



**Australian Government**

**Department of Infrastructure, Transport,  
Regional Development, Communications and the Arts**

# **Western Sydney International (Nancy-Bird Walton) Airport – Airspace and flight path design**

Draft Environmental Impact Statement

Part D: EIS synthesis



© Commonwealth of Australia 2023

ISBN: 978-1-922879-05-9

September 2023

## Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this draft Environmental Impact Statement (EIS) is owned by the Commonwealth of Australia (referred to below as the Commonwealth).

## Digital Data Sources

Data used in the maps contained in this EIS has been obtained from the following sources: Base map data including aerial photography – NSW Department of Customer Services; NSW Department of Infrastructure, Transport, Regional Development and Communications; NSW Department of Planning and Environment; GeoScience Australia; nearmap.com and Esri. Note Esri base map data is sourced from Esri, HERE, Garmin, (c) OpenStreetMap contributors, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS user community. Other map data sources have been obtained from: Australian Government Department of Infrastructure, Transport, Regional Development, Communications and the Arts; Commonwealth of Australia and Department of Climate Change, Energy, the Environment and Water (DCCEEW) including DCCEEW National Flying-fox monitoring viewer spatial platform and Find Environmental Data; Australian Government Data.gov.au; National Native Title Tribunal, NSW Department of Customer Services; NSW Department of Planning and Environment (DPE) including DPE Important habitat maps for threatened species and Heritage Databases; NSW Department of Planning; NSW Department of Education; NSW Government – Heritage NSW (AHIMS); NSW Government, SEED The Central Resource for Sharing and Enabling Environmental Data in NSW; Navin Officer Heritage Consultants Pty Ltd; Airbiz; IRIS Visual Planning + Design; Environmental Risk Science Pty Ltd. and Todoroski Air Sciences.

## Disclaimer

This draft EIS has been prepared by, or on behalf of, the Commonwealth in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and the Guidelines for the content of a Draft Environmental Impact Statement – Western Sydney International Airport – Airspace and flight path design issued on 26 April 2022 and reflects the preliminary flight paths. Some of the information is illustrative or conceptual only, includes statements as to future matters which may not eventuate, and has been based on opinions and assumptions which may not be correct. The actual flight paths, aircraft movements, noise contours and aircraft noise over specific addresses may be different to that shown in the draft EIS.

The Commonwealth, its contractors and the respective data custodians make no representations or warranties as to the accuracy or completeness of the data, maps, statements or other information (including from third party sources) contained in this draft EIS. To the extent permitted by law, the Commonwealth, its contractors and the respective data custodians disclaim any and all liability whatsoever arising directly or indirectly from anything done or omitted to be done, or directly or indirectly from any use of, or reliance on, the data, maps, statements or other information contained in this draft EIS by any person for any purpose.

To the extent permitted by law users of this draft EIS release the Commonwealth, its contractors and the respective data custodians from any and all liability (including for negligence) arising directly or indirectly from any use of, or reliance on, the data, maps, statements or other information contained in this draft EIS, by themselves or any other party.

## Creative Commons licence

With the exception of (a) the Coat of Arms; and (b) any third party material, and where otherwise stated, copyright in this EIS is licensed under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Australia Licence (CC BY-NC-ND Licence).



The **CC BY-NC-ND** Licence allows you to copy and distribute this publication in any medium or format in unadapted form only, for non-commercial purposes only, provided that you attribute the publication to the Commonwealth, and that you abide by the other licence terms: <https://creativecommons.org/licenses/by-nc-nd/3.0/au/>.

Further information on the licence terms is available from <https://creativecommons.org/licenses/by-nc-nd/3.0/au/legalcode>

This publication should be attributed in the following way:

© Commonwealth of Australia 2023.

## Use of the Coat of Arms

The Department of the Prime Minister and Cabinet sets the terms under which the Coat of Arms is used. Please refer to the Commonwealth Coat of Arms – Information and Guidelines publication available at <http://www.pmc.gov.au>.

## Contact us

This EIS is available in hard copy or (and) PDF format. All other rights are reserved, including in relation to any departmental logos or trademarks which may exist. For enquiries regarding the licence and any use of this EIS, please contact:

Director – Creative Services  
Communication Branch  
Department of Infrastructure, Transport, Regional Development, Communications and the Arts  
GPO Box 594  
Canberra ACT 2601  
Australia

Email: [WSIflightpaths@infrastructure.gov.au](mailto:WSIflightpaths@infrastructure.gov.au)

Website: [www.WSIflightpaths.gov.au](http://www.WSIflightpaths.gov.au)

# Draft EIS guide

Summary	Outlines the key findings of the Draft EIS for the project. The summary also describes the project and its development to date, including its legislative framework and the outcomes of public consultation.
<b>Part A</b>	<b>Background</b>
	Terms and acronyms
Chapter 1	Introduction
Chapter 2	Strategic context and need
Chapter 3	Introduction to airspace
Chapter 4	Project setting
Chapter 5	Statutory context
<b>Part B</b>	<b>The project</b>
Chapter 6	Project development and alternatives
Chapter 7	The project
Chapter 8	Facilitated changes
Chapter 9	Community and stakeholder engagement
<b>Part C</b>	<b>Environmental impact assessment</b>
Chapter 10	Approach to impact assessment
Chapter 11	Aircraft noise
Chapter 12	Air quality and greenhouse gas
Chapter 13	Aircraft hazard and risk
Chapter 14	Land use
Chapter 15	Landscape and visual amenity
Chapter 16	Biodiversity
Chapter 17	Heritage
Chapter 18	Social
Chapter 19	Economic
Chapter 20	Human health
Chapter 21	Facilitated impacts
Chapter 22	Cumulative impacts
Chapter 23	Matters of National Environmental Significance

<b>Part D</b>		<b>EIS synthesis</b>	
Chapter 24		Mitigation and management	
Chapter 25		Conclusion	
Chapter 26		References	
<b>Appendices</b>			
Appendix A		Proponent details and environmental record	
Appendix B		EIS team	
Appendix C		EIS Guidelines	
Appendix D		List of persons and agencies consulted during the preparation of the Draft EIS	
Appendix E		Project coordinates	
Appendix F		Background to the draft Western Sydney International noise insulation and property acquisition policy	

<b>Technical papers</b>			
Technical paper 1		Aircraft noise	
Technical paper 2		Air quality	
Technical paper 3		Greenhouse gas emissions	
Technical paper 4		Hazard and risk	
Technical paper 5		Wildlife strike risk	
Technical paper 6		Land use and planning	
Technical paper 7		Landscape and visual amenity	
Technical paper 8		Biodiversity	
Technical paper 9		Heritage	
Technical paper 10		Social	
Technical paper 11		Economic	
Technical paper 12		Human health	
Technical paper 13		Facilitated changes	
Technical paper 14		Greater Blue Mountains World Heritage Area	

# Contents

<b>Chapter 24</b>	<b>Mitigation and management</b>	<b>24-1</b>
24.1	Environmental management framework	24-1
24.1.1	Stage 1 Development environmental management framework	24-3
24.1.2	Environmental management objectives	24-3
24.1.3	Relevant legislation and statutory requirements	24-3
24.2	Proposed safeguards and mitigation measures	24-4
24.2.1	Timing and responsibilities	24-4
24.2.2	Western Sydney International (Nancy-Bird Walton) Airport Stage 1 mitigation measures	24-5
24.2.3	Summary of mitigation measures	24-6
24.2.4	Effectiveness of mitigation measures	24-11
24.2.5	Cost of environmental management measures	24-12
<b>Chapter 25</b>	<b>Conclusion</b>	<b>25-1</b>
25.1	Introduction	25-1
25.2	Summary of project benefits and impacts	25-2
25.2.1	Project benefits	25-2
25.2.2	Justification for undertaking project in manner proposed	25-2
25.2.3	Summary of impacts	25-3
25.3	Mitigating and managing impacts	25-14
25.4	Objects of the EPBC Act	25-15
25.5	Principles of ecologically sustainable development	25-16
25.6	Concluding statement	25-18
<b>Chapter 26</b>	<b>References</b>	<b>26-1</b>

## List of tables

Table 24.1	Summary of proposed mitigation measures	24-6
Table 24.2	Proposed monitoring programs	24-11
Table 25.1	Compliance of the project against objects of EPBC Act	25-15
Table 25.2	Evaluation of the project against ESD principles	25-16

## List of figures

Figure 24.1	Project Environmental Management Framework	24-2
Figure 24.2	Agency responsibilities and indicative timing	24-5

## Appendices

Appendix A Proponent details and environmental record

Appendix B EIS team

Appendix C EIS Guidelines

Appendix D List of persons and agencies consulted during the preparation of the Draft EIS

Appendix E Project coordinates

Appendix F Background to the draft Western Sydney International noise insulation and property acquisition policy

## Chapter 24 Mitigation and management

This chapter provides an overview of the environmental management framework for the project including an overview of how environmental, social and sustainability issues will be managed for the project. A consolidated summary of the environmental mitigation measures proposed for the project is also provided, summarising the relevant chapters and technical papers informing the draft EIS.

### 24.1 Environmental management framework

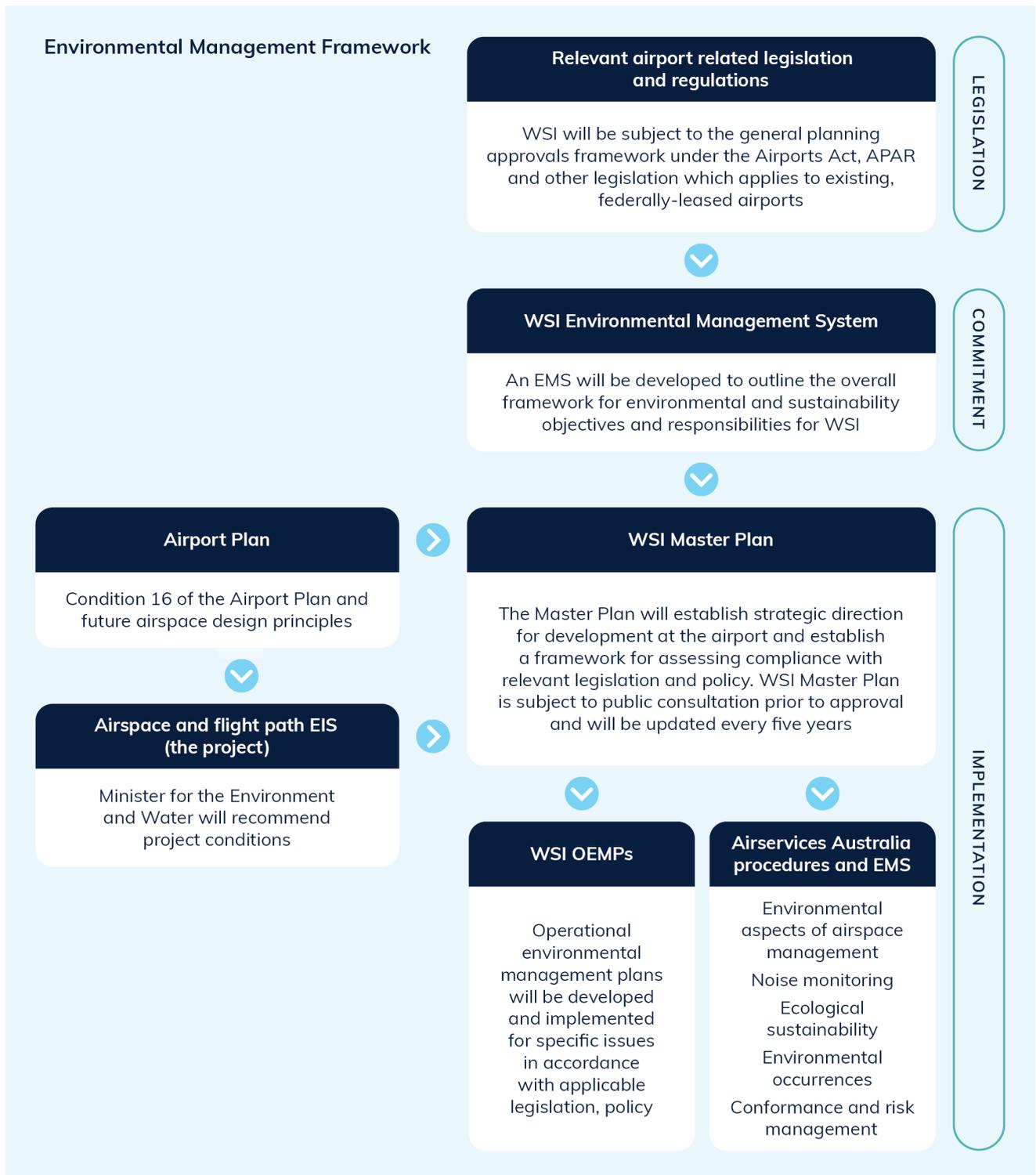
This Environmental Management Framework (EMF) provides an overview of how environmental, social and sustainability issues will be managed for the project. The EMF outlines the policies, legislation, commitments and activities which will guide improved environmental outcomes associated with implementation and operation of airspace and ground based operations for WSI.

The project's EMF consists of:

- relevant legislation that regulates the Australian airspace
- Condition 16 of the Airport Plan and the future airspace design principles set out in 2.2.5 of the Airport Plan and developed as part of the preliminary design phase
- regulatory oversight by the Commonwealth Department of Infrastructure, Transport, Regional Development, Communication and the Arts (DITRDCA)
- Airservices Australia's existing Environmental Management System
- the draft EIS management measures
- existing policies, procedures and plans developed for Western Sydney Airport.

The implementation of environmental management measures during further design development, implementation and operation of the project would minimise any potential adverse impacts arising from the proposed work on the surrounding environment.

The EMF for the project is presented as Figure 24.1.



**Figure 24.1 Project Environmental Management Framework**

### 24.1.1 Stage 1 Development environmental management framework

The Airport Plan set out the Australian Government's intent for the operation of the airport and provided authorisation for the construction and operation of Stage 1 of the development. Part 3 of the Airport Plan outlines the conditions for the design, construction and operation of the Stage 1 development, which include environmental standards and implementation of mitigation measures identified in the 2016 EIS. Under these conditions, a suite of construction plans, a Community and Stakeholder Engagement Plan and a Sustainability Plan were developed and approved.

The Airport Plan forms a transitional planning instrument under the Airports Act. WSA Co are required (under the Act) to submit for approval a Master Plan for WSI which is subject to public consultation. The WSI Master Plan will include a 20 year strategic vision for the airport which is renewed every 5 years. The Master Plan includes future land uses, types of permitted development, and noise and environmental impacts. The Master Plan will also include an environment strategy which sets out the airport's strategy to manage environmental issues within a 5 year period and beyond. It is the basis on which environmental performance will be measured.

To date, a range of management plans, policies and procedures have been developed and implemented for the Stage 1 development.

Future stages of development for WSI (including this project) are subject to the general planning approvals framework under the Airports Act, which applies to existing, federally-leased airports.

### 24.1.2 Environmental management objectives

The objective of the EMF is to ensure the project minimises impacts to the 'whole of the environment' in a manner consistent with the applicable environmental approvals and regulatory context.

The environmental management objectives for the project are:

- to deliver sound environmental and social outcomes for the Australian community
- to ensure operation of the project is consistent with the future airspace design principles outlined in the Airport Plan
- to identify the regulatory and governance framework for environmental management during operation of the project
- to ensure the project is operated in accordance with the environmental management measures outlined within this draft EIS and any conditions of approval
- to build on the environmental management objectives and commitments outlined in the Airport Plan
- to provide a robust framework for the development of management plans for the project
- to promote improvement in environmental performance through continuous monitoring, auditing and update of environmental management plans
- to provide a framework for community and stakeholder engagement with the goal of providing a mechanism for managing and responding to complaints within a suitable timeframe
- to ensure that operation of the project is consistent with the principles of ecologically sustainable development.

### 24.1.3 Relevant legislation and statutory requirements

The Australian airspace is governed by Commonwealth legislation, specifically the *Airspace Act 2007* (the Airspace Act) the *Civil Aviation Act 1988* (the Civil Aviation Act), and their associated regulations, whereas the on-ground development of certain airports and protection of the airspace is primarily governed by the *Airports Act 1996* (the Airports Act) (and its regulations).

Chapter 5 (Statutory context), provides an overview of the relevant planning and legislative framework that applies to the project. It explains the relationship of the legislation that regulates the Australian airspace, the Airport Plan and the environmental assessment process for the project.

## 24.2 Proposed safeguards and mitigation measures

Table 24.1 provides a compilation of the measures to minimise and mitigate the potential impacts of the of the project as identified for each environmental aspect assessed in Chapters 11 to 22. The mitigation measures are supported by proposed monitoring/research programs outlined in Table 24.2.

The project does not include any physical infrastructure or construction work, and so the mitigation measures apply to proposed flight paths and a new controlled airspace volume for single runway operations at WSI.

The mitigation measures may be revised in response to submissions raised during public exhibition. A revised list of mitigation measures would be provided in the Final EIS for the project. The mitigation measures and monitoring programs should also be considered in the context of supporting the range of mitigation and management measures described for operation of WSI in the Western Sydney Airport – Environmental Impact Statement (2016 EIS).

### 24.2.1 Timing and responsibilities

The timing for implementation of mitigation measures outlined in Table 24.1 is referred to as either pre-operation or operation. Pre-operation refers to project phases prior to operation of the airport and flight paths. Operation refers to the implementation of flight paths and the ongoing operation of WSI. The indicative timing of the project's pre-operation and operational phases as well as the project's key delivery agencies is shown on Figure 24.2.

The detailed design phase will include further evaluation and refinement of the proposed selected airspace design for implementation based on feedback received from the community and other technical stakeholders such as airlines and industry bodies on this draft EIS. Once finalised, the Australian Minister for the Environment and Water will then provide advice to the DITRDCA, Airservices Australia and CASA, including any recommended conditions, before any approval is given for the airspace design. Airservices Australia will be responsible for submitting the Airspace Change Proposal that will be submitted to CASA for approval. This would need to consider the advice provided by the Australian Minister for the Environment and Water.

Key responsibilities within the EMF for the project can be summarised as:

- DITRDCA is leading the design of the WSI airspace arrangements for single runway operations at WSI, as well as having regulatory oversight of the project to ensure compliance with the conditions of the Airport Plan
- Airservices Australia, as the relevant Air Navigation Service Provider (ANSP), will ultimately be responsible for the detailed design, implementation and management of the proposed airspace and flight paths
- CASA, as the regulator responsible for the administration of airspace under the Airspace Act, will be responsible for the approval of the proposed airspace management arrangements through the approval of an Airspace Change Proposal (in its role as the Office of Airspace Regulation)
- WSA Co is responsible for building, operating and managing WSI.

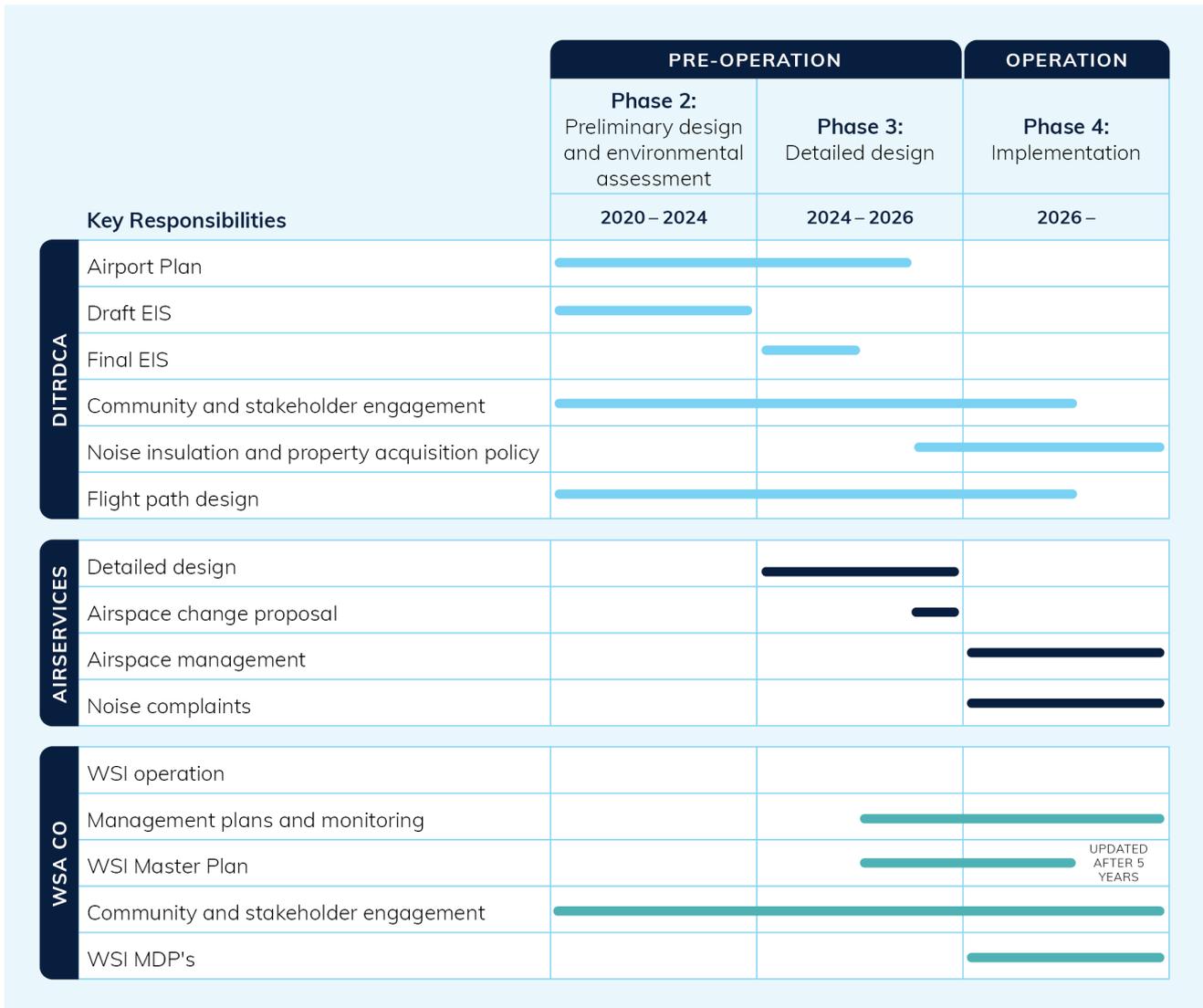


Figure 24.2 Agency responsibilities and indicative timing

### 24.2.2 Western Sydney International (Nancy-Bird Walton) Airport Stage 1 mitigation measures

In 2016 the then Australian Minister for Urban Infrastructure approved development of WSI under the *Airports Act 1996* (Commonwealth). Following the finalisation of the Western Sydney Airport – Environmental Impact Statement (2016 EIS), the Western Sydney Airport – Airport Plan (Airport Plan) (DITRDCA, 2021) was approved. The Airport Plan authorised the construction and operation of the Stage 1 Development of WSI and set the requirements for the further development and assessment of the preliminary airspace design for WSI.

In accordance with subsection 96C(5) of the Act, the Airport Plan sets out the conditions to be complied with in relation to the Airport Stage 1 Development and the Rail Development. and contains operational conditions that govern the operational phase of the Stage 1 Development, including the requirement of a series of Operational Environment Management Plans (OEMPs) and a Community and Stakeholder Engagement Plan.

Part 2 of the Airport Plan provides the planning framework for the Airport until the first master plan is in place. Within 5 years of the Airport Lease being granted, or such longer period as allowed by the Minister for Infrastructure, Transport, Regional Development and Local Government, the ALC will be required to submit for approval a full master plan, which will replace Part 2. Master plans are subject to community consultation. Many of the project conditions outlined in the Airport Plan ceases to have effect once there is a Master plan for the Airport.

The mitigation measures in this Draft EIS have been developed in consideration of the 2016 EIS and conditions outlined in the Airport Plan, specifically:

- 3.11.2 Construction conditions
  - the Infrastructure Department must consult with relevant Aboriginal stakeholders and relevant government agencies with the aim of establishing, with the support and collaborative action of governments and other stakeholders, an Aboriginal cultural heritage ‘keeping place’ that would provide secure, above ground storage of artefacts and enable future access for cultural purposes, interpretation, education or research.
- 3.11.4 Operational conditions
  - the preparation of Operational Environmental Management Plans (OEMPs) for noise and air quality management
  - the establishment of community aviation consultation group and preparation of Community and Stakeholder Engagement Plans
  - development of wildlife hazard management plans and programs.
- 3.11.5 General conditions
  - preparation of a Biodiversity Offset Delivery Plan (BODP) in relation to the carrying out of the Airport Stage 1 Development, which takes into account specific species (such as the Southern Myotis (*Myotis macropus*)).

### 24.2.3 Summary of mitigation measures

Table 24.1 provides a compilation of the measures to minimise and mitigate the potential impacts of the of the project as identified for each environmental aspect assessed in Chapters 11 to 22. The mitigation measures are supported by proposed monitoring/research programs outlined in Table 24.2.

**Table 24.1 Summary of proposed mitigation measures**

ID No.	Issue	Mitigation measure	Owner	Timing
<b>Aircraft noise</b>				
<b>N1</b>	Noise insulation and property acquisition	DITRDCA will finalise the noise insulation and property acquisition policy which details the eligibility requirements for inclusion in the program.  This policy will apply to eligible properties that are significantly impacted by aircraft overflight noise from WSI.	DITRDCA	<b>Pre-operation</b> (Detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026 – conclusion of program)
<b>N2</b>	Noise abatement	Airservices Australia will develop and review noise abatement procedures in consultation with stakeholders, including aircraft operators, airlines, WSA and FoWSA/WSI Community Aviation Consultation Group (CACG) following a draft proposal developed by the Expert Steering Group in response to feedback on the draft EIS.	Airservices Australia/ DITRDCA	<b>Pre-operation</b> (Initial proposal as part of the final EIS, with any further refinements in detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026 – ongoing)

ID No.	Issue	Mitigation measure	Owner	Timing
<b>N3</b>	Communication	WSA Co will establish a CACG to ensure appropriate community engagement on airport planning and operations. This will ensure community and industry have a forum for the groups best positioned to identify, share and test solutions or measures including relevant national or international best practice initiatives.	WSA Co	<b>Pre-operation</b> (At the conclusion of detailed design, 2024–2026)
<b>N4</b>	Noise complaints	The Airservices Australia Noise Complaints and Information Service will handle complaints and enquiries about aircraft noise and operations associated with the project to help identify issues of community concern and provide opportunities for improvement.	Airservices Australia	<b>Operation</b> (Implementation, 2026 – ongoing)
<b>N5</b>	Aircraft noise	The Aircraft Noise Ombudsman (ANO) provides independent reviews of aircraft noise-related activities to ensure appropriate governance and oversight of operations. The ANO is also available to make targeted reviews on specific issues as they are identified or arise.	Airservices Australia	<b>Operation</b> (Implementation, 2026 – ongoing)
<b>N6</b>	Flight path design	Airservices Australia will undertake a post-implementation review (PIR) of the flight path design and implementation.	Airservices Australia	<b>Operation</b> (within 2 years of implementation, 2026 – ongoing)
<b>Air quality and greenhouse gas</b>				
No project specific air quality or greenhouse gas emissions mitigations are proposed.				
As this assessment did not identify any significant change in the approved ground level impacts per the 2016 EIS, no additional monitoring for aircraft emissions is required.				
<b>Aircraft hazard and risk</b>				
<b>HR1</b>	Airspace conflicts	Airservices Australia will continue to address hazard identification and risk mitigation during the remainder of the design process and prioritise on-going safety performance monitoring.	Airservices Australia	<b>Pre-operation</b> (Detailed design, 2024–2026)
<b>HR2</b>	Contingency planning	WSA Co will implement contingency planning to respond to the impacts of crash events as per Part 139 Aerodromes Manual of Standards 2019.	WSA Co	<b>Operation</b> (Implementation, 2026 – ongoing)
<b>HR3</b>	Aircraft fuel jettisoning	Airservices Australia will apply existing procedures to deal with aircraft fuel jettisoning occurrences as per Manual of Air Traffic Services (MATS) section 4.2.11.	Airservices Australia	<b>Operation</b> (Implementation, 2026 – ongoing)
<b>HR4</b>	Local meteorological hazards	Automated Thunderstorm Alert Service (ATSAS) will be implemented by the Bureau of Meteorology (BoM) to provide improved thunderstorm forecasting.  Implementation of a Doppler LIDAR, if required, will support the identification of turbulence and wind shear (subject to the conclusions of an appropriate cost-benefit study).	WSA Co (in coordination with BoM)	<b>Operation</b> (Implementation, 2026 – ongoing)

ID No.	Issue	Mitigation measure	Owner	Timing
HR5	Wildlife strike	WSA Co will monitor and control the presence of birds and other wildlife on or in the vicinity of WSI in accordance with Civil Aviation Safety Regulations (CASR) Part 139 MOS requirements and National Airports Safeguarding Framework (NASF) Guideline C (See Table 24.2).	WSA Co	<b>Operation</b> (Implementation, 2026 – ongoing)
HR6	Wildlife strike	WSA Co will liaise with planning authorities on matters related to the development of, or modifications to, off-airport land uses that have the potential to attract hazardous numbers or types of wildlife.	WSA Co	<b>Pre-operation</b> (Detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026 – ongoing)
HR7	Wildlife strike	WSA Co will establish a WSI Wildlife Hazard Management Committee (WHMC) that will likely comprise Western Sydney local government representatives, NSW Department of Planning and Environment and other relevant aviation stakeholders.	WSA Co	<b>Operation</b> (within 6 months of Implementation, 2026–ongoing)
HR8	Wildlife strike	The WHMC will contribute to the preparation of regional species management programs (including Australian White Ibis) as required. Regional species management plans will build on any existing management programs (e.g. the Canterbury-Bankstown Council Australian White Ibis Management Program). The regional programs will aim to: <ul style="list-style-type: none"> <li>• reduce species impacts on aviation and the community in general</li> <li>• provide advice to landowners on how they can contribute to species management programs on non-council land</li> <li>• establish measurable targets for species management</li> <li>• maintain the long-term sustainability of the local species populations.</li> </ul>	WSA Co	<b>Operation</b> (Implementation, 2026–ongoing)
<b>Land use</b>				
LUP1	Aircraft noise	DITRDCA and WSA Co will liaise with State and local government agencies to ensure applicable environmental planning instruments have regard to ANEC forecasts produced for the project.	DITRDCA and WSA Co	<b>Pre-operation</b> (Detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026–ongoing)

ID No.	Issue	Mitigation measure	Owner	Timing
LUP2	Protected airspace	DITRDCA will coordinate with relevant State and local government agencies to implement appropriate PANS-OPS requirements in applicable planning instruments to ensure future development does not impeded safe aircraft operations in accordance with the National Safeguarding Framework.	DITRDCA	<b>Pre-operation</b> (Detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026 – ongoing)
LUP3	Wildlife buffers	WSA Co will liaise with State and local government agencies to establish mechanisms that will identify land uses and prevent the creation of land uses that would cause hazardous wildlife attraction within the wildlife buffers.	WSA Co	<b>Pre-operation</b> (Detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026–ongoing)
LUP4	Wildlife buffers	WSA Co will negotiate with State and local government agencies and land owners if required on agreed action plans for monitoring and, where necessary, reducing wildlife attraction to areas in the vicinity of WSI.	WSA Co	<b>Operation</b> (Implementation, 2026–ongoing)
<b>Landscape and visual amenity</b>				
Based on the nature of the potential impacts, no reasonable or feasible project specific mitigations are considered to be available that would reduce the potential landscape and visual impacts that have been identified as a result of the project.				
<b>Biodiversity</b>				
Project specific mitigation measures related to wildlife strike are presented as HR5 to HR8 and those related to wildlife buffers are presented in LUP3 and LUP4. There are no other project specific mitigations related to biodiversity.				
<b>Heritage</b>				
H1	Aboriginal heritage	DITRDCA will ensure that the detailed design phase considers Aboriginal cultural places and values, noting that safety is not negotiable and that capacity, environment and efficiency factors must also be considered in the flight path design.	DITRDCA	<b>Pre-operation</b> (Detailed design, 2024–2026)
H2	Heritage	A research program will be undertaken to investigate the potential impact of aircraft emissions on historic and Aboriginal heritage sites (including rock art sites), with a particular focus on sites within the Greater Blue Mountains Area.  The research program will be designed and implemented in consultation with Heritage NSW and include participation of local First Nations stakeholders.	DITRDCA/ Airservices Australia/ WSA Co	<b>Pre-operation</b> (Detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026–ongoing)

ID No.	Issue	Mitigation measure	Owner	Timing
H3	Heritage consultation	WSA Co will establish a CACG for WSI which will facilitate consultation with stakeholders and community on a range of matters including heritage issues.	WSA Co	<b>Pre-operation</b> (Detailed design, 2024–2026)
<b>Social</b>				
S1	Social impacts	The WSI CACG will undertake consultation with stakeholders and community, including social organisations, to seek feedback on social issues and to promote social and economic welfare of the community.	WSA Co	<b>Pre-operation</b> (Detailed design, 2024–2026)
S2	First Nations employment	WSA Co will implement a program to ensure opportunities for First Nations employment.	WSA Co	<b>Operation</b> (Implementation, 2026–ongoing)
<b>Economic</b>				
E1	Existing airspace users	DITRDCA will continue to consult with aerodrome operators and airspace users at Bankstown and Camden Airports regarding airspace requirements in order to minimise risks and associated economic costs.	DITRDCA	<b>Pre-operation</b> (Detailed design, 2024–2026)
E2	Emergency services	DITRDCA and Airservices Australia will continue to consult with emergency services operators regarding priorities of airspace in order to minimise risks and associated economic costs.	DITRDCA and Airservices Australia	<b>Pre-operation</b> (Detailed design, 2024–2026) and <b>Operation</b> (Implementation, 2026–ongoing)
<b>Human health</b>				
Mitigation measures related to Aircraft noise are presented as N1 to N7 and mitigations related to aircraft hazard and risk are presented as HR1 to HR8. There are no other project specific mitigations related to human health.				

**Table 24.2 Proposed monitoring programs**

ID No.	Issue	Monitoring measure	Owner	Timing
<b>M1</b>	Aircraft noise	<p>Airservices Australia will install a system of permanent and temporary noise monitoring terminals at suitable locations and incorporated into the Airservices Australia NFPMS network and reporting systems. The interface will allow community and other stakeholders to see where aircraft fly and explore historical trends and patterns.</p> <p>The system will provide accurate noise monitoring data for reporting, validation and noise model calibration. With an established baseline it could give an evidence base for any future flight path modification or noise abatement initiatives.</p> <p>This system will operate 24-hours-a-day, 7-days-a-week, collecting data from every aircraft operating to and from WSI.</p> <p>Noise monitoring will consider the requirements of the WSI Stage 1 Development Noise OEMP.</p>	Airservices Australia	<b>Operation</b> (Implementation, 2026–ongoing)
<b>M2</b>	Wildlife strike	<p>A bird and bat strike monitoring program will be conducted to monitor for the presence of wildlife on the WSI site and in vicinity of WSI. The monitoring program will:</p> <ul style="list-style-type: none"> <li>• identify wildlife hazards which must be assessed to reduce potential risk to aircraft operations</li> <li>• be conducted in accordance with relevant Commonwealth and State guidelines and standards including any recovery plans for threatened species</li> <li>• carried out under the direction of a suitably qualified person</li> <li>• be carried out in liaison with local government in relation to plans for proposed developments within 13 km of WSI that are likely to increase bird and bat strike</li> <li>• identify locations where reasonable and feasible mitigation measures to manage wildlife strike risk are required</li> <li>• be reviewed annually to determine its effectiveness.</li> </ul>	WSA Co	<b>Operation</b> (Implementation, 2026–ongoing)

#### 24.2.4 Effectiveness of mitigation measures

The management of potential impacts associated with the future development of WSI and the operation of flight paths has been incorporated into strategic planning and legislation over the last decade. Land-use planning in particular has also been an effective means to ensure that land use near WSI is compatible with noisy aviation activities, with a primary goal of minimising the population affected by aircraft noise.

Aircraft noise is an unavoidable consequence of an operating major airport in proximity to heavily populated areas. Appropriate noise management controls referencing International and Australian guidelines (such as the National Airport Safeguarding Framework (NASF)) have also been included in applicable planning instruments in advance of WSI's operations.

In addition to land use planning, there is a well-established range of mechanisms supporting the WSI operational framework and these include:

- the Airservices Australia Noise Complaints and Information Service – to handle complaints and enquiries about aircraft noise and operations associated with WSI to help identify issues of community concern and provide opportunities for improvement
- the Aircraft Noise Ombudsman (ANO) (an independent administrative office) – to conduct reviews of Airservices Australia's and Defence's management of aircraft noise-related activities. The ANO would also monitor and report on the effectiveness of the community consultation processes related to aircraft noise for WSI and the presentation and distribution of aircraft noise-related information.

Airservices Australia's Noise and Flight Path Monitoring System (NFPMS) currently collects noise and flight path data from airports across Australia and it is anticipated that WSI will be incorporated into this network. Data collected from NFPMS is used to reduce uncertainty around aviation noise impacts on the community and to determine potential environmental (noise) impacts from existing and proposed new flight paths and noise abatement trials, including post-implementation reviews.

The detailed planning of flight paths, the implementation of air traffic control procedures, noise abatement procedures and airport operating strategies are also effective measures in achieving lower impact over noise sensitive areas without impacting safety and significantly reducing airport capacity.

The adoption of WSI's flight path design principles are the result of national consultation with community, industry and government stakeholders, and are consistent with international global practices. This guidance will assist in minimising the impact of aircraft noise on the surrounding community by directing aircraft away from overflying populated areas where possible.

Airservices Australia will ultimately be responsible for the implementation and management of the proposed airspace and flight paths and are experienced in managing a range of environmental aspects associated with airspace operations. This is partly achieved through a maintained Environmental Management System (EMS) which assures compliance with legal obligations, appropriate risk management of activities and continual improvement. The Airservices Australia EMS aligns with ISO 14001:2015, which provides an internationally recognised framework for effective organisational environmental management and to achieve improved environmental performance.

The range of existing management measures, already built into legislative, environmental and operational framework for WSI are effective in the management and minimising of impacts associated with aircraft noise.

The project specific mitigation measures outlined within Table 24.1 have been developed to add to the range of existing measures discussed above. Where possible, the measures have been developed to consider the "S.M.A.R.T" principle. The effectiveness of the mitigation measures will be reviewed during operation of the project and through ongoing stakeholder consultation and oversight through relevant community forums and community engagement as required by the Australian Government at major airports in Australia.

## 24.2.5 Cost of environmental management measures

Costing of proposed mitigation measures will be considered by DITRDCA, Airservices Australia, CASA, WSA Co, and the Australian Government as part of the delivery of Western Sydney International Airport.

The costing of mitigation measures will have particular regard to the key mitigations outlined in this draft EIS including, but not limited to, implementation of the noise insulation and property acquisition policy in relation to aircraft overflight noise for buildings outside the Airport site. The detailed cost associated with the noise insulation and property acquisition policy will be provided once finalised.

## Chapter 25 Conclusion

This chapter seeks to draw together the residual impacts, benefits and commitments for the project. It summarises the project for which approval is sought and provides the justification for it, considering the compliance with principles of Ecologically Sustainable Development and the objects and principles of the EPBC Act.

### 25.1 Introduction

This Draft Environmental Impact Statement (EIS) has been prepared to address the requirements of Condition 16 of the Airport Plan and support the request to the Australian Minister for the Environment and Water for advice in accordance with Section 160 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This advice from the Minister is required prior to any approval of the airspace and flight paths.

The project has been developed by an Expert Steering Group led by the Australian Government Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) and including Defence, ASA, and CASA. It involves:

- the development and implementation of proposed flight paths and a new controlled airspace volume for single runway operations at WSI
- the development of associated air traffic control and noise abatement procedures for eventual use by civil, commercial passenger and freight aircraft
- changes to the Sydney Basin airspace to facilitate the new volume of WSI traffic – specifically to other existing airports' operations (including Sydney (Kingsford Smith) Airport).

The preliminary airspace and flight path design is a further development to the 'proof-of-concept' design presented in the *2016 Western Sydney Airport – Environmental Impact Statement* (refer to Chapter 1 (Introduction)).

The Draft EIS has considered the whole-of-environment EPBC Act requirements as defined in *Actions on, or impacting upon Commonwealth land, and actions by Commonwealth agencies, Significant impact guidelines 1.2* (Significant impact guidelines 1.2) (Commonwealth of Australia, 2013b). It represents a comprehensive assessment of the potential impacts associated with the operation of the project.

This chapter documents the benefits of the project that have been identified throughout the Draft EIS. The adverse impacts assessed as significant have also been summarised and an explanation is provided why these impacts are considered to be acceptable in the overall context of the project. This chapter also documents where each assessment has considered the interaction with other projects forecast to be in construction or operation at the same time as the project, to consider the cumulative impact of the project. The project will necessitate changes to the Sydney Basin airspace, which in turn has implications for the operations of other airports. These facilitated impacts are also summarised.

## 25.2 Summary of project benefits and impacts

### 25.2.1 Project benefits

The project is an integral part of WSI, ensuring that the benefits of the airport are realised. The objectives for WSI are to:

- improve access to aviation services for Western Sydney
- resolve the long-term aviation capacity constraints in the Sydney Basin
- maximise the economic benefit for Australia by maximising the value of the Airport as a national asset
- optimise the benefit of WSI for employment and investment in Western Sydney
- deliver sound financial, environmental and social outcomes for the Australian community.

The project will assist in achieving the overall objectives for WSI as it will enable single runway operations to commence at WSI through the introduction of new flight paths and a new controlled airspace volume.

### 25.2.2 Justification for undertaking project in manner proposed

Condition 16 of the Airport Plan requires the Australian Government to undertake an airspace design process and as such it is considered that a 'take no action' (that is, to consider a no-flight path option) is not a feasible alternative.

The project is justified to be undertaken in the manner proposed as it has been developed as part of an extensive airspace and flight path design development process set out in Condition 16 of the Airport Plan. This process optimises the currently proposed preliminary flight paths for WSI for introduction into the Sydney Basin to ensure they integrate as seamlessly as possible. The development process to date has focused on 4 key elements being safety, efficiency, capacity, and environmental considerations, while minimising changes to existing airspace arrangements in the Sydney Basin. In addition, the preliminary airspace design has been developed to comply with all relevant national and international practices and regulations for safe and efficient air navigation and aircraft operation.

In developing the preliminary flight paths, the design team and Expert Steering Group were guided by a range of constraints which determined what was technically feasible for the flight path design. These included:

- the runway alignment is fixed: there will be no changes to the north-east/south-west runway alignment, which was approved in the 2016 EIS and is currently under construction by Western Sydney Airport Company Limited
- the final approach and initial departure paths are fixed: given the fixed runway alignment and the requirement for aircraft to approach and depart WSI on a relatively straight trajectory, there will be some areas/suburbs directly connecting to the runway ends that would be impacted by aviation operations
- the altitude of aircraft is constrained: the height at which aircraft operate is determined by a number of factors, including the aircraft type, weather conditions, safety requirements and international rules of aviation
- the presence of existing airports in Greater Sydney: major changes cannot be made to the flight paths for Sydney (Kingsford Smith) Airport and considerations need to be made for operations at other airports, such as Camden, Bankstown, RAAF Richmond Base and Holsworthy
- WSI has 24-hour operations: WSI has always been planned to operate 24-hours, and this is fundamental to the viability of its operations.

The need to process aircraft in an orderly sequence when arriving has limited the opportunity to develop multiple alternative approach paths for aircraft arriving at WSI.

In developing this preliminary airspace design, proposed flight paths and runway operating modes have been subject to multiple and iterative reviews with the objective of optimising outcomes (that is, minimising the unavoidable residual impacts of aircraft noise on communities).

Future design phases would continue to ensure a rigorous approach to the finalisation and implementation of the airspace and flight path design. The detailed design phase will include further evaluation and refinement of the proposed selected airspace design to a level appropriate to secure regulatory approvals. This would have consideration of feedback received from the community, technical stakeholders such as airlines and industry bodies, and regulatory authorities. The implementation phase would include the regulatory certification and authorisation of the proposed airspace design and its implementation and post-implementation would involve the ongoing monitoring of the operation of the design by key operational stakeholders.

### 25.2.3 Summary of impacts

Key environmental issues have been examined throughout the design and development of the project. Consultation has been carried out with relevant stakeholders to identify key potential impacts at an early stage. Where possible, the proposed flight paths have avoided and minimised impacts as part of the project design and development. The assessment has been carried out to meet the Australian Minister for the Environment and Water's EIS Guideline assessment requirements

The assessment considered the nature and extent of likely short-term (year 2033) and long-term (year 2055) impacts of the Stage 1 Development associated with the project to account for increases in associated service capacity in terms of millions of annual passengers (MAPs) and air traffic movements (ATMs) per year (including freight operations). In relevant cases, for example, the evaluation of aircraft noise for some mitigations, an interim year (2040) was used to assess impacts.

Potential environmental impacts of the project can be appropriately identified at this stage of the design development. Impacts relating to the majority of issues are well understood and any uncertainties are documented where relevant in individual impact assessments of Part C and technical reports attached to this EIS.

#### 25.2.3.1 Aircraft noise

Aircraft noise impacts were assessed to reflect the expected growth of single runway operations in 2033, 2040 and 2055. Three runway modes of operation were modelled.

- In designing the flight paths for WSI, safety of operations is the most important consideration. The preliminary airspace design process also considered, to the extent practical, noise mitigation and environmental impacts associated with single runway operations. However, increased exposure to aircraft noise in areas in the vicinity of WSI and under its proposed arrival and departure flight paths will be an unavoidable consequence of aircraft operations at WSI.

As the single runway approaches capacity in 2055:

- between 7,000 to 12,200 residents may experience 5 or more aircraft noise events above 70 dB(A) over a 24-hour period, which can lead to an indoor sound level of 60 dB(A) when windows are opened (enough to disturb conversation)
- between 23,500 to 84,500 residents may experience 2 or more aircraft noise events above 60 dB(A) over the night time period (11 pm to 5:30 am). This significant variation is due to the use of Reciprocal Runway Operation (RRO) mode (when available), when flight paths would be minimised over more densely populated areas
- between 114,000 to 155,000 residents may experience 10 or more noise events above 60 dB(A) over a 24-hour period. By 2055, N60 contours extend well beyond the runway ends, north towards Penrith, north-east towards St Marys and north, west and south-west into the Blue Mountains National Park.

The number of residents affected by different levels of aircraft noise depends on the runway operating scenario adopted. Comparison of the 3 primary runway operating scenarios indicates that while there is limited variability of noise exposure levels in close proximity to WSI, the choice of runway operating strategy has a more pronounced effect on communities further away.

With respect to the ANEC, the ANEC extends along the standard instrument arrival and departure routes and would generally remain within the published ANEC contours for WSI. The results show that less than 1,000 people may be living within the 20 ANEC contours by 2055, an increase from approximately 250 people in 2033, regardless of the operational scenario. While there are very few residents within the 25 ANEC contours, mostly in Greendale, the 20 ANEC contours could progressively over time include the community of Twin Creeks and (currently) rural portions of the suburb of Kemps Creek.

The use of an alternative suite of proposed WSI day and night flight paths results in a level of respite and noise being shared to some areas impacted by the proposed higher traffic volumes of WSI day operations and a significant reduction in dwelling and population counts during WSI night operations, particularly when the RRO mode can be applied.

Residential and rural-residential areas to the immediate north-east and south-west of WSI, located on extended runway alignment, and close to the proposed arrival flight paths and initial departure turns would be subjected to a significant and unavoidable level of noise exposure.

Approaches to mitigating aircraft noise generally focus on reducing noise emissions from the aircraft themselves, planning flight paths and airport operating modes in a way that minimises potential noise and environmental impacts, and implementing land use planning or other controls to ensure that future noise-sensitive uses are not located in noise-affected areas.

External to the design, NSW Government planning controls have been in place for several decades and have to the extent practical prevented incompatible noise sensitive developments around WSI. It is expected that future land use planning around WSI would be influenced by final long term ANEC contours, once flight paths and operating modes are finalised and approved.

Subject to relevant considerations such as aircraft safety, all safe and practicable opportunities for mitigating noise impacts will be considered in finalising the flight paths and aircraft operating procedures for the proposed airport.

Various operating strategies for managing aircraft noise will have differing impacts on different populations, particularly at night, when greater airspace flexibility and lower demand permits the use of different runway modes of operation and flight paths. This could be achieved by prioritising, when operationally possible, night-time flights over areas of low density rural land and natural areas to the south-west, west and south of WSI. However, it is noted that these areas could be more noise sensitive than urban areas experiencing similar levels of noise exposure.

DITRDCA will finalise the noise insulation and property acquisition policy which details the eligibility requirements for inclusion in the program. This policy will apply to eligible properties that are significantly impacted by aircraft overflight noise from WSI.

### 25.2.3.2 Air quality and greenhouse gas

The air quality and greenhouse gas (GHG) assessment adopted the 2033 and 2055 reference years for the project. For each reference year, 7 different flight scenarios were considered of which the No preference, Prefer Runway 05 and Prefer Runway 23 scenarios were identified to represent the worst case for potential air quality impacts.

The local air quality assessment indicates the predicted levels would be below criteria for all the assessed air pollutants in 2033 and 2055, except for PM<sub>2.5</sub> (particles with a diameter of 2.5 micrometres or less) and NO<sub>2</sub> (Nitrogen Dioxide) during 2055 at several receivers located to the immediate north-west of the runway. However, the elevated PM<sub>2.5</sub> levels arise due to existing elevated background levels, and the effect of the project would be intangible and insignificant.

Whilst the project would contribute significantly to 1-hour average NO<sub>2</sub> levels at the nearest receivers to the north-west of the runway, the predicted levels of NO<sub>2</sub> are slightly above the more stringent, recently updated Environment Protection Authority (EPA) criteria for only a portion of the hours throughout the year that were assessed. The elevated NO<sub>2</sub> levels would only occur at a few locations immediately adjacent to WSI. As the predicted results are likely to be conservative (overestimating of impacts) and as it is likely there will be improvements in fuel efficiency (for aircraft and motor vehicles) it is reasonable to conclude that no significant impacts would arise. Further, the intensification of residential receivers in this location would be limited as the land has been zoned for Agribusiness and the area largely corresponds to land within the ANEC 20 contour and above, thus excluding residential development.

The regional air quality assessment identified a similar small scale of NO<sub>2</sub> impacts consistent with the local assessment, with predicted levels above the new EPA criteria in close vicinity to the airport in 2055, representing a small localised potential impact. The predicted impacts for NO<sub>2</sub> are small, infrequent and highly localised. PM<sub>2.5</sub> impacts arise due to elevated background pollutant levels. An improvement in the predicted maximum ozone impacts relative to the 2016 EIS has been calculated. The project's impact on the concentrations of all other assessed pollutants would be negligible and unlikely to be discernible or measurable within the existing background concentrations.

With respect to potential greenhouse gas emissions, the most emissions-intensive flights are those operating regular passenger transport services to medium and long haul destinations. In 2033 and 2055, these services accounted for only 27 and 23 per cent of projected total air traffic movements but were responsible for more than half of all full-flight emissions of CO<sub>2e</sub> (Carbon dioxide equivalent). Emissions of CO<sub>2e</sub> from domestic aviation are projected to grow steadily between 2033 and 2055, as activity continues to grow generally in line with population.

Overall, the emissions of CO<sub>2e</sub> attributed to WSI from main engine use by aircraft operating along WSI's flight paths in either 2033 or in 2055 are not considered to result in significant impacts or inhibit the achievement of net zero economy targets set by the Australian or NSW Government for 2050.

Emissions from aircraft movements are predominantly due to the engine emissions, which are required to meet Australian (and international) performance specifications. Measures to help reduce emissions from aircraft operations generally involve procedures and techniques to optimise the vertical profiles of aircraft climbing or descending to an airport. Beyond those measures, no project specific air quality or greenhouse gas emissions mitigations are proposed.

### 25.2.3.3 Aircraft hazard and risk

A range of potential hazards associated with the operation of WSI's flight paths have been considered, including the risks associated with aircraft crashes to people and critical infrastructure, risks due to fuel jettisoning and objects falling from aircraft, risks to buildings due to wake vortex, and risks to aircraft due to wildlife strike and meteorological conditions.

A hazard analysis process was used as the basis for risk assessment, derived from the NSW Government's Hazardous Industry Planning Advisory Papers (HIPAP), with guidance from aviation-specific risk assessment processes produced by CASA and International Civil Aviation Organization (ICAO).

For individual fatality risk due to an aircraft crash, a risk of 1 in 100,000 per annum is considered to be a low risk that is a generally acceptable level of exposure for members of the public but one that can be considered acceptable, provided that the risk is managed to be as low as reasonably practicable. For most residential properties, the risks would be negligible. This reflects the position of the runway and the design of the flight paths. In 2055, a small number of people (5) are within the 1 in 100,000 per annum risk contour and 108 people are located between the 1 in 100,000 per annum and 1 in 1,000,000 per annum risk contour. As the number of people exposed to risks would increase, these risks are classified as being of moderate effect but are not significant based on the criteria applied.

Societal risk in 2033 and 2055 are within the middle to lower risk part of the 'as low as reasonably practicable' region. These risks are considered acceptable, provided no further practicable means for mitigating these residual risks is available. In this regard, based on the runway location, airspace design requirements and the relative location of developed areas within Sydney, the flight path design has minimised these risks, as far as is practicable.

Critical infrastructure, such as hospitals, transport links, water storage and the Defence Establishment Orchard Hills, are located in the vicinity of the Airport Site. The typical event frequencies and scale of fatalities associated with aircraft crashes are consistent with risks that would be considered acceptable. Operation of flight paths over the GBMA presents a very low risk of introducing fire through aircraft accidents.

With respect to other considerations:

- risks due to fuel jettisoning and objects falling from aircraft, or risks to buildings due to wake vortex are concluded to be low or remote events. In particular, fuel jettisoning is a relatively uncommon, non-standard operational requirement that would have no ground level impacts if carried out in accordance with appropriate procedures. All fuel jettisoning would be carried out in accordance with Manual of Air Traffic Services (MATS) Section 4.2.11
- wildlife strike risk mitigation for WSI that would deliver an acceptable level of safety is achievable, provided that a site-specific wildlife management program is implemented

- compared with other airports which operate with an acceptable level of safety, there are no exceptional meteorological conditions at WSI that might lead to significant risks to operational safety. The risks to safety and operational efficiency from meteorological hazards can be mitigated by provision of improved forecasting.

Operations at WSI and the associated airspace in the Sydney Basin are being introduced within a well-established regulatory and management framework that places importance on safety. This is underpinned by key requirements that risks should be 'as low as reasonably practicable' and meet appropriate levels of safety. Assessment of the residual risks associated with WSI operations indicate that those key requirements would be met.

Risk mitigation is provided by a wide variety of general measures adopted across the aviation industry that will apply to operations at WSI. Additionally, project specific mitigations have been developed. These include Airservices Australia continuing to address hazard identification and risk mitigation during the remainder of the design process and prioritise on-going safety performance monitoring. Other project specific mitigations include contingency planning to respond to the impacts of crash events and wildlife strike measures to monitor and control the presence of birds and other wildlife on or in the vicinity of WSI.

#### 25.2.3.4 Land use

There are several International and Australian publications and policies which provide strategic guidance on land use management in proximity to airport operations. The National Airports Safeguarding Framework (NASF) in particular, provides guidance on planning requirements for developments that could potentially affect aviation operations.

Land use planning in the vicinity of WSI has considered and incorporated the operational needs of WSI into land use planning in accordance with guidance provided in the NASF. DITRDCA (formally Department of Infrastructure and Regional Development) liaised with State government agencies and relevant local councils concerning the adoption of the necessary guidelines into the applicable environmental planning instruments. The range of existing planning controls in place in the vicinity of WSI have been an effective means of providing appropriate controls over land use planning and development.

This includes the *State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (NSW)* (Western Parkland City SEPP), which outlines that no new noise sensitive development (including residential development) will be permitted within the ANEC 20 and above contours (except in limited circumstances for certain applications for dwelling houses and subdivision that were permissible prior to the SEPP coming into effect). The consent authority for any such development would need to be satisfied that indoor noise levels set in AS 2021:2015 are met. This does not prohibit the enlargement or modification to an existing use.

The predicted composite ANEC presented in the Draft EIS differs in some locations and an additional area of land in the vicinity of WSI is predicted to be within the 20 ANEC contour, when reviewed in comparison to the published ANEC mapping within the Western Parkland City SEPP. This includes areas within Erskine Park, Eastern Creek and to the south of Wallacia, which are currently zoned 'general industrial' (Penrith City Council, 2010) and 'primary production' (Liverpool City Council, 2008) and include a small number of semi-rural residential dwellings and around 5 residential dwellings located within the Twin Creeks Golf and Country Club. The ANEF contour for WSI will be prepared during the detailed airspace design phase, based on modelled long-term parallel runway operations. Until an ANEF contour is prepared and approved for WSI, the prescribed WSI ANEC is to be used to inform land use planning. Any changes to relevant planning instruments as a result of adopting an ANEF could see planning conditions imposed on these additional areas.

#### 25.2.3.5 Landscape and visual amenity

The landscape and visual amenity study area includes several important environmental, cultural and historic places and routes, which have varying levels of sensitivity. Key receptors that have an elevated landscape character or visual sensitivity include the GBMA itself, many scenic lookouts, campgrounds and day use areas or protected areas, scenic and tourist drives and other heritage places. The assessment has considered the landscape and visual impacts of the project in 2033 and 2055 in areas close to WSI (being within 15 km) and the Blue Mountains.

Based on similar topography, vegetation type and cover, land use and built form (existing and emerging), 12 landscape character zones were considered within Western Sydney. Generally, the landscape character of Western Sydney would be transformed by intended changes facilitated and planned for through a number of strategic planning projects. While there would be some landscape character and visual impacts to the areas within 15 km, these would generally be of a moderate or lower impact level. The level of landscape character impact on the Luddenham village and agricultural landscape character zone would increase from moderate in 2033 to high-moderate in 2055 due to the to the proximity of the runway and increase in flights arriving and departing the runway.

Eight viewpoints were also considered within Western Sydney. Viewpoints from the public domain that would experience visual impacts ranging from moderate to high-moderate, include those with elevated vantage points with views to recreational areas (George Maunder Lookout at Prospect Reservoir and Warragamba Dam Lookout) and/or locations in close proximity to the airport (Kemps Creek and Luddenham village).

Three landscape character zones within the Blue Mountains landscape were assessed:

- high-moderate landscape character impact in 2033 and 2055 on the Blue Mountains iconic features landscape character zone
- moderate landscape character impact in 2033 on the Blue Mountains forested hills and valleys landscape character zone, increasing to high-moderate in 2055 due to the increase in flight frequency
- moderate-low landscape character impact in 2033 and 2055 on the Blue Mountains township spine landscape character zone.

While the introduction of multiple high altitude and low frequency flights would result in a low magnitude of change to each of the landscape character zones, the variation in landscape sensitivity influences the resulting level of impact.

Of the 8 views assessed in the Blue Mountains, there would be:

- high-moderate visual impact in views from Walls lookout and Echo Point lookout due to the very high sensitivity of these views and the introduction of flights that would be perceptible moving across these views
- moderate visual impact in views from Burragorang Lookout, The Rock Lookout, Wynnes Rocks Lookout and Clearys Memorial Lookout, with the visual impact from Burragorang Lookout increasing to high-moderate in 2055 due to the increase in flight frequency at relatively low altitudes
- moderate-low visual impact in the view from the Hawkesbury Lookout. This view has an urban outlook and a moderate sensitivity, allowing it to absorb the aircraft activity with less of an impact.

From campgrounds and day-use areas within the Blue Mountains there would be a moderate visual impact in 2033 and 2055, as views of aircraft overhead would not be highly visible. If seen overhead, however, they would detract from the amenity of views.

There would be a moderate-low visual impact experienced in the views from scenic routes within the Blue Mountains, including the Great Western Highway and Bells Line of Road, during 2033 and 2055. These impacts would be intermittent and experienced particularly in locations where the flights pass over and across these views.

The project would not directly alter any natural landscape feature on the ground. However, the contribution of the sky to landscape character and its appreciation in views make the sky, in some locations, a landscape feature. This includes locations in the Blue Mountains and also where the naturalness of the sky contributes to landscape character. There is a real chance or possibility that the project would substantially alter the appreciation of the sky in views from the following viewpoints:

- south of Katoomba (represented in this assessment by the view from Echo Point)
- from lookouts along the Grose Valley (represented by the assessment of the view from Walls Lookout).

This alteration would be intermittent, would not be permanent and is reversible.

The design of the flight paths has aimed to minimise landscape and amenity impacts, to the maximum extent practical while still achieving safe and efficient operations. Based on the nature of the potential impacts, no reasonable or feasible project specific mitigations are considered to be available that would reduce the potential landscape and visual impacts from the project.

### 25.2.3.6 Biodiversity

There are a wide variety of habitats that support biodiversity values in the biodiversity study area, including the GBMA and other large tracts and isolated pockets of native vegetation (predominantly Dry Sclerophyll Forests), wildlife corridors and wetlands. These provide habitat for EPBC Act listed threatened species including 92 fauna species such as the Regent Honeyeater, Swift Parrot and Grey-headed Flying-fox, and 79 migratory species including migratory shorebirds. Fifty-eight wildlife attractants (such as permanent basins, ponds, non-native ecosystems, waste management facilities, Flying-fox camps and Ibis colonies) were identified within a 30 km buffer of the airport runway boundary.

The key potential impacts on biodiversity values and measures to address them are:

- direct impacts from wildlife strike leading to mortality. Impacts associated with wildlife strike are likely to be intermittent during the airports operation but this would not significantly affect the viability of local populations of any species. Flying-foxes are particularly susceptible to wildlife strike. There would be no other direct impacts on biodiversity values
- indirect impacts including potential changes to noise, light, water quality, air quality and ecosystems associated with aircraft overflight:
  - noise can impact behavioural changes and communication interference in wildlife. Most noise related impacts on biodiversity would be concentrated in proximity to the airport (where the highest noise impacts are) and to a lesser degree areas where aircraft are at higher altitudes at distances from the airport. Overall, impacts from noise were assessed as low and unlikely to significantly modify species behaviours or use of habitats that are locally or regionally available
  - light spill and pollution can have adverse impacts on wildlife including behavioural and physiological changes which make them more prone to predation or wildlife strike. The project's operational light would be limited to lights on aircraft as they travel along the flight paths during nocturnal hours. This slight increase in light is unlikely to significantly affect biodiversity
  - emissions from aircraft operating along the flight paths may result in local and regional reductions in air quality. Habitats for wildlife in proximity to WSI are already highly disturbed and likely to be subject to similar emission types associated with urban development and other aircraft. Any alterations to air quality would be temporary, localised and unlikely to impact biodiversity values
  - deposition of aircraft pollutants and subsequent potential impacts on water quality are unlikely and negligible
  - fuel dumping (jettisoning) has the potential to introduce harmful contaminants into the sensitive environments within the study area such as native terrestrial and aquatic ecosystems, if not appropriately managed. Fuel dumping can be carried out safely and without any impacts at ground level when appropriate procedures are followed. Fuel jettisoning would only occur in accordance with the Manual of Air Traffic Services (MATS) – Section 4.2.11 Fuel Dumping (Airservices Australia, 2023).

In addition, the project:

- is unlikely to have a significant impact on Commonwealth heritage places listed under the EPBC Act
- is unlikely to have a significant impact on threatened or migratory species listed under the EPBC Act or on native plants and animals
- would not breach or raise inconsistencies with any of Australia's obligations under the various biodiversity related international agreements to which it is a signatory
- is unlikely to compound impacts on biodiversity associated with the 2019-2020 bushfires.

The project is not likely to have significant impacts (residual or otherwise) on biodiversity. As the project is not likely to have significant impacts, the project is not obligated to provide offsets in accordance with the EPBC Act Offsets Policy.

### 25.2.3.7 Heritage

There are a significant number of items, places and areas within the heritage study area, with around 13,500 Aboriginal heritage sites/places and around 19,000 listed historical sites/areas. For Aboriginal heritage, this is likely to be an underestimate given the lack of systematic survey for sites within protected areas (such as the GBMA). As such, engagement with First Nations knowledge holders and stakeholders has assisted in identifying areas of particular high cultural value. For historic heritage, there are several World Heritage Areas (notably the GBMA), 19 National Heritage items, and numerous State and local heritage items. Of these places, most occur at a distance greater than 10 km from WSI.

The proposed flight paths would fly over a large number of significant sites and places, however in many cases existing flight paths already traverse the airspace above these sites and places. Many types of heritage places are also considered robust in the face of impacts such as air pollution, noise and visual impacts. In most cases aircraft would be at such a distance as to render the impact from these factors as minimal. However, the places closest to WSI are likely to experience higher impacts.

There is general acknowledgement that air pollution is likely to be detrimental to sandstone heritage buildings and Aboriginal rock art, however there has been little direct research on sites within or close to Sydney. It is impossible to evaluate the risk presented by these processes, or indeed to identify and quantify any resulting damage due to a lack of previous research and comparative data, as well as the difficulty in differentiating aircraft emission derived deterioration from other anthropogenic pollution sources via the same processes (such as acidity, nutrients and dust). However, there remains a potential impact that increased emissions to these environments may potentially result in some impact, though the likelihood of this is considered to be generally minimal.

The project would not physically impact or restrict use of an Aboriginal heritage site or place. However, it is acknowledged that noise and visual intrusion can impact cultural values. In particular, noise does have the potential to disrupt cultural practices at site, which could lead to its use being discontinued. Aircraft on WSI flight paths would also be detrimental to sites connected to the Emu in the Sky constellation at Faulconbridge and Emu Cave Aboriginal Place.

Due to the position of flight paths, frequency of overflight and the predicted noise levels, the project would significantly impact the Aboriginal cultural values of Bents Basin and the Shaws Creek – Yellomundee Aboriginal Place, which are places of cultural importance with values associated with peace, tranquillity and connection to nature. Impacts to other key sites of cultural significance identified through engagement would have low to moderate impacts due to noise and/or visual intrusion.

Mitigation measures have been developed that require the DITRDCA to ensure that the detailed design of flight paths considers Aboriginal places and sites of high cultural value, where safe and feasible. There is the likelihood that many other Aboriginal sites are located in protected valleys within the GBMA that are overflowed by WSI aircraft. Due to the complexity of terrain height and orientation of rock shelters in the rugged sandstone country, it is not possible to predict to what extent this will be an issue for many of the unknown sites.

Many historic properties are located in town centres. The flight path design principles seek to avoid population centres and have worked to protect such places from significant impacts, although in some cases aircraft may still be visible in the distance or would be heard. It is inevitable that some properties would suffer some impact from noise given that in many cases to the west and south-west of WSI the properties are located in rural contexts. This includes Mulgoa, an historical rural village with several State significant heritage properties (Fern Hill Estate and St Thomas' Church). Given the aircraft altitude and aircraft noise, impacts to Fern Hill and other heritage places at Mulgoa would be subject to moderate impacts given changes to the rural setting of these item.

Outside the GBMA, there is no discernible impact on the cultural values of nationally listed places. Of the 89 places on the Commonwealth Heritage list, only 2 are within close proximity to WSI and/or are likely to be adversely impacted by the flight paths; Orchard Hills Cumberland Plain Woodland, and Shale Woodland Llandilo.

At greater distances from WSI, noise and visibility of aircraft begins to diminish, and emissions are likely to disperse and be less concentrated. However, some cultural values remain sensitive to additional aircraft noise, while the frequency of flights can exacerbate this. This applies to the GBMA and many heritage places within it that are valued for their serenity and their ability to connect people to the spirituality of nature.

### 25.2.3.8 Social

This Social Impact Assessment has been prepared to understand the social changes resulting from the project and has addressed the social impacts of the project in 2033 and 2055. The assessment has been based on the NSW Department of Planning and Environment's (DPE) *Social Impact Assessment Guideline for State Significant Projects 2023* and considers the actual and perceived impacts of the project. The assessment has been informed by community engagement.

The actual or perceived impacts of the project on a broad range of potential social and community issues, including changes to community composition, inequality and vulnerability, way of life, Indigenous and non-Indigenous culture, health and wellbeing, livelihoods and decision-making systems has been assessed.

Operations at WSI and the associated airspace in the Sydney Basin would sit within a well-established regulatory and management framework. Mitigation measures outlined in this Draft EIS, and the existing planning controls (specific to WSI) will reduce the significance of the potential social impacts identified from a High significance rating to Medium or Low.

Following implementation of the flight paths, only one social impact is anticipated to remain with a High significance rating, being a potential increase of inequality for vulnerable groups located in areas within ANEC 20, N60 and N70 contours for both the 2033 and 2055 scenarios.

To further manage social impacts associated with the project, the WSI Community Aviation Consultative Group (CACG) will undertake consultation with stakeholders and community, including social organisations, to seek feedback on social issues and to promote social and economic welfare of the community.

### 25.2.3.9 Economic

Demand for aviation services is predicted to continue to increase to service Sydney's ongoing growth in population and business activities. Any shortage in capacity to meet the rising demand will affect future economic growth, productivity, employment, lifestyle and amenity of the Sydney region. The project is an integral part of WSI, ensuring that the benefits of the airport are realised. These benefits will grow commensurate with the forecast increase in passenger demand over time.

Overall, WSI (and the associated flight paths that allow for its operation) will be a major catalyst for investment and jobs growth in the Western Sydney region and will deliver benefits to the Australian economy more broadly. WSI will provide direct connections across the world, allowing for opportunities to enhance Western Sydney's connection to other parts of the world economy. The operation of WSI will also allow for improved access to tourism opportunities, providing better accessibility to destinations across Western Sydney and the Greater Blue Mountains. New or upgraded transport infrastructure that would be built to service the airport would also provide benefit to local communities.

It is estimated that the airport itself will generate a significant number of jobs for Western Sydney and contribute significantly to gross regional product. Ernst and Young (2016) concluded as part of the 2016 EIS that airport operations would directly generate around 8,730 jobs in 2031 increasing to 61,500 jobs by 2063. It is noted that these jobs would be generated by the airport itself and not specifically generated by the flight paths, however the project is an essential part of the overall operation of WSI.

The project, in conjunction with the broader development of WSI, has the potential to affect the tourism industry both positively (through increased tourist access) and adversely (if it results in loss of amenity at sensitive land uses). For example, the closer proximity and ready access to an international airport to the Greater Blue Mountains is expected to provide a boost to this industry. However, flight paths have the potential to negatively affect the amenity of tourist experiences in the area, either through the visual location of aircraft or the noise they will generate. The increased access to key tourist destinations, in particular for tourists visiting areas such as the Greater Blue Mountains, is considered to outweigh the potential adverse amenity impact of the flight paths.

WSI and the proposed flight paths would impact the use of the airspace. Currently the area is used by Bankstown and Camden airports for flying training, emergency services and other operations. As a result of the facilitated changes required to accommodate WSI, greater distances would need to be travelled to reach new flying training areas resulting in increased 'transit' flight durations, extended training schedules and increased costs including increased flying training times and increased fuel and maintenance costs. The cost of this was estimated at around \$15 million in 2026 increasing at a rate of around one per cent per annum.

Operation of the project may result in potential loss in property values for residential properties that may be more adversely impacted by the operation of the flightpaths. Total impact has been estimated at around \$53 million loss in total residential values in 2033, increasing to a cumulative value of around \$147 million by 2055 (measured in 2022 dollars). While the impact appears high it is important to realise that residential values in Western Sydney have increased considerably over the past 10 years. Dwellings within the N70 contour (and outside the ANEC 20) are expected to have a low level of impact resulting in a loss in residential values of 3 per cent average. In all likelihood this loss would be 'made good' by 6 months growth in real capital gain.

Project-specific mitigations have been identified, including continuing consultation with aerodrome operators and airspace users during the ongoing airspace design for WSI to consider the impacts to operators at Bankstown and Camden airports. Consultation with emergency services operators regarding priorities of airspace in order to minimise risks and associated economic costs will also continue.

### 25.2.3.10 Human health

The assessment of human health impacts evaluated the potential health impacts to the existing (and future) communities resulting from the project. In considering the potential impacts, the assessment focused on community health impacts resulting from changes in air quality, noise and other hazards and risks associated with the operation of aircraft from WSI.

With respect to the potential for the project to result in changes to air quality, the assessment did not identify any significant risks. Impacts to community health due to exposure to air emissions from the project in areas close to WSI would be low, and in most cases, considered to be negligible. Of the impacts identified, the potential impact to community health would occur as a result of exposure to increases in nitrogen dioxide within areas in the immediate vicinity of WSI. These potential impacts are however considered to be limited and the potential impact on respiratory health issues for the community is considered to be low. It is noted also that the areas where elevated exposures have been identified are anticipated to be rezoned in the future such that residential use would no longer be relevant.

Additionally, emissions to air derived from the operation of aircraft are expected to have a negligible impact on water quality in Prospect Reservoir or rainwater tanks in the community. Potential impacts on these water supplies would be so low they would not be measured. No risks to community health due to air emissions on a regional level were identified.

Aircraft noise from the project has the potential to result in significant increases in sleep disturbance, noise annoyance and to a lesser degree, cognitive impairment for children (assessed in terms of learning delays). These potentially significant impacts would occur at a number of locations located close to the runway, or below the immediate arrivals and departure flight paths. However, not all the locations identified as being potentially significant are used for residences, schools or childcare centres and have been used as an indicator of where issues may arise. Most of the impacts that are considered to be significant are located within the published ANEC 20 contour or the predicted 2055 ANEC contour for the project. Controls are currently in place to prevent future noise sensitive development within these areas, including new residential developments, schools and childcare centres.

DITRDCA and WSA Co will continue to liaise with State and local government agencies to ensure applicable environmental planning instruments have regard to ANEC forecasts produced for the project, where differences occur to the predicted ANEC presented in this Draft EIS.

By 2055 there would be some additional locations, outside of the modelled ANEC 20 contours where impacts on community health may be of significance. Changes in noise as a result of operations between 2033 and 2055 would be expected to be gradual, and hence the significance of the impacts identified may be influenced by community adjustment to the presence of aircraft noise in the environment. These changes, however, may remain of significance to some members of the community.

Existing strategic planning in the vicinity of WSI has considered and incorporated the operational needs of WSI into land use planning. In conjunction with the mitigation measures outlined throughout the Draft EIS the risks to community safety and health are considered low and acceptable.

### 25.2.3.11 Facilitated changes

The preliminary airspace design for WSI was specifically required to avoid any impact on the ability of Sydney (Kingsford Smith) Airport to operate all existing runway modes. There is to be no impact on the Sydney (Kingsford Smith) Airport curfew between 11 pm and 6 am (local time).

Through the preliminary design process, some changes were identified as being required to maintain the safety assurance of flight operations in the Sydney Basin, while also meeting the requirements of efficiency, capacity and environment. These changes are generally minor in nature, but include changes to some of the existing departures and arrivals in use at Sydney (Kingsford Smith) Airport, as well as changes to Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) operations at Bankstown and Camden Airports, RAAF Base Richmond, and changes to lower level transit flights in the Sydney Basin.

Impacts would vary according to the proposed change. Changes involving more significant lateral changes in flight paths or the narrowing of flight paths for Sydney (Kingsford Smith) Airport for jet aircraft would result in changes in the area or population within N60 or N70 contours. In the case of Runway 25 departures (jets) they are infrequent and only used around 4 per cent of the year.

Changes to IFR procedures for Bankstown Airport would likely be used by around 145 movements per day. These areas are already subject to overflight by Bankstown Airport aircraft, however certain areas would be subject to an increase in the frequency and concentration of overflight, particularly arriving aircraft.

Existing flying training areas would be reduced as a result of the WSI airspace, and new possible training areas have been identified. Flying training activity is highly variable and potential overflight noise impacts from this activity cannot be accurately quantified. VFR flight operations would be constrained by WSI and RAAF Base Richmond, both laterally and vertically. VFR flight operations constitute a low number of aircraft and similar aircraft already fly over these predicted areas. However, aircraft would be flying at lower altitudes which would result in higher noise levels and more visible aircraft.

All other changes to over flights associated with flying training would involve low numbers of aircraft daily and would result in minimal changes from a noise or visual perspective.

The introduction of single runway operations at WSI and the adjustments required to Sydney Basin operations to facilitate flight paths and airspace structures will be introduced in 2026 on a scheduled Aeronautical Information Regulation and Control (AIRAC) date prior to the official opening of WSI in 2026. Introduction at this time will allow pilots and air traffic control to update their systems and become familiar with changes to current procedures before WSI commences operations and will minimise the likelihood of conflicts or incidents in the Sydney Basin airspace. Changes to flying training areas would be subject to a separate change proposal.

### 25.2.3.12 Cumulative impacts

Cumulative impacts are a result of incremental, sustained and combined effects of human action and natural variations over time and can be both positive and negative. This assessment considers potential impacts associated with the project in conjunction with other known and proposed developments.

The assessment of cumulative impacts has been undertaken in accordance with the EIS Guidelines and has adopted an approach based on the NSW *Cumulative Impact Assessment Guidelines for State Significant Projects*.

The assessment of cumulative impacts has considered each of the environmental aspects requiring assessment in the EIS Guidelines. In many cases, the quantitative assessment of issues is difficult, due to the large study area, the indirect nature of potential impacts and the lack of sufficient baseline data relative to some impacts.

Cumulative impacts from flight path corridors from both WSI and other airports within the Sydney basin would occur at the location where they cross each other.

A range of cumulative impacts have the potential to occur as a result of the project's location, in proximity to current and future large-scale infrastructure projects, strategic growth areas and economic corridors associated with rapid development in Western Sydney. The cumulative effects of noise impacts from WSI in conjunction with other airspace operations would likely manifest as a greater number of noticeable events over a given period of time. Aircraft operating from WSI concurrently with aircraft from other Sydney Basin airports has the potential to increase overall noise exposure to communities being directly overflown and/or in the vicinity to other existing flight paths.

The cumulative impact of aircraft noise at locations where there are intersecting flight paths is widespread. At these locations, cumulative noise impacts from over flights are likely to be most significant. The application of WSI's flight path design principles along with the necessary separation between flight paths would inherently reduce potential cumulative impacts. Additionally, due to the relatively low number of WSI flight paths relative to existing flight paths, and the existing and proposed complex of flight paths within the Sydney Basin, the cumulative impact of introducing WSI flight path noise is not considered high.

The air quality assessment included consideration of background air quality levels (including emissions from other existing sources in the region) and found all pollutants were below regulatory criteria for 2033, with only minor short term exceedances for nitrogen dioxide in 2055. On a regional level, contributions of ozone as a result of the project make no significant difference to a 'no project' scenario in both 2033 and 2055. The assessment also found that the cumulative greenhouse gas impacts associated with the project and related projects and developments are not considered to be significant.

Potential cumulative impacts on biodiversity related to wildlife strikes could result from the project operating in conjunction with other existing airports in the study area. A prediction of the cumulative impact on biodiversity of wildlife strikes was undertaken by comparing strike rates at other airports but does not account for the site-specific variables at each airport, including the quality of wildlife management programs applied at each airport. The cumulative impact on biodiversity as a result of wildlife strikes by aircraft operating in the Sydney region is considered low.

The assessment of cumulative aircraft related hazards and risks identified that WSI would introduce new elevated crash risks into areas that are currently subject to entirely negligible risk from existing operations. However it would introduce a very small additional crash risk into areas that are currently subject to potential risk from existing operations.

Potential cumulative impacts to landscape character and visual amenity would include changes to landscape character and views in the vicinity of WSI resulting from over flights in conjunction with future large-scale infrastructure projects. There would also be the potential for cumulative effects on the landscape character zones across the Blue Mountains, which are subject to increasing air traffic from both WSI and other airports within the Sydney basin.

Despite the low estimates of the proportional contribution of WSI airspace emissions to the totality of air pollution within the Sydney airshed, there is the potential that increased emission levels could have a negative impact on Aboriginal rock art sites and on some historical buildings over time. However there is currently no comparative data or research to test this possibility. Despite this, it can be expected that additional emissions add to the general impact on heritage items and there is growing evidence that the deterioration will be accelerated by other anthropogenic factors such as climate change.

Positive and negative changes to composition of the community surrounding WSI may occur once the flight paths are operating in conjunction with other developments. Access to transport, social and other infrastructure would have positive cumulative impacts on the social and economic wellbeing of the community. Incremental increases in noise, alterations to air quality and light exposure may result in adverse effects to wellbeing, and changes to the way people enjoy social infrastructure and their own properties.

The implementation of project specific mitigation measures would avoid, to the greatest extent possible, cumulative impacts with surrounding developments and other airspace users and reduce the potential cumulative impacts to acceptable levels.

## 25.3 Mitigating and managing impacts

Each assessment chapter identifies the mitigation measures that have been included in design, are in existing policy or legislation and additional project specific measures that would be undertaken to mitigate impact during the project's operation. These are consolidated in Chapter 24 (Mitigation and management).

The project's Environmental Management Framework consists of:

- relevant legislation that regulates the Australian airspace
- Condition 16 of the Airport Plan and the future airspace design principles set out in 2.2.5 of the Airport Plan and developed as part of the preliminary design phase
- regulatory oversight by the Commonwealth Department of Infrastructure, Transport, Regional Development, Communication and the Arts (DITRDCA)
- Airservices Australia's existing Environmental Management System
- the Draft EIS management measures
- existing policies, procedures and plans developed for Western Sydney Airport.

The effectiveness of the proposed mitigation and management measures will be ensured through:

- further evaluation and refinement of the proposed selected airspace design for implementation based on feedback received from the community and other technical stakeholders such as airlines and industry bodies
- environmental management requirements of the Airports Act, including a system to regulate, and assign accountability for, activities at the airport site that generate or have the potential to generate pollution or excessive noise
- ongoing stakeholder consultation and oversight through relevant community forums as required by the Australian Government at major airports in Australia.

Under the Western Sydney Airport Plan, the Infrastructure Department is required to develop a noise insulation and property acquisition policy in relation to aircraft overflight noise for buildings outside WSI, having regard for the 24-hour nature of operations at the airport. DITRDCA will finalise the noise insulation and property acquisition policy which details the eligibility requirements for inclusion in the program. This policy will apply to eligible properties that are significantly impacted by aircraft overflight noise from WSI.

Taken together, these mechanisms will ensure that mitigation and management measures proposed are effective and achieve the intended outcomes. The application of comprehensive mitigation and management measures and continuous improvement through review of the performance of environmental controls would be implemented (refer Chapter 24 (Mitigation and management)).

## 25.4 Objects of the EPBC Act

The environmental assessment of the proposed airport development has been conducted having regard to the objectives of the EPBC Act, which provide a policy framework within which the project can be considered. Table 25.1 evaluates the compliance of the project against each of these objects.

**Table 25.1 Compliance of the project against objects of EPBC Act**

Objects	Evaluation
<p>To provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance.</p>	<p>This EIS assesses the likely impacts of the project and provides mitigation measures for protection of the environment. The EIS specifically assesses potential impacts on, matters of national environmental significance, including listed species and ecological communities and the GBMA, and National Heritage Place (refer Chapter 23 (Matters of National Environmental Significance)). It also considers the impacts on the general environment from the operation of the project (refer to Section 25.2.3).</p> <p>The planning phase of the airspace and flight design process considered environmental and social constraints including the GBMA (refer to Chapter 6 (Project development and alternatives)).</p>
<p>To promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources.</p>	<p>Ecologically sustainable development is considered in Section 25.5.</p>
<p>To promote the conservation of biodiversity.</p>	<p>The potential impacts of the project on biodiversity are assessed in detail in Chapter 16 (Biodiversity) and protection measures to avoid, mitigate and offset potential impacts on biodiversity have been developed (see Chapter 24 (Mitigation and management)).</p>
<p>To promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples.</p>	<p>The airspace and flight path design process has involved consultation with key stakeholders including Forum on Western Sydney Airport, and community and First Nations knowledge holders have been engaged with during the preparation of the Draft EIS.</p> <p>Consultation with key stakeholders and the community will continue alongside and following the exhibition of the Draft EIS and will inform the finalisation of the detailed flight paths (refer Chapter 9 (Community and stakeholder engagement)).</p>
<p>To assist in the co-operative implementation of Australia's international environmental responsibilities.</p>	<p>The airspace and flight path design process included consideration of approaches to minimise impacts on areas. The planning phase of the airspace and flight design process considered environmental and social constraints including consideration of the potential impacts to the GBMA and Australia's obligations under the World Heritage Convention to protect this World Heritage Property, its Outstanding Universal Values and its integrity).</p> <p>The preparation of this Draft EIS (and the supporting technical paper addressing potential impacts on the GBMA, is considered to be consistent with the guidance on integrating natural World Heritage sites into environmental assessments as outlined in the <i>Guidance and Toolkit for impact assessments in a World Heritage Context</i> (UNESCO, 2022a) and the preceding IUCN Advice Note (IUCN, 2013) (which is a requirement of the EIS Guidelines).</p> <p>The project has adopted the ICAO Balanced Approach to Aircraft Noise Management for the safety of international civil aviation. This includes minimising the adverse environmental effects of civil aviation activities, including aircraft noise.</p>

Objects	Evaluation
To recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity.	Extensive consultation with First Nations peoples has occurred in relation to the protection and management of the environment (refer Chapter 9 (Community and stakeholder engagement)).
To promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.	Extensive consultation with First Nations peoples has occurred in relation to the protection and management of the environment (refer Chapter 9 (Community and stakeholder engagement)).

## 25.5 Principles of ecologically sustainable development

The promotion of Ecological Sustainable Development (ESD) through the conservation and ecologically sustainable use of natural resources is an object under section 3 of the EPBC Act. Section 3A of the EPBC Act defines the principles of ecologically sustainable development. A discussion on the project's compliance with the principles of ecologically sustainable development against section 3A is provided in the Table 25.2.

**Table 25.2 Evaluation of the project against ESD principles**

Principle	Evaluation
Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.	<p>The development of the project as part of WSI would be consistent with the objective of effectively integrating both long-term and short-term economic, environmental, social and equitable considerations in decision making. This Draft EIS has considered the environmental impacts and issues of the preliminary airspace and flight path design associated with Stage 1 Development.</p> <p>The proposed airport would provide both short and long-term benefits in terms of job creation and provision of accessibility to aviation services. The airport would also address the long-term aviation capacity requirements of the Sydney region.</p>
If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.	<p>The precautionary principle states that if there are threats of serious environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In applying the principle, decisions should be guided by careful evaluation to avoid, wherever practicable, serious damage to the environment, including an assessment of the risks associated with various options.</p> <p>The planning phase of the airspace and flight design process considered environmental and social constraints including the GBMA (refer to Chapter 6 (Project development and alternatives)) and this EIS implemented a compliance, risk, and/or significance-based approach to impact assessment (refer Chapter 10 (Approach to impact assessment)).</p> <p>The assessments of the potential impacts of the project are consistent with the precautionary principle. The assessments undertaken are consistent with accepted scientific and assessment methodologies and have considered relevant statutory and agency requirements. The assessments have applied a conservative approach with regard to any the modelling used. Lack of full scientific certainty has not been used as a reason to postpone or avoid identification and adoption of design or management measures to avoid or minimise environmental degradation.</p> <p>This Draft EIS higher risk aspects are to be managed through avoidance or suitable mitigation strategies as outlined in Section 25.2.3.</p>

Principle	Evaluation
<p>The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.</p>	<p>The principle of intergenerational equity states that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. The project would support the operation of proposed airport which would be consistent with the principle of intergenerational equity. Given the project development and alternatives considered (refer to Chapter 6 (Project development and alternatives)) and the proposed management framework (refer Chapter 24 (Mitigation and management)), the implementation of the project as part of WSI, would ensure there would be no significant impact that would diminish the health, diversity or productivity of the environment for future generations.</p> <p>The incremental nature of the long-term development of the airport would provide opportunities for intergenerational equity and decision making that takes full advantage of changing conditions and technologies. The project, as part of WSI, would also provide a broad range of economic benefits which would continue to increase with time.</p>
<p>The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.</p>	<p>The conservation of biological diversity and ecological integrity should be a fundamental consideration of any development proposal. The project would support the operation of proposed airport which would be consistent with this principle. Where feasible, the project, as part of WSI, has minimised impacts on sensitive ecological areas during design. Mitigation measures include those relating to minimising the risk of wildlife strike.</p>
<p>Improved valuation, pricing and incentive mechanisms should be promoted.</p>	<p>The principle of improved valuation states that environmental factors should be considered in the valuation of assets and services. The principle is implicit in such concepts as ‘polluter pays’, lifecycle costing, and triple bottom line accounting.</p> <p>The assessment has identified the environmental and other consequences of the project, and identified mitigation measures, where appropriate, to manage potential impacts. If approved, the project would be implemented in accordance with relevant legislation and the proposed management framework.</p> <p>These requirements would result in an economic cost to the proponent. The implementation of mitigation measures would increase both the capital and operating costs of the project; this signifies that environmental resources have been included in the valuation of assets and services in the design and assessment of the proposal.</p> <p>The value of environmental resources is also inherently considered in the development of a design that has avoided and minimised impacts where possible (acknowledging the project must meet civil aviation safety regulatory standards and other international rules and regulations).</p> <p>Costing of proposed mitigation measures will be considered by DITRDCA and the Australian Government as part of its overall funding for WSI, including operation of flight paths and the construction and operation of WSI Stage 1. The cost of mitigation measures are included in the total estimated project costs.</p> <p>The costing of mitigation measures will have particular regard to the key mitigations outlined in this Draft EIS including, but not limited to, the implementation of the final noise insulation and property acquisition policy in relation to aircraft overflight noise for buildings outside the Airport site. The detailed cost associated with the noise insulation and property acquisition policy will be provided on finalised.</p>

## 25.6 Concluding statement

This Draft EIS has been prepared to address the requirements of Condition 16 of the Airport Plan and support the request to the Australian Minister for the Environment and Water for advice in accordance with Section 160 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Advice from the Minister is required prior to any approval of the airspace and flight paths.

The project has been developed by an Expert Steering Group led by the Australian Government DITRDCA, including Defence, ASA, and CASA and is an integral part of WSI, ensuring that the benefits of the airport are realised.

The project will achieve the overall objectives for WSI by enabling single runway operations to commence through the introduction of new flight paths and a new controlled airspace volume. The preliminary airspace and flight paths have been designed to minimise community impacts as much as possible through the incorporation of flight path design principles intended to avoid, manage or otherwise minimise the unavoidable residual impacts, including aircraft noise.

WSI would be a major catalyst for investment and jobs growth in the Western Sydney region and would deliver benefits to the Australian economy more broadly.

WSI would provide direct connections to the world, allowing opportunities for residents and the community to enhance Western Sydney's connection to world economies. Tourism is also expected to be boosted, with WSI providing improved accessibility to destinations across Western Sydney and the Blue Mountains. New or upgraded transport infrastructure that would be built to service the airport would also provide benefit to local communities.

Extensive stakeholder and community consultation and engagement has been carried out as part of the Draft EIS, including dedicated engagement to support the release of the Aircraft Noise Tool. This included engagement with First Nations representatives and communities within the surrounding Local Government Areas. Feedback received throughout the engagement process will be used to inform the detailed design process and incorporated into the final EIS.

The Draft EIS found that impacts associated with the operation of the WSI flightpaths would have adverse impacts in relation to aircraft noise. Noise will result in changes in amenity and impacts on Aboriginal Places and sites of high cultural value.

A suite of mitigation measures has been developed to further minimise and mitigate operational impacts, where safe and feasible. There are a range of operational measures that will mitigate the impacts of aircraft noise. Also, there are land use planning controls in place to safeguard the operations of WSI while protecting future communities from aircraft noise. A NIPA policy has been established to ameliorate residual noise impacts where applicable.

While mitigation measures would serve to minimise impacts, residual impacts would remain for communities subject to high levels of aircraft noise and/or the visual presence of aircraft (and the associated amenity impacts) given these are an unavoidable consequence of aircraft operations.

The residual impacts of the project need to be considered within the context of the overall objectives of the project and the significant benefits WSI would provide over the short to longer term and particularly for future generations. The consequences of not proceeding with the ongoing design development would compromise the success of WSI.

The project has been evaluated as consistent with the objects of the EPBC Act and principles of ecological sustainable development defined under the EPBC Act. DITRDCA, Airservices Australia and WSA Co are committed to managing the potential impacts to the environment through commitments to mitigation measures to further reduce remaining residual impacts. Future design phases would continue to ensure a rigorous approach to the finalisation and implementation of the airspace and flight path design.

## Chapter 26 References

- ABS (Australian Bureau of Statistics) (2022) *Population and dwelling counts from 2021 Census*.
- ACECQA (Australian Children's Education and Care Quality Authority) (2023) *Service search*, [https://www.acecqa.gov.au/resources/national-registers/services?s=Orchards+hill&field\\_service\\_id=](https://www.acecqa.gov.au/resources/national-registers/services?s=Orchards+hill&field_service_id=), accessed 31 July 2023.
- Airservices Australia (1996) *Long Term Operating Plan for Sydney (Kingsford Smith) Airport and Associated Airspace*, <https://sacf.infrastructure.gov.au/sites/default/files/documents/ltop.pdf>, accessed 30 August 2022.
- Airservices Australia (2015) *Preliminary Airspace Management Analysis*, <https://www.westernsydneyairport.gov.au/sites/default/files/airservices-australia-wsa-preliminary-airspace-management-analysis.pdf>, accessed 30 August 2022.
- Airservices Australia (2022a) *Aeronautical Information Publication Australia Book*, <https://www.airservicesaustralia.com/aip/aip.asp?pg=20&vdate=15JUN2023&ver=1>, accessed 30 August 2022.
- Airservices Australia (2022b) *Environmental Management of Changes to Aircraft Operations standard (NOS) – AA-NOS-ENV2.100*, version 18, effective 1 July 2022.
- Airservices Australia (2023) *Manual of Air Traffic Services, Electronic Edition Version 64.3*, <https://www.airservicesaustralia.com/mats/docs/nos-saf-2000.pdf>, accessed 2 August 2023.
- ATSB (Australian Transport Safety Bureau) (2019) *Australian Aviation Wildlife Strike Statistics 2008-2017*, ATSB Transport Safety Report AR-2018-035, final – 13 March 2019.
- Australia ICOMOS (International Council on Monuments and Sites) (2013) *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance 2013*, Deakin Victoria.
- Australian Heritage Commission (2002) *Ask First: a guide to respecting Indigenous heritage places and values*, The Australian Heritage Commission, Canberra.
- Australian Institute of Landscape Architects Queensland (2018) *The Guidance Note for Landscape and Visual Assessment*, [https://www.aila.org.au/common/Uploaded%20files/\\_AILA/Submission%20Library/QLD/RLG\\_GNLVA\\_V3.pdf](https://www.aila.org.au/common/Uploaded%20files/_AILA/Submission%20Library/QLD/RLG_GNLVA_V3.pdf), accessed 17 August 2022.
- Bankstown Airport Limited (2019) *Bankstown Airport Master Plan*, Sydney Metro Airports.
- BITRE (Bureau of Infrastructure, Transport and Regional Economics) (2022) *Airport Traffic Data*, [https://www.bitre.gov.au/publications/ongoing/airport\\_traffic\\_data](https://www.bitre.gov.au/publications/ongoing/airport_traffic_data), accessed 19 August 2022.
- Blackwell B, Devault T and Seamans T (2015) 'Understanding and Mitigating the Negative Effects of Road Lighting on Ecosystems', *Handbook of Road Ecology*, 143–150.
- Blue Mountains City Council (2020) *Blue Mountains 2040: Living Sustainably, Local Strategic Planning Statement*, <https://www.bmcc.nsw.gov.au/local-strategic-planning-statement>, accessed on 16 August 2022.
- Blue Mountains City Council (2021) *Tourism Industry Profile 2021*, <https://www.bmcc.nsw.gov.au/sites/default/files/docs/Blue%20Mountains%20Remplan%20Tourism%20Profile%202021.PDF>, accessed 20 April 2023.
- Bramwell D (2007) 'The response of botanic gardens to climate change', *BGjournal*, 4(2):3–8.
- Bureau of Meteorology (2015) *Western Sydney Airport Usability Report*, April 2015.
- Burgers M and Walsh S (2002) *Exposure Assessment and Risk Characterisation for the Development of a PM2.5 Standard*.
- Busnel R and Fletcher J (1978) 'Effects of noise on wildlife', *Academic Press*.

Camden Airport Limited (2021) *Camden Airport Master Plan 2020*, Sydney Metro Airports.

CASA (Civil Aviation Safety Authority) (2014) *Safety Risk Management SMS 3*, 2<sup>nd</sup> Edition.

Catterall C, Green R and Jones D (1991) *Habitat use by birds across a forest-suburb interface in Brisbane: Implications for corridors*, Chipping Norton, Surrey Beatty and Sons.

Coffey (2014) *Draft Environmental Impact Statement for Flying Operations of the F-35A Lightning II RAAF Base Williamstown and Salt Ash Air Weapons Range*.

Commonwealth of Australia (2013a) *Matters of National Environmental Significance, Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*,

<https://www.dcceew.gov.au/environment/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance>, accessed on 16 August 2022.

Commonwealth of Australia (2013b) *Actions on, or impacting upon Commonwealth land, and actions by Commonwealth agencies, Significant impact guidelines 1.2 Environment Protection and Biodiversity Conservation Act 1999*,

<https://www.dcceew.gov.au/environment/epbc/publications/significant-impact-guidelines-12-actions-or-impacting-upon-commonwealth-land-and-actions>, accessed on 16 August 2022.

Commonwealth of Australia (2015a) *Wildlife Conservation Plan for Migratory Shorebird*.

Commonwealth of Australia (2015b) *Australian Heritage Strategy*.

Cope M, Lee S, Physick B, Abbs D, Nguyen K and McGregor J (2008) 'A Methodology for Determining the Impact of Climate Change on Ozone Levels in an Urban Area', *CSIRO*, November 2008.

DAWE (Department of Agriculture, Water and the Environment) (2020) *State Party Report on the state of conservation of the Greater Blue Mountains Area (Australia)*.

DAWE (Department of Agriculture Water and the Environment) (2021) *Directory of Important Wetlands in Australia*, <https://www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands>, accessed 21 October 2022.

DAWE (Department of Agriculture Water and the Environment) (2022) *Potential cumulative impacts of mining on the Outstanding Universal Value of the Greater Blue Mountains Area*, <https://www.dcceew.gov.au/parks-heritage/heritage/publications/potential-cumulative-impacts-mining-ouv-greater-blue-mountains-area>, accessed 13 December 2022.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022a) *Protected Matters Search Tool*, <https://www.awe.gov.au/environment/epbc/protected-matters-search-tool>, accessed 1 May 2023.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022b) *National Flying-fox monitoring viewer*, <https://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf>, accessed 21 October 2022.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022c) *Australian National Greenhouse Accounts Factors*, <https://www.dcceew.gov.au/climate-change/publications/national-greenhouse-accounts-factors>, accessed 9 May 2023.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022d) *World Heritage places - Greater Blue Mountains Area*, <https://www.dcceew.gov.au/parks-heritage/heritage/places/world/blue-mountains#outstanding-universal-value>, accessed 13 December 2022.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022e) *Greater Blue Mountains Area - Additional heritage values and areas National Heritage Assessment*, <https://www.dcceew.gov.au/parks-heritage/heritage/places/world/blue-mountains/additional-values-areas>, accessed 22 December 2022.

- DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022f) *Greater Blue Mountains and World Heritage Area*, <https://www.dcceew.gov.au/environment/biodiversity/bushfire-recovery/regional-delivery-program/greater-blue-mountains#:~:text=Impacts%20of%20the%202019%E2%80%9320,high%20or%20very%20%20high%20severity>, accessed 20 April 2023.
- DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2023) *Australian Heritage Database*, <http://www.environment.gov.au/cgi-bin/ahdb/search.pl>, accessed June 2023.
- DEE (2020) *National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds*, Queensland Department of Environment and Energy.
- Delaney D, Grub T, Beier P, Pater L and Reiser M (1999) 'Effects of Helicopter Noise on Mexican Spotted Owls', *The Journal of Wildlife Management*, 63(1):60-76.
- Department of Infrastructure and Regional Development (2016) *Western Sydney Airport – Environmental Impact Statement*, <https://www.westernsydneyairport.gov.au/media-resources/resources/environmental-assessment#eis-2016>, accessed 29 August 2022.
- Department of Infrastructure and Transport (2012) *2012 Joint Study on Aviation Capacity in the Sydney Region*, [https://www.westernsydneyairport.gov.au/sites/default/files/sydney\\_aviation\\_capacity.pdf](https://www.westernsydneyairport.gov.au/sites/default/files/sydney_aviation_capacity.pdf), accessed 29 August 2022.
- Department of Sustainability, Environment, Water, Population and Communities (2012) *EPBC Act Environmental Offsets Policy*.
- Department of the Environment (2015) *Referral guideline for management actions in grey-headed and spectacled flying-fox camps - EPBC Act Policy Statement*.
- Department of Transport and Regional Services (2000) *Expanding Ways to Describe and Assess Aircraft noise*, March 2000.
- Destination NSW (2022) *Blue Mountains Visitor Profile – Year ended September 2022*, <https://www.destinationnsw.com.au/wp-content/uploads/2023/01/travel-to-blue-mountains-ye-sep-2022.pdf>, accessed 15 March 2023.
- DITRDC (Department of Infrastructure, Transport, Regional Development and Communications) (2021) *Western Sydney Airport – Airport Plan September 2021*, <https://www.westernsydneyairport.gov.au/sites/default/files/documents/wsa-plan-2021.pdf>, accessed 24 August 2022.
- DITRDCA (Department of Infrastructure, Transport, Regional Development, Communications and the Arts) (n.d.) *Why Another Airport?*, <https://www.westernsydneyairport.gov.au/about/why-another-airport>, accessed 17 August 2022.
- DITRDCA (Department of Infrastructure, Transport, Regional Development, Communications and the Arts) (2012) *National Airports Safeguarding Framework Principles and Guidelines*, <https://www.infrastructure.gov.au/infrastructure-transport-vehicles/aviation/aviation-safety/aviation-environmental-issues/national-airports-safeguarding-framework/national-airports-safeguarding-framework-principles-and-guidelines>, accessed 17 August 2022.
- DITRDCA (Department of Infrastructure, Transport, Regional Development, Communications and the Arts) (2022) *Australia's State Action Plan – International Civil Aviation Organization (ICAO) Assembly Resolution A37-19 on Climate Change*, October 2022.
- Dolbeer R (2011) 'Increasing Trend of Damaging Bird Strikes with Aircraft Outside the Airport Boundary: Implications for Mitigation Measures', *Human-Wildlife Interactions*, 5(2):235-248.
- Duquette C, Loss S and Hovick T (2021) 'A meta-analysis of the influence of anthropogenic noise on terrestrial wildlife communication strategies', *Journal of Applied Ecology*, 58(6):1112-1121.
- Ecosure (2021) *A review of noise, light and dust impacts on grey-headed flying fox camps. Queensland*, prepared for the Department of Agriculture, Water and the Environment.

EEA (2020) *Environmental noise in Europe*, European Environment Agency, Luxembourg, <https://www.eea.europa.eu/publications/environmental-noise-in-europe>.

Environmental Health Committee (2012) *Environmental Health Risk Assessment, Guidelines for assessing human health risks from environmental hazards*, Commonwealth of Australia, Canberra.

Environmental Health Committee (2017) *Health Impact Assessment Guidelines*, enHealth.

Environmental Health Committee (2018) *The health effects of environmental noise*, Commonwealth Department of Health, Canberra.

Ernst and Young (2016) *Western Sydney Airport EIS – Economic Analysis, Appendix P3*, Department of Infrastructure and Regional Development 2016 Western Sydney Airport Environmental Impact Statement, Volume 4, Commonwealth of Australia.

Ernst and Young (2017) *Western Sydney Airport Market Analysis, Department of Infrastructure and Regional Development, Western Sydney Unit*, [https://www.westernsydneyairport.gov.au/sites/default/files/WSA\\_Labour\\_Market\\_Analysis.pdf](https://www.westernsydneyairport.gov.au/sites/default/files/WSA_Labour_Market_Analysis.pdf), accessed 29 August 2022.

Federal Airports Corporation (Australia) (1990) *Proposed third runway Sydney (Kingsford Smith) Airport: draft environmental impact statement*, prepared for Federal Airports Corporation by Kinhill Engineers.

Federal Aviation Administration (2017) *Instrument Procedures Handbook*, [faa.gov/sites/faa.gov/files/regulations\\_policies/handbooks\\_manuals/aviation/instrument\\_procedures\\_handbook/FAA-H-8083-16B.pdf](https://www.faa.gov/sites/faa.gov/files/regulations_policies/handbooks_manuals/aviation/instrument_procedures_handbook/FAA-H-8083-16B.pdf), accessed 15 August 2022.

GHD (2022) *Orchard Hills Offset Area Offset Plan*, prepared for Department of Defence.

Giesen M, Ung A, Warke P, Christgen B, Mazel A and Graham D (2014) 'Condition assessment and preservation of open-air rock art panels during environmental change', *Journal of Cultural Heritage*, 15(1):49-56.

Greater Sydney Commission (2018a) *Our Greater Sydney 2056 Western City District Plan – connecting communities March 2018 updated*, <https://greatercities.au/western-city-district-plan/introduction>, accessed 17 August 2022.

Greater Sydney Commission (2018b) *Greater Sydney Region Plan*, <https://greatercities.au/metropolis-of-three-cities/introduction>, accessed 17 August 2022.

Harris P, Harris-Roxas B, Harris E and Kemp L (2007) *Health Impact Assessment: A Practical Guide*, Centre for Health Equity Training, Research and Evaluation (CHETRE), part of the UNSW Research Centre for Primary Health Care and Equity, University of New South Wales.

IAP2 Australasia (International Association for Public Participation) (2019) *Core Values*, <https://iap2.org.au/about-us/about-iap2-australasia/core-values/>, accessed 17 August 2022.

ICAO (International Civil Aviation Organization) (n.d.) *Aircraft Noise – Balanced Approach to Aircraft Noise Management*, <https://www.icao.int/environmental-protection/pages/noise.aspx>, accessed 9 March 2023.

ICAO (International Civil Aviation Organization) (2010) *Guidance on the Balanced Approach to Aircraft Noise Management*, 2<sup>nd</sup> edition, October 2010.

ICAO (International Civil Aviation Organization) (2017) *Annex 16: Environmental Protection - Volume I Aircraft Noise*, 8<sup>th</sup> Edition, July 2017.

ICAO (International Civil Aviation Organization) (2018) *Safety Management Manual*, 4<sup>th</sup> edition, doc 9859 AN/474.

.id Consulting Pty Ltd (2022) *City of Canterbury Bankstown Economic Profile*, <https://economy.id.com.au/canterbury-bankstown>, economy.id.

Infrastructure NSW (2022) *Staying Ahead: State Infrastructure Strategy 2022-2042*, May 2022.

Inkpen R (2004) *Atmospheric Pollution, Climate Change and Historic Buildings*, Building Conservation Directory, Cathedral Communications Ltd.

IUCN (International Union for Conservation of Nature) (2013) *IUCN World Heritage Advice Note: Environmental Assessment & World Heritage*, [https://www.icrom.org/sites/default/files/2018-07/iucn\\_world\\_heritage\\_advice\\_note\\_environmental\\_assessment\\_world\\_heritage.pdf](https://www.icrom.org/sites/default/files/2018-07/iucn_world_heritage_advice_note_environmental_assessment_world_heritage.pdf), accessed 13 December 2022.

IUCN (International Union for Conservation of Nature) (2022) *IUNC Members list*, [https://www.iucn.org/our-union/members/iucn-members?mbr\\_cgry=All&rgn=1095&stat=1420](https://www.iucn.org/our-union/members/iucn-members?mbr_cgry=All&rgn=1095&stat=1420), accessed 13 December 2022.

JLL (2016) *Western Sydney Airport EIS – Property Values, Appendix P2*, Department of Infrastructure and Regional Development 2016 Western Sydney Airport Environmental Impact Statement, Volume 4, Commonwealth of Australia.

JLW Advisory (1997) *Property Values: Technical Paper 4, Proposal for a Second Sydney Airport at Badgerys Creek or Holsworthy Military Area*.

Keith D (2004) *Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT*, published by NSW Department of Environment and Conservation.

Landscape Institute and Institute of Environmental Management & Assessment (2013) *The Guidelines for Landscape and Visual Impact Assessment*, 3<sup>rd</sup> Edition.

Liverpool City Council (2008) *Liverpool Local Environmental Plan 2008*, <https://www.liverpool.nsw.gov.au/development/liverpools-planning-controls/liverpool-local-environment-plan>, accessed 16 August 2022.

LMIP (Labour Market Information Portal) (2022) *Small Area Labour Markets (SALM)*, <https://www.jobsandskills.gov.au/work/small-area-labour-markets>, accessed 20 April 2023.

Marszałek M, Alexandrowicz Z and Rzepa G (2014) 'Composition of weathering crusts on sandstones from natural outcrops and architectural elements in an urban environment', *Environmental Science and Pollution Research*, 21(24):14023-14036.

Masiol M and Harrison R (2014) 'Aircraft engine exhaust emissions and other airport-related contributions to ambient air pollution: A review', *Atmospheric Environment*, 95:409-455.

Mato R and Mufuruki T (1999) 'Noise pollution associated with the operation of the Dar es Salaam International Airport', *Transportation Research Part D: Transport and Environment*, 4(2):81-89.

Miedema H and Vos H (2004) 'Noise annoyance from stationary sources: Relationships with exposure metric DENL and their confidence intervals', *Journal of the Acoustic Society of America*, 116:334–343.

NBMLHD (Nepean Blue Mountains Local Health District) (2013) *Health Profile: Nepean Blue Mountains Region*, [https://www.nbmphn.com.au/Resources/About/043\\_1115-Regional-health-profile-final-weba](https://www.nbmphn.com.au/Resources/About/043_1115-Regional-health-profile-final-weba), accessed 20 April 2023.

NEPC (National Environment Protection Council) (2003) *National Environmental Protection (Air Toxics) Measure, Impact Statement for the National Environment Protection (Air Toxics) Measure*, May 2003.

NEPC (National Environment Protection Council) (2004) *National Environmental Protection (Air Toxics) Measure*, <https://www.legislation.gov.au/Series/F2007B01121>, December 2004.

NEPC (National Environment Protection Council) (2010) *Review of the National Environmental Protection (Ambient Air Quality) Measure, Discussion Paper, Air Quality Standards*, July 2010.

NEPC (National Environment Protection Council) (2013) *National Environmental Protection (Assessment of Site Contamination) Measure Schedule B8 Guideline on Community Engagement and Risk Communication*, 1999 amended 2013.

NEPC (National Environment Protection Council) (2021) *National Environmental Protection (Ambient Air Quality) Measure*, <https://www.legislation.gov.au/Details/F2021C00475>, May 2021.

NoiseMeters Australia (n.d) *Decibel Calculator*, <https://au.noisemeters.com/apps/db-calculator/>.

Nolan R, Leigh A, Ooi M, Bradstock R, Curran T, Fairman T and Resco de Dios V (2021) *Climate change is testing the resilience of native plants to fire, from ash forests to gymea lilies*, <https://newsroom.unsw.edu.au/news/science-tech/climate-change-testing-resilience-native-plants-fire-ash-forests-gymea%C2%A0lilies>, accessed 5 December 2022.

NSW DEC (Department of Environment and Conservation) (2006) *Technical Framework Assessment and Management of Odour from Stationary Sources in NSW*, November 2006.

NSW DECC (Department of Environment and Climate Change) (2009) *Greater Blue Mountains World Heritage Area Strategic Plan*, <https://www.environment.nsw.gov.au/research-and-publications/publications-search/greater-blue-mountains-world-heritage-area-strategic-plan>, accessed 12 August 2022.

NSW DECCW (Department of Environment, Climate Change and Water) (2011) *NSW Road Noise Policy*, NSW Department of Environment, Climate Change and Water, Sydney.

NSW Department of Communities and Justice (2023) *NSW Rent and Sales Reports*.

NSW Department of Planning (2011a) *Hazardous Industry Planning Advisory Paper No 10 Land Use Safety Planning*.

NSW Department of Planning (2011b) *Hazardous Industry Planning Advisory Paper No 4 Risk Criteria for Land Use Safety Planning*.

NSW Department of Planning (2011c) *Hazardous Industry Planning Advisory Paper No 3 Risk Assessment*.

NSW DPE (Department of Planning and Environment) (2011) *Grey-headed Flying-fox Foraging Habitat*.

NSW DPE (Department of Planning and Environment) (2016) *Wind Energy: Visual Assessment Bulletin for State significant wind energy development*, <https://www.planning.nsw.gov.au/sites/default/files/2023-03/wind-energy-visual-assessment-bulletin.pdf>, accessed 15 August 2022.

NSW DPE (Department of Planning and Environment) (2022a) *Aviation Safeguarding Guidelines - Western Sydney Aerotropolis and surrounding areas*, [https://shared-drupal-s3fs.s3.ap-southeast-2.amazonaws.com/master-test/fapub\\_pdf/Keelie+Drupal+Documents/Aviation+Safeguarding+Guidelines+-+Western+Sydney+Aerotropolis+and+surrounding+areas.pdf](https://shared-drupal-s3fs.s3.ap-southeast-2.amazonaws.com/master-test/fapub_pdf/Keelie+Drupal+Documents/Aviation+Safeguarding+Guidelines+-+Western+Sydney+Aerotropolis+and+surrounding+areas.pdf), accessed 18 August 2022.

NSW DPE (Department of Planning and Environment) (2022b) *Luddenham Village Interim Strategy*, NSW Government.

NSW DPE (Department of Planning and Environment) (2022c) *Western Sydney Aerotropolis Development Control Plan*, <https://www.planning.nsw.gov.au/plans-for-your-area/priority-growth-areas-and-precincts/western-sydney-aerotropolis/western-sydney-aerotropolis-development-control-plan>, accessed 18 August 2022.

NSW DPE (Department of Planning and Environment) (2022d) *BioNet Atlas of NSW Wildlife*, NSW Environment and Heritage.

NSW DPE (Department of Planning and Environment) (2022e) *BioNet Vegetation Classification Database*, <https://www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx>, accessed 2022.

NSW DPE (Department of Planning and Environment) (2022f) *NSW State Vegetation Type Map*.

NSW DPE (Department of Planning and Environment) (2022g) *Western Sydney Aerotropolis Development Control Plan Phase 2*, <https://pp.planningportal.nsw.gov.au/western-sydney-aerotropolis-DCP>, accessed 18 August 2022.

NSW DPE (Department of Planning and Environment) (2022h) *Cumulative Impact Assessment Guidelines for State Significant Projects*, NSW Government, October 2022.

NSW DPE (Department of Planning and Environment) (2023a) *Western Sydney Aerotropolis Precinct Plan*, May 2023.

- NSW DPE (Department of Planning and Environment) (2023b) *Social Impact Assessment Guideline for State Significant projects*, [https://www.planningportal.nsw.gov.au/sites/default/files/documents/2023/GD1944%20SIA%20Guideline\\_NEW%20VI\\_14\\_02\\_23.pdf](https://www.planningportal.nsw.gov.au/sites/default/files/documents/2023/GD1944%20SIA%20Guideline_NEW%20VI_14_02_23.pdf), accessed 20 April 2023.
- NSW DPE (Department of Planning and Environment) (2023c) *Technical Supplement for Social Impact Assessment Guideline for State Significant projects*, [https://www.planningportal.nsw.gov.au/sites/default/files/documents/2023/GD1944%20SIAG%20-%20Technical%20Supplement\\_NEW%20VI\\_14\\_02\\_23.pdf](https://www.planningportal.nsw.gov.au/sites/default/files/documents/2023/GD1944%20SIAG%20-%20Technical%20Supplement_NEW%20VI_14_02_23.pdf), accessed 20 April 2023.
- NSW DPE (Department of Planning and Environment) (2023d) *Everglades historic garden case study Preparing your heritage property for the impacts of climate change*, <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Heritage/everglades-historic-garden-case-study-230047.pdf>, accessed 26 April 2023.
- NSW DPIE (Department of Planning, Industry and Environment) (2020) *Fire Extent and Severity Mapping (FESM) 2019/20*, SEED.
- NSW DPIE (Department of Planning, Industry and Environment) (2021) *New South Wales Annual Compliance Report 2020 – National Environment Protection (Ambient Air Quality) Measure*, October 2021.
- NSW EPA (Environment Protection Authority) (2011) *Tiered Procedure for Estimating Ground-Level Ozone Impacts from Stationary Sources*, published September 2011.
- NSW EPA (Environment Protection Authority) (2012) *Air emissions inventory for the Greater Metropolitan Region in New South Wales, 2008 Calendar Year*, August 2012.
- NSW EPA (Environment Protection Authority) (2017) *NSW Noise Policy for Industry*, October 2017.
- NSW EPA (Environment Protection Authority) (2019) *Air Emissions Inventory for the Greater Metropolitan Region in New South Wales – 2013 Calendar Year*, October 2019.
- NSW EPA (Environment Protection Authority) (2022) *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*, August 2022.
- NSW Government (2018) *NSW Freight and Ports Plan 2018-2023*, September 2018.
- NSW Government (2020) *Net Zero Plan Stage 1: 2020-2030*, March 2020.
- NSW Government (2021) *State Environmental Planning Policy (Resilience and Hazards) 2021*, NSW Government.
- NSW National Parks and Wildlife Service (2001) *Blue Mountains National Park Plan of Management*, <https://www.environment.nsw.gov.au/research-and-publications/publications-search/blue-mountains-national-park-plan-of-management>, accessed 16 August 2022.
- NSW Office of Environment and Heritage (2014) *Metropolitan Sydney Climate Change Snapshot*, <https://www.climatechange.environment.nsw.gov.au/sites/default/files/2021-06/Metropolitan%20Sydney%20climate%20change%20snapshot.pdf>, accessed 8 April 2022.
- NSW Office of Environment and Heritage (2018) *Greater Blue Mountains World Heritage Area Strategic Plan Addendum 2016*, <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Types-of-protected-areas/greater-blue-mountains-world-heritage-area-strategic-plan-addendum-2016-180173.pdf?la=en&hash=6202D26A57F04F976EBF38452467A868C562CAD2>, accessed 3 March 2023.
- Ostro B (2004) *Outdoor Air Pollution: Assessing the environmental burden of disease at national and local levels*, World Health Organization.
- Pacific Environment Limited (2016) *Western Sydney Airport EIS – Local Air Quality and Greenhouse Gas Assessment, Appendix F1 Local air quality and greenhouse gas*, Department of Infrastructure and Regional Development 2016 Western Sydney Airport Environmental Impact Statement, Volume 4, Commonwealth of Australia.

- Parsons J, Blair D, Luly J and Robson S (2008) 'Flying-fox (Megachiroptera: Pteropodidae) Flight Altitudes Determined via an Unusual Sampling Method: Aircraft Strikes in Australia', *Acta Chiropterologica*, 10(2):377-379.
- Paton-Walsh C, Rayner P, Simmons J, Fiddes S, Schofield R, Bridgman H, Beupark S, Broome R, Chambers S, Chang L and Cope M (2019) 'A clean air plan for Sydney: An overview of the special issue on air quality in New South Wales', *Atmosphere*, 10(12):774.
- Penrith City Council (2010) *Penrith Local Environmental Plan 2010*, <https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2010-0540>, accessed 16 August 2022.
- Penrith City Council (2019) *Penrith Scenic & Cultural Landscapes Study*, [https://www.penrithcity.nsw.gov.au/images/documents/council/council-business/Enclosure\\_3\\_-\\_Draft\\_Penrith\\_Scenic\\_and\\_Cultural\\_Landscapes\\_Study.pdf](https://www.penrithcity.nsw.gov.au/images/documents/council/council-business/Enclosure_3_-_Draft_Penrith_Scenic_and_Cultural_Landscapes_Study.pdf), accessed 6 March 2023.
- Penrith City Council (2020) *Planning for a Brighter Future: Penrith Local Strategic Planning Statement*, <https://yoursaypenrith.com.au/penrith-LSPS>, accessed 18 August 2022.
- Penrith City Council (2022) *Rural Lands Strategy*, <https://yoursaypenrith.com.au/rural-lands-strategy>, accessed 6 March 2023.
- Pepper C, Nascarella M and Kendall R (2003) 'A Review of the Effects of Aircraft Noise on Wildlife and Humans, Current Control Mechanisms and the Need for Further Study', *Environmental Management*, 32(4):418-432.
- Radle A (2007) 'The effect of noise on wildlife: a literature review', *World Forum for Acoustic Ecology Online Reader*.
- Ratliff G, Sequeira C, Waltz I, Ohsfeldt M, Thrasher T, Graham M and Thompson T (2009) *Aircraft Impacts on Local and Regional Air Quality in the United States*, PARTNER Project 15.
- Recher H, Shields J, Kavanagh R and Webb G (1987) *Retaining remnant mature forest for nature conservation at Eden, New South Wales: a review of theory and practice*, Chipping Norton, Surrey Beatty and Sons.
- SAAH (Sydney Aviation Alliance Holdings) (2022) *Sustainability Report 2022*, prepared for and published by SAAH Pty Limited.
- SACL (Sydney Airport Corporation Limited) (2019) *Sydney Airport Master Plan 2039*, [https://downloads.ctfassets.net/v228i5y5k0x4/6BdjDg1hDpubx2F8817Nrl/597809341db00e0953a2df403a53136c/Sydney\\_Airport\\_Master\\_Plan\\_2039\\_F.pdf](https://downloads.ctfassets.net/v228i5y5k0x4/6BdjDg1hDpubx2F8817Nrl/597809341db00e0953a2df403a53136c/Sydney_Airport_Master_Plan_2039_F.pdf), accessed 17 August 2022.
- Sesana E, Gagnon A, Ciantelli C, Cassar J and Hughes J (2021) 'Climate change impacts on cultural heritage: A literature review', *Wiley Interdisciplinary Reviews: Climate Change*, 12(4)e710.
- Shannon G, McKenna M, Angeloni L, Crooks K, Fristrup K, Brown E, Warner K, Nelson M, White C, Briggs J and McFarland S (2016) 'A synthesis of two decades of research documenting the effects of noise on wildlife', *Biological Reviews*, 91(4):982-1005.
- Smith B, Gomez-Heras M and McCabe S (2008) 'Understanding the decay of stone-built cultural heritage', *Progress in Physical Geography*, 32(4):439-461.
- Smith P (2021) *Impact of the 2019-20 Fires on the Greater Blue Mountains World Heritage Area –Version 2*, Report to Blue Mountains Conservation Society.
- SQM Research (2022) *Residential Vacancy Rates, Region: Blue Mountains*, [https://sqmresearch.com.au/graph\\_vacancy.php?sfx=&region=nsw%3A%3ABlue+Mountains&t=1](https://sqmresearch.com.au/graph_vacancy.php?sfx=&region=nsw%3A%3ABlue+Mountains&t=1), accessed 20 April 2023.
- Standards Australia (2015) *AS2021:2015 Acoustics – Aircraft noise intrusion – building siting and construction*, published 25 March 2015.
- Standards Australia (2019) *AS/NZS4282:2019 Control of the obtrusive effects of outdoor lighting*, published 13 February 2019.

- SWSLHD (South-Western Sydney Local Health District) (2019) *South West Sydney: our health, in brief*, <https://www.swslhd.health.nsw.gov.au/pdfs/SWS%20Our%20Health%20in%20brief.pdf>, accessed 31 July 2023.
- Sydney Metro (2022) *Sydney Metro – Western Sydney Airport – Project construction update newsletter: June 2022*, <https://www.sydneymetro.info/sites/default/files/2022-06/WSA-Project-update-newsletter.pdf>, accessed 18 August 2022.
- Tacon P, Hooper S, Brennan W, King G, Kelleher M, Domicelj J and Merson J (2007) *Assessment of the Aboriginal Cultural Heritage Values of the Greater Blue Mountains World Heritage Area*, Blue Mountains World Heritage Institute and Griffith University.
- Threatened Species Scientific Committee (2001) *Commonwealth Listing Advice on Loss of terrestrial climatic habitat caused by anthropogenic emissions of greenhouse gases*, <http://www.environment.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=7>, accessed 5 December 2022.
- Transport for NSW (2020a) *Planning for a transport connection between the Hume Motorway and Appin Road, Consultation on shortlisted corridor options for the Outer Sydney Orbital Stage 2*, <https://www.transport.nsw.gov.au/corridors/oso2>, accessed 17 August 2022.
- Transport for NSW (2020b) *Guideline for landscape character and visual impact assessment, Environmental impact assessment practice note EIA-N04*, <https://www.transport.nsw.gov.au/system/files/media/documents/2023/guideline-landscape-character-and-visual-impact.pdf>, accessed 17 August 2022.
- Transport for NSW (2022) *Travel Zone Explorer – Visualisation; Travel Zone Dashboard – Workforce*, <https://www.transport.nsw.gov.au/data-and-research/reference-information/travel-zone-explorer-visualisation>, NSW Government.
- TRC Environmental Corporation (2011) *Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia*, prepared for the NSW Office of Environment and Heritage.
- Tzanis C, Varotsos C, Ferm M, Christodoulakis J, Assimakopoulos M and Efthymiou C (2009) 'Nitric acid and particulate matter measurements at Athens, Greece, in connection with corrosion studies', *Atmospheric Chemistry and Physics*, 9(21):8309-8316.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2021) *Operational Guidelines for the Implementation of the World Heritage Convention*, <https://whc.unesco.org/en/guidelines/>, accessed 13 December 2022.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2022a) *Guidance and Toolkit for impact assessments in a World Heritage Context*, <https://whc.unesco.org/en/guidance-toolkit-impact-assessments/>, accessed 17 August 2022.
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2022b) *Greater Blue Mountains Area*, [https://whc.unesco.org/en/list/917 December 2022](https://whc.unesco.org/en/list/917%20December%202022), accessed 13 December 2022.
- Varotsos C, Tzanis C and Cracknell A (2009) 'The enhanced deterioration of the cultural heritage monuments due to air pollution', *Environmental Science and Pollution Research*, 16(5):590-592.
- WaterNSW (2023) *Warragamba Dam update*, <https://www.waternsw.com.au/community-news/media-releases/2023/waternsw-statement-warragamba-dam>, accessed 26 June 2023.
- Western Sydney Parklands (2018) *Western Sydney Parklands Plan of Management 2030*, <https://www.westernsydeyparklands.com.au/assets/About-Us/POM2030/PlanOfManagement2030-Final.pdf>, accessed 14 November 2022.
- WHO (World Health Organization) (2000) *Air Quality Guidelines for Europe, 2<sup>nd</sup> Edition, 2000 (CD ROM version)*, World Health Organization.
- WHO (World Health Organization) (2009) *Night Noise Guidelines for Europe*, World Health Organization Regional Office for Europe.

WHO (World Health Organization) (2011) *Burden of disease from environmental noise, Quantification of healthy life years lost in Europe*, World Health Organization and JRC European Commission.

WHO (World Health Organization) (2018) *Environmental Noise Guidelines for the European Region*, World Health Organization Regional Office for Europe, <http://www.euro.who.int/en/publications/abstracts/environmental-noise-guidelines-for-the-european-region-2018>.

Wilson A and Lindenmayer D (1995) *Wildlife Corridors and the Conservation of Biodiversity: A Review*, National Corridors of Green Program, Green Australia Ltd.

WRI (World Resources Institute and World Business Council for Sustainable Development) (2004) *GHG Protocol, A Corporate Accounting and Reporting Standard*.

WSA Co (2023) Figure 4.13 (Construction activity at WSI) and Figure 4.14 (Terminal construction activity at WSI) in Chapter 4 (Project setting) sourced from WSA Co. April 2023.

# Appendix A

Proponent details and environmental  
record

---

## Designated Proponent information

**Title of the Action:** Western Sydney International airspace and flight path design

EPBC Referral Number: 2022/9143

Designated proponent: Department of Infrastructure, Transport, Regional Development, Communications and the Arts

ABN: 86 267 354 017

Postal address: 111 Alinga Street, Canberra, Australian Capital Territory (ACT)  
GPO Box 594, Canberra ACT 2601

## Other referring parties

**Name** Airservices Australia

ABN: 59 698 720 886

Postal address: Alan Woods Building, 25 Constitution Avenue, Canberra ACT  
GPO Box 367, Canberra ACT 2601

**Name** Civil Aviation Safety Authority

ABN: 44 808 014 470

Postal address: Aviation House, 16 Furzer Street, Phillip ACT  
GPO Box 2005, Canberra ACT 2601

## Environmental record of the responsible party

		Yes	No
1	<p><b>Does the party taking the action have a satisfactory record of responsible environmental management?</b></p> <p>The Australian Government, as represented by the Department of Infrastructure, Transport, Regional Development, Communications and the Arts, has demonstrated commitment to responsible environment management.</p>	X	
2	<p><b>Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application – ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of the natural resources?</b></p> <p>The Australian Government, through its various departments and agencies, has been subject to proceedings various jurisdictions in relation to the protection of the environment and the conservation and sustainable use of natural resources.</p>	X	
3	<p><b>If the party taking the action is a corporation, will the action be taken in accordance with the corporation’s environmental policy and planning framework?</b></p> <p>The Australian Government is not a corporation.</p>		X
4	<p><b>Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?</b></p> <p>The Australian Government, through its various departments and agencies, has undertaken numerous activities which have been the subject of referral and approval (as relevant) under the EPBC Act. This includes the referral for the Proposed Western Sydney Airport (2014-7391).</p>	X	

# Appendix B

EIS team

---

## Names of persons involved in preparing the EIS

Name	Organisation	Role in the EIS
<b>Project leadership team</b>		
Western Sydney Airport Regulatory Policy Branch	Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA)	Program Management and counter party to all WSP personnel
Bruce Lean	WSP	Senior Program Manager
Louise MacDonald	WSP	Project Manager
Paula Bradshaw	WSP	Program Manager Stream 1 Specialist Manager
Ken Conway	Airbiz	Aviation planning and operations advisor (aircraft noise, airspace and facilitated airspace changes)
Mark Willey	Airbiz	Airspace architecture and capacity specialist
Greg Marks	Airbiz	Aviation expert advisor and peer reviewer (aircraft noise and GHG emissions)
David Cohney	Airbiz	Aviation expert advisor and peer reviewer (aircraft noise and GHG emissions)
Jye Robinson	WSP	Project controls support and field work assistance (wildlife strike)
<b>EIS documentation</b>		
Caitlin Bennett	WSP	EIS Lead
Helen Sloane	WSP	EIS author
Jarryd Barton	WSP	EIS author
Kerrie Atkins	WSP	EIS author/Specialist assistance
Damian Williams	WSP	EIS author/Specialist assistance/EIS Lead (alternate)
Natalia Anderson	WSP	EIS author
Kerry Gassner	WSP	Document production
<b>Geospatial and graphics</b>		
Emma Buxton	WSP	GIS
Rebecca Choi	WSP	GIS
Isaac Augey	WSP	GIS
Lachlan Reinheimer	WSP	Graphic Designer

Name	Organisation	Role in the EIS
Nic Drummond	WSP	Graphics
Jessie Milligan	WSP	Graphics
Michael Sparrow	WSP	Visualisation photomontages lead
Raymond Castro	WSP	Visualisation photomontages
Tony Kaihea	WSP	Visualisation photomontages
Lachlan Reinheimer	WSP	Graphic Designer
Nicholas Barnard	WSP	Digital
<b>Community and stakeholder</b>		
Deborah Palmer	Deborah Palmer Consulting	Stream 2 Program Manager
Chris O'Brien	WSP	Engagement Lead
Katie Casson	WSP	Engagement Manager
Calli Brown	WSP	Digital Engagement Lead
Abby Kernaghan	WSP	Engagement Support – Community relations
Lucy Dinn	WSP	Engagement Support
Olivia Dodds	WSP	Engagement Manager
Oscar Langley	WSP	Engagement Support
Steve Nguyen	WSP	Engagement Support
Rebecca Smith	WSP	Engagement
<b>Aircraft noise</b>		
Martin Leprohon	Airbiz	Aircraft Noise
Tristan Noel	Airbiz	Aircraft noise technical assistant (lead AEDT modeller)
Adam Wing	Airbiz	Aircraft noise technical assistant (assistant AEDT modeller) and geospatial support
Hannah Fairbairn	Airbiz	Aircraft noise technical assistant and demand schedule analyst
Blake Gaudry	Airbiz	Geospatial and creative design support
Amina Ziana	Airbiz	Creative design lead
Alex Lampadov	Airbiz	Computer aided design assistant
Daniel Wanasili	Airbiz	Aircraft noise advisor and peer reviewer

Name	Organisation	Role in the EIS
<b>Noise monitoring</b>		
Rebecca Warren	WSP	Noise monitoring lead
Neil Macabenta	WSP	Noise monitoring
Linnea Eriksson		Noise monitoring
Mo Ali		Noise monitoring
Lance Robles	WSP	Noise monitoring
Jennifer Feng	WSP	Noise monitoring
<b>Air quality</b>		
Aleks Todoroski	Todoroski Air Sciences (TAS)	Air quality lead
Daniel Kjellberg	TAS	Air Quality lead technical modeller
Philip Henschke	TAS	Regional air quality lead
<b>Greenhouse gas and climate</b>		
Ken Conway	Airbiz	GHG emissions and climate lead
Tristan Noel	Airbiz	GHG emissions technical assistant (full flight emissions)
Adam Wing	Airbiz	GHG emissions technical assistant (lead AEDT modeller for emissions below 10,000 ft)
Daniel Wanasili	Airbiz	GHG emissions model peer reviewer
<b>Aircraft hazards and risk</b>		
Mark Eddowes	Eddowes Aviation Safety Limited (EASL)	Hazards and risk lead
Kate Grant	EASL	Hazards and risk technical assistant
<b>Land use</b>		
Natalia Anderson	WSP	Planning and land use author
Damian Williams	WSP	Planning and land use lead
Paul Greenhalgh	WSP	Planning and land use technical reviewer
<b>Landscape and visual</b>		
Flora Wehl	IRIS	Landscape and visual assessment specialist author
Suzie Rawlinson	IRIS	Landscape and visual assessment specialist lead
Tania Metcher	IRIS	Landscape and visual assessment specialist author

Name	Organisation	Role in the EIS
<b>Biodiversity</b>		
Toby Lambert	WSP	Biodiversity lead and technical reviewer
Tanya Bangel	WSP	Biodiversity author
<b>Wildlife strike</b>		
Kylie Patrick	Avisure	Wildlife strike assessment lead, author, project manager (Principal Consultant)
Alexandra Stone	Avisure	GIS support and field work (Senior Wildlife Biologist)
Charlotte (Xiang Nin) Kok	Avisure	Administrative support (Wildlife Biologist/Administration)
Jeff McKee	Avisure	Technical contributor (Director of R&D)
Martin Ziviani	Avisure	Field work (Senior Wildlife Biologist)
Phil Shaw	Avisure	Technical contributor (Managing Director)
Will Jamieson	Avisure	Field work, technical review (Principal Biologist)
Chaos Degan-Delauney	WSP	Field work assistance
<b>Greater Blue Mountains World Heritage Area</b>		
Jarryd Barton	WSP	Author
Caitlin Bennett	WSP	Technical reviewer
Bruce Lean	WSP	Technical reviewer
<b>Heritage</b>		
Sue McIntyre-Tamwoy	Navin Officer Heritage Consultants (NOHC)	Heritage lead
Jacob McIntyre	NOHC	Heritage author
Kelvin Officer	NOHC	Heritage author
Meg Walker	NOHC	Heritage author
Nicola Hayes	NOHC	Heritage author

Name	Organisation	Role in the EIS
<b>Indigenous heritage engagement</b>		
Shane Smithers	500 Voices	Darug Culture Specialists. Provided an Indigenous perspective, Indigenous knowledge and input into community engagement
Saskia Reijners	500 Voices	Darug Culture Specialists. Provided an Indigenous perspective, Indigenous knowledge and input into community engagement
Matt Pellow	WSP	Indigenous Specialist Services/ Stakeholder and community engagement
<b>Social</b>		
Carla Martinez	WSP	Social impact assessment lead
Elena Bakhanova	WSP	Social impact assessment author
Jessica Walker	WSP	Social impact assessment author
Sian Hromek	WSP	Social impact assessment author
Felicity Richards	WSP	Social impact assessment technical reviewer
Sophie Le Mauff	WSP	Social impact assessment author
<b>Economic</b>		
Adrian Hack	Hill PDA	Economic impact assessment lead
Aneta Ramos	Hill PDA	Economic impact assessment author
Elizabeth Griffin	Hill PDA	Economic impact assessment author
Henry Zheng	Hill PDA	Economic impact assessment author
Nick Hill	Hill PDA	Economic impact assessment author
Taylor Richardson	Hill PDA	Economic impact assessment author
<b>Human health</b>		
Jackie Wright	Environmental Risk Sciences Pty Ltd (EnRiskS)	Health – Technical lead
<b>Facilitated impacts</b>		
Ken Conway	Airbiz	Facilitated airspace changes lead
Mark Willey	Airbiz	Aviation planning and operations advisor
Greg Marks	Airbiz	Airspace architecture and capacity specialist
Adam Wing	Airbiz	Aircraft noise technical lead
Daniel Wanasili	Airbiz	Aircraft noise and MNES technical advisor and peer reviewer

# Appendix C

## EIS Guidelines

---

# Guidelines for the content of a draft Environment Impact Statement

## Western Sydney International airspace and flight path design

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>1 – General Content</b>	<p>The EIS should be a stand-alone document that contains sufficient information to avoid the need to search out previous or supplementary reports.</p>	<p>EIS – the EIS is a standalone document and contains sufficient information.</p>
	<p>The EIS should take into consideration the EPBC Act Significant Impact Guidelines and other relevant EPBC Act policy statements that can be downloaded from the following web site:  <a href="https://www.awe.gov.au/environment/epbc/policy-statements">https://www.awe.gov.au/environment/epbc/policy-statements</a>.</p>	<p>EIS – the EIS has had due regard to the EPBC Act Significant Impact Guidelines. The EIS represents a comprehensive assessment of the potential impacts associated with the operation of the project            Chapter 10 (Approach to impact assessment) – Section 10.2.</p>
	<p>The EIS should enable interested stakeholders and the Minister to understand the environmental consequences of the proposed development. Information provided in the EIS must be objective, clear, succinct and, where appropriate, be supported by maps, plans, diagrams or other descriptive detail. The body of the EIS is to be written in a clear and concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text but must be specific (e.g. section 1.1.1).</p>	<p>EIS – the EIS enables interested stakeholders and the Minister to understand the environmental consequences of the proposed development.</p>
	<p>The EIS should be done in consultation in Airservices Australia and have regard to relevant Airservices Australia policies and standards.</p>	<p>EIS – the EIS was done in consultation with Airservices Australia and has regard to relevant Airservices Australia policies and standards            Chapter 5 (Statutory context) – Section 5.2            Chapter 9 (Community and stakeholder engagement) – Section 9.2            Appendix D (List of persons and agencies consulted during the preparation of the Draft EIS).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>In assessing World Heritage, the EIS should take into consideration the <i>World Heritage Advice Note: Environmental Assessment</i> that can be downloaded from the following web site:  <a href="https://www.iucn.org/sites/dev/files/import/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf">https://www.iucn.org/sites/dev/files/import/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf</a></p>	<p>EIS – the EIS takes into consideration the World Heritage Advice note, including Technical paper 9 (Heritage) and Technical paper 14 (Greater Blue Mountains World Heritage Area).</p>
	<p>The level of analysis and detail in the EIS should reflect the level of significance of the expected impacts on the environment and heritage.                      Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed.                      The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed.</p>	<p>EIS Part C – Environmental impact assessment                      Technical papers 1 to 14.</p>
	<p>Detailed technical information, studies or investigations necessary to support the main text should be included as appendices to the EIS. It is recommended that any additional supporting documentation and studies, reports or literature not normally available to the public from which information has been extracted be made available at appropriate locations during the period of public display.</p>	<p>Technical papers 1 to 14.</p>
	<p>If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with the department before submitting it to the Minister for approval for publication.</p>	<p>N/A</p>
	<p>The proponent should ensure that the EIS assesses compliance of the action with principles of Ecological Sustainable Development as set out in the EPBC Act, and the objects of the Act at <a href="#">Attachment 1</a>.                      A copy of Schedule 4 of the EPBC Regulations, <i>Matters to be addressed by draft public environment report and environmental impact statement</i> is at <a href="#">Attachment 2</a>.</p>	<p>Chapter 25 (Conclusion) – Section 25.4.</p>

Requirement	Paragraph	Where addressed <i>(note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant)</i>
<b>2 – Format and Style</b>	<p>The EIS should comprise three elements, namely:</p> <ul style="list-style-type: none"> <li>• the executive summary;</li> <li>• the main text of the document; and</li> <li>• appendices containing detailed technical information and other information that can be made publicly available.</li> </ul>	<p>EIS – the EIS comprises a summary document, Parts A to D, appendices and technical papers.</p>
	<p>The guidelines have been set out in a manner that may be adopted as the format for the EIS. This format need not be followed where the required information can be more effectively presented in an alternative way. However, each of the elements must be addressed to meet the requirements of the EPBC Act and Regulations.</p>	<p>EIS – each element of the guidelines have been addressed as outlined in this checklist.</p>
	<p>The EIS should be written so that any conclusions reached can be independently assessed. To this end, all sources must be appropriately referenced. The reference list should include the address of any Internet web pages used as data sources.</p>	<p>EIS Part C – Environmental impact assessment                      Chapter 25 (Conclusion)                      Chapter 26 (References)                      Technical papers 1 to 14.</p>
	<p>The main text of the EIS should include a list of abbreviations, a glossary of terms and appendices containing:</p> <ul style="list-style-type: none"> <li>• a copy of these guidelines;</li> <li>• a list of persons and agencies consulted during the EIS;</li> <li>• contact details for the proponent; and</li> <li>• the names of the persons involved in preparing the EIS and work done by each of these persons.</li> </ul>	<p>Abbreviations and glossary of terms is provided at the front of the EIS                      Appendix A (Proponent details and environmental record)                      Appendix B (EIS team)                      Appendix C (EIS Guidelines)                      The organisations, agencies and individuals are detailed in Chapter 9 (Community and stakeholder engagement) – Section 9.2.</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>Maps, diagrams and other illustrative material should be included in the EIS. The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size and in colour where possible.</p> <p>The proponent should consider the format and style of the document appropriate for publication on the Internet. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.</p>	<p>EIS Parts A to D Technical papers 1 to 14.</p>
<b>Specific Content</b>		
<b>3 – Background Information</b>	The EIS must provide the background and context of the action including:	EIS Parts A and B.
	a. the title of the action;	Chapter 1 (Introduction) – Section 1.1.
	b. the location of the action;	Chapter 1 (Introduction) – Section 1.1.
	c. the legislative background and approvals framework for the action;	Chapter 5 (Statutory context) – Sections 5.1 and 5.2.
	d. the current status of the action;	Chapter 1 (Introduction) – Section 1.1.
	e. a clear outline of the objective of the action;	Chapter 1 (Introduction) – Section 1.2.
	f. the consequences of not proceeding with the action;	Chapter 6 (Project development and alternatives) – Section 6.1.
	g. consultation undertaken about the action with stakeholders and identification of key issues and views expressed;	Chapter 9 (Community and stakeholder engagement) – Sections 9.2 and 9.3.
	h. describe how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, are being or are proposed to be taken or that have been approved in the region affected by the action; and	Chapter 5 (Statutory context) – Section 5.4.

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	i. describe the legislative basis for the referral, as well as the following: <ul style="list-style-type: none"> <li>– the full name and postal address of all agencies referring the action;</li> <li>– identification of the designated proponent;</li> <li>– identification of the person proposing to take the action; and</li> <li>– outline responsibilities for preparing the EIS.</li> </ul>	Chapter 1 (Introduction) – Section 1.3 Chapter 5 (Statutory context) – Sections 5.1 and 5.2 Appendix A (Proponent details and environmental record) Appendix B (EIS team).
<b>4 – Description of the action</b>	This section must describe the proposal in sufficient detail to allow an understanding of all stages and components of the proposal, and to determine potential environmental impacts associated with the proposal.	Chapter 7 (The project).
	The project must be described in the text and illustrated with maps, diagrams, plans (at a suitable scale) and other information as required to provide sufficient context and basis for the identification and assessment of impacts.	Chapter 7 (The project).
	Include the precise location (including coordinates) of all elements of the action that may have impacts on Matters of National Environmental Significance (MNES).	Chapter 10 (Approach to impact assessment) – Section 10.2 Chapter 23 (Matters of National Environmental Significance) – Section 23.3 Appendix E (Project coordinates).
	Detail the process undertaken to develop the flight paths, including any key factors in determining the routes.	Chapter 6 (Project development and alternatives) – Sections 6.2 and 6.3.
	Describe the following: <ul style="list-style-type: none"> <li>a. operating hours and flexibility of operating arrangements;</li> </ul>	Chapter 7 (The project) – Sections 7.1 and 7.4.
	<ul style="list-style-type: none"> <li>b. runway operating modes for both day and night, noting any seasonal variations</li> </ul>	Chapter 7 (The project) – Section 7.4.

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>c. flight paths and other operational procedures governing aircraft movements, including an estimate of normal variability of movements on defined flight paths, and locational criteria governing flight path selection</p>	<p>Chapter 7 (The project) – Section 7.5</p> <p>In the Draft EIS, the ‘locational’ criteria for the selection of flight paths is:</p> <ul style="list-style-type: none"> <li>• in the development phase (Chapter 6 (Project development and alternatives) – Sections 6.1 and 6.3) – which is informed by SIDs and STARs, noting Chapter 6 also refers to the scope boundaries for the determination of flight paths between the runway and enroute (for example, fixed airfield geometry and infrastructure)</li> <li>• based on air traffic control procedures managed by air traffic control (Chapter 7 (The project) – Section 7.3)</li> <li>• determined by the selection of the runway mode of operation by air traffic control based on weather/night-time operations (Chapter 7 (The project) – Section 7.4).</li> </ul>
	<p>d. expected flight frequencies with number and percentage of aircraft movements by type, typical annual and daily movements;</p>	<p>Chapter 7 (The project) – Section 7.2.</p>
	<p>e. expected noise pollution and light levels in relation to flight path selection, aircraft heights and flying patterns;</p>	<p>Chapter 7 (The project) – Section 7.5 Chapter 11 (Aircraft noise).</p>
	<p>f. aircraft operating heights for approaches and departures, variability of aircraft heights for given locations, and describe flight paths of the proposed action; and</p>	<p>Chapter 7 (The project) – Section 7.5.</p>
	<p>g. underlying assumptions and forecast reliability.</p>	<p>Chapter 7 (The project) – Section 7.2.</p>
	<p>Include updated information if any changes have been made to the project since the referral documentation was submitted.</p>	<p>Chapter 7 (The project).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>5 – Feasible Alternatives</b>	Describe any feasible alternatives to the action including:	Chapter 6 (Project development and alternatives) – Section 6.1.
	a. the alternative of taking no action (if relevant);	
	b. alternative flight paths considered; and	Chapter 6 (Project development and alternatives) – Section 6.3.
	c. sufficient detail to make clear why any alternative is preferred to another.	Chapter 6 (Project development and alternatives) – Section 6.3.
	Short, medium and long-term advantages and disadvantages of the options should be discussed.	Chapter 6 (Project development and alternatives) – Section 6.3.
<b>6 – Description of the Environment</b>	If there are no feasible alternatives, provide sufficient information as to why this is the case and why there are no alternatives for the airspace design.	Chapter 6 (Project development and alternatives) – Sections 6.1 and 6.3.
	The EIS must include a description of the environment, land uses and character of the proposal site and the surrounding areas that may be affected by the action. It must include the following: a. The EIS must include a description of the environment, land uses and character of the proposal site and the surrounding areas that may be affected by the action. It must include the following: A general description of the environment on the Airport site. Include a brief statement on the current status of on-ground construction works, including ground activities and aeronautical infrastructure to manage aircraft operations, and the expected state of the site upon commencement of the proposed action.	Chapter 4 (Project setting) – Sections 4.2 and 4.3.

Requirement	Paragraph	Where addressed <i>(note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant)</i>
	<p>b. A general description of the environment in surrounding areas that may be affected by the proposed action. This should include details of current and historical land use of the area, and proposed urban, industrial, rural and tourism activities within areas that may be affected by the proposal.</p> <p>Undertake an ambient noise study in surrounding areas that may be affected by the proposed action and describe the findings in the context of land use and sensitive receivers.</p>	<p>Chapter 4 (Project setting) – Section 4.3</p> <p>EIS Part C – Environmental impact assessment chapters (Existing environment section)</p> <p>Technical papers 1 to 14, including Technical paper 1 (Aircraft noise).</p>
	<p>c. Identify known historical records of fauna and undertake an assessment to identify species and suitable habitat in the area. Identify species relevant to impacts of the action and provide:</p>	<p>Chapter 16 (Biodiversity) – Section 16.5</p> <p>Technical paper 5 (Wildlife strike risk) – Chapter 6 (Impact assessment)</p> <p>Technical paper 8 (Biodiversity) – Chapter 5 (Existing biodiversity values) and Appendix B.</p>
	<ul style="list-style-type: none"> <li>– A description of species characteristics, preferred habitat, and any state or commonwealth threatened or migratory listing status;</li> </ul>	<p>Chapter 16 (Biodiversity) – Section 16.5</p> <p>Technical paper 5 (Wildlife strike risk) – Chapter 6 (Impact assessment)</p> <p>Technical paper 8 (Biodiversity) – Chapter 5 (Existing biodiversity values).</p>
	<ul style="list-style-type: none"> <li>– The location, relative to the action;</li> </ul>	<p>Chapter 16 (Biodiversity) – Section 16.5</p> <p>Technical paper 5 (Wildlife strike risk) – Chapter 1 (Introduction)</p> <p>Technical paper 8 (Biodiversity) – Chapter 4 (Methodology).</p>
	<ul style="list-style-type: none"> <li>– The amount and quality of habitat, breeding areas, movement corridors or flight paths, threats and the regional context; and</li> </ul>	<p>Chapter 16 (Biodiversity) – Section 16.5</p> <p>Technical paper 5 (Wildlife strike risk) – Chapter 6 (Impact assessment)</p> <p>Technical paper 8 (Biodiversity) – Chapter 5 (Existing biodiversity values).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<ul style="list-style-type: none"> <li>– Detailed mapping and present details on the scope, timing/effort (survey season/s) and methodology for studies and surveys used to provide information on the relevant fauna. This includes details of how best practice survey guidelines have been applied and for commonwealth listed threatened species, how surveys are consistent with (or a justification for divergence from) published Australian Government guidelines and policy statements.</li> </ul>	<p>Chapter 16 (Biodiversity) – Section 16.3                      Technical paper 5 (Wildlife strike risk) – Chapter 3 (Methodology)                      Technical paper 8 (Biodiversity) – Chapter 4 (Methodology).</p>
	<p>d. Identify any listed World Heritage properties and National Heritage places that may be impacted by the proposed action.</p> <ul style="list-style-type: none"> <li>– Provide information about location, physical features, condition, historical context, current uses, and social, economic and cultural aspects of the property; and</li> </ul>	<p>Technical paper 9 (Heritage) – Chapter 4 (Existing conditions)                      Technical paper 14 (Greater Blue Mountains World Heritage Area) – Chapter 3 (Project setting).</p>
	<ul style="list-style-type: none"> <li>– Provide a description of the World Heritage and National Heritage values of the Greater Blue Mountains Area World Heritage property and National Heritage Place (GBMA), as described in the Statement of Outstanding Universal Value, and the values of any additional World Heritage properties and National Heritage places identified. Include references to the listing criteria, as well as integrity, including Aboriginal cultural connections with the land and any wilderness heritage of the property.</li> </ul>	<p>Technical paper 9 (Heritage) – Chapter 4 (Existing conditions)                      Technical paper 14 (Greater Blue Mountains World Heritage Area) – Chapter 3 (Project setting).</p>
	<p>e. Identify any Commonwealth lands relevant to the impacts of the action. If sites are identified, provide a description of the land, current usage and ownership (if known), along with any listed Commonwealth heritage sites and other relevant components of the environment on Commonwealth land.</p>	<p>Chapter 4 (Project setting) – Sections 4.5 and 4.6.</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>f. Identify any places with heritage value, as a component of the whole of the environment, in areas relevant to the impacts of the action.</p> <p>Information gathering should be integrated into consultation processes using a method that is accessible to all members of the community for which the site has value.</p> <p>Heritage values include any element of a place’s natural and cultural environment, including Aboriginal cultural heritage, that has aesthetic, historic, scientific, social or other significance, for current and future generations – see the Significant Impact Guidelines 1.2 for further detail. Further discussion with the department can determine this scope of work.</p>	<p>Chapter 4 (Project setting) – Sections 4.4 and 4.6</p> <p>EIS Part C – Environmental impact assessment chapters (Existing environment section)</p> <p>Technical paper 8 (Biodiversity) – Chapter 5 (Existing biodiversity values)</p> <p>Technical paper 9 (Heritage) – Chapter 4 (Existing conditions)</p> <p>Technical paper 10 (Social) – Chapter 4 (Existing environment)</p> <p>Technical paper 14 (Greater Blue Mountains World Heritage Area) – Chapter 3 (Project setting).</p>
	<p>g. A description of the environment in all areas of potential impact, including all components of the environment as defined in Section 528 of the EPBC Act:</p> <ul style="list-style-type: none"> <li>– ecosystems and their constituent parts, including people and communities;</li> <li>– natural and physical resources;</li> <li>– the qualities and characteristics of locations, places and areas,</li> <li>– heritage values of places; and</li> <li>– the social, economic and cultural aspects of a thing mentioned in paragraph a, b, c or d.</li> </ul>	<p>Chapter 4 (Project setting) – Sections 4.3 to 4.6</p> <p>EIS Part C – Environmental impact assessment chapters (Existing environment section)</p> <p>Technical papers 1 to 14 (Existing environment section).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>Relevant policy includes the Significant Impact Guidelines 1.2 Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies (2013) which states that in understanding the environmental context of the action, it is helpful to determine whether any components or features of the environment are “rare, endemic, unusual, important or otherwise valuable”.</p> <p>See also the EPBC Act Policy Statement – Definition of ‘Environment’ under section 528 of the EPBC Act.</p>	<p>EIS, including Chapter 10 (Approach to impact assessment) – Section 10.2                      Technical papers 1 to 14.</p>
<p><b>7 – Relevant impacts</b></p>	<p>Based on the information provided in the referral, including the nature and scale of the proposed action, the department considers that impacts potentially arise in relation to fauna, heritage, people and communities, and air pollution as a result of flight paths used by aircraft to arrive and depart the Airport.</p>	<p>EIS Part C – Environmental impact assessment chapters (Impact assessment section)                      Technical papers 1 to 14 (Impact assessment section).</p>
	<p>Should any other aspects of the environment be identified by the proponent that may or are likely to be significantly impacted, these need to be described and assessed in an appropriate manner and the department should be informed at the earliest opportunity.</p>	<p>EIS Part C – Environmental impact assessment chapters (Impact assessment section)                      Technical papers 1 to 14 (Impact assessment section).</p>
	<p>It is the proponent’s responsibility to be aware of any changes to the listing status and distribution of listed threatened and migratory species and ecological communities. Information is available in the Species Profile and Threats (SPRAT) Database. The proponent must ensure that a recent Protected Matters Search Tool (PMST) report has been generated and considered before finalising the draft EIS. This PMST should be provided as an attachment to the EIS.</p>	<p>Technical paper 8 (Biodiversity) – Chapter 4 (Methodology) and Appendix A4 (Protected Matters Search Tool results).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>7.1 – Describe and assess relevant impacts</b>	<p>The EIS must include a description of all of the relevant impacts of the action (including direct, indirect, facilitated and cumulative), including the magnitude, duration and frequency of the impacts. Relevant impacts are impacts that the action will have or is likely to have.</p>	<p>EIS Part C – Environmental impact assessment chapters (Impact assessment section)                      Chapter 21 (Facilitated impacts) – Section 21.5                      Chapter 22 (Cumulative impacts) – Section 22.4                      Technical papers 1 to 14, including Technical paper 13 (Facilitated changes).</p>
	<p>a. Provide the following information:</p> <ul style="list-style-type: none"> <li>– a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts;</li> <li>– a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;</li> <li>– analysis of the significance of the relevant impacts; and</li> <li>– any technical data and other information used or needed to make a detailed assessment of the relevant impacts, including details of the scope, timing (survey season/s) and methodology for studies or surveys used to provide information.</li> </ul>	<p>EIS Part C – Environmental impact assessment chapters (Impact assessment section)                      Technical papers 1 to 14 (Impact assessment section).</p>
	<p>b. The EIS should identify and address facilitated impacts on operations at Sydney (Kingsford Smith) Airport and other aerodromes and aviation activities in the region as a direct result of arrival and departure paths into and out of the Airport and associated airspace control zone.</p>	<p>Chapter 21 (Facilitated impacts) – Section 21.5                      Technical paper 13 (Facilitated changes) and appendices.</p>
	<p>c. The EIS should identify and address cumulative impacts, where potential project impacts are in addition to existing impacts of other activities (including known potential future expansions or developments by the proponent and other proponents in the region and vicinity). This should include changes to noise levels arising from the proposed action in relation to on-ground sources such as road, rail and industry.</p>	<p>Chapter 22 (Cumulative impacts) – Section 22.4                      Technical papers 1 to 14 (Cumulative impacts section).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>d. The EIS should identify areas where ambient man-made noise sources are limited and any increase in aircraft noise would be noticeable.</p> <p>e. The impact assessment must include details of consultation and cultural heritage surveys undertaken to identify and evaluate impacts to heritage, completed in collaboration with Traditional Owners (or their representative bodies) and the people and communities of Western Sydney and the Greater Blue Mountains.</p>	<p>Chapter 11 (Aircraft noise) – Section 11.6 Technical paper 1 (Aircraft noise) – Chapter 4 (Overview of the study area).</p> <p>Chapter 9 (Community and stakeholder engagement) – Section 9.2 Chapter 17 (Heritage) – Section 17.3 Technical paper 9 (Heritage) – Chapter 3 (Methodology).</p>
<b>7.2 – Impacts to fauna</b>	Information required	
7.2.1	<p>Detailed assessment of any likely impact that the proposed action may facilitate (at the local, regional, state and national scale) including but not limited to impacts from noise, lights and risk of bird and bat strike.</p> <p>Include quantification of the habitat area (in hectares) to be impacted as well as quantification of impacted individuals and populations, where feasible.</p> <p>Consider potential compounding impacts of the proposal and the 2019–2020 bushfires, including consideration of impacts of the proposal to potential post-bushfire recovery.</p>	<p>Chapter 16 (Biodiversity) – Sections 16.6 and 16.7 Technical paper 5 (Wildlife strike risk) – entire technical report focuses on the bird and bat strike risk Technical paper 8 (Biodiversity) – Chapter 7 (Impact assessment, including design scenarios), Chapter 8 (Cumulative impacts), Chapter 9 (Significant impact assessments) and Appendix C (Significant impact assessments).</p>
7.2.2	Assessment of the likely duration of impacts and a discussion of whether any impacts are likely to be unknown, unpredictable or irreversible.	<p>Chapter 16 (Biodiversity) – Sections 16.6 and 16.7 Technical paper 5 (Wildlife strike risk) – entire technical report focuses on the bird and bat strike risk Technical paper 8 (Biodiversity) – Chapter 7 (Impact assessment, including design scenarios), Chapter 8 (Cumulative impacts), Chapter 9 (Significant impact assessments) and Appendix C (Significant impact assessments).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
7.2.3	<p>Discussion on whether fauna would still continue to use the Airport and surrounding areas on a long-term basis.</p>	<p>Chapter 16 (Biodiversity) – Sections 16.6 and 16.7</p> <p>Technical paper 5 (Wildlife strike risk) – entire technical report focuses on the bird and bat strike risk</p> <p>Technical paper 8 (Biodiversity) – Chapter 7 (Impact assessment, including design scenarios), Chapter 8 (Cumulative impacts), Chapter 9 (Significant impact assessments) and Appendix C (Significant impact assessments).</p>
7.2.4	<p>For EPBC listed fauna include a justification, with supporting evidence, how the proposed action will not be inconsistent with:</p> <ul style="list-style-type: none"> <li>• Australia’s obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and</li> <li>• A recovery plan or threat abatement plan.</li> </ul>	<p>Chapter 16 (Biodiversity) – Section 16.6</p> <p>Technical paper 5 (Wildlife strike risk) – entire technical report focuses on the bird and bat strike risk</p> <p>Technical paper 8 (Biodiversity) – Chapter 7 (Impact assessment, including design scenarios).</p>
7.2.5	<p>For EPBC listed migratory species, justify, with supporting evidence, how the proposed action will not be inconsistent with Australia’s obligations under:</p> <ul style="list-style-type: none"> <li>• The Bonn Convention;</li> <li>• China-Australia Migratory Bird Agreement;</li> <li>• Japan-Australia Migratory Bird Agreement;</li> <li>• International Agreement – Republic of Korea-Australia Migratory Bird Agreement; and</li> <li>• Any international agreement approved under subsection 209(4) of the EPBC Act.</li> </ul>	<p>Chapter 16 (Biodiversity) – Section 16.6</p> <p>Technical paper 5 (Wildlife strike risk) – entire technical report focuses on the bird and bat strike risk</p> <p>Technical paper 8 (Biodiversity) – Chapter 7 (Impact assessment, including design scenarios).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>7.3 – Heritage</b>	Information required	
7.3.1	<p>Detailed assessment of any likely impact that the proposed action may facilitate on the natural, cultural, heritage and socio-economic values of the GBMA, and any other World Heritage properties or National Heritage places identified as relevant to the impacts of the proposed action.</p> <p>Include explicit assessment against the Outstanding Universal Value, including the integrity of the property. This should be based on (but is not limited to) the following:</p> <ul style="list-style-type: none"> <li>• Noise and light assessments.</li> <li>• Visual assessment of representative viewpoint locations and visual amenity impact on tourist drives.</li> <li>• Impacts to biological attributes of the GBMA.</li> <li>• Assessment of risks to heritage associated with the proposed action (such as contamination risk from fuel jettisoning or increased risk of bushfire).</li> </ul>	<p>Impact assessment section of technical papers, including:</p> <ul style="list-style-type: none"> <li>• Technical paper 1 (Aircraft noise)</li> <li>• Technical paper 4 (Hazard and risk)</li> <li>• Technical paper 7 (Landscape and visual amenity)</li> <li>• Technical paper 8 (Biodiversity)</li> <li>• Technical paper 9 (Heritage)</li> <li>• Technical paper 10 (Social)</li> <li>• Technical paper 11 (Economic)</li> <li>• Technical paper 14 (Greater Blue Mountains World Heritage Area)</li> </ul> <p>Corresponding environment impact assessment chapters (in Part C of the EIS).</p>
7.3.2	A description of how the design of the proposed action was selected to avoid and minimise impacts on the GBMA and any other World Heritage properties or National Heritage places.	<p>Chapter 6 (Project development and alternatives) – Section 6.3</p> <p>Technical paper 14 (Greater Blue Mountains World Heritage Area – Chapter 4 (Project overview and alternatives).</p>
7.3.3	Assessment of impacts to any places in the area surrounding the airport with heritage value as a component of the whole of the environment, with reference to consultation undertaken to identify values and their importance to the community.	<p>Chapter 9 (Community and stakeholder engagement) – Section 9.2</p> <p>Technical paper 9 (Heritage) – Chapter 5 (Impact assessment) and also Chapter 3 (Methodology) and Chapter 4 (Existing conditions).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
7.3.4	<p>A discussion of impacts on the natural, cultural, heritage and socio-economic values of the GBMA. This discussion must include, but not limited to, the consideration of:</p> <ul style="list-style-type: none"> <li>Habitats, species and ecological communities within the GBMA, and the processes that support their connectivity, productivity and function.</li> <li>The benefit of national parks for people, businesses and the economy.</li> <li>Living and historic cultural heritage recognising Indigenous beliefs, practices and obligations for country, places of cultural significance and cultural heritage sites.</li> <li>Non-Indigenous heritage that has aesthetic, historic, scientific or social significance.</li> </ul>	<p>Impact assessment section of technical papers, including:</p> <ul style="list-style-type: none"> <li>Technical paper 4 (Hazard and risk)</li> <li>Technical paper 7 (Landscape and visual amenity)</li> <li>Technical paper 8 (Biodiversity)</li> <li>Technical paper 9 (Heritage)</li> <li>Technical paper 10 (Social)</li> <li>Technical paper 11 (Economic)</li> <li>Technical paper 14 (Greater Blue Mountains World Heritage Area)</li> </ul> <p>Corresponding environmental impact assessment chapters (in part C of the EIS).</p>
7.3.5	<p>For World Heritage, discuss how the proposed action adheres to, and is not inconsistent with:</p> <ul style="list-style-type: none"> <li>Australia’s obligations under the World Heritage Convention and the provisions in the 2021 Operational Guidelines for the Implementation of the World Heritage Convention.</li> <li>The Australian World Heritage management principles (Schedule 5 of the EPBC Regulations).</li> <li>The 2009 Greater Blue Mountains World Heritage Area Strategic Plan and 2016 Addendum and any future iterations in place at time of report preparation.</li> <li>The 2013 IUCN advice note on environmental assessments.</li> </ul>	<p>Technical paper 9 (Heritage) – Chapter 8 (Conclusion)</p> <p>Technical paper 14 (Greater Blue Mountains World Heritage Area) – Chapter 3 (Project setting)</p> <p>Corresponding environmental impact assessment chapters (in part C of the EIS).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
7.3.6	<p>For National Heritage, discuss how the proposed action adheres to, and is not inconsistent with:</p> <ul style="list-style-type: none"> <li>• The National Heritage management principles (Schedule 5B of the EPBC Regulations).</li> <li>• An agreement to which the Commonwealth is party in relation to the National Heritage place.</li> <li>• The 2009 Greater Blue Mountains World Heritage Area Strategic Plan and 2016 Addendum and any future iterations in place at time of report preparation.</li> </ul>	<p>Technical paper 9 (Heritage) – Chapter 8 (Conclusion).</p>
<b>7.4 – People and communities</b>		
7.4.1	<p>Information required</p> <p>Detailed assessment of impacts that the proposed action may facilitate on people and communities. Including, but not limited to assessment of impacts from noise, change in land use and an assessment of any identified risks to people and communities associated with the proposed action.</p> <p>This should be based on relevant metrics such as the Australian Noise Exposure Concept (ANEC), Australian Noise Exposure Forecast (ANEF) if available, the Number Above ‘N’ measure, and the maximum noise level (<math>L_{Amax}</math>) single event noise measure.</p>	<p>Impact assessment section of technical papers, including:</p> <ul style="list-style-type: none"> <li>• Technical paper 1 (Aircraft noise)</li> <li>• Technical paper 4 (Hazard and risk)</li> <li>• Technical paper 6 (Land use and planning)</li> <li>• Technical paper 10 (Social)</li> <li>• Technical paper 11 (Economic)</li> <li>• Technical paper 12 (Human health)</li> </ul> <p>Corresponding environmental impact assessment chapters (in part C of the EIS).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>Identify whether land uses that are noise sensitive could be affected, directly and indirectly, by the proposal including identification and analysis of impacts to:</p> <ul style="list-style-type: none"> <li>• Health and wellbeing.</li> <li>• Changes to land use and affordability.</li> <li>• Lifestyle and culture.</li> <li>• Social and economic factors.</li> </ul>	<p>Impact assessment section of technical papers, including:</p> <ul style="list-style-type: none"> <li>• Technical paper 1 (Aircraft noise)</li> <li>• Technical paper 4 (Hazard and risk)</li> <li>• Technical paper 6 (Land use and planning)</li> <li>• Technical paper 10 (Social)</li> <li>• Technical paper 11 (Economic)</li> <li>• Technical paper 12 (Human health)</li> </ul> <p>Corresponding environmental impact assessment chapters (in part C of the EIS).</p>
	<p>Discuss recent and proposed changes in planning, such as the aerotropolis precinct, and how these changes will alter the likely impacts to people and communities. Where land use is likely to intensify, assess any foreseeable impacts to new residents and visitors to the region.</p>	<p>Impact assessment section of:</p> <ul style="list-style-type: none"> <li>• Technical paper 6 (Land use and planning)</li> <li>• Technical paper 10 (Social)</li> <li>• Technical paper 11 (Economic)</li> </ul> <p>Corresponding environmental impact assessment chapters (in part C of the EIS).</p>
7.4.2	<p>A discussion of social and economic impacts, including both positive and negative impacts for a range of stakeholders and communities. Include a discussion of impacts to existing and proposed urban, industrial, rural and tourism activities within areas that may be affected by the proposal.</p>	<p>Impact assessment section of:</p> <ul style="list-style-type: none"> <li>• Technical paper 10 (Social)</li> <li>• Technical paper 11 (Economic)</li> </ul> <p>Corresponding environmental impact assessment chapters (in part C of the EIS).</p>
<b>7.5 – Air Pollution</b>	Information required	
7.5.1	<p>Analyse and describe the contribution and impacts of the proposed action on air quality at the relevant local, regional and national scales, having regard to relevant weather characteristics including winds, fogs and temperature inversions and any topographic features which may affect the dispersion of air pollutants.</p>	<p>Chapter 12 (Air quality and greenhouse gas) – Sections 12.3 to 12.5                      Technical paper 2 (Air quality) – Chapter 3 (Methodology), Chapter 6 (Impact assessment) and Appendices C &amp; D.</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	Reference must be made to levels of oxides of nitrogen, hydrocarbons, reactive organic compounds, sulphur dioxide, carbon monoxide, odours, air toxics and ultrafine particles.	Chapter 12 (Air quality and greenhouse gas) – Sections 12.3 to 12.5 Technical paper 2 (Air quality) – Chapter 6 (Impact assessment) and Appendices C and D.
	Include specific reference to impacts on rainwater tanks and drinking water catchment areas from dispersion of air pollutants.	Technical paper 2 (Air quality) – Chapter 3 (Methodology).
	Estimate greenhouse gas emissions and include a discussion on design and procedural measures to reduce such emissions. Provide context and comparisons to other sources at local, regional and national levels as appropriate	Chapter 12 (Air quality and greenhouse gas) – Sections 12.4 and 12.5 Technical paper 3 (Greenhouse gas emissions) – Chapters 3 to 10.
7.5.2	Detail emergency fuel dumping procedures, including designated locations for such contingencies, effects of weather conditions on fuel dumping locations, notification to emergency services of fuel dumping occurring, and effects of fuel dumping.	Technical paper 2 (Air quality) – Chapter 3 (Methodology) Technical paper 4 (Hazard and risk) – Chapter 8 (Assessment of other risks) Corresponding environmental impact assessment chapters (in part C of the EIS).
<b>8 – Proposed safeguards and mitigation measures</b>	<p>The EIS must provide information on proposed safeguards and mitigation measures to deal with the relevant impacts of the action including those required by other Commonwealth, State and local government approvals. Use committed language (e.g. ‘will’) rather than non-committal language (e.g. ‘may’, ‘where possible’, ‘if required’, etc.).</p> <p>The proposed measures must consider the ‘S.M.A.R.T’ principle:</p> <ul style="list-style-type: none"> <li>• S – Specific (what and how);</li> <li>• M – Measurable (baseline information, number/value, auditable);</li> <li>• A – Achievable (timeframe, money, personnel);</li> <li>• R – Relevant (address the impacts identified); and</li> <li>• T – Time-bound (specific timeframe to complete).</li> </ul>	EIS Part C – Environmental impact assessment chapters (Mitigation and management section) Chapter 24 (Mitigation and management) – Section 24.2 Technical papers 1 to 14 (Mitigation and management section).

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>Specific and detailed descriptions of proposed measures must be provided and substantiated, based on best available practices and must include a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action.</p> <p>Provide the following:</p> <ul style="list-style-type: none"> <li>• An assessment of the predicted effectiveness and environmental outcomes of the proposed measures, including details of any baseline data or proposed monitoring required to demonstrate progress towards achieving these outcomes;</li> <li>• Any statutory or policy basis for the mitigation measures;</li> <li>• Any laws or regulations that function to reduce the likelihood or degree of impacts;</li> <li>• Details of ongoing management, including monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed measures, and details of any proposed environmental auditing;</li> <li>• Information on the timing, frequency and duration of the measures to be implemented;</li> <li>• The name of the agency responsible for endorsing or approving a measure or monitoring program; and</li> <li>• The cost of the mitigation measures.</li> </ul>	<p>EIS Part C – Environmental impact assessment chapters (Mitigation and management section)</p> <p>Chapter 24 (Mitigation and management) – Section 24.2</p> <p>Technical papers 1 to 14 (Mitigation and management section).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>9 – Offsets and compensatory measures</b>	<p>a. The EIS must provide details of the likely residual impacts upon a matter protected by a controlling provision after the proposed avoidance and mitigation measures have been taken into account. This includes:</p> <ul style="list-style-type: none"> <li>– the reasons why avoidance or mitigation of impacts may not be reasonably achieved; and</li> <li>– quantification of the extent and scope of significant residual impacts.</li> </ul> <p>b. The EIS must include details of any measures proposed to compensate for residual significant impacts associated with the project, as well as an analysis of how the offset meets the requirements of the department’s <i>Environmental Offsets Policy</i> October 2012 (EPBC Act Offset Policy).</p>	<p>Chapter 25 (Conclusion) – Section 25.2 No offsets are identified for the project.</p>
<b>10 – Other approvals and conditions</b>	<p>The EIS must include information on any other requirements for authorisation or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. Please provide:</p> <p>a. An outline of the role of government authorities in identifying and authorising flight paths and managing airspace;</p> <p>b. Details of any approvals or authorisations that have been obtained or will need to be obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the EPBC Act), including:</p> <ul style="list-style-type: none"> <li>– A summary of any environmental assessment undertaken for the approval of the proposed action;</li> <li>– Any conditions that apply to the proposed action;</li> <li>– How the instrument provides for the prevention, minimisation and management of any relevant impacts; and</li> <li>– A description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.</li> </ul>	<p>Chapter 1 Introduction – Section 1.3.</p> <p>Chapter 5 (Statutory context) – Section 5.2 Chapter 10 (Approach to impact assessment).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>c. The EIS must include information on how the action relates to any other actions (of which the proponent should be reasonably aware) including:</p> <ul style="list-style-type: none"> <li>– The proposal’s interaction with local and regional planning aims and strategic implications for population growth and urban expansion; and</li> <li>– Identifying any potential land use conflicts (such as those that may result from the impact of aircraft noise and any change to the Obstacle Limitation Surface).</li> </ul>	<p>Chapter 4 (Project setting) – Sections 4.2 and 4.3                      Chapter 5 (Statutory context) – Section 5.4                      Chapter 22 (Cumulative impacts) – Section 22.3                      Chapter 14 (Land use), including Sections 14.5, 14.6 and 14.7                      Technical paper 6 (Land use and planning) – Chapter 2 (Planning framework) and Chapter 3 (Existing environment).</p>
<b>11 – Consultation</b>	<p>The EIS must include discussion of all consultation about the action, including:</p> <ul style="list-style-type: none"> <li>a. any consultation that has already taken place;</li> <li>b. proposed consultation about relevant impacts of the action;</li> <li>c. if there has been consultation about the proposed action, any documented response to, or result of, the consultation;</li> <li>d. identification of affected parties, including a statement mentioning any communities that may be affected and describing their views; and</li> <li>e. a description of how consultation was used in identifying and assessing impacts to heritage.</li> </ul>	<p>Chapter 9 (Community and stakeholder engagement) – Section 9.2.</p> <p>Chapter 9 (Community and stakeholder engagement) – Sections 9.4 and 9.6.</p> <p>Chapter 9 (Community and stakeholder engagement) – Section 9.3.</p> <p>Chapter 9 (Community and stakeholder engagement) – Sections 9.2 and 9.3                      Technical paper 9 (Heritage) – Chapter 3 (Methodology) and Chapter 4 (Existing conditions)                      Technical paper 10 (Social) – Chapter 3 (Methodology), Chapter 4 (Existing environment) and Chapter 5 (Consultation).</p> <p>Chapter 9 (Community and stakeholder engagement) – Sections 9.2 and 9.3                      Technical paper 9 (Heritage) – Chapter 3 (Methodology) and Chapter 4 (Existing conditions).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>The department recommends the following publications are considered in planning and undertaking consultation, particularly with Indigenous communities:</p> <ul style="list-style-type: none"> <li>• Engage Early – Indigenous engagement guidelines</li> <li>• Working Together: Managing Commonwealth Heritage Places.</li> <li>• Working Together: Managing National Heritage Places</li> <li>• The principles of the Burra Charter for best-practice heritage standards.</li> </ul>	<p>Chapter 9 (Community and stakeholder engagement) – Section 9.1                      Technical paper 9 (Heritage) – Chapter 2 (Legislation and strategic context).</p>
<p><b>12 – Environmental record of person(s) proposing to take the action</b></p>	<p>The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:</p> <ol style="list-style-type: none"> <li>a. the person proposing to take the action; and</li> <li>b. for an action for which a person has applied for a permit, the person making the application.</li> </ol> <p>If the person proposing to take the action is a corporation, details of the corporation’s environmental policy and planning framework must also be included.</p>	<p>Appendix A (Proponent details and environmental record).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>13 – Economic and social matters</b>	The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest may include:	Impact assessment section of: <ul style="list-style-type: none"> <li>• Technical paper 10 (Social)</li> <li>• Technical paper 11 (Economic)</li> </ul> Corresponding environmental impact assessment chapters (in part C of the EIS).
	a. details of any public consultation activities undertaken and their outcomes;	Chapter 9 (Community and stakeholder engagement) – Sections 9.2 and 9.3 Technical paper 10 (Social) – Chapter 3 (Methodology), Chapter 4 (Existing environment) and Chapter 5 (Consultation) Technical paper 11 (Economic) – Chapter 5 (Economic impact assessment) Corresponding environmental impact assessment chapters (in part C of the EIS).
	b. projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies;	Chapter 19 (Economic) – Section 19.5 Technical paper 11 (Economic) – Chapter 5 (Economic impact assessment).
	c. employment opportunities expected to be generated by the project;	Technical paper 10 (Social) – Chapter 6 (Impact assessment) Technical paper 11 (Economic) – Chapter 5 (Economic impact assessment) Corresponding environmental impact assessment chapters (in part C of the EIS).
	d. human health impacts arising from the proposal, with reference to the findings of impact assessments including those relating to noise, air quality, and social/community issues. Give consideration to the demographic characteristics of the sub-region such as the prevalence of existing medical conditions and capacity of health services.	Technical paper 10 (Social) – Chapter 6 (Impact assessment) Technical paper 12 (Human health) – Chapter 4 (Existing conditions), Chapter 5 (Assessment of health impacts: changes in air quality), Chapter 6 (Assessment of health impacts: changes in noise) and Chapter 7 (Assessment of health impacts: changes in hazard and risks). Corresponding environmental impact assessment chapters (in part C of the EIS)
	e. impacts on potential Native Title claimants; and	Technical paper 9 (Heritage) – Chapters 3 (Methodology) Technical paper 10 (Social) – Chapter 4 (Existing environment) and Chapter 6 (Impact assessment).

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
	<p>f. impacts on regional and local communities including impacts on demographic characteristics due to redevelopment or changes in land values.</p>	<p>Technical paper 10 (Social) – Chapter 6 (Impact assessment)                      Technical paper 11 (Economic) – Chapter 5 (Economic impact assessment)                      Technical paper 12 (Human health) – Impact assessment chapters (5 to 7)                      Corresponding environmental impact assessment chapters (in part C of the EIS).</p>
	<p>g. Economic and social impacts should be considered at the local, regional and national levels.</p>	<p>Technical paper 10 (Social) – Chapter 6 (Impact assessment)                      Technical paper 11 (Economic) – Chapter 5 (Economic impact assessment)                      Corresponding environmental impact assessment chapters (in part C of the EIS).</p>
	<p>h. Details of the relevant cost and benefits of alternative options to the proposed action, as identified in section 5 above, should also be included.</p>	<p>Chapter 6 (Project development and alternatives) – Section 6.3                      The costs and benefits have not been quantified. However, the development of the preliminary flight path design considered a range of factors in addition to safety, including capacity to meet demand, efficiency of the airspace and minimising the adverse effects on the environment. This chapter also details the consequences of not proceeding with the project.</p>
<p><b>14 – Information sources provided in the EIS</b></p>	<p>For information given in a draft EIS, the draft must state:</p> <ol style="list-style-type: none"> <li>the source of the information;</li> <li>how recent the information is;</li> <li>how the reliability of the information was tested; and</li> <li>what uncertainties (if any) are in the information.</li> </ol>	<p>EIS, including:</p> <ul style="list-style-type: none"> <li>Part C – Environmental impact assessment</li> <li>Chapter 26 (References)</li> <li>Technical papers 1 to 14 (References, and limitations &amp; assumptions, sections).</li> </ul>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>15 – Conclusion</b>	<p>An overall conclusion as to the environmental acceptability of the proposal should be provided, including discussion on compliance with principles of Ecologically Sustainable Development and the objects and principles of the EPBC Act at <a href="#">Attachment 1</a>. Reasons justifying undertaking the proposal in the manner proposed should also be outlined.</p> <p>Measures proposed or required by way of offset for any unavoidable impacts on NES matters, and the relative degree of compensation, should be restated here.</p>	Chapter 25 (Conclusion) – Sections 25.2, 25.3, 25.4 and 25.5.
<b>Attachment 1 – The objects and principles of the EPBC Act 1999 – Sections 3 and 3A</b>		
<b>3 – Objects of the Act</b>	<ul style="list-style-type: none"> <li>a. to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;</li> <li>b. to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;</li> <li>c. to promote the conservation of biodiversity;</li> <li>d. to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples;</li> <li>e. to assist in the co-operative implementation of Australia’s international environmental responsibilities;</li> <li>f. to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia’s biodiversity; and</li> <li>g. to promote the use of indigenous peoples’ knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.</li> </ul>	Chapter 25 (Conclusion) – Section 25.3, noting elements extend into relevant considerations such as biodiversity/heritage/other impact areas throughout the EIS.

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>3A – Principles of Ecologically Sustainable Development</b>	<p>The following principles are principles of ecologically sustainable development.</p> <ol style="list-style-type: none"> <li>a. Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.</li> <li>b. If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</li> <li>c. The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.</li> <li>d. The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.</li> <li>e. Improved valuation, pricing and incentive mechanisms should be promoted.</li> </ol>	<p>Chapter 25 (Conclusion) – Section 25.4, noting elements extend into relevant considerations such as biodiversity/heritage/other impact areas throughout the EIS.</p>
<b>Attachment 2 – Matters that must be addressed in a PER and EIS (Schedule 4 of the EPBC Regulations 2000)</b>		
<b>1 - General information</b>	<p>1.01 The background of the action including:</p> <ol style="list-style-type: none"> <li>a. the title of the action;</li> <li>b. the full name and postal address of the designated Proponent;</li> <li>c. a clear outline of the objective of the action;</li> <li>d. the location of the action;</li> <li>e. the background to the development of the action;</li> <li>f. how the action relates to any other actions (of which the Proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;</li> <li>g. the current status of the action; and</li> <li>h. the consequences of not proceeding with the action.</li> </ol>	<p>EIS Part A – Background and Part B – The project, including:</p> <ul style="list-style-type: none"> <li>• Chapter 1 (Introduction) – Sections 1.1 and 1.2</li> <li>• Chapter 5 (Statutory context) – Section 5.4</li> <li>• Chapter 6 (Project development and alternatives) – Sections 6.1 and 6.3</li> <li>• Appendix A (Proponent details and environmental record).</li> </ul>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<p><b>2 - Description</b></p>	<p>2.01 A description of the action, including:</p> <ul style="list-style-type: none"> <li>a. all the components of the action;</li> <li>b. the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;</li> <li>c. how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;</li> <li>d. relevant impacts of the action;</li> <li>e. proposed safeguards and mitigation measures to deal with relevant impacts of the action;</li> <li>f. any other requirements for approval or conditions that apply, or that the Proponent reasonably believes are likely to apply, to the proposed action;</li> <li>g. to the extent reasonably practicable, any feasible alternatives to the action, including: <ul style="list-style-type: none"> <li>i. if relevant, the alternative of taking no action;</li> <li>ii. a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action; and</li> <li>iii. sufficient detail to make clear why any alternative is preferred to another;</li> </ul> </li> <li>h. any consultation about the action, including: <ul style="list-style-type: none"> <li>i. any consultation that has already taken place;</li> <li>ii. proposed consultation about relevant impacts of the action; and</li> <li>iii. if there has been consultation about the proposed action — any documented response to, or result of, the consultation; and</li> <li>iv. identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.</li> </ul> </li> </ul>	<p>Chapter 6 (Project development and alternatives) – Sections 6.1 and 6.3</p> <p>Chapter 7 (The project) – all sections</p> <p>Chapter 9 (Community and stakeholder engagement) – Sections 9.2 and 9.3</p> <p>EIS Part C – Environmental impact assessment chapters (Impact assessment section)</p> <p>Chapter 24 (Mitigation and management) – Section 24.2.</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>3 - Relevant impacts</b>	<p>3.01 Information given under paragraph 2.01(d) must include</p> <ul style="list-style-type: none"> <li>a. a description of the relevant impacts of the action;</li> <li>b. a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;</li> <li>c. a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;</li> <li>d. analysis of the significance of the relevant impacts; and</li> <li>e. any technical data and other information used or needed to make a detailed assessment of the relevant impacts.</li> </ul>	<p>EIS Part C – Environmental impact assessment chapters (Impact assessment section)</p> <p>Technical papers 1 to 14 (Impact assessment section).</p>
<b>4 - Proposed safeguards and mitigation measures</b>	<p>4.01 Information given under paragraph 2.01(e) must include:</p> <ul style="list-style-type: none"> <li>a. a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;</li> <li>b. any statutory or policy basis for the mitigation measures;</li> <li>c. the cost of the mitigation measures;</li> <li>d. an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;</li> <li>e. the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and</li> <li>f. a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the Proponent.</li> </ul>	<p>EIS Part C – Environmental impact assessment chapters (Mitigation and management section)</p> <p>Chapter 24 (Mitigation and management) – Section 24.2</p> <p>Technical papers 1 to 14 (Mitigation and management section).</p>

Requirement	Paragraph	Where addressed ( <i>note that Technical Papers contain further details on where the EIS Guidelines have been addressed as relevant</i> )
<b>5 - Other Approvals and Conditions</b>	5.01 Information given under paragraph 2.01(f) must include: <ul style="list-style-type: none"> <li>a. details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:                             <ul style="list-style-type: none"> <li>i. what environmental assessment of the proposed action has been, or is being carried out under the scheme, plan or policy; and</li> <li>ii. how the scheme provides for the prevention, minimisation and management of any relevant impacts;</li> </ul> </li> <li>b. a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;</li> <li>c. a statement identifying any additional approval that is required; and</li> <li>d. a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.</li> </ul>	Chapter 5 (Statutory context) – Section 5.2.
<b>6 - Environmental record of person proposing to take the action</b>	6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against: <ul style="list-style-type: none"> <li>a. the person proposing to take the action; and</li> <li>b. for an action for which a person has applied for a permit, the person making the application.</li> </ul>	Appendix A (Proponent details and environmental record).
	6.02 If the person proposing to take the action is a corporation — details of the corporation’s environmental policy and planning framework.	The person is not a corporation.
<b>7 - Information sources</b>	7.01 For information given the EIS must state: <ul style="list-style-type: none"> <li>a. the source of the information; and</li> <li>b. how recent the information is; and</li> <li>c. how the reliability of the information was tested; and</li> <li>d. what uncertainties (if any) are in the information.</li> </ul>	Technical papers 1 to 14 (References, and limitations & assumptions, sections).

# Appendix D

List of persons and agencies consulted  
during the preparation of the Draft EIS

---

## List of persons and agencies consulted during the preparation of the Draft EIS

Stakeholder group	Stakeholder
Australian Government agencies and authorities	Department of Infrastructure, Transport, Regional Development, Communications and the Arts WSA Airservices Australia Civil Aviation Safety Authority (CASA) Department of Agriculture, Water and the Environment/Department of Climate Change, Energy, the Environment and Water Department of Defence.
NSW Government agencies, authorities and organisations	Transport for NSW Sydney Metro Department of Planning and Environment Western Parkland City Authority Sydney Water Corporation Department of Premier and Cabinet Greater Cities Commission Infrastructure NSW Water NSW Western Sydney Parklands Trust Environment Protection Authority Department of Education NSW Health South-Western Sydney Local Health District Western Sydney Local Health District.
Local government	Blacktown City Council Blue Mountains City Council Camden Council Campbelltown City Council Fairfield City Council Hawkesbury City Council Liverpool City Council Penrith City Council Wollondilly Shire Council Canterbury-Bankstown City Council Cumberland City Council The Hills Shire Council City of Parramatta Council Sutherland Shire Council.

Stakeholder group	Stakeholder
Aviation	General Aviation Advisory Network Aeria Management (formerly Sydney Metro Airports (Bankstown and Camden)) Sydney (Kingsford Smith) Airport Regional Aviation Association Australia NSW Rural Fire Services NSW Fire & Rescue NSW Police NSW Ambulance Australian Federal Police Board of Airline Representatives of Australia (covers international airlines) Airlines Freight companies (DHL, FedEx, Toll etc) Flying schools Corporate charter organisations Recreational flying companies and individuals Sport aviation groups.
First Nations	Deerubbin Local Aboriginal Land Council Gandangara Local Aboriginal Land Council Murru Mittigar Dharug strategic management group Darug Tribal Aboriginal Corporation Darug Custodian Aboriginal Corporation Dharug Ngurra Aboriginal Corporation Western Sydney Aboriginal Regional Alliance Tharawal Local Land Council Tharawal Aboriginal Corporation Cubbitch Barta Gundungurra Tribal Council Aboriginal Corporation Gundungurra Aboriginal Heritage Association Blue Mountains Aboriginal Culture and Resource Centre Blue Mountains World Heritage Advisory Committee Metropolitan Local Aboriginal Land Council La Perouse Local Aboriginal Land Council Dharug Knowledge Holders Dharawal Knowledge Holders Gundungurra Knowledge Holders.

Stakeholder group	Stakeholder
Peak bodies, think-tanks and advocacy groups	Tourism and Transport Forum Committee for Sydney Western Sydney Leadership Dialogue Infrastructure Partnerships Australia Urban Development Institute of Australia Urban Taskforce Property Council of Australia CEDA (Committee for Economic Development of Australia) Business Western Sydney National Growth Areas Alliance Western Sydney Business Connection Regional Development Australia Aerotropolis Multiversity (the University of Newcastle, UNSW Sydney, the University of Wollongong, Western Sydney University and TAFE NSW) Shelter NSW Multicultural NSW Ethnic Communities' Council of NSW Inc.
Environment and Blue Mountains	UNESCO Australian Conservation Foundation The Nature Conservancy Australia NSW National Parks (Blue Mountains Branch) Nature Conservation Council of NSW Blue Mountains Conservation Society Greater Blue Mountains World Heritage Area Advisory Committee (GBMWH AAC) Mulgoa Valley Landcare Group Environmental Defenders Office NSW Environmental Health Australia Friends of the Earth Australia National Parks Association of NSW Give a Dam Greater Sydney Landcare Network The Colong Foundation for Wilderness Blue Mountains Accommodation and Tourism Association Mount Wilson Progress Association Mount Irvine Progress Association Blue Mountains World Heritage Advisory Committee Residents Against Western Sydney Airport (RAWSA).

Stakeholder group	Stakeholder
Tourism	<p>Destination NSW</p> <p>Tourism Australia</p> <p>Tourism and Transport Forum</p> <p>Australian Tourism Export Council</p> <p>Blue Mountains Accommodation and Tourism Association</p> <p>Australian Attractions</p> <p>Business Events Sydney.</p>
Forum of Western Sydney Airport (FOWSA)	<p>FOWSA was established to link the community, government and the Western Sydney Airport Corporation and is made up of members representing:</p> <ul style="list-style-type: none"> <li>• up to 10 community representatives</li> <li>• up to five local government representatives</li> <li>• one NSW Government representative</li> <li>• one regional airport operator representative</li> <li>• up to two representatives of general aviation users</li> <li>• up to two representatives of the major airlines</li> <li>• up to two persons with connections to relevant representative agencies or organisations</li> <li>• an independent Chair</li> <li>• ex-officio members and other members.</li> </ul>
Community representative groups	<p>Western Sydney Aerotropolis, Community Consultative Committee (CCC) and Commissioner</p> <p>Luddenham Progress Association</p> <p>Ethnic Communities Council of NSW</p> <p>Mulgoa Valley Landcare</p> <p>Wallacia Progress Association</p> <p>Mount Wilson Progress Association</p> <p>Mount Irvine Progress Association</p> <p>Residents Against Western Sydney Airport (RAWSA).</p>
Chambers of Commerce	<p>Wentworth Falls Chamber of Commerce and Community</p> <p>Katoomba Chamber of Commerce and Community</p> <p>Penrith Valley Chamber of Commerce</p> <p>Fairfield City Chamber of Commerce</p> <p>Campbelltown Chamber of Commerce</p> <p>Camden Chamber of Commerce and Industry</p> <p>Liverpool Chamber of Commerce and Industry</p> <p>Narellan Chamber of Commerce</p> <p>Blue Mountains Business Chamber</p> <p>Greater Blacktown Business Chamber</p> <p>Blaxland and Districts Chamber of Commerce</p> <p>Sydney Hills Chamber of Commerce.</p>

Stakeholder group	Stakeholder
Health and education services	Luddenham Public School
	Holy Family Primary School
	Wallacia Public School
	South Western Sydney Local Health District
	Luddenham Medical Centre
	Bush Babies Pre-School Warrimoo.

---

# Appendix E

## Project coordinates

---

## Project coordinates

Given the project does not have a physical boundary, the project coordinates represent the centre of Runway 05/23 at Western Sydney International. Aircraft are expected to operate up to approximately 20,000 ft (6 km) and higher within 45 nautical miles of WSI.

GDA94 MGA56	WGS84
X: 288489	Lat: -33.8833
Y: 624829	Long: 150.7130

# Appendix F

Background to the draft Western Sydney  
International noise insulation and property  
acquisition policy

---

# Overview of research to inform the draft noise insulation and property acquisition policy for WSI

## F1 Introduction

Under Condition 16(7) of the Western Sydney Airport Plan, DITRDCA is required to develop a noise insulation and property acquisition (NIPA) policy in relation to aircraft overflight noise for buildings outside the airport, having regard for the 24-hour nature of operations at the airport. This condition was included as part of the Government's approval for Stage 1 of WSI for single runway operations and 10 million annual passengers.

Land use planning and development restrictions have been in place for some time in proximity to WSI, including through a range of State Environmental Planning Policies. Outside of these planning restrictions, the primary mechanism to manage aircraft noise within communities is the application of *Australian Standard 2021: Acoustics – Aircraft Noise Intrusion – Building Siting and Construction:2015* (AS2021). The purpose of AS2021 is to inform land use planning of new developments near existing airports (e.g., within ANEF contours) and building requirements associated with noise affected areas. Further information is outlined in Technical paper 6: Land use and planning.

There will still remain residual noise impacts that may not be fully addressed by the flight operations design at existing sensitive buildings and land-uses. DITRDCA recognises this, and the need to preserve living amenity for those most severely affected residents and communities.

The draft NIPA outlines criteria for those properties most severely impacted by aircraft overflight noise who, subject to final government approval, will be eligible for either voluntary acquisition or noise insulation treatment.

In order to inform the development of this policy the Department undertook a review of:

- literature associated with aircraft noise impacts and perceptions of noise
- existing standards and guidelines commonly adopted to reduce aircraft noise impacts
- similar noise insulation and acquisition policies and associated programs that have been implemented in Australia and internationally.

The section below summarises this process and the key findings.

## F2 Aircraft noise treatment

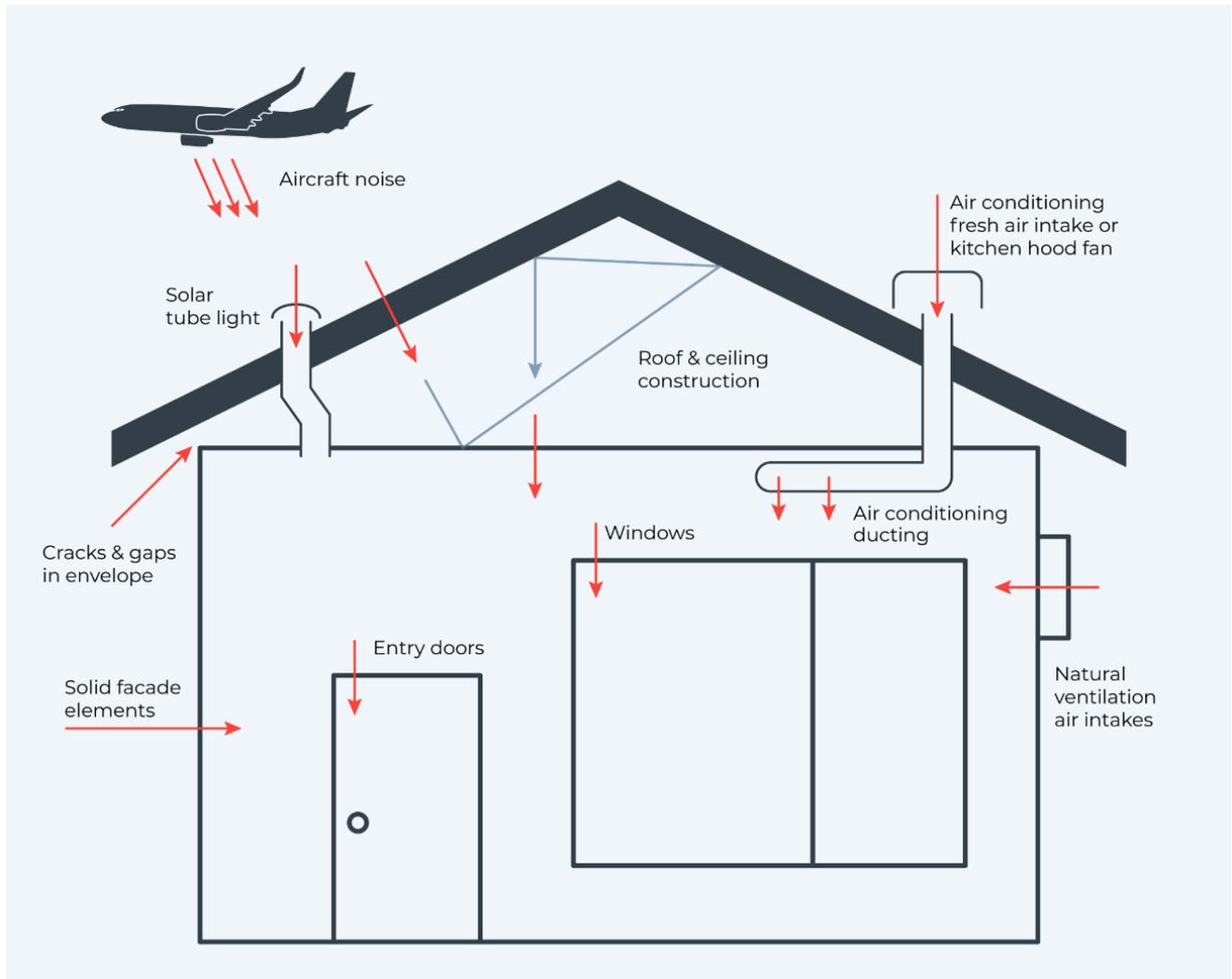
Aircraft noise, a by-product of a growing economy, is considered the most significant cause of adverse community reaction to aviation operations. Given the spread of sound, potentially affected parties include all residents and other noise sensitive land-uses in the areas surrounding airports and under flight paths. For those relatively close to these flight paths, aircraft noise can be well above the background noise. Additionally, aircraft noise events can be infrequent and occur at some of the most sensitive times of the day, including night-time hours.

While it is not possible to guarantee any suburb, group, or individual exemption from aircraft noise exposure, aircraft noise management needs to consider the effects of noise on everyday activities.

Noise, being airborne sound, enters a residential dwelling or building in broadly the same ways that air enters – through openings (windows and doors) and cracks and gaps (window frames, open eaves etc.). The pathways and mechanism for aircraft noise to penetrate a building, via the building envelope elements, is provided in Figure F.1. This figure highlights the common weak points where noise intrusion is greatest, which tends to be the elements that have a low density or a large area.

The main building elements that contribute to noise intrusion within an existing dwelling include:

- cracks and gaps in building envelope at joints (e.g., window/door frames, roof-façade junction, etc.)
- open windows or natural ventilation vents
- closed windows or solar tube lights
- entry doors (e.g., glazed sliding doors or solid core entry doors)
- combined roof and ceiling construction (e.g., steel roof or rooftiles)
- airconditioning ducts or kitchen exhaust fans
- solid façade elements (e.g., masonry, weatherboard, etc.).



**Figure F.1 How sound can permeate into a building**

The overall level of external noise entering a dwelling is the combined effect of all the pathways for sound. Measures to restrict and limit the intrusion of noise within a dwelling therefore need to target the primary (dominant) pathways for sound to achieve an overall reduction to the noise intrusion.

As aircraft fly overhead, the roof area is the largest element of a home exposed to aircraft noise. Aircraft noise usually impacts the façades of a dwelling fairly equally, unlike noise from road traffic where one or two façades of a dwelling tend to experience the majority of the noise. Options to help reduce the amount of aircraft noise within a dwelling may have to consider treatments to all major elements of the building, including the roof and ceilings.

An aircraft noise event comprises sounds across a wide range of frequencies. At its source aircraft noise contains high, mid, and low frequency noise. Due to the distances people are located from runways and flight paths, it is often the residual low frequency aircraft noise that can cause annoyance.

Low frequency sound can penetrate buildings, and in some cases induce perceptible vibration of elements such as glazing and light weight walls. The standard sound insulation of a dwelling does not always sufficiently reduce low frequency noise, and to achieve an overall improvement to the internal noise environment the intrusion of the low frequency noise needs to be controlled.

Due to its acoustic characteristics, low frequency noise can be difficult to attenuate. To improve the low frequency sound insulation performance of building elements, the following two principles apply:

- Increasing the weight or density of the element. (e.g., adopting concrete or masonry wall constructions, increasing the glazing thickness of windows, and adding additional layers of plasterboard)
- increasing the width of the cavity between two construction elements. (e.g., implementing timber stud constructions and double glazing). The sound energy dissipates across the air gap introduced by the cavity.

Good acoustic design for properties and buildings should incorporate one or both of these principles. It is good practice to first mitigate noise intrusion via the weakest elements to achieve a suitable reduction in noise and provide a cost-effective solution. For example, upgrading window glazing would result in a more noticeable improvement compared to upgrading a solid masonry wall.

In most cases the effectiveness of noise reduction measures to a home or dwelling requires the external windows and doors to be kept closed. Any open windows or doors can substantially limit the level of aircraft noise reduction that could be achieved. Requirements to close windows and doors are usually accompanied by complementary measures to ensure adequate air flow and ventilation within a dwelling.

Referencing *Reducing Aircraft Noise in Existing Homes* provided by Perth Airport, a summary of the conventional options available to reduce the intrusion of aircraft noise to existing homes is provided in Table F.1.

**Table F.1 Practical ways to reduce noise levels in a home<sup>1</sup>**

Option	Example treatment	Potential noise reductions
<b>Sealing gaps around doors and windows</b>	<ul style="list-style-type: none"> <li>• Caulking gaps around window frames with a mastic sealant.</li> <li>• Sealing larges gaps (&gt;15 mm) with expandable foam.</li> <li>• Installing compressible seals to window and door frames.</li> <li>• Installing seals to door thresholds.</li> </ul>	<ul style="list-style-type: none"> <li>• Reductions up to 10 dB (possibly higher) can be achieved.</li> </ul>
<b>External doors</b>	<ul style="list-style-type: none"> <li>• Replace or upgrade hollow doors.</li> <li>• Install perimeter seals to door frames.</li> </ul>	<ul style="list-style-type: none"> <li>• Hollow doors can reduce noise by approximately 18 dB(A).</li> <li>• Solid core doors with acoustic seals can improve noise reduction to up to 30 dB(A).</li> </ul>
<b>Closing vents in walls and ceilings</b>	<ul style="list-style-type: none"> <li>• Grouting up wall vents or covering over with fibre cement sheeting.</li> <li>• Removing vents in walls that are not currently in use and sealing over the openings.</li> </ul>	<ul style="list-style-type: none"> <li>• Reductions up to 10 dB (possibly higher) can be achieved.</li> </ul>
<b>Ventilation</b>	<ul style="list-style-type: none"> <li>• Closing windows.</li> <li>• Install small fans in the roof with acoustic seals and ductwork.</li> <li>• Install an acoustic baffle over ceiling exhaust fans.</li> <li>• Avoid through-wall air conditioning systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Reductions up to 10 dB (possibly higher) can be achieved.</li> </ul>

Option	Example treatment	Potential noise reductions
<b>Roofs and ceilings</b>	<ul style="list-style-type: none"> <li>• Add thermal insulation above the ceiling.</li> <li>• Use surface mounted or drop lights.</li> <li>• Lay plasterboard over joists and add insulation above the plasterboard.</li> <li>• Install loaded vinyl noise blanket over insulation and joists.</li> </ul>	<ul style="list-style-type: none"> <li>• Reductions greater than 10 dB can be achieved.</li> </ul>
<b>Windows</b>	<ul style="list-style-type: none"> <li>• Increasing the thickness of single glazing.</li> <li>• Install double glazing (two panes of glass with an air gap).</li> <li>• Consider awning windows rather than sliding windows.</li> </ul>	<ul style="list-style-type: none"> <li>• Improvements to single glazing can reduce noise by up to 8 dB.</li> <li>• Upgrading to double glazing is more effective and can reduce noise by 10 dB or more.</li> </ul>
<b>Other elements</b>	<ul style="list-style-type: none"> <li>• Remove skylights.</li> <li>• Close open eaves.</li> <li>• Insulate the cavity of weatherboard walls.</li> </ul>	<ul style="list-style-type: none"> <li>• Reductions up to 10 dB (possibly higher) can be achieved.</li> </ul>

1. Perth Airport (2016). Reducing Aircraft Noise in Existing Homes

One of the main challenges of an noise insulation program is the range of application, both in terms of volume and breadth of property typologies. Without considering the particularities of WSI’s location and surroundings, it is expected that any program would have to deliver noise treatments to suit a broad range of properties and dwellings – such as single-dwellings, high-density residential, retail and commercial properties. In addition to these building typologies, the building elements presented in Table F.2 may impact individual treatments and therefore cost of noise treatments.

**Table F.2 Summary of noise insulation cost considerations**

Cost consideration	Description
<b>Pre-1980’s construction</b>	Dwellings constructed prior to 1980 are highly likely to contain hazardous materials (e.g., asbestos) and will require removal and remediation. In some overseas programs (e.g., Sea-Tac) the airport required residents to remove/treat hazardous materials, at their own cost, before amelioration. Managing a program this way for WSI may reduce cost and risk but may raise issues of equity for local residents.
<b>Heritage listed buildings</b>	Heritage listed buildings are likely to require bespoke amelioration treatment.
<b>Non-code compliant buildings</b>	Non-code compliant structures may require additional work to be made compliant prior to amelioration work (if deemed eligible).
<b>Respite costs</b>	Some properties (both residential and non-residential) may require temporary relocation while amelioration works are underway.
<b>Rectification costs</b>	If the scheme is to include monitoring post completion of the amelioration program, some properties may require rectification works to meet program objectives and/or internal noise targets (if targets are established).
<b>Unique property features</b>	Properties with unique property features such as oversized windows and bifold external doors can significantly increase the cost of amelioration treatment.

The construction industry is currently experiencing unforeseen increases in construction costs due to a range of factors including increased demand, constrained supply chains, devaluation of the Australian currency, high escalation, rising cost of raw materials, and labour shortages. This creates additional uncertainty and risk regarding the delivery of an amelioration program. Other socio-economic issues such as international conflict and the ongoing impact of COVID-19 further exacerbate this risk.

### F3 Aircraft noise guidelines and standards

There are two main areas to consider when discussing and evaluating noise and noise impacts from aircraft operations; the level and characteristics of the noise, and how the noise is perceived and experienced. The international aviation industry does not have a consistent approach to address these aspects. There are a range of noise levels and noise metrics applied to assess aircraft noise and provide a benchmark for noise reduction and the amelioration of impacts.

However, the overarching principles are generally the same across industry and regulatory bodies – the management of aircraft noise needs to address both the highest levels of noise and the long-term exposure to noise to understand aspects such as annoyance, sleep disturbance, and the effect of noise on health and well-being.

In Australia, the primary mechanism to manage aircraft noise is the application of Australian Standard 2021: *Acoustics – Aircraft Noise Intrusion – Building Siting and Construction:2015* (AS2021). The primary purpose of AS2021 is to inform land use planning for new developments near existing airports. In lieu of a standard to address aircraft noise impacts for existing properties, AS2021 has been used as a guide and benchmark for airport expansions at Sydney’s Kingsford Smith Airport and Adelaide Airport. The standard provides an indoor noise level target for new buildings that can also be used as a benchmark to support recommendations for the treatment of existing buildings.

Other planning policies and guidelines that describe the application of AS2021 for the management of aircraft noise intrusion for new developments near airports include:

- National Airports Safeguarding Framework (NASF); Guideline A
- State Environmental Planning Policy (Western Sydney Aerotropolis) 2021
- other local council development control plans.

Internationally, a range of regulations and guidelines have also been developed. The most recent example is the *Guidelines for Sound Insulation of Residences Exposed to Aircraft Operations* developed in the United States of America by the FAA and released in June 2022. This guideline provides a phased approach to the development of a noise amelioration program including prescribed eligibility criteria and internal noise targets.

The European Union’s (EU) *Environmental Noise Directive* is the main EU instrument to identify noise pollution levels and to trigger the necessary action both at Member State and EU level. However, the directive does not prescribe eligibility criteria or internal noise targets, nor does it prescribe the measures to be included in action plans, thus leaving those issues at the discretion of the competent authorities of each Member State.

Research findings suggests that the appropriate noise threshold ranges for night-time sleep disturbance is between 32 dB and 55 dB, and the noise threshold range for general annoyance is between 42 dB and 50 dB. Guideline levels proposed by WHO establish a high standard for managing noise related health effects yet it may not always be possible to achieve these levels with reasonable and practicable measures for aircraft noise management. A desired internal noise target of 50 dB(A) aligns with recommended indoor noise level under AS 2021 for new properties constructed adjacent to an airport.

## F4 Reference years for assessment of aircraft noise exposure

Noise exposure calculations for WSI air traffic are based on projected aircraft movements in the projected demand schedules. For the purpose of the draft EIS, 3 operating years have been modelled (see also Technical paper 1 – Aircraft noise).

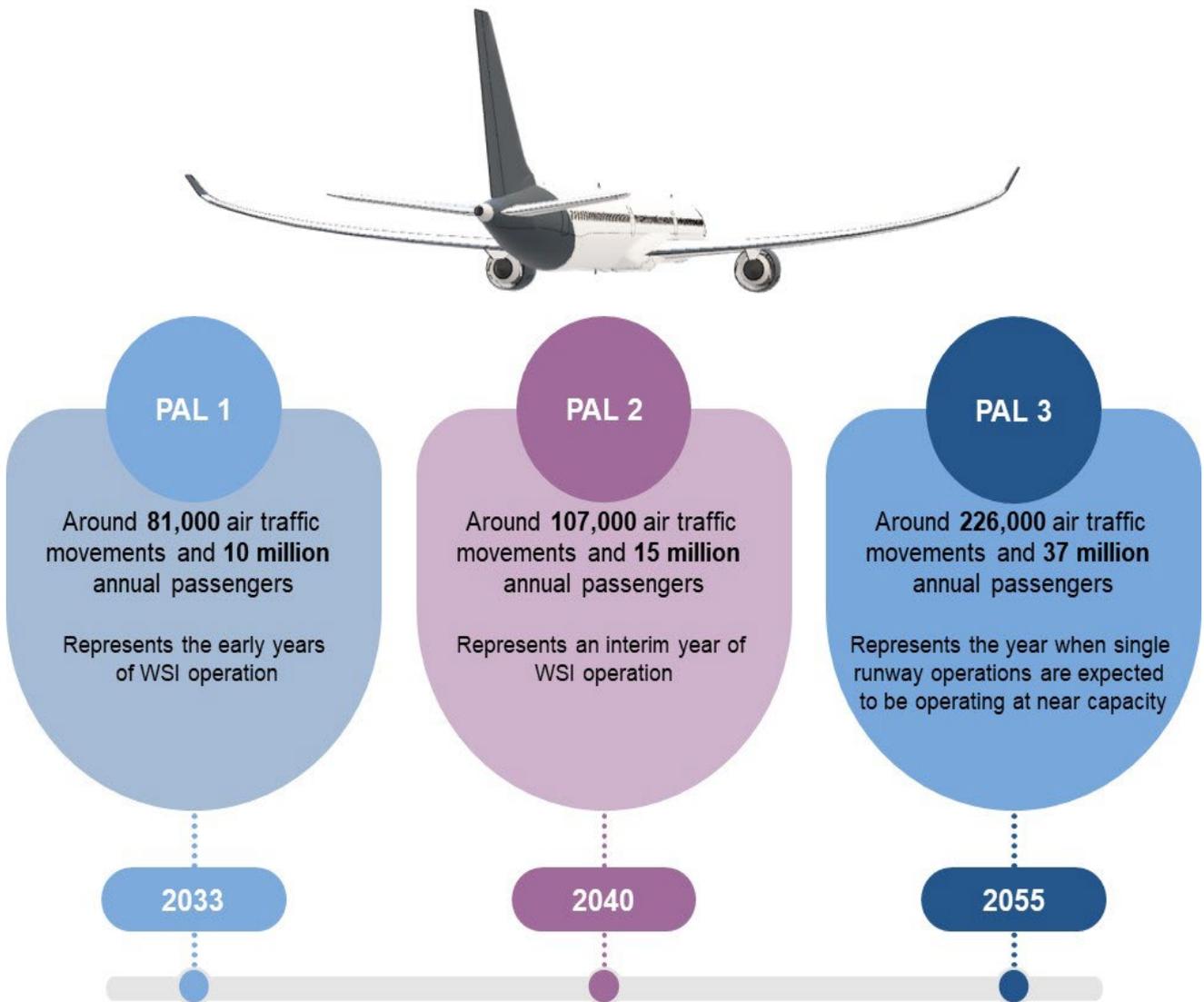


Figure F.2 Reference years for assessment of aircraft noise exposure

## F5 Review of existing noise insulation and acquisition programs

In addition to the review of literature associated with aircraft noise and existing standards and guidelines, a review of similar noise insulation and acquisition policies and associated programs that have been implemented in Australia and internationally was undertaken. This review considered the following aspects:

- a review of the airport's operations, layout, geographical context and surrounding developments
- the eligibility criteria, amelioration treatments implemented, and any unique features associated with the program's delivery
- how the program was rolled out including timeframes, governance and delivery mechanisms (e.g., Government owned and delivered, engagement of a managing contractor to act on behalf of the government or one-off payments provided directed to property owners)
- outcomes of the program including effectiveness, community response and costs
- lessons learnt for the development of a similar program for WSI.

Sydney Kingsford Smith Airport (KSA), Third Runway and Adelaide Airport (ADL) extension of Runway 05/23 are the most relevant Australian examples for WSI.

The following section summarises the policy and associated program for KSA's third runway as well as a summary of lessons learnt from reviewing a number of different Australian and international examples.

### F5.1 Sydney Kingsford Smith Airport (KSA) Third Runway

The KSA program was facilitated by the Federal Airports Corporation, which at the time was a Commonwealth Government business enterprise. Full privatisation of the airport occurred in 2002, therefore the airport was owned by the Government when the amelioration program commenced. Eligibility for the SYD noise amelioration program was determined using Australian Noise Exposure Forecast (ANEF) contours – which uses a historic record of the previous 12 months of aircraft movements to generate 'current' noise exposure levels and geographical areas affected by airport operating procedures including flight paths, operating schedules, aircraft, and engine types.

Eligibility criteria included:

- voluntary acquisition for residential properties, churches, and child-care centres in the Australian Noise Exposure Forecast (ANEF) 40 contour zone
- insulation for schools and colleges, hospitals and healthcare centres and churches within the ANEF 25 contour zone (some with conditions)
- financial and technical assistance for insulation of residential properties within the ANEF 30 contour zone<sup>1</sup>.

The program was developed for existing dwellings, therefore new developments were not eligible for the program.

Eighty-five public buildings were inside the ANEF 25 contour, and the aim was to insulate the noise sensitive areas within the buildings. Given the heritage, design, functional and architectural features of these buildings were quite disparate an acoustic consultant was engaged to assess and recommend a cost effective solution to achieve the noise reduction. Eligibility for the residential insulation program included approximately 4,200 properties and a menu of treatment options was provided for a package approach. This was to provide a cost-effective solution while allowing choice by the homeowner<sup>2</sup>. Approximately 160 properties were eligible for voluntary acquisition.

<sup>1</sup> Department of Transport and Regional Development (1997), [Sydney Airport Noise Amelioration Program](#)

<sup>2</sup> Burgess, M, et. al (2000), [Residential Insulation Scheme Around Sydney Airport](#)

## F5.2 Adelaide Airport (ADL)

The extension of Runway 05/23, completed at the end of 1999, could be seen as the trigger of the ADL noise insulation program. In 2000, the Government introduced a \$63.7 million, four-year Noise Insulation Program for ADL3. The program was established in areas of high aircraft noise exposure around ADL.

Under ADL’s noise amelioration program residential properties in the Australian Noise Exposure Concept (ANEC) 30 and 35 contour and public buildings (non-residential) in the ANEC 25 contour were eligible for noise amelioration. Public buildings included schools, places of worship, day care centres and hospitals.

Approximately 600 residential dwellings and five public buildings were identified within these contours. Majority of the eligible residential properties were single dwellings built between 1920 and 1970.

Amelioration treatments included, but was not limited to:

- up-rated single glazing or double glazing
- up-rated external doors
- up-rated roof/ceiling insulation.

Based on a property assessment, a noise amelioration package was tailored to the individual property requirements.

By 2010, all eligible residential properties had been ameliorated. Amelioration treatments works on some public buildings continued until 2012 when the Government closed the program.

A comparison of the key eligibility criteria for these two treatment programs is provided in Table F.3.

**Table F.3 Key eligibility criteria, KSA and ADL**

Eligibility	Sydney Kingsford Smith Airport Third Runway	Adelaide Airport
Acquisition	ANEF 40	–
Amelioration (residential)	ANEF 30	ANEF 30
Amelioration (non-residential)	ANEF 25	ANEF 25

## F5.3 Other programs

A review of several Australian and international amelioration programs found that airports tend to approach the amelioration of aircraft noise for impacted properties differently. These differences range from the way eligibility is determined, through to how the programs are delivered. In addition, each jurisdiction around the world uses different noise impact metrics, therefore it is challenging to directly compare eligibility criteria.

Some of the key lessons learnt for consideration for an amelioration program for WSI include:

- In Australia, the ANEF/ANEI contours are the ‘standard’ approach to identify eligibility based on noise. Over time this has been criticised as not addressing the full range of issues caused by aircraft noise. Airservices Australia has now increased requirements for assessing the impact of noise on populations from flight path changes (in conjunction with *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) requirements). This provides the potential opportunity to supplement eligibility with additional noise levels and metrics.
- Most programs used an annual average or annual average maximum noise metric to determine eligibility. Some airports adopted additional ‘peak event’ type noise metrics to address properties impacted by night-time noise.
- Most amelioration programs are centrally managed by either private providers, the airport, or government departments. This often includes technical assessment of properties and engaging prequalified contractors to complete treatment works.

- A new policy and associated noise amelioration program will likely need to be a dynamic program to respond to airport operational changes, post commissioning noise impacts compared to modelled impacts, community feedback, and lessons learnt as the program is delivered. The amelioration programs studied have all been altered or amended over time, often in response to community feedback, changing operational conditions, or changes to noise metrics, measures, or standards.
- Programs with rigorous eligibility assessments, pre-treatment requirements, and multistep centrally managed design processes can result in lengthy timeframes between a property owner applying for the program through to implementation of amelioration treatment. However, this level of rigour and more bespoke approach to amelioration may result in greater community acceptance.
- Periodic auditing is a useful tool to assess the success and up take of the program. Most programs reviewed changed over time in response to community feedback and changing airport conditions.
- Careful consideration should be given to how communications and engagement with the community is undertaken for the program. This is especially relevant for newly established airports without an existing background of aircraft noise.

## F6 Developing of policy

As outlined above, DITRDCA has developed a draft NIPA for public consultation in relation to aircraft overflight noise for buildings outside the airport.



**Australian Government**

**Department of Infrastructure, Transport,  
Regional Development, Communications and the Arts**

