

File With

SECTION 131 FORM

Appeal No

ABP— 314485-22

Defer Re O/H

☐

Having considered the contents of the submission dated/received 14/12/2023
from Thomas Fee I recommend that section 131 of the Planning
and Development Act, 2000 be/not be invoked at this stage for the following reason(s):

~~no new material issues~~

Section 131 not to be invoked at this stage.

☒

Section 131 to be invoked — allow 2/4 weeks for reply.

☐

Signed

Pat B

EO

Date

21/12/2023

Signed

SEO/SAO

Date

M

Please prepare BP — Section 131 notice enclosing a copy of the attached submission.

To

Task No

Allow 2/3/4 weeks

BP

Signed

EO

Date

Signed

AA

Date



Planning Appeal Online Observation

Online Reference
NPA-OBS-002974

Online Observation Details

Contact Name
Tom Fee

Lodgement Date
14/12/2023 13:30:39

Case Number / Description
314485

Payment Details

Payment Method
Online Payment

Cardholder Name
Tom Fee

Payment Amount
€50.00

Processing Section

S.131 Consideration Required

☒ Yes — See attached 131 Form

☐ N/A — Invalid

Signed

Pat B

EO

Date

21/12/2023

Fee Refund Requisition

Please Arrange a Refund of Fee of

€

Lodgement No

LDG— 068826-23

Reason for Refund

Documents Returned to Observer

☐ Yes ☐ No

Request Emailed to Senior Executive Officer for Approval

☐ Yes ☐ No

Signed

EO

Date

Finance Section

Payment Reference

ch_3ONEzrB1CW0EN5FC1IPqwzDL

Checked Against Fee Income Online

EO/AA (Accounts Section)

Amount

€

Refund Date

Authorised By (1)

SEO (Finance)

Authorised By (2)

Chief Officer/Director of Corporate Affairs/SAO/Board Member

Date

Date

Observation on Planning Appeal: PL06f.314485

- **Planning Authority:** Fingal County Council
- **An Bord Pleanála appeal case number:** PL06F.314485
- **Planning Authority Case Reference:** F20A/0668
- **Location of Planned Development:** Dublin Airport

Name: Thomas Fee

Address: 47 Carrickhill Heights
Portmarnock
Co. Dublin
D13X261

Observation on the Planning Appeal

My name is Tom Fee. I am a resident in Portmarnock adversely affected by aircraft noise. I am a professional Risk Manager and a Mathematician and I have developed and validated statistical and simulation models in a highly regulated sector, to internationally established standards, for over 30 years. My observations, in large part, relate to the modelled simulations supporting the relevant application and can be summarised as:

- The modelled forecasts relating to aircraft noise and its impact are evidentially unreliable, misleading and inadequate to support the changes proposed in the relevant application
- The modelled approach, to achieve a level of aircraft noise that appears acceptable, is heavily reliant on redistribution of noise (which would be facilitated by the relevant application) in a way that is diametrically at odds with the WHO Guidelines of 2018 and the European Noise Directive.
- All parties are agreed that the relevant application changes would facilitate more aircraft noise being generated at night than under the current restrictions. More noise at night is internationally accepted as being correlated with more sleep disturbance. When the modelling shows the opposite result, as it does in the relevant application, it requires the modelling and supporting materials and rationale to be evidenced as robust and sound and the results explainable. This is not evidenced in the relevant application.

Key Observations (with further supporting materials in appendices)

Context:

The level of aircraft noise we are experiencing in Portmarnock and in other communities since the introduction of the North Runway is much greater than residents could have expected and the proposed changes to planning restrictions will have the dual effect of supporting existing flight paths that were never assessed for adverse impacts and of making their impact worse.

Observations on the proposals and supporting information submitted to ABP:

1. **The two aircraft movement restrictions that are proposed to be removed and replaced in the planning application are currently the ONLY two provisions providing protection against dangerous concentrations of aircraft noise at night. If the proposed changes proceed they expose communities across Fingal and Meath to the prospect of virtually unlimited concentrations of aircraft noise at harmful levels during the hours of night.**
 - a. The proposed night noise quota would allow as many as 178 737-800's (the preferred aircraft in Ryanair's fleet currently by way of example) or c360 737-Max's, which are growing in use but only slightly quieter, every night of the year. Either of these type of aircraft will generate noise levels above the WHO strong guidance (2018) during landing and take-off, for affected communities.
(Ref: Appendix 1)
 - b. Internationally, the noise quota systems are used to restrict the use of the loudest planes but recognised not to restrict the overall noise nuisance unless they are used in conjunction with other limits and particularly a limit on movements also. That is because the decibel ranges are turned into points and at the upper and lower end of the points, the ranges are unlimited (Ref: Appendix 1). So, in theory:

- the noise of a jet flying in excess of the sound barrier at 300ft, noise that could awaken all of Dublin, could get the same 16 points as an old heavy 747 coming in to land (>101 EPNdB = 16 points; note that same 16 points for 1 noisy old plane would allow 128 737-max-8's that are also noisy).
- a single aircraft generating over 114db SEL could attract the same 65 Lden/lnight as 100 aircraft generating over 94db SEL (this is an example taken from the US FAA website as they explain policy and illustrate the limitations of metrics) (Ref: Appendix 2)

2. The data and calculations underpinning the assessments of the potential impact of the changes are evidentially unreliable for the purposes of making any significant decision such as changes to existing operating restrictions protecting Health and Safety of the public.

- a. The noise contours used are generated using models developed and run by the applicant that have not been independently validated as reliable for the purpose they are being put to. The high level review by Noise Consultants Limited (NCL) commissioned by ANCA, in the application papers, does not include:
- Assessment of Input data accuracy and completeness
 - Assessment of impact of all modelling assumptions
 - Assessment of impact of output modelling adjustments
 - Assessment for impact of model implementation errors (The NCL review takes comfort from the fact that AEDT standard software has been used in keeping with international standards but fails to follow-up on how this has been configured or to point out there are thousands of configurations of such software internationally done by the local modellers which may be subject to multiple errors in applying the regulatory guidance)

There are no papers showing that model validation and quality assurance has been adequately done, and evidenced, by anybody including the DAA modelling team

- b. As the models are creating simulations of what might happen (or might have happened for historical contours) the information should include - but does not - evaluations of variability and key sensitivities. Internationally, these models are known to sometimes show wide variability to actual experience and to be very sensitive to several variables including deviation to core expected flight path.
- One would expect to see the impact of one and two standard deviations of key input data variation to the contours and that sensitivity extrapolated to the number of people assessed as annoyed/disturbed
 - One would expect to see forecast flightpaths/routes being 'distributed' around the core path for generating contours and number of people highly annoyed/disturbed (best practice is to have as many as 7 flight paths modelled around the backbone route and/or a gaussian distribution of expected variation around the central route – this is not evidenced)
 - European Civil Aviation Conference (ECAC who provide the detailed guidance for the implementation of aircraft noise measurement across Europe) state in their Dec 2016 'Report on Standard Method of Computing Noise Contours around Civil Airports' that "average noise levels calculated on the assumption that aircraft follow the nominal routes exactly can be liable to localized errors of several decibels"

- c. The model simulations are supposed to be validated and calibrated with reference to the actual noise measured by noise tracking stations around the airport. The only validation of this sort, referenced in the Noise Consultants Limited (NCL) review commissioned by ANCA, shows the modellers only used 3 of the Noise Trackers available (there are up to 18 now) closest to the end of the runway and for only two months in 2018 (Jan and Dec). This is not adequate to extrapolate validation across the entire flightpaths affecting communities in 2018, or across the entirety of the year (given meteorological conditions have a significant influence on noise) in Fingal and Meath or for the North Runway flightpaths which did not exist in 2018.
 - d. The assessment of a decrease in people affected by harmful levels of noise is with reference to 2018 (ANCA reporting references 2019). There is no comparison offered or independent check made to ensure the models applied each year since 2018/2019 and those generating the forecasts use the same modelling assumptions, methodological adjustments, output adjustments etc... There is no assessment showing what differences changes in the modelling to the model assumptions or methodologies or data quality over time have had on generating the expected reduction. Changes to models or model assumptions (choices and changes often made by the modelling practitioners) when run for different periods could account for all of the differences in outcome results.
3. **The choice of metrics used in the assessment of the impact of the relevant application on the health of affected communities, and the approach chosen to 'averaging' applied to these metrics, has the effect of supporting an increase in the number of people exposed to harmful levels of noise while appearing to reduce it. These measurement choices taken by DAA and ANCA are at odds with international guidance and practice. The metric choices and averaging are also presented as if they are the only option available to DAA whereas this is evidentially incorrect and consequently generates a misleading body of evidence.**
- a. The measures Lden and Lnight are used to generate an assessment of the number of people Highly Annoyed (HA) and Highly Sleep Disturbed (HSD). These are the measures required by World Health Organisation and for which they have provided Strong Guidelines with respect to Aircraft Noise (2018). However the definition of Lden (or form of it) defined by WHO is different to the one used by DAA and ANCA who use a version from the European Noise Directive (END) for the purposes of international policy and comparisons using Strategic Contours across all noise types. The END requires all countries to average Lden over 365 days of an average year, the WHO does not require this. There is a big difference! This is a case of apples and oranges (Ref; Appendix 1) and when combined with redistribution of noise across flightpaths and runways, it results in the dilution of the harmful concentrations of noise such that there appears to be very few.
 - b. If a population group are subject to high levels of noise 4 days per week say, every week. The appropriate Lden average is to discount the 3 days and average the 4 days for every week of the year while noting that this level of annoyance/disturbance happens 4 days out of 7 (this sort of approach is described also in European Civil Aviation Conference (ECAC) guidance). Similarly, if a population group is subject to high noise levels for 3 months of the year when a supplementary runway is used for

holiday traffic, then the appropriate Lden average is the Lden over those three months, not Lden365, while noting that this level of potentially harmful noise happens during these 3 months. (this is similar to an approach taken in UK where they use an Lden averaged over the 92 days of peak summer traffic (and set restrictions based on it) in conjunction with other measures. In each of these cases the DAA and ANCA calculations would average the effects as if they were happening across 365 days of the year and would result in showing these populations being exposed to a much lower level of noise.

- c. All of the regulations and guidelines allow for and encourage the use of additional metrics relevant to the noise type and local circumstances, for noise management and assessment of impact on communities. There is therefore no impediment to generating metrics that allow consistency when combining across regulations and guidelines to manage risks. The Lden365 measure is required to be measured and reported to EC and to be used in assessing health impacts. That does prevent
- d. The ISO 1996-1 standard for calculation of Lden/night does not require averaging over all the days of a year – averaging in that form is only a regulatory requirement for reporting (European Noise Directive END) which enables lowest common denominator comparisons across the 33 EEA and 6 additional countries that participate in the comparisons of Noise data across countries, populations and noise source types. (Ref: Appendix 3)
- e. The WHO Environmental Noise Guidelines of 2018 which DAA and ANCA reference in their planning and forecasts gives the precise definition of Lden and Lnight to be used in conjunction with their recommendations (consistent with ISO 1996-1) and it does not require Lden and Lnight to be averaged over all the days of a year. The WHO Environmental Noise Guidelines further state ‘the best noise indicator is the one that performs best in predicting the effect of interest’ (Ref: Appendix 4)
- f. Irish regulations and the international regulations guiding Irish law/regulation on managing the harmful effects of aircraft noise also allow for and encourage the use of additional metrics to Lden/night (as defined in the regulation); they provide some examples of supplementary metric use such as when ‘the noise source under consideration only operates for a small proportion of the time’. They also give the example of using Lmax ‘for night period protection in the case of noise peaks’. Lmax is a commonly used aircraft noise metric as, combined with the number of movements above a threshold, this allows for limits to be put on the number of opportunities for awakenings during the hours of night. (Ref: Appendix 5)
- g. The European Civil Aviation Conference (ECAC) guidelines on calculation of aircraft noise contours around civil airports also defines Lden/night per the ISO 1996-1 standard and does not require averaging over 365 days again emphasising that the annual average is solely a minimum reporting standard under separate legislation for a separate purpose (END). (Ref: Appendix 6)
- h. ECAC guidelines give examples of how the core metrics (Lden/night) are applied in appropriate but different ways and/or supplemented/replaced by other metrics for

managing aircraft noise in Germany, France, Netherlands, UK, Switzerland and Norway (Ref: ECAC-Doc_29_4th_edition_Dec_2016_Volume_1_Appendix C)

- i. The use of Lden/night averaged over 365 days is not promoted as an adequate metric alone for managing aircraft noise in relevant legislation. Lden/night metrics may be averaged over any period that is relevant to the noise hazard.
- j. By choosing to take the noise (Lden) experienced by aircraft taking off on the North Runway c30% of the time (wind blowing from east) and averaging it as if it were happening 100% of the time, it clearly dilutes the effect. This means that communities experiencing damaging levels of noise 30% of the time can appear not to experience damaging levels at all. To take an analogy – if we were to expose 50% of the population to dangerous radiation for half of the week and 50% to dangerous radiation for the other half of the week but average the radiation for each sub-population over the full week such that it was below the dangerous level... it would not protect either communities from cancer. Distribution of noise is one of the key strategies that is openly applied to reduce the number of people counted as Highly annoyed/Sleep disturbed. That only works due to this specific limited choice of metrics and their averaging. This is at odds with the objective of reducing the number of people exposed to harmful levels of noise.
- k. The incorrect conflating of the Lden form required by the European Noise Directive (Lden365) with the guidelines from the WHO based on the core ISO definition of Lden undermines the ‘strong recommendations’ of the WHO in relation to aircraft environmental noise and is mis-leading to affected residents and policy/decision makers.
 - o WHO: ‘A strong recommendation can be adopted as policy in most situations. The guideline is based on the confidence that the desirable effects of adherence to the recommendation outweigh the undesirable consequences. The quality of evidence for a net benefit – combined with information about the values, preferences and resources – inform this recommendation, which should be implemented in most circumstances’
- l. Averages are not generally used in calculating risk relating to health and safety (e.g. in the aircraft engine industry the tolerance for failures has long been based on span – a measure of the occurrence of the extremes – and concentrations/cluster analysis). To apply only an average of averages (Lden365) to assess the number of people exposed to harmful levels of aircraft noise is fundamentally unsafe.
- m. The recent results of the modelling with respect to the number of people annoyed or disturbed by aircraft noise close to Dublin Airport are at odds with what is evident on the ground and this should raise a RED flag requiring proper independent assessment of the approach to modelling the noise impact.
 - o The EIAR update of Chapter 13 undertaken by Billerdicke and Allen (B&A) notes that the results of the modelling undertaken shows that the number of people Highly Sleep Annoyed (based on the 365 average version of Lden) will have reduced by 50% from 2018 in 2025. They also state that due to faster recovery post covid the 2025 results will happen about two

years early in 2023 (i.e. now). The ANCA noise abatement report issued in July 2023 (on their website) based on the same data and modelling also shows the 2022 number of people Highly Annoyed had reduced by 55% since 2019 (thereby already exceeding their 2050 target in just two years).

- This exceptional reduction in the number of people counted as Highly Annoyed has been achieved through the models and modelling choices (including metrics) despite an increase in passenger numbers and flight movements and the introduction of the new runway bringing flights over new urban concentrations with a massive increase in the number of complaints and public protests about increased noise annoyance.
- The scale of the decrease in HA/HSD already achieved (based on model results) in just two years, renders much of the analysis irrelevant as almost any scenario will show a reduction in 2035 compared to 2018 even with noise increasing over coming years.
- This alone should be a RED flag that the models including the choice of metrics, assumptions and adjustments do not appear to be working as they should. They are unsafe unless/until they are validated to international standards by competent and independent specialists.

4. The strategy being pursued by DAA for managing down the level of those Highly Annoyed and Highly Sleep Disturbed to achieve the forecasts in the 'relevant application', heavily relies on redistribution of noise across communities, (while the overall amount of noise increases). The EIAR new Chapter 13 section on modelling prepared by B&A describes 'net' reductions i.e. some people will have increased exposure to noise and some would have a relative decrease (acknowledging that overall noise is accepted as increasing). This re-distribution however is precisely at odds with the WHO 2018 Guidance and the European Noise Directive (which Ireland is required to implement):

- a. In a meeting with Portmarnock Residents on 24/11/23 ANCA advised that the key expected drivers of the DAA achieving aircraft noise reductions required by their NAO targets are quieter aircraft and redistribution of noise. They acknowledged that the impact of quieter aircraft is marginal for the foreseeable future and therefore 're-distribution' is key for the next decade or more.
- b. Principle 1 (of 4) in the WHO Environmental Noise Guidelines 2018 states: "The first principle is to reduce exposure to noise, while conserving quiet areas". "noise exposure reduction in one area should not come at the expense of an increase in noise elsewhere"
- c. The European Noise Directive 2002/49/EC which is adopted in Irish law includes objective 1.c requiring member states to take action "reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good".
- d. Both the European Directive and the WHO Strong Guidelines are clear that reducing noise harmful effects for some people must not be at the expense of increasing it for others i.e. redistribution of noise that could cause HA/HSD for populations not

currently affected at those levels is not a valid strategy. Redistribution is the core strategy for noise reduction currently.

- e. The July 2023 ANCA update on their NAO shows a 55% reduction in their Lden 365 average driven assessment of the number of people Highly Annoyed by aircraft noise in just two years, thereby already achieving the WHO 2050 target of a 50% reduction. It is achieved with the help of re-distribution and shows how impactful redistribution is on the targeted outcomes when used in conjunction with averages that dilute the lived experience of residents. The redistribution together with the changes to planning restrictions as proposed in the relevant application will allow many more areas to be exposed to harmful levels of noise while on average all appearing to adhere to the WHO Guidelines. The risk of this happening was specifically anticipated by WHO in explaining their first principle for the implementation of their guidelines – ‘noise exposure reduction in one area should not come at the expense of an increase in noise elsewhere’. This principle needs to be implemented by DAA and enforced by ANCA but as yet this is not the case. To allow the changes requested in these circumstances would be unsafe.

5. The information provided in the relevant application papers and the communications/consultation undertaken is inadequate for most residents to understand or anticipate the potential range of impacts on their lives arising from the relevant application.

- a. The information in the original planning application turned out to be mis-leading for thousands of residents who are now affected by unexpected high levels of noise annoyance and sleep disturbance. The same range and forms of information are being provided for this application and we can see that it is certainly incomplete. The type of information that communities need to have in order to understand what the planning application means for them include:
 - o The maximum, as well as, the expected number of plane movements that will be allowed, under the revised restrictions, that could generate a potentially harmful level of noise over their community (per WHO 40/45db) by various splits of day and night using the ISO definition of Lden/Lnight/Lmax measured appropriately for the potential impact on their community.
 - o How that compares to the maximum and expected numbers based on existing planning approvals (and existing/current practices if different)
 - o Sensitivities to these numbers for their community if other things were to change including if the DAA strategic plans to grow passenger numbers to 40m by 2028 and to 65m by 2050 were to happen in conjunction with existing planning restrictions and if the relevant application were approved.
 - o Sound simulations of what an aircraft movement at the maximum levels actually sounds like relevant to their communities – particularly relevant to communities who will be newly affected by an increased level of aircraft noise. This is readily available from receptors/noise trackers that are already experiencing aircraft at a similar height/distance/profile.

- What that sound level, when averaged out according to the metrics used in the DAA contours, translates to e.g. if it is happening only two hours of night but averaged over the eight hours of night does this result in it not being considered harmful for that community?
 - How to translate the only current contours available, using an Lden/night averaged over the previous calendar year, into the type of sound impact and frequency they could expect when the aeroplanes are taking off or landing on a flight path that goes over or close to their home.
 - How to translate the noise they are currently experiencing into the measures that would allow them to equate their experience to a contour e.g. if a resident is kept awake all night with 100 flights with an Lmax (which they find from webtrak) of c80db and that happens for two weeks every month, how can they even estimate what that translates into in the DAA calculations in order to be able to engage in a discussion or challenge whether the DAA assessment is consistent with reality.
 - It is reasonable to expect such information to be made available prior to any decision significantly affecting significant concentrations such as Portmarnock, Swords, Ballyboughal etc
- b. The proposed changes to restrictions would allow a wide range of scenarios that are not evaluated e.g. non-stop take-offs on the North Runway between 06.00 and 07.00, and 23.00 and 24.00/00.00 every day; that could make sleep impossible for many in newly affected communities between those hours. It could interrupt sleep for children and those who would tend to sleep before 24.00. It could reduce the possible hours of any sleep for tens of thousand to 6 hours and eliminate even that for an unknown number. These effects are not mentioned and the omission of any assessment of such scenarios gives the impression that they will not happen. Where there is any related simulation addressed in contours, impacts of this sort, enabled by the proposed changes, are lost in averages. There is therefore no way in which most residents (who are not versed in reading highly technical documents), could understand the potential implications enabled by the relevant application.

6. The level of expected awakenings and their health implications have not been adequately assessed. The analysis of the impact of future scenarios on sleep relies solely on one averaged metric while the WHO guidelines and ECAC guidelines advise using multiple sources including relevant studies and the feedback from affected residents. The scientific work which could calibrate the assessment of awakenings is actively underway sponsored by the FAA in US across 111 airports – the largest ever such study – and could inform decisions on any changes affecting aircraft noise at night, in the relatively near future. This should be used to inform decisions such as this.

- a. The ABP RFI requests information on awakenings and Professor Penzel notes in his response for DAA that “isolated noise events, like airplane overflight, may cause arousals, the dB level required to causes an arousal is not the same across the night. During light sleep much lower noise levels can cause awakenings”. He notes that he is a sleep expert whereas Prof. Mathias Basner is one of the foremost aircraft noise sleep disturbance experts but that even Prof Basner does not have strong calibration of the level of awakenings to be expected relating to db levels and movements. Dr

Penzel should have also said that Prof. Mathias Basner is currently leading an international team working with the Federal Aviation Administration in the US to establish the precise relationship between aircraft noise (LA,s,Max) and awakenings over the course of 50 weeks covering 111 airports in a National Sleep Study (NSS) which asserts it is “unprecedented in its size and scope and is poised to become a landmark study for the understanding of the effects of aircraft noise on sleep.” The full detail of the study underway is set out in “Effects of Aircraft Noise on Sleep: Federal Aviation Administration National Sleep Study Protocol” (Mathias Basner et al) published in the International Journal of Environmental Research and Public Health, 6 November 2023.

- b. Many European countries with major airports have invested in studies to assess the Health impacts of aircraft noise on their citizens and to inform decisions. ANCA have commissioned no study to inform the structure and targets of their NAO and the resultant impact on Health effects thus far. In a meeting with Portmarnock residents on 24/11/2023, they noted that a study would not be wise now as the airport noise situation is in a state of flux and could remain so for the next few years. This strongly suggests that relevant application changes that have the potential to increase noise concentrations for communities (and to continue this state of flux) should not be made until there is adequate stability to establish the degree of damaging impacts that recent changes (North Airport and Flight Paths) may have already introduced for some communities.
7. **The Ground Noise impact of increased number of aircraft movements that would be allowed (by removing the 65 limit and by reducing the hours of night restrictions) for the closest communities to the airport, has not been measured/simulated in the application.**
 - a. Ground noise generated by planes on the runway at maximum thrust is commented on by NCL as having been considered by DAA as insignificant without any supporting evidence or validation.
 - b. Ground noise is not included in Lden/night (this is normal as they are used for airborne aircraft noise) but there is not detailed additional measures or analysis offered (albeit international guidance points to the need for separate measurements and mitigations).
 - c. Ground noise will increase significantly with aircraft movements yet there is little assessment offered in any of the papers supporting the planning application.
8. **The potential for a significant increase in aircraft movements as a result of proposed night time restriction changes (which could enable parking up of planes, more cargo planes etc without significantly affecting the passenger numbers) has not been assessed for impact on air quality pollution.**
 - o While the relevant application does not seek approval for a specific increase in aircraft movements, it seeks changes that enable an unlimited increase as the change from 65 plane movements per night to a noise quota which includes a zero weighting for many plane types is unlimited. Zero weighting relates to a db level at

take-off/landing only. It is not zero harmful fumes. The changes requested equate to an unlimited ability to generate additional air pollution, which even if not currently intended, needs to be assessed and prevented from affecting the health of communities.

9. The voice of affected residents of Fingal and Meath is not properly reflected in the planning papers thus far:

- a. The vast majority of the elected representatives of Fingal (Fingal County Councillors) voted against the changes proposed in the relevant planning application reflecting the concerns of residents but this representation of the views of affected communities through the appropriate democratic processes is not considered in the planning papers. The elected councillors are not part of the decision process for the relevant application. The CEO FCC as competent authority has sole authority for changes to planning restrictions for the airport. However the views of the elected representatives who carry the feedback from the affected communities should be reflected in the papers otherwise the interests and voice of the affected people is effectively silenced.
- b. There is no evaluation of the scale, concentration and nature of complaints from different communities already affected by dangerous levels of noise and pollution and what these proposed changes may do to increase the danger for those people. The only evaluation is based on modelled metrics which are inadequate to properly risk assess the relevant application, in isolation of feedback on the range of potentially unanticipated and unintended consequences that could arise.

10. The Noise Insulation proposal has inadequate supporting evidence to show that it will provide any meaningful mitigation to harmful levels of sleep disturbance. There has not been any independent evaluation of the effectiveness of the noise insulation program that has already been deployed and none is planned.

- a. The EIAR attributes significant noise reduction based on theoretical expectations of mitigation (taken at the upper end of mitigation) and a sample of twenty where the approach to measuring the effectiveness is left unclear and it is also unclear whether it was assessed by the installers themselves.
- b. Those who have shown an interest in exploring noise insulation as an option have found it nigh on impossible to find professional installers for residential properties.
- c. There is no assessment offered in the application in relation to what part (%) of a full/recommended insulation, the proposed grant will typically cover. It would likely only partially pay for changing all doors, windows and then insulating roof and walls in most homes and average earners would not be able to afford the balance.

11. The governance relating to the analysis provided and input to the decisions thus far in relation to the relevant application is evidentially not fit for purpose or appropriate for these type of decisions that involve the health and safety of thousands of people. An Bord Pleanala appears to be the first truly independent body involved.

- a. There are multiple layers of potential conflict of interest that could inadvertently influence the positioning of supporting evidence and decisions:
- The National Competent Authority for Aircraft Noise is the CEO of Fingal County Council (FCC) who also has the relevant Planning Authority for Dublin Airport reporting to them and who is also responsible for balancing the budget of FCC which derives a substantial part of its income from the DAA.
 - ANCA who supports the National Competent Authority in their regulation of aircraft noise from Dublin Airport do not have in-house expertise to assess or challenge the models used for aircraft noise related measurements. ANCA take the model outputs directly from DAA and are not qualified to assess for appropriateness or errors.
 - ANCA state a principle in the explanation of their Noise Abatement Objectives (on ANCA website) that “The NAO must ensure the sustainable development of Dublin Airport with regard to aircraft noise”.
 - The consultants used to provide ANCA with a review of the modelling work done by DAA are also used by the DAA and airlines based in Dublin who have a vested interest in the expansion of aircraft movements by night. The consultants chosen should have been from outside of the country and vetted for close relationships and potential conflicts.
- b. The absence of a full risk assessment of the proposed changes in the relevant application documentation, given the significance of the potential impacts of the decisions requested, and the absence of a proper validation of the models (evidencing and assessing model metric and assumptions appropriateness, input data quality, input/coding errors impact, suitability and impact of adjustments, confidence intervals and sensitivities etc) is a failure of governance.
- c. Neither the Environmental Protection Agency nor ANCA believe that responding to residents in relation to Aircraft Noise issues is within their remit – each suggests it is the other. This means that residents who are severely affected by aircraft noise issues can only raise their concerns with the DAA and have no point of appeal or body whose role it is to provide them with some protection against extremes of aircraft noise impacts on their health. The governance ambiguity across the state agencies is a key source of danger for the future health of affected residents.

Appendix 1: Noise Quota

Certified noise level (EPNdB)	Quota Count Classification
Greater than 101.9 EPNdB	16
99 - 101.9 EPNdB	8
96 – 98.9 EPNdB	4
93 – 95.9 EPNdB	2
90 – 92.9 EPNdB	1
87 – 89.9 EPNdB	0.5
84 – 86.9 EPNdB	0.25
81 – 83.9 EPNdB	0.125
Below 81 EPNdB	0

By reference to EASA Noise Certification MAdB_JETS_20230906 look-up tables many 737-800's are certified to qualify for 84-86.9 EPNdB and therefore a quota of 0.25 (others for 81-83.9 and 0.125 quota points). (these noise certification tables are publicly available on the web and are not copied here simply as they have many thousands of rows in an excel sheet)

By reference to EASA Noise Certification MAdB_JETS_20230906 look-up tables many 737-Max-8's are certified to qualify for 81-83.9 EPNdB and therefore a quota of 0.125 (others could get lower and qualify for 0 points)

Taking this example of one of the most popular planes (737-800) and the one of the main planes heralded as quieter (the 737-Max-8): Either 84 or 81 EPNdB is more than enough to waken residents under their approach or take-off flight path.

The annual nighttime quota proposed in the relevant application of 16,260 would allow for 178 737-800's or 356 737-Max-8's every night of the year or any concentration above that on any given night, so long as the annual total is not exceeded. Twice as many 737-Max would be allowed despite the fact that the 737-Max-8 at 81EPNdB is clearly not half the noise energy of a 737-800 at 84EPNdB.

356 movements during the eight hours of night would allow an aircraft landing/take-off every 80sec if that were operationally possible, every night of the year and more if they were not evenly spread. It does not represent any meaningful limit as virtually no airport can cope with that even during the day. Many less than this would generate considerably more noise than the WHO strong guideline for night of 40db Lnight.

Given that many 737-Max-8's may qualify for 0.0 rating at 80EPNdB there is actually no limit. The 737-Max-8 is already in use in Dublin and regularly causes sleep disturbance already.

Appendix 2: FAA guidance on noise and quota interpretation



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Fundamentals of Noise and Sound

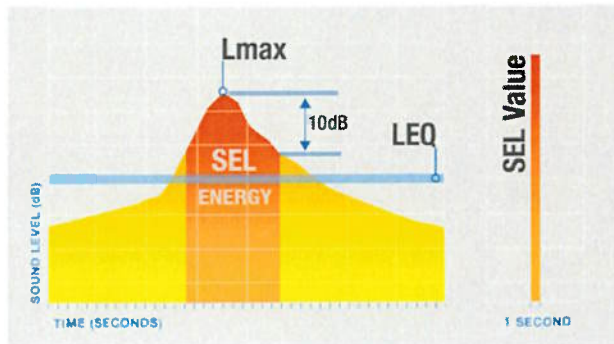
- [Noise Metrics](#)
- [Noise Contours](#)

Sound is energy transferred through the air that our ears detect as **small** changes in air pressure. The more energy put into making a sound, the **louder** it will be. Try whispering. Then yell. You can feel how much more energy goes into yelling.

Noise is sound that is **unwanted**. Some sounds, like a distant **train** whistle, can be a pleasant sound for some, while being considered noise by others. Other sounds, like a neighbor's barking dog in the middle of the night, are more universally found to be annoying. Even sounds that are pleasant at one volume can become noise to us as they get louder. Noise, then has both an objective, physical component; as **well** as a subjective component that takes account of a person's individual perception, or reaction, to a sound.

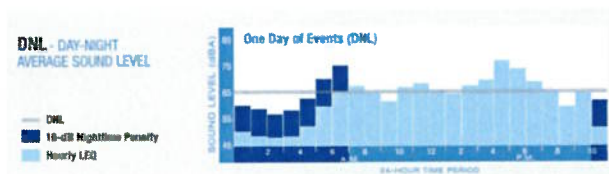
The **decibel (db)** is the unit used to measure the intensity of a sound. The human ear hears sound pressures over a wide range. Decibels, which are measured on a *logarithmic* scale, correspond to the way our ears interpret sound pressures.

Sound Pressure Level (SPL, dB) At One Microphone Location



The **equivalent sound level (LEQ)** measures the average acoustic energy over a period of time to take account of the cumulative effect of multiple noise events. This could, for example, provide a measure of the aggregate sound at a location that has airplane flyovers throughout the day. LEQ is defined as the level of continuous sound over a given time period that would deliver the same amount of energy as the actual, varying sound exposure.

Finally, the **day-night average sound level (DNL)** noise metric is used to reflect a person's cumulative exposure to sound over a 24-hour period, expressed as the noise level for the average day of the year on the basis of annual aircraft operation. The DNL noise metric provides a mechanism to describe the effects of environmental noise in a simple and uniform way. DNL is the standard noise metric used for all FAA studies of aviation noise exposure in airport communities. (For more on DNL, see [FAA History of Noise](#).) DNL and the closely related CNEL metric used in California are both similar to LEQ, but they differ in how noise is treated during the evening and nighttime.



Because DNL takes into account both the amount of noise from each aircraft operation as well as the total number of operations flying throughout the day, there are many ways in which aircraft noise can add up to a specific DNL. Small numbers of relatively loud operations can result in the same DNL as large numbers of relatively quiet operations.

Equivalent Operations For DNL = 65

1 Event/Day SEL 114.4 dBA = DNL 65

10 Events/Day SEL 104.4 dBA = DNL 65

100 Events/Day SEL 94.4 dBA = DNL 65

[Back to top](#)

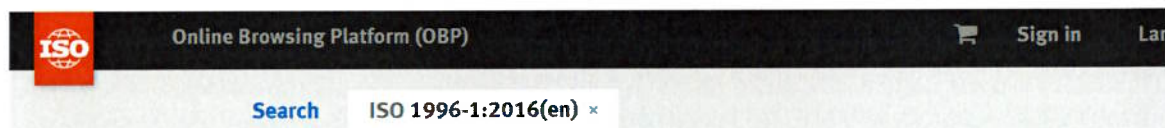
Noise Contours

Noise levels can be computed at individual locations of interest, but to show how noise can vary over extended areas, noise metric results like DNL are often drawn on maps in terms of lines connecting points of the same decibel (dBA). Similar to topographical maps showing the elevation of terrain in an area, these noise "contours" are useful for comparing aircraft noise exposure **throughout** an airport community. The shape of noise contours depends on many factors, but are influenced by things like whether more arriving or departing aircraft are **flying** over an area.

Appendix 3: Calculating Lden/night

INTERNATIONAL STANDARD

ISO 1996-1



ISO 1996-1:2016(en) Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures

3.6.4

day-evening-night sound level

L_{den}

day-evening-night-weighted sound pressure level is defined by

$$L_{den} = 10 \lg \left[\frac{1}{24 \text{ h}} \left(t_{\text{day}} \cdot 10^{0,1(L_{\text{day},12})} + t_{\text{evening}} \cdot 10^{0,1(L_{\text{evening},4}+5 \text{ dB})} + t_{\text{night}} \cdot 10^{0,1(L_{\text{night},8}+10 \text{ dB})} \right) \right] \text{ dB}$$

where t_{day} , t_{evening} , and t_{night} are expressed in hours and $t_{\text{day}} + t_{\text{evening}} + t_{\text{night}} = 24 \text{ h}$.

Note 1 to entry: The default values for t_{day} , t_{evening} , and t_{night} are 12 h, 4 h, and 8 h, respectively, but individual countries, e.g. EU member states, reduce the evening period.

L_{den} is defined in the ISO standards per above and this is faithfully reflected in multiple guidance documents that use L_{den} such as World Health Organisation (WHO) Environmental Noise Guidelines 2018 and European Civil Aviation Conference (ECAC) guidelines on noise measurement. The European Noise Directive 2002/49/EC (END) introduced and requires a common time scale for the production of strategic contours applied to all noise sources (including aircraft) for countries reporting to the European Commission (EC). This requirement is for L_{den} averaged over all the days of a year where '— a year is a relevant year as regards the emission of sound and an average year as regards the meteorological circumstances'. This ensures a minimum metric that is applied in the same way across all populations and all sound types. The European Directive and Irish enactment of this allows for the use of supplementary metrics for the management of the environmental health impacts of noise relevant to the noise type, source and frequency. The WHO guidance specifies the base metric of L_{den} per the ISO above which may be averaged over the period relevant to the noise. This is the metric upon which their definition of Highly Annoyed (HA) and Highly Sleep Disturbed (HSD) are based upon and their associated 2018 Guidelines referenced in the relevant application. By only using the L_{den365} average measure even where the averaging is inappropriate, the translation into numbers of people HA or HSD is a case of apples and oranges.

Appendix 4: (extract from WHO guidelines 2018)

2.2.2 Environmental noise indicators used in the guidelines

From a scientific point of view, the best noise indicator is the one that performs best in predicting the effect of interest. There are, however, a number of additional criteria that may influence the choice of indicator because, for example, various indicators might be suitable for different health end-points and some indicators are more practical to use or easier to calculate than others. Some of these considerations are of a more political nature, as mentioned in the EC's Position paper on EU noise indicators (EC, 2000).

The current guidelines are intended to be suitable for policy-making primarily in the WHO European Region. They are therefore based on the most frequently used average noise indicators in Europe: L_{den} and L_{night} . These are often reported by authorities and are used widely for exposure assessment in health effect studies and noise impact assessments in the Region. The L_{den} (also referred to as "DENL") indicator can be calculated as the A-weighted average sound pressure level, measured over a 24-hour period, with a 10 dB penalty added to the average level in the night (23:00–07:00 or 22:00–06:00), a 5 dB penalty added to the evening (19:00–23:00 or 18:00–22:00) and no penalty added to the daytime period (07:00–19:00 or 06:00–18:00). The penalties are introduced to indicate people's extra sensitivity to noise during the evening and night. The L_{night} indicator is the A-weighted average sound pressure level, measured over an eight-hour period during night time, usually between 23:00 and 07:00 (EC, 2002a).

Appendix 5: Using Supplementary Indicators (metrics)

The Irish legislation takes into law the EU minimum standards for 'strategic noise contour mapping' to be reported annually to the European Commission. These are to cover all forms of noise sources and in the most part are overseen by the Environmental Protection Agency with later authority granted over aircraft noise to the National Competent Authority for Aircraft Noise (the CEO of Fingal County Council). The minimum standards for reporting contours to the commission across all noise types are $L_{den}/night$ averaged over 365 days. This is separate to the guidance from WHO, ECAC and others on aircraft noise adverse effects measurement and management (including the measurement of Highly Annoyed and Highly Sleep Disturbed) which only requires $L_{den}/night$ as set out in the ISO 1996-1 standard which does not require the 365 averaging. The Irish legislation allows for the use of additional measures to the minimum metrics prescribed for commission reporting:

"supplementary noise indicators may be used in special circumstances, including those set out in Part III of the First Schedule."

Supplementary noise indicators

In some cases, in addition to L_{den} and L_{night} , and where appropriate L_{day} and $L_{evening}$, it may be advantageous to use special noise indicators. Some examples are:

- the noise source under consideration operates only for a small proportion of the time (for example, less than 20 % of the time over the total of the day periods in a year, the total of the evening periods in a year, or the total of the night periods in a year),
- the average number of noise events in one or more of the periods is very low (for example, less than one noise event an hour; a noise event could be defined as a noise that lasts less than five minutes; examples are the noise from a passing train or a passing aircraft),
- the low-frequency content of the noise is strong,
- L_{Amax} , or SEL (sound exposure level) for night period protection in the case of noise peaks,
- extra protection at the weekend or a specific part of the year,
- extra protection of the day period,
- extra protection of the evening period,
- a combination of noises from different sources,
- quiet areas in open country,
- the noise contains strong tonal components,
- the noise has an impulsive character.

It does not prevent other metrics being used for the management of harm from noise as guided by WHO and others who require the use of relevant metrics mostly of $L_{den}/night$ per the ISO 1996-1

ECAC.CEAC Doc 29

4th Edition

Report on Standard Method of Computing Noise Contours around Civil Airports

Volume 1: Applications Guide

As endorsed by DGCA/147 on 7 December 2016

L_{DEN}

Day-evening-night level DENL, a (L_{eq} -based) noise index adopted by the European Commission which weights evening noise by 5dB and night-time noise by 10dB.

L_{eq}

→ *Equivalent sound level*. The subscript is sometimes extended to denote the scale and the measurement period, e.g. $L_{Aeq(24h)}$.