 below shows that in total there are 90.93 flights (<7,000 ft) from 2038 that overfly the local designations across an average summer day. Each unique black line on Figure 8 16 shows either an arrival to or departure from the airport from each individual aircraft modelled as part of this full options appraisal. These flight paths vary depending on the aircraft, and have been shown individually as opposed to being aggregated to ensure the widest possible area has been considered as each aircraft's swath pathing is unique to ensure a robust and worst case approach has been undertaken. This 90.93 flights compared to a zero base case does highlight a fairly significant change when comparing to baseline in the case of this ASC which is a zero-base case. However, although not within the scope of the ASC process specifically, a significant amount of engagement was undertaken with the Kent Wildlife Trust[12] and Natural England[13] regarding the assessment and management of local biodiversity and habitat as part of the DCO process. In both cases it was agreed that European species were been adequately dealt with in the assessment and in the case of this ASC, the potential effects to those sites would not be materially different to those in the DCO and would follow the same procedures to ensure the sites were managed. Nevertheless, as per the CAP1616 process, the Habitats Regulations Assessment – Early Screening has been undertaken in the following section.

[12] https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR020002-004043-SoCG%20with%20Kent%20Wildlife%20Trust.pdf

[13] https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR020002-003779-Signed%20SoCG%20with%20Natural%20England.pdf

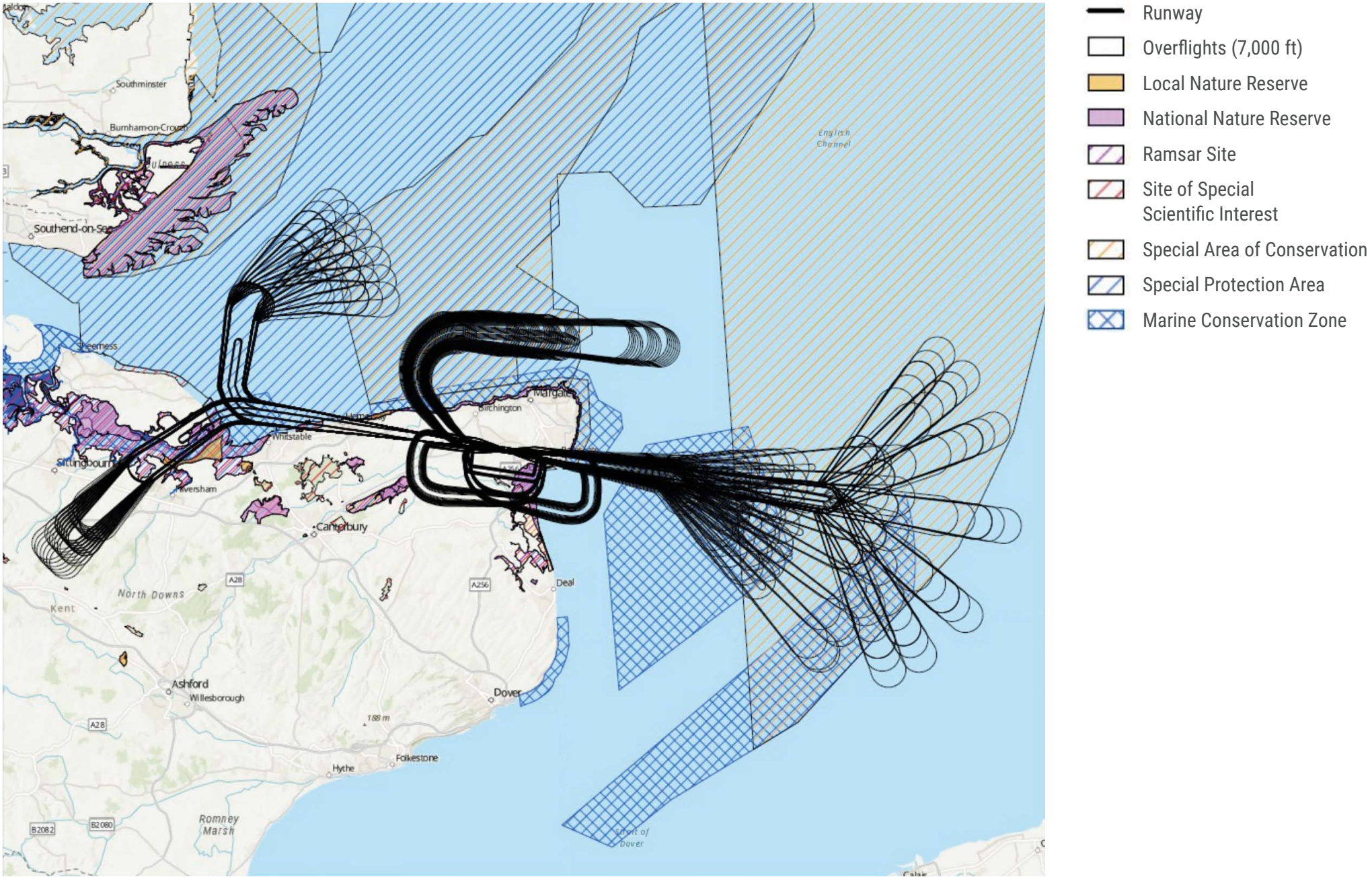


Figure 8-16 - 2038 Overflights (<7,000 ft) Intersecting Designated Sites

## E.2 Habitats Regulation Assessment Screening

CAP1616i details the questions that must be answered as part of the Early Screening Criteria. In particular, the screening requires sponsors to consider the impacts on the following types of areas:

**Sites of Special Scientific Interest (SSSI):** These are the most important sites for wildlife conservation in England, Wales, and Northern Ireland. They are designated for their flora, fauna, geological or geomorphological features.

**Special Areas of Conservation (SACs):** These sites are designated under the EU Habitats Directive to protect habitats and species of European importance.

**Special Protection Areas (SPAs):** These sites are designated under the EU Birds Directive to protect important bird species.

**Ramsar Sites:** Wetlands of international importance, designated under the Ramsar Convention.

**National Nature Reserves (NNRs):** These are nationally important sites managed by Natural England (in England) or equivalent bodies in other UK nations.

**Local Wildlife Sites (LWSs):** These are locally important sites identified and protected by local authorities.

**Marine Conservation Zones (MCZs):** These are areas of the sea protected for their marine life and habitats.

Within CAP 1616i (Chapter 9) the questions that sponsors must consider are:

***"Q1. Are there any changes to air traffic patterns or number of movements expected below 3,000 feet due to the airspace change proposal?***

***If the answer to Q1 is 'no' then habitats regulations assessment is no longer required. If the answer to Q1 is 'yes' then proceed to Q2 below.***

***Q2A. Are there any European sites within a radius of 18 km of each runway end? Q2B. Are any European sites identified in Q2A overflown (i.e. plane passing directly overhead or within 2,655 feet of the boundary of a European site at 3,000 feet or below) by proposed flight routes?***

***If the answer to Q2A and Q2B are both 'no' then habitats regulations assessment is no longer required. If the answer to Q2A or Q2B is 'yes' then proceed to Q3 below.***

***Q3A Will the airspace change proposal reduce the number of movements overflying one or more European sites, while not increasing them over another?***

***Q3B Will the airspace change proposal increase the altitude of aircraft overflying one or more European sites, whilst not decreasing altitude over another?***

***If the answer to Q3A and Q3B are both 'yes' then habitats regulations assessment is no longer required. If the answer to Q3A or Q3B is 'no' then secondary screening will be required. As described above, there are changes in air traffic below 3000 ft when compared to the zero-base case.***

As described in Section E.1, both Option A and B propose changes the current airspace when compared to the baseline which in the case of this ACP is zero operation.

Q2A and 2B ask the sponsor to consider if any European sites both within 18 km of each runway end are overflown (shown in Table 8-1), and of those sites identified do any passing directly overhead or within 2,655 feet of the boundary of the European site. In this case Table 8-2 outlines 15 designated sites overflown which satisfy the criteria of both Q2A and 2B.

| Type | Site Name |
|---|---|
| **Local Nature Reserve** | Prince's Beachlands |
| **National Nature Reserve** | Sandwich & Pegwell Bay |
| **National Nature Reserve** | Stodmarsh |
| **Ramsar** | Thanet Coast & Sandwich Bay |
| **Site of Special Scientific Interest** | Sandwich Bay to Hacklinge Marshes |
| **Site of Special Scientific Interest** | Thanet Coast |
| **Site of Special Scientific Interest** | Stodmarsh |
| **Special Area of Conservation** | Thanet Coast |
| **Special Area of Conservation** | Sandwich Bay |
| **Special Area of Conservation** | Stodmarsh |
| **Special Area of Conservation** | Margate and Long Sands |
| **Special Protection Area** | Outer Thames Estuary |
| **Special Protection Area** | Thanet Coast & Sandwich Bay |
| **Marine Conservation Zone** | Thanet Coast |
| **Marine Conservation Zone** | Goodwin Sands |

Table 8-2 - Protected Sites Within 18 km Overflown (Option A and B)

Q 3A and 3B are both answered as yes in the case of this ACP, given the base case is zero operations.

It has been calculated using overflight data, that there are 89.73 operations (<3,000 ft) from 2038 (worst-case year) that pass over designated sites for both options. As described in Section E.1, each unique red line on Figure 8 17 shows either an arrival to or departure from the airport by each individual aircraft modelled as part of the FOA, and displays the interactions between flight paths with designated sites within 18 km of the runway ends.

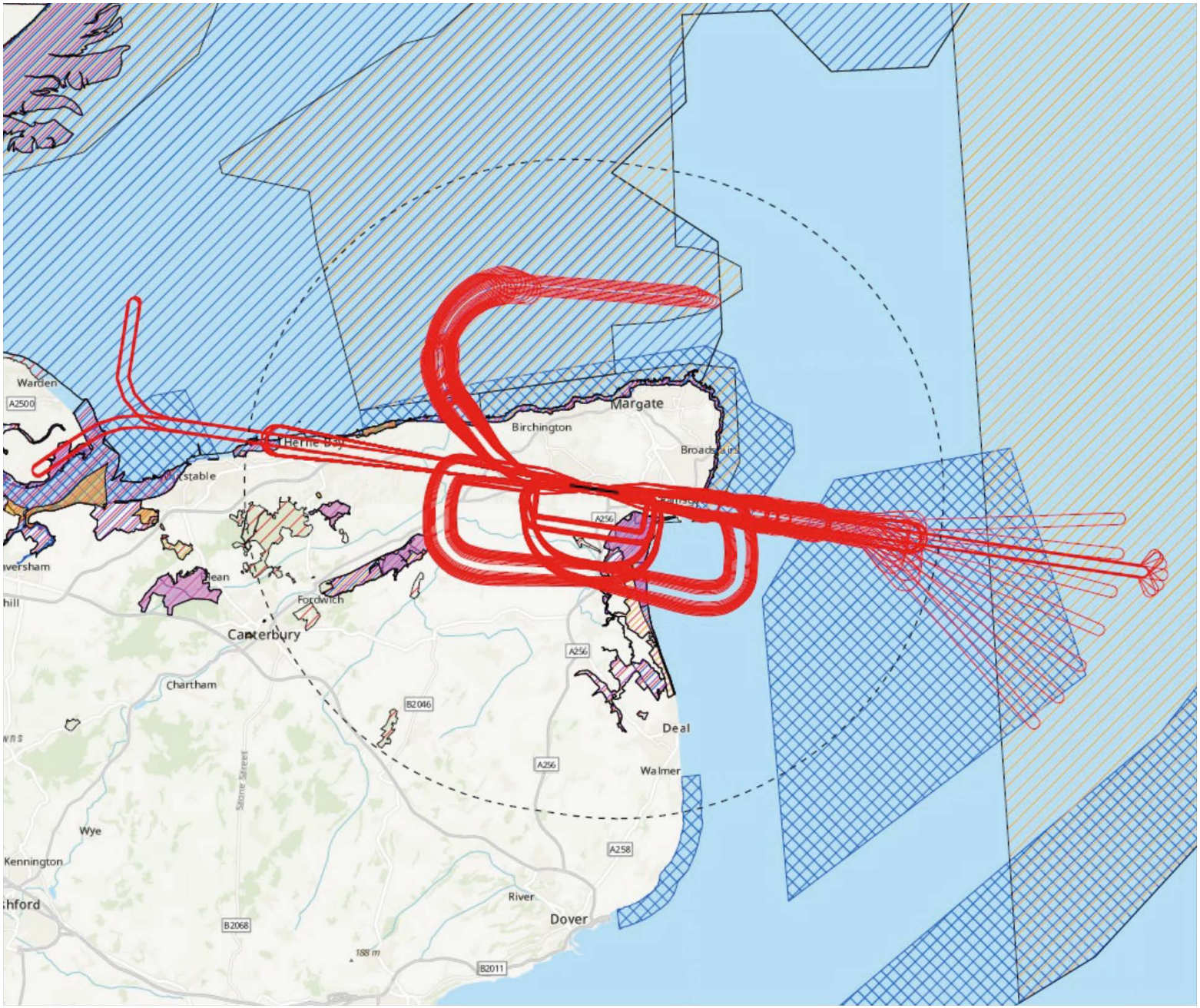


Figure 8-17 - 2038 Overflights (<3,000 ft) Intersecting Designated Sites Within 18 km of Runway Ends

Despite there being approximately 90 flights in total interacting with designated sites on an average summer day showing a fairly significant change against the zero-base case, the HRA[14] submitted as part of the DCO for Manston Airport comprehensively and robustly assessed all relevant European sites, and was accepted by the Secretary of State, Natural England, and Kent Wildlife Trust.

The ASC application does not introduce any new or greater impacts than those already assessed and mitigated. The apparent increase in overflights when compared to a 'zero flights' baseline is a procedural artefact, as the airport is not yet operational, but all environmental effects have already been considered and addressed. Therefore, there are no outstanding HRA issues for the CAA to be concerned about in the context of the ASC.

## E.3 Habitats Regulation Assessment Conclusion

The change sponsor believes that they can answer 'no' to the question posed in the 'Habitats Regulation Assessment – Early Screening Criteria' needing further detailed assessment, by the implementation of both Option A or Option B at Manston Airport within the context of the consultation and engagement previously undertaken as part of the DCO (as described in Section E.1) including a full HRA Appropriate Assessment and several Statements of Common Ground with Natural England[15] and Kent Wildlife Trust[16], whereby all matters were agreed in principle between the parties regarding the assessment and management of surveys and European sites.

[14] https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR020002-006363-220818%20-%20Manston%20Airport%20HRA.pdf

[15] https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR020002-003779-Signed%20SoCG%20with%20Natural%20England.pdf

[16] https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR020002-004043-SoCG%20with%20Kent%20Wildlife%20Trust.pdf

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