

Wellington City Council Council Officers Report - NOISE



Wellington International Airport Main Site Notice of Requirement East Side Area (ESA) Notice of Requirement

Council Officers Report - NOISE

Title	Noise / Acoustic Review		
	Main and Eastern NoR Designation		
Applicant	Wellington International Airport Limited	Version	9
Date	27 April 2021	Status	Final
Author	Mathew Borich (Compliance Manager)	Issued to	Hearing
		SR Number	455891(AP)/462159(GC)

1 Introduction

My name is Mathew Borich. I am the Manager of Compliance & Advice, City Consenting and Compliance at Wellington City Council for the last 11 years. I have approximately 25 years' experience in measuring and assessing environmental noise. I have a Bachelor of Science degree from Victoria University, a Diploma of Public Health Inspection from the Royal Society of Health, London and a Certificate in Acoustics from Hawkesbury, University of Sydney Australia. I have been a member of various New Zealand Standards Committees, including NZS:6802: 2008, Acoustics *Environmental Sound* and 6801:2008 Acoustics *Measurement of Environmental Sound*. I have also been a member of the Airports Air Noise Management Committee for approx 20 years.

2 Background

In order to expand airport activities onto the adjacent land, including the southern area of the Miramar Golf Course, Wellington International Airport (WIAL/Wellington Airport) has filed a 'Notice of Requirement' (NoR) to establish two "airport purposes designations" for the Main Site and East Side Area (ESA).

The designation is to allow Wellington Airport to use the land for the operation, maintenance, expansion and development of the airport.

3 Summary of Proposed Designations (Main and East)

The first 'airport purposes' NOR (the Main Site NOR) was lodged with Wellington City Council in August 2019. The proposed designation is primarily over the area of land making up the existing Airport – zoned as Airport Precinct in the District Plan – and is largely consistent with the current noise related rules and requirements outlined in the District Plan in relation to airport activities.

The Airport states that the proposed changes will enable the airport to establish a more efficient and flexible planning framework for existing and future airport activities and development. The **Main Site Designation** includes a host of development precincts, shown as follows:



Figure A: Main Site NoR Map. Reference: Requiring Authority (Wellington Airport).

The second ‘airport purposes’ NOR (The East Side Area NOR (ESA)) was lodged with Wellington City Council in February 2020. The proposed designation is primarily over the area of land making up the southern portion (16.5 ha) of the existing Miramar Golf Course. If approved, this will enable WIAL to use the land to the east of the airport for aircraft operations, taxiways and aprons and ancillary activities. The extent of the East Side NOR is shown as follows:



Figure B: East Side NoR Map. Reference: Requiring Authority (Wellington Airport).

Both Notices of Requirement for these designations were publicly notified by Wellington City Council in December 2020 and submissions were open until 26 February 2021.

As the proposed Main Site designation is largely consistent with the current noise rules and requirements outlined in the Wellington City District Plan in relation to airport activities, the Council's noise assessment concentrates on the changes of effects associated with the potential expansion into the ESA and recommend mitigation beyond what has already been proposed in the Marshall Day Acoustics technical assessment report. The extent of the **Main Site Designation and East Side NOR**, overlaid on an aerial of the airport and surrounds is shown as follows:

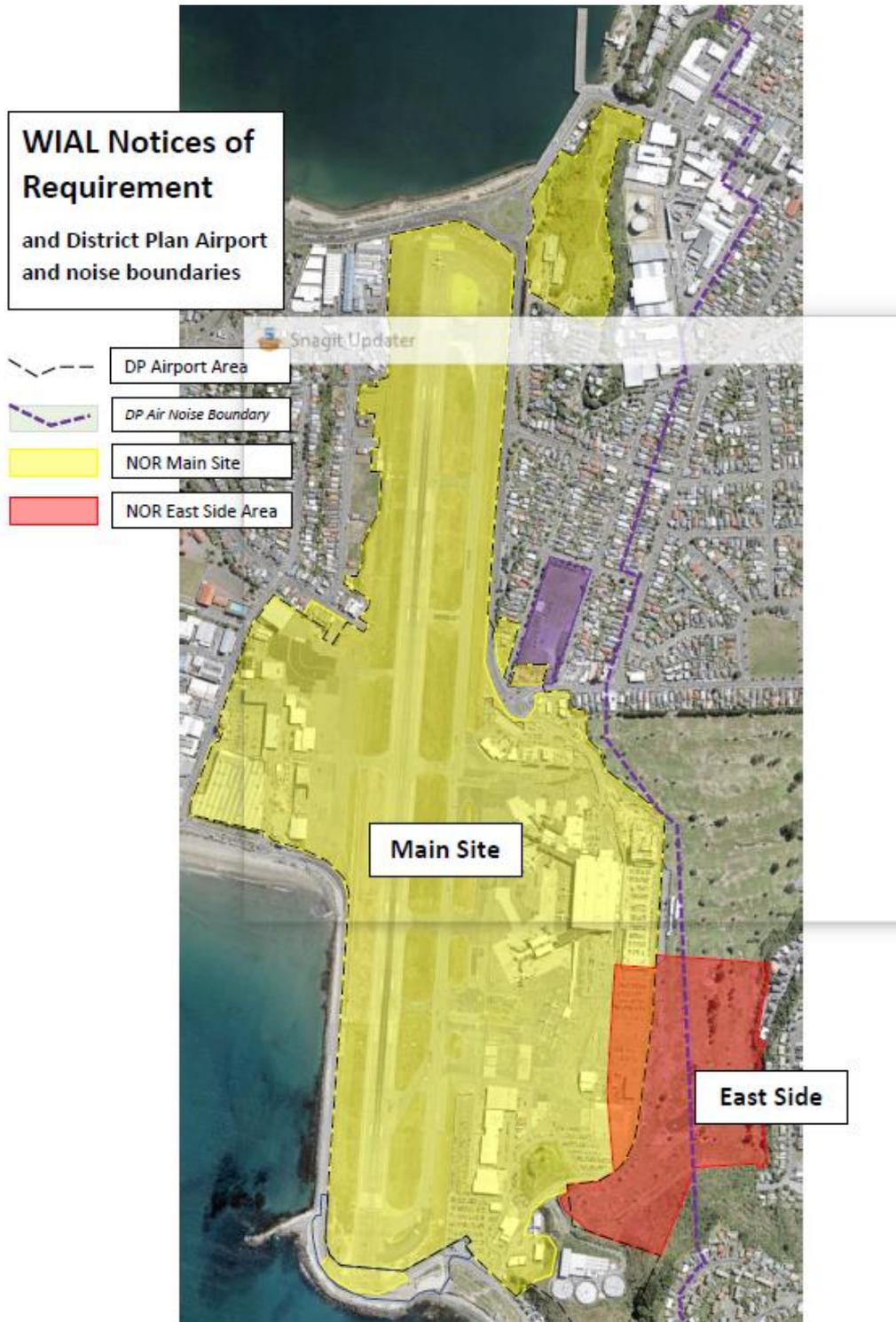


Figure C: Main and East Side NoR Map. Reference: WCC

4 Background Reporting and Analysis

Marshall Day Acoustics (MDA) have been commissioned by Wellington Airport to prepare an Acoustic Assessment Report¹ (the 'MDA report') which is included as Appendix G to the overall NoR document². In addition to the original MDA report a further information response³ (FIR) was also submitted to clarify a number of technical issues raised by Wellington City Council, including noise.

In response to the technical MDA report a Technical Environmental Noise Review was prepared in December 2020 by myself and my colleague Lindsay Hannah. A copy is attached in **Appendix A** of this Hearing Report.

Following the initial reporting a review of submissions has also been undertaken (refer to **Section 6** below). A summary of submissions received for noise is contained within **Appendix B** of this Hearing Report. A review of the conditions proposed by WIAL with recommended changes is attached in **Appendix C** of this Hearing Report. These recommended conditions pre-date the caucusing expected to be conducted between acoustic experts during May 2021.

5 Addendum to Original WCC Noise Assessment (ESA)

Aircraft noise at the airport is divided into several unique noise sources all of which contribute to the total overall combined sound levels in the receiving areas adjacent to the airport area.

Chapter 11A Airport Area Rules of the Wellington City District Plan sets out the aircraft noise rules. Section 7.0 'Existing District Plan Provisions' of the MDA Report sets out in detail the existing Operative Wellington City District Plan noise provisions. The District Plan's noise controls for Wellington International Airport are divided into two key areas being:

1. Aircraft operations (engine runup, taxiing, take-off, and landing (air noise boundary (ANB); and
2. Land use noise controls (engine testing, APU/GPU, land-based activities).

The District Plan defines 'Aircraft Operations' as including:

1. Engine run-up;
2. Taxiing; and
3. Take-off and landing of aircraft.

The dominant noise source dictating the current noise environment at the receiving sites is noise emanating from jet take-offs and to a lesser extent, landings on the airport runways. The initial noise effects arising from designation of the East Side Area would be associated with construction activities associated with the expansion of facilities onto the golf course land. This work will include but not be limited to earthworks and construction. Once the aircraft operational areas have been established, there will be an increase in noise effects from ground-based aircraft operations and associated activities occurring within closer proximity to existing residential dwellings along:

1. Raukawa Street;
2. Bunker Way; and

¹ Refer to Marshall Day Acoustics Report entitled 'Wellington Airport East Side Area Assessment of Noise Effects Rp 003 r04 20181298' dated February 2020.

² Refer NoR prepared by Mitchell Daysh entitled NoR for An Airport Purposes Designation East Side Area.

³ Refer to Marshall Day Acoustics FIR response dated 17.7.20

Wellington City Council's position is the assessment of effects from APUs operating in the ESA is understated in the MDA report⁷

The effects on residents immediately adjacent to the ESA from noise emanating from the operation of APUs in the ESA is summarised in the MDA report as: ***“For ESA receivers, APU noise levels are predicted to range from 57 – 62 dB while APU’s are operating on the eastern stands. This is a just perceptible 4 dB increase on current predicted APU noise levels. The predicted 62 dB L_{Aeq} for noisier APU’s is elevated for a residential environment but not unusual for residential sites near an airport.”⁸*** The MDA report goes on to state, ***“Although the noise level received with APU running would be 6 dB higher than the land-based activity limit, the duration restrictions would control the overall daily exposure to APU noise for ESA receivers. Based on the 2050 operating scenario we calculate that APU’s on the eastern side stands could potentially run for an average of 24 minutes per hour during the day (or 364 minutes 7.00am – 10.00pm). This is equivalent to 57 dB L_{Aeq} (15 hours) and 55 dB L_{dn}. Considering the predicted APU noise levels in the context of the total noise environment and the recommended mitigation measures, we consider that the effects from APU noise on the ESA receivers would be appropriately managed.”⁹***

In my view the effects assessment is understated as it simply compares the predicted level from APUs operating in the ESA with the sound level emanating from APUs currently operating on the existing stands. This results in a 4 dB increase and MDA states this is a just perceptible increase. The MDA report then concludes by considering this increase within the context of the current total noise environment effects is acceptable. It is noted the total noise environment is currently dominated by short duration high energy noise events and that APUs are likely to be very audible between these events. I note that APU noise is currently audible in Bunker Way when aircraft are parked at the eastern stands. Therefore, if the existing level is undesirable and or the predicted increase in noise levels results in an unreasonable level of noise when compared to recommended acoustical criteria and or existing background (L_{A90}) levels, the increase may cause undue levels of annoyance. The Council review report accepts the Land Use limits¹⁰ as acceptable.

Monday to Saturday 7am to 10pm	55 dB L _{Aeq} (15 MIN)
At all other times	45 dB L _{Aeq} (15 MIN)
All days 10pm to 7am	75 dB L _{Amax}

When stating that, cognisance must be given to the fact that 55 dB L_{Aeq} is the upper recommended limit specified in NZS 6802:2008 Acoustics Environmental Noise (the standard), *Clause C8.6.2* of this acoustic standard explains the upper limit of 55 dB L_{Aeq} is recommended as *‘few people are seriously annoyed’* from activities with levels below 55 dB L_{Aeq}. In my view this level is only suitable for sites with high ambient (background) noise levels (such as the airport). To provide further context to 55 dB L_{Aeq} as a criterion, I note the following:

- *The noise limits specified for noise emanating from mechanical plant operating from within the airport received in outer residential area are 5 decibels higher during the daytime and at night and 10 dB higher for the evening period of 7.00pm - 10.00pm when compared to limits set for mechanical plant operation in the Business Area¹¹(industrial), Centres Zone (mixed use) and the Central Area Zone (Inner city/mixed use) received in adjacent outer residential areas.*

⁷ Wellington Airport East Side Area Assessment of Noise Effects Rp003 r04 20181298 / 26 February 2020

⁸ Page 31 ,10.3, Wellington Airport East Side Area Assessment of Noise Effects Rp003 r04 20181298 / 26 February 2020

⁹ Page 31 ,10.31, Wellington Airport East Side Area Assessment of Noise Effects Rp003 r04 20181298 / 26 February 2020

¹⁰ Rule 11.1.1.1.8 of the Wellington District Plan

¹¹ Rule 34.6.1.1.6 Wellington District Plan

- *The daytime noise limit of 55 L_{Aeq} (15 min) specified for noise emanating from mechanical plant operating from within the airport received in outer residential area are consistent with the daytime limits set between sites within mixed use areas in the district plan where mandatory sound proofing of noise sensitive uses is required.*

I conclude that 55 dBA is the upper acceptable level, and that exceedance of this level is likely to result in levels of noise that are unreasonable and that will cause undue levels annoyance to some people. In addition, consideration needs to be given to the fact that when the district plan rules were established, the sound limits were set as controls for an existing airport with existing houses adjacent to the airport.

In my opinion, the current proposal should not be afforded the same leniency. This is because development and use of the East Side Area will involve new noisy airport activities moving closer to existing residential sites, increasing noise levels above the acceptable criterion. Rather than accept a 4 dB increase over existing levels that themselves are not necessarily desirable, the following should be taken into account:

- The existing district plan airport rules are permissive, adopting the recommended upper acceptable limits specified in the NZ standard. The airport rules include no adjustment for an evening shoulder period for noise emitted by mechanical plant and received in the district plan's outer residential area. This stands in contrast to the approach adopted for other commercial/industrial areas of the city.
- Exemptions were applied for the noise emanating from the current APU operations and it appears the noise exceeds the levels specified in the limits. The exemptions applied to an existing environment.
- The MDA report states that when APUs are running, noise levels would be 6dB higher than the land-based activity limit.
 - This means APUs will exceed the limits even with any adjustment made under the standard (for duration and or special audible characteristics).
 - No assessment has been made for special audible characteristics;
 - Duration would include the operation of existing APUs; and
 - 6dB exceeds the maximum adjustment possible.
- The proposal will increase levels over acceptable criterion and exemptions are requested for what will be "newly introduced noise".
- The predicted level of 57 L_{Aeq} (15 hours) exceeds the upper recommended level specified in the NZ standard. The upper level in the standard is recommended as '*few people are seriously annoyed*' from activities with levels below 55 dB L_{Aeq}
- The levels exceed limits specified for mechanical noise emanating from mixed use areas (commercial/ industrial) received in outer residential areas.

In conclusion, the noise level predictions are based on the mitigation measures recommended in the MDA report. This resulted (in combination with taxiing noise) in the recommendations for further mitigation in our review report. In addition, I recommend that noise emanating from APUs exempted from the proposed Land Use limits should still be controlled through limits.

5.2 Assessment and Control of Taxiing (Single Event) Noise

Taxiing operations will be part of the ESA development. The MDA report states that airport operations (taxiing) in the ESA will increase operational L_{dn} noise levels by only 1 dB at 2050 (1-2 dB initially). This 1 dB increase relates to the Air Noise Boundary (ANB) which is based on a 90-day rolling average.

The MDA report has however also considered single event levels for individual receiver sites from taxiing aircraft, which, along with APU noise, is a key noise source in my view. The 2050 operating scenario applied by MDA was for 12 narrow bodied jet aircraft and 12 wide bodied taxiing jet aircraft movements in the ESA per day, a total of 24 per day. The MDA report states that the predicted noise exposure levels at the receiving sites in Raukawa Street will be:

- 84 dB L_{AE} and 75 L_{AFMax} for taxiing of narrow-bodied jet aircraft and
- **95 dB L_{AE} and 83 L_{AFMax}** for the **wide-bodied** taxiing jet aircraft.

The MDA assessment notes that existing single events are already 83 dB to 89 dB L_{AE} at the Raukawa Street houses. The MDA report states that taxiing of narrow body aircraft on the new taxiways will subjectively sound, at the receiving sites, as loud as a jet aircraft take-off on the runway. MDA also state that wide body jet aircraft taxiing in the ESA would sound subjectively twice as loud as a jet take-off on the runway¹². In *Section 10.1.3* of the MDA report it is explained that noise from the taxiing would disrupt communication outdoors and indoors (windows open) and quieter activities with windows closed.

At 2050 the receiving sites will be exposed to noise emanating from an estimated 110 jet aircraft take-offs per day. MDA clarified in response to Council's further information request that these take-offs would occur during the operational hours of the airport, 6.00am to 1.00am. The introduction of similar or higher sound exposure levels from 24 taxiing movements in the ESA during the day between 7.00am and 10.00pm increases these high energy noise events from 110 to 134 during the operational period. This equates to a percentage change increase in short duration high energy noise events over this period of 21.8%. The percentage increase is higher during daytime hours. In addition, taxiing noise from wide body jet aircraft will represent the top 9% of sound exposure levels received each day at the residential sites adjoining the ESA.

Although there is a minimal increase in L_{dn} levels presented within the MDA report from taxiing operations in the ESA area, the effects **cannot** be considered imperceptible. Mitigation proposed in the MDA report is '**No taxiing under power will be permitted on ESA taxiways at night (10.00pm -7.00am)**'. This will help prevent adverse effects at night. However, effects during the day should be considered in conjunction with the effects during daytime APU operation within the ESA also. An assessment of effects based on human perception when applied to increases to L_{dn} levels alone does not provide a "comprehensive" effect assessment in my view.

In summary, I am of the view that residents of sites in Raukawa Street and Bunker Street directly adjoining the boundary of the East Side Area (ESA receivers of the Marshall Day Acoustics report Appendix G) should be offered a mitigation package at least 6 months prior to commencement of the operation of the ESA. The package should take the form of both sound insulation and mechanical ventilation consistent with the airport's LUMINS report for dwellings located within the air noise boundary (ANB).

My view is that this sound and ventilation package should be at no charge to the homeowner and provide all habitable rooms in the dwelling with a positive supplementary source of fresh air ducted from the outside to achieve a minimum of 7.5 litres per second/per person.

6 Assessment Summary

In my view, noise emanating from all activities can be managed to a reasonable level except for single event sound exposure levels from taxiing of jet aircraft and the operations of APUs during the day. I therefore recommend the need for further mitigation to prevent potentially significant adverse noise effects. Importantly, the recommended sound insulation and mechanical ventilation package addresses internal amenity but does not address external amenity. Affected residents may have an acceptable level of internal amenity during the day, but their level of outdoor amenity will be decreased. It is my assessment that their outdoor daytime/evening amenity will be more similar to that of residents located within the air noise boundary, than sites located outside the airnoise boundary.

¹² MDA ,p25

Due to the fact that ESA aircraft movements (and other associated noise sources) will only occur during the daytime and evening periods, when adopting the recommended sound insulation and mechanical ventilation package, night time internal amenity will improve for dwelling occupants. However, daytime outdoor amenity will be affected.

7 Noise Submissions

I have reviewed submissions for both notices of requirement with respect to noise. A summary of submissions received for noise is contained within **Appendix B** of this Hearing Report.

Below I provide a summary of submissions that raise noise as a concern. There are a number of main themes and these are summarised as follows:

1. *The relocation of the airport activities closer to existing noise sensitive sites and locations*
2. *Not all affected parties have been assessed (including Raukawa Community Centre for example)*
3. *Averaging of noise limits which understates actual noise effects on health and amenity*
4. *Increased operational noise levels which will result in negative effects for health and amenity values*
5. *Adverse noise effects including from night time airport activity*
6. *Localised exceedances of the current Air Noise Boundary*
7. *Increased temporary noise levels from construction works which will result in negative impacts for health and amenity values*
8. *Sound Insulation and acoustic treatment (as well as ventilation for fresh air)*
9. *Updating of Noise Management Plan / 'Quieter Homes' Scheme to allow for acoustic treatment*
10. *Real time noise monitoring and reporting (including public access of noise monitoring)*
11. *Exemptions i.e. military movements, dignitaries and emergencies*
12. *Limited assessment including Best Practical Option of Noise Management*
13. *Engine testing noise*
14. *Taxiing Noise (single event movements from aircraft operations)*
15. *Auxiliary Power Unit (APU) noise*

8 Recommended Conditions

The NOR includes a comprehensive suite of proposed conditions which Wellington Airport state are '*designed to effectively manage any actual or potential of effects on the surrounding environment*'. I have reviewed these conditions and provide a review of the draft conditions with recommended changes marked up. The conditions are attached in **Appendix C**.

Author:



Matthew Borich

Manager Compliance & Advice

City Consenting and Compliance: Wellington City Council

Date of Issue: 27th April 2021

Glossary of Terms and Definitions

Decibel (denoted dB) is a relative unit of measurement used in acoustic science. The dB is a logarithmic ratio between the measured level and a reference (threshold) level of 0 dB (for sound pressure).

dBA is the A-weighting sound level. A weighting refers to the *A weighted curve or A filter and A network* under frequency weightings. The A-weighting attempts to correlate sound level meter (objective) measurements with the subjective human response. Human hearing (our ears) are frequency selective, being most sensitive between 500 Hz and 6,000 Hz, compared with the full range of the dBA scale ranging from 20Hz up to 20,000 Hz.

L_{Aeq} is the A-weighted equivalent continuous sound level. T denotes the time period over which the fluctuating sound levels are averaged.

L_{AE} is A-weighted sound exposure level also known as **SEL or L_{AE}**. The Sound Exposure Level is the constant sound level that has the same amount of energy in one second as the original noise event.

L_{AFmax} is the A-weighted *maximum sound level* measured with a fast time-constant (L_{max} should not be confused with L_{peak})

L_{dn} is the day-night noise level, configured from the L_{Aeq} (equivalent noise level) over a 24-hour period with a night time operations penalty of 10 dBA for noise events during the hours of 22:00-07:00 (10.00pm to 7.00am).

Wellington International Airport Limited (**WIAL**)

East Side Area (**ESA**)

Wellington International Airport (**WIA or WIAL**)

Marshall Day Acoustics (**MDA**)

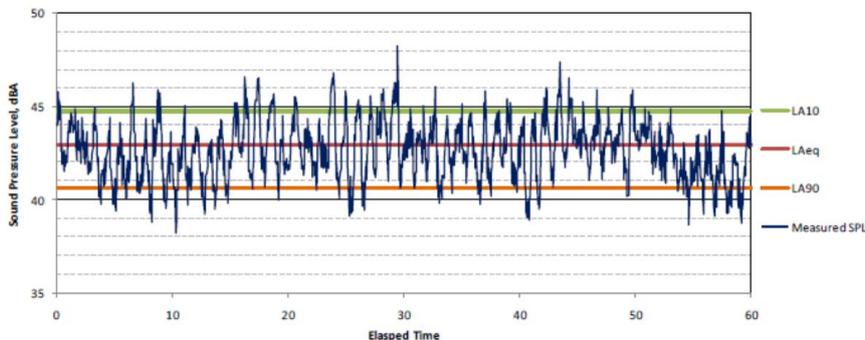
Notice of Requirement (**NoR**)

Wellington City Council (**Council / WCC**)

Wellington Airport Runway Extension (**RESA**)

Land Use Management and Insulation For Airport Noise Study (**LUMENS**)

Sample time varying graph of **L_{Aeq} versus L_{A90}** and sound pressure levels:



Appendix A

WCC Recommended Draft Conditions

Main Site and East Side Area Designations

Main Site NoR

Recommended Draft WCC Noise Conditions

Aircraft Operations Noise

Condition 6

The Requiring Authority shall ensure that all aircraft operations are managed so that the rolling day average 24-hour night-weighted sound exposure level does not exceed a Day/night Level (L_{dn}) of 65 dBA outside the Air Noise Boundary shown on Wellington City Council District Plan Map 35.

Condition 7

Aircraft noise shall be measured and modelled in accordance with NZS6805:1992: 1992 Airport Noise Management and Land Use Planning and calculated as a L_{dn} 90-day rolling average. All terminology shall have the meaning that may be used or defined in the context of NZS:6805 1992 Airport Noise Management and Land Use Planning

Condition 8

The following aircraft operations shall be excluded from the calculation of the ~~rolling~~ 90-day rolling average described in Conditions 6 and 7:

- a) Aircraft landing in an emergency;
- b) The operation of emergency flights required to rescue persons from life-threatening situations or to transport patients, human vital organs or medical personnel in an emergency.
- c) The operation of unscheduled flights required to meet the needs of a national civil defence emergency declared under the Civil Defence Act 2002;
- d) Military aircraft operations.

For the purposes of this condition a schedule of any aircraft operations that occur under this condition shall be maintained on a publicly accessible web site maintained and operated by the Requiring Authority.

Condition 9

The Requiring Authority shall ensure that:

- a) All domestic aircraft operations shall not occur during the hours from midnight (12.00am) to 6.00am; and
- b) All international aircraft operations shall not occur during the hours:
 - i. Midnight to 6.00am for departures.
 - ii. 1.00am to 6.00am for arrivals.

For the purposes of this condition "operations" means the start of the take-off roll or touch down on landing.

Condition 10

The following are exceptions to Condition 9:

- a) Disrupted flights where aircraft operations are permitted for an additional 30 minutes;
- b) In statutory holiday periods where operations are permitted for an additional 60 minutes.

For the purposes of this condition, statutory holiday period means:

- i. *The period from 25 December to 2 January, inclusive. Where 25 December falls on either a Sunday or Monday, the period includes the entire of the previous weekend. Where 1 January falls on a weekend, the period includes the two subsequent working days. Where 2 January falls on a Friday, the period includes the following weekend*

- ii. *ii. The Saturday, Sunday and Monday of Wellington Anniversary weekend, Queens*
- iii. *iii. Birthday Weekend and Labour Weekend.*
- iv. *iii. Good Friday to Easter Monday inclusive.*
- v. *iv. Waitangi Day.*
- vi. *v. ANZAC Day.*
- vii. *vi. Where Waitangi Day or ANZAC Day falls (or is recognised) on a Friday or a Monday, the adjacent weekend is included in the statutory holiday period.*
- i. *vii. The hours from midnight to 6.00am immediately following the expiry of each statutory holiday period defined in (i) to (vi).*

- c) Aircraft using the Airport as a planned alternative to landing at a scheduled airport, but which shall not take off unless during the scheduled hours in Condition 9;
- d) Aircraft landing in an emergency;
- e) The operation of emergency flights required to rescue persons from life threatening situations or to transport patients, human vital organs, or medical personnel in a medical emergency;
- f) The operation of unscheduled flights required to meet the needs of any state of emergency declared under the Civil Defence Emergency Management Act 2002 or any international civil defence emergency;
- g) Aircraft carrying heads of state and/or senior dignitaries acting in their official capacity or other military aircraft operations;
- h) No more than 4 aircraft movements per night with noise levels not exceeding 65 dB L_{AFmax} (1 sec) at or beyond the Air Noise Boundary.

For the purposes of this condition a schedule of any aircraft operations that occur under this condition shall be maintained on a publicly accessible web site maintained and operated by the Requiring Authority

Engine Testing

Condition 11

11. The Requiring Authority shall ensure that aircraft propulsion engines may be run within the Designated Area for the purpose of engine testing as follows:

- a) Undertaken during the hours of 6.00am to 8.00pm only;
- b) To carry out essential unscheduled maintenance between 8.00pm and 11.00pm only;
- c) To operate an aircraft within flying hours but provided the engine run is no longer than required for normal procedures, which for the purpose of this condition, shall provide solely for short duration engine runs by way of flight preparation while the aircraft is positioned on the apron;
- d) No person shall start or run any aircraft propulsion engine for the purposes of engine testing on the locations shown on the map attached as Attachment 4;
- e) Restrictions on engine testing from 11.00pm to 6.00am do not apply if engine testing can be carried out in compliance with all of the following:
 - i. measured noise levels do not exceed 60 dB ~~$L_{AEQ}(15\ min)$~~ $L_{Aeq}(15\ min)$ at or within the boundary of any residential zone;
 - ii. measured noise levels do not exceed 75 dB L_{AFmax} at or within the boundary of any residential zone;
 - iii. noise levels shall be measured in accordance with NZS6801: 2008 Acoustics – Measurement of Environmental Sound
 - iv the total number of engine test events relating to aircraft using the Airport as an alternate landing site shall not exceed 18 in any consecutive 12-month period;
 - v. the total duration of engine test events relating to aircraft using the Airport as an alternate landing site in terms of Condition 10 c) shall be no more than 20 minutes.

For the purposes of this condition a schedule of any aircraft operations that occur under this condition shall be maintained on a publicly accessible web site maintained and operated by WIAL.

Ground Power and Auxiliary Power Units (GPUs/APUs)

Condition 12

The Requiring Authority shall ensure that the operation of ground power units (GPUs) and auxiliary power units (APUs) when measured at any adjoining residential zone shall not exceeding the following limits:

- a) Monday to Saturday 7.00am to 10.00pm 55 dB ~~L_{Aeq}(15 MIN)~~ L_{Aeq}(15 min)
- b) At all other times 45 dB ~~L_{Aeq}(15 MIN)~~ L_{Aeq}(15 min)
- c) All days 10.00pm to 7.00am 75 dB ~~L_{AFmax}~~ L_{AFMax}

Exception that these limits shall not apply to APUs for:

- i. Aircraft under tow;
- ii. The first 90 minutes after an aircraft has stopped on the gate;
- iii. 60 minutes prior to scheduled departure;
- iv. The use of APUs to provide for engine testing pursuant to Condition 11.

Land Based

Condition 13

The Requiring Authority shall ensure that noise emission levels from any activity within the Designated Area, other than aircraft operations, engine testing ~~and the operation of APUs~~ when measured at any adjoining residential zone, shall not exceed the following limits:

- a) Monday to Saturday 7.00am to 10.00pm 55 dB ~~L_{Aeq}(15 MIN)~~ L_{Aeq}(15 min)
- b) At all other times 45 dB ~~L_{Aeq}(15 MIN)~~ L_{Aeq}(15 min)
- c) All days 10.00pm to 7.00am 75 dB ~~L_{AFmax}~~ L_{AFMax}

Noise Management Plan

Condition 14

Without in any way limiting its obligations to fully comply with the conditions attaching to this designation, the Requiring Authority shall update its Noise Management Plan (“NMP”) which describes in detail how it proposes to manage the Airport in order to comply with the relevant noise conditions.

Condition 15

The Noise Management Plan shall include, as a minimum:

- a) A statement of noise management objectives and policies for the Airport;
- b) Details of methods and processes for remedying and mitigating adverse effects of Airport noise including but not limited to:
 - i. improvements to Airport layout to reduce ground noise;
 - ii. improvements to Airport equipment (including provision of engine test shielding such as an acoustic enclosure for propeller driven aircraft) to reduce ground noise;
 - iii. aircraft operating procedures in the air and on the ground procedures to minimise noise where this is practicably achievable;
- c) The procedures for the convening, ongoing maintenance and operation of the Airport Noise Management Committee (“ANMC”) as set out in Condition 17;
- d) The mechanisms to give effect to a noise monitoring programme to assess compliance with Conditions 6 – 13;

- e) The procedures for reporting to the ANMC any Aircraft Operations and engine testing activities which contravene a condition of this designation;
- f) Fulfilment of the LUMINs programme (as required);
- g) The dispute resolution procedures to resolve any disputes between Wellington International Airport Limited (“WIAL”) and ANMC about the contents and implementation of the NMP;
- h) The procedures for reviewing and amending the NMP.

Condition 16

The ~~relevant~~ current version of the Noise Management Plan, shall be updated to include the requirements for monthly operational noise monitoring results, current noise contours and schedules of activity under Conditions 8, 10 and 11. This information shall be made available to the public on WIAL’s web site.

Condition 17

The Requiring Authority shall at its cost be responsible for the ongoing membership and function of the ANMC identified in Condition 15 c). The purpose, membership and functions of the ANMC shall be set out within the Terms of Reference included in the NMP.

East Site NoR

Recommended WCC Draft Noise Conditions

Earthworks and Construction Management

8. For any site enabling work involving any earthworks or construction activities within the Designated Area, an outline plan required by section 176^A of the Resource Management Act (RMA) shall include an Earthworks and Construction Management Plan (ECMP). The purpose of the Earthworks and Construction Management Plan shall be to:

- a. Describe the methods proposed for the development of the Designated Area and the programme for earthworks and construction activities, including any staging;
- b. Provide details regarding the quantity of excavated material and the location in which it will be stockpiled, used elsewhere within the Airport, and/or transported from the site;
- c. Describe what actions will be taken to manage the actual or potential effects arising from earthworks and construction activities including, but not limited to:
 - i. Specific erosion and sediment control and stability requirements proposed on the site, management and monitoring requirements;
 - ii. Construction noise ~~and vibration~~ so that it complies where practicable with the requirements of New Zealand Standard 6803:1999 Acoustics Construction Noise. ~~Where~~ Any construction activity or work that cannot comply with the recommended limits of New Zealand Standard 6803:1999 Acoustics Construction Noise:
 - Shall be identified;
 - The duration for each activity shall be specified;
 - The Best Practical Option (BPO) to reduce noise to a reasonable level shall be adopted;
 - An assessment of what is the best practical option shall be included in the Noise Management Plan;

~~mitigation measures to properly manage the effects of any exceedances. The Methods employed to assist with this during construction activities shall include, but not be limited to the identification of mitigation and management measures necessary to assist in reducing the effect of construction noise and vibration on sensitive receptors (such as the selection of construction equipment or~~

~~methods, hours of operation, screening of the affected area, temporary relocation of persons directly affected);~~

iii Vibration construction so that it complies where practicable with the requirements of set out in German Standard 'DIN 4150-3:1999 "Structural Vibration – Part 3: Effects of vibration on structures' Any vibration construction activity or work that cannot comply with the recommended limits of German Standard 'DIN 4150-3:1999 "Structural Vibration – Part 3: Effects of vibration on structures'

- Shall be identified;
- The duration for each activity shall be specified;
- The Best Practical Option (BPO) to reduce noise to a reasonable level shall be adopted;
- An assessment of what is the best practical option shall be included in the Noise Management Plan.

iii. Waste management.

iv. Dust control measures to ensure there is no airborne or deposited dust beyond the Designated Area or other Airport land as a result of the earthworks and construction activities that is noxious, offensive or objectionable; and v. Traffic related movements and parking.

Operational Noise

Condition 16

16. The Requiring Authority shall ensure that all aircraft operations within the East Side Designated Area are managed so that the ~~rolling~~ 90-day ~~rolling~~ average, 24 hours night-weighted sound exposure does not exceed a Day/Night Level (L_{dn}) of 65 dBA outside the Air Noise Boundary shown on District Plan Map 35 of the EEA Compliance Line identified on Figure 1 below.

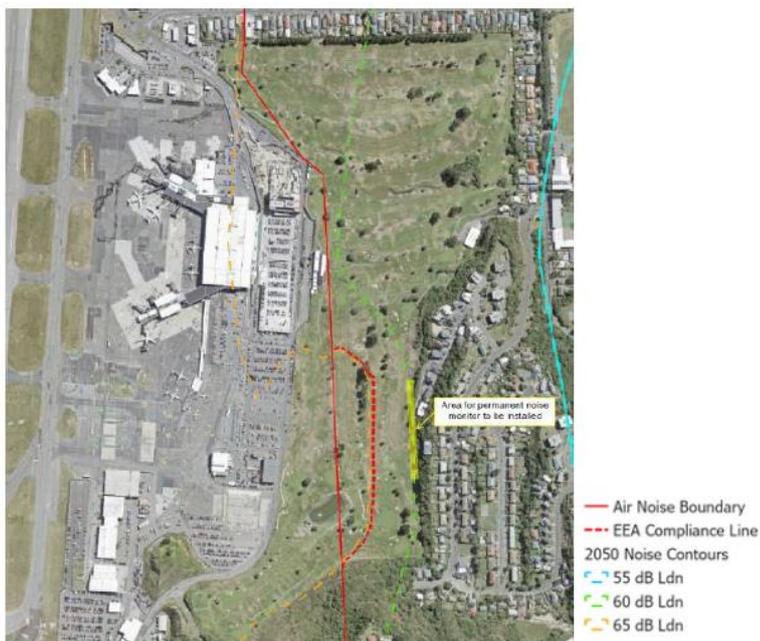


Figure 1: Aircraft operations EEA compliance line.

Condition 17

17. Aircraft noise shall be measured and modelled in accordance with NZS6805:1992 Airport Noise and Management and Land Use Planning and shall include all aircraft operations from the Airport. All terminology shall have the meaning that may be used or defined in the context of NZS ~~6805:8605~~ 1992 Airport Noise and. Management and Land Use Planning.

Condition 18

18. The following aircraft operations shall be excluded from the calculation of the ~~rolling~~ 90-day rolling average described in Condition 16:

Proposed East Side Area Designation – Proposed Conditions 5

- a. Aircraft landing in an emergency;
- b. The operation of emergency flights required to rescue persons from life threatening situations or to transport patients, human vital organs, or medical personnel in a medical emergency;
- c. The operation of unscheduled flights required to meet the needs of any state of emergency declared under the Civil Defence Emergency Management Act 2002 or any international civil defence emergency;
- d. Aircraft carrying heads of state and/or senior dignitaries acting in their official capacity or other military aircraft operations;
- e. No more than 4 aircraft movements per night with noise levels not exceeding 65 dB L_{AFmax} (1 sec) at or beyond the Air Noise Boundary.

For the purposes of this condition a schedule of any aircraft operations that occur under this condition shall be maintained on a publicly accessible web site maintained and operated by the Requiring Authority

Condition 19

A continuous noise monitoring station shall be established within the location shown in Figure 1. The purpose of this monitoring station is to collect regular and frequent noise measures that confirm compliance with the limit described in Condition 16. *Noise monitoring data and supporting information shall be maintained on a publicly accessible web site maintained and operated by the Requiring Authority.*

Condition 20

20. The Requiring Authority shall ensure that the combined noise emission levels from within the Designated Area, from any activity other than aircraft operations when measured from a point within the location shown in Figure 1 shall not exceed the following limits:

- a. All days 7.00am to 10.00pm 55 dB $L_{Aeq(15\text{ MIN})}$ $L_{Aeq(15\text{ min})}$
- b. At all other times 45 dB $L_{Aeq(15\text{ MIN})}$ $L_{Aeq(15\text{ min})}$
- c. All days 10.00pm to 7.00am 75 dB L_{AFmax}

WCC Comment: In WCC opinion Condition 20 is an unnecessary repeat of Condition 13 (Main Designation). Having a separate condition allows for a larger adjustment for duration with regards to APU operations in the ESA Duration of operations of all APUs in the airport should be considered when making adjustments for duration.

Condition 21

21. The operation of Auxiliary Power Units (“APUs”) shall be exempt from the noise limits in condition 20 for a period not exceeding 20 minutes after the aircraft has stopped at the gate and 20 minutes prior to the aircraft’s scheduled departure.

Condition 22

22. There shall be no aircraft engine testing in the East Side Designated Area.

Condition 23

23. There shall be no operating of APUs in the East Side Designated Area between the hours of 10.00pm and 7.00am.

Condition 24

24. Any aircraft stand within the East Side Designated Area shall have a Plug-in Ground Power Unit (GPU) available and used where practical.

Condition 25

25. The Requiring Authority shall ensure that there are no aircraft operating under its own power within the East Side Designated Area between the hours of 10.00pm and 7.00am. For the avoidance of doubt, this condition does not include aircraft under tow or parked on a taxiway.

Condition 26

26. The Requiring Authority shall amend its Airport Noise Management Plan in line with conditions 16 – 24 as soon as the East Side designation is confirmed. Additional operational procedures should be developed and included in the Airport Noise Management Plan once the demand for night-time GSE operations on the eastern stands and the types of equipment are known.

Condition 27A

Any existing dwelling shown in Figure 2 of the MDA report (Appendix G) as ESA receivers and listed below must be offered sound insulation and offered mechanical ventilation to achieve a positive supplementary source of fresh air ducted to the outside of the dwelling. The sound insulation and mechanical ventilation shall be consistent with mitigation measures under the Wellington Airport 'Quieter Homes' sound treatment and ventilation package offered by Wellington Airport to existing dwellings located within the Air Noise Boundary. The Requiring Authority shall be responsible for all costs associated with the sound treatment and mechanical ventilation package.

The written offer to provide mechanical ventilation and sound insulation shall be made to the owners of the properties listed in condition 27B with 12 months of the ESA designation being given effect to. Individual properties owners have 3 months to accept the offer. A record of the offer shall be kept and on request shall be provided to the compliance officer, Wellington City Council.

Condition 27B

The owners of the properties at the following listed addresses must be offered the sound treatment and mechanical ventilation package by the Requiring Authority in accordance with **Condition 27A**:

- Bunker Way Numbers 2,4,6,8,110,12,14,16, 15, 17, 19, 21
- Raukawa Street Numbers 36, 38, 38A, 40, 40A 42, 44, 44A, 46, 46A, 48, 48A, 50, 50A, 50B, 50C, 52, 52A, 54, 54A, 56, 56A, 1/58, 2/58, 58a, 60, 62, 62A, 62B, 64, 66, 68, 70, 72, 74, 76, 76A, 79, 77;
- Kekerenga Street Numbers 20, 22, 24, 26, 28, 30, 32
- Nuku Street Numbers 1,3, 3A 13,15,11, 11A, 9, 9A

Condition 27C

Any habitable room within any dwelling listed above in **Condition 27B** where the owner accepts the sound insulation offer must have suitable sound insulation to achieve an internal sound level of no more than $L_{dn} 45$ dB with all doors and windows closed. The certification of an approved acoustical engineer will be accepted as evidence that the sound proofing of the dwelling meets this sound insulation standard.

Condition 27D

Any habitable room within any dwelling listed above ion **Condition 27B** with openable windows where the owner of the property accepts the offer to provide mechanical ventilation must be provided with a positive supplementary source of fresh air ducted to the outside of the habitable room. The supplementary source of fresh air is to achieve a minimum of 7.5 litres per second/per person. The certification of an approved specialist will be accepted as evidence that the ventilation system meets this minimum ventilation standard.

Appendix B

Summary of Submissions

Noise

WCC Summary of Noise Submissions

Sub No	Submitter Name	Submitter Comment and Concern (Noise Only)	Comment
30	Marieke Boleyn (Oppose)	Acoustic noise assessment fails to cover all affected parties (northern boundary). Decision Sought - Acoustic Assessment that covers ALL affected parties (including northern boundary, across the golf course)	Council considers the most affected houses from the operations proposed in the ESA have been identified namely, ESA receivers in Bunker Way, Kekerenga Street and Raukawa Street. With regards to the main designation effects are unchanged.
		Decision Sought - Retrofitting existing houses with sound insulation.	
31	Anna Rogers (Oppose)	Expansion will make the area louder. Decision Sought - Not stated	Agreed as explained in the WCC review report.
37	BARNZ (Support)	The NoR allows for WIAL to achieve its objectives and managed noise by proposing conditions and amendments to NMP. Decision Sought - That the Notices of Requirement are confirmed in their entirety	Council has some concerns with regards to managing noise as outlined in the WCC review report.
60	Christopher Service (Oppose)	Acoustic noise assessment fails to cover all affected parties (northern boundary). Decision Sought - Acoustic Assessment that covers ALL affected parties (including northern boundary, across the golf course)	As discussed for submission No 30
107	Guardians of the Bays (GOTB) (Oppose)	Will create negative noise effects and increase in noise effects that are detriment of the residential, recreational and education communities that surround WIAL.	Will increase the level of noise effects during the day to ESA receivers in Bunker Way, Kekerenga Street and Raukawa Street
		Noise pollution will affect amenity.	Agreed as explained in WCC review report.
		GOTB supports Noise Management Plan but the NMP does not mention GOTB as a stakeholder. GOTB submits it has grave concern regarding noise pollution from the East Side Designation as it brings the airport activities and aircraft movements on taxiways and aprons closer to noise sensitive residential locations including houses on Raukawa Street, Bunker Way and Kekerenga Street (the 'receiving sites').	There are resident representatives appointed to the airnoise committee. This is an opportunity for GOTB to become involved.
		GOTB submits that the conditions limiting the number of taxing movements and offers to install mechanical ventilation to only the most affected existing homes is not appropriate, and this designation should be declined on noise effects alone.	Council accepts sound insulation will not mitigate outdoor amenity but does not recommend declining the application. With insulation ESA receivers will have daytime amenity similar to some sites located within the airnoise boundary. They will potentially have a higher level of internal

	amenity at night than they currently enjoy (not having to open windows).
We submit that there will be significant nuisance from earthwork noise to the residents that surround the East Side Designation.	This can be adequately managed by the condition requiring a NMP with the changes suggested by Council.
We submit that WIAL should not be granted localised exceedance of the Air Noise Boundary because they want to move the noisier activities of the airport closer to residential houses in Strathmore Park. The Air Noise Boundary is in place to manage WIAL's noise in the agreed boundaries. If WIAL wants to alter this they must work with the Council and community to develop a new Air Noise Boundary	A NOR application or an application for a resource consent is the correct process to consider these matters.
We submit that Sunday levels of noise should not be increased as the WIAL's proposal would increase land-based activities up to twice the noise volume as present on a Sunday between 7am and 10pm	The Sunday limits are unreasonably stringent as explained in the MDA report. These have been corrected in other sections of the WCC District Plan following background monitoring showing the ambient noise levels on Sunday are no different than other days of the week.
We submit that more a granular land-based activity noise monitoring regime is undertaken by WIAL to obtain more accurate levels of existing airport land-based noise prior to any changes in the Air Noise Boundary	Don't understand the point being made.
GOTB submits that the Main Designation should remove the military aircraft movements from any exemption of the calculations of the 90-day noise average	Should have a separate condition as currently specified in the WCC District Plan and suggested by WCC draft conditions.
Decision Sought 1 - GOTB submit the East Side Designation be declined in its entirety	No comment
Decision Sought 2 - GOTB supports a 'Noise Management Plan' but this needs to include much stronger community consultation in its development.	This is a technical document and is correctly developed within the airnoise management committee which has resident representatives as members and access to advice from a technical subcommittee, continually consult on the document. It is not practical to include in a separate condition to mirror current WCC District Plan requirement.
Decision Sought 3 -GOTB opposes Military Aircraft being excluded from the calculations of the 90-day average as set out in conditions 6 and 7 unless required in an emergency situation	
Decision Sought 4 - GOTB submits that WIAL should reduce the international aircraft operations hours to 10pm to 6am for departures and 11pm to 6am for arrivals.	The airport is an existing transport infrastructure of national importance with existing operation hour currently outlined in the District Plan which went through a public process with mitigation measures included as rules. These rules are mirrored in the NOR.

113	Helen Salisbury (Oppose)	The sound generated by taxiing planes is a significant noise nuisance for residential neighbours.	Covered in the Council WCC review report.
		The reference to "operations" in the condition (at page 7) should also include taxiing.	
		The engine testing exclusion area should also include those parts of Precincts 1 through 6 that have residential neighbours within a certain distance.	
		Decision Sought 1 -I believe that the noise measurements should also include the sound generated by aircraft while on the ground (i.e. During taxiing). Decision Sought 2 -Believe the reference to "operations" in the condition (at page 7) should also include taxiing.	Sound level measurements for all activities (ground based) not just ANB.

136	Jeffrey Weir (Oppose)	The NOR understates – and in some cases omits – key environmental and social costs of the designation including noise and emissions externalities that pose an actual threat to both nearby affected residents and the wider community.	Effects from noise are discussed in the WCC review report.
		WIAL should not be permitted to change existing noise rules in a way that would increase in permitted levels on Sundays (7am – 10pm)	The Sunday noise limits are unreasonably stringent as explained in the MDA report. These have been corrected in other sections of the district plan following background monitoring showing the ambient noise levels on Sunday are no different than other days of the week.
		Noise modelling estimates are not sufficiently robust and extending the existing airport operational area under the NOR will increase noise up to and possibly beyond safe limits that will adversely impact community health and amenity values.	Modelling is undertaken in accordance with appropriate standards.
		WIAL have gone for a ‘dream’ masterplan scenario that puts a new road and jet-capable taxiway as close to residents as the land and noise limitations will possibly allow them to. There is no counterfactual.	The Applicant can respond to this question
		The NOR is silent on what options might exist to use some or all of the east side land for WIAL activities that increase overall operations efficiency without similarly increasing operational noise. In short, the NOR is all or nothing.	Council’s has recommending sound insulation.
		WIAL’s plans in the NOR to build a taxiway on the ESA treats the noise thresholds at the ANB more as an allowable limit rather than a limit to be actively avoided. In seeking to extend airport operations eastward they point out that despite the increased noise, that noise remains (just) under the existing hard limit imposed by the ANB (or in fact above it as outlined above in regard to WIAL’s requested change in compliance point at localised parts of the ANB).	The airnoise boundary acts as a planning method to manage the future development of the airport. Changing the airnoise boundary should go through a public consultation process such as a resource consent for NOR application.
		WIAL advise that the price affected residents pay in terms of noise are “not unusual for residential properties adjacent to transport infrastructure such as roads and airports.” But let us be clear: We are not talking here about residents that have elected to voluntarily live immediately adjacent to existing transport infrastructure boundaries. Rather, we are talking about transport infrastructure boundaries being moved so that they are right in residents’ faces, noses, and ears	Agreed.

<p>Taxiing brings those aircraft closer still, and Marshall Day Acoustics estimates that noise levels from this would be twice that of single event levels experienced by these receivers from jet departures. Make no mistake – this would not merely be ‘elevated and undesirable’. Rather, it would be ‘maddening and sustained’:</p>	<p>The comment regarding the perception of the noise is a subjective analysis with no reference to acoustical criteria. That said, Council does agree single event noise will be high.</p>
<p>The NOR advises that “the predicted single event levels (95 dB L_{AE} and 83 dB L_{Amax}) on adjacent receivers are moderately high but not uncommon for residents living near an airport” (emphasis added). This is disingenuous: those receivers do not currently live adjacent to an airport...rather, they live adjacent to a golf course, with that golf course providing a significant and much needed buffer to airport noise. WIAL is in effect making the point that residents will be no worse off after the removal of that buffer than a hypothetical situation where such a buffer never existed.</p>	
<p>The NOR seeks to effectively change the compliance point of the existing Air Noise Boundary, due to predictions showing that noise from 2050 aircraft operations will exceed the ANB within the ESA around the new taxiways. I argue that the exact opposite is true: That the compliance point of the 65 dB L_{dn} contour at this location necessitates a change to the proposed taxiing activity</p>	<p>Council accepts that this point should be considered. This and the point above is one of the justifications for sound insulation of affected houses in the ESA</p>
<p>As per the district plan, WIAL must manage aircraft operations so that sound exposure does not exceed 65 dBA L_{dn} outside the Air Noise Boundary. WIAL should not be granted a localised exceedance to it merely because they want to relocate their noisier activities there</p>	<p>Council accepts that this point should be considered.</p>

<p>234</p>	<p>Keith Lewis Regional Health Board (Hutt District Health Board) (Neutral Oppose and Support with changes)</p>	<p>Proposed Condition 7 - Support in Part. Amend so reads "aircraft noise shall be measured and modelled in accordance with.."</p>	<p>MAIN SITE NoR</p>
		<p>Proposed Condition 8 a, b and c- Support in Part. Condition 8 allows exemption to noise limits for emergencies and a record should be maintained and made public. Amend so reads "A schedule of any aircraft operations that occur under this condition shall be maintained on a publicly accessible web site.."</p>	<p>WCC agrees.</p>
		<p>Proposed Condition 8d - Oppose. Condition 8d allows exclusion for aircraft for admin convenience rather health effects. Amend so "Military aircraft operations.." IS DELETED</p>	<p>Military operations should be controlled by a separate condition to mirror what is currently in the WCC District Plan.</p>
		<p>Proposed Condition 10 - This condition allows for erosion of sleep protection however they are a carryover from the District Plan. Given the health effects a record of occurrences should be maintained. Amend so reads "A schedule of any aircraft operations that occur under this condition shall be maintained on a publicly accessible web site.."</p>	<p>This mirrors the WCC District Plan rule and went through a public process. Additions to the condition eventuated through the NMP process and plan changes. I have been on the noise committee for 20 years and these exemptions are enacted rarely and only with good cause.</p>

Proposed Condition 11 - This engine testing condition is not supported based on health effects as it does not prove certainty on timing, locations and limits it is a carryover from the District Plan. Given the health effects a record of occurrences should be maintained. Amend so reads "A schedule of engine tests that occur under this condition shall be maintained on a publicly accessible web site.."	Discuss further at caucusing.
Proposed Condition 12 provides extensive exemptions to APUS and does not require quieter engine tech or methods. The NoR simply proposes to continue with no noise limits for APU's under routine circumstances, at the least noise from APU in such circumstances should be subject to operational noise limits (condition 6). Amended Condition 6 to read "noise from APU operations that is exempt from the noise limits in Condition 12 shall be included in aircraft operations noise"	Council considers that there should be some limits and measurement applied to exempted APU operations.
Proposed Condition 13 noise limits are based on guidance for community exposure however relating the limits in Condition 12 and 13 does not allow for cumulative exposure when considering that guidance. While aircraft may be subject to separate regime, other sources should be considered holistically. Amend proposed condition 13 as follows :...and the operation of APUs" delete this	WCC considers there should be one rule for APU noise in the ESA and main designation.
Condition 15. Significant adverse health effects to occur for aircraft noise exposures below 65 dB Ldn (WHO 2018) i.e. beyond the ANB. As occurs at some other airport in NZ (Auckland, Rotorua, Qtown) the requiring authority should acoustically treat existing houses outside the 65 dB Ldn contour, where adverse health effects are likely. Amend Condition 15 as follows "The procedures to acoustically treat exercising houses adversely affected boggy aircraft noise beyond the Air Noise Boundary" .	Council has considered the houses affected by the proposed changes only and considers sound insulation of adversely effected ESA houses is justified.
Proposed Condition 16 even the controls proposed the community will continue to pay for the airports environmental noise emissions in terms of adverse health effects. It is important that noise exposure is transparent, and reports made available to the community. In addition to the current version of the Noise Management Plan, public information should include real time noise monitoring date and current predicted noise contours. Amend Condition 16 as follows. "The current version of the Noise Management Plan, real time noise monitoring data, current noise controls, and schedule of activity under conditions 8,10 and 11 shall be made available to the public on WIALS web site"	Noise data can be placed on the web site. There are questions around the usefulness of real time data in a very high wind environment where processing of the data is required and correlating aircraft movement to measurements.
Decision Sought - Seeks amendments as per comments above	

234	Keith Lewis Regional Health Board (Hutt District Health Board) (Neutral Oppose and Support with changes)	Entire Designation Oppose. The community is exposed to all aircraft noise from WIAL. Aircraft noise should be assessed and controlled with a single consistent control boundary and not separate precinct. Seeking to authorise the East Side under a separate NoR but not identical operational aircraft noise controls undermines the integrity of the controls and allows ambiguity and uncertainty	Council agrees that some rules should apply to the entire airport.
		The effect of the change to the control boundary (ANB) have been understated and noise will be substantially far greater at the nearest neighbours	Agreed.
		Averaging of noise for the control boundary manifests itself as a visually small movement in the boundary when neighbours will be exposed to high levels of noise	They will be exposed to high levels of taxiing noise and high levels of high energy short duration event noise

Proposed Condition 16 - Oppose. The same control boundary should apply to noise from aircraft operations Amend so reads "16. The Requiring Authority shall ensure that all aircraft operations are managed so that the rolling 90 day average 24 hours night-weighted sound exposure does not exceed a Day/Night Level (L_{dn}) of 65 dBA outside the Air Noise Boundary shown on District Plan Map 35"	Council agrees that some rules should apply to the entire airport. Requires further discussion.
Proposed Condition 17 - Support in Part. Change conditions so takes account of modelling and measurements, rather than relying on measurement alone	Agreed.
Proposed Condition 18 - Support in Part. Support a, b and c to all exemptions for emergencies however aircraft for dignitaries, military aircraft is not justified with respect to the noise exposure and health effects on residents.	Military aircraft should be exempted and have their own condition mirroring the WCC District Plan rule. Aircraft for dignitaries exemption was agreed with by the airnoise committee and went through a plan change process. It is rarely invoked and when it is applied it is scrutinised by the airnoise committee.
Proposed Condition 19 - Support in Part. A permanent noise monitoring station can assist with understanding exposure and give transparency. Include in condition 'Noise monitoring data including real time information shall be maintained on a publicly accessible web site maintained and operated by WIAL'	There are questions around the usefulness of real time data in a very high wind environment where processing of the data is required and correlating aircraft movement to measurements.
Proposed Condition 21 - Oppose in Part. Noise from APUS should be subject to aircraft operational noise limits not exempt. Include in condition 'Noise from APU operations that is exempt from the noise limits in Condition 21 shall be included in aircraft operation noise.'	Agree in principle that some controls should be placed to exempted APU noise.
Proposed Condition 22 - Support. Engine testing should be avoided in Eastern Area	WCC Support
Proposed Condition 23 - Support. APU should be avoided at night	WCC Support
Proposed Condition 24 - Support in part. Plug in GPU should be made available to reduce noise	WCC Support plug in (electric) GPU
Proposed Condition 25 - Support. Aircraft operations under their own power AT NIGHT should be avoided	WCC Support
Proposed Condition 26 - Support in part. The NMO should include procedures to acoustically treat existing houses adversely affected by aircraft noise beyond the ANB	For house adversely affected by ESA.

249	S and M Holmes	The NoR will impose unacceptable additional noise levels on adjacent residents in Raukawa, Tukanae, Taiaroa St and Bunker Way	To the extent mitigation is suggested through sound insulation of affected houses.
		The primary concern is the effects of increased noise on residents in Raukawa, Tukanae, Taiaroa St and Bunker Way. The increase in noise projected is likely to make life intolerable here. Based on the projections and evidence provided around 30% of residents will experience high annoyance at the 65 dB level forecast in 2050	As explained in WCC review report.

WIAL's arguments that projected noise levels are 'reasonable' in the context of an international airport. That presupposes people have a choice about living there	No comment necessary
The airport noise standard is from 1992 - meaning it does not take account of the latest research on the adverse health effects of chronic noise.	Whether acoustically standards require review is periodically considered. The standard is still relatively robust otherwise it would have been updated like other standards.
The WIAL talks about noise improvements in aircraft and flightpaths etc., but it's not guaranteed that these will happen.	No comment required
The increased noise will only happen gradually' (so what? - the end state is the same); It is 'reasonable' to expect this level of noise next to an airport - this argument assumes people have a choice about living there (state housing residents don't). Both arguments imply a shifting baseline effect/creeping externality where each incremental noise increase is justified because it is small or imperceptible, but ignores the cumulative effect.	Immediate effects and future effects should be considered.
Decision Sought 1 additional conditions we would like to see for the East side NoR: - expand the quieter homes programme to cover homes experiencing 55 dB L _{dn} to compensate for the significant increase in expected L _{dn} and in single event noise. Decision Sought 2 -Introduce a single-event noise control. Decision Sought 3 - retain stronger control for Sundays to provide respite and ability to use outdoor spaces. Decision Sought 4 - Progressively improve the 65 dB ANB over time to reflect the benefits of new technology. Decision Sought 5 - Require WIAL to work pro-actively with Kainga Ora and/or relevant public housing provider to ensure affected houses are insulated and ventilated and maintenance of these installations is funded and carried out	<ol style="list-style-type: none"> 1. Council considers for house adversely affected by ESA 2. This is not practical and may mean jet aircraft cannot take off. 3. Disagree for reasons explained above. 4. Refining the boundary could be put in NMP if it is not already 5. LUMINS report.

267	Strathmore Park Community Centre Trust	The Nor does not show the communicate centre (Raukawa Community Centre). The Trust is concerned about the increased noise effects on thus using the community centre. NoR states wide body taxiing on ESA would significantly increase single event levels and this will disturb indoor communications indoors where windows are needed to be opened for ventilation. As there is no detailed assessment about the centre there is too much uncertainty.	The Applicant should comment on the level of effects at the c Raukawa Community Centre.
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Decision Sought 1 - WIAL adopt program that benefit community such as work programme of other mutual benefit.

280	Tim Jones (Oppose)	Will create negative environmental and noise effects to the detriment of the residential, recreational and educational community that surrounds WIAL.	Very broad statement. The Levels of effects regarding the changes proposed are reviewed in WCC review report.
		The East Side Designation brings the airport activities and aircraft movements on taxiways and aprons closer to noise sensitive residential locations including houses on Raukawa Street, Bunker Way and Kekerenga Street (the receiving sites).	Yes it does.
		Significant adverse noise effect that cannot be mitigated by conditions	The effects of the changes affect daytime amenity. Council recommends sound

		insulation of affected ESA houses.
Noise effects of the Main Designation will arise due to the removal of military aircraft movements at night within the calculations of the 90 day noise average		Separate condition required that mirrors district plan rule.
Decision Sought 1 - The conditions limiting the number of taxing movements and offers to install mechanical ventilation to only the most affected existing homes is not appropriate, and this designation should be declined on noise effects alone		WCC Disagree.

281	Tom Moynihan	There will be negative effects include air and noise pollution.	Yes
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Appendix C

WCC Technical Noise Report

Published December 2020

Technical Review – Acoustics (Environmental Noise) Wellington Airport East Side Area (ESA)

Title	Noise / Acoustic Review Main and Eastern NoR Designation	
Applicant	Wellington International Airport Limited	Version 9
Date	27 April 2021	Status Final
Authors	Mathew Borich Lindsay Hannah	Issued to WCC Planning
		SR Number 455891 (AP)/462159(GC)

1 Introduction

Wellington International Airport Limited (**WIAL**) has purchased the southern area of Miramar Golf Course. WIAL seeks to designate land over this southern area of the Miramar Golf Course to the east of the airport for airport purposes within an area which is described as the East Side Area (**ESA**). The purpose of the designation is to accommodate expected long-term growth in air traffic, as well as remain consistent with the Wellington International Airport (**WIA**) extensions proposed under the WIA 2040 Master Plan. The proposed designation and related activities bring airport activities closer to noise sensitive locations including houses on Raukawa Street, Bunker Way and Kekerenga Street (the ‘receiving sites’). These sites are zoned Outer Residential Zone under the Wellington City Council Operative District Plan. These residential properties which lie to the east of the airport are currently separated by the southern end of the golf course which acts as a buffer zone.

The Notice of Requirement (NoR) for the ESA involves redevelopment of part of the existing Miramar Golf Course site into taxiways, aprons and associated airport activities¹³. Marshall Day Acoustics (**MDA**) have been commissioned by WIAL to prepare an Acoustic Assessment Report¹⁴ (the MDA report) which is included as Appendix G to the overall NoR Application¹⁵ for the ESA. In addition to the original MDA report a Further Information Response¹⁶ (FiR) was also submitted to clarify a number of technical issues raised by Wellington City Council, including noise, with respect to the original MDA assessment and modelling. For clarity the assessment below reproduces a number of graphics from the NoR and MDA reviews.

This review has been prepared by Matthew Borich and Lindsay Hannah.

2 The Purpose of the Designation

The designation is shown as Attachment 1 (the Designated Area) within the NoR. The NoR states within the Designated Area, land may be used for activities for the operation of WIA, limited to the following:

- *Aircraft operations and associated activities, including all ground-based infrastructure, plant and machinery necessary to assist aircraft operations;*
- *Taxiways, aprons and other aircraft movement areas;*

¹³ MDA report, p7

¹⁴ Refer to Marshall Day Acoustics Report entitled ‘Wellington Airport East Side Area Assessment of Noise Effects Rp 003 r04 20181298’ dated February 2020.

¹⁵ Refer NoR prepared by Mitchell Daysh entitled NoR for An Airport Purposes Designation East Side Area.

¹⁶ Refer to Marshall Day Acoustics FiR response dated 17.7.20

- Navigation and safety aids, monitoring stations, lighting and telecommunications facilities;
- Car parking, roads, accessways, pedestrian ways, stormwater and wastewater infrastructure,
- utility activities and security fencing;
- All demolition (if required), construction and earthworks activities, including associated structures;
- Landscaping, planting, tracks and trails;
- Ancillary activities, buildings and structures related to the above; and
- Servicing, testing and maintenance activities related to the above

The NoR¹⁷ states that due to existing growth and development needs have already put significant pressure on WIA constrained 110ha landholding and this has required it to be particularly efficient in its use of space. However, there are limits to this intensification, and the NoR states that it has become clear to WIA that they require additional land to accommodate its activities in both the short and longer term.

3 The Designation Site

The site is located to the east of WIA and comprises approximately 15.6 hectares of existing WIA land, and Miramar Golf Club land, which as noted above has being acquired by WIAL. The following illustrates the extend of the proposed designation¹⁸ and the related designation boundary applied for under the NoR.

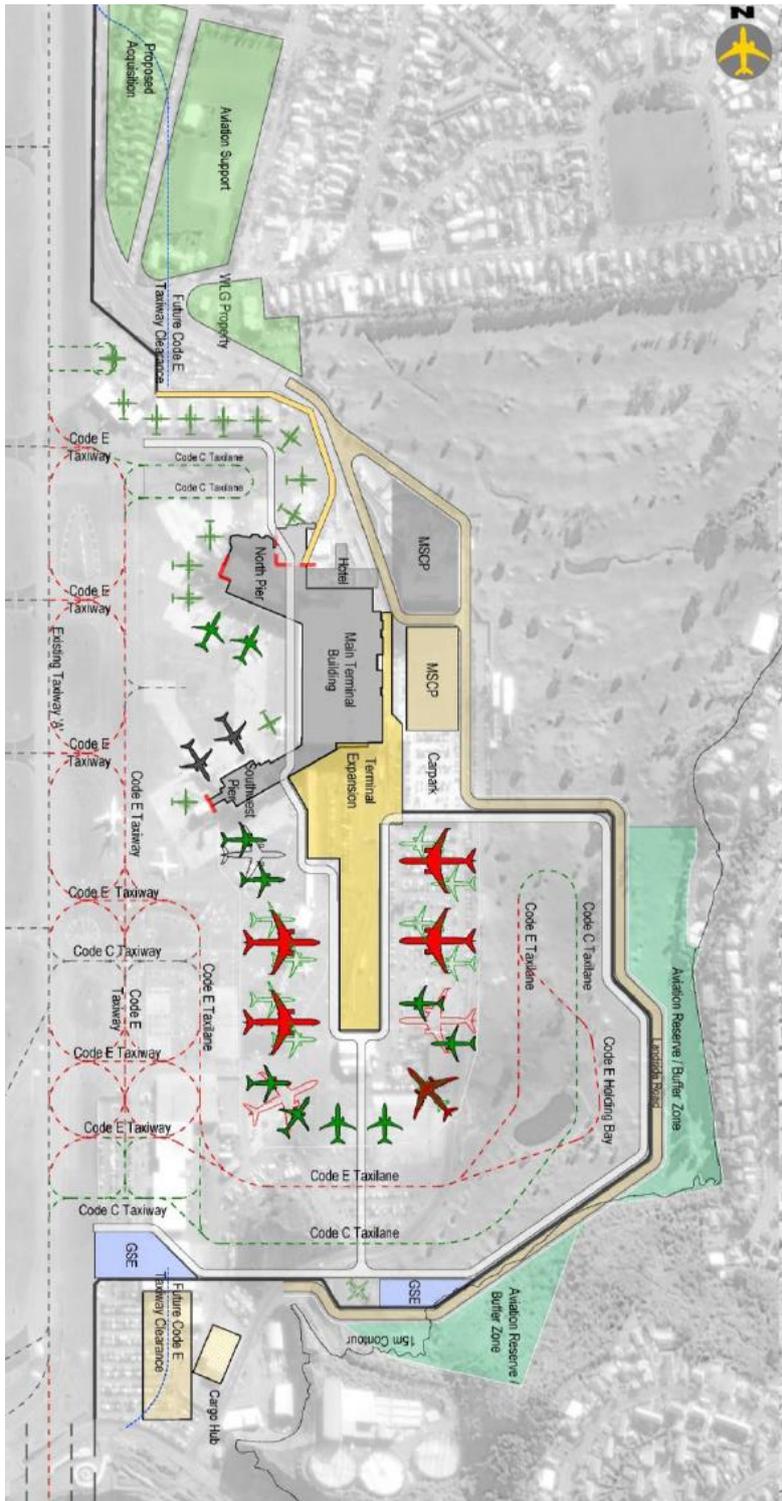


The majority of the land affected by the NOR is currently utilised as part of an 18-hole private golf course. To provide guidance on how the site could be developed and to assist with the effects assessment and development of conditions the NoR sets out a detailed conceptual (draft) master plan of this part of the Airport has been prepared which shows

¹⁷ NoR, p23

¹⁸ NoR Figure 1,p11

how the operational activities proposed might be laid out on the land concerned, and how this could be integrated with the adjacent terminal area. This Master Plan is shown below¹⁹ note the location to residential receiver sites:



The following is an artist's impression of the ESA²⁰.

¹⁹ NoR Figure 2,p13

²⁰Sourced from <https://www.rnz.co.nz/news/national/402008/wellington-council-should-rein-in-airport-expansion-environmental-group-says>



The above diagrams are particularly beneficial in identifying the most exposed properties and visually showing how taxiing aircraft operations, aprons and associated activities will extend into the ESA and how much closer these activities will be to the receiving sites. The proposed designation and related activities bring airport activities much closer to houses on Raukawa Street, Bunker Way and Kekerenga Street, effectively bringing the airport designation adjacent to the Outer Residential Zone boundary interface, with the exemption of the Aviation Reverse Buffer Zone. These properties which lie to the east of the airport are currently separated by the southern end of the golf course. The most affected sites from the airport activities in the ESA are identified in the MDA report; however, noise will be audible beyond these closest sites also. There will be a significant increase in noise levels from some airport activities in the ESA associated with the loss of sound attenuation from buffer distance and screening.

4 Wellington City Council District Plan Noise Rules

Aircraft noise at WIA is divided into a number of unique noise sources. Chapter 11A Airport Area Rules of the Wellington City District Plan set out the aircraft noise rules. Section 7.0 *'Existing District Plan Provisions'* of the MDA Report sets out in detail the existing Operative Wellington City District Plan noise provisions. The District Plans noise controls for WIA are generally divided into two key areas being:

3. Aircraft operations (engine runup, taxiing, take-off and landing (air noise boundary (ANB))); and
4. Land use noise controls (engine testing, APU/GPU, land-based activities).

The District Plan defines 'Aircraft Operations' as engine run up, taxiing, take-off and landing of aircraft. Importantly take off, landing and taxiing currently take place with the Airport Area. The MDA report states that the only 'Airport Operations' proposed in the ESA are engine run up and taxiing.

4.1 WIA Aircraft Operations and the Air Noise Boundary (ANB)

NZS 6805:1992 *Airport Noise Management and Land Use Planning (NZS 6805)* is the basis for the management of airport noise effects at airports including WIA. The standard NZS6805 is used as a basis for both managing maximum (long term) noise from airports, while also providing guidance on land use planning controls to deal with effects of aircraft noise on noise sensitive activities establishing within noise affected areas surrounding airports.

The overall purpose of the standard is for the control of airport noise. The standard establishes maximum acceptable levels of aircraft noise exposure around airport and aerodromes for the protection of community health and amenity, whilst recognising the requirement for the airport to operate effectively. The standard is divided into three key areas being: Part 1 - Airport noise management using the air noise boundary concept; Part 2 - Measurement and description of aircraft noise exposure and Part 3 - Investigation for aircraft noise monitoring.

Part 1 is the main focus of this review and sets out airport noise management using the 'Airnoise Boundary (ANB)' concept. The Airnoise Boundary (**ANB**) is a critical contour as it defines the total measured exposure to noise emitted by aircraft using the airport. According to NZS 6805:1992, the objective of the Airnoise Boundary is ***“avoiding, remedying or mitigating any adverse effects on the environment, including effects on community health and amenity values whilst recognising the need to operate an airport efficiently”***. Controls associated with the Air Noise Boundary are therefore intended to manage the effects of aircraft noise associated with the movement of aircraft to and from the airport while also providing for the safe and efficient operation of the airport.

Noise from aircraft operations at WIA is controlled by setting maximum levels of aircraft sound exposure at an Airnoise Boundary (ANB), given as a 24-hour daily sound exposure averaged over a 'rolling' 90-day average period. This is termed the day-night level (L_{dn}) where the sum of the sound energy from individual events are averaged over 24 hours with night-time noise penalised by adding 10 dB to account for increased sensitivity at night.

This method does not directly control individual aircraft movements but does so indirectly by taking into account the total overall; contribution to the day-night level. The MDA report explains international research has found that the L_{dn} metric correlates well to community annoyance relating to aircraft movements. This control method acts as a management tool where the airport can plan future growth of aircraft operations within the limitations placed by the requirement to comply at the air noise boundary and residents have certainty of noise emissions being adequately controlled. Ninety (90) day L_{dn} levels can be influenced by increases or decreases in the volume of aircraft traffic over the period, an increase or decrease in night flights (which are penalised by 10 dB) or by the introduction of quieter or noisier aircraft. In Wellington the measured L_{dn} has been shown to be strongly influenced by the very high energy short duration take-offs and landings of “jet aircraft”. The Operative Wellington City District Plan also specifies a night curfew however in effect this only applies for a 5-hour period (1.00am - 6.00am) and has numerous exemptions. The Wellington City District Plan sets the following rule for control of aircraft operations, described as follows:

Aircraft operations in general

11.1.1.1.1

Aircraft operations shall be managed so that the rolling 90-day average 24-hour night-weighted sound exposure does not exceed a Day/Night Level (L_{dn}) of 65 dBA outside the Airnoise Boundary shown on District Plan Map 35.

Aircraft noise will be measured in accordance with NZS 6805:1992 and calculated as a 90-day rolling average. All terminology shall have the meaning that may be used or defined in the context of NZS: 6805.

The level of noise from aircraft operations, for comparison with L_{dn} 65 dBA, is calculated from the total amount of noise energy produced by each aircraft event (landing or take-off) over a period of 90 days. This method of control does not directly control individual aircraft events, but does so indirectly by taking into account their contribution to the amount of noise generated in a 24-hour period.

Rule 11.1.1.1. limits noise from aircraft operations to 65 dB L_{dn} at the ANB (refer to Map 35 of the District Plan (Appendix C)). **Rule 11.1.1.1** also sets out a host of exclusions from the limits. The MDA review provides a detailed review of the current and future predicted operational noise levels with respect to the ANB, *NZS 6805:19992 Airport Noise Management and Land Use Planning* and Wellington City District Plan. This NoR proposes to impose a condition on WIAL, the requiring authority, to ensure that it manages aircraft operations to achieve compliance with the prescribed noise limit at the ANB identified on the relevant planning map of the District Plan (any adjustments from the NoR will therefore need to comply).

4.2 Land/Ground Based Operations

The District Plan sets out rules from airport noise activities that are not aircraft operations, engine testing or APU's under **Rule 11.1.1.1.8**

Land Based Activities

11.1.1.1.8

Noise emission levels, from any activity within the Airport area, other than aircraft operations, engine testing and the operation of APUs (as provided for in rule 11.1.1.1.9) when measured at any residential site shall not exceed the following limits:

Monday to Saturday 7am to 10pm 55 dB L_{Aeq} (15 MIN)

At all other times 45 dB L_{Aeq} (15 Min)

All days 10pm to 7am 75 dB L_{Amax}

The noise limits in **Rule 11.1.1.1.8** are from the upper recommended noise limits specified in the New Zealand environmental noise standard **NZS6802: 2008 Acoustics Environmental Noise** and are consistent with community noise levels published by the World Health Organization (WHO). The upper recommended levels are designed to prevent serious annoyance during the day and sleep disturbance at night for the average person. These limits are generally acceptable for residential areas in high ambient noise environments or adjoining industry or transport infrastructure (such as an airport). Background sound surveys undertaken by Wellington City Council have shown the stringent Sunday daytime limits are not justified and this has been corrected for most other areas in the plan to date.

4.3 Ground Power and Auxiliary Power Operations (GPU's and APU's)

The Wellington City District Plan sets out rules from ground power and auxiliary power units under **Rule 11.1.1.1.9**

Ground power and auxiliary power units (GPUs/APUs)

11.1.1.1.9

(a) GPUs must comply with the noise limits in rule 11.1.1.1.8.

(b) APUs must comply with the noise limits in rule 11.1.1.1.8, with the exception of:

- aircraft under tow
- the first 90 minutes after the aircraft has stopped on the gate
- 60 minutes prior to scheduled departure
- the use of APUs to provide for engine testing pursuant to rule 11.1.1.1.7.

Rule 11.1.1.1.7 also applies, however unscheduled engine testing does not occur at WIA. We understand that engine testing at WIA is only very occasional with unscheduled emergency testing associated with breakdowns. The MDA reports states WIA records show there has been no engine testing between 11.00pm and 6.00am in the last 10 years, which is a significant period. Noise from engine testing is not included in the noise limits on aircraft operations due to the distinct noise profiles of such activities. However, these activities are subject to express control measures. The limits proposed are consistent with the current permitted activity thresholds in the District Plan for the same activities.

4.4 Construction Noise

The Wellington City District Plan does not currently set out rules for Construction Noise in each chapter, however Chapter 3.0 ‘Definitions’ of the Wellington City District plan sets out the term for ‘Noise Emission Level’. As part of this definition construction noise is included. Specifically, the definition requires the assessment of construction noise by stating:

...Noise from construction, maintenance and demolition activities, including those associated with the urgent repair of utilities to maintain continuity of service, on any site or on any road shall comply with, and be measured and assessed using, the

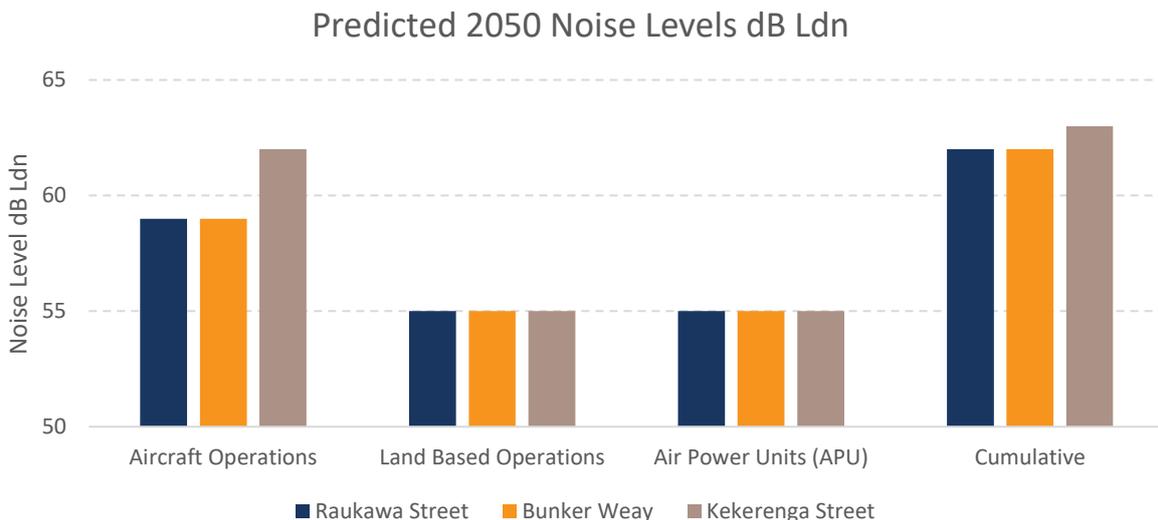
recommendations of NZS6803:1999 Construction Noise except:

- *work on public highways, railways and the Airport;*
- *work on domestic roads where construction work will cause traffic congestion;*
- *in the Central Area where construction work will endanger the safety of pedestrians and the footpath cannot be closed during the day;*
- *in the Central Area where the best practicable option to reduce noise to a reasonable level requires construction work to be undertaken outside normal working hours.*

The MDA report states that construction should be assessed using New Zealand Standard **NZS6803:1999 Acoustics Construction Noise**²¹ The MDA report also states that construction noise has yet to be assessed as the project as not at a stage where the final detailed methodologies have been set. MDA do however recommend a detailed Construction Noise Management Plan be prepared as part of the assessment.

5 Noise Environment at Receiving Sites from Airport Activities

The receiving sites adjacent to WIA are currently exposed to noise emanating from golf course and airport activities. Golf course activities would produce only modest levels of noise from people and related recreational noise. The following graph is a summary of results from Table 4 data of the MDA report for predicted L_{dn} levels for 2050 (with proposed mitigation measures in place).



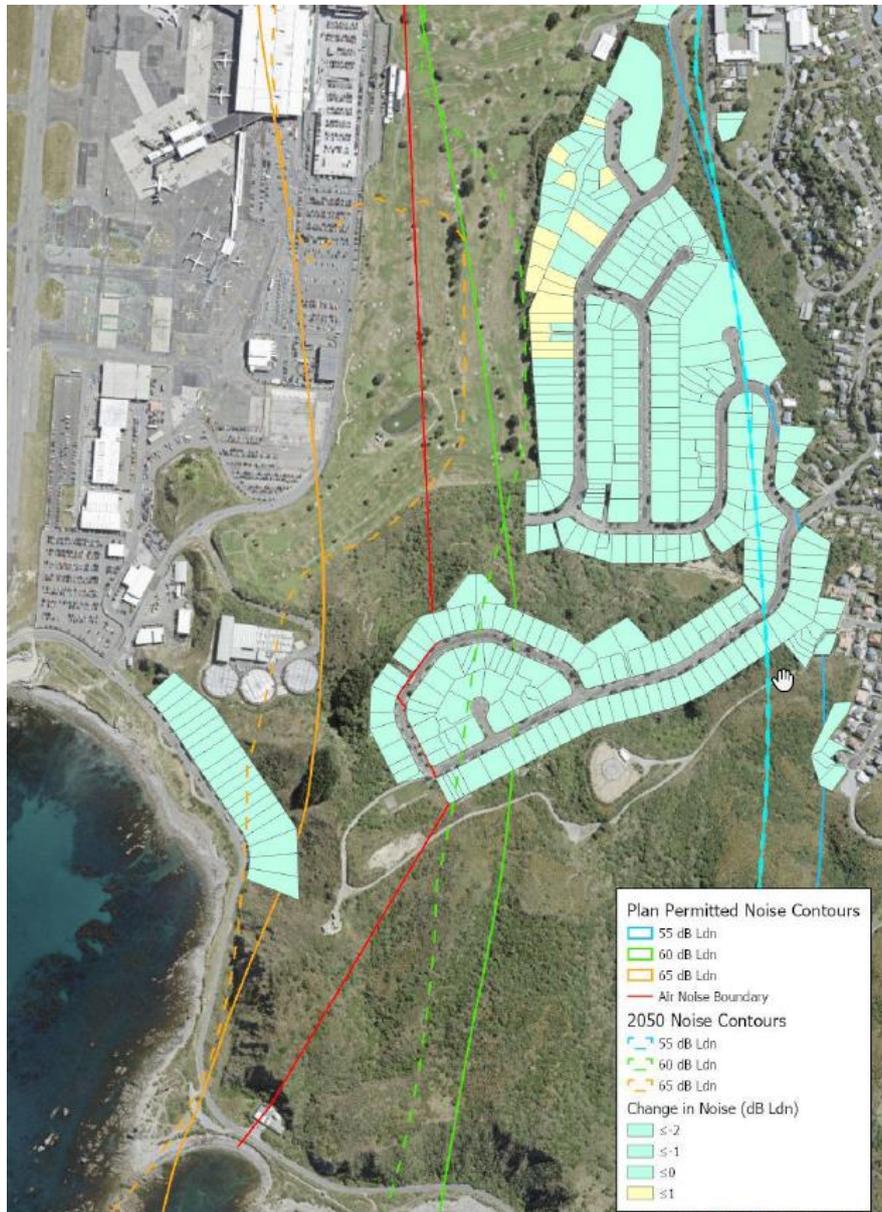
The above graph is for the total overall noise exposure levels (2050) based on the L_{dn} metric. It is noted that the MDA assessments considers cumulative noise which can only be done by converting all sources to the same noise metric.

²¹ MDA p16

MDA has therefore used L_{dn} for the cumulative noise assessment. The MDA report has also considered single event levels for individual receiver sites from taxing aircraft, which is a key noise source. The following is a break down off each individual activity proposed at the ESA:

5.1 Aircraft Operations

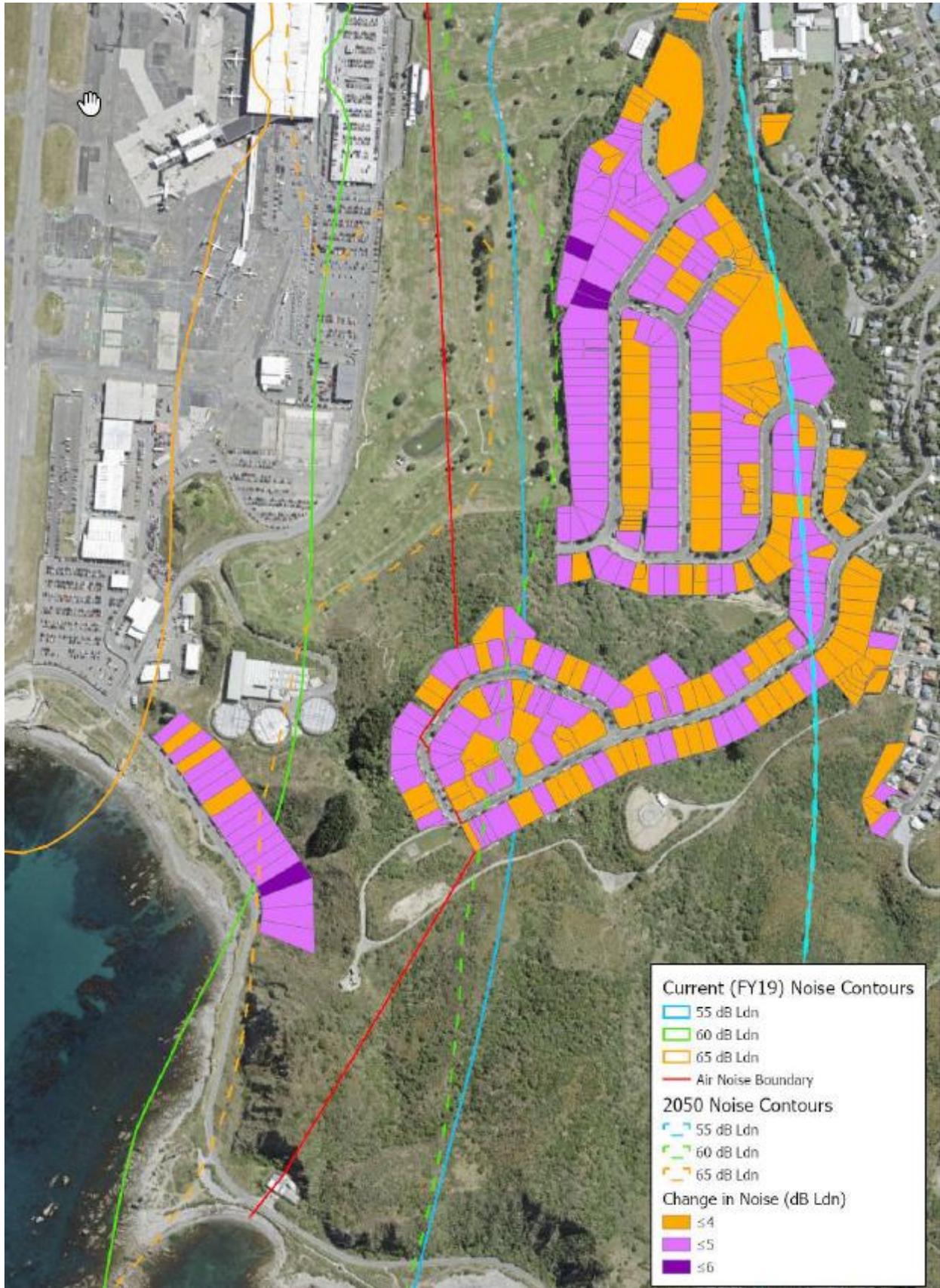
The following is reproduced from Figure C4 'Change in Aircraft Operations Noise 2050 vs Plan Permitted Contours' from the MDA report²²:



The following is reproduced from Figure C5 'Change in Aircraft Operations Noise 2050 vs Current (FY19 Contours)' from the MDA report²³:

²² MDA p49

²³ MDA p50



The MDA report confirms the dominant noise source dictating the current noise environment is from aircraft operations²⁴. Current L_{dn} levels at the receiving sites are calculated to range between 53 dB to 57 dB L_{dn} . As expected, the total L_{dn} is estimated to increase over time as airport operations increase (L_{dn} measurements are currently 5 dB below what is permitted by the District Plan at the ANB and therefore may increase by up to 5 dB). The MDA report further states airport operations (taxiing) on the ESA will increase levels by 1 dB at 2050 (1-2 dB initially) which is imperceptible. In specific the MDA report states:²⁵

- As the ESA is developed, a progressive, increase in aircraft operations noise will occur and it is predicted that by the year 2050 this will comprise an increase of 1 dB L_{dn} (imperceptible) compared with the levels currently allowed under the current planning provisions.

An assessment of effects based on human perception as listed below when applied to increases to L_{dn} levels does not provide a comprehensive effects assessment and I note MDA made an effects assessment based on single event noise in addition to projected increases in L_{dn} levels²⁶. Change in apparent loudness are summarised from the MDA report as follows:²⁷

However, the following general response to an immediate change in noise is typical:

- An increase in noise level of 9 to 10 dB sounds subjectively about 'twice as loud';
- A change in noise of 7 to 8 dB is regarded as 'appreciable';
- A change in noise level of 5 to 6 dB is regarded as 'noticeable';
- A change in noise level of 3 to 4 dB is 'just discernible';
- A change in noise level of 1 to 2 dB is 'not discernible'.

As discussed L_{dn} levels can be influenced by an increase or decrease in aircraft traffic movements over the period, an increase or decrease in night flights (which are penalised by 10 dB) or by the introduction of quieter or noisier aircraft. This makes a straight comparison with change in apparent loudness (human perception) difficult when considering changes to L_{dn} levels. For example, while an increase of 3 dB may be just discernible when comparing two distinct aircraft movements, one aircraft measuring 3 dB higher than the other quieter aircraft, an increase of 3 dBA L_{dn} over the 90-day period is a very different noise effect. For example, a 3 dB L_{dn} increase (or doubling the sound energy) may equate to twice as many aircraft movements of the same type which will be very noticeable to a receiver.

In this instance taxiing operations are proposed to be introduced into the ESA. The 2050 operating scenario is 12 narrow bodied jet aircraft and 12 wide bodied taxiing jet aircraft movements on the ESA per day. The predicted noise exposure levels at the receiving sites are 84 dB L_{Ae} for taxiing of narrow-bodied jet aircraft and 95 dB L_{Ae} for the wide-bodied taxiing jet aircraft. When considering "individual" single event noise events, sound exposure levels for taxiing of wide-bodied jet aircraft is predicted to be up to 10 dB higher than noise exposure levels of jet take offs on the runway when received at the sites directly adjoining the ESA. The MDA report states taxiing of narrow body aircraft on the new taxiways will subjectively sound at the receiving sites as loud as a jet aircraft take-off on the runway and wide body jet aircraft taxiing in the ESA would sound subjectively twice as loud as a jet- take-off on the runway²⁸. In **Section 10.1.3** of the MDA report states noise effects are stated as '*disrupting communication outdoors and indoors (windows open) and with window closed quieter activities*'.

²⁴ MDA report p15

²⁵ MDA p36

²⁶ 10dB + 10dB = 13 dB (not 20 dB). A 3dB increase is double of sound energy while 10 dB increase appears twice as loud.

²⁷ MDA report p27

²⁸ MDA ,p25

At 2050 the receiving sites will be exposed to noise emanating from an estimated 110 jet aircraft take-offs per day. The introduction of similar or higher sound exposure levels from 24 taxiing movements in the ESA equates to a percentage change increase in short duration high energy noise events of 21.8%. In summary, approximately a quarter shorter duration high energy noise events per day. This percentage would increase further if the 110 take-offs stated by MDA actually occur over a 24-hour period and are not restricted to daytime hours. In addition, taxiing noise from wide wing jet aircraft will represent the top 9% of sound exposure levels received at the adjoining residential sites to the ESA each day.

Therefore, although there is a minimal increase to L_{dn} levels (which are averaged over a 24 hour period) from taxiing operations in the ESA area which is explained by the limited number of taxiing events compared to jet take-offs, the effects **cannot** be considered imperceptible as the 1 dB change in L_{dn} levels indicates. Mitigation proposed in the MDA report is 'No taxiing under power will be permitted on ESA taxiways at night (10.00pm -7.00am). This will help prevent adverse effects at night. The effects during the day will be considered in conjunction with the effects of daytime APU operation with the ESA.

5.2 Land Based Activities

During the day and during curfew hours the receiving sites will be exposed to noise emanating from occasional exempted aircraft movements and possibly noise emanating from "distant" APU's or GPU's and other land-based activities. With activities moving closer to the receiving sites the following is predicted by MDA:

1. Ground support equipment (baggage and cargo handling, refuelling etc) **will not comply** with the Land based night-time limits of 45 dB L_{Aeq} . However, there is a potential **to comply** with the use of quieter Electric GSE;
2. Traffic movements on combined GSE and road noise can be managed to comply with the night-time limit;
3. GPU's **will comply** if they are the plug-in type where noise emission levels will be negligible; and
4. APU's **will not comply** with levels of 62 dBA predicted, and 57 dBA for quieter APU models.

The MDA report recommends controlling land-based activities (apart from APU's and GPUs) through a Noise Management Plan which will ensure management of activities to ensure compliance with the following noise limits:²⁹

10.2 Noise Effects from Land Based Activities

We recommend land based activities in the ESA are controlled by the following limits at residential receivers:

7am to 10pm	55 dB $L_{Aeq,(15 MIN)}$
At all other times	45 dB $L_{Aeq,(15 MIN)}$
	75 dB L_{Amax}

I concur with the MDA report³⁰ that these limits should apply to the cumulative noise emanating from land-based activities both in the airport area and the ESA to prevent noise creep. As discussed, these limits are consistent with the upper recommended limits in the New Zealand environmental noise standard **NZS6802:2008 Acoustics Environmental**

²⁹ MDA report p30

³⁰ MDA report, p32

Noise, which are designed to prevent serious annoyance during the day and sleep disturbance at night for the 'average person'.

These limits are generally acceptable for residential areas in high ambient noise environments or adjoining industry or transport infrastructure (such as an airport). I also concur with MDA that more stringent limits on Sundays cannot be acoustically justified within the context of the high background sound levels. This requirement will ensure effects from these land-based activities are reasonable. The proposed requirement for plug in GPUs will ensure effects from the operation of GPUs will be negligible.

Currently the aircraft stands are approx. 400m away³¹ from the receiving sites. The closest stands using jet aircraft are currently 480m away and MDA calculates noise emissions from APU's when received at the closest receiving sites will be approximately 58 dB L_{Aeq} and 53 dBA L_{Aeq} for quieter APU models. The District Plan allows APU's to run 60 minutes prior to take-offs and 90 minutes after landing. On saying that the MDA report states that APU's often operate for only 30 -45 minutes³². Predicted noise levels emanating from APU's on the stands in ESA are 62 dB L_{Aeq} and 57 dB L_{Aeq} for quieter APU models with operation times up to 30 minutes. When APU units are operating at the same time in the airport area and the ESA, cumulative noise from APU operations may be higher than 62 dB L_{Aeq}.

The MDA report propose the following mitigation. That APU's must comply with the land-based activity noise limits except for:

- *Aircraft under tow (7.00am -10.00pm);*
- *20 minutes after block on stand (7.00am -10.00pm);*
- *10 minutes prior to block off time on stand (7.00am -10.00pm); and*
- *This in effect prohibits the operation of APU's in the ESA between 10.00pm and 7.00am and (as the MDA report states, limits operational hours to what is absolutely necessary).*

5.3 Assessment of Effects from Noise Emanating from Taxiing and APU Operations

From the information provided in the MDA report, the APU operations will be for significant periods in the ESA. Predicted noise emissions from APU operations of 62 dB L_{Aeq} received at the residential sites adjoining the ESA will exceed the recommended upper daytime limits of 55 dB L_{Aeq(15min)} specified in the New Zealand standard, **NZS 6802:2008 Acoustics Environmental Noise**. These levels are more consistent with the noise limits set in the Wellington City District Plan for sites in mixed use industrial areas and the Central Area (set at 60 dB L_{Aeq} at all times day and night).

Clause C8.6.2 of NZS 6802:2008 Acoustics Environmental Noise explains the upper limit of 55 dB L_{Aeq} is recommended as '*few people are seriously annoyed*' from activities with levels below 55 dB L_{Aeq}. The exceedance by 7 dBA for standard APU models will sound appreciably louder than the upper limit specified in the standard and based on this serious annoyance can be expected from some of the residents in the receiving sites. It is noted noise emanating from APU's operating in the airport area only exceed the upper limit by 3 dBA hence an exceedance here is just perceptible.

Taxiing noise in the ESA is likely to immediately precede or occur immediately after APU operations. Although of short duration taxiing noise will be very noticeable to the occupiers of the adjacent receiving sites. Noise from taxiing of wide-bodied jet aircraft will sound twice as loud to these residents when compared to any current airport noise events they are currently exposed to. The noise exposure levels are predicted to be 10 dB higher than noise received at these sites from current jet aircraft take-offs. Currently such noise exposure levels from airport operations would

³¹ MDA report p19

³² MDA report p20

only occur from noise emanating from jet take-offs when received at some sites within the Airnoise boundary. All sites within the Airnoise Boundary are currently being offered sound insulation to mitigate unacceptable levels of noise and these noise exposure levels will therefore have a lower effect at these sites.

The day time amenity effects from the proposed operation of APU's combined with the effects from the proposed taxiing within the ESA are considered to be at a high level and additional mitigation beyond that recommended in the MDA report is recommended to ensure internal amenity effects are reasonable, namely I recommend as a minimum:

- *No more than 12 movements of wide body jet aircraft on taxiways within the ESA are permitted per day; and*
- *Property owners of sites in Raukawa Street and Bunker Street directly adjoining the boundary of the East Side area as identified on Figure 2, ESA Receivers of the Marshall Day Acoustics report Appendix G, shall be offered 6 months prior to commencement of the operation of the ESA a mechanical ventilation package at no charge to the owner where all habitable rooms within their dwelling house are provided with a positive supplementary source of fresh air ducted from the outside. The supplementary source of fresh air is to achieve a minimum of 7.5 litres per second per person.*

6 Proposed Noise Management (Noise Control Methods)

The MDA review sets out a host of recommended noise management methods under **Section 11.0** of the Acoustic Report³³.

11.0 RECOMMENDED NOISE CONTROLS

It is recommended that the designation conditions generally reflect the limits imposed by the existing District Plan Airport Area noise rules but with seven changes to enable the Masterplan and manage the noise effects:

1. Undertake construction noise assessment and prepare construction noise management plan;
2. Allow an exceedance of the ANB within the ESA to allow for localised taxiing noise;
3. Align the daytime noise limits for land based airport activities on Sunday with those for Monday to Saturday;
4. Tighten the allowance for APUs within the ESA to be exempt from noise limits;
5. Exclude taxiing under power within the ESA between 10pm and 7am;
6. Require continuous monitoring of airport noise at the interface between the ESA and the residential zone;
7. Exclude engine testing from the ESA.

7 Summary

The project will initially involve construction works which are temporary in nature. A specific construction assessment and noise management plan will need to be prepared when the final construction methodology is known. Construction noise can be adequately managed by the provision of a noise management plan in general accordance with the New Zealand construction standards, **NZS6803:1999 Acoustics Construction Noise**. Community consultation will also be a key part to the day to day management of construction noise of this nature and scale.

³³ MDA report, p34

Following construction, the ongoing day to day noise effects at receiver sites will include the proposed new taxiways, aircraft stands, roading and auxiliary activities. As the ESA develops there will be an increase in aircraft operations noise at receiver sites.

The dominant noise source dictating the current noise environment at the receiving sites is noise emanating from jet take-offs and to a lesser extent, landings on the airport runways. With the designation of the ESA this remains unchanged when considering L_{dn} levels as the new aircraft operations within the ESA are predicted to increase L_{dn} levels by only an indiscernible level of 1 dB. On saying that this equates to approximately a quarter more short duration high energy noise events per day and taxing noise from wide wing jet aircraft will represent the top 9% of sound exposure levels received at the adjoining residential sites to the ESA each day. Overall Aircraft Operations will result in an increase of 5-6 dB L_{dn} by 2050.

When considering individual noise single events, sound exposure levels (SEL/ L_{AE}) predicted at the receiving sites for taxiing of wide-bodied jet aircraft is predicted to be up to 10 dB higher (subjectively twice as loud) than noise exposure levels of jet aircraft take offs. In the MDA report noise effects are stated as *'disrupting communication outdoors and indoors (windows open) and with window closed quieter activities*. The exceedance by up to 7 dBA by APU models operating during the day will sound appreciably louder than the recommended upper limit, 55 dB $L_{Aeq(15min)}$ specified in the New Zealand standard, **NZS 6802:2008 Acoustics Environmental Noise** and serious annoyance can be expected from some of the residents in the receiving sites. In my view the change in noise environment from taxiing and APU operation within the ESA will be very noticeable to the occupiers of the receiving sites and unless suitable mitigation is in place, there is the potential to cause significant adverse noise effects to both health and amenity.

A condition limiting the number of such taxiing movements and the offer to install mechanical ventilation to the existing most affected homes, so occupiers have a choice whether to open windows is recommended as an additional mitigation measure for internal amenity.

Noises emanating from Land based activities are reasonable as they will be managed to meet the upper recommended levels in the environmental noise standard **NZS 6802:2008 Acoustics Environmental Noise** which protects against sleep disturbance and undue levels of community annoyance.

In summary, I have considered the proposed noise levels in the existing environment and within the special WIA context where existing residential houses are exposed to high levels of aircraft noise and located within the current ANB.

In my view noise emanating from all activities can be managed to a reasonable level except for sound exposure levels of taxiing of wide-bodied jet aircraft, and the operations of APU's during the day where further mitigation is needed as recommended to prevent potentially significant adverse effects. Importantly the mitigation solutions address internal amenity not external amenity.

8 Recommended Conditions

8.1 Aircraft Operations

1. No taxiing under power will be permitted on ESA taxiways at night (10.00pm -7.00am).
2. No more than 12 movements of wide body jet aircraft on taxiways within the ESA are permitted per day.
3. All residents of sites in Raukawa Street and Bunker Street directly adjoining the boundary of the East Side Area above. These ESA receivers of the Marshall Day Acoustics report Appendix G shall be offered 6 months prior to operation of the ESA a mechanical ventilation package where all habitable rooms are provided with a

g. The plan must be implemented for the duration of the site works.

Note: Guidance on the preparation of a Construction Noise Management Plan can be found in the document enclosed with this decision, and in Annex E2 of New Zealand Standard **NZS6803: 1999 Acoustics Construction Noise**.

8.4 General

9. No engine testing is permitted in the ESA.
10. Only plug in GPUs shall be used in the ESA.
11. Continuous noise monitoring shall be undertaken representative of noise immission received at the closest residential sites to the ESA. Results shall be made available at the Airnoise Management Committee to be tabled at meetings.

Author:



Matthew Borich

Manager Compliance & Advice. City Consenting and Compliance: Wellington City Council



Lindsay Hannah

Acoustic Engineer. City Consenting and Compliance: Wellington City Council

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22nd December 2020

Glossary of Terms and Definitions

Decibel (denoted dB) is a relative unit of measurement used in acoustic science. The dB is a logarithmic ratio between the measured level and a reference (threshold) level of 0 dB (for sound pressure).

dBA is the A-weighting sound level. A weighting refers to the *A weighted curve or A filter and A network* under frequency weightings. The A-weighting attempts to correlate sound level meter (objective) measurements with the subjective human response. Human hearing (our ears) are frequency selective, being most sensitive between 500 Hz and 6,000 Hz, compared with the full range of the dBA scale ranging from 20Hz up to 20,000 Hz.

L_{Aeq} is the A-weighted equivalent continuous sound level. T denotes the time period over which the fluctuating sound levels are averaged.

L_{AE} is A-weighted sound exposure level also known as **SEL**. The Sound Exposure Level is the constant sound level that has the same amount of energy in one second as the original noise event.

L_{AFmax} is the A-weighted *maximum sound level* measured with a fast time-constant

L_{dn} is the day-night noise level, configured from the L_{Aeq} (equivalent noise level) over a 24-hour period with a night time operations penalty of 10 dBA for noise events during the hours of 22:00-07:00 (10.00pm to 7.00am).

Wellington International Airport Limited (**WIAL**)

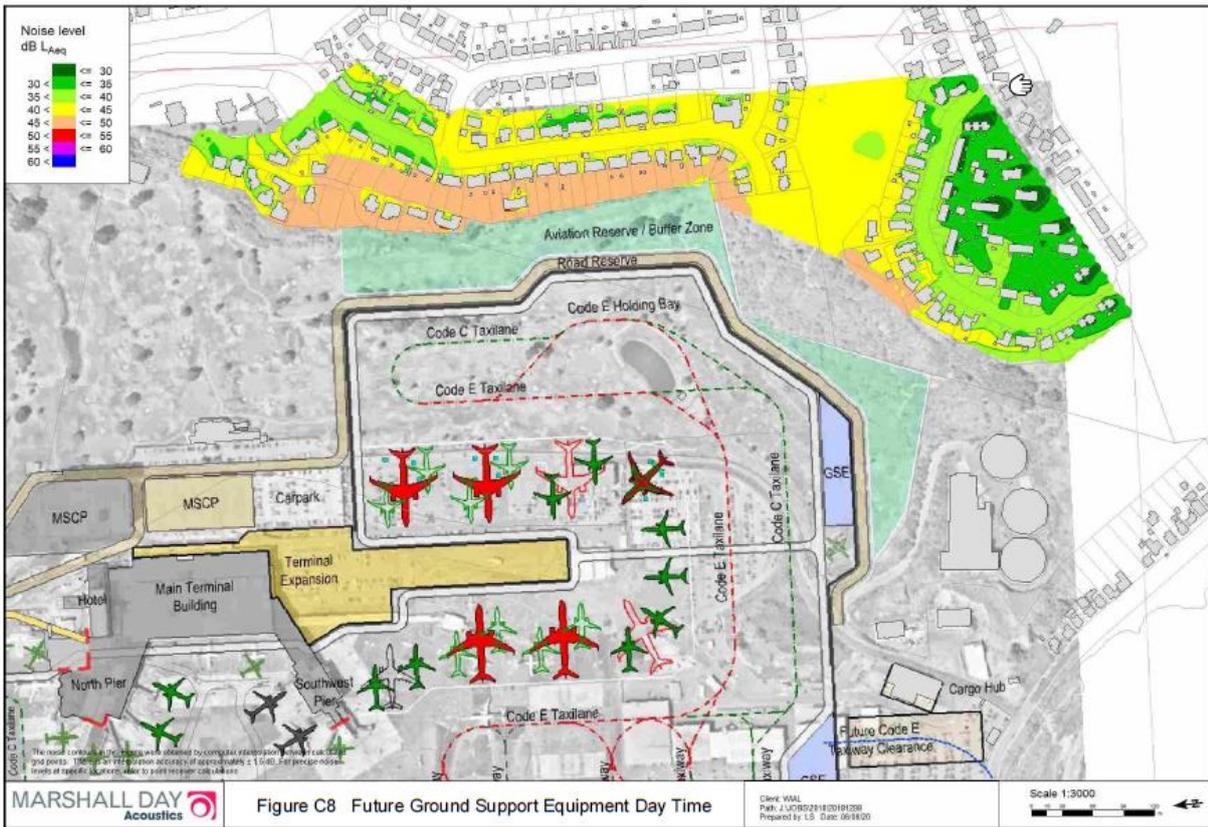
East Side Area (**ESA**)

Wellington International Airport (**WIA**)

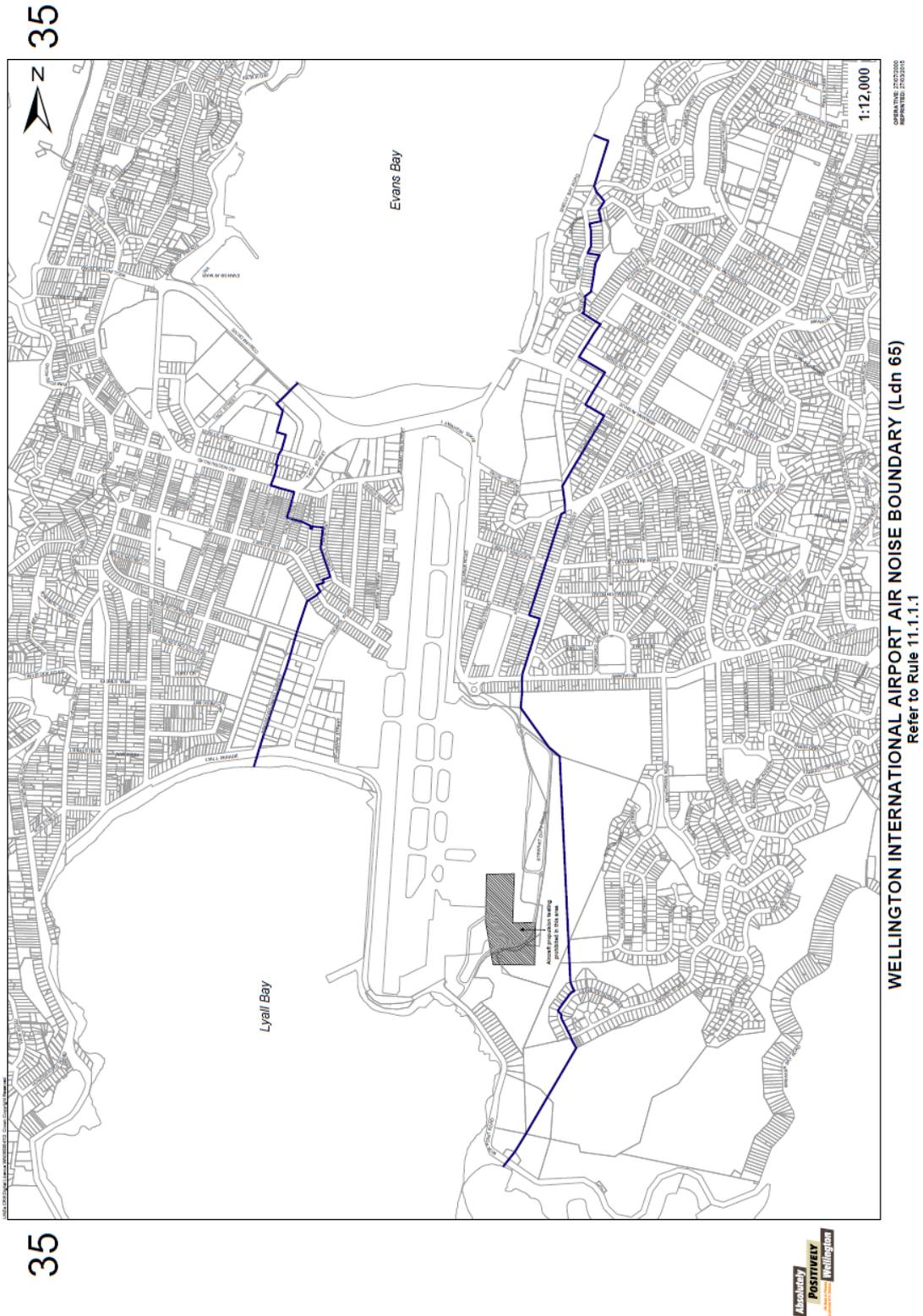
Marshall Day Acoustics (**MDA**)

Notice of Requirement (**NoR**)

Wellington City Council (**Council / WCC**)



Appendix B: WCC District Plan Map 35 (Air Noise Boundary L_{dn} 65)



Appendix C: Summary of Operative Wellington City Council District Plan Noise Rules Chapter 11 Rules

Chapter 11^A Airport Area Rules

Chapter 11^B Golf Course Recreational Prescient Rules

11.1.1.1 Noise

Aircraft operations in general

11.1.1.1.1

Aircraft operations shall be managed so that the rolling 90-day average 24-hour night-weighted sound exposure does not exceed a Day/Night Level (L_{dn}) of 65 dBA outside the Airnoise Boundary shown on District Plan Map 35.

Aircraft noise will be measured in accordance with NZS 6805:1992 and calculated as a 90-day rolling average. All terminology shall have the meaning that may be used or defined in the context of NZS: 6805.

The level of noise from aircraft operations, for comparison with L_{dn} 65 dBA, is calculated from the total amount of noise energy produced by each aircraft event (landing or take-off) over a period of 90 days. This method of control does not directly control individual aircraft events, but does so indirectly by considering their contribution to the amount of noise generated in a 24-hour period.

11.1.1.1.2

The following aircraft operations are **excluded** from the calculation of the rolling 90 day average in **rule 11.1.1.1.1**:

- aircraft landing in an emergency
- the operation of emergency flights required to rescue persons from life-threatening situations or to transport patients, human vital organs or medical personnel in a medical emergency

the operation of unscheduled flights required to meet the needs of a national civil defence emergency declared under the Civil Defence Act 1983

- military aircraft movements which shall be managed in compliance with rule **11.1.1.1.3**.

11.1.1.1.3 The following conditions shall apply to New Zealand Defence Force Military aircraft:

(a) New Zealand military transport aircraft operations shall be managed so that the following 90 day average 24 hour night-weighted sound exposure does not exceed a Day/Night Level (L_{dn}) of 55 dBA outside the Airnoise Boundary shown on District Plan Map 35.

Aircraft noise will be measured in accordance with NZS6805:1992 and calculated as a 90 day rolling average.

All terminology shall have the meaning that may be used or defined in the context of NZS6805. The level of noise from aircraft operations, for comparison with L_{dn} 55 dBA, is calculated from the total amount of noise energy produced by each aircraft event (landing or take-off) over a period of 90 days. This method of control does not directly control individual aircraft events, but does so indirectly by taking into account their contribution to the amount of noise generated a 24 hour period.

(b) Movements of New Zealand military combat aircraft shall be limited to 80 per year.

(c) For the purpose of this rule:

- military transport aircraft means any fixed wing transport or logistics aircraft including Andover, Boeing 727, Hercules, Orion and Airtrainer (and their replacements)

- military combat aircraft means any fixed wing strike or training aircraft including Macchi and Skyhawk (and their replacements)
- movements of New Zealand military combat aircraft equate to:
landing = 1 movement
takeoff = 1 movement
touch and go = 2 movements

low level pass = 2 movements.

11.1.1.1.4 No non-noise certified jet aircraft or chapter 2 jet aircraft shall be operated, except:

- in the event of unscheduled non-serviceability when substitute aircraft meeting chapter 2 may be used for the period of the non-serviceability; or
 - in the event of Wellington Airport being used as an alternate airport; or
 - in the event of emergencies; or
- military aircraft which shall be subject to rule **11.1.1.1.2**.

Chapter 2 jet aircraft are those which are certified with noise levels defined in the International Civil Aviation Organisation Convention Annex 16. Non noise certified jet aircraft are those which have no certification within the context of the International Civil Aviation Organisation Convention Annex 16 – Environmental Protection, Volume 1 (Aircraft Noise) Chapters 2 (second edition 1988) or United States Federal Aviation Regulations Part 36, Stage 2.

Night flying operations

11.1.1.1.5 Domestic operations must not occur during the hours from

- midnight to 6am.

International operations must not occur during the hours:

- midnight to 6 am for departures
- 1 am to 6 am for arrivals

For the purposes of this Rule ‘operations’ means the start of a take off roll or touch down on landing.

11.1.1.1.6 The following are exceptions to rule **11.1.1.1.5**:

- (a) disrupted flights where operations are permitted for an additional 30 minutes
- (b) in statutory holiday periods when operations are permitted for an additional 60 minutes
 - (c) aircraft using the Airport as a planned alternative to landing at a scheduled airport, but which shall not take off until otherwise permitted under rule **11.1.1.1.5**
- (d) aircraft landing in an emergency
- (e) the operation of emergency flights required to rescue persons from life-threatening situation or to transport patients, human vital organs or medical personnel in a medical emergency
- (f) [the operation of unscheduled flights required to meet the needs of any state of emergency declared under the Civil Defence Emergency Management Act 2002 or any international civil defence emergency.]^{PC76}
- (g) aircraft carrying heads of state and/or senior dignitaries acting in their official capacity
- (h) no more than 4 aircraft movements per night with noise levels not exceeding 65 dB LAF_{max} (1 sec) at or beyond the airnoise boundary.

For the purpose of (b), statutory holiday period means:

- (i) the period from 25 December to 2 January, inclusive. Where 25 December falls on either a Sunday or a Monday, the period includes the entire of the previous weekend. Where New Year’s day falls on a weekend, the period includes the two subsequent working days. Where 2 January falls on a Friday the period includes the following weekend
- (ii) the Saturday, Sunday and Monday of Wellington Anniversary weekend, Queens Birthday weekend and Labour weekend

- (iii) Good Friday to Easter Monday inclusive
- (iv) Waitangi Day
- (v) ANZAC Day
- (vi) where Waitangi Day or ANZAC Day falls on a Friday or a Monday, the adjacent weekend is included in the statutory holiday period
- (vii) the hours from midnight to 6:00am immediately following the expiry of each statutory holiday period defined in (i) to (vi) above.

The purpose of (h) is to allow certain quiet aircraft to operate at Wellington Airport during the curfew. The 65 $L_{max(1sec)}$ dBA noise limit has been based on noise levels from aircraft that have been found to be acceptable for operating at night at Wellington. The level does not purport to be the upper limit necessary to avoid sleep disturbance.

Engine testing

11.1.1.1.7 (a) Aircraft propulsion engines may be run for the purpose of engine testing:

- during the hours of 0600 to 2000
- to carry out essential unscheduled maintenance between 2000hrs and 2300hrs
- to operate an aircraft within flying hours but provided the engine run is no longer than required for normal procedures, which for the purpose of this rule shall provide solely for short duration engine runs by way of flight preparation while the aircraft is positioned on the apron.

(b) No person shall start or run any aircraft propulsion engine for the purposes of engine testing on the hardstand area south and west of the Air New Zealand hanger at any time. This area is depicted by the shaded portion of Map 35.

(c) Restrictions on engine testing from 2300hrs to 0600hrs do not apply if engine testing can be carried out in compliance with all of the following:

- (i) measured noise levels do not exceed 60 dB $L_{Aeq(15 min)}$ at or within the boundary of any residentially zoned site
- (ii) measured noise levels do not exceed 75 dB L_{AFmax} at or within the boundary of any residentially zoned site
- (iii) noise levels shall be measured in accordance with NZS6801: 2008 Acoustics – Measurement of Environmental Sound.
- (iv) the total number of engine test events to which rule **11.1.1.1.6(c)** applies shall not exceed 18 in any consecutive 12 month period
- (v) the total duration of engine test events to which rule **11.1.1.1.6(c)** applies shall be no more than 20 minutes.

Land based activities

11.1.1.1.8

Noise emission levels, from any activity within the Airport area, other than aircraft operations, engine testing and the operation of APUs (as provided for in rule **11.1.1.1.9**) when measured at any residential site shall not exceed the following limits:

Monday to Saturday 7am to 10pm 55 dB $L_{Aeq(15 MIN)}$

At all other times 45 dB $L_{Aeq(15 MIN)}$

All days 10pm to 7am 75 dB L_{AFmax}

Ground power and auxiliary power units (GPUs/APUs)

11.1.1.1.9

- (a) GPUs must comply with the noise limits in rule **11.1.1.1.8**.
- (b) APUs must comply with the noise limits in rule **11.1.1.1.8**, with the exception of:
 - aircraft under tow
 - the first 90 minutes after the aircraft has stopped on the gate
 - 60 minutes prior to scheduled departure
 - the use of APUs to provide for engine testing pursuant to rule **11.1.1.1.7**.

11.1.1.2 Screening of Activities and Storage

Sites with yards which abut a Residential or Open Space Area must be screened from view by a fence not less than 1.8m high

11.3 Discretionary Activities (Restricted)

11.3.1.7

noise, except for 11.1.1.1.1, 11.1.1.1.2, 11.1.1.1.3 and 11.1.1.1.7

The conditions in rule 11.1.1 may be waived totally, except that:

- rule 11.1.1.1.8 noise emission levels shall not be exceeded by more than 5 decibels
- rule 11.1.1.6, maximum lighting levels, must not be exceeded by more than 20 percent

11.3.1.17 Noise

11.3.1.17.1 The degree to which noise emissions can be reduced through mitigation or management measures, changes in the location, or methods of operation of the activity.

11.3.1.17.2 Whether the proposal will have any adverse effects on the health and safety of people.

11.3.1.17.3 The effects of the type, intensity and duration of the noise emitted from any activity.

It is appropriate for noise sensitive activities locating within the Airport area to be protected from intrusive noise effects.

11B GOLF COURSE RECREATION AREA RULES

11.5.1.1 Noise

11.5.1.1.1 Noise emission levels when measured at or within the boundary of any site, other than the site from which the noise is generated, shall not exceed the following:

Monday to Saturday 7am to 10pm 45 dB $L_{AEQ(15 MIN)}$

At all other times 40 dB $L_{AEQ(15 MIN)}$

All days 10pm to 7am 65 dB L_{AFmax}

11.5.1.1.2 Any activity occurring within the Golf Course recreation area when measured from any land or premises outside the precinct shall comply with the noise limits stated in Appendix 1.

11.6 Discretionary Activities (Restricted)

11.6.1.1 Noise

noise emission levels under Rule 11.5.1.1, shall not be exceeded by more than 5 decibels

11.6.1.10 Noise

The extent to which noise emissions will be intrusive. Council will seek to ensure that the best practicable option is used to mitigate noise and that adverse effects are minor.

Appendix 1. Noise

Activities must comply with the following noise limits.

Residential (Outer)

Noise emission levels when measured on any residential site in the Outer Residential Area must not exceed:

Monday to Saturday 7am to 7pm 50dB ($L_{AEQ(15 MIN)}$)

Monday to Saturday 7pm to 10pm 45dB ($L_{AEQ(15 MIN)}$)

At all other times 40dB ($L_{AEQ(15 MIN)}$)

All days 10pm to 7am 65dB (L_{AFmax})

Where it is impractical to measure outside a dwelling, then measurements shall be made inside (with windows closed). Where indoor measurements are made the noise limits stated above shall be reduced by 15dB.

3.10 Definitions

AIRCRAFT OPERATIONS: means the engine runup, taxiing, take-off or landing at an airport of an aircraft, and "operate" has a corresponding meaning

NIGHT CURFEW EXEMPTION CERTIFICATE: means a certificate issued by the Wellington City Council to the effect that the single event noise level of the stated aircraft type (and configuration) has been measured at Wellington International Airport and has been able to adequately demonstrate that it creates no more than 75 dB L_{AFmax} (1 sec Leq time-weighting) at or beyond the airnoise boundary during a minimum of 10 landings and/or departures. A list of night curfew exempt aircraft shall be compiled and copies of the approved list will be maintained by WIAL with copies held at Wellington City Council offices for public inspection.

[PRIMARY FUNCTION OF THE AIRPORT AREA: means the transport of people and cargo by aircraft and any ancillary activity or service that provides essential support to that function. This includes, but is not limited to, aircraft operations, airport operational activities (such as runways, traffic control structures and terminal buildings), cargo warehouses and other storage facilities, airport travellers' accommodation and services, vehicle parking and servicing, aircraft catering and servicing, retail and commercial services that support airport activities (provided that such retail and commercial services are located within the Terminal Area), internal roading, access and service ways.]

NOISE EMISSION LEVEL: means the noise level measured and assessed in accordance with NZS 6801: 2008 "Acoustics - Measurement of Environmental Sound" and NZS 6802: 2008 "Acoustics - Environmental Noise", where this Plan or conditions of consent refer to the $L_{Aeq(15\text{ minute})}$ descriptor and in accordance with NZS 6801: 1991 "Measurement of Sound" and NZS 6802: 1991 "Assessment of Environmental Sound" where this Plan or conditions of consent refer to the L_{10} descriptor, except as expressly provided for in this Plan.

In addition:

- The assessment of cumulative effect of activities (with the exception of road traffic noise) shall be determined. Measurement of noise shall be made in such a way that as far as reasonably practical, the contribution of individual activities creating the noise shall be identified.
- The following activities and specific noise sources are not appropriately controlled using assessment by either NZS 6802: 2008 "Acoustics – Environmental Noise" or NZS6802:1991 "Assessment of Environmental Sound" and noise rules in this Plan, unless the rule states to the contrary:
 - vehicles driven on a road (within the meaning of s.2(1) of the Transport Act 1962) or vehicular movements on any sites which are in keeping with normal residential activity
 - **the operation of aircraft including helicopters, at Wellington International Airport and airborne aircraft elsewhere throughout the District.**
- High energy impulsive sounds such as gunfire, blasting and warning devices are not adequately controlled using assessment by either NZS 6802: 2008 "Acoustics - Environmental Noise" or NZS6802:1991 "Assessment of Environmental Sound" and noise rules in this Plan, unless the rule states to the contrary.
Noise from high energy impulsive sounds are not adequately controlled using the current New
 - Where in noise rules in this Plan, the noise emission limit applies "at or within the boundary of any site, other than the site from which the noise is generated" then neither shall the noise standard apply at or within the boundaries of any other site included in the parcel of land that incorporates the site from which the noise is generated, provided that:
 - all sites in the parcel of land are held under the same ownership or under the same management
 - to be considered part of the parcel of land each site shall remain contiguous with at least one other site in the parcel that is under the same ownership.

Existing uses that are established before the Plan became notified may emit noise that exceeds the noise emission standards in the District Plan. The Resource Management Act provides for these activities to continue as long as the uses are the same or similar in character, intensity, and scale to those which existed before the rule became operative or the proposed plan was notified.

Any change to the activity that causes a worsening of the effects will require a resource consent.

This does not remove the duty placed on every occupier and every person carrying out an activity to adopt the best practicable option to ensure that the emission of noise does not exceed a reasonable level *Zealand Standards. Activities that emit noise with such characteristics are generally likely to cause greater annoyance than assessment using Rules within this Plan would indicate. The impact of such activities would be assessed by reference to Section 16(1) of the Resource Management Act.*

- Noise from construction, maintenance and demolition activities, including those associated with the urgent repair of utilities to maintain continuity of service, on any site or on any road shall comply with, and be measured and assessed using, the recommendations of NZS6803:1999 Construction Noise except:
 - work on public highways, railways and the Airport;
 - work on domestic roads where construction work will cause traffic congestion;
 - in the Central Area where construction work will endanger the safety of pedestrians and the footpath cannot be closed during the day;
 - in the Central Area where the best practicable option to reduce noise to a reasonable level requires construction work to be undertaken outside normal working hours.
- Nothing in the noise rules shall be used to prevent emergency work from taking place. Such work would arise from the need to protect life or limb or minimise or prevent loss or serious damage to property or minimise or prevent environmental damage.

[NOISE SENSITIVE ACTIVITY: means

- any residential activity
- any hotel, motel or other premises where residential accommodation for five or more travellers is offered at a daily tariff or other specified time
- early childhood centres]

And, within the airnoise boundary depicted on Map 35, also includes

- Any school or other learning facility; and
- Any hospital, rest home, hospice, respite facility or other activity with the primary purpose of care for the infirm.

[NON-AIRPORT ACTIVITY: means an activity within the Airport and Golf Course Recreation Precinct which is not related to the primary function of the Airport area.

--Document Ends--