

9 Approach to impact assessment

9.1 Introduction

The Department of Infrastructure and Regional Development is proposing the design, construction and operation of the proposed Western Sydney Airport (proposed airport) to cater for ongoing growth in demand for aviation services in the Sydney region and to support economic and employment growth in Western Sydney. This environmental impact statement (EIS) has been prepared in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to support determination of an Airport Plan under the *Airports Act 1996* (Airports Act).

The revised draft Airport Plan, a companion document to the EIS, will provide the strategic direction for the proposed airport, and includes a specific proposal for the Stage 1 development and an indicative concept for the long term development.

This EIS assesses the Stage 1 development, incorporating a single runway and support facilities to cater for an operational capacity of approximately 10 million annual passengers and approximately 63,000 air traffic movements per year, allowing for the anticipated demand for the first five years of operation.

Volume 2 of the EIS has been prepared to provide a detailed consideration of environmental impacts arising from the Stage 1 development. The assessment is based on construction and operational parameters described in detail in Volume 1 of this EIS and included within Part 3 of the revised draft Airport Plan. The Stage 1 development broadly includes:

- construction activities associated with establishing a graded (level) site, which will include site clearing and major earthworks over approximately 1,150 hectares of the site;
- a 3,700 metre runway positioned on the northern portion of the site on an approximate north-east/south-west or 50/230 degree orientation and a single full length taxiway;
- aviation support facilities including passenger terminals, cargo and maintenance areas, car parks, car rental and navigational instrumentation; and
- operational capacity to accommodate up to 10 million annual passengers (domestic and international) for Stage 1 operations, which along with freight services is equivalent to approximately 63,000 air traffic movements per year.

The proposed airport is expected to be developed progressively as demand increases beyond the predicted capacity of the Stage 1 development. As demand increases beyond approximately 10 million annual passengers, additional aviation infrastructure and aviation support precincts will be developed to add capacity. The need for a second runway will be triggered when the demand approaches 37 million annual passengers by around 2050. The long term capacity of the airport to cater for 82 million passengers is expected to be required by around 2063.

All major infrastructure developments beyond the scope of the Stage 1 development will be subject to additional approvals in accordance with Part 5 of the Airports Act, and do not form part of the development for authorisation under the Airport Plan.

It is recognised that approval of the Stage 1 development would directly facilitate growth of the proposed airport beyond the scope of the development described in the Airport Plan. The progressive expansion of site operations has the potential to increase the level of impacts associated with the airport, particularly in regards to the surrounding community's exposure to aircraft noise.

A strategic level assessment has therefore been undertaken to assess the impacts arising from the long term development and these are presented in Volume 3 of this EIS. The strategic level assessment recognises the uncertainty in predicting impacts that may occur nearly 50 years into the future and the additional approval requirements for all future development. The approach provides flexibility in the master planning process to allow land use changes, technological improvements and changes in operational practices to be reflected in future development scenarios, while providing stakeholders and the community with greater clarity of the likely extent of future changes at the airport site to support the consideration of the Stage 1 development.

It is recognised that aircraft noise is one of the most sensitive issues associated with the development of the proposed airport and an increase in air traffic movements has the potential to increase the level of noise disturbance experienced by the surrounding community. Taking this into account, the EIS has assessed aircraft noise impacts for a 2050 scenario where the single runway is operating at a capacity of around 37 million annual passengers or approximately 185,000 aircraft movements per year. This scenario allows an assessment of the extent of noise exposure and associated potential impacts from the maximum capacity of the single runway that may result from the Stage 1 development.

A summary of assessment scenarios considered within the EIS is presented in Table 9–1. The potential impacts associated with the Stage 1 development are considered for all environmental aspects and are presented in Volumes 2a and 2b of this EIS. The long term development is addressed separately in Volume 3.

Table 9–1 Assessment scenarios

Development stage	Indicative year(s)	Environmental aspects considered	EIS reference
Preparatory activities and Construction	Late-2016 to mid-2020s	All relevant aspects	Volume 2a – Chapters 9 through 26
Stage 1 development (10 million annual passengers, approximately 5 years after the commencement of operations)	2030	All relevant aspects	Volume 2a – Chapters 9 through 27 Volume 2b – Chapters 28 and 29
Long term development Single runway at capacity (37 million annual passengers)	2050	Noise	Volume 3 – Chapter 31
Long term development Two runways operating at capacity (82 million annual passengers)	2063	Strategic assessment for all relevant aspects	Volume 3 – Chapters 31 through 40

9.2 Impact assessment process

The framework for the impact assessment has been designed to provide a structured and objective approach to identifying the proposed airport's environmental, social and economic impacts, and to developing effective mitigation, management and offset measures. The approach has generally involved:

- project definition including analysis of the need and alternatives to address the growing aviation demand in the Sydney basin;
- identification of key issues through reviewing previous investigations, preparation of an EPBC Act referral and a gap analysis and risk assessment process;
- identifying existing environmental, social and economic baseline conditions;
- completion of impact assessments for the project based on the broad parameters presented in the Airport Plan having regard to the baseline conditions;
- refinement of the project having regard to the impact assessments; and
- identification of appropriate mitigation, management, monitoring measures and (where appropriate) offset measures for the identified potential impacts.

The baseline (or existing environment) conditions for the airport site and surrounding locality were derived using a combination of desktop and field investigations relevant to each environmental aspect or value. Where possible, the investigations built on previous studies that have been completed at the airport site.

The impact assessment methodology for each environmental, social and economic value was developed to meet the EIS guidelines issued by the Australian Government Department of the Environment, now called the Department of the Environment and Energy, (see Appendix C (Volume 4)). The intent and objectives of the New South Wales legislative framework and assessment guidelines were also considered where appropriate for each environmental value.

Mitigation and management measures were applied to reduce the level of identified potential impacts. These measures aim to protect the identified environmental values and would be applied as required during the planning and design, construction and operation phases of the project.

A number of monitoring plans would also be developed and implemented to monitor and, in some situations, address various residual impacts associated with the development of the proposed airport.

9.3 Issues identification

9.3.1 Overview

Key issues and risks to be assessed within the EIS were identified using a number of related processes.

The EIS guidelines provide the overall framework of specific matters to be addressed by the EIS. A gap analysis and risk assessment process was undertaken at the start of the assessment to help prioritise key issues and develop the scope of the specialist investigations to be undertaken to support the preparation of the EIS.

Government and community stakeholders were also consulted to help identify their key issues, attitudes and concerns regarding the proposed airport, as outlined in Chapter 8 (Volume 1).

9.3.2 EPBC Act referral

The Department of Infrastructure and Regional Development submitted a referral under the EPBC Act for the Stage 1 development of the proposed airport on 4 December 2014. The referral was available for public comment for 12 business days.

On 23 December 2014, a delegate of the Minister for the Environment determined the proposed Western Sydney Airport to be a controlled action. The referral decision instrument identifies the following controlling provisions under the EPBC Act as being relevant for this proposal:

- world heritage properties (sections 12 & 15A);
- national heritage places (sections 15B & 15C);
- listed threatened species and communities (sections 18 & 18A); and
- Commonwealth actions (section 28).

At the same time the delegate decided that the proposed airport development would be assessed by preparation of an EIS.

Tailored guidelines for the preparation of a draft EIS were issued by the Department of the Environment on 29 January 2015. The EIS guidelines detail the information about the proposed airport and its relevant impacts that must be provided in the EIS; these are presented in full in Appendix B (Volume 4). The EIS guidelines also include a range of general requirements for the format and style of the EIS, together with specific requirements for the content of the EIS.

Table 9–2 provides a summary of the specific guideline requirements and identifies where in the EIS they have been addressed for the Stage 1 development.

Table 9–2 EIS guidelines

EIS guideline requirement	Where it is addressed
Section 1 – General information	
<p>This should provide the background and context for the action including:</p> <ul style="list-style-type: none"> a. the title of the action; b. the full name and postal address of the designated Proponent; c. a clear outline of the objective of the action; d. the location of the action; e. the background to the development of the action; 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; g. the current status of the action; and h. the consequences of not proceeding with the action. 	Chapters 1 and 2 (Volume 1)
Section 2 – Description of the action	
<p>All construction, operational and (if relevant) decommissioning components of the action should be described in detail. This should include the precise location (including coordinates) of all works to be undertaken, structures to be built or elements of the action that may have impacts on matters of National Environmental Significance.</p> <p>The description of the action must also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for those aspects of the structures or elements of the action that may have relevant impacts.</p>	Chapters 4 to 7 (Volume 1)
Section 3 – Feasible alternatives	
<p>Any feasible alternatives to the action to the extent reasonably practicable, including:</p> <ul style="list-style-type: none"> a. if relevant, the alternative of taking no action; b. a comparative description of the impacts of each alternative on the matters of national environmental significance and other matters protected by controlling provisions of Part 3 of the EPBC Act for the action; and c. sufficient detail to make clear why any alternative is preferred to another. 	Chapter 2 (Volume 1)
Short, medium and long term advantages and disadvantages of the options should be discussed.	
Section 4 – Description of the environment	
<p>(a) Listed threatened species (including suitable habitat) and ecological communities that are or are likely to be present in all areas of potential impact. To satisfy this requirement details must be presented on the scope, timing/effort (survey season/s) and methodology for studies and surveys used to provide information on the relevant listed threatened species/ecological community/habitat (as identified in Attachment 3). This includes details of:</p> <ul style="list-style-type: none"> ▪ how best practice survey guidelines have been applied; and ▪ how surveys are consistent with (or a justification for divergence from) published Australian Government guidelines and policy statements. 	Chapters 16 (Volume 2a) Appendix K1 (Volume 4)

EIS guideline requirement

Where it is addressed

- | | |
|--|--|
| (b) A description of the World Heritage/National Heritage values of the Greater Blue Mountains Area World Heritage property/National Heritage Place, as described in the Statement of Outstanding Universal Value and including reference to the World Heritage criteria the area is listed for as well as the integrity of the property. | Chapters 26 (Volume 2a) and 38 (Volume 3) |
| (c) 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: <ul style="list-style-type: none">▪ ecosystems and their constituent parts, including people and communities;▪ natural and physical resources;▪ the qualities and characteristics of locations, places and areas;▪ heritage values of places; and▪ the social, economic and cultural aspects of a thing mentioned in the preceding dot points. | Chapters 10 to 39 (Volumes 2a, 2b and 3)
Relevant appendices (Volume 4) |

Section 5 – Relevant Impacts

- | | |
|---|---|
| (a) The EIS must include a description of all of the relevant impacts of the action. Relevant impacts are impacts that the action will have or is likely to have on a matter protected by a controlling provision (as listed in the preamble of this document). Impacts during both the construction, operational and (if relevant) the decommissioning phases of the project should be addressed, and the following information provided: <ul style="list-style-type: none">▪ a detailed assessment of the nature and extent of the likely short term and long term relevant impacts (detailing direct and indirect impacts);▪ a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;▪ analysis of the significance of the relevant impacts; and▪ any technical data and other information used or needed to make a detailed assessment of the relevant impacts. | Chapters 10 to 39 (Volumes 2a, 2b and 3)
Relevant appendices (Volume 4) |
| (b) 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).

The EIS should address the potential cumulative impact of the proposal on ecosystem resilience. The cumulative effects of climate change impacts on the environment must also be considered in the assessment of ecosystem resilience. Where relevant to the potential impact, a risk assessment should be conducted and documented. | Chapter 27 (Volume 2a)
Volume 3 |
| (c) The EIS should address the potential for facilitated impacts upon MNES at the local, regional, state, national and international scale. | Chapters 10 to 39 (Volumes 2a, 2b and 3) |
| (d) If the conclusion is made that any relevant controlling provision or element of a relevant controlling provision will not be impacted by the proposed action, then justification must be provided for how this conclusion has been reached. This includes any threatened species or ecological communities that are likely to be present on site, heritage items/places likely to be on site and other relevant elements of the environment that may be impacted by the proposed action. | Chapters 10 to 39 (Volumes 2a, 2b and 3)
Detailed assessment has been undertaken for all controlling provisions. |
| (e) To support the assessment of local historic and indigenous heritage values, the EIS must include a full heritage impact assessment and the findings of the further program of archaeological survey that was foreshadowed in the referral for this project. | Chapters 19, 20 and 39 (Volumes 2a and 3)
Appendices M1 and M2 |

EIS guideline requirement	Where it is addressed
(f) Further details of threatened species and ecological communities protected by the controlling provisions of Part 3 of the EPBC Act are provided at Attachment 3.	Chapters 16 and 39 (Volumes 2a and 3) Appendix K1 (Volume 4)
<ul style="list-style-type: none"> ▪ changes to water quality on site and downstream of the site ▪ changes to siltation ▪ hydrological changes 	Chapters 16, 18, 34 and 39 (Volumes 2a and 3) Appendices K1 and L (Volume 4)
<ul style="list-style-type: none"> ▪ removal and degradation of heritage items/places (historic, natural and indigenous) 	Chapters 19, 20 and 39 (Volumes 2a and 3) Appendices M1 and M2 (Volume 4)
<ul style="list-style-type: none"> ▪ native flora and fauna habitat removal and degradation (on site and in surrounding areas that may be affected by the action) 	Chapters 16 and 39 (Volumes 2a and 3) Appendix K1 (Volume 4)
<ul style="list-style-type: none"> ▪ aircraft noise and vibration impacts on everyday activities and on sensitive environmental receptors (all sensitive receptors within the community and natural environment). Discussion and quantification/modelling of aircraft noise impacts should include consideration of all potential flight paths, height of flights, noise exposure patterns, noise contours, the range of frequencies of the noise, cumulative exposure, peak noise, frequency of overflights and temporal variability of this (including long term trends), varying aircraft types, varying aircraft operating procedures, and variations in noise patterns due to seasonal and meteorological factors 	Chapters 10 and 31 (Volumes 2a and 3) Appendices E1 and E2 (Volume 4)
<ul style="list-style-type: none"> ▪ noise and vibration from construction activities and machinery 	Chapter 11 (Volume 2a) Appendix E2 (Volume 4)
<ul style="list-style-type: none"> ▪ changes to air quality during construction and operation (including consideration of seasonal and meteorological variations that influence local air quality) 	Chapters 12 and 32 (Volumes 2a and 3) Appendices F1 and F2 (Volume 4)
<ul style="list-style-type: none"> ▪ potential fuel dumping impacts 	Chapter 7 and 13 (Volume 2a) Appendices F1 and F2 (Volume 4)
<ul style="list-style-type: none"> ▪ changes in traffic movements during construction and operation (associated with both passenger movements and workers) 	Chapters 15 and 33 (Volumes 2a and 3) Appendix J (Volume 4)
<ul style="list-style-type: none"> ▪ bird or bat air strike 	Chapter 14 and 16 (Volume 2a) Appendix I (Volume 4)
<ul style="list-style-type: none"> ▪ lighting impacts on everyday activities and on sensitive environmental receptors (all sensitive receptors within the community and natural environment) 	Chapters 22 and 36 (Volumes 2a and 3) Appendix O (Volume 4)
<ul style="list-style-type: none"> ▪ changes in recreational use and amenity of natural areas 	Chapters 21, 22 and 23 (Volume 2a) Appendices N, O and P1 (Volume 4)
<ul style="list-style-type: none"> ▪ change in qualities and characteristics of the surrounding areas and associated impacts to local communities (including land values and other economic impacts) 	Chapters 21, 22, 23 and 24 (Volume 2a) Appendices N, O, P1, P2 and P3 (Volume 4)

EIS guideline requirement

Where it is addressed

- creation of any risks or hazards to people or property that may be associated with any component of the action.

Chapters 14 and 39
(Volumes 2a and 3)
Appendix H (Volume 4)

Quantification and assessment of impacts should:

- be against appropriate background/baseline levels;
- be prepared according to best practice guidelines and compared to best practice standards;
- consider seasonal and temporal variations where appropriate (including temporal changes in the sensitivity of the receptor); and
- be supported by maps, graphs and diagrams as appropriate to ensure information is readily understandable.

Chapters 10 to 39
(Volumes 2a and 3)
Relevant appendices (Volume 4)

Guidelines and standards used to quantify baselines and impacts should be explained and justified.

Section 6 – Avoidance and mitigation measures

- (a) The EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impact of the action on a matter protected by a controlling provision (as listed in the preamble of this document).

Chapter 28 (Volume 2b)
Relevant appendices (Volume 4)

- (b) The EIS must take into account relevant agreements and plans that cover impacts or known threats to a matter protected by a controlling provision (including but not necessarily limited to):

Chapters 16 and 26 (Volume 2a)
Appendices K1 and K2 (Volume 4)

- (a) any recovery plan and/or conservation advice for the affected species or ecological community;
 - (b) any threat abatement plan for a process that threatens an affected species or ecological community;
 - (c) any wildlife conservation plan for the affected species;
 - (d) any relevant strategic assessment undertaken in accordance with an agreement under Part 10 of the EPBC Act; and
 - (e) For the Greater Blue Mountains Area World Heritage property, the World Heritage Convention; the Australian World Heritage Management Principles; the Greater Blue Mountains Area World Heritage Area Strategic Plan, and relevant NSW National Parks and Wildlife Service/Office of Environment and Heritage Plans of Management.
-

EIS guideline requirement

Where it is addressed

- | EIS guideline requirement | Where it is addressed |
|---|------------------------|
| (c) The EIS must include specific and detailed descriptions of the proposed avoidance and mitigation measures based on best available practices. This must include the following elements : <ol style="list-style-type: none">A consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including:<ul style="list-style-type: none">▪ a detailed description of proposed measures;▪ assessment of the expected or predicted effectiveness of the mitigation measures;▪ any statutory or policy basis for the mitigation measures; and▪ the likely cost of the mitigation measures.A detailed outline of a plan for the continuing management, mitigation and monitoring of relevant matters protected by a controlling provision, including a description of the outcomes that will be achieved and any provisions for independent environmental auditing.Where appropriate, each project phase (construction and operation) must be addressed separately. It must state the environmental outcomes, performance criteria, monitoring, reporting, corrective action, contingencies, responsibility and timing for each environmental issue.The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program. | Chapter 28 (Volume 2b) |

Section 7 – Residual impacts and offsets

- | | |
|---|---|
| Residual impacts | Chapters 10 to 28
(Volumes 2a and 2b) |
| (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: <ol style="list-style-type: none">the reasons why avoidance or mitigation of impacts may not be reasonably achieved; andquantification of the extent and scope of significant residual impacts. | |
| Offset package | Chapter 16 (Volume 2a) |
| (a) The EIS must include details of an offset package to be implemented 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 Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy October 2012 (EPBC Act Offset Policy). | Appendices K1 and K2 (Volume 4) |
| (b) The offset package can comprise a combination of direct offsets and other compensatory measures, as long as it meets the requirements of the EPBC Act Offset Policy. Offsets should align with conservation priorities for the impacted protected matter and be tailored specifically to the attribute of the protected matter that is impacted in order to deliver a conservation gain. | Chapter 16 (Volume 2a)
Appendices K1 and K2 (Volume 4) |
| (c) Offsets should compensate for an impact for the full duration of the impact. | Chapter 16 (Volume 2a)
Appendices K1 and K2 (Volume 4) |
| (d) Offsets must directly contribute to the ongoing viability of the protected matter impacted by the project and deliver an overall conservation outcome that maintains or improves the viability of the protected matter, compared to what is likely to have occurred under the 'status quo' (i.e. if the action and associated offset had not taken place). | Chapter 16 (Volume 2a)
Appendices K1 and K2 (Volume 4) |
| (e) Note: offsets do not make an unacceptable impact acceptable and do not reduce the likely impacts of a proposed action. Instead, offsets compensate for any residual significant impact. | Chapter 16 (Volume 2a)
Appendices K1 and K2 (Volume 4) |

EIS guideline requirement	Where it is addressed
(f) The EIS must provide: <ul style="list-style-type: none"> i details of the offset package to compensate for significant residual impacts on a protected matter; and ii an analysis of how the offset package meets the requirements of the EPBC Act Offsets Policy. 	Chapter 16 (Volume 2a) Appendices K1 and K2 (Volume 4)
Section 8 – Environmental Record	
(a) The information provided must include details of any past or current 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"> i the person proposing to take the action; and ii the person making the application for any related permits. 	Appendix A (Volume 4)
(b) 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.	Appendix A (Volume 4)
Section 9 – Other approvals and conditions	
The EIS must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. This must include:	
(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"> • what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy; and • how the scheme provides for the prevention, minimisation and management of any relevant impacts; 	Chapter 3 (Volume 1)
(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;	Chapter 3 (Volume 1)
(c) a statement identifying any additional approval that is required; and	Chapter 3 (Volume 1)
(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.	Chapter 28 (Volume 2b)
Section 10 – Economic and social matters	
(a) The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest may include: <ul style="list-style-type: none"> i details of any public consultation activities undertaken, and their outcomes; ii details of any consultation with Indigenous stakeholders; iii projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies; and iv employment opportunities expected to be generated by the project (including construction and operational phases). 	Chapters 24 and 37 (Volumes 2a and 3) Appendices P1, P2 and P3 (Volume 4)
(b) The economic and social impacts must include impacts at the local, regional and national level.	Chapter 23, 24 and 37 (Volumes 2a and 3) Appendices P1, P2 and P3 (Volume 4)

EIS guideline requirement	Where it is addressed
(c) Details of the relevant cost and benefits of alternative options to the proposed action, as identified in Section 3, should also be included.	Chapter 2 (Volume 1)
Section 11 – Information sources	
For information given in the EIS, the EIS must state:	
(a) the source of the information;	Throughout
(b) how recent the information is;	Throughout
(c) how the reliability of the information was tested;	Throughout
(d) what uncertainties (if any) are in the information; and	Throughout
(e) what guidelines, plans and/or policies have been considered during preparation of the EIS.	Throughout
Section 12 – Conclusion	
An overall conclusion as to the environmental acceptability of the proposal on protected matters must be provided, which includes:	Chapters 29 and 40 (Volumes 2a and 3)
(a) a discussion on how consideration has been given to the objects of the EPBC Act, the principles of ecologically sustainable development, and the precautionary principle (as detailed at Attachment 1);	Chapter 29 (Volume 2b)
(b) justification for undertaking the proposal in the manner proposed, including the acceptability of the avoidance and mitigation measures; and	Chapter 29 (Volume 2b)
(c) if relevant, a discussion of residual impacts and any offsets and compensatory measures proposed or required for significant residual impacts on protected matters, and the relative degree of compensation and acceptability.	Chapter 29 (Volume 2b)

9.3.3 Gap analysis

Consideration of the need and potential location of a second Sydney airport has been ongoing for a number of decades and has included the preparation of two previous EISs, in 1985 and 1997–99. Badgerys Creek was initially assessed as the preferred second Sydney airport site in the 1985 *Second Sydney Airport Site Selection Programme Draft Environmental Impact Statement* (1985 EIS) (Kinhill Stearns 1985). The 1997–99 *Second Sydney Airport Proposal Environmental Impact Statement* (1997–99 EIS) (PPK 1997) provides a comprehensive environmental assessment of the site and considered an airport concept (known as ‘Option A’) that had a similar runway configuration to the current proposal.

The previous EISs provided a substantial compilation of environmental baseline conditions and considered potential impacts associated with the development of the proposed airport at the Badgerys Creek site, in the context of the proposed operational parameters and approvals framework at the time of publication of each EIS.

A gap analysis was undertaken to determine the degree to which these previous studies could be relied or expanded upon to address the potential impacts associated with the proposal described in Part 3 of the Airport Plan. The length of time since previous investigations were completed was considered to limit their applicability to the current assessment.

Key observations from the gap analysis included the following:

- introduction of the EPBC Act, which has resulted in a revised Commonwealth statutory environmental assessments framework and increased stakeholder expectations about the level of assessment to be included within an EIS;
- listing of the Greater Blue Mountains Area on the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List;
- an increased emphasis on biodiversity protection and consideration of offset requirements;
- the broadening of the legislative description of threatened species since 1999, at both the State and Commonwealth levels, which has meant that previous mapping of Cumberland Plain Woodland and threatened species at the site would no longer be considered accurate;
- the changing context of the airport site, including the emergence of Western Sydney as a focus for economic and urban growth and the need to consider current strategic land use planning considerations for Western Sydney;
- revised operational parameters for the proposed airport, changes in forecast aircraft fleet mix and improvements in aviation technology since the previous studies, which have the potential to change the predicted environmental performance of the proposed airport; and
- revised standards and stakeholder expectations for data collection, analysis and reporting across a range of environmental disciplines, which have also limited the applicability of the previous assessments.

Despite these limitations, the previous investigations were considered useful to provide a substantial baseline for the identification of some of the key issues to inform the scope of this EIS. Building on the previous studies, a range of specialist investigations were undertaken to support the preparation of the EIS and address the requirements of the EIS guidelines. These investigations are included in Volume 4.

9.3.4 Risk assessment

A risk assessment process was undertaken to build on the identification of issues through the EPBC referral and the gap analysis. The risk assessment was undertaken to help prioritise the assessment and inform the scope of specialist studies. The risk assessment involved the following four main steps:

- identifying environmental aspects;
- identifying the source of potential risks associated with each of these aspects;
- evaluating the risks (including likelihood and severity) and applying a preliminary consideration of potential mitigation measures; and
- considering significant findings, including any residual risks after mitigation measures are applied.

The identified risks were then considered through a risk assessment workshop that involved subject matter experts and the EIS development team. A summary of key issues identified from the risk assessment, and where each risk has been assessed in detail as part of the EIS, is presented in Table 9–3.

Table 9–3 Risk assessment outcomes (initial risk ranking ‘high’ or above) for Stage 1 Development

Issue	Where addressed
Noise and vibration	
Amenity and health impacts caused by exposure to excessive construction noise	Chapters 11 and 13 (Volume 2a) Appendices E2 and G (Volume 4)
Amenity and health impacts caused by short term exposure to road traffic noise (construction traffic, haul, workforce etc.)	Chapters 11 and 13 (Volume 2a) Appendices E2 and G (Volume 4)
Exposure to excessive vibration impacting amenity, and/ or contributing to damage to nearby buildings/ structures.	Chapters 10 and 11 (Volume 2a) Appendices E1 and E2 (Volume 4)
Amenity and health impacts caused by exposure to aircraft noise beyond airport boundary	Chapters 10, 11, and 13 (Volume 2a) Appendices E1, E2 and G (Volume 4)
Amenity and health impacts associated with long term generation of road traffic noise (servicing the airport)	Chapters 11 and 13 (Volume 2a) Appendices E2 and G (Volume 4)
Amenity and health impacts caused by exposure to ground running noise and vibration adjacent to airport e.g. taxiing, refuelling, engine testing, general maintenance etc.	Chapters 11 and 13 (Volume 2a) Appendices E2 and G (Volume 4)
Air quality	
Generation of construction dust leading to amenity and human health impacts	Chapters 12 and 13 (Volume 2a) Appendices F1 and G (Volume 4)
Generation of construction vehicle emissions leading to amenity and human health impacts	Chapters 12 and 13 (Volume 2a) Appendices F1 and G (Volume 4)
Amenity and human health impacts caused by aircraft and other operational emissions (local)	Chapters 12 and 13 (Volume 2a) Appendices F1, F2 and G (Volume 4)
Community health	
Amenity and health impacts associated with potential construction impacts e.g. noise, air quality etc.	Chapter 13 (Volume 2a) Appendix G (Volume 4)
Local health and amenity impacts associated with exposure to operational impacts e.g. noise, air quality, water quality etc. for properties and communities surrounding the airport	Chapter 13 (Volume 2a) Appendix G (Volume 4)
Amenity and health impacts caused by reduction in regional air quality associated with aircraft operations	Chapter 13 (Volume 2a) Appendix G (Volume 4)
Amenity and health impacts caused by noise impacts associated with aircraft operations (over flights)	Chapter 13 (Volume 2a) Appendix G (Volume 4)
Surface transport and access	
Risk of injury or death caused by construction traffic (including haul) interacting with local traffic and pedestrians	Chapter 15 (Volume 2a) Appendix J (Volume 4)
Congestion on existing transport routes caused by increased traffic volumes associated with construction	Chapter 15 (Volume 2a) Appendix J (Volume 4)

Issue	Where addressed
Risk of injury or death caused by operational traffic servicing the airport interacting with local traffic and pedestrians	Chapter 15 (Volume 2a) Appendix J (Volume 4)
Congestion on existing transport routes caused by increased operational traffic servicing the airport	Chapter 15 (Volume 2a) Appendix J (Volume 4)
Regional accessibility insufficient to service the operation of the airport e.g. road network etc.	Chapter 15 (Volume 2a) Appendix J (Volume 4)
Biodiversity	
Clearing of vegetation and earthworks impacting on threatened species and communities	Chapter 16 (Volume 2a) Appendix K1 (Volume 4)
Habitat removal	Chapter 16 (Volume 2a) Appendix K1 (Volume 4)
Construction in waterways/crossings impacting on water quality, threatened species and aquatic habitat	Chapter 16 (Volume 2a) Appendix K1 (Volume 4)
Increased erosion and sedimentation impacting on water quality, threatened species and aquatic habitat	Chapter 16 (Volume 2a) Appendix K1 (Volume 4)
Potential impacts to threatened species, communities and habitat caused by indirect impacts during construction e.g. noise, dust, light	Chapter 16 (Volume 2a) Appendix K1 (Volume 4)
Potential impacts to threatened species, communities and habitat caused by indirect impacts during operation e.g. noise, dust, light	Chapter 16 (Volume 2a) Appendix K1 (Volume 4)
Bird and bat strike—mortality risk to threatened fauna	Chapter 16 (Volume 2a) Appendix K1 (Volume 4)
Hydrology and water quality	
Alteration of local hydrology caused by earthworks and interruption of existing local flow regime	Chapter 18 (Volume 2a) Appendix L1 (Volume 4)
Affectation of stream stability caused by vegetation clearing, earthworks and changes to existing flow regimes (increased flows, concentrated flows etc.)	Chapter 18 (Volume 2a) Appendix L1 (Volume 4)
Increased erosion and sedimentation associated with earthworks, exposed soil surfaces etc.	Chapters 17 and 18 (Volume 2a) Appendices L1 and L2 (Volume 4)
Poor on-site management of sewage effluent during construction causes overflow event/ impacts on water quality	Chapter 18 (Volume 2a)
Poor ongoing on-site management of sewage effluent causing overflow event/ impacts on water quality	Chapter 18 (Volume 2a)
Increase in nutrient/heavy metal pollutants during operation	Chapter 18 (Volume 2a) Appendix L2 (Volume 4)
Reduced groundwater recharge caused by increased impervious surface area	Chapter 18 (Volume 2a) Appendix L3 (Volume 4)

Issue	Where addressed
Hazards and risks	
Accident involving construction vehicle causing fatality or serious injury	Chapter 14 (Volume 2a) Appendix H (Volume 4)
Incident involving the transportation and/ or storage of fuel or other substances causing injury, fatality or environmental impact	Chapter 14 (Volume 2a) Appendix H (Volume 4)
Bird and bat strike causing aircraft accident	Chapter 14 (Volume 2a) Appendix I (Volume 4)
Visual impact	
Presence of construction site and plant in the landscape causing impact to visual amenity	Chapter 22 (Volume 2a) Appendix O (Volume 4)
Unacceptable light spill or visibility for closest residents causing amenity and/ or health impacts (with regard to sleep disturbance- perceived or otherwise)	Chapter 22 (Volume 2a) Appendix O (Volume 4)
Visibility of airport infrastructure, including ancillary facilities such as advertising billboards on airport approaches etc.	Chapter 22 (Volume 2a) Appendix O (Volume 4)
Aboriginal heritage	
Harm to registered Aboriginal artefacts, places and cultural values	Chapter 19 (Volume 2a) Appendix M1 (Volume 4)
Harm to unregistered Aboriginal objects or places	Chapter 19 (Volume 2a) Appendix M1 (Volume 4)
Degradation of surrounding Aboriginal objects, places and cultural values	Chapter 19 (Volume 2a) Appendix M1 (Volume 4)
European and other heritage	
Harm to listed buildings, sites or artefacts	Chapter 20 (Volume 2a) Appendix M2 (Volume 4)
Harm to non-listed buildings, sites or artefacts	Chapter 20 (Volume 2a) Appendix M2 (Volume 4)
Socio-economic	
Significant reduction in business activity and services caused by general access and land use changes associated with construction	Chapters 23 and 24 (Volume 2a) Appendices P1 and P3 (Volume 4)
Difficulty in sourcing of local airport workforce	Chapter 24 (Volume 2a) Appendix P3 (Volume 4)
Planning and land use	
Impacts associated with change of land use on site and off site	Chapters 21 and 23 (Volume 2a) Appendix N (Volume 4)

Issue	Where addressed
Loss of productive agricultural land	Chapter 21 (Volume 2a) Appendix N (Volume 4)
Property values	
Reduction in property values	Chapter 21 (Volume 2a) Appendix P2 (Volume 4)
Geology, soils and topography	
Impacts associated with change in topography e.g. hydrology, visual impact	Chapters 17 and 22 (Volume 2a) Appendix O (Volume 4)
Waste and resources assessment	
Generation of construction waste	Chapter 25 (Volume 2a)
Generation of operational waste	Chapter 25 (Volume 2a)
Cumulative impacts	
Congestion on existing transport routes caused by construction traffic	Chapter 27 (Volume 2a)
Cumulative impacts associated with construction of airport at the same time as other developments e.g. Northern Road deviation, Elizabeth Drive, TransGrid power line relocation etc.	Chapter 27 (Volume 2a)
Congestion on existing transport routes during operation	Chapter 27 (Volume 2a)
Impacts on other airport facilities during operation e.g. Sydney Airport, Bankstown, Camden	Chapters 7 and 27 (Volume 1 and Volume 2a)
Reduction/ impact on natural resources	Chapters 25 and 27 (Volume 2a)

9.4 EIS Volume 2 structure

Volume 2 provides a detailed impact assessment of the Stage 1 development presented in Part 3 of the revised draft Airport Plan. It is in three parts:

- Part D provides a detailed consideration of all environmental aspects potentially affected by the proposed airport;
- Part E provides the environmental management framework and mitigation requirements to be implemented as part of the proposed airport; and
- Part F provides a conclusion about the assessment of impacts.