Aeronautical Impact Assessment

Kemps Creek Industrial Community
657-769 Mamre Rd,
Kemps Creek, NSW.

A – 22 September 2021

PREPARED FOR
FPI Developments NSW Pty Ltd

PRESENTED BY
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technical note

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Date:	8th November 2021		
Project Name:	Kemps Creek Industrial Community – Ardex Development		
Project Number:	LB00474		
Subject:	Specific Development Consideration against Aeronautical Impact Assessment Report (Kemps Creek Industrial Community 657-769 Mamre Rd, Kemps Creek, NSW)		
Version:	C	**Status:**	Final
Author:	E Catindig	**Checker:**	I Guy

1 Use of this document

This technical note is to be read in conjunction with L&B Aeronautical Impact Assessment (Kemps Creek Industrial Community 657-769 Mamre Rd, Kemps Creek, NSW) report version A (Final), dated 22 September 2021.

The report assessed a generic maximum permitted extent building over the entire Kemps Creek Industrial Community development site and confirmed there were no potential aviation impacts. However, the conclusions of the report would need to be confirmed against specific development proposals.

This technical note reviews the specific proposed development noted in section 2 below and provides a confirmed impact summary.

2 Proposed development assessed

The Technical Note covered the proposed Ardex warehouse development. This development is to construct, fit out and operate a manufacturing facility and associated warehouse facility at 657-769 Mamre Road, Kemps Creek (proposed Lot 12, refer to Figure 2) which will be occupied and operated by Ardex. The warehouse development has a powder silo tower height of 38 m (Refer to Figure 1) above ground level.

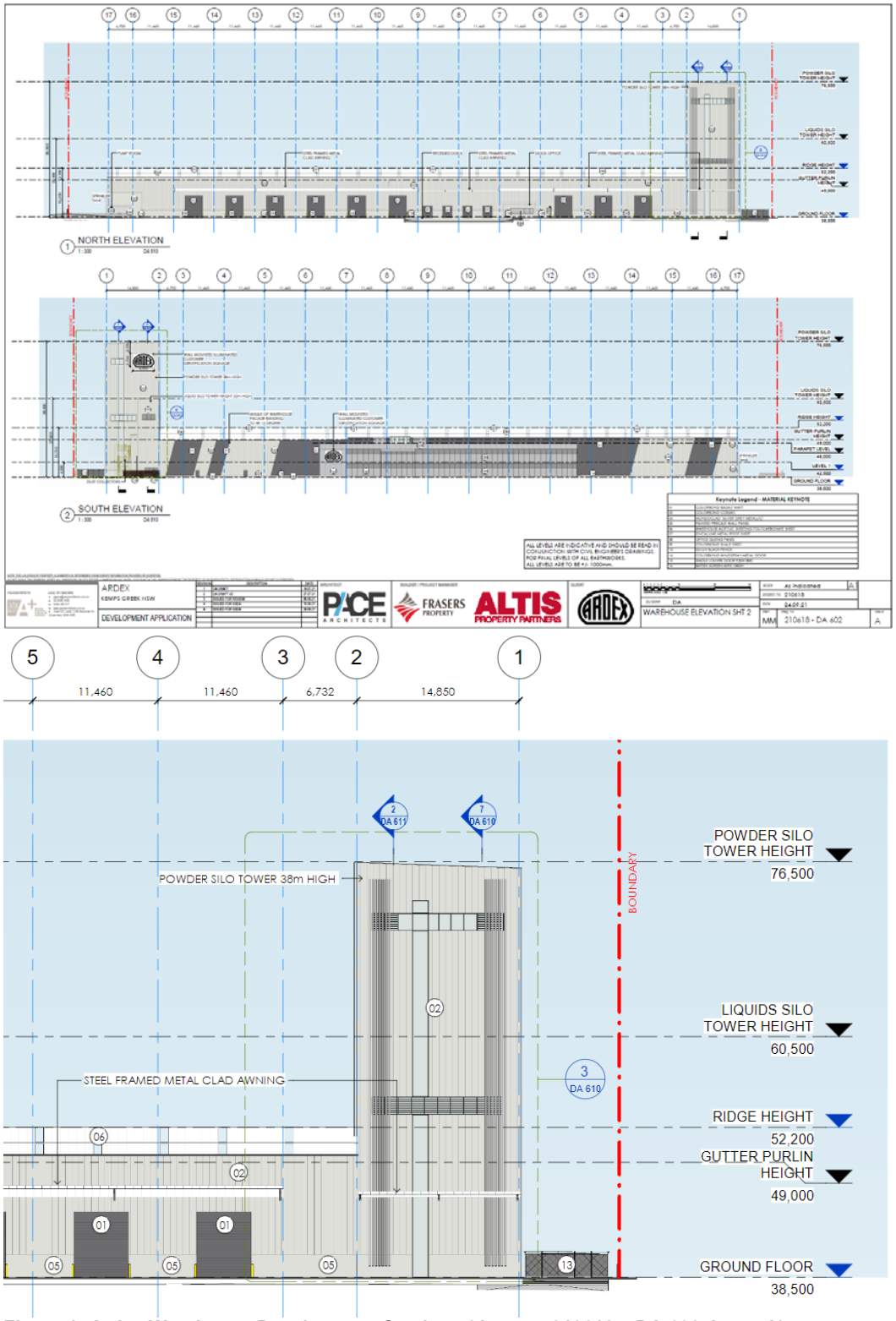

Figure 1: Ardex Warehouse Development Sections (dwg no. 210618 – DA 602, issue A)

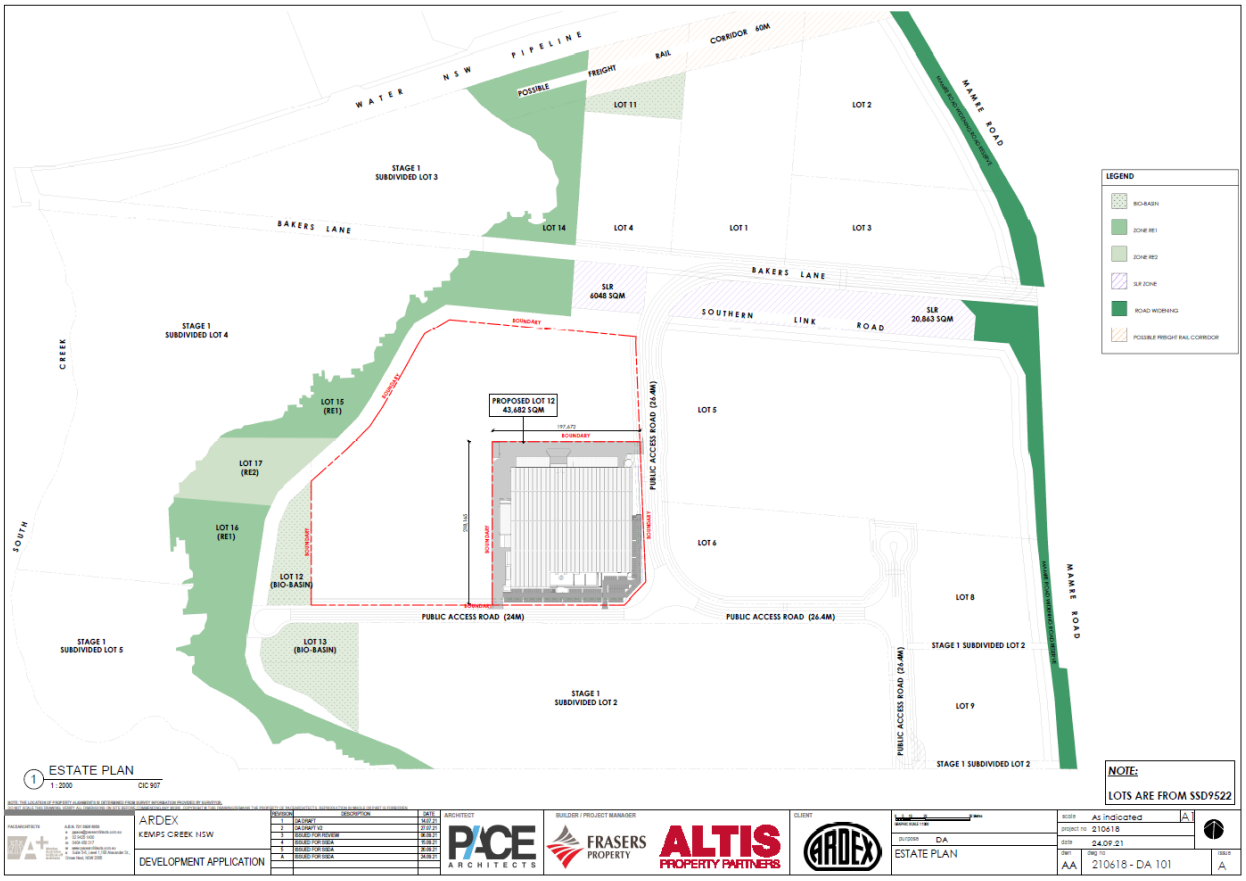

Figure 2: Ardex Warehouse Development Locality Site Plan (dwg no. 210618 – DA 101, issue A)

3 Deviations from main report assumptions

The main Aeronautical Impact Assessment report considered a building of max height 100 m (145 m AHD). The proposed development for the Ardex site is 38 m (76.5m AHD). Therefore, the building height parameters have no deviations.

The main Aeronautical Impact Assessment report considered a building that was for light industrial use and that did not have any source of emissions. This assumption holds for the Ardex site. Therefore, the building use parameters have no deviations.

4 Aviation Impact Summary

In common with the approach taken in the main Aeronautical Impact Assessment report, our consideration of the proposed development covered the aspects shown in the table below. Where impacts are noted, then proposed required remedial actions are also presented. References in the right-hand column of the table refer to section in the original main report.

The Ardex development has been assessed with buildings to a maximum height of **38 m** (**76.5 m AHD)**.

4.1 National Airports Safeguarding Framework

NASF / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
NASF Guideline A: Measures for Managing Impacts of Aircraft Noise	No impact.	8 / 2.1.2.2
NASF Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports	No impact.	9 / 2.2.2
NASF Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports	No impact.	11 / 2.3.2
NASF Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation	No impact.	13 / 2.4.2
NASF Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports	No impact	15 / 2.5.2.1
NASF Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports	No impact.	17 / 2.6.1.1 18 / 2.5.3.1
NASF Guideline G: Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS)	No impact.	18 / 2.7.1.2 19 / 2.7.2.2 19 / 2.7.3.2
NASF Guideline H: Protecting Strategically Important Helicopter Landing Sites (HLS)	No impact.	20 / 2.8.1
NASF Guideline I: Public Safety Areas (PSAs)	No impact.	21 / 2.9.1

4.2 NSW State Environment Planning Policy (Western Sydney Aerotropolis) 2020

SEPP (WSA) 2020 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 19: Aircraft Noise	No impact.	22 / 3.1.1
Clause 20: Building Windshear and Turbulence	No impact.	22 / 3.2.1
Clause 21: Wildlife Hazards	No impact.	22 / 3.4.1
Clause 22: Wind Turbines	No impact.	23. / 3.4.1
Clause 23: Lighting	No impact	23 / 3.5.1
Clause 24: Airspace Operations	No impact.	26 / 3.6.3.2 27 / 3.6.4.2
Clause 25: Public Safety	No impact.	28 / 3.7.1

4.3 NSW State Environmental Planning Policy (Western Sydney Employment Area) 2009

SEPP (WSEA) 2009 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 33E: Airspace Operations	No impact.	30 / 4.1.2
Clause 33F: Development of land adjacent to Airport	No impact.	30 / 4.2.2

4.4 NSW Penrith Local Environmental Plan (LEP) 2020

Penrith LEP 2020 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 7.9: Development of land in the flight paths of the site reserved for the proposed Second Sydney Airport (WSA)	No impact.	31 / 1.1.2

5 Conclusion

In our opinion, there is no aviation reason why the proposed development should not proceed.

Version and Use Information:

Version	Date	Author(s)	Approver	Comments
v001	30 June 2021	PWW		Initial draft for client review
A	22 September 2021	EV Catindig	I Guy	Final Version

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1 Executive Summary

The Kemps Creek Industrial Community development has been assessed with proposed buildings to a maximum height of approximately **145 m AHD** and temporary construction crane activity to approximately **155 m AHD**.

1.1 National Airports Safeguarding Framework

NASF / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
NASF Guideline A: Measures for Managing Impacts of Aircraft Noise	No impact.	8 / 2.1.2.2
NASF Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports	No impact.	9 / 2.2.2
NASF Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports	No impact.	11 / 2.3.2
NASF Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation	No impact.	13 / 2.4.2
NASF Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports	No impact	15 / 2.5.2.1
NASF Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports	No impact.	17 / 2.6.1.1 16 / 2.5.3.1
NASF Guideline G: Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS)	No impact.	18 / 2.7.1.2 19 / 2.7.2.2 19 / 2.7.3.2
NASF Guideline H: Protecting Strategically Important Helicopter Landing Sites (HLS)	No impact.	20 / 2.8.1
NASF Guideline I: Public Safety Areas (PSAs)	No impact.	21 / 2.9.1

Table 1: NASF Conclusions

1.2 NSW State Environment Planning Policy (Western Sydney Aerotropolis) 2020

SEPP (WSA) 2020 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 19: Aircraft Noise	No impact.	22 / 3.1.1
Clause 20: Building Windshear and Turbulence	No impact.	22 / 3.2.1
Clause 21: Wildlife Hazards	No impact.	22 / 3.3.1

Clause 22: Wind Turbines	No impact.	23 / 3.4.1
Clause 23: Lighting	No impact	23 / 3.5.1
Clause 24: Airspace Operations	No impact.	26 / 3.6.3.2 27 / 3.6.4.2
Clause 25: Public Safety	No impact.	28 / 3.7.1

Table 2: SEPP (WSA) 2020 Conclusions

1.3 NSW State Environmental Planning Policy (Western Sydney Employment Area) 2009

SEPP (WSEA) 2009 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 33E: Airspace Operations	No impact.	30 / 4.1.2
Clause 33F: Development of land adjacent to Airport	No impact.	30 / 4.2.2

Table 3: SEPP (WSEA) 2009 Conclusions

1.4 NSW Penrith Local Environmental Plan (LEP) 2020

Penrith LEP 2020 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 7.9: Development of land in the flight paths of the site reserved for the proposed Second Sydney Airport (WSA)	No impact.	31 / 1.1.2

Table 4: Penrith LEP 2020 Conclusions

2 Introduction

2.1 The Development

The Altis Frasers JV Pty Ltd as trustee for the ARET Frasers Project Trust has tasked Landrum & Brown Worldwide (Australia) Pty Ltd to prepare an Aeronautical Impact Assessment (AIA) for the entire Kemps Creek Industrial Community at 657-769 Mamre Road, Kemps Creek (the site), within the Penrith Local Government Area.

It is understood that final planning of the various specific buildings within the overall site is still being developed. This report is therefore prepared to indicate the maximum building height above Australian Height Datum (AHD) that can be constructed.

Once planning for any specific lots or buildings within the overall Kemps Creek Industrial Community site has progressed to a sufficient level, then such plans will be subject to review against the parameters within this report and specific Technical Notes issued to confirm alignment with the findings of this report. This report does not cover any specific proposed building / development unless accompanied by an associated Technical Note.

For the purposes of developing this report a virtual building covering the entire site has been assumed. This virtual building has a height of 143 m AHD. It is assumed that any plant will be no more than 2m higher than the height of the virtual building resulting in a height, for permanent objects, of 145 m AHD. In addition, temporary craneage will be required to operate at 10m higher than the permanent objects. Thus, a height of 155 m AHD is used for assessment against the various airspace requirements. Refer to **Figure 1.**

It is also assumed that all buildings on the site will be of light industrial nature and will not include any facilities that emit smoke, dust or other plumes into the atmosphere.

This report considers:

- National Airports Safeguarding Framework Principles and Guidelines (NASF).
    - Guideline A: Measures for Managing Impacts of Aircraft Noise
    - Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports
    - Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports
    - Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation
    - Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports
    - Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports
    - Guideline G: Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS)
    - Guideline H: Protecting Strategically Important Helicopter Landing Sites (HLS)
    - Guideline I: Public Safety Areas (PSAs)

- NSW State Environment Planning Policy (Western Sydney Aerotropolis) 2020:
    - Clause 19: Aircraft Noise
    - Clause 20: Building Generated Windshear ang Turbulence
    - Clause 21: Wildlife Hazard
    - Clause 22: Wind Turbines
    - Clause 23: Lighting

- Clause 24: Airspace Operations
- Clause 25: Public Safety

- NSW State Environmental Planning Policy (Western Sydney Employment Area) 2009;
  - Clause 33E: Airspace Operations; and
  - Clause 33F: Development of land adjacent to Airport

- Penrith Local Environmental Plan (LEP) 2020
  - Clause 7.9: Development of land in the flight paths of the site reserved for the proposed Second Sydney Airport (WSA).

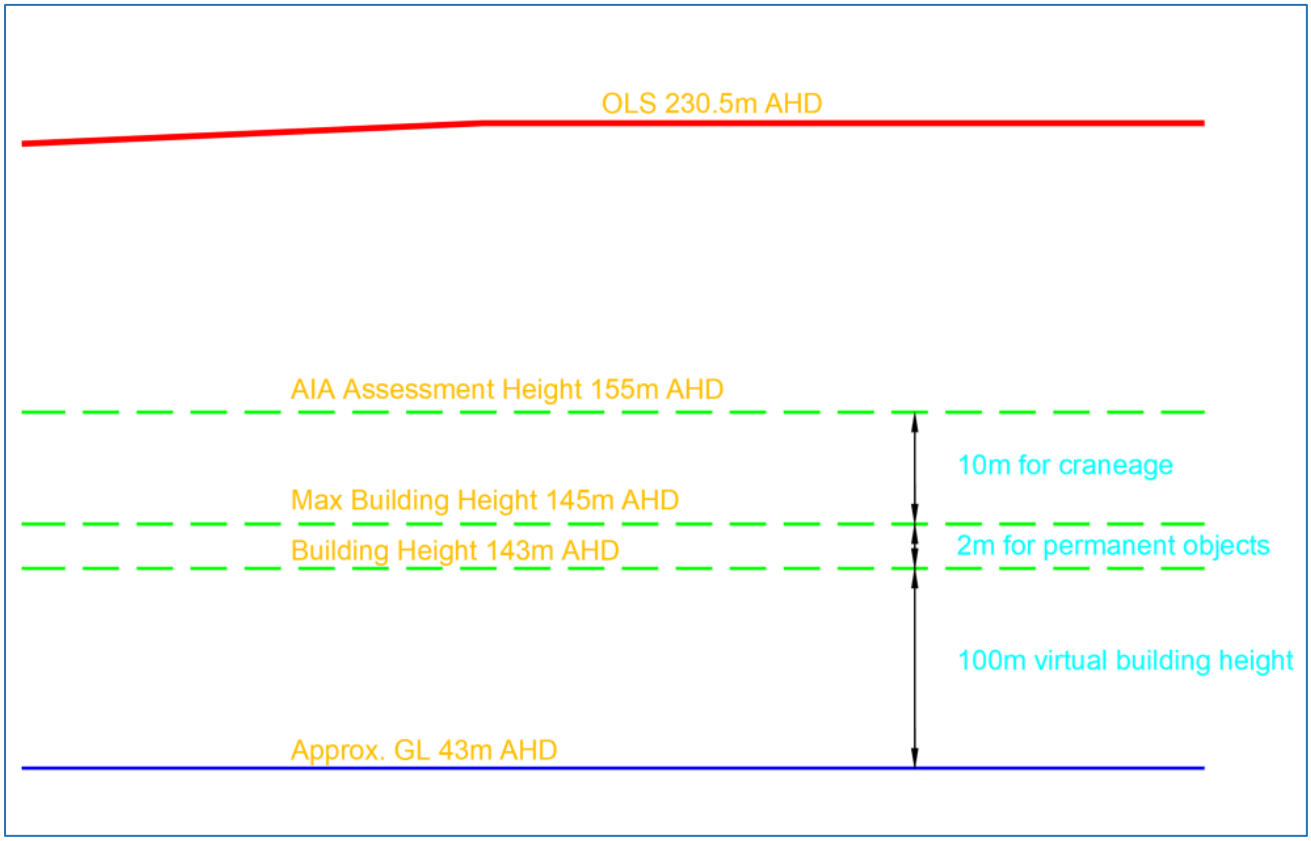


Figure 1: Virtual Building Assessment Height

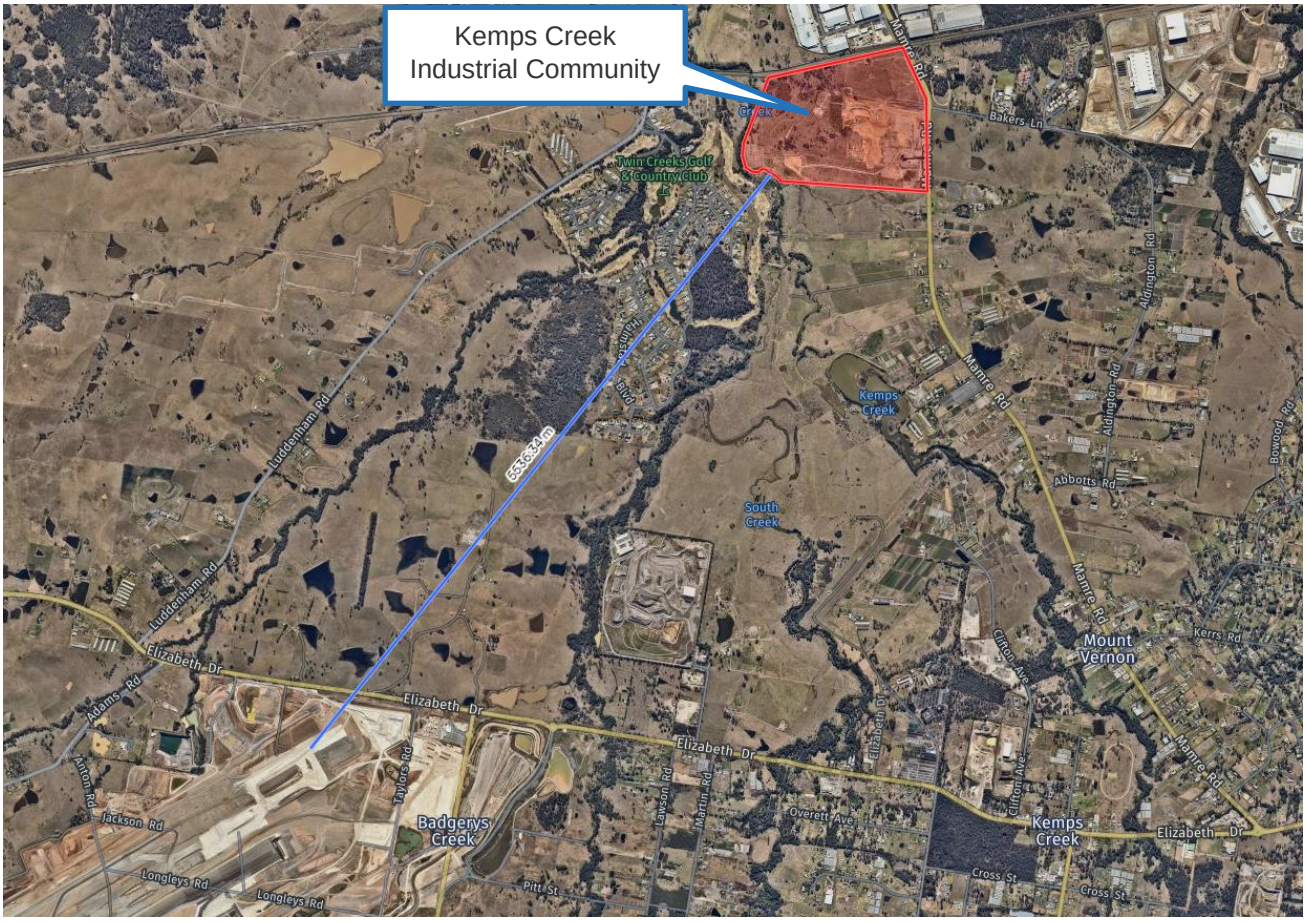


Figure 2: Location in relation to Western Sydney Airport (NearMap)

The site is located approximately 6.8 km north east of the Aerodrome Reference Point for Western Sydney Airport (WSA) and approximately 5.4 km from the nearest Runway 23 end, as shown in Figure 2.

L&B notes that Frasers Property Industrial is committed to providing WSACo with information regarding the development of the Kemps Creek Industrial Community.

2 National Airports Safeguarding Framework (NASF) Principles and Guidelines

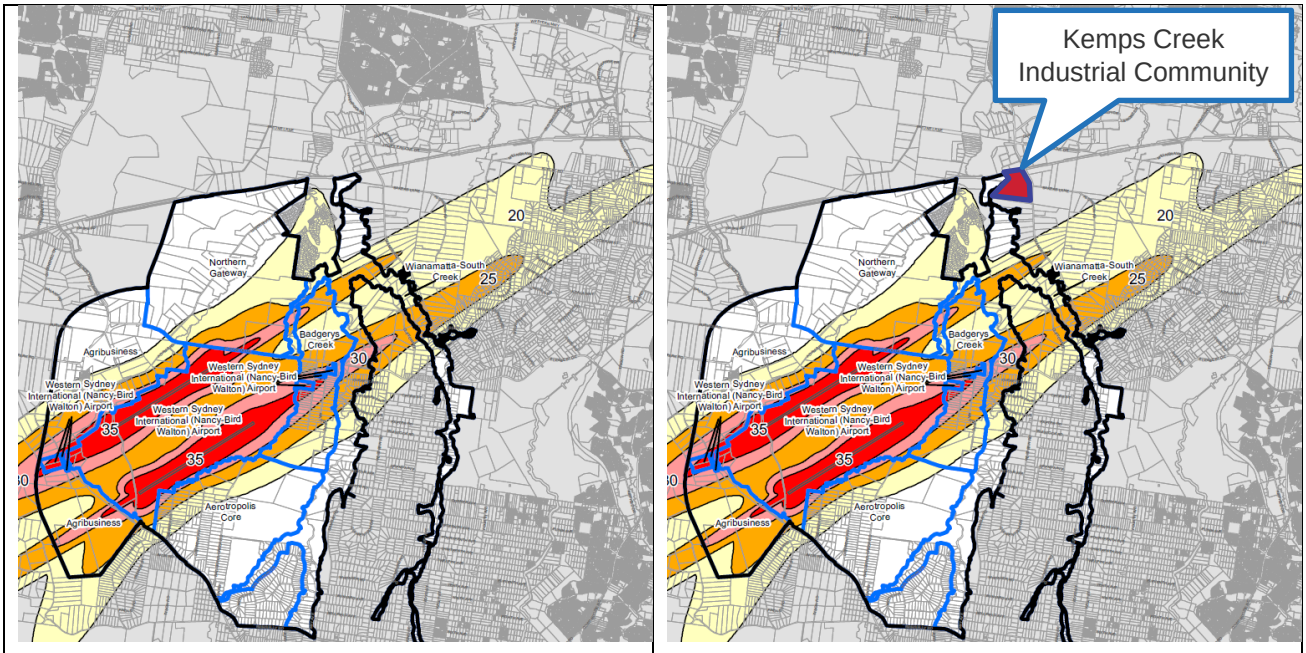
2.1 NASF Guideline A – Measures for Managing Impacts of Aircraft Noise

Guideline A provides guidance to Commonwealth, State, Territory and Local Government decision makers to manage the impacts of noise around airports including assessing the suitability of developments. Noise sensitive uses include residential, education establishments, offices, hospitals, aged care, churches, religious activities, theatres, cinemas, recording studios, court houses, libraries and galleries.

2.1.1 Objectives and Background Information

The objectives of this clause are:

- To prevent certain noise sensitive development on land near the airport; and
- To minimise the impact of aircraft noise for other noise sensitive development; and
- To ensure that land use and development near the airport do not hinder or have other adverse impacts on the ongoing, safe and efficient 24 hours a day operation of the airport.



Base Diagram from SEPP (WSA) 2020 Noise Contour Map

Marked-up Diagram Showing Kemps Creek Insdustrial Estate

Figure 3: SEPP (WSA) 2020 Noise Contour Map

2.1.2 Australian Noise Exposure Forecast (ANEF) Contours

2.1.2.1 Standard and Input Data

Australian Standard AS 2021:2015 – Acoustics – Aircraft Noise Intrusion – Building Siting and Construction, provides guidance on the siting and construction of buildings in the vicinity of airports to minimise aircraft

noise intrusion. It also describes the process that should be followed in producing ANEF charts for use in applying this standard,

The projected ANEF contours for Western Sydney Airport are described in the Western Sydney Airport Plan Section 2.3.3 and shown in **Figures 4 to 6** below.

DITRDC provides a Noise Modelling Tool on its Western Sydney Airport website. Table 5 and the associated figures shows the ANEC contour levels for each particular stage of development of the airport and the particular runway in use.

Building Type	Acceptable	Conditionally Acceptable	Unacceptable
House, home unit, flat, Caravan Park	< 20 ANEF	20 < 25 ANEF	> 25 ANEF
Hotel, motel, hostel	< 25 ANEF	25 < 30 ANEF	> 30 ANEF
School, university	< 20 ANEF	20 < 25 ANEF	> 25 ANEF
Hospital, nursing home	< 20 ANEF	20 < 25 ANEF	> 25 ANEF
Public building	< 20 ANEF	20 < 30 ANEF	> 30 ANEF
Commercial building	< 25 ANEF	25 < 35 ANEF	> 35 ANEF
Light industrial	< 30 ANEF	30 < 40 ANEF	> 40 ANEF
Other industrial	Acceptable in all ANEF zones		

Table 5: Building Type Acceptability Table (AS2021-2015)

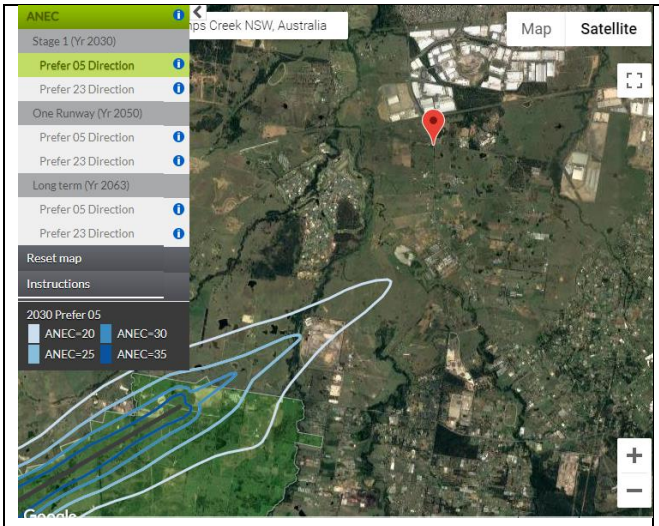
The following noise contour diagrams are sourced from **The Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) noise modelling tool** for Western Sydney Airport.

Stage 1 (Year 2030)

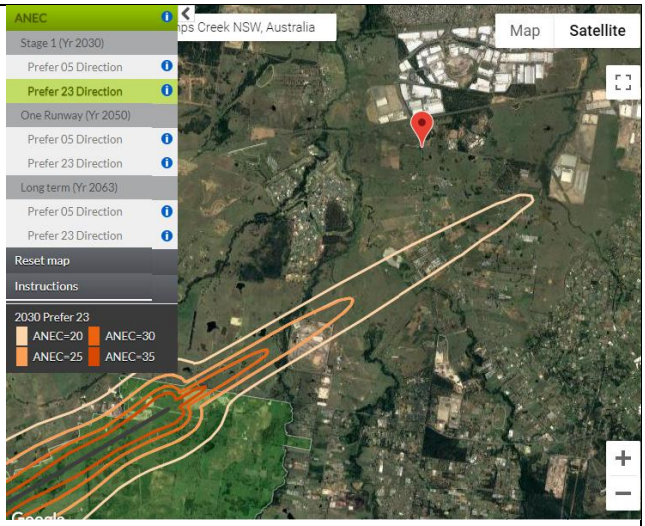
Noise predictions for Stage 1 (2030) represent the anticipated noise exposure levels associated with an airport handling about 10 million annual passengers (similar to the size of Adelaide Airport). A single runway would be constructed initially. Refer to Figure 4.

"Prefer 05 Direction" refers to the primary mode of operation; i.e. prioritising the use of runway direction "05". This mode would result in the majority of departures to the north east and arrivals from the south west.

"Prefer 23 Direction" refers to the primary mode of operation; i.e. prioritising the use of runway direction "23". This mode would result in the majority of departures to the south west and arrivals from the north east.



Stage 1 (Yr 2030) Prefer 05 Direction



Stage 1 (Yr 2030) Prefer 23 Direction

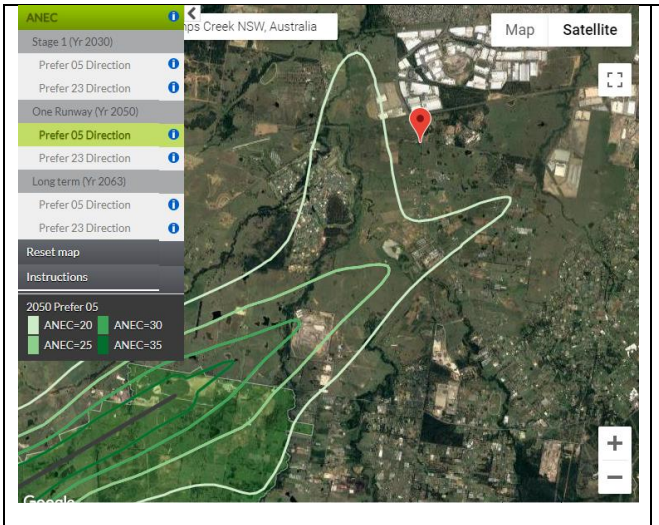
Figure 4: ANEC Stage 1 (Yr 2030), (Source DITRDC Noise Modelling Tool)

Stage 1 Additional Capacity (One Runway Year 2050)

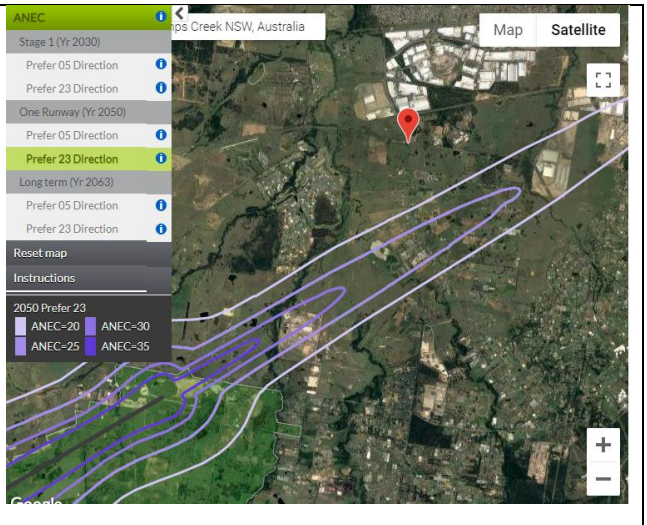
Noise predictions for the year 2050 consider the anticipated growth of WSA. This scenario considers noise exposure levels at a time when the initial single runway would likely be approaching its capacity (approximately 37 million annual passengers). Refer to Figure 5.

"Prefer 05 Direction" refers to the primary mode of operation; i.e. prioritising the use of runway direction "05". This mode would result in the majority of departures to the north east and arrivals from the south west.

"Prefer 23 Direction" refers to the primary mode of operation; i.e. prioritising the use of runway direction "23". This mode would result in the majority of departures to the south west and arrivals from the north east.



One Runway (Yr 2050) Prefer 05 Direction



One Runway (Yr 2050) Prefer 23 Direction

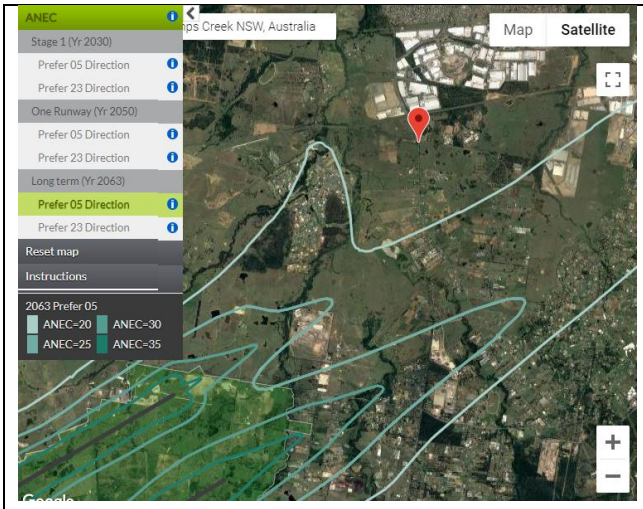
Figure 5: ANEC One Runway (Yr 2050), (Source DITRDC Noise Modelling Tool)

Long term (Year 2063)

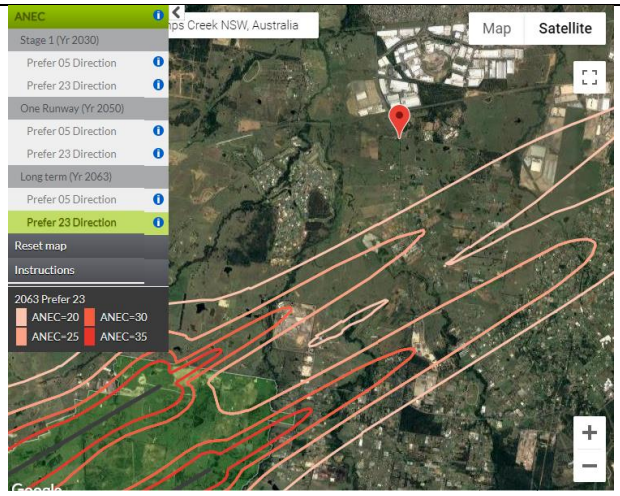
Noise predictions for the long term development (approx. year 2063). The long term development would operate with two runways. Refer to Figure 6.

"Prefer 05 Direction" refers to the primary mode of operation; i.e. prioritising the use of Runways "05L" (left) (northern runway) and "05R" (right) (southern runway). This mode would result in the majority of departures to the north east and arrivals from the south west.

"Prefer 23 Direction" refers to the primary mode of operation; i.e. prioritising the use of runway directions "23L" (left) (northern runway) and "23R" (right) (southern runway). This mode would result in the majority of departures to the south west and arrivals from the north east.



Long Term (Yr 2063) Prefer 05 Direction



Long Term (Yr 2063) Prefer 23 Direction

Figure 6: ANEC One Runway (Yr 2050), (Source DITRDC Noise Modelling Tool)

2.1.2.2 Observation

Airport Runway Development Stages	Prefer 05 Direction	Prefer 23 Direction
Stage 1 (Year 2030)	Outside the ANEC Zone	Outside the ANEC Zone
Stage 1 Additional Capacity (One Runway Year 2050)	Outside the ANEC Zone	Outside the ANEC Zone
Long term (Year 2063)	Outside the ANEC Zone	Outside the ANEC Zone

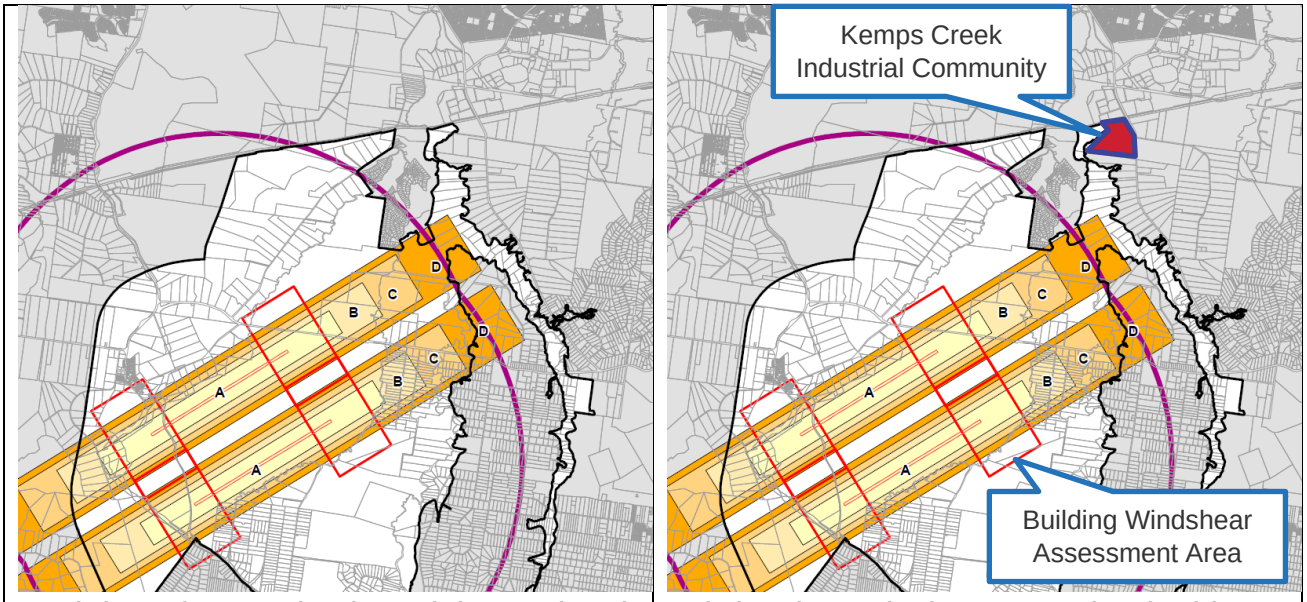
The Kemps Creek Industrial Community site is located outside the ANEC Zones.

2.2 NASF Guideline B – Managing the Risk of Building Generated Windshear and Turbulence at Airports

Guideline B provides guidance to Commonwealth, state/territory and local government decision makers and airport operators to manage the risk of building generated windshear (i.e. changes in wind speed and/or direction between two points) and building generated turbulence (i.e. rapid irregular changes in wind speed and/or direction at a fixed point) at airports.

2.2.1 Standard and Input Data

The objective of these clauses is to safeguard airport operations from wind shear and turbulence generated by buildings that could cause a hazard to aircraft operations during the final stages of flight prior to landing or just after take-off.



Based Diagram from SEPP (WSA) 2020 Ligting Intensity and Wind Shear Map

Marked-up Diagram Showing Kemps Creek Insdustrial Estate

Figure 7: SEPP (WSA) 2020 Lighting Intensity and Wind Shear Map

2.2.2 Observation

The development site is located outside of the Windshear Assessment Trigger Area and will not have any impact on turbulence at Western Sydney Airport, as shown on **Figure 7**.

2.3 NASF Guideline C – Managing the Risk of Wildlife Strikes in the Vicinity of Airports

Guideline C provides guidance to State/Territory and local government decision makers to manage the risk of collisions between wildlife and aircraft at or near airports where that risk may be increased by the presence of wildlife-attracting land uses.

2.3.1 Standard and Input Data

The objective of this clause is to regulate development on land surrounding the Airport where wildlife may present a risk to the operation of the Airport.

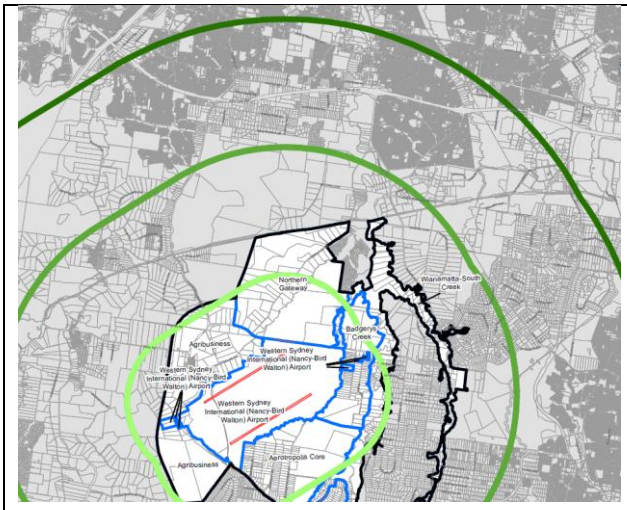
The clause specifies relevant developments that must be approved by the consent authority within the wildlife buffer zone.

Prepared by the Australian Aviation Wildlife Hazard Group

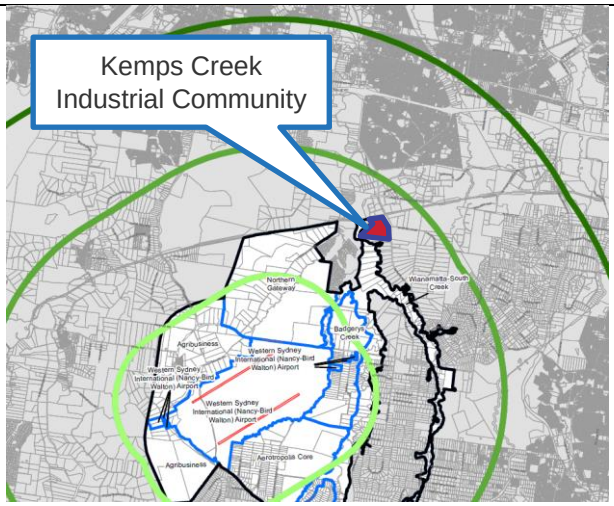
Guideline C
Attachment 1 to Wildlife Strike Guidelines

Land Use	Wildlife Attraction Risk	Actions for Existing Developments			Actions for Proposed Developments/ Changes to Existing Developments		
		3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)
Agriculture							
Turf farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Piggery	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fruit tree farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fish processing /packing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Cattle /dairy farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Poultry farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Forestry	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Plant nursery	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Conservation							
Wildlife sanctuary / conservation area - wetland	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Wildlife sanctuary / conservation area - dryland	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Recreation							
Showground	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Racetrack / horse riding school	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Golf course	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sports facility (tennis, bowls, etc)	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Park / Playground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Picnic / camping ground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Commercial							
Food processing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Warehouse (food storage)	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Fast food / drive-in / outdoor restaurant	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Shopping centre	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Office building	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Hotel / motel	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Car park	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Cinemas	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Warehouse (non-food storage)	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Petrol station	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Utilities							
Food / organic waste facility	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - landfill	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - transfer station	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Non-putrescible waste facility - landfill	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - transfer station	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sewage / wastewater treatment facility	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Potable water treatment facility	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action

Table 6: NASF Guideline C, Attachment 1 – Wildlife Attraction Risk and Action by Land Use



Based Diagram from SEPP (WSA) 2020 Wildlife Buffer Zone Map



Marked-up Diagram Showing Kemps Creek Insdustrial Estate

Figure 8: SEPP (WSA) 2020 Wildlife Buffer Zone Map

2.3.2 Observation

The Kemps Creek Industrial Community site lies within the 8 km radius wildlife buffer zone (Area B) as shown in **Table 6** and **Figure 8**, and additionally highlighted below.

Prepared by the Australian Aviation Wildlife Hazard Group

Guideline C
Attachment 1 to Wildlife Strike Guidelines

Land Use	Wildlife Attraction Risk	Actions for Existing Developments			Actions for Proposed Developments/ Changes to Existing Developments		
		3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)
Commercial							
Food processing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Warehouse (food storage)	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Fast food / drive-in / outdoor restaurant	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Shopping centre	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Office building	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Hotel / motel	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Car park	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Cinemas	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Warehouse (non-food storage)	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Petrol station	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Utilities							
Food / organic waste facility	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - landfill	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - transfer station	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Non-putrescible waste facility - landfill	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - transfer station	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sewage / wastewater treatment facility	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Potable water treatment facility	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action

Within the 8km zone there are no “incompatible” uses that would normally align with an industrial precinct of the type understood to be foreseen at Kemps Creek Industrial Community. Specific building / lot uses may need to ensure that any “mitigate” and “monitor” actions are included.

The nature of the proposed Kemps Creek Industrial Community does not include large dams, large waterbodies, wastewater treatment plants, parks or biodiversity conservation sites. Any stormwater evaporation ponds required under DCP Stormwater Strategy will be covered with netting in accordance with DCP Stormwater requirements.

The land where the Kemps Creek Industrial Community is planned to be located is currently farm allotments and open vegetation paddocks. The industrial estate will consume a significant amount of this grassland and farming activity, effectively reducing the amount of wildlife present in the area that could cause a hazard to overflying aircraft.

L&B understands that the developer is assessing the appropriate types of flora that will enhance the visual features of the estate without being an attractant for birds or bats and not encouraging fauna such as rats and mice, being recognised as food, that would attract birds to the site.

2.3.3 Actions

The developer to continue to assess the appropriate types of flora that will enhance the visual features of the estate without being an attractant for birds or bats and not encouraging fauna such as rats and mice, being recognised as food, that would attract birds to the site.

2.4 NASF Guideline D – Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation

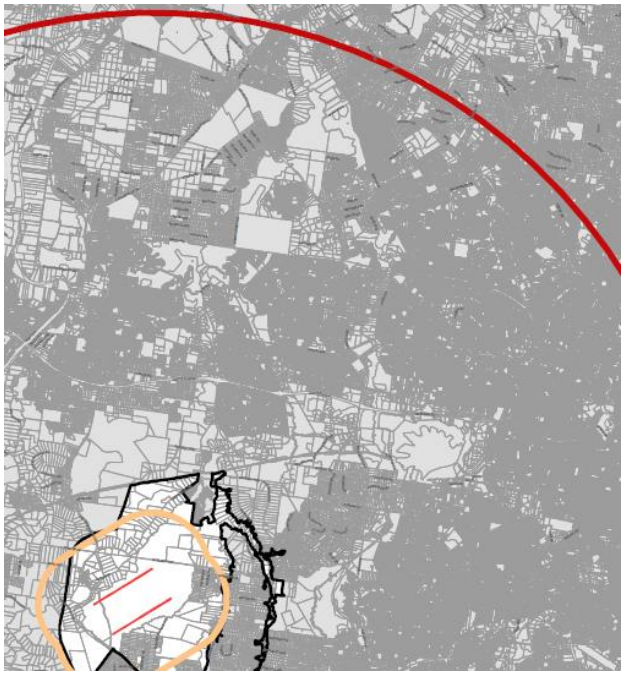
Guideline D provides guidance to State/Territory and local government decision makers, airport operators and developers of wind farms to jointly address the risk to civil aviation arising from the development, presence and use of wind farms and wind monitoring towers.

2.4.1 Standard and Input Data

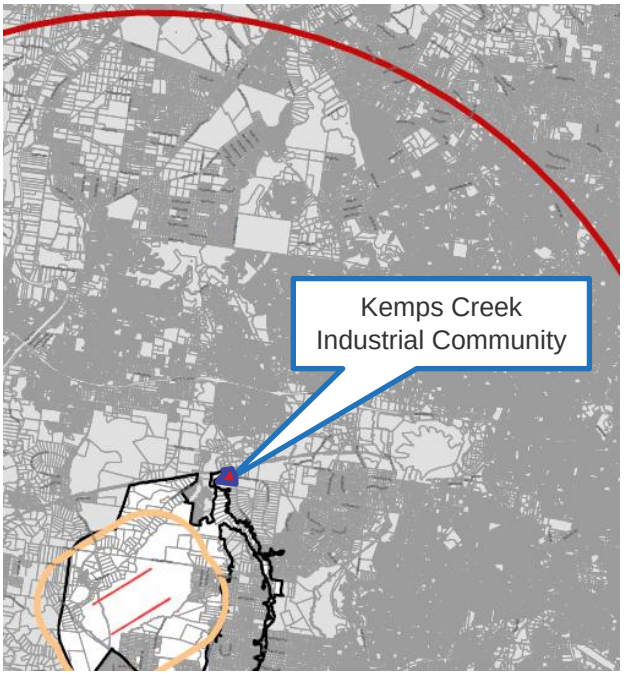
The objective of this clause is to regulate the construction of wind turbines and wind monitoring towers on land within 30 kilometres of the Airport.

Development consent must not be granted to development for the purposes of a large wind monitoring tower in the 3–30 km zone unless the consent authority has consulted the relevant Commonwealth body.

The Kemps Creek Industrial Community site is located in the 3-30 kilometre zone.



Based Diagram from SEPP (WSA) 2020 Wind Turbine Buffer Zone Map



Marked-up Diagram Showing Kemps Creek Insdustrial Estate

Figure 9: SEPP (WSA) 2020: Wind Turbine Buffer Zone

2.4.2 Observation

It is understood that no wind turbines are planned for the site. Therefore, the site will be in compliance with the requirements.

2.5 Guideline E – Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports

2.5.1 Standard and Input Data

The objective of this clause is to safeguard airport operations from the risk of lighting and reflectivity distractions for pilots.

Pilots are reliant on specific patterns of aeronautical ground lights during inclement weather and outside daylight hours. The aeronautical ground lights, such as runway light and approach light, play a vital role in enabling pilots to align aircraft with the runway and land aircraft appropriately.

Therefore, certain types of lighting in close proximity to the Airport can cause glare, distraction or confusion to pilots which can result in significant safety risk.

The area in which lighting is considered likely to impact on the safe operations of aircraft is defined in four Lighting Intensity Zones in immediate proximity to the runways and a six kilometre radius of the Airport for certain other development. The Lighting Intensity Zones are referred to as Zones A-D and there are restrictions on lighting intensity/light spill in the Zones.

Any land mapped in the Lighting Intensity Map of the SEPP, as being within the lighting intensity area and which incorporates significant new lighting and/or coloured lights (whether temporary such as part of construction or permanent) is required to be referred to WSA, for consultation. Examples of such lighting include but are not limited to, stadium flood lighting and construction lighting.

Additionally, buildings should be designed having regard to reducing distraction to pilots as a result of reflected sunlight.

2.5.2 Lighting

The guideline relates to lighting intensity within four light control zones all of which are within 6 kilometres of the centre of each runway**. Figure 10** depicts those zones.

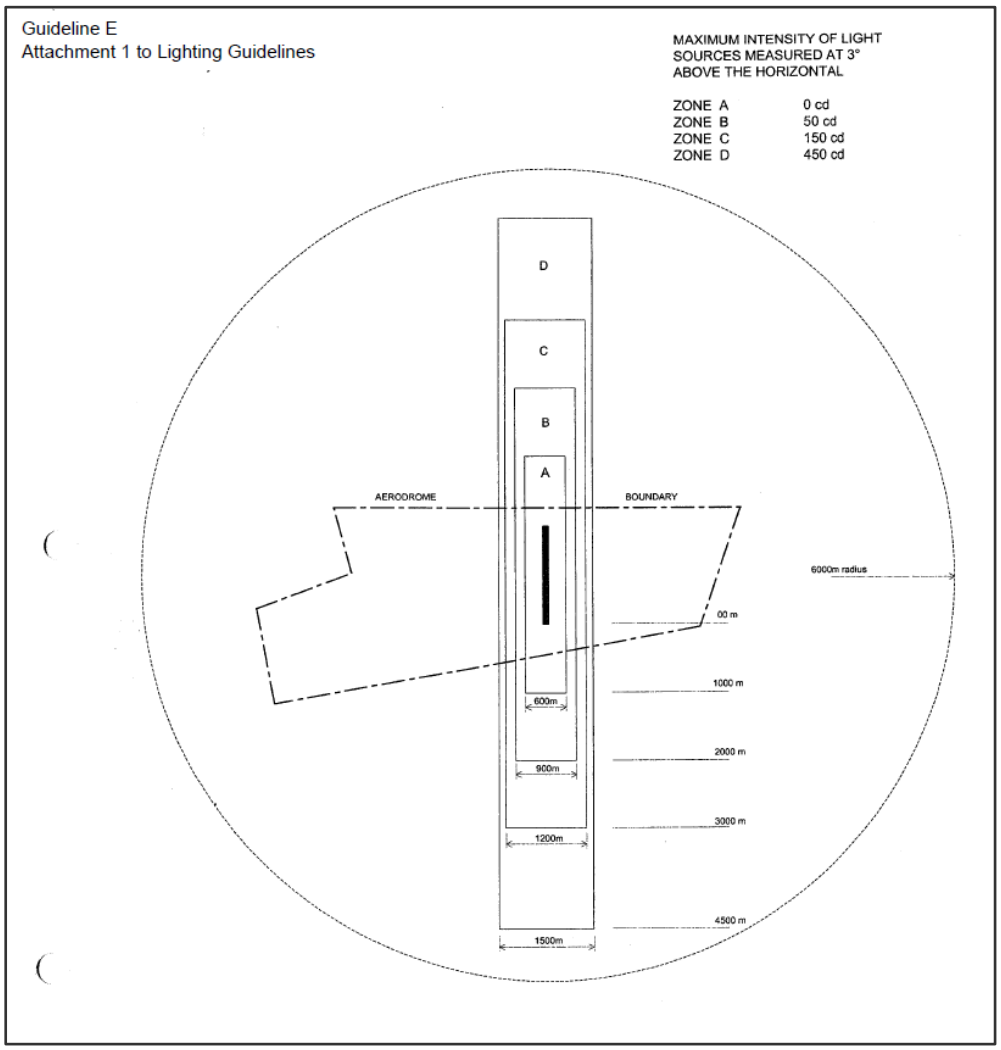


Figure 10: NASF Guideline E Lighting Zones

2.5.2.1 Observations

The nearest point of the Kemps Creek Industrial Community is approximately 6.8 km from the centre of Runway 05L/23R and does not lie within any of the NASF light zones and therefore no special lighting requirements apply.

2.5.3 Reflectivity

There are no requirements in any Australian aviation regulations regarding the reflectivity of building surfaces in the vicinity of airports.

The movement of the sun causes reflections from many surfaces including roads, lakes, cars, aircraft and even wet grass paddocks.

CASA often requires airports operators to assess solar farm installations for glint and glare impacts to pilots using a USA Federal Aviation Administration approved software tool but as the Kemps Creek Industrial Community is located 5.4 km from the nearest Runway 23 end, any such glint and glare is unlikely to have an adverse effect on pilot eyesight to the extent that would potentially cause a hazard.

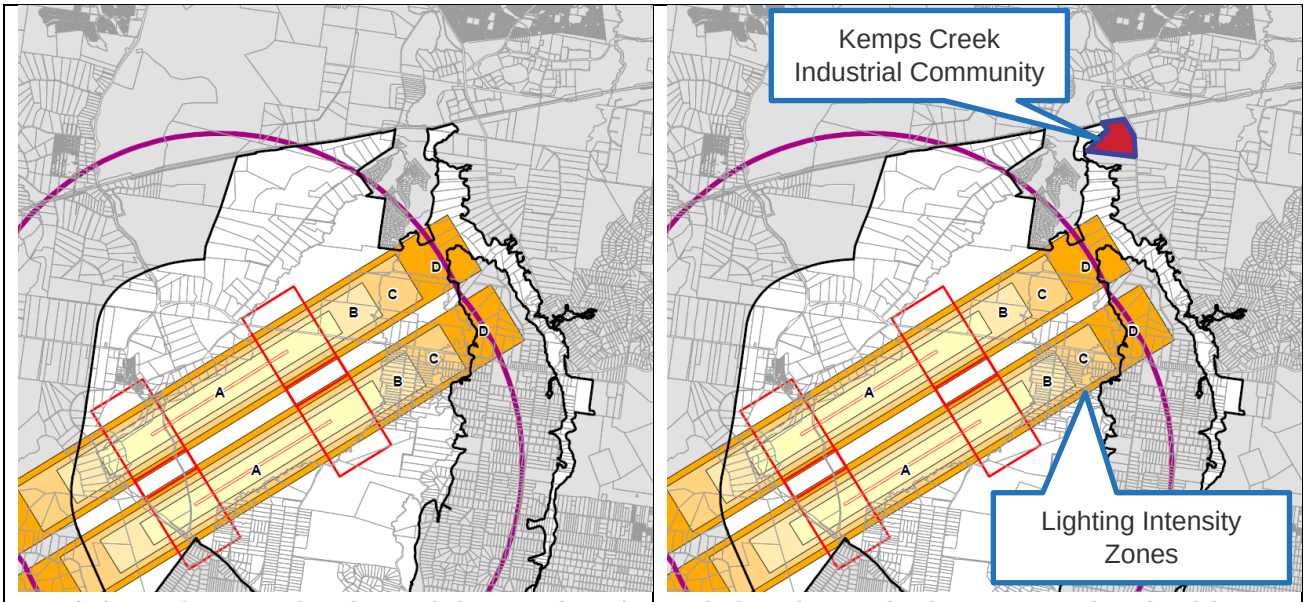
Pilots, airline operators and airline manufacturers are well aware of glare both within the atmosphere when the sun is low or reflecting off clouds or mist and from ground-based man-made objects and natural objects such as lakes and dams.

2.5.3.1 Observations

There are many existing potential sources of sun reflections in the area surrounding the proposed Kemps Creek Industrial Community including large sheds and dams.

The location of the proposed Kemps Creek Industrial Community is not in the immediate vicinity of any of the proposed runways at Western Sydney Airport and therefore any reflections from the estate are unlikely to cause a hazard greater than what already exists today.

The development site is located outside of the Lighting Intensity Zones and will not have any impact on the Airport operations from the risk of lighting and reflectivity distractions for pilots at Western Sydney Airport, shown on **Figure 11**.



Based Diagram from SEPP (WSA) 2020 Ligting Intensity and Wind Shear Map

Marked-up Diagram Showing Kemps Creek Insdustrial Estate

Figure 11: SEPP (WSA) 2020 Lighting Intensity and Wind Shear Map

2.6 NASF Guideline F – Managing the Risk of Intrusions into the Protected Airspace of Airports

Guideline F provides guidance to State/Territory and local government decision makers as well as airport operators to jointly address the issue of intrusions into the operational airspace of airports by tall structures, such as buildings and cranes, as well as trees in the vicinity of airports.

The guidelines are also designed to address the following risks:

a. activities that could cause air turbulence, where the turbulence could affect the normal flight of aircraft operating in the prescribed airspace; and
b. activities that could cause the emission of steam, other gas, smoke, dust or other particulate matter, where the smoke, dust or particulate matter could affect the ability of aircraft to operate in the prescribed airspace in accordance with Visual Flight Rules (VFR).

2.6.1 Roof Top Exhaust Plumes

Part 139 of the Civil Aviation Safety Regulations 1988 (CASR 1988) provides that CASA may determine that a gaseous efflux having a velocity in excess of 4.3 m/s is, or will be, a hazard to aircraft operations because of the velocity of the efflux. In this case, any exhaust plume with a velocity in excess of 4.3 m/s from any vent on top of the building is unlikely to reach the height of the lowest PANS OPS or OLS.

2.6.1.1 Action

Planned activity within the estate is not likely to produce such an exhaust plume.

2.7 NASF Guideline G – Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS)

The purpose of Guideline G is to:

a. Provide land use planning guidance to better protect CNS facilities which support the systems and processes in place by Airservices Australia (Airservices), the Department of Defence (Defence) or other agencies under contract with the Australian Government, to safely manage the flow of aircraft into, out of and across Australian airspace.
b. Provide a consistent approach to land use planning protection of CNS facilities, as applied through State, Territory or Local planning systems.
c. Inform procedures which ensure development and associated activities within Building Restricted Areas (BRA) of CNS facilities do not adversely affect the facility or cause interference for air traffic controllers or aircraft in transit.
d. Provide Commonwealth, State, Territory and Local Government land use planning decision makers with guidance for assessing development proposals in a BRA, and for working with Airservices and Defence in assessing those proposals.
e. Formalise the protection of CNS facilities in land use planning decisions.

2.7.1 ATC Communications

Reliable ATC communications require a clear line-of-sight path between the base station and aircraft and vehicles using the facilities.

The Area of Interest for the ATC Communication facilities includes all developments between 100 m and 2000 m that exceed a height of 10 m above ground level at the base of the VHF/UHF antenna.

2.7.1.1 Observation

The closest part of the industrial estate at the development site is located approximately 6 km from the likely location of ATC Communication facilities on the airport.

2.7.1.2 Action

The Kemps Creek Industrial Community will not have any impact upon the performance of ATC Communications systems installed at Western Sydney Airport.

2.7.2 Navigation Aid Performance

Instrument Landing System (ILS), Distance Measuring Equipment (DME) and a Ground Based Augmentation System (GBAS) are planned at Western Sydney Airport.

It is unlikely that any other ground-based navigation system will be installed at the airport due to the modern developments of GPS based navigation systems.

Airservices Australia operates these ground-based navigation systems and protects their signal integrity by applying Building Restricted Area (BRA) criteria to the critical areas around the navigation aid antenna.

The ILS BRA extend to 1000 m from the facility, part of which is located close to the runway end.

The GBAS BRA extend to 3 km from the facility which is planned to be based in the middle of the airport but may move to the north side of the airport as the second runway is developed.

The DME BRA extend to 1500 m from the facility which is planned in the middle of the airport.

2.7.2.1 Observation

The closest part of the industrial estate at the development site is located approximately 6 km from the nearest of the navigation systems at the airport and is therefore beyond the BRA associated with all of them.

2.7.2.2 Action

The Kemps Creek Industrial Community site is located outside all of the BRA and will not have any impact upon the performance of navigation aids installed at Western Sydney Airport.

2.7.3 ATC Surveillance System Performance

2.7.3.1 Observation

The nearest ATC Surveillance equipment (Terminal Area Radar - TAR) is located at Cecil Park, approximately 6.9 km to the south east of the development site.

Surveillance System	Distance from development	Antenna Elevation (AHD)	Clearance Plane Elevation at development site Distance x Tan 0.5° + TAR elevation
Cecil Park TAR	6970 m	200.5 m	**261.3 m AHD**

Table 7: Surveillance System Clearance Plane

It is likely that a ground surveillance system will be installed on the WSA site to monitor and control aircraft and vehicular traffic on the surface of the airport.

2.7.3.2 Action

The Kemps Creek Industrial Community site will be located well beyond the airport boundary and will not impact the operation of such a surveillance system.

The building and the cranes will not have an impact upon ATC Surveillance systems.

2.8 NASF Guideline H – Protecting Strategically Important Helicopter Landing Sites (HLS)

Guideline H provides guidance to State/Territory and local government decision makers as well as the owners/operators of identified strategically important HLS (SHLS) to ensure:

a. the ongoing operation of those SHLS;
b. the use of those SHLS are not compromised by any proposed development encroaching into flight paths;
c. new development (and associated activities) do not present a hazard to helicopters arriving or departing from those SHLS; and
d. any new SHLS are appropriately located.

This guideline is also designed to address the following matters:

a. lighting that either distracts or causes interference with night operations;
b. mitigating noise relating to helicopter operations;
c. wildlife/bird strikes;
d. Remotely Piloted Aircraft Systems (RPAS) “drones” operation/strikes; and
e. building induced windshear or air turbulence, where this could affect the normal flight of helicopters operating from these SHLS.

2.8.1 Observation

The Kemps Creek Industrial Community site is located well beyond the airport boundary and will not impact any helicopter landing sites.

2.9 NASF Guideline I – Public Safety Areas (PSAs)

Guideline I provides guidance to Australian Government, state, territory and local government decision makers on the assessment and treatment of potential increases in risk to public safety which could result from an aircraft incident or development proposal in areas near the end of an airport runway.

This Guideline is intended to inform a more consistent approach to the application of Public Safety Areas (PSAs) at and near Australian airports. The guideline notes that "implementation of PSAs varies internationally and is not uniform. Some overseas jurisdictions have taken a specialised approach to the assessment and treatment of land use conflicts near airport runway ends and different models have been applied in the United Kingdom (UK), the Netherlands and the United States of America."

The objective of this clause is to regulate development on land on which there is an appreciable risk to public safety from the operation of the Airport.

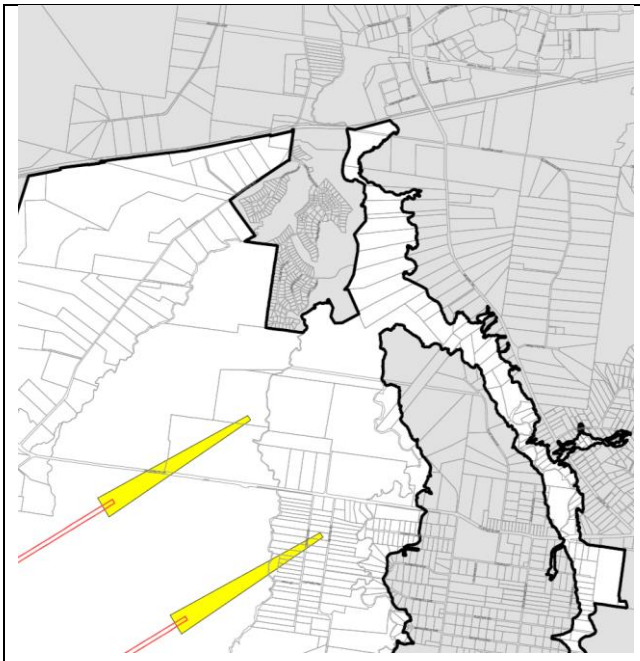
Public Safety Areas (PSA) can reduce the already low risk of an air transport accident affecting people who live, work or travel in close proximity to airports.

A PSA is a designated area of land at the end of an airport runway within which development may be restricted in order to control the number of people on the ground at risk of injury or death in the event of an aircraft accident on take-off or landing.

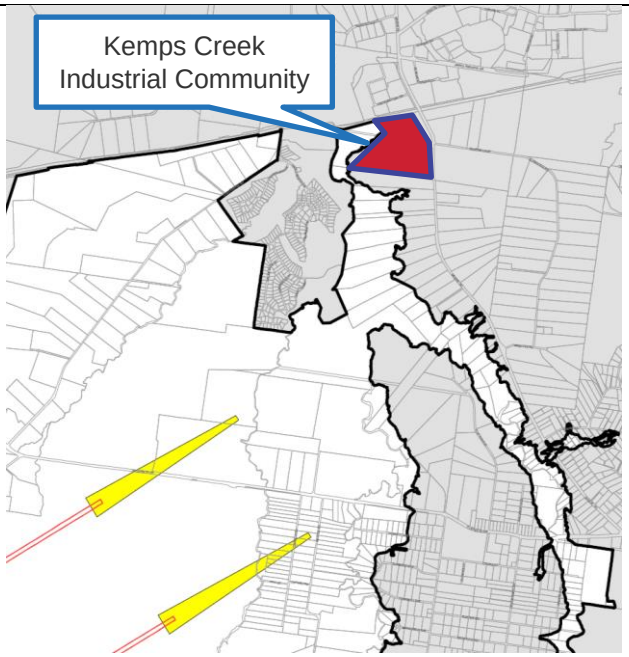
These risks are also considered for developments and emergency management in the vicinity of a range of existing or proposed industrial sites that can give rise to adverse public safety outcomes.

2.9.1 Observation

The Kemps Creek Industrial Community is located outside of the designated PSAs associated with the runways at WSA.



Based Diagram from SEPP (WSA) 2020 Public Safety Area Map



Marked-up Diagram Showing Kemps Creek Insdustrial Estate

Figure 12: SEPP (WSA) 2020 Public Safety Area Map

3 NSW State Environment Planning Policy (Western Sydney Aerotropolis) 2020

The report assesses the site against the relevant clauses (19 to 25 inclusive) of the NSW State Environmental Planning Policy (Western Sydney Aerotropolis) 2020, Part 3 Development Controls – Airport Safeguarding

Additional diagrams are included in the Appendix A.

3.1 Clause 19: Aircraft Noise

The objectives of this clause are:

1) to prevent certain noise sensitive development on land near the Airport, and
2) to minimise the impact of aircraft noise for other noise sensitive development, and
3) to ensure that land use and development near the Airport do not hinder or have other adverse impacts on the ongoing, safe and efficient 24 hours a day operation of the Airport.

3.1.1 Findings

The Kemps Creek Industrial Community site is located outside the ANEF and ANEC Zones.

Covered under Item 3.1: NASF Guideline A – Measures for Managing Impacts of Aircraft Noise

3.2 Clause 20: Building Generated Wind Shear and Turbulence

The objective of this clause is to safeguard Airport operations from wind shear and turbulence generated by buildings.

Development consent must not be granted to the following development unless the consent authority has consulted the relevant Commonwealth body

1. development on land shown on the Lighting Intensity and Wind Shear Map,
2. development that penetrates the 1:35 surface.

3.2.1 Findings

The development site is located outside of the Windshear Assessment Trigger Area and will not have any impact on turbulence at Western Sydney Airport.

Covered under Item 3.2: NASF Guideline B – Managing the Risk of Building Generated Windshear and Turbulence at Airports

3.3 Clause 21: Wildlife Hazards

The objective of this clause is to regulate development on land surrounding the Airport where wildlife may present a risk to the operation of the Airport.

3.3.1 Findings

The Kemps Creek Industrial Community site lies within the 8 km radius wildlife buffer zone (Area B); and

Within the 8km zone there are no “incompatible” uses that would normally align with an industrial precinct of the type understood to be foreseen at Kemps Creek Industrial Community. Specific building / lot uses may need to ensure that any “mitigate” and “monitor” actions are included.

Covered under Item 3.3: NASF Guideline C – Managing the Risk of Wildlife Strikes in the Vicinity of Airports

3.4 Clause 22: Wind Turbines

The objective of this clause is to regulate the construction of wind turbines and wind monitoring towers on land within 30 kilometers of the Airport.

Development for the following purposes is prohibited on land in the 3 km zone

- electricity generating works comprising a wind turbine,
- wind monitoring towers that are not ancillary or incidental to the Airport.

Development consent must not be granted to development for the purposes of a large wind monitoring tower in the 3–30 km zone unless the consent authority has consulted the relevant Commonwealth body.

3.4.1 Findings

The Kemps Creek Industrial Community site is located in the 3-30 kilometre zone; and

It is understood that no wind turbines are planned for the site. Therefore, the site will be in compliance with the requirements.

Covered under Item 3.4: NASF Guideline D – Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation

3.5 Clause 23: Lighting

The objective of this clause is to safeguard Airport operations from the risk of lighting and reflectivity distractions for pilots.

Development consent must not be granted to development for the following purposes on land shown on the Lighting Intensity and Wind Shear Map unless the consent authority has consulted the relevant Commonwealth body

(a) installation and operation of external lighting (whether coloured or white lighting) in connection with development for the following purposes
    i. classified roads,
    ii. freight transport facilities,
    iii. heavy industrial storage establishments,
    iv. recreation facilities (major),
    v. recreation facilities (outdoor),

(b) installation and operation of external lighting in connection with construction works that is likely to be obtrusive or create light spill outside the land on which the construction works are carried out.

3.5.1 Findings

The development site is located outside of the Lighting Intensity Zones and will not have any impact on the Airport operations from the risk of lighting and reflectivity distractions for pilots at Western Sydney Airport

Covered under Item 3.5: Guideline E – Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports.

3.6 Clause 24: Airspace Operations

3.6.1 Standard and Input Data

The objectives of this clause are:

- to provide for the effective and ongoing operation of the Airport by ensuring that its operation is not compromised by development that penetrates the prescribed airspace for the Airport, and
- to protect the community from undue risk from the operation of the Airport.

The content of this Aeronautical Impact Assessment clearly shows that the Kemps Creek Industrial Community does not penetrate the prescribed airspace for Western Sydney Airport, or any other airport.

Whilst the Runway locations have been planned, Obstacle Limitation Surfaces have been declared and provisional Instrument Landing System (Basic ILS) PANS OPS surfaces have been declared for WSA there is still the possibility that they may change slightly as the airport construction program progresses and consequently, the airport's Prescribed Airspace may also change slightly.

WSA data used to determine the probable Prescribed Airspace above the Kemps Creek Industrial Community site was derived from information published on WSA's website - https://westernsydney.com.au/

Major reports referenced are:

- Western Sydney Airport – Airport Plan 2016;
- Western Sydney Aerotropolis State Environmental Planning Policy 2020 (SEPP 2020);
- Airservices Australia – Western Sydney Airport Preliminary Airspace Management Analysis – 10 April 2015.

3.6.2 Airspace Overview

The Airports (Protection of Airspace Regulations) 1996 specifies volumes of Prescribed Airspace related to Federally leased airports such as Western Sydney Airport that protect them from uncontrolled obstacle growth that may have an adverse impact upon flight safety or the regularity of flight operations.

Prescribed Airspace for an airport is the airspace above any facet of the Obstacle Limitation Surfaces (OLS) or the PANS OPS (Procedures for Air Navigation Services – Aircraft Operations) surfaces, or the Radar Terrain Clearance Chart (RTCC) protection surfaces.

Flight operations at an airport are protected from uncontrolled obstacle intrusion by Obstacle Limitation Surfaces (OLS) and the PANS OPS (Procedures for Air Navigation Services – Aircraft Operations) surfaces which are published in Airport Master Planning Documents for the use of local planning authorities to show areas where building activity requires consideration of aviation requirements and in Aeronautical Publications for the use of pilots during pre-flight planning processes and in-flight operations to ensure that the airport is capable of supporting and suitable their planned operation.

3.6.2.1 OLS

The OLS are conceptual surfaces associated with runways that are designed to protect aircraft operations that are conducting visual take-off and landing operations from unrestricted obstacle growth. Intrusions into some areas of the OLS can be approved subject to an aeronautical study that shows that the obstacle does not impact upon flight safety or the regularity of flight operations at the airport.

3.6.2.2 PANS OPS

The PANS OPS surfaces are designed beneath instrument approach and departure flight paths with a prescribed minimum obstacle clearance above the obstacles or terrain. They provide an obstacle free flight path to enable safe and efficient flight operations in Instrument Meteorological Conditions (IMC) during which flight crews cannot necessarily see the ground or obstacles and they must rely upon aircraft instrumentation to determine their position in relation to navigation aids and runways.

Infringements into Prescribed Airspace requires the approval of the Department of Infrastructure, Transport, Regional Development and Communications (DITRDC), following an application to the aerodrome operator which is then referred to the Civil Aviation Safety Authority (CASA) and Airservices Australia (AsA). DITRDC will then assess the information from CASA and AsA to determine the matter.

Permanent infringement of PANS OPS protection surfaces are generally not supported by the aviation authorities, however, temporary activities such as construction cranes may be able to be approved subject to support from the airport, Airservices Australia and CASA for limited periods of time. In some cases, the PANS OPS surfaces can be amended to accommodate important infrastructure.

If the infringement is shown to impact on aviation safety or regularity of aircraft operations, it is unlikely to be approved.

3.6.3 Obstacle Limitation Surfaces

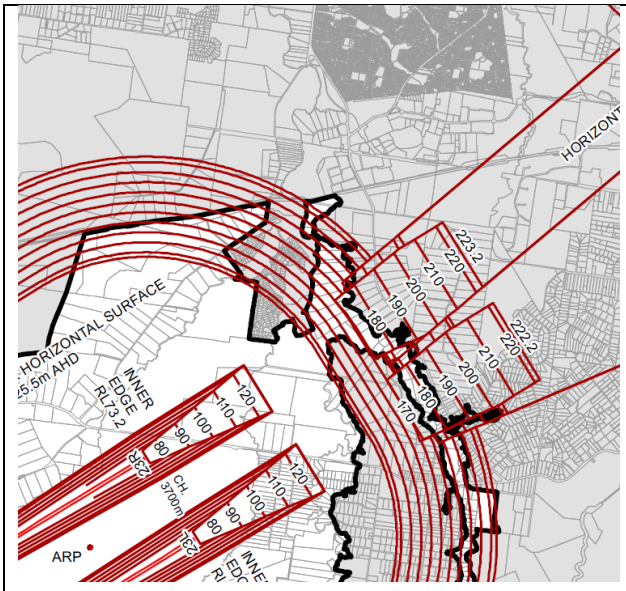
The OLS at Western Sydney Airport comprises:

- conical surface;
- inner horizontal surface (IHS);
- approach surface for each runway;
- inner approach surface for each runway;
- transitional surface for each runway;
- inner transitional surface;
- baulked landing surface; and
- take-off climb surface for each runway.

3.6.3.1 Observation

The estate is located beneath the Conical Surface with a height of **220.0m AHD** to **230.5.0m AHD** and Outer Horizontal Surface with a height of **230.5 m AHD**.

Figure 13 is an inset from the State Environmental Planning Policy (SEPP) Western Sydney Aerotropolis (WSA) 2020 Obstacle Limitation Surface Map that shows the location of the industrial estate and the relevant OLS.



Based Diagram from SEPP (WSA) 2020 Obstacle Limitation Surface Map

Marked-up Diagram Showing Kemps Creek Insdustrial Estate

Figure 13: SEPP (WSA) 2020 Obstacle Limitation Surface Map

3.6.3.2 Action

With maximum building heights projected to be beneath **145 m AHD** there will not be any infringements of the OLS for Western Sydney Airport. There is also adequate clearance for typical construction cranes to be used on the site.

3.6.4 PANS OPS Surfaces

Draft PANS OPS surfaces related to the Basic ILS surfaces and the Standard Instrument Departures (SID) for each runway have been declared for the preliminary phase of the construction and operation of the airport.

The Basic ILS surfaces are very conservative and may be infringed if an assessment of the Obstacle Assessment Surfaces (OAS) or application of the Collision Risk Model determines a safe result for the overall obstacle environment surrounding the airport.

3.6.4.1 Observation

The lowest Basic ILS surface above the industrial estate is related to the Runway 23R ILS and is at a height of **210.1 m AHD**.

The SID procedures have PANS OPS surfaces determined by the Procedure Design Gradient (PDG) that is the minimum climb gradient that aircraft are required to perform to in order to ensure obstacle clearance during the initial climb after take-off.

The lowest SID PANS OPS surface above the development site is 214.6 m AHD, based on an estimated turn height of 500 ft AMSL and PDG of 4%. Any increase in the turn height will increase the height of the associated PANS OPS surface.

With building heights and crane activity projected to be beneath 155m AHD there will not be any infringements of the PANS OPS surfaces for Western Sydney Airport.

Other instrument approach procedures will be promulgated for WSA once construction of the first runway, Runway 05L/23R, nears completion. RNAV (GNSS) and RNP-AR (see Appendix C) approached are likely to be implemented for both runways. Given that the minimum obstacle clearance level between terrain/obstacles is 75 m for the final approach segment of an instrument approach, there is adequate clearance available above the Kemps Creek Industrial Community site to not interfere with any future instrument approach procedures that may be implemented.

It is likely that any industrial estate activities, including construction crane activity to a height of approximately 15 m above any building within the estate, will not infringe either the OLS or the PANS OPS surfaces above the estate due to the large margin above the proposed buildings.

3.6.4.2 Findings

The proposed development at the Kemps Creek Industrial Community will not infringe the OLS or PANS OPS surfaces at Western Sydney Airport, the lowest of which is approximately **210.1 m AHD**.

3.7 Clause 25: Public Safety Area

The objective of this clause is to regulate development on land on which there is an appreciable risk to public safety from the operation of the Airport.

Development for the following purposes is prohibited on land shown as the “public safety area” on the Public Safety Area Map:

- Camping grounds;
- Caravan parks;
- Cemeteries;
- Centre-based child care facilities;
- Commercial premises;
- Community facilities;
- Correctional centres;
- Crematoria;
- Eco-tourist facilities;
- Education establishments;
- Entertainment facilities;
- Function centres;
- Funeral homes;
- Health services facilities;
- Heavy industrial storage establishments;
- Industrial retail outlets;
- Industrial training facilities;
- Industries;
- Information and education facilities;
- Passenger transport facilities;
- Places of public worship;
- Recreation areas;
- Recreation facilities (indoor);
- Recreation facilities (major);
- Recreation facilities (outdoor);
- Registered clubs;
- Residential accommodation;

- Tourist and visitor accommodation

Development consent must not be granted to development for a purpose not specified in subclause (2) on land shown as the “public safety area” on the Public Safety Area Map unless the consent authority.

(a) has considered a written assessment of the risk of the development to persons provided by the applicant, which includes
    a. the risk to persons on the land in the event of an emergency or other incident at or around the Airport, including an incident involving an aircraft landing or taking off from the Airport, and
    b. the likely number of people who will use or otherwise be present on the land, and
    c. the compatibility of the development with the risk, including in relation to the number of people who will use or otherwise be present on the land, and

(b) is satisfied that the development will adequately mitigate the risk to persons on the land, including by limiting the number of people or vehicles.

3.7.1 Findings

The Kemps Creek Industrial Community is located outside of the designated PSAs associated with the runways at WSA.

Covered under Item 3.9: NASF Guideline I – Public Safety Areas (PSAs)

4 NSW State Environmental Planning Policy (Western Sydney Employment Area) 2009

The report assesses the site against the relevant clauses (33E and 33F) of the NSW State Environmental Planning Policy (Western Sydney Employment Area) 2009.

4.1 Clause 33E: Airspace operations

4.1.1 Objectives

- The objectives of this clause are as follows—
    - to provide for the effective and ongoing operation of the Airport by ensuring that such operation is not compromised by proposed development that penetrates the prescribed airspace for the Airport,
    - to protect the community from undue risk from that operation.
- If a development application is received and the consent authority is satisfied that the proposed development will penetrate the prescribed airspace, before granting development consent, the consent authority must consult with the relevant Commonwealth body about the application.
- The consent authority may grant development consent for the development if the relevant Commonwealth body advises that—
    - the development will penetrate the prescribed airspace, but it has no objection to its construction, or
    - the development will not penetrate the prescribed airspace.
- To avoid doubt, the consent authority must not grant development consent for the development if the relevant Commonwealth body advises that the development will penetrate the prescribed airspace and should not be constructed.
- In this clause—

OLS and PANS-OPS surface have the same meanings as in the Airports (Protection of Airspace) Regulations 1996 of the Commonwealth.

prescribed airspace means the airspace—

- above any part of either an OLS or a PAN-OPS surface for the Airport, and
- declared under regulation 5 of the Airports (Protection of Airspace) Regulations 1996 of the Commonwealth relating to the Airport, under section 181(1) of the Airports Act 1996 of the Commonwealth.

- relevant Commonwealth body means—
    - the airport-operator company for the Airport (within the meaning of the Airports Act 1996 of the Commonwealth), or

- if there is no airport-operator company for the Airport—the Secretary of the body, under Commonwealth legislation, that is responsible for development approvals for development that penetrates the prescribed airspace.

4.1.2 Findings

The proposed development at the Kemps Creek Industrial Community will not infringe the OLS or PANS OPS surfaces at Western Sydney Airport, the lowest of which is approximately 210.1 m AHD.

Refer to Section 2: National Airports Safeguarding Framework (NASF) and Section 3: NSW SEPP (Western Sydney Aerotropolis) 2020.

4.2 Clause 33F: Development of land adjacent to Airport

4.2.1 Objectives

- The objectives of this clause are as follows—
  - to provide for the effective and ongoing operation of the Airport by ensuring that such operation is not compromised by proposed development in close proximity to the Airport,
  - to protect the community from undue risk from that operation.
- This clause applies to development on land, any part of which is less than 13 kilometres from a boundary of the Airport.
- The consent authority must not grant consent for development to which this clause applies unless the consent authority is satisfied that the proposed development will not attract birds or animals of a kind and in numbers that are likely to increase the hazards of operating an aircraft.

4.2.2 Findings

The proposed development at the Kemps Creek Industrial Community will not impact or affect the flight safety or the regularity of operation at the airport.

Refer to Section 2: National Airports Safeguarding Framework (NASF) and Section 3: NSW SEPP (Western Sydney Aerotropolis) 2020.

4.3 Conclusions

On the basis of the findings described above, our conclusion is that the development of the site in the manner set out in section 1 of this report will not have any impact upon Western Sydney Airport's Prescribed Airspace and will not affect flight safety or the regularity of operations at the airport.

The proposed development site at Kemps Creek Industrial Community complies with the SEPP WSEA 2009 Clauses 33E and 33F.

5 Penrith Local Environmental Plan (LEP) 2020

5.1 Clause 7.9: Development of land in the flight paths of the site reserved for the proposed Second Sydney Airport (WSA).

1.1.1 Objectives

- The objective of this clause is to ensure that development in the vicinity of the proposed Badgery's Creek airport site—
    - has regard to the use or potential future use of the site as an airport, and
    - does not hinder or have any other adverse impact on the development or operation of an airport on that site.
- This clause applies to development that—
    - is on land that—
        - is near the proposed Badgery's Creek airport site, and
        - is in an ANEF contour of 20 or greater, and
    - the consent authority considers is likely to be adversely affected by aircraft noise.
- Before determining a development application for development to which this clause applies, the consent authority—
    - must consider whether the development will result in an increase in the number of dwellings or people affected by aircraft noise, and
    - must consider the location of the development in relation to the criteria set out in Table 2.1 (Building Site Acceptability Based on ANEF Zones) in AS 2021—2000, and
    - must be satisfied that the development will meet AS 2021—2000 with respect to interior noise levels for the purposes of—
        - if the development will be in an ANEF contour of 20 or greater—centre-based child care facilities, educational establishments, entertainment facilities, hospitals, places of public worship, public administration buildings or residential accommodation, and
        - if the development will be in an ANEF contour of 25 or greater—commercial premises, hostels or hotel or motel accommodation.

1.1.2 Findings

The Kemps Creek Industrial Community site is located outside the ANEF and ANEC Zones.

Covered under Item 3.1: NASF Guideline A – Measures for Managing Impacts of Aircraft Noise

6 Summary of Conclusions and Actions

The Kemps Creek Industrial Community development has been assessed with proposed buildings to a maximum height of approximately 145 m AHD and temporary construction crane activity to approximately 155 m AHD.

6.1 National Airports Safeguarding Framework

NASF / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
NASF Guideline A: Measures for Managing Impacts of Aircraft Noise	No impact.	8 / 2.1.2.2
NASF Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports	No impact.	9 / 2.2.2
NASF Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports	No impact.	11 / 2.3.2
NASF Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation	No impact.	13 / 2.4.2
NASF Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports	No impact	15 / 2.5.2.1
NASF Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports	No impact.	17 / 2.6.1.1 16 / 2.5.3.1
NASF Guideline G: Protecting Aviation Facilities – Communication, Navigation and Surveillance (CNS)	No impact.	18 / 2.7.1.2 19 / 2.7.2.2 19 / 2.7.3.2
NASF Guideline H: Protecting Strategically Important Helicopter Landing Sites (HLS)	No impact.	20 / 2.8.1
NASF Guideline I: Public Safety Areas (PSAs)	No impact.	21 / 2.9.1

Table 8: NASF Conclusions

6.2 NSW State Environment Planning Policy (Western Sydney Aerotropolis) 2020

SEPP (WSA) 2020 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 19: Aircraft Noise	No impact.	22 / 3.1.1
Clause 20: Building Windshear and Turbulence	No impact.	22 / 3.2.1
Clause 21: Wildlife Hazards	No impact.	22 / 3.3.1

Clause 22: Wind Turbines	No impact.	23 / 3.4.1
Clause 23: Lighting	No impact	23 / 3.5.1
Clause 24: Airspace Operations	No impact.	26 / 3.6.3.2 27 / 3.6.4.2
Clause 25: Public Safety	No impact.	28 / 3.7.1

Table 9: SEPP (WSA) 2020 Conclusions

6.3 NSW State Environmental Planning Policy (Western Sydney Employment Area) 2009

SEPP (WSEA) 2009 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 33E: Airspace Operations	No impact.	30 / 4.1.2
Clause 33F: Development of land adjacent to Airport	No impact.	30 / 4.2.2

Table 10: SEPP (WSEA) 2009 Conclusions

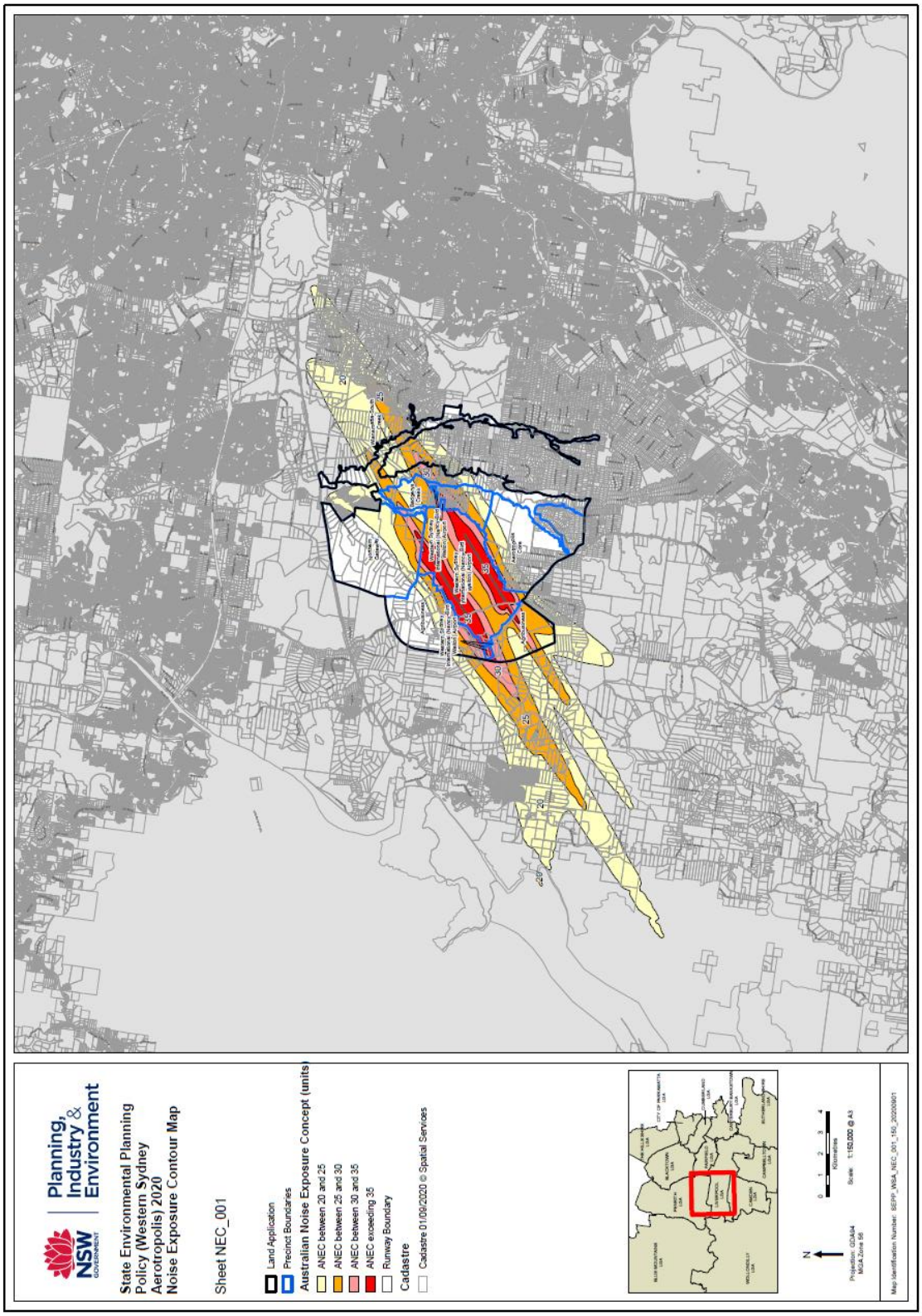
6.4 NSW Penrith Local Environmental Plan (LEP) 2020

Penrith LEP 2020 / Other Assessment Principle	Conclusion / Action Required	Report Reference Page / Section
Clause 7.9: Development of land in the flight paths of the site reserved for the proposed Second Sydney Airport (WSA)	No impact.	31 / 1.1.2

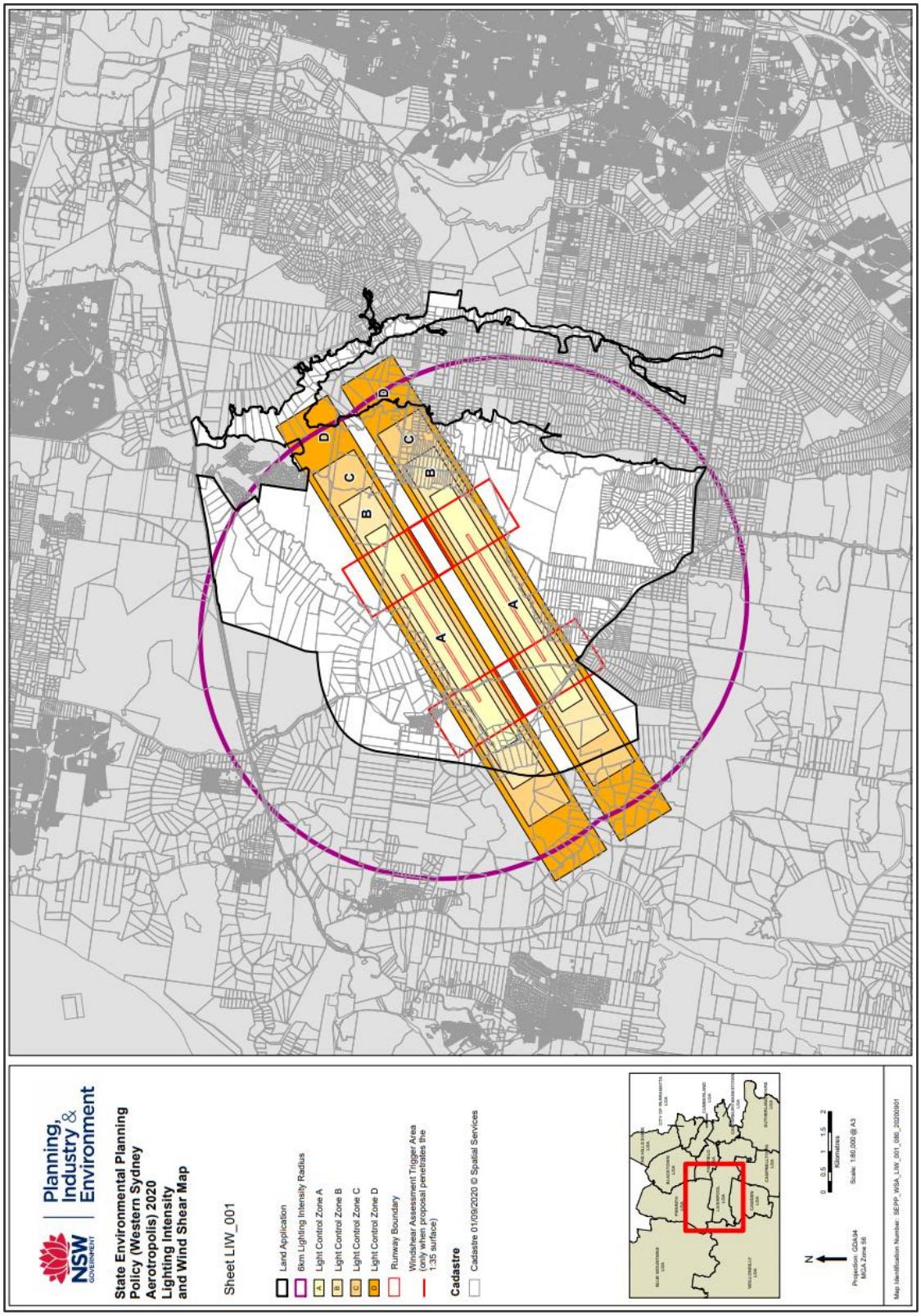
Table 11: Penrith LEP 2020 Conclusions

Appendix A – State Environmental Planning Policy Maps

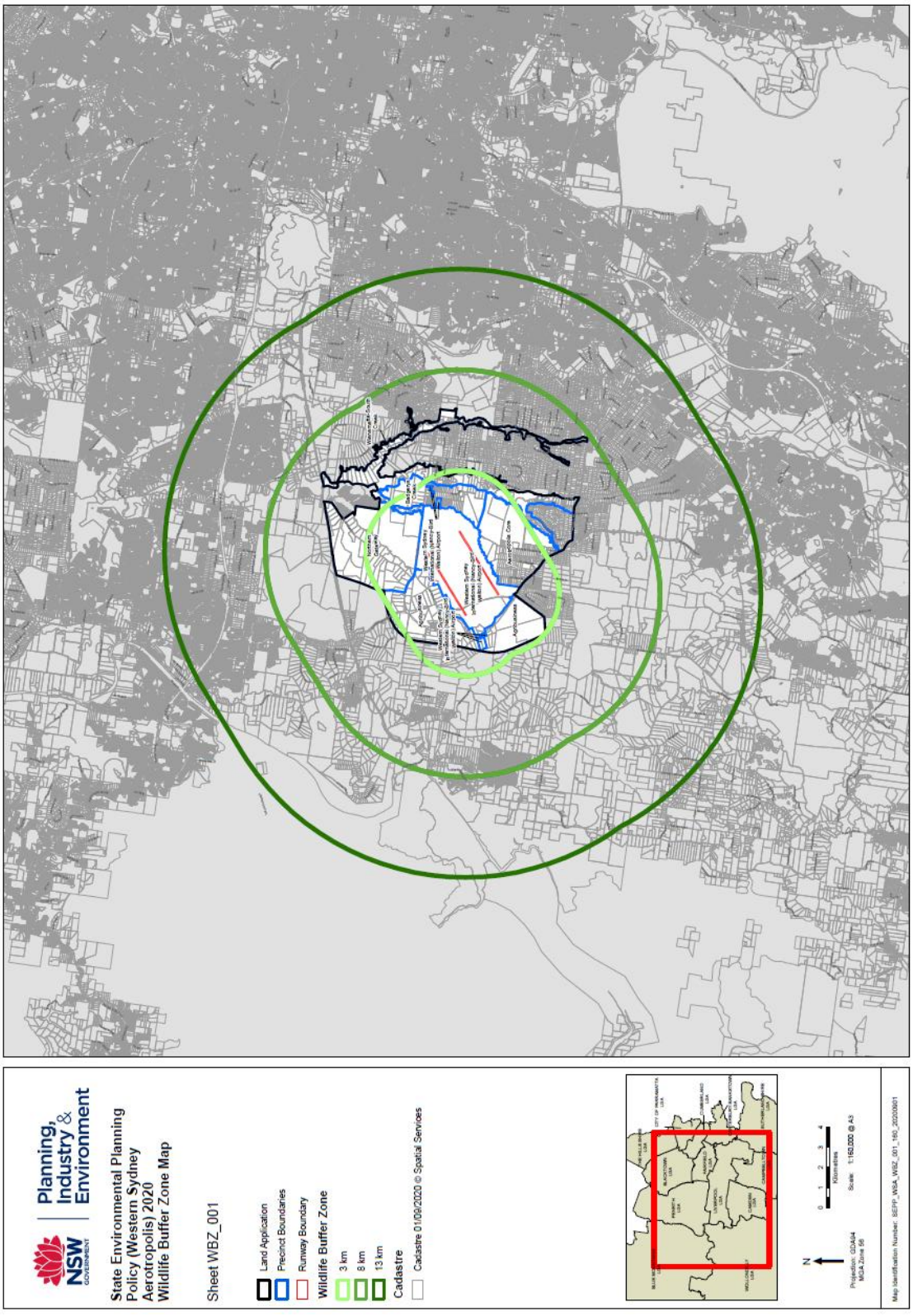
Noise Exposure Map (NSW DPIE WSA SEPP 2020)



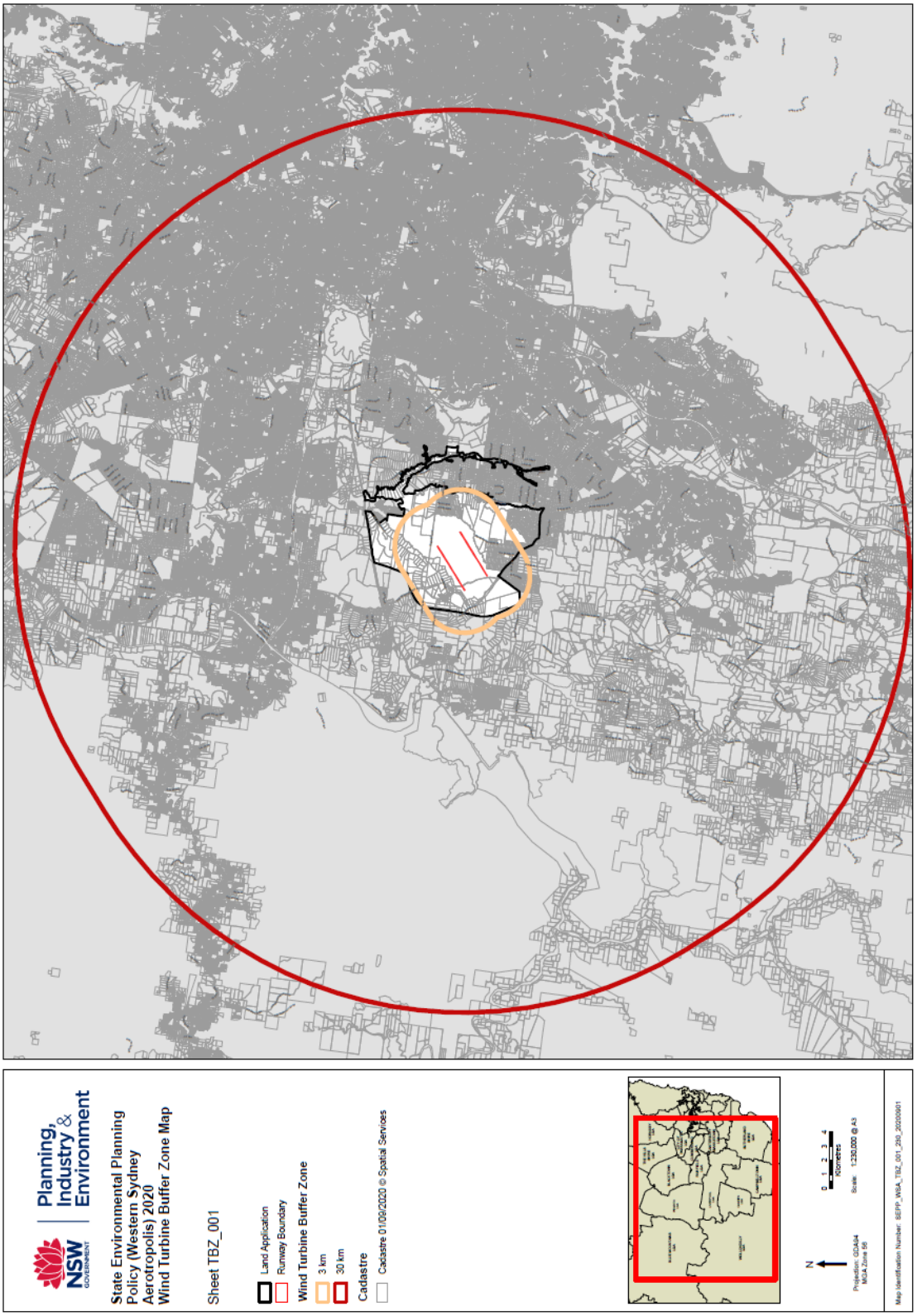
Lighting Intensity and Wind Shear Map (NSW DPIE WSA SEPP 2020)



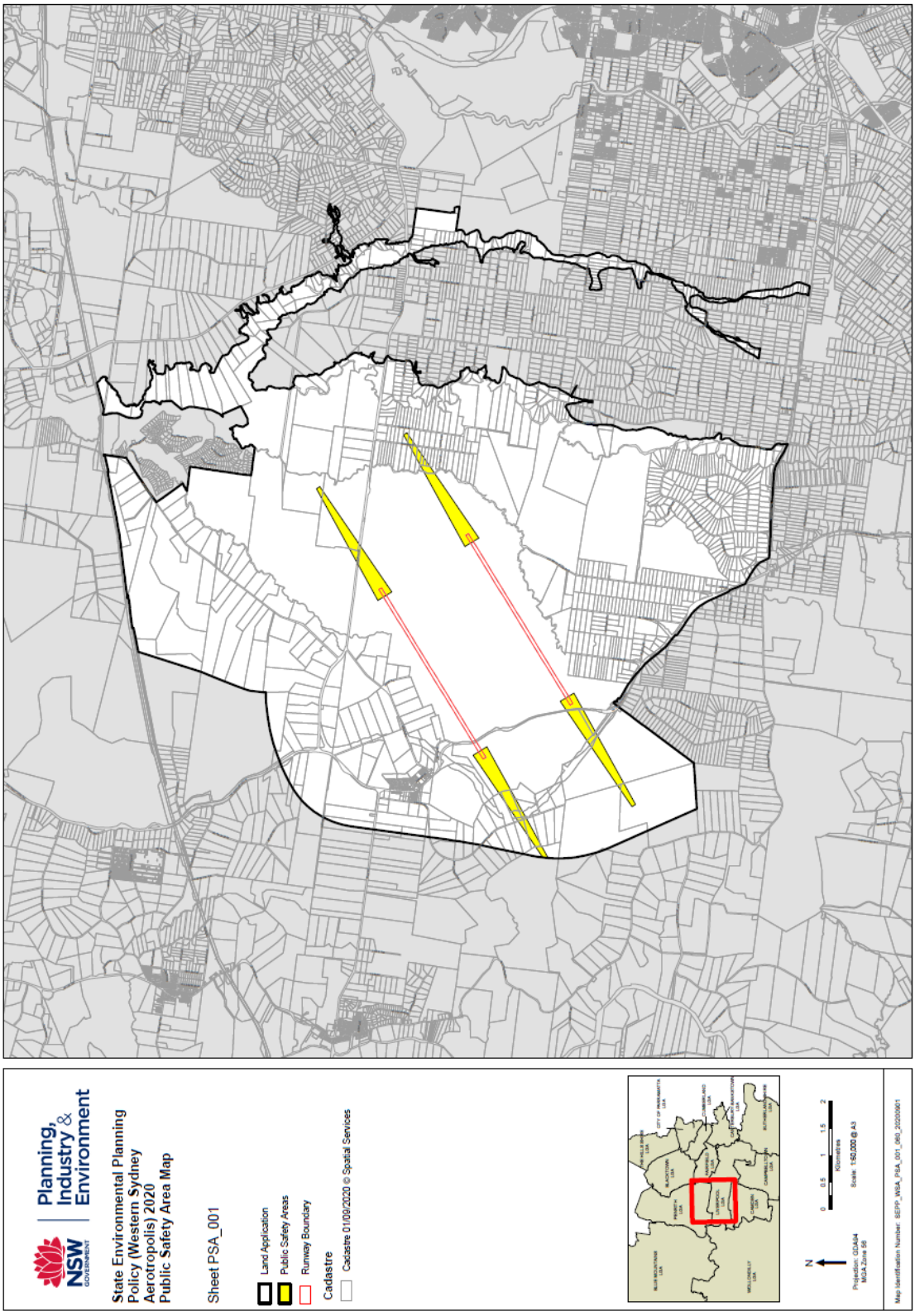
Wildlife Buffer Zone Map (NSW DPIE WAS SEPP 2020)



Wind Turbine Buffer Zone Map (NSW DPIE WAS SEPP 2020)



Public Safety Area Map (NSW DPIE WSA SEPP 2020)



Appendix B – Assessment Methodology

In preparing aeronautical impact assessments associated with airport safeguarding and protection, it is necessary to observe the requirements of the relevant aviation authorities including:

- The Department of Infrastructure, Regional Development and Cities (DIRDC);
- The Civil Aviation Safety Authority of Australia (CASA);
- Airservices Australia (ASA);
- Airport Operators; and
- Department of Defence where appropriate.

Relevant Acts and Regulations applicable to developments near airports and air traffic routes were referenced during this assessment.

The major relevant documents include:

- Civil Aviation Safety Regulation (CASR) Part 139 Manual of Standards – Aerodromes;
- Aeronautical Information Publication (AIP);
- Airservices Australia's Airways Engineering Instruction – Navigation Aid Building Restricted Areas and Siting Guidance (BRA);
- International Civil Aviation Organisation (ICAO) DOC 8168 Procedures for Air Navigation – Aircraft Operations (PANS OPS);
- The Planning Secretary's Environmental Assessment Requirements (SEARS);
- Western Sydney Airport – Airport Plan 2016;
- Western Sydney Aerotropolis State Environmental Planning Policy 2020;
- Airservices Australia – Western Sydney Airport Preliminary Airspace Management Analysis – 10 April 2015;
- NSW State Environmental Planning Policy (Western Sydney Employment Area) 2009.

A Glossary of Aeronautical Terms and Abbreviations is shown at Appendix C.

Appendix C – Glossary of Aeronautical Terms and Abbreviations

To facilitate the understanding of aviation terminology used in this report, the following is a glossary of terms and acronyms that are commonly used in aeronautical impact assessments and similar aeronautical studies.

Aeronautical Terms:

AC (Advisory Circulars) are issued by CASA and are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations.

Aeronautical study is a tool used to review aerodrome and airspace processes and procedures to ensure that safety criteria are appropriate.

AIPs (Aeronautical Information Publications) are publications promulgated to provide operators with aeronautical information of a lasting character essential to air navigation. They contain details of regulations, procedures and other information pertinent to flying and operation of aircraft. In Australia, AIP is issued by Airservices Australia on behalf of CASA.

Air routes exist between navigation aid equipped aerodromes or waypoints to facilitate the regular and safe flow of aircraft operating under IFR.

Airservices Australia is the Australian government-owned corporation providing safe and environmentally sound air traffic management and related airside services to the aviation industry.

Altitude is the vertical distance of a level, a point or an object, considered as a point, measured from mean sea level.

ATC (Air Traffic Control) service is a service provided for the purpose of:

a. preventing collisions:
    1. between aircraft; and
    2. on the manoeuvring area between aircraft and obstructions; and
b. expediting and maintaining an orderly flow of air traffic.

CASA (Civil Aviation Safety Authority) is the Australian government authority responsible under the *Civil Aviation Act 1988* for developing and promulgating appropriate, clear and concise aviation safety standards. As Australia is a signatory to the ICAO *Chicago Convention*, CASA adopts the standards and recommended practices established by ICAO, except where a difference has been notified.

CASR (Civil Aviation Safety Regulations) are promulgated by CASA and establish the regulatory framework (*Regulations*) within which all service providers must operate.

Civil Aviation Act 1988 (the Act) establishes the CASA with functions relating to civil aviation, in particular the safety of civil aviation and for related purposes.

ICAO (International Civil Aviation Organization) is an agency of the United Nations which codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth. The ICAO Council adopts standards and recommended practices concerning air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for international civil aviation. In addition, the ICAO defines the protocols for air accident investigation followed by transport safety authorities in countries

signatory to the Convention on International Civil Aviation, commonly known as the *Chicago Convention*. Australia is a signatory to the *Chicago Convention*.

IFR (Instrument Flight Rules) are rules applicable to the conduct of flight under IMC. IFR are established to govern flight under conditions in which flight by outside visual reference is not safe. IFR flight depends upon flying by reference to instruments in the flight deck, and navigation is accomplished by reference to electronic signals. It is also referred to as, "a term used by pilots and controllers to indicate the type of flight plan an aircraft is flying," such as an IFR or VFR flight plan. Pilots must hold IFR qualifications and aircraft must be suitably equipped with appropriate instruments and navigation aids to enable flight in IMC.

IMC (Instrument Meteorological Conditions) are meteorological conditions expressed in terms of visibility, distance from cloud and ceiling, less than the minimum specified for visual meteorological conditions.

LSALT (Lowest Safe Altitudes) are published for each low-level air route segment. Their purpose is to allow pilots of aircraft that suffer a system failure to descend to the LSALT to ensure terrain or obstacle clearance in IMC where the pilot cannot see the terrain or obstacles due to cloud or poor visibility conditions. It is an altitude that is at least 1,000 feet above any obstacle or terrain within a defined safety buffer region around a particular route that a pilot might fly.

MDA (Minimum Descent Altitude) is the lowest altitude that can be used during a non-precision approach in IMC. Flight below the MDA reduces the clearance above obstacles and is not permitted in IMC.

MOS (Manual of Standards) comprises specifications (Standards) prescribed by CASA, of uniform application, determined to be necessary for the safety of air navigation.

NOTAMs (Notices to Airmen) are notices issued by the NOTAM office containing information or instruction concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to persons concerned with flight operations.

Obstacles. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.

OLS (Obstacle Limitation Surfaces) are a series of planes associated with each runway at an aerodrome that defines the desirable limits to which objects may project into the airspace around the aerodrome so that aircraft operations may be conducted safely.

PANS OPS (Procedures for Air Navigation Services – Aircraft Operations) is an Air Traffic Control term denominating rules for designing instrument approach and departure procedures. Such procedures are used to allow aircraft to land and take off under Instrument Meteorological Conditions (IMC) or Instrument Flight Rules (IFR). ICAO document 8168-OPS/611 (volumes 1 and 2) outlines the principles for airspace protection and procedure design which all ICAO signatory states must adhere to. The regulatory material surrounding PANS OPS may vary from country to country.

PANS OPS Surfaces. Similar to an Obstacle Limitation Surface, the PANS OPS protection surfaces are imaginary surfaces in space which guarantee the aircraft a certain minimum obstacle clearance. These surfaces may be used as a tool for local governments in assessing building development. Where buildings may (under certain circumstances) be permitted to infringe the OLS, they cannot be permitted to infringe any PANS OPS surface, because the purpose of these surfaces is to guarantee pilots operating under IMC an obstacle free descent path for a given approach.

Prescribed airspace is an airspace specified in, or ascertained in accordance with, the Regulations, where it is in the interests of the safety, efficiency or regularity of existing or future air transport operations into or out of an airport for the airspace to be protected. The prescribed airspace for an airport is the airspace above any

part of either an OLS or a PANS OPS surface for the airport and airspace declared in a declaration relating to the airport.

Radar Terrain Clearance Chart (RTCC) is a chart that provides air traffic controllers with the lowest usable altitude that they can vector an aircraft using prescribed surveillance procedures within controlled airspace. There is a protection surface below this usable altitude which is shown in airport master plans.

Regulations (Civil Aviation Safety Regulations)

VFR (Visual Flight Rules) are rules applicable to the conduct of flight under VMC. VFR allow a pilot to operate an aircraft in weather conditions generally clear enough to allow the pilot to maintain visual contact with the terrain and to see where the aircraft is going. Specifically, the weather must be better than basic VFR weather minima. If the weather is worse than VFR minima, pilots are required to use instrument flight rules. Pilots must be specifically qualified and aircraft specifically equipped to enable flight in IMC,

VMC (Visual Meteorological Conditions) are meteorological conditions expressed in terms of visibility, distance from cloud and ceiling, equal or better than specified minima.

Abbreviations

Abbreviations used in this report, and the meanings assigned to them for the purposes of this report are detailed in the following table.

Abbreviations

Abbreviations used in this report, and the meanings assigned to them for the purposes of this report are detailed in the following table.

Abbreviation	Meaning
AC	Advisory Circular (documents that support CAR 1998)
ACFT	Aircraft
AD	Aerodrome
ADS-B	Automatic Dependent Surveillance – Broadcast
AHD	Australian Height Datum
AIP	Aeronautical Information Publication
Airports Act	Airports Act 1996, as amended
AIS	Aeronautical Information Service
ALT	Altitude
AMSL	Above Mean Sea Level
APARs	Airports (Protection of Airspace) Regulations, 1996 as amended
ARP	Aerodrome Reference Point
AsA	Airservices Australia
ATC	Air Traffic Control(ler)
ATM	Air Traffic Management
BARO-VNAV	Barometric Vertical Navigation
BRA	Building Restricted Area
CAO	Civil Aviation Order
CAR	Civil Aviation Regulation
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulation
Cat	Category
DAP	Departure and Approach Procedures (charts published by AsA)
DER	Departure End of (the) Runway

Abbreviation	Meaning
DME	Distance Measuring Equipment
Doc nn	ICAO Document Number nn
DITRDC	Department of Infrastructure, Transport, Regional Development and Cities
ELEV	Elevation (above mean sea level)
ENE	East North East
ERSA	Enroute Supplement Australia
FAF	Final Approach Fix
FAP	Final Approach Point
FAS	Final Approach Surface of a BARO-VNAV approach
ft	feet
GBAS	Ground Based Augmentation System (satellite precision landing system)
GNSS	Global Navigation Satellite System
GP	Glide Path
HLS	Helicopter Landing Site
IAS	Indicated Airspeed
ICAO	International Civil Aviation Organisation
IHS	Inner Horizontal Surface, an Obstacle Limitation Surface
ILS	Instrument Landing System
ISA	International Standard Atmosphere
km	kilometres
kt	Knot (one nautical mile per hour)
LAT	Latitude
LOC	Localizer
LONG	Longitude
LNAV	Lateral Navigation criteria
m	metres
MAPt	Missed Approach Point
MDA	Minimum Descent Altitude

Abbreviation	Meaning
MGA94	Map Grid Australia 1994
MOC	Minimum Obstacle Clearance
MOS	Manual of Standards, published by CASA
MSA	Minimum Sector Altitude
MVA	Minimum Vector Altitude
NASAG	National Airports Safeguarding Advisory Group
NDB	Non Directional Beacon
NE	North East
NM	Nautical Mile (= 1.852 km)
nnDME	Distance from the DME (in nautical miles)
NNE	North North East
NOTAM	NOtice to AirMen
OAS	Obstacle Assessment Surface
OCA	Obstacle Clearance Altitude
OCH	Obstacle Clearance Height
OHS	Outer Horizontal Surface
OIS	Obstacle Identification Surface
OLS	Obstacle Limitation Surface
PANS OPS	Procedures for Air Navigation Services – Aircraft Operations, ICAO Doc 8168
PBN	Performance Based Navigation
PRM	Precision Runway Monitor
QNH	An altimeter setting relative to height above mean sea level
REF	Reference
RL	Relative Level
RNAV	aRea NAVigation
RNP	Required Navigation Performance
RPA	Rules and Practices for Aerodromes — replaced by the MOS Part 139 — Aerodromes
RPT	Regular Public Transport

Abbreviation	Meaning
RTCC	Radar Terrain Clearance Chart
RWY	Runway
SFC	Surface
SID	Standard Instrument Departure
SOC	Start Of Climb
STAR	STandard ARrival
SGHAT	Solar Glare Hazard Analysis Tool
TAR	Terminal Approach Radar
TAS	True Air Speed
THR	Threshold (Runway)
TNA	Turn Altitude
TODA	Take-Off Distance Available
VNAV	Vertical Navigation criteria
V_n	aircraft critical Velocity reference
VOR	Very high frequency Omni directional Range
WAC	World Aeronautical Chart