



Dublin Airport North Runway Relevant Action Application

Environmental Impact Assessment Report
Volume 1 – Non-Technical Summary

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Introduction

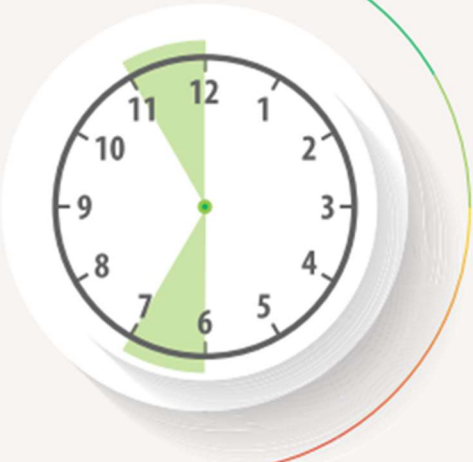
This Non-Technical Summary provides a summary, in non-technical language, of the revised Environmental Impact Assessment Report (EIAR) for the North Runway proposed Relevant Action.

The location of the North Runway and Dublin Airport is shown on Figure 1. Figure 2 shows the environmental context of the North Runway and the airport complex.

Project Overview

The proposed Relevant Action relates to the night-time use of the runway system at Dublin Airport. It involves the amendment of the operating restriction set out in condition number 3(d) and the replacement of the operating restriction in condition number 5 of the North Runway Planning Permission. It also proposes new noise mitigation measures. Conditions number 3(d) and 5 have not yet come into effect, as the North Runway is not yet operational.

The proposed Relevant Action, if permitted, would change the average number of flights that would be allowed to take off or land at Dublin Airport between 11pm and 7am by replacing the numerical cap on flights with an annual 'night-time noise quota' between 11.30pm and 6am. It would also change the normal operating hours of the North Runway by allowing flights to take off from and/or land on the North Runway for an additional two hours daily, from 11pm to midnight and from 6am to 7am.



We propose to:

- only use North Runway from 6am to midnight*, rather than 7am to 11pm as set out in the current planning conditions;
- introduce an enhanced noise monitoring framework;
- introduce a Noise Quota Count system from 11.30pm to 6am, rather than an airport-wide 65 cap from 11pm to 7am as set out in the current planning conditions;
- introduce a noise insulation grant scheme for those most impacted by proposed amendments

* Except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems, declared emergencies at other airports, or where the extra runway length is required for a specific aircraft.

The proposed Relevant Action would allow an increase in the number of flights taking off and/or landing at Dublin Airport between 11pm and 7am when compared to that permitted by the current Condition 5 as long as the noise quota limits were complied with. Condition 5 of the North Runway Planning Permission allows an average of 65 night-time aircraft movements per night at the entire airport between 11pm and 7am measured over a period of 92 days (15th June to 15th September). The proposed annual night-time noise quota is 7,990 quota count points between 11.30pm and 6am. The insert box provides an explanation of the Noise Quota Count System.

The proposed Relevant Action also proposes new measures to monitor and reduce the impact of aircraft noise. These are:

- A noise insulation grant scheme for eligible dwellings
- A detailed 'Noise Monitoring Framework' under which noise levels would be monitored and results would be reported annually to the Aircraft Noise Competent Authority

The proposed Relevant Action, if permitted, would not change any of the other conditions of the North Runway Planning Permission, nor would it affect the maximum number of passengers currently permitted to pass through the terminals at Dublin Airport. This passenger throughput is currently limited to 32 million passengers per annum (mppa) and will remain so unless a new application is made to raise the limit. Under the proposed Relevant Action, it is expected that the 32 mppa level would be reached in 2025. A separate planning application will be required to increase the number of passengers above 32 mppa.

Proposed Noise Quota Count System

The proposed Noise Quota Count System would set a noise target per air traffic movement (take-off or landing) based upon the noise generated by the aircraft type. This is referred to as the Quota Count Unit and the target is set at 0.49.

A total night-time quota of 7,990 Quota Count Units is proposed between 23:30 and 06:00 per year and if aircraft are noisier than expected – i.e. the Quota Count Unit average exceeds 0.49 - then fewer night-time flights will be allowed over the course of a year.

Overall, the proposed Relevant Action would allow for an increase in the number of flights taking off and/or landing at Dublin Airport between 23:00 and 07:00 in accordance with the annual night-time noise quota and this also results in a faster return to 32mppa, which is reached in 2025. Between 2022 and 2026 there would be more passengers using the airport with the proposed Relevant Action in place than without. However, by 2027 the 32mppa Cap will also have been reached if it is not consented, meaning that the return to the pre-Covid-19 passenger throughput will take approximately two years longer without the proposed Relevant Action. Around 7.1 million additional passengers will have used the airport in the period 2022-2026 if the proposed Relevant Action is consented.

Why the Relevant Action is Needed

Dublin Airport handles 85% of commercial flights in the Republic of Ireland and is Ireland's main gateway. Its infrastructure and policy objectives are to develop as a growth hub, facilitating connectivity, enabling route development, driving tourism and passenger numbers and supporting economic recovery and growth. Pre-Covid-19, Dublin Airport was facilitating 32 million passengers on 47 airlines, to 200 destinations, with circa 2,400 flights per week. Dublin-London was the world's second busiest international air route and Dublin was the fifth largest airport in Europe for transatlantic connectivity. This activity enabled the airport to make a €9.8bn contribution to Gross Domestic Profit, support more than 130,000 jobs and drive inbound tourism and business investment.

From 2010 to 2018, the total passenger traffic at Dublin Airport saw an increase of nearly 53.6 percent, with 31.5 million passengers using the airport in 2018. The airport serves mostly short haul services (90 percent of flights) to points in the UK and Europe. Long haul services are mainly to North America, with some services to the Middle East, Asia and Africa. The largest growth in passenger traffic in this period was to international destinations including China, the rest of Asia, the Middle East and Africa. The total passenger traffic on these routes increased by over 359%, though from a low absolute base. Transatlantic traffic saw growth of 155 percent from increased services to the United States and Canada. European and United Kingdom passenger traffic both increased by 70 percent and 50 percent respectively.

The demand for flights between the hours of 11pm and 7am is driven mainly by the short haul services operated by aircraft based at Dublin Airport. In order to achieve the high levels of aircraft utilisation necessary for airline competitiveness, Dublin-based aircraft, such as those operated by Aer Lingus and Ryanair, would usually tend to operate with the first departure between 6am and 7am and the last arrival after 11pm. Other flights in the 11pm to 7am period are long haul arrivals in the early morning and a small number of cargo flights mainly operated by time-critical package delivery firms, such as FedEx, DHL, TNT and UPS.

The one-hour time difference between Ireland and mainland Europe means that flights need to leave early (before 7am) to arrive in time for business passengers to have a full working day at their destination. The geographical position of Dublin Airport means that there is a longer distance to travel to many European destinations than from

other competing airports. This means that Dublin Airport requires longer operating days than competing European hubs. Similarly, Dublin Airport's proximity to North America compared to the rest of Europe means that transatlantic flights arrive earlier in Dublin than at other European airports.

Pre-Covid-19 levels of demand for night flights (11pm to 7am) was over 100 flights per night, with 116 flights per night associated with regularly scheduled services on a typical busy day in summer 2019. This is far in excess of the average of 65 flights per night cap that is provided for in condition no. 5 of the North Runway Permission. Demand for 23:00 to 07:00 night flights is not expected to reduce significantly during the post Covid-19 recovery.

Impacts of Restrictions

The operating restrictions imposed by the North Runway Planning Permission, which will come into force across the entire airfield when the North Runway becomes operational would limit air traffic growth and delay post-Covid-19 recovery to 2018 traffic levels by around two years, pushing a return to those levels from 2025 to 2027¹. Air passenger traffic would reduce by 1.8 million passengers in 2023 and by 1.6 million passengers in 2025, with an overall cumulative loss of 6.3 million passengers between 2022 and 2025 compared to passenger traffic without the operating restrictions.

The economic impact of the operating restrictions would be that the Irish economy could forgo an additional 5,170 jobs and €392 million in Gross Value Added in 2023, relative to the situation under the proposed Relevant Action. By 2025, the around 4,120 jobs and €314 million in Gross Value Added could be foregone. This forgone economic impact represents approximately 3 percent of the total projected economic impact of Dublin Airport in 2025 – in other words, the economic contribution of Dublin Airport to the Irish economy would be reduced by 3 percent due to the operating restrictions. The majority of the forgone economic impact is expected to occur outside of the aviation section. Based on the current distribution of jobs and economic impact, it is anticipated that a significant proportion of this forgone economic impact would affect the Fingal region, with 89 percent of the forgone direct employment and at least 25 percent of the forgone total employment located in County Fingal.²

The effect of the operating restrictions imposed by the North Runway Planning Permission on both short haul and long-haul flights would be to reduce the connectivity and competitiveness of Dublin Airport and reduce the economic contribution that the Airport makes to Ireland's economy. It would, therefore, contradict the goals of the National Aviation Policy³, which are to enhance Ireland's connectivity, foster growth of aviation enterprise and maximise the economic contribution of the aviation sector. The proposed Relevant Action would amend and replace those operating restrictions and thereby facilitate the goals of the National Aviation Policy and support Ireland's post-19 Covid-19 economic recovery.

Impact of Covid-19 pandemic

In March 2020, it became apparent that the Covid-19 pandemic was having a significant impact on global aviation. The immediate impacts were severe, and in the short-medium term these impacts will continue to manifest themselves in reduced air traffic demand in Ireland and globally.

¹ Mott MacDonald, 2021. Airport Operating Restrictions, Quantification of Impacts on Future Growth, Updated analysis in response to ANCA RFI.

² InterVISTAS, 2021. Dublin Airport Economic Impact of Operating Restrictions.

³ Department of Transport, Tourism and Sport, 2015. The National Aviation Policy

The EIA Process and the Need for an EIA

Environmental Impact Assessment (EIA) is the process for assessing the likely significant effects, if any, which proposed development, if carried out, would have on the environment. An EIA is required for certain types of project, which are defined in domestic legislation that transposes the EIA Directives 2011/92/EU and 2014/52/EU. Amendments introduced by the 2014 Directive were transposed into Irish law on the 1st September 2018 in the form of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (hereafter referred to as 'the EIA Regulations'), which amended the Planning and Development Regulations, 2001.

An EIA is required for certain classes of projects defined in Schedule 5, Part 2(10) (d) of the Planning and Development Regulations 2001, as amended. Where a project falls into one of these classes and exceeds a related size threshold (also defined in the legislation) an EIA is required. Where the project is below the threshold an EIA may still be required if there is the potential for significant environmental effects and this potential is assessed in relation to criteria set out in Annex III of the EIA Directive.

The application relates to a proposed Relevant Action only and will involve no construction works or changes to the consented physical infrastructure of the North Runway. Therefore, the proposed Relevant Action is not a project within the meaning of the EIA Directive.

On the basis of the case law of the Court of Justice of the European Union (CJEU), and, in particular, the Judgments in the *Brussels Airport Case* (Case C-275/09) and *Pro-Braine* (Case C-121/11), this application to amend Condition 3(d) and replace Condition 5 of the North Runway Planning Permission is not an application for development consent for a 'project' within the meaning of the EIA Directive, and is therefore outside the scope of that Directive. Strictly without prejudice to that position, daa is submitting an EIAR with the application in order to allow a comprehensive assessment of the environmental effects of the proposed Relevant Action take place.

EIA Methodology

The revised EIAR and this NTS have been prepared in accordance with the requirements of the EIA Directive and relevant guidance.

The main objective of the revised EIAR is to: describe the Current State of the Environment and its evolution without the proposed Relevant Action. This is then assessed against the proposed Relevant Action to predict potential beneficial and/or adverse impacts, to identify potential significant adverse effects and to propose appropriate mitigating measures where necessary and feasible.

Scenarios Assessed and Assessment Years

As described above, the proposed Relevant Action involves the amendment of the operating restriction set out in condition number 3(d) and the replacement of the operating restriction in condition number 5 of the North Runway Permission. This is referred to in the revised EIAR and in this NTS as the 'Proposed Scenario' (i.e. without condition numbers 3 and 5 of the North Runway Permission in place).

If these conditions are not amended or replaced, Dublin Airport would have the North Runway Permission with associated conditions in place, on completion of construction of the runway. This is referred to in the revised EIAR and in this NTS as the 'Permitted Scenario' (i.e. with condition numbers 3 and 5 of the North Runway Permission in place).

The EIA focuses on the comparison between the Permitted Scenario and the Proposed Scenario. In both scenarios there would be a limit on the number of passengers passing through the terminals at the airport each year. This limit or 'cap' is 32 million passengers per year. The cap is forecast to be reached in 2025 under the Proposed Scenario and in 2027 under the Permitted Scenario.

The EIA assesses the impacts and effects of the Permitted and Proposed Scenarios at three points in time:

- In 2022, when the North Runway will become operational
- In 2025, when 32 million passengers per annum is expected to be reached but not exceeded under the proposed Relevant Action
- In 2035, 13 years from the opening of the North Runway

Alternatives

The EIA regulations require an outline of the reasonable alternatives considered and reasons why the proposed Relevant Action has been selected. Alternatives considered included do nothing, alternative locations, alternative layouts, alternative designs, alternative processes and alternative mitigation measures. The do nothing alternative in this case is the same as the Permitted Scenario described above.

As the proposed Relevant Action relates only to a change in operating restrictions and does not include the delivery of any physical infrastructure or construction works, consideration of reasonable alternative locations, layouts or designs is not relevant to the proposed Relevant Action application.

The reasonable alternative processes considered included thirteen different ways in which the airport runways could be operated. Further details of these can be found in the revised EIAR *Chapter 4: Alternatives*. Of the alternatives assessed, the Proposed Scenario would result in the lowest number of people being significantly affected by changes in noise levels. For all other environmental topics in the revised EIAR, the difference between each of the alternative ways of operating the airport runways (other than the Permitted Scenario) would be imperceptible.

Mitigation measures are discussed by each individual specialist topic throughout the revised EIAR and discussed in detail in the Dublin Airport North Runway, Regulation 598/2014 (Aircraft Noise Regulation) Forecast Without New Measures and Additional Measures Assessment Report (the Aircraft Noise Regulation 598 Assessment). These measures are outlined in detail in the revised EIAR *Chapter 13: Aircraft Noise and Vibration*.

Consultation

Consultation on proposals to amend condition number 3(d) and replace condition number 5 of the North Runway Permission was undertaken in June, July and October 2016. Since the 2016 consultations, there has been more recent and ongoing engagement between the Applicant and specific stakeholders through the St Margaret's Community Liaison Group, Dublin Airport Environmental Working Group, drop-in clinics and other established channels, with engagement set to continue through 2021 and beyond.

During the preparation of the revised EIAR, the statutory submissions and observations received by the Planning Authority were reviewed with items addressed, where practicable, as presented in the revised EIAR *Chapter 5: Consultation* (Section 5.7 – *Statutory Submissions and Observations*).

Statutory public consultation will continue to form part of both the planning application and any subsequent appeal. Further participation is guaranteed through the proposed Relevant Action as it is mandated by the Aircraft Noise Competent Authority's process when setting the Noise Abatement Objective and issue of their draft regulatory decision. This process is in parallel to the statutory planning process and the Planning Authority is precluded from deciding to grant or refuse the proposed Relevant Action until this process has been completed.

The revised EIAR *Chapter 5: Consultation* provides details of the consultation and stakeholder engagement which has been undertaken and the ongoing consultation process.

Population and Human Health

Chapter 7 of the revised EIAR: *Population and Human Health*, provides an assessment of the potential impacts and effects on population and human health as a result of the proposed Relevant Action.

Methodology

The appraisal of impacts and effects was conducted by reviewing the current socio-economic environment and the potential impact on this environment. The focus of the assessment was on:

- Potential impacts of the proposed Relevant Action that would affect amenity uses of community and recreational facilities
- Potential impacts of the proposed Relevant Action on the health and wellbeing of residents and users of the communities in the local area

The Amenity and Local Communities assessment considered the assessment findings from Air Quality, Aircraft Noise and Vibration and the Ground Noise and Vibration assessments.

The Human Health and Well-being impacts were assessed qualitatively using the health and well-being determinants set out in the *London HUDU Rapid Health Impact Assessment Tool*. This uses a checklist approach which provides a broad overview of the potential health impacts and is applicable to a wide range of proposals that considers impacts on a range of health determinants. Not all health determinants included in the checklist are relevant to the proposed Relevant Action. For the assessment of impacts of the Proposed Relevant Action, the health determinants considered were: air quality, noise and neighbourhood amenity; and climate change. The Human Health and Well-being assessment therefore considered the findings from the air quality, air noise and vibration, ground noise and vibration and climate and carbon assessments

The assessment took into consideration a package of existing and proposed sound insulation schemes, which are currently offered and would continue to be offered by the Applicant as part of the proposed Relevant Action, to deliver improvements in internal noise levels experienced by residential and community facilities.

Environmental Design and Management

Measures already in place at Dublin Airport to reduce and mitigate the noise effects of aircraft operations:

- Reduction of noise at source
- Land use planning and management (noise zones, voluntary residential sound insulation schemes, schools sound insulation scheme and dwelling purchase scheme)
- Operational procedures.

Additional measures under the proposed Relevant Action:

- Noise insulation grant scheme for eligible dwellings
- Noise Quota Count system
- A detailed 'Noise Monitoring Framework' under which noise levels would be monitored and results would be reported annually to the Aircraft Noise Competent Authority

Receiving Environment

Current State of the Environment

The most recent data available on the receiving environment is data from the year 2016 (most recent census). This was therefore used to describe the Current State of the Environment.

In 2016, the resident populations of the Airport and Dubber Electoral Divisions was 5,018 and 7,372 respectively. The area where the airport is located has a higher proportion of working age residents and lower proportion of retirement age (65+ years) than elsewhere in the region or in Ireland, with a large proportion of workers employed

to support Dublin Airport's operations. Life expectancy and health for men and women is in line with national averages.

The area surrounding Dublin Airport is made up of several local communities, including numerous residential areas, together with community and recreational facilities such as open spaces and parks and several healthcare facilities.

Strategic land-use planning means there are a lot fewer residential developments within close proximity to Dublin Airport in comparison to other airports of a similar size. There are approximately thirty residential properties immediately adjacent to the airport campus. To the north of the airport is Swords, the largest town within the surrounding area. To the west of the airport is the community of Saint Margaret's. East of the airport towards the coast are the suburbs of The Baskins and Kinsealy, whilst further east towards the Irish Sea are the coastal towns of Malahide and Portmarnock.

Future Receiving Environment

Between 2016 and 2036, the population in Dublin is projected to increase by between 19 percent and 32 percent, depending on the level of internal migration in and out of the city. The population of Ireland is projected to increase by just over 17.5 percent over the same period. It is reasonable to assume that similar population trends will be experienced at the local level and hence within Fingal County and the Airport and Dubber Electoral Divisions.

Potential Impacts and Effects, Mitigation and Residual Effects

Amenity and Local Communities

The proposed Relevant Action would not result in any significant change to local air quality or odour which would affect amenity and local communities.

With regards noise from aircraft and ground-based activities:

With existing and proposed mitigation measures in place, a small number of people (less than 0.01 percent of the population of County Fingal) would experience significant beneficial effects as a result of reduced annoyance and/or sleep disturbance due to aircraft noise in all of the Assessment Years. In 2022 and 2025, about 9,000 and 10,000 people respectively would experience significant adverse effects at night-time, with potential to cause sleep disturbance, as a result of the proposed Relevant Action. This represents about 3.0 and 3.6 percent respectively of the population of County Fingal. In 2035, the number of people affected by significant adverse effects with potential to cause sleep disturbance would reduce to about 4,000 people, which represents about 1.5 percent of the population of County Fingal. Those people who would be adversely affected due to increases in aircraft noise levels would generally be in dwellings closer to flight paths to the west of the North Runway.

No residents would experience significant beneficial effects due to reductions in ground noise levels, whilst nine residents (less than 0.01 percent of the population of County Fingal) would experience significant adverse effects at night-time in 2025 and 2035 as a result of the proposed Relevant Action.

Consideration has also been given to the overall change in noise levels that may be experienced as a result of the overall effects of aircraft noise, ground noise and road noise. The relative contribution to noise levels from the different noise sources is similar for the Permitted and Proposed Scenarios though it varies by location. For all Assessment Years (2022, 2025 and 2035), the overall 24-hour noise level would either remain the same or increase by up to 2 decibels (2dB L_{den}) as a result of the proposed Relevant Action. At night-time, the overall noise level would either remain the same or increase by up to 5 decibels (5dB L_{night}) as a result of the implementation of the proposed Relevant Action.

Overall, on the basis of the number of residents adversely affected by aircraft noise, the effect of the proposed Relevant Action on amenity and local communities is considered to moderate adverse, significant effect for all of the Assessment Years.

Human Health and Well-being

With regards air quality, the proposed Relevant Action would not result in any exceedance of either the European standards or the upper Irish air quality threshold levels considered for the protection of human health.

With regards noise, noise pollution, both as a result of air noise and vibrations and ground noise and vibrations, can have a detrimental impact on human health, resulting in sleep disturbance, cardiovascular and psycho-

physiological effects. As described above, with existing and proposed mitigation measures in place, the proposed Relevant Action would result in some residents benefitting from lower noise levels whilst others would experience increases in noise levels. Given the number of people who would be adversely affected by increases in noise levels (about 9,000 in 2022, 10,000 in 2025 and 4,000 in 2035), the proposed Relevant Action would have an overall residual negative effect on human health and well-being.

With regards climate change as a determinant of human health and well-being, the proposed Relevant Action would result in an increase in greenhouse gas emissions in 2025, however, this would be less than one percent of Ireland's projected National Emissions Inventory for that year, which would not be significant. Overall, the impact of the proposed Relevant Action on climate change as a determinant of human health and well-being would not be significant.

Major Accidents and Disasters

The revised EIAR *Chapter 8: Major Accidents and Disasters* describes the findings of an assessment of the impacts and effects of the proposed Relevant Action associated with the risks to third parties and the environment arising from aircraft operation.

Methodology

The primary focus of the assessment was on the risk of air accident since the proposed Relevant Action is a purely operational change concerning the use of the runways, with no requirement for new physical infrastructure anywhere in the airport and consequently no change in the risk profile of other potentially dangerous activities such as the storage or delivery of aviation fuel.

The assessment also considered risks associated with bird strike, wake vortex (disturbance in the atmosphere that forms behind an aircraft as it passes through the air) and emergency fuel dumping from aircraft in the air.

The risks associated with civil aviation are well-understood on the basis of considerable operational experience worldwide over a substantial period of time. Whilst aircraft crashes may be considered rare, reference to the wider international accident record over an extended time period provides an effective basis for characterising this risk. The primary hazard in the context of the proposed Relevant Action relates to aircraft crash that might affect people living and working in the vicinity of the airport.

With regards aircraft crashes, risks to the public in the vicinity of the airport were estimated quantitatively by using an empirical modelling approach, based on historical accident data that characterises risk by reference to:

- The likelihood or probability (frequency per annum) of an aircraft crash occurring during take-off or landing operations, anywhere in the vicinity of an airport
- The probability of impact at any specific location at or near an airport relative to the runway ends and the flight paths
- The severity of the consequences of an impact on the ground, according to the size of the aircraft concerned

Two measures were used to characterise risk:

- Individual Risk: the annual probability of fatality for a hypothetical resident at a location relative to the runway
- Societal Risk: the annual probability of accidents causing fatalities in an area of development, taking account of the nature of the development such as the number of people living or working there

With regards individual risk, risk contours were used to define the area within which there is a defined level of individual risk. Three different levels of risk are typically considered:

- A risk of 1 in 10,000 per annum, considered to be a relatively high risk and at the limit of what is considered to be an acceptable level of risk exposure for members of the public
- A risk of 1 in 100,000 per annum, considered to be a risk that is of potential concern but one that can nevertheless be considered acceptable in return for the economic benefits from the activity that causes the risk. This is provided that the risk is managed to be as low as reasonably practicable
- A risk of 1 in a million per annum, considered to be a low risk that is a generally acceptable level of exposure for members of the public

In addition to the risk levels above, the relative numbers of people exposed to these risk levels provide a further criterion which was used to evaluate the significance category for risk effects. Details of how the levels of risk and the numbers of people exposed to these risk levels are combined to define the risk significance can be seen in Table 8-1 of the revised EIAR *Chapter 8: Major Accidents and Disasters*.

Societal risk takes into account the estimated frequency of accidents which may result in fatalities. Significance of societal risk uses a criterion known as the "Scaled Risk Integral" (SRI): for societal risk, a significant effect is one

where the SRI is more than 500,000. Further details and an explanation of the SRI can be found in the revised EIA *Chapter 8: Major Accidents and Disasters, Section 8.3.*

Potential Impacts, Effects, Mitigation and Residual Effects

The estimated individual risks associated with the Proposed Scenario in 2022, 2025 and 2035 are very similar to those identified for the Permitted Scenarios. In each of the Assessment Years, the significance category would be on the border of “slight” to “moderate” on the basis of the low numbers of people to an individual fatality risk between 1 in 100,000 per annum and 1 in 1,000,000 per annum. Slight to moderate effects are not considered significant.

Whilst the proposed Relevant Action would have some effect on the geographical extent of the individual risk level contours, the number of dwellings and commercial properties encompassed by the risk level contours would mostly be the same as for the Permitted Scenario in each Assessment Year. The only exception to this is under the Proposed Scenario in 2025 when five additional dwellings would be encompassed within the 1 in a million risk level contour. Nonetheless, a risk of 1 in a million is a low risk and is a generally acceptable level of exposure for members of the public. By 2035, the number of dwellings would be the same as for the Permitted Scenario.

Societal risk estimates for Assessment Years 2022 and 2025, as indicated by SRI values, are slightly larger for the Proposed Scenario than for the Permitted Scenario, in accordance with the increased number of aircraft movements that would result with the proposed Relevant Action. In 2035, the societal risk estimates are similar for the Permitted Scenario and the Proposed scenario, as annual aircraft movements and average crash rates would be the same.

Overall, there is a third-party risk associated with the operations at Dublin Airport under both the Permitted Scenario and the Proposed Scenario. Under the Proposed Scenario, there would be a very modest increase in risk as a result of the increased level of activity at the airport, however the risk would remain well within the level that is considered acceptable.

The proposed Relevant Action would not have a significant effect on individual or societal risk levels and would not cause a significant additional risk to the wider environment.

Dublin Airport directs a considerable amount of effort towards ensuring the safety of air transport operations, primarily from the perspective of the safety of passengers. These efforts similarly limit the risk to third parties on the ground. No new mitigation measures are proposed over and above those already in place at Dublin Airport.

Traffic and Transportation

An assessment of the potential traffic and transport impacts and effects of the proposed Relevant Action was undertaken and is reported in Chapter 9 of the revised EIAR.

Methodology

The traffic and transportation assessment used a model of the road network (Local Area Model) in the vicinity of the airport to look at and compare future traffic flows under the Permitted Scenario and the Proposed Scenario and to thereby determine the impacts on the road network of the proposed Relevant Action on those traffic flows. The Local Area Model includes traffic that would be generated by committed future projects and takes into account background growth in traffic, including from third party developments and committed public transport and road schemes.

To determine the changes in traffic flows as a result of the proposed Relevant Action, the assessment has taken into consideration:

- Air traffic forecasts for the Permitted and Proposed scenarios and hence passenger numbers for 2022, 2025 and 2035, in order to assess the increase in people using the road network to go to and from the airport
- Recorded times at which passengers arrive and leave the airport as traffic on the road network changes during different times of the day with road traffic peak periods during 8am to 9am and from 5pm to 6pm
- Recorded numbers of passengers using shared vehicles and the number of passengers per vehicle
- Recorded starting locations and destinations for journeys undertaken by passengers travelling to and from the airport

The predicted increase or decrease in traffic flows was compared to recorded existing traffic flows on the surrounding road network to determine the percentage increase or decrease caused by the proposed Relevant Action.

Receiving Environment

Current State of the Environment

Existing traffic flows on the surrounding road network were determined using traffic count data from surveys undertaken in May 2019. The survey locations and traffic count data are presented in Chapter 9, Figure 2 and Table 9-4.

Future Receiving Environment

Traffic flows in the future receiving environment are represented by the Permitted Scenario traffic flows Potential Impacts and Effects, Mitigation and Residual Effects.

Potential Impacts and Effects, Mitigation and Residual Effects

Hour by hour, the proposed Relevant Action would result in an increase in traffic flows on some adjacent roads and a decrease on others.

For the majority of the 24-hour period, increases in traffic flows caused by the proposed Relevant Action would be less than five percent. However, during some hourly periods, there would be increases in traffic greater than five percent on a number of roads in the vicinity of the airport. Roads affected by increases in traffic flows greater than five percent include:

- M1 Airport Link
- M1 Junction 1 to Junction 2 and Junction 2 to Junction 3
- M50 Junction 3 to Junction 5
- R132 North and R132 South

- Old Airport Road; R108
- Naul Road

For most of these roads, the increases would generally be during the early morning period (4am to 5am or midnight to 1am), when flows of traffic not associated with the airport operations would be low. M1 Airport Link and Old Airport Road would, however experience increases of greater than five percent in the late afternoon: between 4pm and 5pm in 2022 and between 3pm and 4pm (M1 Airport Link) and 4pm and 5pm (Old Airport Road) in 2025. The proposed Relevant Action would not result in increases in traffic flows of greater than five percent during the road traffic peak periods, from 8am to 9am and from 5pm to 6pm.

The increase in traffic flows due to the proposed Relevant Action would have a slight but not significant effect overall on the surrounding road network. No additional mitigation is proposed.

Air Quality

An air quality impact assessment was undertaken to assess the impact and effects of emissions from operation of the proposed Relevant Action on local air quality at nearby sensitive receptors (where members of the public are likely to be regularly present (residential housing, schools, hospitals, places of worship) and most likely to be affected by the operation of the North Runway and the impact of additional traffic on the public road network). The assessment is reported in the revised EIAR *Chapter 10 – Air Quality*.

Methodology

The assessment focussed on the impact and effect of changes to long-term and short-term concentrations of nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}). These are considered to be the pollutants from aircraft emissions which are of greatest concern for human health. The assessment compares the concentrations of these pollutants and any changes in those concentrations to Air Quality Limit Values set by The Air Quality Standard Regulations⁴.

Consideration was also given to the potential for odour nuisance associated with aircraft operations. Odour levels were predicted using modelling and compared to UK Environment Agency guidance⁵, which defines 1 odour unit as the point of detection, that is, an odour level below this level would not be detected by a person, irrespective of how offensive the odour is.

Whilst the air quality assessment is primarily concerned with the impacts and effects of emissions associated with a change in the numbers of aircraft movements, the proposed Relevant Action would also affect traffic on the public road network. Therefore, the assessment also considered the potential combined impacts of aircraft and road traffic emissions on local air quality.

Receiving Environment

Current State of the Environment

Information on the current air quality environment within and in the vicinity of the study area was obtained from monitoring data made available by the Applicant and the Environmental Protection Agency.

The Applicant monitors a range of pollutants at a monitoring station located within the grounds of Dublin Airport. Monitoring data collected from 2011 to 2019 demonstrate that annual mean concentrations of nitrogen dioxide and particulate matter at the airport are consistently below relevant Air Quality Limit Values set by The Air Quality Standard Regulations 2011 and are typically fifty to sixty percent of those values⁶. The Applicant also measures concentrations of nitrogen dioxide and benzene at a number of off-site locations in the vicinity of the airport. The data collected from 2011 to 2019 demonstrates that the measured concentrations are not exceeding Air Quality Limit Values for these two pollutants. Concentrations of nitrogen dioxide are noticeably higher at locations close to roads where the main source of air pollution is road traffic.

The Environmental Protection Agency measures annual mean concentrations of pollutants in the Dublin region. The closest monitoring location to the airport is in Swords, which is over 2 kilometres from the airport. Data available for the most recent years demonstrates that air quality complies with the air quality standard values for nitrogen dioxide and particulate matter (both PM₁₀ and PM_{2.5}⁷) at the majority of locations monitored by the Environmental Protection Agency. The only exceptions are recent levels of nitrogen dioxide recorded on Pearse Street and St. Johns Road. Neither Pearse Street nor St Johns Road is in proximity to Dublin Airport.

⁴ The Air Quality Standard Regulations 2011 implement the European Union Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe.

⁵ Environment Agency (2011), Additional guidance for H4 Odour Management How to comply with your environmental permit

⁶ The only exception to this is nitrogen dioxide concentration recorded at a single location, the Airport Bus Depot, in 2019, which was 43 ug/m³. This location does not, however, represent a relevant air quality sensitive receptor. The annual nitrogen dioxide concentration at the same location for 2020 was 30 ug/m³.

⁷ The size of the particulate; 10 and 2.5 microns respectively

Future Receiving Environment

The likely air quality of the Future Receiving Environment has been predicted by extrapolating background air quality pollutant concentrations available from the most recent local monitoring data. The predicted background pollutant concentrations are well below the air quality standard values.

Potential Impacts and Effects, Mitigation and Residual Effects

The predicted annual mean concentrations of nitrogen dioxide and particulate matter (PM₁₀ and PM_{2.5}) for the Permitted Scenario and the Proposed Scenario are all well below the Air Quality Limit Values for these pollutants, for all of the Assessment Years.

Whilst there would be some increases in concentrations of nitrogen dioxide and particulate matter at some of the representative receptor locations for the Proposed Scenario, in comparison to the Permitted Scenario, the increases would be negligible and the resulting annual mean concentrations of all the pollutants would remain below the relevant Air Quality Limit Values for all of the receptor locations.

The highest predicted concentration of nitrogen dioxide under the Proposed Scenario would be 27.3 µg/m³, which is less than 75% of the Air Limit Quality Value (40µg/m³) for nitrogen dioxide. Whilst the proposed Relevant Action would result in an increase in the annual mean concentration of nitrogen dioxide in all Assessment Years, the largest increases in 2022, 2025 and 2035 would be +1.1 µg/m³ (2022), +0.7 µg/m³ (2025) and +0.3 µg/m³ (2035) respectively. These increases equate to negligible impacts and would not result in significant effects.

The highest predicted PM₁₀ and PM_{2.5} concentrations for the Proposed Scenario would be 11.1 µg/m³ and 6.8µg/m³ in 2022, and would reduce in 2025 and 2035. These values are considerably less than 75 percent of the Air Quality Limit Values (40µg/m³ and 25µg/m³ for PM₁₀ and PM_{2.5} respectively). The largest increases in both PM₁₀ and PM_{2.5} with the Proposed Scenario in any of the assessment years would be +0.04 µg/m³. As for nitrogen dioxide, these increases equate to negligible impacts and would not result in significant effects.

With regards odour due to the proposed Relevant Action, the highest predicted odour levels at the modelled receptor location 500 metres east of the airport are less than one odour unit. Hence, the potential for odour nuisance is low and would not result in significant odour effect.

The residual effects on air quality and odour sensitive receptors would be imperceptible and would not be significant. No additional mitigation is proposed.

Climate and Carbon

The revised EIAR *Chapter 11: Climate and Carbon* assesses the potential impacts and effects of the proposed Relevant Action on greenhouse gas emissions.

Methodology

The assessment considers the impacts of additional greenhouse gas emissions resulting from the proposed Relevant Action. Changes to greenhouse gas emissions when compared to the Permitted Scenario would be associated with changes in air traffic movements (during the landing and take-off cycle phase and cruise descent phases for departing flights) and the additional road journeys by passengers accessing the airport as a result of the proposed Relevant Action.

The predicted changes in greenhouse gases as a result of the proposed Relevant Action were compared against the projected total National Emissions Inventories for Ireland (EPA, 2019). The changes in greenhouse gas emissions have also been set in the context of Ireland's projected total Transport Emissions Inventory. Neither of the emissions inventories includes emissions from international aviation, however, comparing the results of the assessment to numbers in those inventories helps provide a sense of scale. For the purposes of this assessment, a major (significant effect) would be where total annual emissions from the operation of the proposed Relevant Action would be equal to or more than 1% of the projected National Emissions Inventory for Ireland. A minor (not significant effect) would be where total annual emissions from the operation of the proposed Relevant Action would be less than 1% of the projected National Emissions Inventory for Ireland.

Greenhouse gases include a range of different gases. For the purposes of the greenhouse gas assessment for the proposed Relevant Action, greenhouse gas emissions associated with air traffic movements are reported as tonnes of carbon dioxide (tCO₂). Greenhouse gas emissions associated with additional passenger road journeys are reported as tonnes of carbon dioxide equivalent (tCO₂e).

Receiving Environment

Current State of the Environment

The receiving environment is the global climate. The most recent emissions inventory for Ireland (2019), as reported in Ireland's National Inventory Report 2021⁸, amounts to emissions of 59,778 kilotonnes of carbon dioxide equivalent (ktCO₂e).

Future Receiving Environment

The Future Receiving Environment is the global climate during each of the Assessment Years (2022, 2025 and 2035). Ireland's projected National Emissions Inventories are 61,510, 61,430 and 55,200 kilotonnes of carbon dioxide equivalent for 2022, 2025 and 2035 respectively. Projected future emissions associated with transport, taken from Ireland's Transport Emissions Inventory, are 12,970, 12,490 and 11,000 tonnes carbon dioxide equivalent for 2022, 2025 and 2035 respectively.

Potential Impacts and Effects, Mitigation and Residual Effects

Under the Proposed Scenario for 2022 and 2025, there would be an increase in greenhouse emissions compared to the Permitted Scenario, due to an increased number of flights. However, in 2035, the Proposed Scenario is expected to result in a decrease in emissions compared to the Permitted Scenario. This is due to the assumption made in the forecasting that some of the long-haul day flights⁹ associated with the Permitted Scenario would be replaced by short-haul flights under the Proposed Scenario (in the Proposed Scenario the short haul flights in the 6-7am period area accommodated in the schedule whereas in the Permitted Scenario one of the main effects of the restrictions is a loss of short haul services). The number of flights would be the same for the Proposed and Permitted Scenarios by 2035.

⁸ Environmental Protection Agency (EPA), (2021); Ireland's National Inventory Report 2021: Greenhouse Gas Emissions 1990-2019

⁹ Long-haul flights would increase greenhouse gas emissions.

When compared to Ireland's projected National Emissions Inventories, the greenhouse gas emissions would be less than one percent of both the projected National Emissions Inventory and the projected Transport Emissions Inventory for all of the Assessment Years. This is considered to be a minor effect and the residual effect on the global climate would not be significant. The reduction in emissions in 2035 would be a permanent improvement.

Carbon and Greenhouse Gas Management Measures

The Applicant has an extensive carbon management programme in place and is also certified under Level 3+ "Neutrality" of the Airport Carbon Accreditation programme (<https://www.airportcarbonaccreditation.org/>). Measures to manage and where appropriate to offset greenhouse gas emissions are included in the Applicant's draft Carbon Reduction Strategy (https://www.dublinairport.com/docs/default-source/sustainability-reports/dublin-airport-carbon-reduction-strategy.pdf?sfvrsn=96ad40d1_2).

Further details can be found in EIAR *Chapter 11: Climate and Carbon, Section 11.6 – Environmental Design and Management*

Water

Revised EIAR *Chapter 12: Water* considers the potential impacts and effects on the water environment, including surface water, groundwater, water supply and foul drainage.

Methodology

The study area for the surface water receptors encompasses all catchments that receive stormwater and overland flows from the airport lands. The study area for groundwater comprised the airport lands footprint and a 1 km buffer area. Information on the existing water environment was obtained from a desktop review of the data sources listed in revised EIAR *Chapter 12 - Water*, from site walkovers and from previous site investigation.

Receiving Environment

Current State of the Environment

Surface water

Surface watercourse in the vicinity of Dublin Airport are shown on Figure 2, the Environmental Context plan. Dublin Airport is located within four Water Framework Directive (WFD) catchment areas or sub-basins:

- The Mayne River Sub-basin, which includes the Cuckoo Stream and covers the majority of the airport campus, including the terminal, the west and central aprons, and the majority of the South Runway. The Cuckoo Stream flows into the Mayne River, which then flows into the Baldoyle Estuary Special Area of Conservation (SAC)
- The Sluice sub-basin, which includes the Forrest Little Stream and Kealy's Stream and extends across the majority of the North Runway, the North Apron, and other airport areas. Forrest Little Stream and Kealy's Stream flow into the Sluice River, which then flows into the Baldoyle SAC
- The Ward River sub-basin. The Ward River's natural catchment extends across the western part of the North Runway, however, does not receive drainage from the North Runway. The Ward River flows into the Malahide Estuary Special Protection Area (SPA) and SAC
- The Santry River sub-basin, which extends across the western part of the South Runway and airport car parking. The Santry River flows into Dublin Bay behind Bull Island

Surface watercourses in the vicinity of the airport are shown on Figure 2.

Surface water quality within the airport complex and within the study area surrounding the airport is poor to moderate.

The sensitivity of the surface water environment features to potential impacts depends upon the importance of the feature, WFD status and water quality. Sensitivity of the Cuckoo Stream, River Mayne sub-basin and the Forest Little / Sluice sub-basin is considered to be low. Sensitivity of the Ward sub-basin, the Malahide Estuary SPA and SAC and the Baldoyle Estuary SAC is considered to be high.

Groundwater

The study area is underlain by bedrock which is a locally important aquifer. The aquifer is moderately productive only in local zones and is classified as being highly to extremely vulnerable to pollution. The majority of the North Runway is underlain by a groundwater body where water quality is considered good and not at risk, although the eastern end of the North Runway is underlain by a groundwater body where the groundwater quality is poor and at risk. There is one borehole within the airport boundary which is used to abstract water for industrial use.

There are no public supply or group scheme Source Protection Areas within the study area.

Stormwater Drainage

Dublin Airport has an existing stormwater drainage network, that flows to various open drains and streams to the local watercourses discussed above. The stormwater network provides attenuation to most hard-standing and developed areas, with the exception of the Mayne and Santry sub-catchments.

Pollution retention facilities are provided for the runways, the aprons and the taxiways, to collect de-icing chemicals. Surface water runoff from other hardstanding areas, including roads and car-parking, does not have any formal treatment prior to downstream discharge. The paved area drainage network is sealed to protect groundwater from contamination. Operational discharges at the airport are controlled under an extant trade effluent licence.

The North Runway is currently under construction; however, the stormwater drainage network has been designed to attenuate flows and avoid water quality impacts to the receiving watercourses.

Water Supply and Foul Sewer

Potable water is supplied to Dublin Airport via existing potable water pipes from the Dublin Airport Reservoir.

The existing public foul sewer system and pumping house serving Dublin Airport is located on the R132 regional road and discharges into the North Fringe Sewer and ultimately to the Ringsend wastewater treatment facility.

Future Receiving Environment

It is assumed that the Future Receiving Environment would not be substantively different than at present.

The proposed Relevant Action would not result in any changes to the existing drainage system or to the drainage system which would be in place under the Permitted Scenario once the North Runway is operational.

Potential Impacts and Effects, Mitigation and Residual Effects

The proposed Relevant Action would not alter the current or consented operational drainage systems and de-icing operations at the airport. It would not result in any additional infrastructure, changes to the design, construction, catchment area, hydrology, flow control, or approach to operation of pollution control of North Runway itself or any of the wider pollution control infrastructure at the airport. The drainage system consented in the North Runway Planning Permission, once operational, should result in an improvement to the current pollution management system. The proposed Relevant Action would not alter the operational drainage systems that would be in place at the airport and would not result in any changes to the de-icing procedures or volumes of drainage water containing de-icing fluid. It would therefore have no effect on the surface water or groundwater environment.

Whilst there would be an increase in the number of passengers in the Proposed Scenario, compared with the Permitted Scenario, which would likely lead to a proportional increase in the volume of water usage and wastewater generation in the Assessment Years of 2022 and 2025, the total volumes in the Proposed Scenario would not cause significant effects as they would be comparable to those experienced in 2018 when the airport was previously operating at close to the consented 32 million passengers per year cap. The difference between the Permitted and Proposed Scenarios in terms of passenger numbers using the terminals would reduce to nothing by 2027 and thus there would be no difference between the two scenarios in the 2035 Assessment Year. Overall, the effect on water usage and wastewater generation would be temporary and imperceptible. The residual effect would not be significant and no additional mitigation is proposed.

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Aircraft Noise and Vibration

Revised EIAR *Chapter 13: Aircraft Noise and Vibration* considers the potential impacts and effects on the noise environment from air noise and vibration.

Methodology

This chapter assesses the air noise and vibration associated with flights into and out of Dublin Airport while airborne or using the runway system. This excludes other aircraft ground operations such as taxiing and when aircraft are stationary on stands: those operations are assessed in the *Chapter 14: Ground Noise and Vibration*.

Air Noise

The noise assessment considered two effects: the potential for ‘annoyance’ due to noise from aircraft activity over 24 hours; and the potential for ‘sleep disturbance’ due to noise from aircraft during the night. From these the number of people predicted to be highly annoyed and the number predicted to be highly sleep disturbed have been calculated. ‘Annoyance’ relates to how much and how many people are affected by noise over a 24-hour period, and ‘sleep disturbance’, relates to how much and how many people are disturbed by noise at night-time.

To determine whether the proposed Relevant Action would result in significant air noise effects, both the absolute noise level and the change in noise level was considered.

The study area for the assessment covers an area that extends 25 kilometres to the west, 30 kilometres to the east, 20 kilometres to the north and 25 kilometres to the south of the centre of the existing main runway at Dublin Airport. This area is considered to represent the largest extent over which potential impacts due to air noise would be likely to occur.

To find out what the existing noise conditions are in the area, both during the daytime and at night-time, noise measurements were undertaken at sensitive locations around Dublin Airport. Sensitive locations include dwellings, schools, residential healthcare facilities and places of worship. Data on noise levels from Dublin Airport’s 24-hour noise monitoring system was also used to get information about the total noise levels and the noise which is due to aircraft only.

To determine the potential noise impacts of the proposed Relevant Action, noise levels were modelled for each of the Assessment Years, using the Federal Aviation Agency (FAA) Aviation Environmental Design Tool (AEDT). This is industry standard software which evaluates aircraft noise in the vicinity of airports based on aircraft type, operation, route, and flight profile, as well as information about the local terrain and meteorological conditions. The noise model was used to produce a series of noise contour maps showing the predicted noise levels within and surrounding the airport and also differences in predicted noise levels between the Proposed Scenario and the Permitted Scenario.

Vibration

Low frequency noise from airborne aircraft can cause perceptible vibration within dwellings. This is most obviously noticed by effects such as windows rattling. Possible vibration impacts were determined by calculating the changes in levels of low frequency noise using the noise model.

The other potential effect from airborne aircraft vibration is vortex damage to buildings. There have been no reported cases of wake vortex damage at Dublin. Effects due to wake vortex from aircraft operations under the Permitted Scenario were considered acceptable by the planning authorities when the North Runway Permission was granted. The proposed Relevant Action would not affect which aircraft are able to use Dublin Airport, therefore effects due to wake vortex from aircraft under the Proposed Scenario is also expected to be considered acceptable and no further assessment has been undertaken.

Receiving Environment

The area surrounding the airport is affected primarily by noise from the local road network and from airport operations. Noise levels vary considerably, depending on how close noise sources such as roads and aircraft flight paths are to sensitive locations which may be affected by noise. Aircraft noise is dominant at a number of locations at certain times of day, whilst in other areas, road noise is dominant.

Current State of the Environment

The current noise environment to the north, north east, east, south east, south, west and north west of the airport, based on the noise monitoring surveys, is summarised below:

- River Valley is a residential area just under 2 kilometres north of the airport. Here, local road traffic is the main noise source. However, at one monitoring location, at Ridgewood, frequent aircraft activity in the morning was found to be the dominant noise source between 6.30am and 7am.
- Malahide is located near the coast, north east of the airport. In the coastal area of Malahide, the regional road (R106) was a dominant noise source in the area during the daytime. Noise levels were lower in south Malahide, a quieter residential area away from busy main roads. Aircraft noise at both of these locations was considered to be negligible.
- The area east of the Dublin Airport, at a distance of approximately 2.5 kilometres, contains rural areas with smaller residential neighbourhoods located away from busy roads. The area is generally quieter than other locations around the airport. Aircraft noise was occasionally dominant. At Portmarnock School, approximately 6.5 kilometres east of Dublin airport, the noise environment was similar to the areas closer to the airport, however aircraft noise was not dominant.
- Clonsaugh's business and technology park and Belcamp Park are located approximately 3 kilometres to the south east of the airport. The motorway and a regional road (M1, M50 and R139) are dominant noise sources in the area. Aircraft noise was occasionally dominant.
- The motorway (M50) and the Hampton Wood residential area are located about 2 kilometres south of the airport. Road traffic is the dominant noise source close to the M50 but at some locations further from the road aircraft noise dominates.
- The area west of the airport contains further rural areas with smaller residential neighbourhoods. Aircraft noise is the dominant noise source at St Margaret's. The surrounding road network consisting of national and regional roads (N2 and R135) were also audible.
- To the north west of the airport, approximately 4 kilometres away, are further rural areas. The regional roads (R135 and R121) roads are dominant noise sources in this area. Aircraft noise was not found to be dominant.

Dublin Airport's permanent noise monitors are set up at locations in and around the airport, including monitors at Bay Lane, St Doolaghs, Bishopswood, Feltrim, Balcultry, Artane, Coast Road and north east of the airport off the Naul Road. At two of these locations, Bay Lane and St Doolaghs (4 kilometres to the east and west respectively of the airports existing main runway) the current noise environment is dominated by aircraft noise.

Future Receiving Environment

The Future Receiving Environment was predicted using noise modelling to produce noise contours maps for the Permitted Scenario in each of the Assessment Years, 2022, 2025 and 2035. The distribution of the aircraft noise reflects the predicted use of the South and North Runways under the Permitted Scenario. During the day aircraft arrivals from the east and departures to the east would primarily use the South Runway with arrivals from the west and departures to the west primarily using the North Runway.

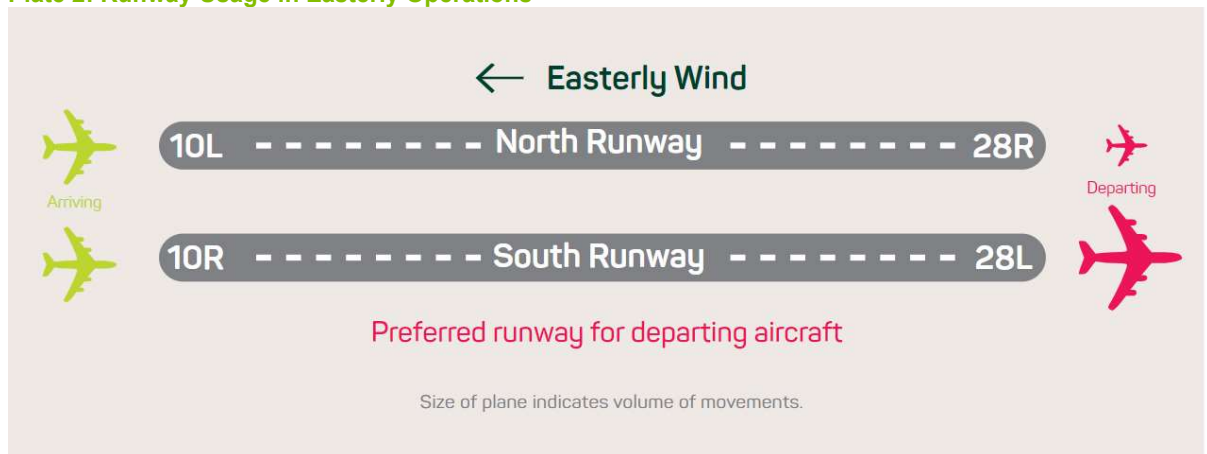
When the wind is coming from the west (approximately 70 percent of the time), aircraft will arrive from the east and take off into the west. The vast majority of daytime arrivals will use the South Runway and the majority of daytime departures will use North Runway as shown in Plate 1 below.

Plate 1: Runway Usage in Westerly Operations



When the wind is coming from the east (approximately 30 percent of the time), aircraft will arrive from the west and take off into the east. Daytime arrivals will use both runways and the vast majority of daytime departures will use the South Runway in easterly operations as shown in Plate 2 below.

Plate 2: Runway Usage in Easterly Operations



There would be very limited use of the cross runway, and under the Permitted Scenario, North Runway would not be used between 11pm and 6am. Further from the airport, the proximity of locations to the departure routes would also influence the noise levels.

From the modelling results in the Permitted Scenario, in 2025 no representative locations are forecast to be exposed to aircraft noise levels associated with a high impact. Locations at St Doolaghs, Kilshane Cross, Portmarnock and St Margret's would be exposed to aircraft noise levels associated with a medium impact, and locations such as Malahide and Dunboyne would be exposed to aircraft noise levels associated with a low impact.

In 2022, noise levels are generally forecast to be lower than those in 2025 by 1 decibel. The lower noise levels in 2022 are due to there being less aircraft activity at that time.

In 2035, noise levels are also generally forecast to be lower than those in 2025 by one to two decibels. The lower noise levels in 2035 are the result of the modernisation of the aircraft fleet resulting in quieter aircraft despite a slightly greater number of aircraft movements in 2035 than in 2025.

Potential Impacts and Effects, Mitigation and Residual Effects

Air Noise

There are a number of measures already in place at Dublin Airport that reduce or mitigate the noise effects of aircraft operations. These include:

- Reduction of noise at source
- Land use planning and management – including establishing Noise Zones; noise sensitive development is managed, and unsuitable development is restricted
- Residential sound insulation schemes
- Schools sound insulation scheme
- Voluntary dwelling purchase scheme
- Operational procedures and operating restrictions

As part of the proposed Relevant Action, further mitigation measures are proposed which include:

- An annual night quota (ANQ) system to replace the limit of 65 flights per night
- A preferential runway use system
- An insulation grant scheme
- A detailed framework for monitoring the noise performance of Dublin Airport

In 2022, 2,110 (4 percent) more people are predicted to be highly annoyed in the Proposed Scenario than in the Permitted Scenario. In the 2025 Proposed Scenario, this is predicted to be just over 15,164 (24 percent) more people than in the 2025 Permitted Scenario and in the 2035 Proposed Scenario it is predicted to be 6,256 (19 percent) more people than in the 2035 Permitted Scenario.

The predicted number of people highly sleep disturbed, in the 2022 Proposed Scenario would be 399 (2 percent) more people than in the 2022 Permitted Scenario. In the 2025 Proposed Scenario this is predicted to be 14,580 (65 percent) more people than in the 2025 Permitted Scenario. In the 2035 Proposed Scenario this is predicted to be 7,337 (65 percent) more people than in the 2035 Permitted Scenario.

With regards to significant residual effects, which consider both the absolute noise levels and the change in noise levels experience, with the proposed mitigation measures in place.

In 2022, with the existing and proposed mitigation measures in place, the Proposed Scenario would result in a residual net significant beneficial effect due to reduced annoyance for existing residents within the study area, due to noise, with 10 residents experiencing significant adverse effects and 79 experiencing significant beneficial effects. In 2025 and 2035 there would be a residual net significant adverse effect due to increased annoyance for residents due to noise, with a total of 54 and 20 residents experiencing significant adverse effects in 2025 and 2035 respectively and a total of 8 and zero residents experiencing significant beneficial effects in 2025 and 2035 respectively. In all three years the number of people experiencing significant residual effects (beneficial or adverse) would be less than one hundred. As reported in the section on Population and Human Health, the numbers of people significantly affected represent less than 0.01 percent of the population of County Fingal.

At night-time, with the proposed mitigation measures in place, the Proposed Scenario would result in a residual net significant adverse effect in terms of sleep disturbance for existing residents, when compared with the corresponding Permitted Scenarios for all Assessment Years. In 2022 this net significant adverse effect would affect around 9,000 people, in 2025 around 10,000 people, and in 2035 around 4,000 people. As reported in the section on Population and Human Health, these numbers respectively represent about 3 percent, 3.6 percent and 1.5 percent of the population of County Fingal.

There would be no significant effects on any of the non-residential receptors assessed.

Figure 3 and Figure 4 illustrate these effects in 2025, the year of maximum impact.

Air Vibration

No dwellings would experience low frequency noise levels above the threshold which could cause significant vibration impacts. Therefore, there would be no significant vibration effects as a result of the proposed Relevant Action.

Ground Noise and Vibration

Chapter 14: Ground Noise and Vibration assesses the potential impacts and effects from ground noise as a result of the proposed Relevant Action. Ground noise specifically includes noise associated with aircraft on the ground at Dublin Airport, mainly aircraft taxiing and aircraft using auxiliary power units (APUs) when on stands. The assessment also considered potential impacts from road traffic noise associated with changes in road traffic as a result of the proposed Relevant Action.

Methodology

Aircraft ground activities do not typically produce any significant vibration effects at sensitive receptors outside of the airport, and therefore assessment of vibration due to aircraft ground operations has not been included in the EIAR.

The study area for the ground noise assessment comprised a rectangular area that extends approximately 3.5 kilometres to the west, 5 kilometres to the east, 4.5 kilometres to the north and 3 kilometres to the south of the centre of the existing main runway at Dublin Airport. This area includes all of the receptors that have the potential to experience significant effects.

Noise surveys were carried out in 2016 at key receptor positions around Dublin Airport to establish the prevailing ambient and background noise conditions during both the daytime and night-time. Additionally, an attended survey of aircraft taxi operations was undertaken in 2019 to measure aircraft taxi noise levels for use in the modelling of current and future ground noise scenarios.

As for aircraft noise, ground noise levels were predicted using industry standard noise modelling software. Impacts were considered over a 24-hour period and at night-time and the number of people exposed to various noise levels was determined for the Permitted Scenario and the Proposed Scenario for each of the Assessment Years.

The effects of ground noise were assessed first for the proposed Relevant Action in isolation, and then for the cumulative effect of the proposed Relevant Action and the Apron 5H application which is another potential development occurring at a similar time within the airport boundary (planning reference number: F20A/0550 planning permission currently under active consideration). That application, if successful, would not result in any change to the number of aircraft operations at Dublin Airport, but would re-distribute some of them to the Apron 5H stands. In general, this would result in a small increase in noise levels for receptors to the north of the airport and a small decrease for receptors to the south.

Consideration was also given to the overall change in noise levels that may be experienced as a result of the overall effects of aircraft noise, ground noise and road noise by examining total noise levels at four representative locations: Ridgewood; The Baskins; Mayeston Hall; and St Margaret's. Further details can be found in the revised EIAR *Chapter 14-Ground Noise and Vibration, Section 14.10*.

Receiving Environment

Current State of the Environment

Current noise levels measured during noise surveys around Dublin Airport vary widely dependent upon how close the noise survey locations were from local noise sources such as airborne aircraft, road traffic and schools. Average ambient daytime noise levels are in the range 50 to 70 decibels whilst the underlying daytime background noise level is in the range of 45 to 55 decibels. The background noise level is the noise level which is exceeded for ninety percent of the time.

At night, average ambient noise levels measured during noise surveys were generally around 3 to 5 decibels lower than during the day and underlying background noise levels are typically 5 to 10 decibels quieter. Road traffic is also a factor at night, with roadside locations tending to have higher ambient night - time noise levels.

Noise level contour maps were produced for current ground noise due to taxiing aircraft and for current road traffic noise.

In daytime, high noise levels, of up to 65 decibels, due to taxiing aircraft, do not currently occur much beyond the airport site. Medium noise levels of up to 55 decibels extend to the west to Shanganhill, to the north into Forrest

Great, to the east just past the R132 regional road and to the south up to the M50 motorway. Low noise levels, up to 50 decibels, extend to the west to St. Margaret's, to the north into Ridgewood, to the east to Glebe and to the south just past the regional road R104 into Santry. At night-time, high noise levels, of up to 55 decibels, due to taxiing aircraft, also do not currently occur much beyond the airport site. Medium noise levels of up to 50 decibels extend to the west to Shanganhill, to the north into Forrest Little, to the east up to the regional road R132 and to the south to Ballymun. Low noise levels, up to 45 decibels, extend to the west to Shanganhill, to the north to Ridgewood, to the east to the M1 motorway and to the south past the M50 motorway towards Santry. The noise contour maps, which show modelled daytime and night-time noise levels due to taxiing aircraft, can be seen in *Chapter 14, Appendix 14C, Figures 14C-1 and 14C-2*.

High noise levels, up to 70 decibels, due to road traffic noise, are concentrated along the M1 and M50 motorways. Closer to other roads, modelled noise levels are often above 65 decibels and in almost all areas are above 50 decibels. The noise contour maps, which show modelled daytime and night-time road traffic noise levels, can be seen in *Chapter 14, Plates 14-4 and 14-5*.

Future Receiving Environment

The Future Receiving Environment was predicted using noise modelling to produce noise contours maps for the Permitted Scenario in each of the Assessment Years, 2022, 2025 and 2035.

For ground noise, due to taxiing aircraft, high daytime noise levels up to 65 decibels would not extend much further than the airport site. Medium noise levels, up to 55 decibels would extend to the west to Shanganhill, to the north to Forrest Great, to the east just past the R132 regional road and to the south up to the M50 motorway. Low noise levels up to 50 decibels would extend to the west to St. Margaret's, to the north to Brackenstown, to the east to Glebe and to the south past the M50 motorway and into Santry. The extent of the areas exposed to the different noise levels would be similar in all Assessment Years but increases from 2022 to 2025. The noise contours maps, which show the modelled noise levels can be seen in *Chapter 14, Appendix 14C, Figures 14C-5, 14C-17 and 14C-29*.

High night-time ground noise levels up to 55 decibels would not extend much further than the airport site. Medium night-time noise levels up to 50 decibels would extend to the west to Shanganhill, to the north to Forrest Little, to the east to the R132 regional road and to the south to Ballymun. Low night-time noise levels up to 45 decibels, would extend to the west to Shanganhill, to the north to Forrest Great, to the east just past the R132 regional road and to the south to the M50 motorway. As for daytime noise levels, the extent of the of the areas exposed to the different noise levels would be similar in all Assessment Years but increases from 2022 to 2025. The noise contour maps can be seen in *Chapter 14, Appendix 14C, Figures 14C-6, 14C-18 and 14C-30*.

Ground noise levels due to road traffic noise would be similar to those for the Current State of the Environment.

Potential Impacts and Effects, Mitigation and Residual Effects

The proposed Relevant Action would not result in any significant effects due to road traffic noise.

In terms of aircraft ground noise, in the 'worst-case' year, 2025, in the daytime, there would be no significant effects.

In 2025, at night-time, 18,312 people would experience slight or greater adverse effects due to increases in ground noise as a result of the proposed Relevant Action. The proposed Relevant Action together with the Apron 5H development would result in 18,821 people experiencing slight or greater adverse effects due to increases in ground noise. However, of these only 62 people would experience significant adverse effects, either with or without the Apron 5H development. The largest predicted noise increase would be experienced by people at Ridgewood and would be about four decibels.

The proposed Relevant Action together with Apron 5H would result in a slight increase in the number of people experiencing slight or greater adverse effects due to ground noise, however the number of people experiencing significant adverse noise effects would remain very low.

The application of the residential sound insulation measures proposed, based on the air noise levels, would reduce the number of people experiencing a significant adverse residual effect at night-time to twelve. During the daytime there would be no significant effects.

With regards to the overall change in noise levels that may be experienced as a result of the overall effects of aircraft noise, ground noise and road noise, the relative contribution to noise levels from the different noise sources is similar for the Permitted and Proposed Scenarios though it varies by location. For all Assessment Years (2022, 2025 and 2035), the overall 24-hour noise level would either remain the same or increase by up to two decibels (2 dB L_{den}) as a result of the proposed Relevant Action. At night-time, the overall noise level would either remain the same or increase by up to five decibels (5 dB L_{night}) as a result of the implementation of the proposed Relevant Action. The greatest increases in total noise, where there is an increase, would be in 2022, with smaller increases in 2025 and 2035.

Terrestrial Biodiversity

Chapter 15 of the revised EIAR: *Terrestrial Biodiversity*, considers the potential impacts and effects of the proposed Relevant Action on terrestrial biodiversity, that is land-based, ecological features.

Methodology

A separate Appropriate Assessment Screening Report has also been prepared for the proposed Relevant Action. This describes the screening exercise conducted, in accordance with the requirements of Article 6(3) of the Habitats Directive, 1992¹⁰, to test whether the proposed Relevant Action, either individually or in combination with other plans or projects, would be likely to have a significant effect on any European statutory designated sites in view of those sites' Conservation Objectives¹¹. European designated sites include, for example, Special Areas of Conservation (SAC) and Special Protection Areas (SPA). The Appropriate Assessment Screening Report concludes that, on the basis of objective information, likely significant effects on European sites from the proposed Relevant Action, both individually and in-combination with other plans and projects, can be excluded.

The study area, adopted for the assessment of impacts on terrestrial biodiversity reported in Chapter 15 of the revised EIAR, was taken to be the airport campus and an area extending up to 5 kilometres from the airport campus boundary. Information on the receiving environment within the study area was obtained from site surveys and desk studies.

The assessment considered the potential for the proposed Relevant Action to result in:

- Noise disturbance to important fauna species as a result of additional night-time flights
- Killing of or injury to important fauna species as a result of additional night-time flights

The assessment took into account a Wildlife Management Plan, which is implemented under licence at Dublin Airport. This prevents flocks of birds such as gulls, waders, geese and swans and/or other animals (e.g. Irish hare) from occurring in areas within which they could present a risk to aircraft.

Receiving Environment

Current State of the Environment

One European site, Malahide Estuary SPA and SAC, is located about 4 kilometres north-east of the airport campus boundary. The SPA and SAC encompasses the estuary, saltmarsh habitats and shallow subtidal areas at the mouth of the estuary. The saltmarshes provide important foraging and roost sites for 14 special conservation interest bird species¹² at high tide. The existing flight path for the airport passes over a small area of the Malahide Estuary, at Burrow Strand.

The landcover within the airport campus is industrial / commercial, comprising the terminals, hangars, piers and support facilities. There are no semi-natural habitats¹³ present within the airport campus boundary which may be affected by the proposed Relevant Action (as land within the airport has been dug up and/ or is under hard-standing). Dominant habitats identified during an ecological walkover survey of the North Runway in March 2020 comprised artificial surfaces (airplane runway and roads), spoil and bare soil and recently seeded sections of amenity grassland, which are all of no or negligible ecological value. No evidence of any protected or notable species were identified during the survey.

Habitat in the surrounding area is largely limited to improved grassland and other agricultural land, dissected by species poor hedgerows and ditches.

¹⁰ Council Directive 1992/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive)

¹¹ Conservation Objectives aim to define the favourable conservation condition for a particular habitat or species.

¹² National Parks & Wildlife Service (2013). Malahide Estuary SPA: conservation objectives supporting document. Version 1. Available online:

https://www.npws.ie/sites/default/files/publications/pdf/004025_Malahide%20Estuary%20SPA%20Supporting%20Doc_V1.pdf

¹³ A semi-natural habitat is defined as: "An ecosystem with most of its processes and biodiversity intact, though altered by human activity in strength or abundance relative to the natural state."

Future Receiving Environment

The continued implementation of the measures under the Wildlife Management Plan together with the continuing intensive use of the airport campus by people and machines is likely to limit any potential increases in terrestrial biodiversity within the airport campus in the Future Receiving Environment. For the purposes of assessing the effects of the proposed Relevant Action, the future receiving environment has therefore been taken to be similar to the Current State of the Environment in all the Assessment Years, 2022, 2025 and 2035.

Potential Impacts and Effects, Mitigation and Residual Effects

The proposed Relevant Action would result in an increase in the number of night-time flights in 2022 and 2025 in the Proposed Scenario. However, given that any faunal species which occur in the vicinity of the airport campus and the North Runway will necessarily be habituated to the presence of aircraft based on the historic activity at the runway and the Permitted Scenario, the Proposed Scenario would result in a negligible change in potential disturbance of faunal species. There would be an imperceptible noise disturbance effect as a result of the proposed Relevant Action.

The number of passengers is expected to return to the 32 million passengers per annum cap in the Proposed Scenario by 2025. A separate planning application will be required to increase the number of passengers above 32 mppa. Fauna in the vicinity of the Dublin Airport would continue to be habituated to aircraft and the difference in magnitude of disturbance between the Permitted Scenario and Proposed Scenario would remain negligible. The residual effect of the proposed Relevant Action due to disturbance would be imperceptible and not significant.

With regards to killing or injury to important fauna species, the implementation of the Wildlife Management Plan would actively prevent flocks of birds and other fauna species which may be considered important from occurring in the vicinity of Dublin Airport. This would be the case under both the Permitted Scenario and the Proposed Scenario. Hence there would be no impacts of this type from the proposed Relevant Action and the residual effects would be imperceptible.

Overall, the proposed Relevant Action would have no residual significant effects on terrestrial biodiversity and no additional mitigation is required.

Aquatic Biodiversity

Chapter 16 of the revised EIAR: *Aquatic Biodiversity*, considers the potential impacts and effects of the proposed Relevant Action on aquatic ecological features.

Methodology

The same study area was used for the assessment of impact on Aquatic Biodiversity as for the assessment of impacts on Terrestrial Biodiversity. That is, the airport campus and an area extending up to 5 kilometres from the airport campus boundary. Information on the receiving environment within the study area was obtained from desk studies which drew on information acquired by previous aquatic biodiversity surveys undertaken in watercourses across the airport. These included surveys required to comply with the planning conditions for the North Runway Planning Permission and historical and ongoing implementation of the Applicant's Wildlife Management Plan.

The assessment considered the potential for the proposed Relevant Action to result in indirect effects from pollution of watercourses as a result of additional flights.

In considering the indirect effects from pollution of watercourses, the assessment took into account the existing drainage network and drainage system which would be in place under the Permitted Scenario once the North Runway is operational. These systems would be in place in both the Permitted Scenario and the Proposed Scenario in all three Assessment Years and include pollution control measures.

Receiving Environment

Current State of the Environment

The Malahide Estuary SPA and SAC is located approximately 4 kilometres east of the North Runway and is the only European statutory designated site within the study area for the Aquatic Biodiversity assessment.

The land uses within the airport are industrial and commercial, comprising the terminals, hangars, piers and support facilities; the North Runway is currently under construction. There are therefore no semi-natural habitats present within the airport boundary which may be affected by the proposed Relevant Action, as land within the airport has been dug up and/or is covered by hard-standing. Habitat in the surrounding area is largely limited to improved grassland and other agricultural land, dissected by species poor hedgerows and ditches.

The airport lies within several watercourse catchments as described under the earlier section on Water. The main surface water course within the airport complex is the Cuckoo Stream. Water quality within Cuckoo Stream is classified as poor and the stream is not known to have any important fisheries or invertebrate populations, due to its historic legacy of poor water quality.

The western end of the North Runway is within the Ward River sub-basin which ultimately discharges to Malahide Estuary SPA and SAC. However, the drainage system for the North Runway diverts runoff from the hardstanding to the Forest Little / Sluice sub-catchment to prevent degradation of the Ward River. The Ward River of moderate water quality and is considered by Inland Fisheries Ireland to be a salmonid river, that is one which can support fish such as salmon, trout, char and whitefish.

Future Receiving Environment

It is assumed that the Future Receiving Environment in 2022, 2025 and 2035 will be similar to the Current State of the Environment

Potential Impacts, Mitigation and Residual Effects

The proposed Relevant Action would not result in any changes to the drainage infrastructure or the associated pollution control infrastructure on North Runway or any other part of Dublin Airport. The net effect of the proposed Relevant Action would be to facilitate recovery in the number of flights permitted to take off from, or land at, Dublin Airport at night in the Proposed Scenario compared with the Permitted Scenario and would facilitate a faster recovery to the 32 million passengers per year cap. Neither the change in the number of passengers nor the increase in the number of night-time flights would have any pollution effect on watercourses at the airport and

consequently there is no scope for an effect on aquatic ecology. Thus, the proposed Relevant Action would have no residual effects on aquatic habitats or ecology in any of the Assessment Years: 2022, 2025 or 2035. No additional mitigation is therefore required.

Landscape and Visual

Revised EIAR Chapter 17: *Landscape and Visual* presents the results of an appraisal of the impacts and effects of the proposed Relevant Action on landscape and visual amenity.

Methodology

The appraisal considered the following types of impacts and effects:

- Potential visual impacts and effects arising from additional flights
- Potential visual impacts and effects from extended hours of lighting

As there would be no physical changes to the current landscape, in including any part of Dublin Airport, for example through the introduction of new structures or changes in ground levels, there is no potential for the proposed Relevant Action to affect landscape character. Therefore, no assessment of impacts and effects on landscape character was undertaken.

The effects of the proposed Relevant Action on tranquillity in important designated landscapes have been considered in a separate report included in the revised EIAR as Appendix 17A.

Receiving Environment

Current State of the Environment

The Fingal Development Plan 2017 - 2023 identifies a number of “Highly Sensitive Landscapes” within four kilometres of Dublin Airport. Highly Sensitive Landscapes are areas which have very high or high landscape value and high or very high landscape sensitivity and are areas of county of national importance. The Fingal Development Plan also identifies ‘Historic Landscape Characterisation’ (HLC) areas. Part of one of these, the Swords designated HLC Area, runs through the northern part of Dublin Airport. The locations of Highly Sensitive Landscapes and Historic Landscape Characterisation areas in the vicinity of the airport are illustrated on Figures 17.1 and 17.2 of the revised EIAR.

Future Receiving Environment

Highly Sensitive Landscapes and Historic Landscape Characterisation areas are afforded protection by national, regional and local planning policy. Given that protection, the Future Receiving Environment it is assumed that the Current State of the Environment will remain unchanged in all three Assessment Years, 2022, 2025 and 2035.

Potential Impacts, Mitigation and Residual Effects

The proposed Relevant Action would not result in any physical change to any part of the airport or its surroundings and would have no impacts on landscape.

Changes to the operation of the North Runway under the Proposed Scenario would result in an increase of about sixty percent in the number of flights at night-time by aircraft which would be visible due to their navigation lights, although there would be generally fewer than 100 flights during between 11pm and 7am. However, given that there would be relatively few observers present at night-time, the visible impact of the additional flights would be imperceptible.

Changes to the operation of the North Runway under the Proposed Scenario would also mean that the ground-based navigation lights at the end of the North Runway would be used for one extra hour each night from 11pm to midnight and also in the morning, when needed, from 6am to 7am. As there would be relatively few observers present at these times, the visible impact of the extended use of the ground-based navigation lights would also be imperceptible.

There would be no significant residual landscape or visual effects as a result of the proposed Relevant Action and no additional mitigation is required.

Land and Soils

Revised EIAR Chapter 18: Land and Soils describes the geology, soils, groundwater resources and present and historic land uses within the airport boundary and in the close surrounding area. The chapter considers the potential impacts and effects from proposed Relevant Action on land and soils.

Methodology

The potential impacts and effects on land and soils considered by the appraisal related to the potential for the proposed Relevant Action to give rise to pollution associated with the additional flights.

As the proposed Relevant Action would not result in any physical changes to any part of the airport or its surroundings, it would not result in any other impacts and effects on land and soils, such as land-take or mobilisation of contamination through groundworks, therefore no assessment of such impacts and effects was undertaken.

Receiving Environment

Current State of the Environment

The geology and soils beneath the airport comprises mainly shales and limestones and glacial till. The majority of the airport is underlain by the Tober Colleen Formation (limestone bedrock). The remainder is underlain by the Malahide Formation (limestone / shale bedrock), and by Waulsortian Limestone (lime / mudstone bedrock). A small portion of the airport is underlain by the Lucan Formation (dark limestone and shale). All of these geological rock formations are of Carboniferous age. Some of the bedrock is locally important as an aquifer (i.e. a groundwater resource).

The bedrock is overlain by glacial till derived from limestones (boulder clay). This is overlain within the airport largely by made ground (disturbed/imported natural soils or man-made/artificial materials). Soils immediately surrounding the airport comprise fine loamy drift material with limestone and has moderate drainage properties.

The bedrock aquifer underlying the airport comprises three different groundwater bodies: the Swords Groundwater Body, the Industrial Facility Groundwater Body; and the Dublin Groundwater Body. The Swords and Dublin Groundwater Bodies are both classified as having 'good' status and 'not at risk'; the Industrial Facility Groundwater body is classified as 'poor; and 'at risk'.

The area occupied by the airport is relatively flat and there is a very low risk of landslide across the airport site.

Before the airport was developed, land in the area was mainly used for agriculture. An airfield was first developed at Collinstown during World War 1. The commercial airport was developed in the late 1930s. Most of the land surrounding the airport is now used for industrial/commercial uses or for agriculture.

Future Receiving Environment

The land environment is not likely to change between now and the Assessment Years of 2022, 2025 and 2035. Thus, the Future Receiving Environment will be largely as described above. In the absence of the proposed Relevant Action, the Permitted Scenario, with its predicted passenger and forecasted air traffic movements will come into effect once the North Runway becomes operational.

Potential Impacts, Mitigation and Residual Effects

The proposed Relevant Action would not pose a significant risk of pollution. The increase in the number of night-time flights in the Proposed Scenario would have no effect on land or soils, since the number and the time of day at which flights operate has little bearing on the volume of pollution in runoff from the runway system. De-icing operations would not be significantly different, and the drainage system is designed to manage runoff from these operations. Furthermore, the drainage system consented as part of the North Runway Planning Permission is sealed to prevent impacts to groundwater and thus indirectly to land and soils. Further information is provided in the revised EIAR *Chapter 12: Water, Sections 12.4 and 12.7*.

Therefore, the proposed Relevant Action would have no effect on land and soils in any of the Assessment Years since the consented drainage system will address any requirements to prevent contamination. No additional mitigation is therefore required.

Material Assets

Revised EIAR Chapter 19: *Material Assets* considers the potential impacts and effects of the proposed Relevant Action on material assets which include waste and built services, that is: waste, gas, electricity and potable water; surface water; and foul drainage. Effects on traffic and transport are considered in revised EIAR *Chapter 9: Traffic and Transport*. Surface water and wastewater are also considered in revised EIAR Chapter 12: *Water*.

Methodology

The qualitative assessment considered the following potential impacts and effects:

- Potential increase in the use of gas and electricity by additional passengers
- Potential increased usage of water by additional passengers
- Potential increased generation of wastewater by additional passengers
- Potential increase in waste generated by additional passengers

As the proposed Relevant Action would not result in any physical changes to any part of the airport or its surroundings, it would not result in any other impacts and effects on material assets.

Receiving Environment

Current State of the Environment

The material assets environment relates to waste, electricity supply, gas supply, drinking water supply, surface water and foul drainage:

- Gas: Dublin Airport consumed some 39,053,010 kWh of gas in 2018 when the airport was operating close to the 32mtpa Cap. By 2020, reflecting the impact of the Covid-19 pandemic, this consumption had declined to 30,663,819 kWh. This is accounted for by the need to heat the terminal buildings irrespective of how many passengers are using them.
- Electricity: Electricity consumption at the airport in 2018 was 46,617,349 kWh and 34,019,557 in 2020. As with the figures for gas consumption, it is notable that the decline in consumption is not proportional to the decline in passenger throughput.
- Drinking Water: In 2018 some 392,404 m³ of water was used by Dublin Airport, according to data provided by the Applicant. This figure had fallen to 186,897 m³ in 2020, a much bigger decline proportionally than seen in the gas and electricity consumption figures. This indicates that water consumption is more sensitive to the number of passengers using the airport than gas or electricity.
- Waste: Dublin Airport is located within the Eastern and Midlands Waste Region and is managed by Dublin City Council, the Waste Enforcement Regional Lead Authority (WERLA). In terms of waste management, the WERLA is responsible for implementing the Eastern-Midlands Region Waste Management Plan 2015-2021 (EMRWMP), as well as setting priorities and common objectives for waste enforcement within the region.
- Waste management in Dublin is largely governed by the requirements set out in the EMRWMP. The EMRWMP addresses all areas of waste management, from waste prevention and minimisation, to its collection treatment, recovery and final disposal. WERLA has set a target of 70% for the reuse, recycling and material recovery of man-made construction and demolition waste (excluding soil and stone) by December 2020.

Future Receiving Environment

As passenger numbers rise at Dublin Airport it is expected that the quantity of waste generated will also rise. Dublin Airport has a target of "Zero Waste to Landfill" which was first achieved in 2016 and is a key part of the Airport's waste management strategy, referenced in the latest Sustainability Report¹⁴. A recent target in respect of waste is to achieve 50% of waste recycled by 2020 (at the time of writing the Applicant had not yet published data on progress against this target). Recycling rates have improved from 11% in 2013 to 42% in 2019.

For the purposes of the revised EIAR, it was assumed that the Future Receiving Environment would evolve in line with the Applicant's sustainability targets. These point to a significant decline in the use of non-renewable sources of power such as gas by 2035, improvements in recycling rates and movement to a circular economy. In the absence of the proposed Relevant Action, the Permitted Scenario, with its predicted passenger and ATM forecasts, will come into effect once the North Runway becomes operational.

Waste Minimisation Plan

The Applicant has recently submitted a Waste Minimisation Plan to Fingal County Council (FCC) as required by the Dublin Airport Local Area Plan. Policies WM01 and WM02 of the Local Area Plan cover waste management and the circular economy and are to "support, where appropriate, the provision of proposals to aid the transition from a waste management economy to a green circular economy" and "promote a waste prevention and minimisation programme to target all aspects of waste in the LAP boundary area, focusing on all airport, commercial and domestic waste producers" respectively.

The Dublin Airport Local Area Plan can be viewed at:
<https://www.fingal.ie/dublin-airport-local-area-plan-2020>

Potential Impacts Mitigation and Residual Effects

The proposed Relevant Action would facilitate an increase in the number of flights at Dublin Airport during the night-time and overall, however this would not facilitate an increase in passenger numbers beyond 32 million passengers per year. Therefore, whilst the proposed Relevant Action may cause some slight differences in the quantities of certain material assets consumed, it would not result in a net increase in consumption of any material assets when comparing the Permitted Scenario and the Proposed Scenario in any of the Assessment Years. All effects of the proposed Relevant Action on material assets would be imperceptible. There would therefore be no significant effects on material assets. No additional mitigation is required.

¹⁴ <https://www.daa.ie/wp-content/uploads/2020/10/Dublin-Airport-Sustainability-Report-Final.pdf>

Cultural Heritage

Chapter 20 of the revised EIAR considers the potential impacts and effects of the proposed Relevant Action on cultural heritage.

Methodology

The study area for the cultural heritage assessment incorporates all airport lands and the immediate vicinity. Information on recorded heritage assets within the study area was obtained from the records of the National Monuments Service, Fingal County Council and the Heritage Council.

The assessment considered the potential for the proposed Relevant Action to cause physical effects on heritage receptors as a result of changes in the numbers of passengers using the airport and/or to affect the setting of heritage receptors due to the additional night flights.

Receiving Environment

Current State of the Environment

Cultural heritage assets identified within the study area included archaeological sites and architectural heritage (Protected Structures and National Inventory of Architectural Heritage). The locations of these assets are shown on Figure 2 of this Non-Technical Summary and on EIAR *Figure 20.1 – Cultural heritage assets within Dublin Airport and vicinity*.

There are no National Monuments within the study area. The closest National Monument to Dublin Airport is HA2 Dunsoghly Castle, a 15th century tower house located within a farmyard about 1.5 kilometres west of the airport.

There are four heritage assets recorded on the Record of Monuments and Places which are within the grounds of Dublin Airport and a further three assets in close proximity outside the airport boundaries. The assets within the grounds of Dublin Airport are: HA6 Corballis Castle (DU014-011), HA5 and enclosure (DU014-008), HA8 a house (DU014-040) dating to the 16th or 17th centuries and HA29 a ring fort (DU011-046). The locations of all these assets are now beneath the airport runway, airport buildings or airport lands.

There are also four recorded Protected Structures within the airport boundary. These are: HA14 Old Central Terminal Building (RPS 612), HA16 the Church of our Lady Queen of Heaven (RPS 864), HA24 Castlemoate House (RPS 611) and HA27 the former Cloghran Stud Farm (RPS 606).

Further details of the heritage assets within the study area are provided within *Chapter 20: Cultural Heritage - of the revised EIAR*.

Future Receiving Environment

New cultural heritage assets may be designated or discovered in future. However, this is not possible to predict. Therefore, with regards to heritage assets, the Future Receiving Environment is considered likely to be substantively the same as the Current State of the Environment.

Potential Impacts, Mitigation and Residual Effects

The increase in the number of passengers using the airport as a result of the proposed Relevant Action, would have no impact on cultural heritage assets outside the airport boundary. Within the airport boundary there would be a higher number of passengers using the airport in Assessment Years 2022 and 2025 under the Proposed Scenario as compared to the Permitted Scenario, but this difference would only be temporary. By 2027 passenger numbers would be the same in both the Permitted and Proposed Scenarios, so there would be no difference in passenger numbers by Assessment Year 2035. The temporary difference in passenger numbers is unlikely to have a material effect on heritage receptors within the airport boundary, particularly as in both scenarios only a very small proportion of passengers ever interact with heritage receptors at the airport.

The increase in the number of night-time flights under the Proposed Scenario would have little if any effect on the setting of cultural heritage assets. As there will be no new flight paths under the Proposed Scenario for all Assessment Years, any potential impact on setting would continue to affect the same heritage assets. The only

variable would be the time of day in which such overflights would occur. In the Proposed Scenario there would be more flights at night-time but less during the day. Whilst this might have a lesser impact on the setting of cultural heritage assets than under the Permitted Scenario, the beneficial effect would be imperceptible.

Overall, the proposed Relevant Action would have no residual effects and no significant effects on cultural heritage in any of the Assessment Years, 2022, 2025 or 2035. No additional mitigation is required.

Interactions and Cumulative Effects

Chapter 21: Interactions and Cumulative Effects in the revised EIAR assesses the effects due to interactions between different types of impacts and the cumulative effects of the proposed Relevant Action in conjunction with other proposed developments. These two types of environmental effects are defined as:

- Interactions – ‘intra-project’ effects that result from the interaction of several different impacts (for example noise, air quality) of the proposed Relevant Action. Individually the effects resulting from these impacts may not be significant, but the accumulation of effects may collectively cause an overall significant effect
- Cumulative effects: these ‘inter-project’ effects occur when the environmental impacts and effects of the proposed Relevant Action interact with those associated with other planned projects and developments and result in significant effects

Methodology

The assessments of interactions and cumulative effects consider all the residual effects identified by the individual technical assessments (Chapters 7 to 20), excluding those which are classified as ‘imperceptible’. For the purposes of the assessment of interactions and cumulative effects, 2025 has been chosen as the assessment year as this would be the first year of highest use of the runway system in the Proposed Scenario (i.e. when 32 million passengers per annum is expected to be reached but not exceeded) and would also be the year of predicted maximum environmental effects in the Proposed Scenario.

The only residual effects of the proposed Relevant Action which are classified as greater than imperceptible are those relating to air noise and to ground noise.

Only those receptors identified in multiple assessments and which would therefore be subject to multiple types of effect would be subject to interactions. The assessment of interactions was therefore limited to consideration of human receptors (residents and local community, including those using schools, healthcare facilities and places of worship) who could be affected by:

- Air noise impacts from aircraft as a result of changes in aircraft noise patterns
- Ground noise as a result of changes to operations at the airport

Cumulative effects on population and human health would be due to air and ground noise impacts and are therefore encompassed within the consideration of air and ground noise effects. The assessment of cumulative effects therefore considered effects due to noise only.

Other third-party developments which could give rise to cumulative effects in conjunction with the proposed Relevant Action were identified by a search of all planning applications within a study area around Dublin Airport where noise levels as a result of the proposed Relevant Action would be 40 decibels or more at night (40dB L_{night}). World Health Organisation guidelines are that night-time aircraft noise above forty decibels is associated with adverse effects on sleep. Noise levels above 40 decibels could result in annoyance or sleep disturbance due to noise.

One hundred and eighty-six third-party developments were identified in the study area. Seven of these were also within an area where the proposed Relevant Action would result in an increase in noise level of three decibels or more. An increase in noise levels of three decibels or more represents a medium increase in noise levels and could result in an effect which is greater than imperceptible. Those seven developments were therefore included in the cumulative effects assessment as having the potential to result in significant cumulative effects.

Potential Impacts, Mitigation and Residual Effects

The proposed Relevant Action would result in greater than imperceptible effects on residents due to increases in noise levels from airborne aircraft resulting in increased annoyance and sleep disturbance. The greatest increases in noise levels would be at night-time, towards the north, east and east-north-east of the airport, in the vicinity of Ridgewood; Swords; Malahide Castle; and Malahide South. Increases in noise levels due to ground noise would generally be very low during the daytime and low at night, although there would be a moderate effect on residents

in the vicinity of Ridgewood. The revised EIAR *Chapter 14: Ground Noise and Vibration*, considers the potential contribution of air noise and ground noise from aircraft and road traffic to overall noise levels and the effect that the proposed Relevant Action, together with the Apron 5H development, would have on the overall noise levels at sensitive receptors. At Ridgewood, where the greatest changes in night-time noise levels would be experienced, the increase in overall night-time noise, due to the proposed Relevant Action is predicted to be 5 decibels in 2022 and would reduce to 3 decibels in 2035. This represents a medium overall impact and would result in a moderate effect (not significant). Therefore, there would be no significant interactions as a result of the proposed Relevant Action.

The proposed Relevant Action would not result in any significant cumulative effects. The seven other developments within the study area and within the area where noise increases of three decibels or more would occur as a result of the proposed Relevant Action, either: have limited potential to generate noise impacts; or would only be operational outside the additional hours of operation proposed under the proposed relevant Action; or are subject to planning conditions which will mitigate and control any potential noise impacts from those developments. There is therefore limited potential for cumulative noise effects and there would be no significant cumulative noise effects.

Summary and Conclusions

The proposed Relevant Action would amend condition number 3(d) and replace condition number 5 of the North Runway Permission. If permitted, it would change the average number of flights that would be allowed between 11pm and 7am by replacing the numerical cap on flights with an annual 'night-time noise quota' between 11.30pm and 6am. It would also change the normal operating hours of the North Runway by allowing flights to take off from and/or land on the North Runway for an additional two hours daily, from 11pm to midnight and from 6am to 7am. There would be a faster return to the 32mppa cap with the proposed Relevant Action in place than without.

The proposed Relevant Action also proposes new measures to monitor and reduce the impact of aircraft noise. These are:

- A noise insulation grant scheme for eligible dwellings
- A detailed 'Noise Monitoring Framework' under which noise levels would be monitored and results would be reported annually to the Aircraft Noise Competent Authority

The proposed Relevant Action is necessary to allow the airlines to maintain competitive levels of aircraft operation, to achieve the objectives set in the National Aviation Policy and to prevent negative economic impacts on the local and national economy of Ireland.

The table below summarises the significant residual effects associated with all the environmental assessments that are presented within the revised EIAR.

Environmental topic area	Receptor	Residual effect of proposed Relevant Action
Population and Human Health		
Population	Amenity and Local Communities	Moderate adverse due to aircraft noise
Human Health	Air Quality, Noise and Neighbourhood Amenity	Negative
Air Noise and Vibration		
Changes in annual average 24-hour noise level with potential to result in annoyance due to noise	Residential receptors	2022: beneficial effects on fewer than 100 people
		2025, 2035: adverse effects on fewer than 100 people
Changes in annual average night-time noise level with potential to result in sleep disturbance due to noise	Residential receptors	2022: adverse effects on 9,000 people
		2025: adverse effects on 10,000 people
		2035: adverse effects on 4,000 people
Ground Noise and Vibration		
Changes in annual average night noise level with potential to result in sleep disturbance due to noise ¹	Residential receptors	Significant adverse effects for 9 people

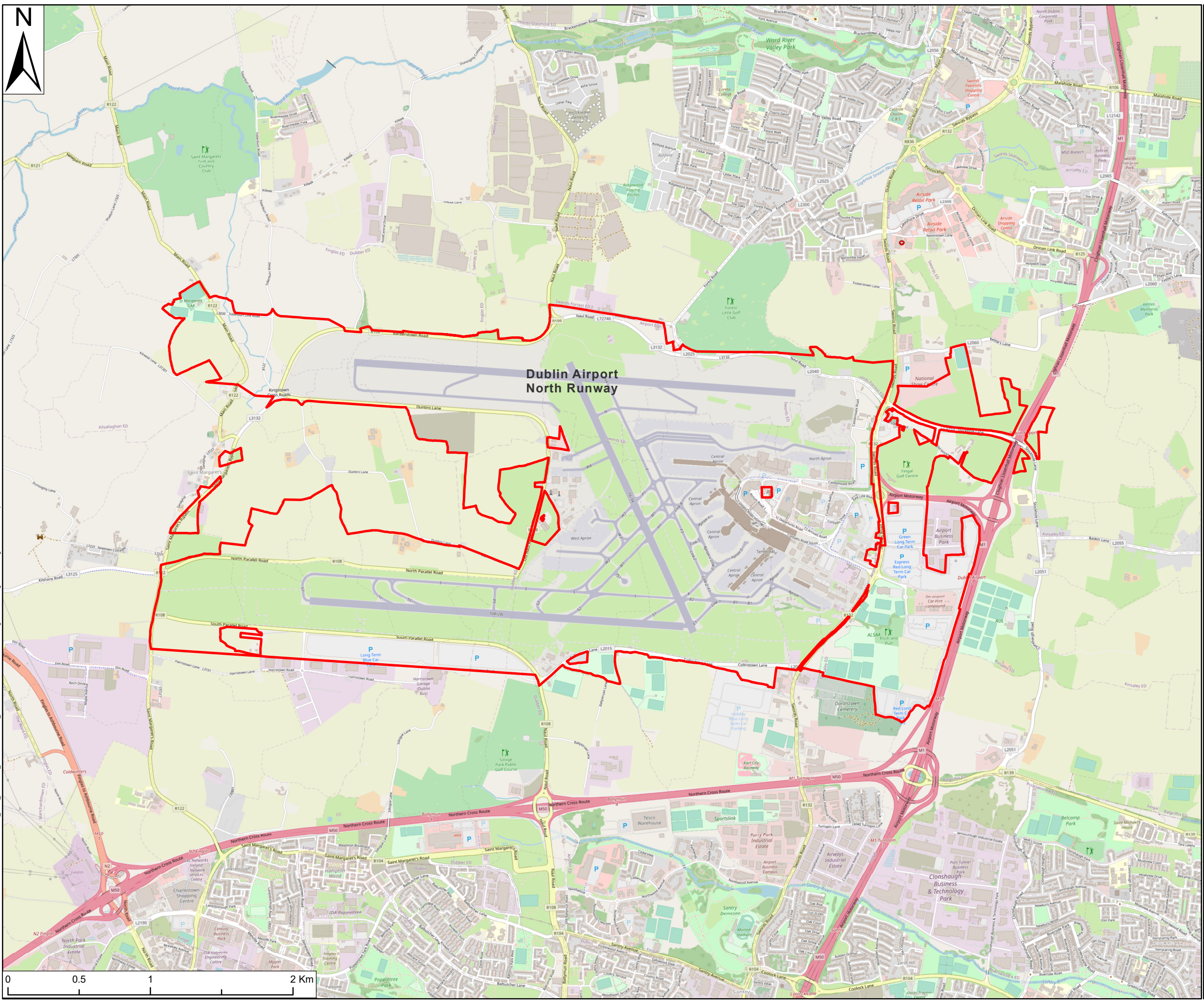
¹ For the proposed Relevant Action together with Apron 5H

Future Development at Dublin Airport

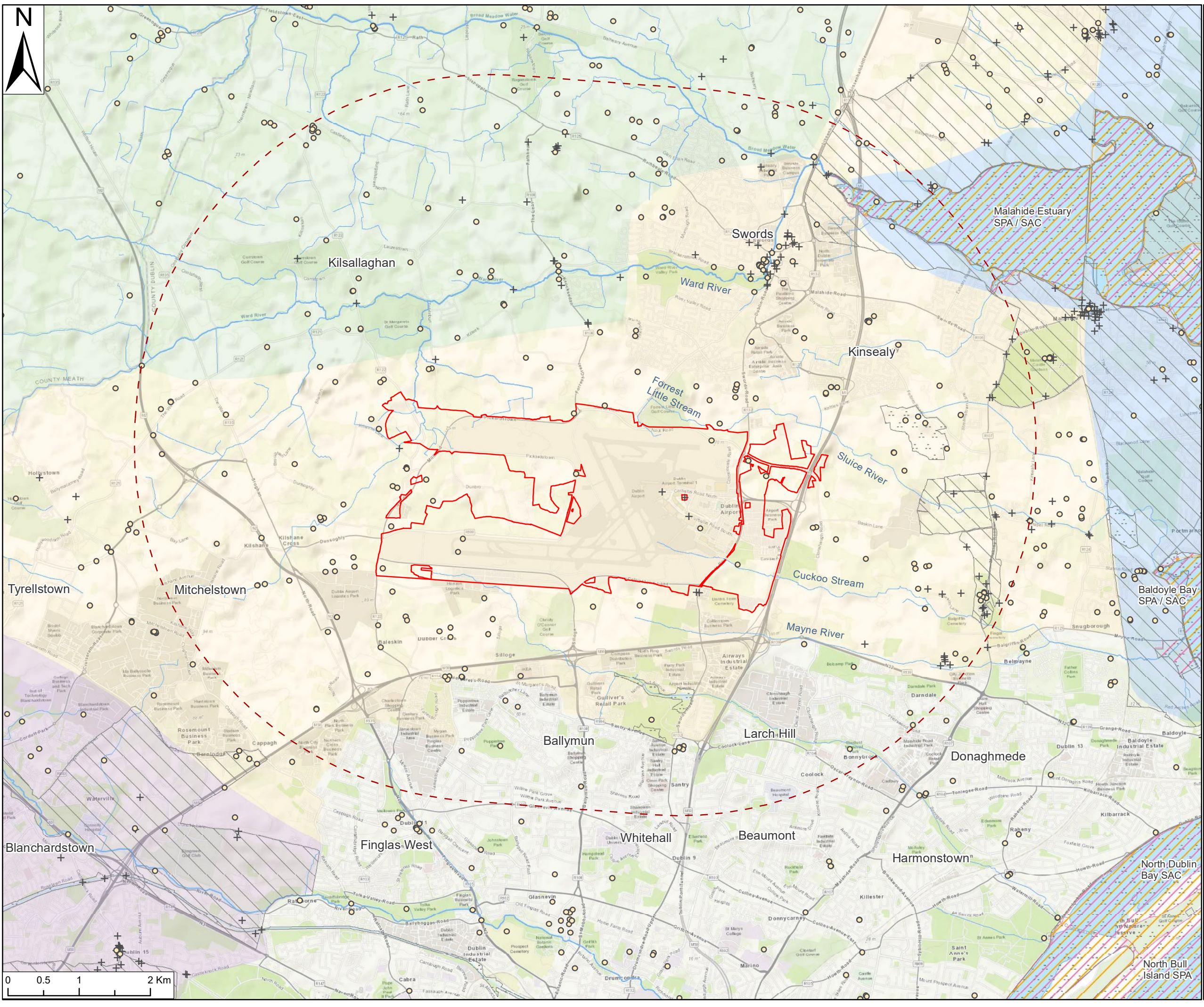
The growth of Dublin Airport is mandated by government policy, as well as national, regional and local planning policy. The proposed Relevant Action seeks to amend and replace planning conditions associated with the operation of the runway system and does not seek to lift the 32 million passengers per year cap on the number of passengers passing through the airport terminals. Nevertheless, if consented, the proposed Relevant Action may influence the way the runway system operates into the future, including any increase in runway operations which may be permitted.

There are development proposals currently in pre-design and feasibility stage which may seek planning permission for future airport growth to 40 million passengers per year. These may include proposals for airport infrastructure required to accommodate this growth. These future development proposals will require a grant of planning permission in order to be realised, which in itself will entail planning and environmental impact assessment.

As a standalone proposal, the proposed Relevant Action is not reliant on future airport growth nor is future airport growth dependent upon the proposed Relevant Action. Nonetheless, as future expansion could affect the future receiving environment, some consideration has been given within the revised EIAR to potential environmental impacts which could be associated with future development at the airport. This is presented in the revised EIAR *Chapter 22: Future Development Plans*.



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LEGEND

- daa Site Boundary
- - - North Runway 5 km buffer
- Watercourses
- Historic Sites and Monuments
- ⊕ Inventory of Architectural Heritage Sites
- Natural Heritage Area
- Sensitive Landscapes
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

Landscape Character Areas

- Coastal / Estuary
- Low Lying Agricultural
- River Valleys / Canal
- Rolling Hills with Tree Belts

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 60586397

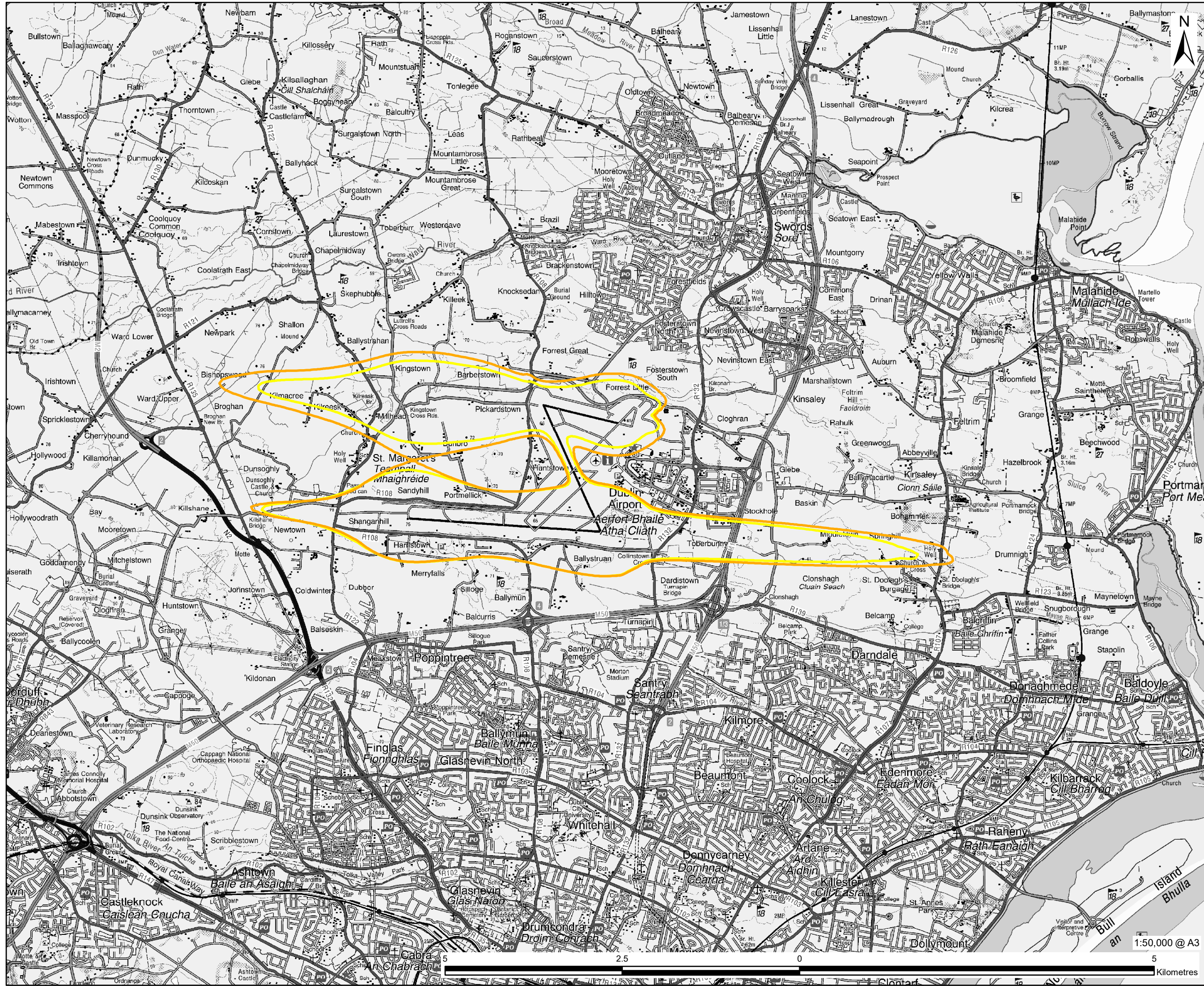
Drawing Title:
 ENVIRONMENTAL
 CONTEXT PLAN

Scale at A3: 1:50,000

Drawing No:
 NTS FIGURE 2

Drawn: Chk'd: App'd: Date:
 DG SW DG 17/08/21

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PROJECT
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 Relevant Action



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LEGEND

- 2025 Proposed
- 2025 Permitted

NOTES

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ISSUE PURPOSE
 FINAL
PROJECT NUMBER
 60601864
FIGURE TITLE
 65dB Lden Noise Contours

FIGURE NUMBER
 Figure 3

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LEGEND

- 2025 Proposed
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NOTES

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ISSUE PURPOSE
 FINAL
PROJECT NUMBER
 60601864
FIGURE TITLE
 55dB Night Noise Contours

FIGURE NUMBER
 Figure 4

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