

Appendix A

Project synthesis

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1. Project synthesis

1.1 Purpose of this document

This project synthesis provides a summary of the Environmental Impact Statement (EIS) for the project in response to the Secretary's environmental assessment requirements (SEARs) issued by Department of Planning, Industry and Environment (DPIE) and detailed in **Table 1-1**. The main body of the EIS should be referred to for further details.

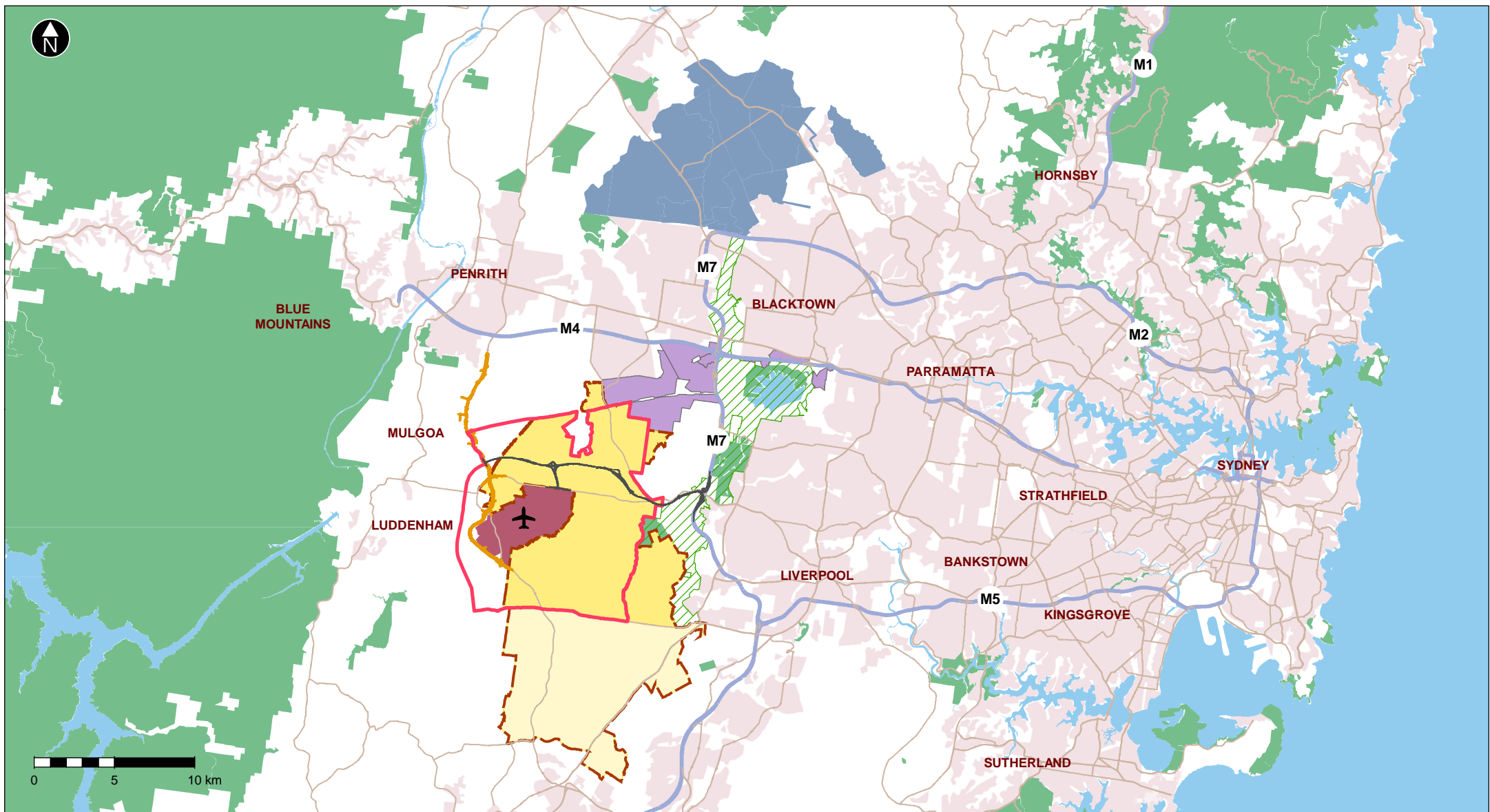
Table 1-1 SEARs relating to the synthesis chapter

General SEARs	Where addressed in this Appendix
Environmental Impact Statement	
1. The EIS must include, but not necessarily be limited to, the following: (p) a chapter that synthesises the environmental impact assessment and provides: <ul style="list-style-type: none">A succinct but full description of the project for which approval is sought;	A succinct description of the project is presented in Sections 1.2 and 1.3
<ul style="list-style-type: none">A description of any uncertainties that still exist around design, construction methodologies and/or operational methodologies and how these will be resolved in the next stages of the project;	Uncertainties are described in Chapter 2
<ul style="list-style-type: none">A compilation of the impacts of the project that have not been avoided;	Impacts that have not been avoided are presented in Sections 3.1 and 3.2
<ul style="list-style-type: none">A compilation of the proposed measures associated with each impact to avoid or minimise (through design refinements or ongoing management during construction and operation) or offset these impacts;	Key impacts are summarised in Section 3.2 , while proposed environmental management measures are summarised in Section 3.3
<ul style="list-style-type: none">A compilation of the outcome(s) the proponent will achieve; and	The project's outcomes are compiled in Chapter 4
<ul style="list-style-type: none">The reasons justifying carrying out the project as proposed, having regard to the biophysical, economic, social considerations, including ecologically sustainable development and cumulative impacts.	A justification is presented in Chapter 5

1.2 Overview of the project

1.2.1 Key features of project

Roads and Maritime Services (Roads and Maritime) proposes to build the M12 Motorway between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham, over a distance of about 16 kilometres, as shown in **Figure 1-1**. The project would provide the main access from the Western Sydney Airport at Badgerys Creek to Sydney's motorway network and is expected to be opened to traffic before the opening of the Western Sydney Airport. The timing of opening of the M12 Motorway is subject to planning approval and completion of detailed design. However, the project is expected to open in 2025.



- The project
- Motorways
- Existing main roads
- The Northern Road upgrade (currently under construction)
- Western Sydney Parklands
- NPWS estate / reserve
- Urban areas
- Main waterbodies
- Growth areas**
- Western Sydney Priority Growth Area
- South West Priority Growth Area
- South West Growth Area
- Western Sydney Airport
- Western Sydney Aerotropolis
- Western Sydney Employment Area
- North West Growth Area

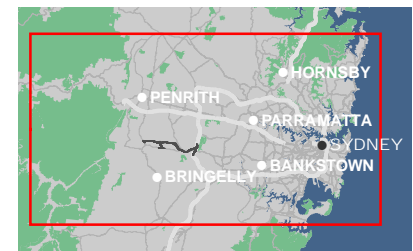


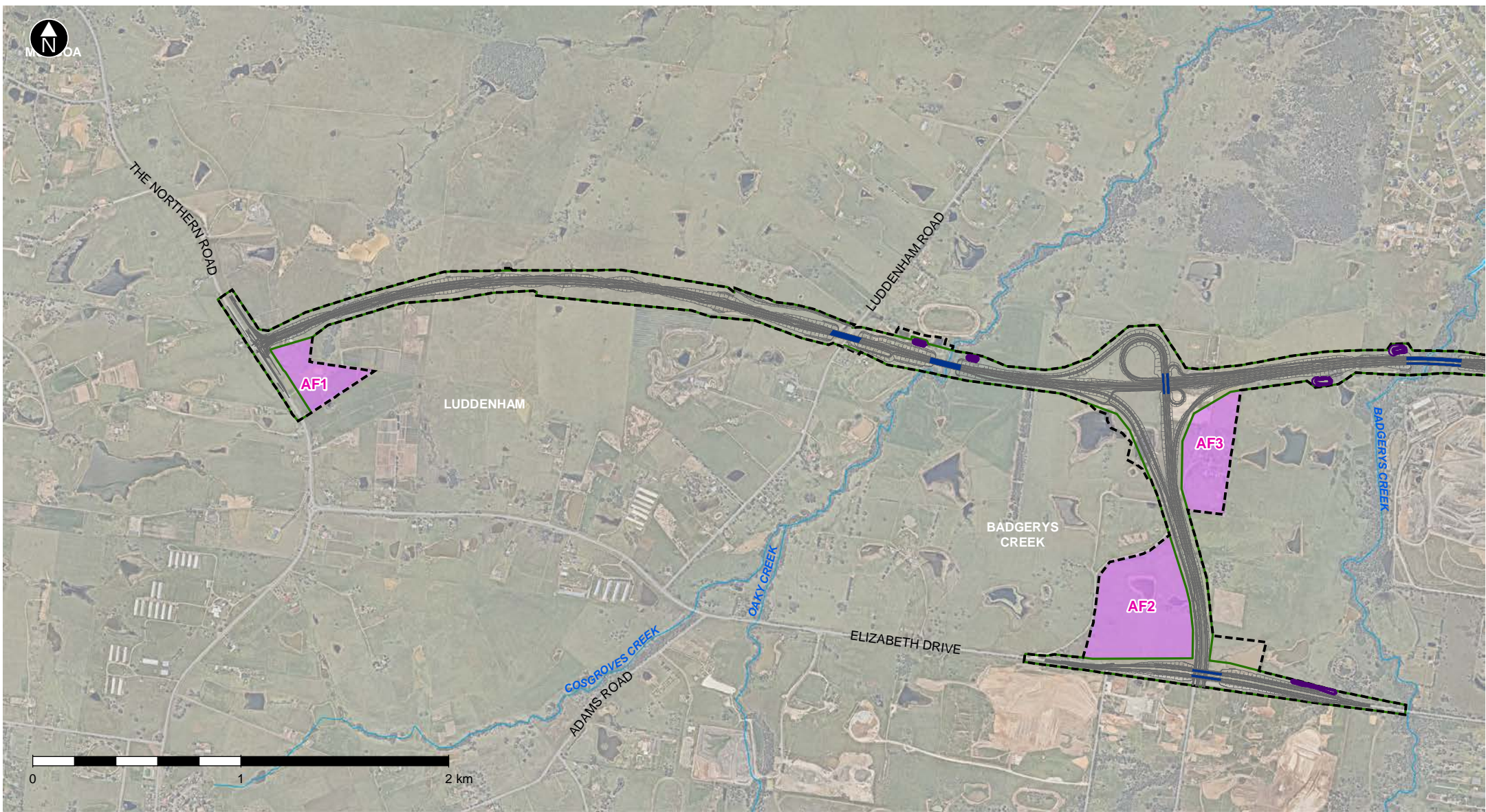
Figure 1-1 Location of the project

The project would include the following key features:

- A new dual-carriageway motorway between the M7 Motorway and The Northern Road with two lanes in each direction with a central median allowing future expansion to six lanes
- Motorway access via three interchanges/intersections:
 - A motorway-to-motorway interchange at the M7 Motorway and associated works (extending about four kilometres within the existing M7 Motorway corridor)
 - A grade separated interchange referred to as the Western Sydney Airport interchange, including a dual-carriageway four lane airport access road (two lanes in each direction for about 1.5 kilometres) connecting with the Western Sydney Airport Main Access Road
 - A signalised intersection at The Northern Road with provision for grade separation in the future
- Bridge structures across Ropes Creek, Kemps Creek, South Creek, Badgerys Creek and Cosgroves Creek
- Bridge structure across the M12 Motorway into Western Sydney Parklands to maintain access to the existing water tower and mobile telephone/other service towers on the ridgeline in the vicinity of Cecil Hills, to the west of the M7 Motorway
- Bridge structures at interchanges and at Clifton Avenue, Elizabeth Drive, Luddenham Road and other local roads to maintain local access and connectivity
- Inclusion of active transport (pedestrian and cyclist) facilities through provision of pedestrian bridges and an off-road shared user path including connections to existing and future shared user path networks
- Modifications to the local road network, as required, to facilitate connections across and around the M12 Motorway including:
 - Realignment of Elizabeth Drive at the Western Sydney Airport, with Elizabeth Drive bridging over the airport access road and future passenger rail line to the airport
 - A realignment of Clifton Avenue over the M12 Motorway, with associated adjustments to nearby property access
 - Relocation of Salisbury Avenue cul-de-sac, on the southern side of the M12 Motorway
 - Realignment of Wallgrove Road north of its intersection with Elizabeth Drive to accommodate the M7 Motorway northbound entry ramp
- Adjustment, protection or relocation of existing utilities
- Ancillary facilities to support motorway operations, smart motorways operation in the future and the existing M7 Motorway operation, including gantries, electronic signage and ramp metering
- Other roadside furniture including safety barriers, signage and street lighting
- Adjustments of waterways, where required, including Kemps Creek, South Creek and Badgerys Creek
- Permanent water quality management measures including swales and basins
- Establishment and use of temporary ancillary facilities, temporary construction sedimentation basins, access tracks and haul roads during construction
- Permanent and temporary property adjustments and property access refinements as required.

The key features of the project are shown in **Figure 1-2**.

A detailed description of the project is provided in Chapter 5 of the EIS. Approval for the project is being sought under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). In addition, the project has been determined as a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act). As such, the project requires assessment and approval under the EPBC Act.



- | | | |
|--------------------------------------|-------------------------------------|--------------|
| — The project | Operational footprint | ~ Waterways |
| Construction footprint | □ The project operational footprint | — Motorway |
| □ The project construction footprint | ■ Bridges | — Main roads |
| ■ Ancillary facilities | ■ Permanent water quality basins | |

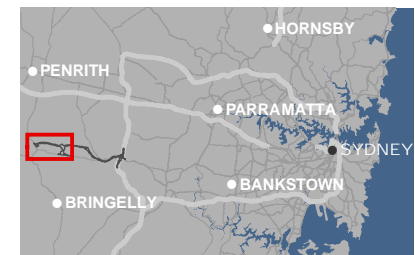
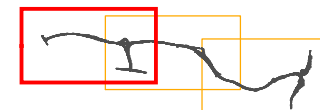


Figure 1-2 Key features of the project

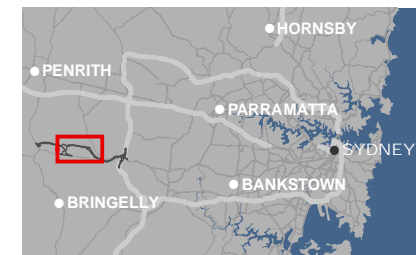
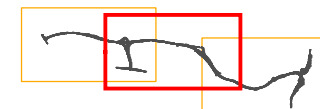
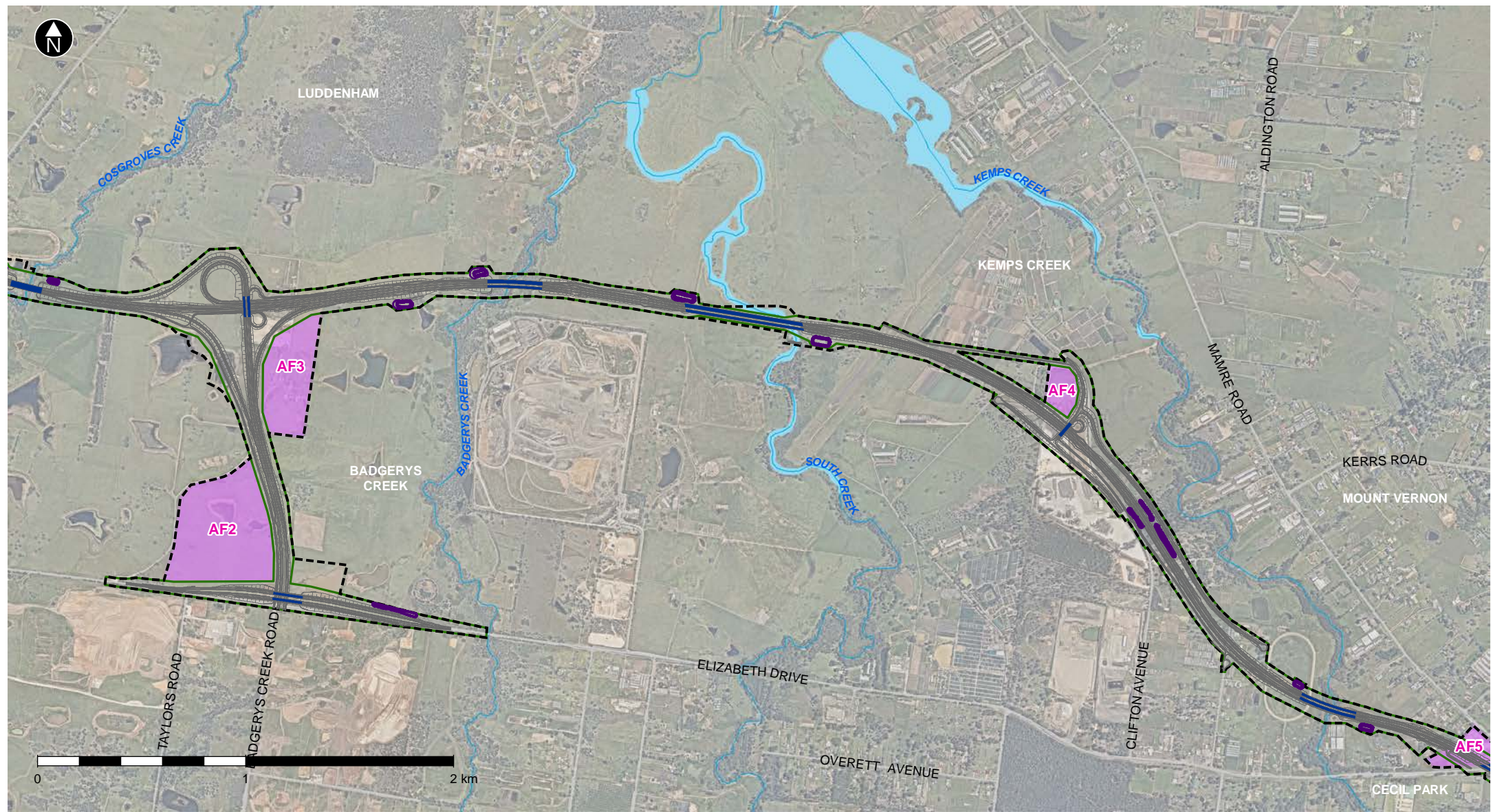
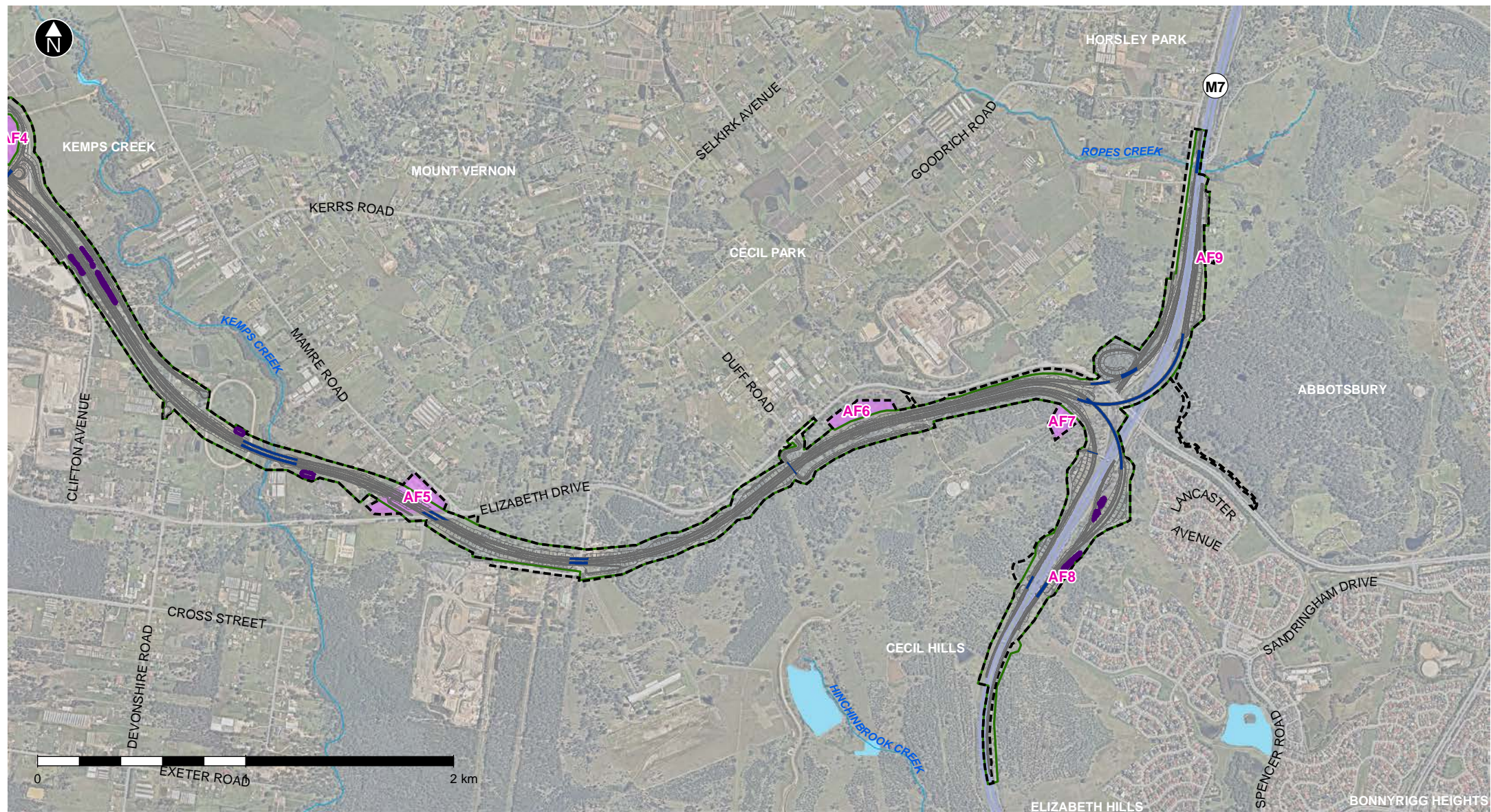


Figure 1-2 Key features of the project



- The project
 - Construction footprint**
 - - - The project construction footprint
 - Ancillary facilities
- | Operational footprint | |
|---|-----------------------------------|
| | The project operational footprint |
| | Bridges |
| | Permanent water quality basins |
- ~~~~~ Waterways
 - Motorway
 - Main roads

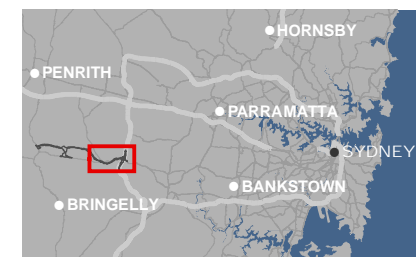
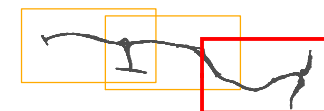


Figure 1-2 Key features of the project

This EIS has been prepared based on a concept design. If approved, the project would be carried out generally in accordance with the description in this EIS and in accordance with any conditions of approval, and taking into account the submissions report and preferred infrastructure report (as required).

The project is required to support the opening of the Western Sydney Airport by connecting Sydney's motorway network to the airport. The project would also serve and facilitate the growth and development within the Western Sydney Aerotropolis (described in **Section 5.1**) and the South West Growth Area (see **Figure 1-1**). The project would provide increased road capacity and reduce congestion and travel times in the future.

The project forms a key part of the **Western Sydney Infrastructure Plan** (WSIP) (Roads and Maritime Services, 2016), a joint initiative of the Australian and NSW governments to fund a \$4.1 billion road and transport linkages investment program for western Sydney. The project currently has combined funding of \$1.8 billion from the Australian and NSW Governments. Construction is expected to start in mid-2022 and finish in 2025 prior to the opening of the Western Sydney Airport.

1.2.2 Project operational components

Interchanges

The project includes the following three key intersections and interchanges, as shown in **Figure 1-2**:

- The M7 Motorway interchange – a grade-separated interchange to facilitate free-flowing connectivity between the M12 Motorway and the M7 Motorway. The project includes the provision of new M7 Motorway tolling gantries on the entries to and exits from the M7 Motorway for the collection of tolls for the use of the M7 Motorway
- The Western Sydney Airport interchange – a grade-separated interchange to facilitate free-flowing access between the M12 Motorway and the airport access road to the Western Sydney Airport
- The Northern Road intersection – an at-grade signalised intersection providing a connection between the M12 Motorway and The Northern Road allowing all left and right turning movements.

Artist's impressions of the three interchanges are provided in **Figure 1-3** to **Figure 1-5**.

Bridges

The project would include 19 new bridge structures along the length of the motorway including:

- Bridges to carry the motorway over waterways and floodplains
 - Designed to mitigate the impact of the project on flooding behaviour and scour potential
 - Designed to provide a minimum level of flood immunity to the M12 Motorway equivalent to the one in 100 year Average Recurrence Interval (ARI) storm event
- Bridges to carry the motorway over existing local roads
- Bridges to support proposed entry and exit ramps as required at the grade separated Western Sydney Airport Interchange and the M7 Motorway Interchange
- Bridges to carry existing local roads over the motorway.

Twin bridges are proposed across the major creeks, being Kemps Creek (about 244 metres in length), South Creek (about 562 metres in length) and Badgerys Creek (about 252 metres in length). Two-lane ramp bridges would be provided for the M12 Motorway to the M7 Motorway southbound (about 680 metres in length) and northbound (about 440 metres in length). Other bridges for local roads and smaller watercourses range from about 46 metres to 140 metres in length. All bridge details are based on the concept design and are subject to change during detailed design.



Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Figure 1-3 Artists impression of M7 Motorway interchange



Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Figure 1-4 Artists impression of Western Sydney Airport interchange



Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Figure 1-5 Artists impression of The Northern Road intersection

Local road changes and upgrades

Several local roads would be affected by the project. Some of these roads would be overpassed while others would be intersected, upgraded or changed to ensure safe and efficient connections with the M12 Motorway. Where the project crosses over a local road on a bridge structure, no works would be expected to be required on those roads. Roads that would be overpassed include the following:

- Range Road, Cecil Park
- Elizabeth Drive, Cecil Park
- Luddenham Road, Luddenham.

Roads to be intersected, upgraded or changed to facilitate the project include the following:

- Wallgrove Road, Cecil Park
- Salisbury Avenue, Kemps Creek
- Clifton Avenue, Kemps Creek
- Elizabeth Drive, Badgerys Creek
- The Northern Road, Luddenham.

1.3 Construction of the project

1.3.1 Key construction activities

Detailed construction planning would be undertaken during detailed design and would consider specific work methods and scheduling to manage community and environmental issues including noise, access, amenity and general disruption and ensure concurrence with current Work Health and Safety legislation.

Equipment and plant requirements would be refined during detailed design and during the development of the construction methodology by the construction contractor. The construction methods and management measures to minimise environmental impacts would be detailed in the construction environmental management plan (CEMP), which would be prepared by the construction contractor.

Construction of the project would generally include the activities described in **Table 1-2**.

Table 1-2 Overview of construction activities

Construction phase	Typical activities
Site establishment and enabling works	<ul style="list-style-type: none">• Site establishment and mobilisation• Early works and property adjustments• Relocation and protection of existing or installation of additional utilities and services• Set up ancillary facilities as needed• Demarcation and fencing of the construction footprint and environmental protection exclusion areas within the footprint• Establish temporary crossings of local roads for haulage routes• Construct local access roads for properties divided by the M12 Motorway• Early stockpiling of fill• Utility works• Heritage salvage or conservation works (as required)• Establish construction ancillary facilities and access• Establish temporary pedestrian and cyclist diversions (as required)

Construction phase	Typical activities
Bulk earthworks and structures	<ul style="list-style-type: none"> • Establish construction traffic management and accesses • Clearing, grubbing and topsoil stripping within the construction footprint • Demolition of existing buildings within the construction footprint • Earthworks and haulage of material • Stockpiling and storage of materials • Excavate new road levels
Construction of drainage structures and creek adjustments	<ul style="list-style-type: none"> • Construct new pits and pipes • Construct new groundwater drainage system • Connect drainage to existing network • Construct water quality basins, constructed wetland, and bioretention facility and basin • Construct drainage channels • Construct spill containment basin • Adjustments to existing drainage infrastructure where impacted • Carry out adjustments of creeks • Demolish and remove redundant drainage (as required)
Construction of bridges	<ul style="list-style-type: none"> • Construct piers and abutments • Construct headstocks • Construct bridge decks, slabs and girders • Demolish and remove temporary crossings
Construction of the M12 Motorway, intersections, interchanges and road widening	<ul style="list-style-type: none"> • Lay select layers and base • Lay road pavement surfacing • Construct pavement drainage • Construct shared path
Finishing works	<ul style="list-style-type: none"> • Landscape works, artwork and urban design elements • Installation of noise management measures • Changes to property access • Line mark to new road surfaces • Installation of signposting, lighting and roadside furniture • Erect toll gantries and other control systems • Finalise tie-in works to other roads and intersections • Demobilisation, decommissioning of ancillary facilities and site rehabilitation

1.3.2 Staging of construction

Construction program

Construction of the project (early works) is expected to commence in the first quarter of 2022 and conclude in 2025 (with decommissioning of ancillary facilities potentially occurring into the first quarter of 2026) with works occurring across the full length of the construction footprint during this period. The overall duration of the project would depend on:

- Timing and outcomes of key decisions regarding procurement, such as early works and contract packaging
- The project delivery method (that is, whether it is 'design and construct' or 'design only' then 'construct only')
- Onsite conditions such as rain events and ground conditions encountered during construction.

The indicative construction program for the project is outlined in **Table 1-3**. The program and duration of activities are indicative only and are subject to change. The timing and duration of construction would be confirmed once a construction contractor is appointed to the project.

Table 1-3 Indicative construction program

Construction Activity	M12 Indicative Construction Program											
	2022			2023			2024			2025		
Mobilisation/Site compounds/Early works												
Property adjustments												
Utilities relocation												
Fencing												
Demolition / Clearing												
Bulk earthworks												
Bridge works												
Drainage												
Pavements												
Barriers												
Landscaping												
ITS												
Lighting												
Signage												
Decommission ancillary sites												

Early works

There would be some mobilisation and site establishment activities before the main construction activities begin. The purpose of these activities would be to prepare the site, gather additional information and install any environmental controls required during construction. These works fall into two main categories for assessment and approval purposes. They are described below.

Early works excluded from the project definition

The project has been declared as Critical State Significant Infrastructure (CSSI) by the NSW Minister for Planning and Public Spaces. Typically CSSI declarations catalogue a list of works that are excluded from the definition of the project and can be carried out as exempt development or through the Part 5, Division 5.1 of the EP&A Act assessment process. These works are, therefore, not bound to the assessment and approval process for the project, or subject to the conditions of approval. Such works may include surveys, test drilling, test excavations, geotechnical or contamination investigations or other tests, utility location identification or surveys, sampling or investigation for the purposes of the design or assessment of the project.

Early works controlled by the approval

Some early works that are not able to be carried out as exempt development or through the Part 5, Division 5.1 of the EP&A Act assessment process may still take place prior to the formal approval of construction management plans by the Secretary of DPIE, and before the main construction work commences. These early works (or pre-construction activities) would be carried out in accordance with the standard NSW Conditions of Approval for State Significant Infrastructure projects and would be managed by either separate early works environmental management plans or environmental work method statements depending on the scope of the activity.

Pre-construction activities for the project would generally include:

- Installation of construction signage and advisory signs
- Installation of environmental controls
- Adjustment, relocation and protection of public utilities and services

- Site establishment activities, such as:
 - Establishment of construction ancillary facilities, including minor clearing, minor earthworks, installation of office accommodation, utilities and other facilities
 - Establishment of construction site fencing, signage and lighting
 - Establishment of construction site access points, traffic management measures, alternative public access routes and diversions, including any minor road modifications
- Relocation or removal of farm infrastructure (including farm dams) as required and in consultation with affected landowners
- Stockpiling of fill that may be available prior to construction commencing (such as fill available from other projects)
- Removal of waste and remediation of contaminated land for site preparation
- The following activities prior to vegetation clearing:
 - Pre-clearing surveys
 - Marking out 'no go' zones and protection measures
 - Identifying fauna habitat trees and fauna release areas through pre-clearing surveys
 - Establishment of temporary drainage and sedimentation and erosion control measures
 - Aboriginal and non-Aboriginal heritage salvage.

Construction hours

Where reasonable and feasible, construction would be carried out during standard working hours as defined by the Interim Construction Noise Guideline (OEH, 2009) and presented in **Table 1-4**. Most of the noisiest activities would be able to be carried out during standard construction hours.

Table 1-4 Construction working hours

Day	Standard construction hours		Extended construction hours	
	Start time	Finish time	Start time	Finish time
Monday to Friday	7am	6pm	6am	7pm
Saturday	8am	1pm	8am	5pm
Sunday and public holidays	No work			

Roads and Maritime is seeking approval for standard construction hours plus additional time at the start and end of each day (Monday to Friday) and Saturday afternoon, referred to as 'extended construction hours' (described in **Table 1-4**). Extended construction hours would apply across the project and Roads and Maritime would undertake targeted consultation with affected residents before work starts, as part of the CEMP and community involvement framework.

In addition to standard working hours and extended construction hours, some construction activities would need to be undertaken 'out of hours'. Out of hours construction activities would be supported by out-of-hours operation of temporary ancillary facilities. The exact timing of out-of-hours work would depend on construction activities, construction techniques and constraints imposed by the affected communities or the relevant authorities (eg utility authorities or road/motorway operators), and would be subject to the requirements of the construction contractor.

Establishment of ancillary facilities

Ancillary facilities would be required at different locations across the construction footprint to provide support to the construction of the project. They may include material and earthworks stockpiling areas (including early stockpiling), construction support areas for bridges, a main project office and compound area, secondary offices located as needed along the length of the construction footprint, workshops for servicing plant and equipment, double-handling and laydown areas, and concrete and/or asphalt batching plants.

The ancillary facilities would generally comprise:

- Temporary buildings (generally prefabricated buildings) including offices and meeting rooms, amenities and first aid facilities (the size and number of office facilities at the main compound would be greater than at the secondary compounds)
- Hardstand parking areas with sufficient space to accommodate the numbers of construction workers expected at any site
- Materials laydown, storage and handling areas, including purpose-built temporary structures as required and appropriately bunded storage for hazardous and non-hazardous substances
- Secure perimeter fencing, including visual screening of construction compounds where necessary
- Bridge construction support areas
- Workshops with appropriate safety and environmental controls for servicing plant and equipment.

Where Roads and Maritime acquires or leases a property that includes buildings or sheds in a nominated ancillary facility location, those buildings may be reused as site offices or compound facilities.

Potential locations for the indicative construction ancillary facilities are shown in **Figure 1-2**. The final type, use, location and number of ancillary facilities would be determined by the construction contractor and identified in a site establishment management plan.

2. Project uncertainties

This EIS has been prepared based on a concept design. If approved, the project would be carried out generally in accordance with the description in this EIS and any conditions of approval, and taking into account the submissions report and preferred infrastructure report (as required). Subject to the project's approval, the project's design and construction methodology would be refined by the contractor in conjunction with Roads and Maritime before works commence.

Some flexibility has been provided in the concept design to:

- Allow for refinement during detailed design to consider alternative construction techniques
- Allow for refinement in response to submissions received following the exhibition of this EIS
- Allow for refinement in response to design development of major infrastructure projects following the exhibition of this EIS
- Avoid or minimise environmental impacts
- Respond to improved technologies or materials
- Improve value for money.

Table 2-1 outlines key project components that have been identified as requiring further resolution during detailed design, construction and/or operation of the project and references where these uncertainties are further described in this EIS.

Table 2-1 Resolution of project uncertainties

Project uncertainties	Proposed resolution	Timing	Where discussed in EIS
The location and layout of construction ancillary facilities, including batching plants and entry and exit arrangements.	<p>The location and layout of construction ancillary facilities, including batching plants, will be confirmed as part of detailed construction planning, following engagement of the design and construction contractor.</p> <p>The construction ancillary facilities will be established and operated in accordance with the terms of the project approval. Updates on ancillary facilities would be provided at the Submissions Report stage of the assessment (if available).</p>	Detailed design	Chapter 5, Project description, Section 7.7, Noise and vibration
Partial versus total property acquisition	The extent of property impacts would be refined and confirmed in consultation with the property owners. For partial acquisitions, property adjustment plans would be developed in consultation with the property owner. Following consultation with property owners, some of the lots listed as requiring partial acquisition may be totally acquired.	Prior to and during detailed design	Section 5.27, Property acquisition
Future alignment of Sydney Metro – Greater West and Western Sydney Airport interchange	The vertical alignment of the project at the Western Sydney Airport Interchange may be subject to change in order to accommodate the planned metro rail line.	Detailed design	Section 5.10.2, Western Sydney Airport interchange
Utilities	Several utilities and services would be impacted by the project, of which some may need to be modified, protected or relocated. As the extent of impact cannot be confirmed until the detailed design is finalised, the description of impacted utilities is preliminary only and subject to change. Roads and Maritime is undertaking ongoing consultation with utility providers with a view to refining potential utility modifications and utility protection measures during detailed design.	Detailed design	Section 5.25, Utilities
Design of bridges and structures	The design would seek to further refine and enhance the aesthetic appearance of bridges and associated structures such as piers and retaining walls. Consideration must be given to the integration of public art and heritage interpretation to ensure a consistent project identity, which reflects the project's urban design and heritage themes.	Detailed design	Chapter 5, Project description Section 7.3, Urban design and visual impacts
Intersections along Elizabeth Drive for entry to the Western Sydney Airport business park	Intersections may be required to be constructed within the operational footprint to access to the Western Sydney Airport business parks.	Detailed design	Chapter 5, Project Description

Project uncertainties	Proposed resolution	Timing	Where discussed in EIS
Earthworks balance calculations and potential for unsuitable material	Further design development is required to confirm the fill and earthworks management required, including sources of fill. In light of the potential for historical contamination of the existing soils within the construction footprint, further investigations are required to identify suitable fill material.	Detailed design and construction	Section 5.28, Construction
Threat abatement measures for reducing potential ecological impacts to be further identified and implemented during construction	<p>Once all practicable steps to avoid or minimise impacts have been implemented at the design phase, management measures would be implemented during both the construction and operational phase of the project to further reduce the potential ecological impacts of the project.</p> <p>The measures would ensure that threat abatement plans (eg for affected EPBC Act listed species or ecological communities) are not compromised. This is relevant to the threat abatement plans that relate to pest species, weeds and pathogens.</p>	Detailed design and construction	Section 7.1, Biodiversity
Potential for permanent waterway adjustments	The need for, extent and design of potential waterway adjustments to Badgerys Creek, South Creek and Kemps Creek would be reconsidered during detailed design with the aim of minimising the adjustments to the natural creek alignment and form.	Detailed design and construction	<p>Chapter 5, Project description</p> <p>Section 7.9, Surface water quality and hydrology</p>
Potential for cumulative noise and vibration impacts on sensitive receivers, due to consecutive construction projects in the local area	The potential cumulative (consecutive) impacts from the M12 Motorway and other major projects in the area would be investigated further as the project progresses when detailed construction planning is developed. Specific additional management measures designed to address potential consecutive impacts would be developed and used to minimise the impacts as far as practicable, in consultation with the affected community. This may include adjustments to the environmental management measures.	Detailed design and construction	Section 7.7.8, Noise and vibration

Project uncertainties	Proposed resolution	Timing	Where discussed in EIS
Potential for cumulative impacts arising as a result of surrounding changes to landscape (due to major infrastructure projects and urban development)	<p>Consultation would be undertaken with local communities potentially affected by the impacts of multiple projects in addition to the project.</p> <p>Consideration should also be given to the creation of a project working group, or equivalent, with the aim of managing project impacts and disruptions through the sharing of relevant project information (ie timing, duration and location of construction activities)</p> <p>Further investigations and modelling may be undertaken during detailed design to confirm potential cumulative impacts and the contribution of the project. Issues that may require further investigations include flooding, noise, climate change, demand for water, hydrology and air quality.</p> <p>Further investigations would take into account any new information on land use within the broader study area that may be available at that time.</p>	Detailed design and construction	<p>Section 8.7, Cumulative impacts</p> <p>Specific issues discussed in Chapters 8 and 7</p>
The construction footprint encompasses large areas of historical and current potentially contaminating activities. There is potential that these areas of unexplained and uncontrolled filling and stockpiling contain contaminants which exceed the adopted soil guidelines, including the presence of ACM.	<p>Areas of potential contamination may require management or further investigation during the construction phase of the project.</p> <p>These areas will be further investigated prior to construction to determine the presence and extent of contamination (if any) and should be considered when developing options for waste removal and disposal.</p> <p>It is possible that asbestos containing material (ACM) may be encountered during earthworks. Where this occurs, a potential management approach would be to contain the material on site and encapsulate it under the pavement in high fill areas, such as between Elizabeth Road and Range Road. The need for encapsulation and identification of suitable encapsulation areas would be further investigated during detailed design.</p> <p>Should extensive contamination be identified following further investigations, appropriate remediation action plans and/or environmental management plans would be developed to remove or suitably reduce the contamination risks during construction activities.</p>	Detailed design and construction	<p>Section 8.1, Soils and contamination;</p> <p>Section 8.5, Health and safety</p>
Gas monitoring indicated that soil vapour contamination may be present beneath areas next to the Elizabeth Drive (Suez) landfill facility.	Prior to construction activities, further gas investigations will be carried out within the area next to the Elizabeth Drive landfill facility to assess the extent of high-risk soil gas.	Detailed design	Section 8.1, Soils and contamination
Potential for bird strikes at Western Sydney Airport, associated with water quality basins and plantings	The type and design of permanent water quality basins for the project will be further investigated during detailed design to confirm their suitability and develop appropriate mitigation measures.	Detailed design	Section 8.3, Health and safety

3. Project impacts and management measures

This section provides a summary of the impacts of the project that could not be avoided. These impacts are discussed in detail in Chapter 7 through to Chapter 8 of this EIS.

3.1 Key impact avoidance

Many potential impacts have been avoided through the project development process which included input from key stakeholders. The project development process included consideration of possible alternatives to building the M12 Motorway (the project) to provide access to western Sydney and the Western Sydney Airport, as well as consideration of different route options for the project. The M12 Motorway with the new preferred alignment through the Western Sydney Parklands was announced in February 2018. The preferred route option is the basis of the concept design development for the M12 Motorway alignment (the project) that is the focus of this EIS (as shown on **Figure 1-2**).

The preferred route option and concept design for the project was identified and refined through an extensive assessment and review process to ensure that it best meets the project objectives, is evaluated against the key performance criteria of function, environment and socio-economic considerations and ultimately provides value for money.

The preferred route option for the project was selected based on the relative overall performance when compared with other route options, including impact to existing land use, impacts to threatened or endangered ecological communities, impact to utilities and impacts to existing roads.

The design of the M12 Motorway has undergone three revisions of the concept design — 20 per cent, 50 per cent and 80 per cent. Key design developments and refinements that have resulted in avoidance or minimisation of environmental impacts are described in **Table 3-1**.

Table 3-1 Concept design refinements

Design refinement	Reason
Revised vertical grading from the Elizabeth Drive and Mamre Road Intersection to the M7 Interchange	Enabled reduced embankment height and reduced the amount of fill required
The vertical alignment grading changes at embankments west of Western Sydney Parklands	Reduce net import of fill material for the project
Airport interchange layout compacted	Reduce the footprint of the interchange and minimise impacts to dams
Change in shared user path that underpasses the Airport Interchange westbound entry ramp via a large culvert structure	Reduced footprint Leave potential open for the shared user path to connect to potential future development to the north of the M12 Motorway and the green grid
Pedestrian bridge over M7 Motorway near Elizabeth Drive and South of Elizabeth Drive retained	Retention of pedestrian access Provision of significant safety improvements as the bridge does not have to be demolished over the existing M7 Motorway
Additional refinement of cut batters east of Range Road to the M7 Interchange	Reduced footprint of the project Reduced length of the utilities access road crossing the M12 Motorway

Design refinement	Reason
M7 Motorway southbound to M12 Motorway Ramp bridge radius tightened	<p>Reduced impacts on the vegetation directly east of the M7 Motorway interchange</p> <p>Allows the bridge to pass positions across the large span where bridge piers can be located with minor impacts to Elizabeth Drive, the M7 Motorway and major utilities</p>
M7 Motorway northbound to M12 Motorway Ramp alignment was shifted towards the M7 Motorway	<p>Reduced footprint of the works</p> <p>Minimised encroachment into the biodiversity offset area in Western Sydney Parklands</p>
<p>Shared user path relocated from separate alignment to the M12 mainline alignment between Luddenham Road and Clifton Avenue, locating the shared user path to the following bridge structures:</p> <ul style="list-style-type: none"> • Cosgrove Creek bridge • Badgerys Creek bridge • South Creek bridge • Airport Access Road overbridge • Clifton Avenue overbridge. 	<p>Allows unimpeded property access, by incorporating shared user path into M12 Motorway bridges instead of a separate, low level shared path bridge</p> <p>Ability to cater for the transitions of the shared user path to future areas listed to be developed into recreation open space</p>

Further refinement of the design including consideration of community issues through the EIS exhibition process may further reduce and if possible avoid impacts.

Potential impacts would also be further avoided and minimised, where possible, through the implementation of the mitigation measures complying with the performance outcomes identified in **Section 4** below.

3.2 Key project impacts

The EIS has assessed the potential environmental impacts that may occur as a result of the project and recommends measures to manage these impacts (see Chapter 9 of the EIS). **Table 3-2** provides a summary of potential impacts of the project that could not be avoided and the associated mitigation measures.

The effectiveness of the measures outlined in **Table 3-2** is demonstrated by the discussion of performance outcomes in **Section 4**.

Table 3-2 Key project impacts and management measures

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Biodiversity <i>Summary of impacts – Biodiversity considerations have informed refinement of the design throughout the site selection phase from the development of a long list of route options through to the selection of the preferred option. Where it is not possible to avoid impacts, management measures focus on minimising impacts to biodiversity as far as possible, in particular minimising the clearing of Cumberland Plain Woodland and offsetting residual impacts where they cannot be avoided.</i> <i>The main potential biodiversity impacts include:</i> <ul style="list-style-type: none"> • <i>Direct removal of about 74 hectares of native vegetation, including about 1.85 hectares of an existing biobanking site within Western Sydney Parklands and other native vegetation classified as threatened ecological communities and one Critically Endangered ecological Community (CEEC)</i> • <i>Indirect impacts to native vegetation including fragmentation and edge effects</i> • <i>Direct and indirect impacts to two threatened plant species including removal of Dillwynia tenuifolia (244 individuals) and removal of Pultenaea parviflora (90 individuals)</i> • <i>Removal of threatened fauna habitat, amounting to about 55.6 hectares of Woodland and Riparian Forest habitat, about 275 hectares of Grassland habitat and about 3.7 hectares of Wetlands and Watercourses. This includes:</i> <ul style="list-style-type: none"> ○ <i>About 0.9 hectares of potential breeding habitat and about 3.7 hectares of potential foraging habitat for Southern Myotis</i> ○ <i>About 1.9 hectares of potential habitat for Cumberland Plain Land Snail</i> ○ <i>About 55.6 hectares of potential foraging habitat for five threatened microbat species</i> ○ <i>About 3.7 hectares of potential foraging habitat and possible removal of one active nest for White-bellied Sea Eagle</i> • <i>Impacts to riparian corridors and minor changes to hydrology at watercourses due to construction of bridges and possible creek adjustments.</i> 		
Clearing of vegetation at the commencement of construction, including native vegetation.	Construction	<ul style="list-style-type: none"> • Clearing will be minimised where reasonable and feasible • A Biodiversity Offsets Strategy (BOS) has been prepared, which states a total of 5786 species credits have been identified as being required • A construction flora and fauna management plan will be prepared as part of the CEMP that will include measures to avoid impacts on sensitive ecological areas and revegetate/restore disturbed areas.
Clearing of riparian vegetation, in stream works and creek adjustments.	Construction	<ul style="list-style-type: none"> • The offsets for aquatic habitat are limited to the area of key fish habitat (KFH) impacted and are considered separately from impacts offset under the FBA. Based on a 2:1 offset ratio as well as the proposed revegetation and designed creek capability, about 5,281 square metres of KFH will be required to be offset, which will cost about \$290,455.
Potential changes to flood regime as a result of the project and creek adjustments	Construction	<ul style="list-style-type: none"> • Creek adjustments will be re-considered and/or further refined to minimise the impact to the creeks during detailed design.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
<p>Transport and traffic</p> <p><i>Summary of impacts – Projected traffic growth in the future is generated mainly by the Western Sydney Airport and surrounding urban development. Modelling indicates that the future road network in the study area will have insufficient capacity to carry the traffic expected to be generated by planned changes to land use and that many roads surrounding the study area will be at or near capacity in the future. The project provides important road transport capacity to support the Western Sydney Airport and planned urban development. Overall, the project will generally improve operational traffic conditions in the study area, particularly in the evening peak, leading to lower delays and higher average speeds across the network.</i></p> <p><i>However, during construction, high numbers of construction vehicle movements may temporarily affect the surrounding road network, particularly heavy vehicles. The construction phase would require temporary traffic arrangements, cyclist and/or pedestrian diversions, road occupation, temporary road closures and temporary changes to speed limits.</i></p> <p><i>The project would result in improved intersection performance along the Elizabeth Drive corridor between The Northern Road and Mamre Road. But for intersections east of Mamre Road, trips using this section of Elizabeth Drive would not have access to M12 Motorway as alternative route, so the improvement in intersection performance in this section would be limited.</i></p> <p><i>Although the number of conflicting traffic movements at the Elizabeth Drive – M7 Motorway interchange would be reduced, forecast traffic demand would still exceed the capacity of this interchange and it would continue to operate at an unsatisfactory level of service with the project.</i></p> <p><i>Travel times along the M7 Motorway may increase with the project in the morning peak period. Generally small increases in travel time would be due to additional merging of traffic at the M7 Motorway interchange. This merging would generate localised delays, particularly in the northbound direction.</i></p> <p><i>Travel times on The Northern Road from Elizabeth Drive, northbound to the M4 Motorway, would also increase with the project. This is would be due to traffic from Western Sydney Airport in the evening peak using the M12 Motorway and The Northern Road to travel north to the M4 Motorway. Without the project, some of that traffic would otherwise travel via Luddenham Road.</i></p> <p><i>Travel time on the M12 Motorway would increase between 2026 and 2036, reflecting the forecast growth traffic volumes associated with the Western Sydney Airport, particularly eastbound to the M7 Motorway. Although travel times would increase over time as traffic demand grows, the change is small (less than five minutes along the length of the motorway), which demonstrates that the project has sufficient capacity to perform acceptably with forecast 2036 traffic volumes.</i></p>		
Traffic-related safety incidents (involving both workers and road users) during construction.	Construction	<ul style="list-style-type: none"> Reduced speed zones and traffic control will be implemented at construction compound accesses to manage heavy vehicles turning onto and off Elizabeth Drive At locations where trucks will turn right from Elizabeth Drive into a worksite, temporary widening and additional pavement to widen will be investigated to determine whether dedicated turn bays into construction compounds can be provided.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Construction road network performance impacts, including delays to traffic On Elizabeth Drive, Mamre Road and The Northern Road associated with construction haulage and reduced speed zones around ancillary facilities.	Construction	<ul style="list-style-type: none"> A construction transport and traffic management plan (CTTMP) will be developed by the construction contractor that identifies guidelines, general requirements and specific procedures required to minimise the impacts of construction activity and traffic on the road network. The CTTMP will place a limit on the number of construction haulage vehicles that can travel via M7 Motorway to Elizabeth Drive and any remaining haulage vehicles will be required to access construction compounds via The Northern Road.
The project would block existing internal access to some properties and existing access to the public road network for some properties.	Operation	<ul style="list-style-type: none"> Specific properties affected by access changes as well as the nature of the access impact to these properties once the motorway is built are described in Table 6-28 of Appendix F to the EIS (Transport and traffic assessment). These affected properties will have their access reinstated as part of the project in consultation with the property owner, unless property acquisition or amalgamation will make this unnecessary Consultation with the Traffic Management Centre and Northwest Roads will continue regarding the management of potential operational traffic impacts.
Impacts on M7 Motorway traffic and shared user path users	Detailed design, construction and operation	<ul style="list-style-type: none"> Consultation will be carried out with the operators of the M7 Motorway to develop measures to manage the potential impacts of construction within the operating M7 Motorway corridor Roads and Maritime will continue to work with Western Sydney Parklands Trust to support the delivery of a shared user path within Western Sydney Parklands to connect from Range Road to the existing M7 Motorway shared user path.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Urban design, landscape character and visual impact <p><i>Summary of impacts – The introduction of a substantial infrastructure element into an existing landscape consistent with the Cumberland Plain is expected to have landscape character impacts ranging from moderate-low to high during operation. There are two areas that would be expected to experience a high landscape character impact including the relatively flat terrain of the plains around the proposed Western Sydney Airport interchange, which would be affected by the scale of the interchange and the realignment of Elizabeth Drive over the project. Areas where the project would transverse the Western Sydney Parklands and fragment the residual land between the project and Elizabeth Drive would also be expected to experience a high landscape character impact. The design of bridges would not preclude accessibility to the creek lines for active transport and potential future north/south pedestrian connectivity.</i></p> <p><i>Potential visual impacts from elements such as permanent lighting, possible noise barriers, earthworks and large structures range from low, where the views of the project would be generally at a distance such as in areas of agricultural land, to high where existing high quality rural views are relatively undisturbed and within close proximity to residential receivers or where the scale of the project significantly impacts the integrity of the view. Where reasonable and feasible, earth mounds or landscape buffers will be used instead of noise structures to reduce impacts on visual amenity.</i></p> <p><i>Substantial land use changes are planned within some areas of the study area including the development of employment lands, the Western Sydney Airport and other transport projects. It is therefore expected that future development within the study area would reduce the project's overall visibility and impact in these changing landscapes. Key potential visual impacts during construction primarily relate to residential receivers that would experience the longest duration of views of construction activities.</i></p>		
Visual impact of bridges, structures and barriers in a currently peri-urban landscape setting	Detailed design	<ul style="list-style-type: none"> An Urban Design and Landscape Plan (UDLP) will be prepared to minimise landscape character and visual impacts, and detail and guide the implementation of landscape features to be installed as part of the project, including re-vegetation requirements.
Removal of vegetation would reduce the tree canopy in the local area	Construction	<ul style="list-style-type: none"> Existing vegetation within the construction footprint will be retained and protected where possible. This includes densely vegetated areas such as remnant riparian forests and Cumberland Woodlands in Western Sydney Parkland. This will reduce visual impacts and screen views of motorway elements A detailed Landscape Plan will be prepared for the project and implemented throughout construction. The plan will guide the implementation of measures to minimise landscape character and visual impacts, including revegetation requirements.
Integration of Aboriginal and non-Aboriginal artwork/s and interpretation	Detailed design	<ul style="list-style-type: none"> The findings and recommendation of the Aboriginal cultural heritage design process managed by Balarinji will be incorporated into the urban design and implemented as part of the project, including interpretive initiatives.
Wildlife strike in the vicinity of the airport	Detailed design	<ul style="list-style-type: none"> Revegetation for the project will consider the land use requirements of the National Airports Safeguarding Framework (NASF) (National Airports Safeguarding Advisory Group, n.d.) to minimise the risk of wildlife strikes at Western Sydney Airport.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Socio-economic <p><i>Summary of impacts – Property acquisition for the project would directly impact 41 properties. About 36 properties would be partially acquired with five properties fully acquired. Temporary leases of land would also be required to accommodate ancillary construction facilities.</i></p> <p><i>Most land affected by the project comprises rural land, including land used for grazing, intensive animal production, and horticulture. Potential acquisition and temporary leases of land for the project would impact on about 10 properties currently used for commercial uses, including agribusinesses. Other directly affected properties include land within the Western Sydney Parklands at Cecil Hills, managed by the Western Sydney Parklands Trust. The significance of land use and property impacts has been evaluated as being moderate to low, with the potential fragmentation of Western Sydney Parklands as High-Moderate.</i></p> <p><i>Permanent adjustments would be required to some private properties, including adjustments to access, fencing and farm infrastructure including farm dams, sheds, and shade houses, due to partial property acquisition. Partial property acquisition may also result in severance or fragmentation of some rural properties, potentially isolating some parts of rural properties and impacting on the efficiency of property management and farming operations.</i></p> <p><i>The project would directly impact on existing social infrastructure including about 90 hectares of land within the Western Sydney Parklands, including bushland and walking trails. The Wylde Mountain Bike trail would be directly impacted, including the jump run, pump track, kids loop, sections of the three-kilometre, six-kilometre and 12-kilometre trails and associated facilities, including shelters. The project would result in the permanent loss of facilities and sections of trails within the operation footprint, requiring the redesign and relocation of these facilities.</i></p> <p><i>During construction, potential impacts to local amenity and character for communities and areas near to construction works and construction compounds would mainly result from:</i></p> <ul style="list-style-type: none"> • Noise, vibration, dust and traffic from construction activities • Changes in visual amenity due to the removal of established vegetation and presence of construction works • Potential light spill from night-time construction works. 		
Changes to access for community facilities and businesses	Construction	<ul style="list-style-type: none"> • Ongoing consultation regarding management of potential impacts will be undertaken in accordance with the Community Communication Strategy.
Acquisition of property required for the project	Construction	<ul style="list-style-type: none"> • Areas of land leased for the purposes of construction will be reinstated at the end of the lease to at least equivalent standard in consultation with the landowner • All partial and full acquisitions and associated property adjustments will be undertaken in accordance with the requirements of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> and the Land acquisition reform 2016 in consultation with landowners • A Personal Manager – Acquisition (PMA) will be appointed to assist land owners and residents who may be affected by acquisition requirements for the project. The PMA will provide ongoing support for relocated persons, including dispute resolution and counselling, and provision of contact information for relevant services.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
The alignment thought Western Sydney Parklands would result in partial removal of the current Wylde Mountain Bike Trail.	Construction	<ul style="list-style-type: none"> Roads and Maritime will continue to work with Western Sydney Parklands Trust to support their delivery of a replacement for the Wylde Mountain Bike Trail prior to construction of the project.
Use of land that is currently used for grazing, agricultural businesses and other peri-urban businesses	Construction	<ul style="list-style-type: none"> Construction activities will be planned to minimise disruption to existing agricultural operations/activities in surrounding properties where feasible and reasonable (eg stock access, access to farm dams, etc) unless otherwise agreed by the landowner Farm infrastructure such as fencing and property access will be relocated prior to construction and in consultation with property owners/ business managers On-going consultation will be undertaken with local business owners that may be impacted during construction (including owners of agricultural businesses) in accordance with the Community Communication Strategy for the project A business impact register will be established and maintained for the duration of construction to identify and manage specific impacts on individual businesses.

Aboriginal heritage

Summary of impacts – There are 19 Aboriginal sites that would be directly impacted by the project. Most of the Aboriginal sites consist of broad distributions of Aboriginal stone artefacts associated with major creeks. Of these 19 sites, 11 would be subject to partial harm, which means they extend beyond the construction footprint and would therefore be left partially intact. Eight of the sites are located entirely within the construction footprint and would therefore be impacted completely.

Three areas associated with recorded sites are designated high Aboriginal cultural heritage significance, including:

- A small knoll immediately to the west of Badgerys Creek*
- A large area on a rise and floodplain between Badgerys Creek and South Creek*
- A prominent ridgeline overlooking the M7 Motorway.*

The three Aboriginal cultural values areas are not gazetted Aboriginal Places under S86(4) of the NPW Act, but identified by the Registered Aboriginal Parties during fieldwork as having values of local significance. All three of these cultural values areas are located within the project construction footprint and would be impacted by the project.

Impacts to Aboriginal heritage during construction	Construction	<ul style="list-style-type: none"> A construction cultural heritage management plan (CCHMP) will be developed for the project in consultation with the project Registered Aboriginal Parties (RAPs) and Environment, Energy and Science Group (EESG) of the DPIE (former NSW Office of Environment and Heritage). The CCHMP will outline procedures and exclusion zones for avoiding impacts on known Aboriginal heritage items.
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Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Potential impact on area of Aboriginal heritage values at Cecil Hills Ridge PAD	Construction	<ul style="list-style-type: none"> Where feasible, detailed design will investigate options to minimise impacts to the Cecil Hills Ridge PAD (CHRP) site.
Potential avoidance of impact on cultural deposits	Construction	<ul style="list-style-type: none"> Investigations will be undertaken during detailed design to determine the feasibility of retaining cultural deposits between the pylons of bridges or elevated structures at the following sites (sites identified in Section 7.5 of the EIS): BCW, BCE, SCW T1, SCW T2, SCE This will include covering the original cultural deposits beneath temporary protective barriers such as geotextile fabric and a layer of clean fill material.
Aboriginal items salvage collection and excavation	Construction	<ul style="list-style-type: none"> A detailed Aboriginal Cultural Salvage Strategy will also be prepared for the project in consultation with project Registered Aboriginal Parties and EESG to guide the salvage excavation process for Aboriginal sites.

Non-Aboriginal heritage

Summary of impacts – The project would have a major impact on four heritage items and a minor impact on one item:

- *McGarvie Smith Farm (State significance, major impact)*
- *McMaster Field Station (State significance, major impact)*
- *Fleurs Aerodrome (local significance, major impact)*
- *Cecil Park School, Post Office and Church Site (local significance, major impact)*
- *The Fleurs Radio Telescope Site (State and potentially nationally significant, minor impact).*

The project has been assessed as having a negligible impact on four other heritage items as the design of the project was able to avoid direct impacts:

- *Luddenham Road Alignment*
- *Upper Canal System*
- *Exeter Farm Archaeological Site*
- *South, Kemps and Badgerys Creek Confluence Weirs Scenic Landscape.*

Full or partial loss or damage to historical heritage items due to demolition.	Construction	<ul style="list-style-type: none"> A construction cultural heritage management plan (CCHMP) will be prepared as part of the CEMP prior to construction in consultation with Department of Premier and Cabinet (DPC) (Heritage) A copy of the non-Aboriginal heritage assessment report (Appendix J of the EIS) will be provided to the appointed detailed design and construction team to ensure that key heritage themes are elements are integrated into: <ul style="list-style-type: none"> - A suitably qualified heritage specialist will be engaged to prepare a heritage interpretation framework to guide development of the detailed urban design for the project. This framework will be prepared in accordance with the Interpreting Heritage Places and Items Guidelines (NSW Heritage Office, 2005)
Integration of heritage themes and values	Detailed design	<ul style="list-style-type: none"> A suitably qualified heritage specialist will be engaged to prepare a heritage interpretation framework to guide development of the detailed urban design for the project.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Item 1: McGarvie Smith Farm	Construction	<ul style="list-style-type: none"> Roads and Maritime to engage a suitably qualified heritage consultant to prepare an archival photographic recording of the entire site, in accordance with the Heritage Division guidelines (Heritage Council of NSW 2006) Roads and Maritime to investigate options to provide funding support to the heritage item landowner for a thematic heritage study of CSIRO and other agricultural research stations.
Item 2: The Fleurs Radio Telescope Site	Construction	<ul style="list-style-type: none"> All extant elements of the radio telescopes and associated infrastructure, including rubbish mounds, are to be left intact Ground penetrating radar, or other remote sensing survey techniques, must precede any ground disturbance within the heritage curtilage of the Fleurs Radio Telescope Site contained within the construction footprint to identify any sub-surface cables Roads and Maritime to engage a suitably qualified heritage consultant to prepare an archival photographic recording of the entire property, in accordance with the Heritage Division of the DPC (Heritage) guidelines (Heritage Council of NSW 2006) The heritage interpretation framework for the project will include interpretation measures that will improve community awareness of the history of the Fleurs Radio Telescope as well as determine suitable locations for the presentation of information that are publicly accessible.
Item 4: Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)	Construction	<ul style="list-style-type: none"> Adhere to measures outlined in The Guidelines for development adjacent to the Upper Canal and Warragamba Pipelines (Sydney Catchment Authority 2012) Incorporate relevant conservation policies outlined in the Upper Canal CMP (NSW Public Works Government Architect's Office 2016) into the CHMP to ensure heritage fabric is not impacted by the project Include an exclusion zone around the tunnel shaft that is in line with the safe work distances outlined by Appendix K of the EIS (Noise and vibration assessment report).
Item 6: McMaster Field Station	Construction	<ul style="list-style-type: none"> Roads and Maritime to engage a suitably qualified heritage consultant to prepare an archival photographic recording of the entire property, in accordance with the Heritage Division of the DPC (Heritage) guidelines (Heritage Council of NSW 2006) Roads and Maritime investigate options to provide funding support to property's current owner to prepare a thematic heritage study of CSIRO and other agricultural research stations An area of potential use zone will be established around the McMaster Farm group of buildings, including a suitable buffer zone, and no construction activities will take place within this zone.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Item 7: Fleurs Aerodrome	Construction	<ul style="list-style-type: none"> Roads and Maritime to engage a suitably qualified heritage consultant to prepare an archival photographic recording of the entire property prior to its disturbance, in accordance with the Heritage Division of the DPC (Heritage) guidelines (Heritage Council of NSW 2006) An interpretive framework developed for the project will include consideration of elements to enable the continued interpretation and understanding of the airstrip at Fleurs Aerodrome as a linear and continuous element. This will be carried out in consultation with Department of Defence and consider opportunities for involvement of veterans groups Relevant guidelines and associated safe working distances will be adhered to for remaining heritage structures.
Item 8: Cecil Park School, Post Office and Church Site	Construction	<ul style="list-style-type: none"> Roads and Maritime will liaise with local museums and/or historical societies to arrange a long-term secure artefact repository for the artefact assemblage. Once that arrangement has been made, DPC (Heritage) will be notified for their records. In the short term, Roads and Maritime must provide secure short-term secure storage for the assemblage An Archaeological Research Design (ARD) for archaeological salvage of the former historical complex will be prepared and implemented prior to construction commencing by a suitably qualified historical archaeologist. The ARD will include a revised impact assessment, revised research questions and a methodology to ensure archaeological relics within the project construction footprint are adequately investigated in accordance with standard NSW archaeological practice.
Item 12: South, Kemps and Badgerys Creek Confluence Weirs Scenic Landscape	Construction	<ul style="list-style-type: none"> Management measures identified in the project UDLP (LVIA01) will be implemented during detailed design to minimise impacts on landscape and vistas Flooding management measures and surface water quality and hydrology management measures will be implemented to reduce broader impacts to the surrounding scenic landscape.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Noise and vibration <p><i>Summary of impacts – The highest impacts during construction are experienced at relatively low numbers of residential receivers to the east of the M7 Motorway and north of Elizabeth Drive at the eastern end of the project, north of Elizabeth Drive near Salisbury Ave and near Clifton Avenue in the north of the construction footprint. During the standard daytime working hours 'peak' impacts are predicted in these areas, with 'moderate' impacts expected at a relatively small number of receivers east of the M7 Motorway and South of Elizabeth Drive at the eastern end of the project.</i></p> <p><i>Night-time works are only proposed in certain areas (associated with bridges, road works and ancillary facilities), with only a small number of receivers are predicted to have 'Peak' impacts around Clifton Avenue and Salisbury Avenue. 'Moderate' impacts are predicted east of the M7 Motorway, along Elizabeth Drive to about Kemps Creek, and near Luddenham Road at the western end of the project. Compliant noise levels or 'minor' impacts are predicted for the rest of the study area.</i></p> <p><i>About 19 structures or buildings that may be sensitive to vibration (generally associated with vibratory rollers and rock breakers) are located within the recommended minimum working distance, including the Upper Canal and two high pressure gas pipelines.</i></p> <p><i>About 262 receivers (183 individual buildings) are predicted to be affected by new or increased road traffic noise impacts during operation and eligible for consideration of additional noise mitigation. Noise mitigation would be considered in order of preference from at-source treatment through quieter road pavement surfaces, noise mounds, noise barriers or as a least preferred treatment option, at-property treatments.</i></p>		
Increased construction traffic, equipment and plant noise for sensitive receivers near the project	Construction	<ul style="list-style-type: none"> Where noise intensive equipment is to be used near to sensitive receivers, the works will be scheduled for standard construction hours, where possible Detailed noise assessments will be carried out for all ancillary facilities (including batching plant operations) Noise and vibration measurements will be carried out to confirm the effectiveness of noise and vibration management measures, respectively The use of alternatives to vibration generating equipment will be considered where vibration impacts are predicted Building condition surveys will be completed before and after the works where buildings or structures are within the minimum working distances for vibration intensive equipment A detailed survey of heritage items will be completed to define appropriate criteria. Vibration monitoring will be undertaken when vibration intensive tasks are occurring within the minimum working distances to these structures.
Potential for cumulative noise and vibration impacts, both consecutive and concurrent, on sensitive receivers	Construction	<ul style="list-style-type: none"> The likelihood of cumulative construction noise impacts will be reviewed during detailed design when detailed construction schedules are available. Construction works will be scheduled with the aim of minimising concurrent works near to sensitive receivers or coordinating respite periods where possible.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Increased road traffic noise for sensitive receivers near the project	Operation	<ul style="list-style-type: none"> Measures such as low noise pavement, noise barriers and property treatments to reduce predicted exceedances will be implemented where reasonable and feasible Operational noise and vibration mitigation measures will be identified in an Operational Noise and Vibration Review (ONVR) Requirements for mitigation measures, including low noise pavements, noise barriers, and at-property treatments, will be reviewed as part of the ONVR during the detailed design. The implementation of treatments will be undertaken in accordance with Roads and Maritime guidelines Within 12 months of commencement of operation of the project, actual operational noise performance will be compared to predicted operational noise performance.
Vibration works within minimum working distance	Construction	<ul style="list-style-type: none"> Where works are within the minimum working distances and considered likely to exceed the cosmetic damage objectives, construction works will not proceed unless: <ul style="list-style-type: none"> A different construction method with lower source vibration levels is used, where feasible. Attended vibration measurements are carried out at the start of the works to determine the risk of exceeding the vibration objectives Building condition surveys will be completed before and after the works where buildings or structures are within the minimum working distances for vibration intensive equipment Following consultation with the asset owners, for the Upper Canal tunnel and Gas Supply Main, and prior to vibration intensive construction works occurring within the nominated minimum working distance (confirmed by asset owner), a detailed assessment will be carried out A detailed survey of heritage items will be completed to define appropriate criteria. Vibration monitoring will be undertaken when vibration intensive tasks are occurring within the minimum working distances to these structures.
Operational noise and vibration	Operation	<ul style="list-style-type: none"> Within 12 months of commencement of operation of the project, actual operational noise performance will be compared to predicted operational noise performance. The need for additional mitigation or management measures to address identified operational performance issues and meet relevant operational noise criteria will be assessed and implemented where reasonable and feasible.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Flooding <i>Summary of impacts – Flood modelling results show that the project would have no flooding impact to buildings currently present in the area surrounding the project. Outside of the project's operational footprint, the proposed flooding conditions are predicted to be largely the same as existing, even during large flooding events like the 100 year ARI. The use of the land surrounding the main creeks would be unaffected by the project with respect to flooding.</i> <i>The modelling of the main creeks shows there is minimal increase to existing afflux levels and surrounding land use would be unaffected by this increase. However, modelling of the minor drainage lines indicates that an increase in volumes and rates of flow would potentially impact surrounding land use. Potential changes to surrounding catchment hydrology as a result of planned future urban and airport development may lead to future changes in those catchments' flooding patterns.</i>		
Potential changes to flood regime as a result of the project and in light of potential future land uses changes in surrounding catchments	Detailed design	<ul style="list-style-type: none"> • Further flood investigations and modelling will be undertaken during detailed design to ensure the flood immunity objectives and design criteria for the project are met (should the design be refined) and to take into account any new information on land use and flooding within the broader catchment that may be available at that time • Creek adjustments will be re-considered and/or further refined to minimise the impact to the creeks during detailed design • Should the updated flood modelling show the project will result in an adverse flooding impact, Road and Maritime will consult with landowners to implement appropriate mitigation measures in relation to each individual property • Measures to address potential impacts of culvert blockage on afflux will be investigated during detailed design, this may include the installation of debris deflectors, trash racks or similar on drainage inlets.
Potential for generating flood impacts during construction	Detailed design, construction	<ul style="list-style-type: none"> • The project CEMP shall include a flood management plan that details the processes for flood preparedness, materials management, weather monitoring, site management and flood incident management • Activities that may affect existing drainage systems during construction will be carried out so that existing hydraulic capacity of these systems is maintained where possible • Detailed construction staging plans will be developed during detailed design so that flood mitigation structures are constructed in a way that minimises flood risk.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Surface water quality and hydrology <p><i>Summary of impacts – Existing water quality in the project area has generally been assessed as poor. However, a number of downstream water bodies were identified as sensitive receiving environments. The project's design has therefore incorporated a number of protection measures to ensure that the quality of stormwater runoff from the M12 Motorway during construction and operation contributes toward the achievement of the NSW Water Quality Objectives. The project's design incorporates standard measures to manage impacts on surface water quality, including stormwater retention devices such as temporary (during construction) and permanent basins, spill prevention, stream bed and bank stabilisation, and scour protection and flow dissipation measures at culvert inlets and outlets.</i></p> <p><i>During construction, the project's potential impacts include the release of pollutants into downstream waterways and sensitive receiving environments, which could impact on stream health and aquatic flora and fauna. Construction may also result in erosion and sedimentation of downstream watercourses, from uncontrolled stormwater runoff. The project would involve some water extraction from sediment basins and farm dams within the construction footprint during construction. However, the total volume of water to be used is relatively low and would have a minor impact on environmental water availability and flows.</i></p> <p><i>During operation, the main risks to downstream water quality would be from the release of pollutants including sediment, hydrocarbons, metals and nutrients contained in stormwater runoff. During operation, there is unlikely to be a significant change to hydrology and flow distribution across the broader catchment. However, there is the potential for localised changes in flow from one sub-catchment to the next. An increase in flows could result in additional water supply and more frequent overtopping of some farm dams, and potentially increase the risk of flooding, scour and erosion. Conversely, a decrease in flow due to changed flow paths could result in a reduced water supply to some farm dams. These operational impacts are considered minor and manageable through the adoption of appropriate measures.</i></p> <p><i>Ongoing management measures would include more detailed modelling during detailed design, monitoring, riparian restoration, stockpile management and spill management through construction and operation. With implementation of the management measures, the project would have minimal impact on surface water quality.</i></p>		
Demand for water during construction	Construction, operation	<ul style="list-style-type: none"> A water reuse strategy will be developed for both construction and operational phases of the project to reduce reliance on potable water. Alternative water supply options to potable water will be investigated, with the aim of using recycled water where feasible.
Surface water quality impacts	Construction	<ul style="list-style-type: none"> A construction soil and water management plan (CSWMP) will be prepared for the project. A construction water quality monitoring program will be developed and included in the CSWMP for the project to establish baseline conditions, observe any changes in surface water and groundwater during construction, and inform appropriate management responses.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
	Operation Detailed design	<ul style="list-style-type: none"> An operational water quality monitoring program will be developed and implemented following the completion of construction to observe any changes in surface water and groundwater following construction and inform appropriate management responses. Further water quality assessment will be undertaken during detailed design to establish site specific discharge criteria for construction sediment basins. Based on this, the number, location and size of the basins will be further refined during the detailed design with consideration to the relevant NSW EPA Environment Protection Licence application requirements and the environmental values of the downstream receiving waterway. Practical measures to prevent water pollution and control, abate or mitigate impacts to the environment will be investigated at the detailed design stages of the project with the aim to make improvements to the currently proposed water quality controls. Such measures may include: <ul style="list-style-type: none"> Larger or high efficiency temporary basins Alternative dry bioretention operational basins.
Impacts on waterbodies	Construction Detailed design	<ul style="list-style-type: none"> The project will manage impacts to waterfront land by implementing measures such as bank stabilisation, installing instream structures, maintaining minimum flows and constructing instream crossings. All drainage features will be designed and constructed in accordance with relevant guidelines. A set of hydrologic and hydraulic models will be developed, which are to be used to define the nature of main stream flooding and major overland flow along the full length of the project operational footprint under pre- and post-project conditions. The models will be used to verify the nature and extent of impacts and to confirm the type of mitigation measures required with consideration to the requirements of landowners. The models will also be used during detailed design to describe the interaction between the project and flows particularly with respect to culverts and to assist in refining the design for flows arriving at and travelling through culverts.
Impacts on SEPP Coastal Wetlands	Detailed design	<ul style="list-style-type: none"> Consideration will be given to the design of operational water quality, erosion and sediment controls incorporated into the design of the construction access track being left in place upstream from the SEPP wetland, and within the proximity area of the SEPP Coastal Wetland ID117.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
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Groundwater quality and hydrology

Summary of impacts – The potential groundwater drawdown impacts of the project are minor and localised (ie at the western cut). The project is not expected to generate groundwater quality impacts during construction or operation, outside of the potential for accidental spills and localised negligible impacts at stormwater basins (operational basins). With the implementation of recommended management measures including an ongoing groundwater monitoring program, spill prevention, remediation of potential contamination sources, and spoil management during construction, the project would result in negligible impacts on groundwater quality, flow and levels.

Potential for impacts to groundwater	Construction	<ul style="list-style-type: none"> • Specific controls to mitigate the potential impacts of spills/leaks occurring during the project's construction phase will be outlined in the CEMP • A groundwater monitoring program will be implemented to observe any changes in groundwater quality and levels and inform appropriate management responses • Potential impacts to groundwater will be reconsidered during construction if road cuttings other than the western cut intersect the water table, or if observed groundwater inflow rates into the western cut are higher than estimated.
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Soils and contamination

Summary of impacts – A number of moderate to high risk areas of environmental interest (AEIs) have been identified within and next to the project footprint. Based on the knowledge of the historical land use of the area, asbestos has a high potential to be present within soils of the construction footprint. The potential for soil erosion during construction is low, subject to standard and suitable erosion control measures being implemented and managed during construction activities. Gas monitoring indicated that soil vapour contamination may be present beneath areas next to the SUEZ Kemps Creek Resource Recovery Park.

Impact of contamination (where disturbed as part of construction activities), if not managed appropriately	Construction	<ul style="list-style-type: none"> • Measures identified to manage construction activities within or near identified AEIs • Further investigations will be carried out in the following AEI locations: <ul style="list-style-type: none"> - Within the area of miscellaneous construction activities and stockpiles of building materials along Luddenham Road) - Within the former AEI Kari and Ghossayn solid waste landfill - Significant volume of illegally dumped material.
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Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Potential for disturbing contaminated soils during construction	Construction	<ul style="list-style-type: none"> - A contaminated land management plan (CLMP) will be prepared as part of the CEMP. The CLMP will include: - Management of surface soils in the vicinity of TP303, TP304, TP310 and TP311 containing heavy metal and PAH concentrations - Procedures for the management of unexpected contamination and asbestos finds - Measures to manage potential ASS (as required based on testing results) within sediments of the creeks in the construction footprint to minimise impacts to the environment - Requirements for excavation of unexpected contaminants to be undertaken in consultation with project Remediation Action Plans - Requirements for the disposal of contaminated waste in accordance with the Protection of the Environment Operations Act 1997 (POEO Act) and the Protection of the Environment Operations (Waste) Regulation 2014 - Prior to demolishing any structures and/or buildings, a hazardous building materials audit will be carried out in accordance with Australian Standard (AS 2601-2001) The demolition of structures. Where hazardous building materials are present, they will be managed to reduce the potential for contamination.
Potential for disturbing asbestos containing material (ACM) during construction	Construction	<ul style="list-style-type: none"> • An asbestos management plan (AMP) will be prepared as part of the CLMP for the project. The AMP will guide the excavation, handling, storage and disposal of management of asbestos discovered during construction, including procedures for any unexpected asbestos. The AMP will also outline requirements for the encapsulation of asbestos to be carried out in accordance with project Remedial Action Plans • Further intrusive asbestos investigations along the construction footprint will be carried out to assess asbestos risks before the start of construction. The investigations are to include visual assessments and ground truthing along the length of the project.
Impacts of soil and groundwater contamination	Construction	<ul style="list-style-type: none"> • Detailed site (contamination) investigations will be carried out in accordance with the relevant guidelines within AEI 19, AEI 7, AEI 21 and within the 'potential areas of existing fill' identified in the Soils and contamination assessment report (Appendix O of the EIS). Depending on results of the investigations, or if remediation is deemed required at any site within the construction footprint, a Remedial Action Plan will be prepared before the construction • Further intrusive asbestos investigations throughout the construction footprint will be carried out to assess asbestos risks before the start of construction. The investigations are to include visual assessments and ground truthing along the length of the project.
Potential for dewatering (if generated) during construction to contaminate groundwater	Construction	<ul style="list-style-type: none"> • Should dewatering be required during construction, further investigations will be carried out to confirm the contaminant levels within the groundwater and potential volumes that may need to be managed. • The CEMP will include control measures to ensure dewatering and discharge of groundwater minimises impacts to surrounding environments (surface and groundwater).

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Potential for earthworks to release high-risk soil gas	Construction	<ul style="list-style-type: none"> Further gas monitoring will be carried out within the area next to the Elizabeth Drive landfill facility to assess the extent of high-risk soil gas which could impact upon construction and/or operation of the project. Ground gas investigations will be carried out in accordance (where applicable) with the Guideline for the Assessment and Management of Sites Impacted by Hazardous Ground Gases (NSW EPA 2012) and Assessing Risks Posed by Hazardous Ground Gases to Buildings Report (C665) (Wilson et al. 2007) Should the further investigations determine that gas concentrations remain elevated near the project footprint, gas monitoring will be carried out during construction within the construction areas next to the Elizabeth Drive landfill facility If excavations are to be carried out within enclosed structures, gas accumulation monitoring will be carried out before and during construction.
Air quality <i>Summary of impacts – With the application of the environmental management measures, it is anticipated that air quality impacts from the project during operation would not result in unacceptable air quality impacts. It is anticipated that contributions at a regional scale would be negligible.</i>		
Construction dust impacts on sensitive receivers and ecological areas	Construction	<ul style="list-style-type: none"> Regularly water exposed and disturbed areas including stockpiles, especially during inclement weather conditions. Adjust the intensity of activities based on measured and observed dust levels, weather forecasts and the proximity of and direction of the works in relation to the nearest surrounding receivers Ensure that all loads are covered, and any loose materials/debris is removed before departure from site. Abide by road speed limits Wherever possible and practical, limit the amount of materials stockpiled around the site Clean loose materials and debris from the tailgate of vehicles unloading materials to stockpiles prior to departure from site Position stockpiling areas as far as possible from surrounding receivers, including identified ecologically sensitive receivers Limit stockpiling activities during conditions where winds are blowing strongly in the direction(s) from the stockpiling location to nearby receivers Develop construction program in consultation with the contractor(s) developing the Western Sydney Airport and Sydney Metro Greater West. Maintain consultation through the course of both projects to plan activities in a manner which limits potential air quality-related impacts. Wherever possible and practical, co-ordinate activities with a high potential to generate dust so that they do not occur at the same time. Stop activities if dust is observed to be emanating from the Airport and Sydney Metro Greater West site which could affect receivers which may also be affected by activities associated with the project.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Potential to generate odours or hazardous air pollutants	Construction	<ul style="list-style-type: none"> Apply odour suppressing agents to materials as necessary to minimise related impacts should any contaminated or hazardous materials be uncovered during the works. Ensure that structures and any dumped waste materials are inspected by a suitably qualified person to confirm that they do not contain any hazardous materials (eg asbestos) which could be broken and mobilised during demolition. Where such materials are identified, adhere to the requirements for removal and disposal listed in the Work Health and Safety Act 2011, and Work Health and Safety Regulation 2011.
Health and safety <i>Summary of impacts – Health and safety risk during construction are not unusual and adequately managed through identified mitigation measures, such as traffic management, noise, air quality and contaminated land. The project is expected to generate a positive overall impact on health and safety impacts during operation, taking into account improved safety for road users, improved network accessibility and provision of shared path.</i>		
Minimise risk of causing bushfire	Construction	<ul style="list-style-type: none"> Measures to mitigate and manage bushfire risk will be developed and included as part of site-specific hazard and risk management measures within the CEMP. Measures will include the maintenance of construction compounds in a tidy and orderly manner and the storage and management of dangerous goods and hazardous materials in a safe location.
Storage and handling of dangerous goods and hazardous substances	Construction	<ul style="list-style-type: none"> The transport, storage, handling and use of dangerous goods and hazardous substances will be in accordance with the relevant legislation, standards and codes.
Sustainability <i>Summary of impacts – With the proposed management measures in place for all issues identified in this EIS, as well as consideration of commitment to achieve an 'Excellent' rating under the IS rating tool, the project is considered to meet the policy and legislative frameworks for sustainability in NSW.</i>		
Project sustainability outcomes	Construction and operation	<ul style="list-style-type: none"> A sustainability management plan for the project will be developed and implemented during detailed design, to give effect to the sustainability strategy for the project. The management plan will detail measures to meet the sustainability objectives and targets and IS rating tool credit requirements.
Waste <i>Summary of impacts – On the basis of implementing the identified management measures, the risk of impacts from waste would be minor during construction and operation of the project.</i>		
Inappropriate handling and/or disposal of waste	Construction	<ul style="list-style-type: none"> A construction waste and resource management plan (CWRMP) and a spoil management plan will be prepared for the project and outline appropriate management procedures. Wherever feasible and reasonable, construction material, including fill material, will be sourced from within the Sydney region.

Key project impact	Detailed design / construction / operation	Management measure (Note: measures to address key issues only – complete descriptions of management measures for all issues are provided in Chapter 9 of the EIS)
Unexpected waste volumes and types during construction	Construction	<ul style="list-style-type: none"> Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Suitable areas will be required to be hardstand or lined areas that are appropriately stabilised and bundled, with sufficient area for stockpile storage.
Climate change risk <i>Summary of impacts – Adaptation and mitigation measures for moderate and high risks reduce the likelihood of each risk and increase the project's resilience to climate change. Where possible adaptation measures have been directly incorporated into the design of the project to minimise GHGF emission and mitigate key climate risks of extreme heat, extreme precipitation and bushfires.</i>		
Climate change risks	Construction and operation	<ul style="list-style-type: none"> Detailed design will incorporate appropriate adaptation measures for all climate change risks with an original risk rating of moderate or above, including: <ul style="list-style-type: none"> Consideration of the full range of potential temperature extremes on the project (particularly bridge structures) which may occur as a result of climate change and consider material capacity to withstand heat during material type selection, to minimise the likelihood of infrastructure failures Consideration of energy dissipation at culvert outlets when velocities exceed existing magnitudes Consideration of the use of native species which are typically more fire tolerant and can more rapidly regenerate after fire events Maintenance of fauna passage along main creek lines under bridges. A climate change monitoring and adaptive management framework will be prepared for the project. The framework will incorporate performance monitoring criteria and measures, and periodic review of the climate change risks assessment and framework against updated climate data to ensure currency. An adaptive management approach will be applied to workplace health and safety planning during construction and operation. This includes use of Roads and Maritime Work Health and Safety Procedures.
Generation of GHG emissions during construction and operation	Construction and operation	<ul style="list-style-type: none"> Targets to reduce GHG emissions during construction and operation, will be included in the project's sustainability management plan. Updated GHG assessment based on the detailed design for the project and the final project when built will be carried out. Vegetation removal will be minimised where practicable. Opportunities that are value for money will be considered to procure goods and services: <ul style="list-style-type: none"> From local suppliers That make use of recycled materials or materials with a low embodied energy content. That are energy efficient or have low embodied energy That minimise the generation of waste. Construction plant and equipment will be well maintained to maximise fuel efficiency.

3.3 Environmental management plan framework

Roads and Maritime manages its environmental responsibilities and environmental performance through the implementation of an environmental management framework that is broadly consistent with the principles contained within the ISO 14000 series and standards. Roads and Maritime's Environment Policy Statement (Roads and Maritime, 2016b) outlines the agency's commitment to effectively manage any impact that may lead to an adverse impact on the environment. The impacts associated with the project have been assessed in accordance with the SEARs.

Roads and Maritime will ensure the commitments made in this EIS as well as any conditions of approval or legal requirements are fulfilled. The environmental management measures set out in **Table 9.1** of the EIS will be monitored during construction and operation of the project to confirm their effectiveness, and whether any additional measures are required.

The management measures related to construction will be captured in a CEMP and associated sub-plans. The plan will provide a framework for establishing how these measures will be implemented and who will be responsible for their implementation.

The plan will be prepared prior to construction of the project and will be reviewed and certified by Roads and Maritime prior to the commencement of any on-site work. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements.

Sub-plans to be prepared for the project will include but may not be limited to:

- Construction flora and fauna management plan
- Construction transport and traffic management plan
- Construction cultural heritage management plan (including Aboriginal and non-Aboriginal heritage)
- Construction noise and vibration management plan
- Construction flood management plan
- Construction soil and water management plan
- Construction contaminated land management plan
- Construction air quality management plan
- Construction waste and resource management plan.

The management of environmental impacts during the project's operation is best achieved through its design. The iterative design and environmental assessment process allows impacts to be avoided or minimised where possible. Roads and Maritime has an ongoing obligation to minimise the environmental impacts during all phases of the project including during detailed design when the design is being optimised. Where environmental controls have been incorporated into the design there is a program of monitoring and review including independent auditing, to ensure the controls comply with stated objectives.

4. Performance outcomes

The project's design has been prepared in consideration of the 'desired performance outcomes' provided in the SEARs. These desired performance outcomes outline the broader objectives to be achieved by Roads and Maritime in the design, construction and operation of the project. **Table 4-1** outlines how each performance outcome will be achieved by the project.

Table 4-1 Design performance outcomes and project outcome

Relevant SEARs desired performance outcome	Project outcome
Consultation The project is developed with meaningful and effective engagement during project design and delivery.	<ul style="list-style-type: none"> An engaged and informed community and key stakeholders.
Biodiversity The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity. Offsets and/or supplementary measures are assured which are equivalent to any remaining impacts of project construction and operation.	<ul style="list-style-type: none"> Impacts on aquatic biodiversity values are minimised Removal of high retention value trees is minimised Appropriate offsets are provided for residual biodiversity impacts
Transport and Traffic Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts. The safety of transport system customers is maintained. Impacts on network capacity and the level of service are effectively managed. Works are compatible with existing infrastructure and future transport corridors.	<ul style="list-style-type: none"> Improved performance and capacity of Sydney's road network Provision of an efficient motorway link to support the Western Sydney Airport, Western Sydney Aerotropolis and surrounding urban development Potential operational impacts to local roads are minimised Potential impacts to road network efficiency during construction are minimised Enhanced pedestrian and cyclist safety through provision of shared user path Access to properties is maintained Significant travel time savings is delivered for motorists and freight vehicles Long-term development of the motorway network in Western Sydney is enabled, including connections to M7 Motorway, future outer Sydney Orbital and major arterial roads (eg The Northern Road).
Urban design and Landscaping The project design complements the visual amenity, character and quality of the surrounding environment. The project contributes to the accessibility and connectivity of communities. The project contributes to an increase in tree canopy for greater Sydney.	<ul style="list-style-type: none"> Sympathetic urban design that integrates with the significance of the Western Sydney Airport, surrounding landscape values and both Aboriginal and non-Aboriginal cultural heritage values New and improved active transport links to support growth in surrounding areas Delivery of a net increase in canopy trees within the construction footprint, guided by a project specific tree management strategy

Relevant SEARs desired performance outcome	Project outcome
Visual Amenity <p>The project minimises adverse impacts on the visual amenity of the built and natural environment (including public open space) and capitalises on opportunities to improve visual amenity.</p>	<ul style="list-style-type: none"> • A landscape setting is established, including associated structures, that minimises adverse impacts on the visual amenity of the existing and future community • A landscape setting for areas near public recreation (eg Western Sydney Parklands) that preserves visual amenity for users • Driver experience celebrated and key views of surrounding landscape maximised
Socio-economic, Land Use and Property <p>The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities.</p> <p>The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure.</p>	<ul style="list-style-type: none"> • Property acquisition is minimised, particularly in relation to private property with dwellings • Fragmentation is minimised and viability of land uses on residual properties is preserved • The property acquisition process is managed to minimise impacts to community • Impacts to businesses during construction are minimised • Access to social infrastructure is provided • Access to Western Sydney Airport and Sydney motorway network is provided • Key transport corridor established early to aid planning for future urban development • Enhanced opportunity for cycle and pedestrian activities through connected shared user path
Heritage <p>The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage and Aboriginal objects and places.</p> <p>The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and Aboriginal objects and places.</p>	<ul style="list-style-type: none"> • Archival recording is completed of impacted items of heritage significance • Features and fabric of heritage significance to the community are salvaged for redistribution • Impacts on heritage items are minimised during construction • Key heritage values and stories are incorporated into the final urban design and landscaping outcome • Damage to features of heritage conservation significance from vibration is minimised
Noise and Vibration - Amenity <p>Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on acoustic amenity.</p> <p>Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the project are effectively managed to protect the amenity and well-being of the community.</p>	<ul style="list-style-type: none"> • Complied with the relevant criteria from the NSW Road Noise Policy, 2011 (RNP) and the NSW Industrial Noise Policy, 2000 (INP) • Road traffic noise is minimised as far as practicable • Noise mitigation measures are implemented effectively during operation • Construction noise and vibration is managed effectively in accordance with relevant guidelines

Relevant SEARs desired performance outcome	Project outcome
<p>Noise and Vibration - Structural</p> <p>Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on the structural integrity of buildings and items including Aboriginal places and environmental heritage.</p> <p>Increases in noise emissions and vibration affecting environmental heritage as defined in the Heritage Act 1977 during operation of the project are effectively managed.</p>	<ul style="list-style-type: none"> No damage to features of heritage significance from vibration
<p>Flooding</p> <p>The project minimises adverse impacts on existing flooding characteristics.</p> <p>Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, or dam failure.</p>	<ul style="list-style-type: none"> Meet flooding criteria determined during project detailed design Maintain the performance of the downstream drainage network during operation Existing upstream and downstream flooding conditions are not increased during construction or operation.
<p>Water - Hydrology</p> <p>Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised.</p> <p>The environmental values of nearby, connected and affected water sources, groundwater and dependent ecological systems including estuarine and marine water (if applicable) are maintained (where values are achieved) or improved and maintained (where values are not achieved).</p> <p>Sustainable use of water resources.</p>	<ul style="list-style-type: none"> Cuttings and ground penetration are designed and constructed to minimise groundwater inflow Reuse of treated water during construction is maximised The need to adjust creek lines is minimised and where required, sensitive riparian restoration of adjusted creek lines is implemented to protect ecological values and hydrological processes Changes to downstream flow characteristics of creeks and minor drainage lines (volume, velocity) do not result in adverse impacts on private property (such as farm dams).
<p>Water - Quality</p> <p>The project is designed, constructed and operated to protect the NSW Water Quality Objectives where they are currently being achieved, and contribute towards achievement of the Water Quality Objectives over time where they are currently not being achieved, including downstream of the project to the extent of the project impact including estuarine and marine waters (if applicable).</p>	<ul style="list-style-type: none"> Existing water quality of watercourses impacted by the project is protected Water quality discharge criteria are established with consideration of NSW Water Quality Objectives Stormwater runoff from the project is effectively treated to meet water quality discharge criteria.
<p>Protected and Sensitive Lands</p> <p>The project is designed, constructed and operated to avoid or minimise impacts on protected and sensitive lands.</p> <p>The project is designed, constructed and operated to avoid or minimise future exposure to coastal hazards and processes.</p>	<ul style="list-style-type: none"> Impact on protected or sensitive lands is minimised Offsets are provided for residual biodiversity impacts.

Relevant SEARs desired performance outcome	Project outcome
Soils <p>The environmental values of land, including soils, subsoils and landforms, are protected.</p> <p>Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination.</p>	<ul style="list-style-type: none"> • Erosion and sediment controls are implemented in accordance with relevant guidelines and standards • Potential acid sulfate soils are managed in accordance with good practice measures • Potentially contaminated lands are managed effectively. • Contamination is managed to protect environmental values and human health.
Air Quality <p>The project is designed, constructed and operated in a manner that minimises air quality impacts (including nuisance dust and odour) to minimise risks to human health and the environment to the greatest extent practicable.</p>	<ul style="list-style-type: none"> • Project operation does not result in unacceptable air quality impacts • Dust, odour and other emissions during construction are managed effectively.
Health and Safety <p>The project avoids or minimises any adverse health impacts arising from the project.</p> <p>The project avoids, to the greatest extent possible, risk to public safety.</p>	<ul style="list-style-type: none"> • The design achieves safe and efficient road user movements • Ancillary facilities and construction sites are established and operated to protect road users and public safety • Hazardous materials within project areas are managed to protect human health • Incidents, crashes and other risks to public safety are minimised during construction.
Sustainability <p>The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources.</p> <p>Conservation of natural resources is maximised.</p>	<ul style="list-style-type: none"> • Sustainability initiatives are implemented during the delivery of the project consistent with the Roads and Maritime Environment Policy and Sustainability Strategy • Infrastructure Sustainability Council of Australia rating of 'Excellent' is achieved for the project.
Waste <p>All wastes generated during the construction and operation of the project are effectively stored, handled, treated, reused, recycled and/or disposed of lawfully and in a manner that protects environmental values.</p>	<ul style="list-style-type: none"> • Uncontaminated spoil is recycled or reused onsite • Off-site waste re-use is managed in accordance with relevant NSW Environment Protection Authority resource recovery exemptions and requirements • Waste is disposed of at appropriately licensed facilities.
Climate Change Risk <p>The project is designed, constructed and operated to be resilient to the future impacts of climate change.</p>	<ul style="list-style-type: none"> • Climate change adaptation measures are incorporated into the detailed design and construction planning for the project.

5. Project justification and conclusion

5.1 Overview of project need

The project is considered to be essential for the State for economic reasons; principally due to the role that the project will have in facilitating the development of and access to the Western Sydney Airport, employment lands and South West Growth Area. To support the airport and realise economic growth objectives for western Sydney a dedicated mixed-use business development zone, the Western Sydney Aerotropolis, is planned in land surrounding the airport.

The combined effect of the Western Sydney Airport and the Aerotropolis is expected to significantly increase traffic demand, placing pressure on the existing local road network. Network performance modelling indicates that the existing road network would have insufficient capacity to carry the traffic that would be generated by the land use surrounding and within the wider study area and that many roads surrounding the study area would be at or near capacity in the future.

Western Sydney is expected to experience record population growth, with around one million additional people living in the region by 2031. The project would allow for an increasing number of residents in western Sydney to access nearby jobs, housing and transport, health facilities, schools and social infrastructure through the provision of transport links. The project would provide essential road capacity to cater for major planned development and reduce projected future demand on the local road network.

The project would help address western Sydney's future transport challenges as follows:

- The project would address major capacity constraints on the arterial road network arising from the development and operation of the Western Sydney Airport. Without the project, ageing, narrow or lower-order roads would perform a traffic function that is better suited to motorway infrastructure. Relying on lower-order roads reduces amenity and results in congestion, increased travel times, decreased travel time reliability and more traffic incidents
- The project would support the Greater Sydney Region Plan's goal of delivering a 30-minute city by facilitating greater access to jobs within 30 minutes of people's homes in western Sydney
- The project would provide critical land transport network capacity to and from Western Sydney Aerotropolis. When operational and fully developed, these will be major trip generators and will be economically critical to Greater Sydney and the NSW economy. Even with major public transport and freight initiatives currently under investigation in western Sydney (for example Sydney Metro Greater West and the Western Sydney Freight Line), major new road capacity is needed to connect Western Sydney Aerotropolis to markets and customers across Greater Sydney
- The project would serve Greater Sydney's wider, highly diverse freight and business travel task. The freight, commercial and service travel tasks require the distribution of goods and services across Greater Sydney, which relies on more diverse and dispersed point-to-point transport connections. The project supports this task by providing connections between Western Sydney Aerotropolis to other employment areas and population centres
- The project would serve natural growth in demand from Greater Sydney's growing population and economy. Over the next 20 years, the number of average weekday trips across Greater Sydney is forecast to increase by 40 per cent, while freight volumes are forecast to double. Much of this growth would occur on the motorway network
- The project would better serve the fragmented land use patterns across Greater Sydney by supporting efficient transport connections for trips that are not well-served by other transport modes due to uneven or fragmented economic or residential development.

There is a need to ensure that connections to the rest of Greater Sydney's transport network are provided to support and maintain Western Sydney Aerotropolis as the catalysts for economic growth in western Sydney. Current infrastructure priorities in the Western City are focussed on supporting the Western Sydney Airport as well as associated employment and population growth. The project would fulfil the goals and objectives of numerous strategic planning instruments, including:

- The NSW State Infrastructure Strategy
- The Greater Sydney Commission's Greater Sydney Region Plan
- The Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan.

5.2 Biophysical, economic and social considerations

The EIS has been prepared with regard to the key issues associated with the project and the integration of biophysical, economic and social considerations. As part of the WSIP program of works, the project would facilitate improved connections between Western Sydney Airport, Western Sydney Aerotropolis and greater Sydney. The M12 Motorway is also considered State significant due to the size, economic value and the potential impacts and opportunities that it may have.

The project is subject to assessment under Part 5.2 of the EP&A Act and has been declared as CSSI by the NSW Minister for Planning and Public Spaces. While the development of the project would have unavoidable impacts (associated with, for example, biodiversity, property acquisition, noise, temporary access disruptions and visual impacts), overall, the project would deliver a large number of benefits. The project would provide a number of benefits that are in the public interest, which include:

- Facilitating the construction and ongoing operation of the Western Sydney Airport
- Accommodating future traffic growth and improving accessibility for road users accessing the Western Sydney Aerotropolis and other development projects in western Sydney
- Developing new infrastructure for public and active transport modes
- Supporting regional benefits related to the broader program of upgrades proposed under the WSIP, such as the provision of high capacity traffic and freight links.

5.3 Sustainable development

The project has been assessed against the relevant sustainability policies with respect to transport infrastructure within the relevant NSW policy context and the NSW legislative context (refer to Chapter 8.4 (Sustainability) of the EIS). With the proposed management measures in place, the project is considered to meet the policy and legislative frameworks for sustainability in NSW.

The project has been designed and assessed in this EIS in accordance with the Roads and Maritime Services Environmental Sustainability Strategy 2015–2019 (Roads and Maritime, 2016f) and would be designed and delivered to achieving 'Design' and 'As Built' ratings of Excellent under the Infrastructure Sustainability Council of Australia infrastructure rating tool (Version 1.2).

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (Ecologically Sustainable Development Steering Committee, 1992). The principles of ESD have been considered throughout the development of the project.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are:

- **The precautionary principle** – This EIS details the evaluation of environmental impacts associated with the project by adopting a conservative approach, which included assessing the worst-case impacts and scenarios. Preparation of the EIS has been undertaken using the best available technical information and adoption of the best practice environmental standards, goals and measures in order to minimise environmental risks. The environmental assessment has been undertaken in collaboration with key stakeholders and relevant statutory and agency requirements.
- **Inter-generational equity** – The project would connect the Western Sydney Airport and the associated Western Sydney Aerotropolis, providing for anticipated future transport needs and creating linkages to service the future population of western Sydney and the Western Sydney Employment Area. This would allow future generations of residents in western Sydney to access nearby jobs, housing and transport, health facilities, schools and social infrastructure through the provision of transport links. Elements of the project, such as bridges, have a design life of about 100 years and would therefore support the needs of both current and future generations. Environmental impacts have been assessed throughout this EIS and environmental management measures have been identified with the intention of maximising intergenerational equity.
- **Conservation of biological diversity and ecological integrity** – Biodiversity values have been considered in the development and selection of the strategic route options and the concept design. Environmental management measures have been identified to further reduce the severity of direct and indirect impacts of the project on biodiversity. Where it is not possible to avoid impacts, ecological input during the remainder of the design process would focus on minimising impacts to biodiversity as far as possible. Where there is likely to be residual impacts associated with vegetation clearance, such impacts would be offset using an assigned credit system, in accordance with the Framework for Biodiversity Assessment (OEH, 2014).
- **Improved valuation and pricing and incentive mechanisms** – The value placed on avoiding and minimising environmental impacts is demonstrated in the design features incorporated into the project description, including opportunities for:
 - Reducing emissions through efficient road design
 - Protecting riparian areas and wildlife corridors through elevating road surface on bridges over major creeks
 - Reducing overall waste by reusing excavated material for fill purposes
 - Managing waste on site as far as practical
 - Maximising use of recycled water sourced on site during construction
 - Minimising noise through adoption of integrated noise reduction measures
 - Protecting biodiversity by assessing and managing impacts on habitat and connectivity of vegetation
 - Ensuring sustainability in procurement through procurement of appropriate skills and maximising enforceability of sustainability contract requirements
 - Design elements to improve local amenity, such as providing the shared user path
 - Integrating urban and landscape design features that reflect the local Aboriginal and non-Aboriginal cultural and historical values.

5.4 Cumulative impacts

The methodology adopted for the cumulative impact assessment is outlined in Section 8.7 (Cumulative impact assessment) of the EIS.

When completed, the project is expected to generate beneficial cumulative impacts associated with:

- Road capacity to meet traffic demand generated by the planned western Sydney urban development
- A high standard connection to the Western Sydney Airport with capacity to meet future freight and passenger needs
- An integrated regional and local public transport system
- A new shared user path with safe and convenient connections to existing and future pathways.

Adverse cumulative impacts may arise during construction and operation of relevant projects, including:

- Western Sydney Airport (approved, under construction). Project is expected to have concurrent construction and operation and occupies adjacent land
- Sydney Metro Greater West (not yet approved). Project is expected to have concurrent construction and operation, and the construction footprints overlap
- The Northern Road Upgrade (approved, construction commenced). Project is expected to have concurrent construction and operation, and occupies adjacent land:
 - Stage 5 (Littlefields Road to Glenmore Park)
 - Stage 6 (Littlefields Road to Eaton Road)
- Other existing road network upgrades and potential road projects (not yet approved). Projects have the potential for concurrent construction and operation, and the construction footprints overlap:
 - Elizabeth Drive Upgrade
 - Mamre Road Upgrade
 - Outer Sydney Orbital
- Major land releases (future strategic government projects). Projects have the potential for concurrent and consecutive construction and operation:
 - Western Sydney Aerotropolis
 - South West Growth Area
 - Western Sydney Employment Area.

The western Sydney area is the focus of large amounts of infrastructure development currently and into the near future. There is also a growing volume of construction activities to support the different proposals occurring either concurrently or consecutively in the region.

In the context of substantial land use changes planned in the immediate locality, including major infrastructure projects, it is likely that there would be moderate cumulative impacts during construction of the project and major cumulative impacts once operational. In light of this substantial cumulative change expected in the project area, combined with the measures to avoid or mitigate the project's impacts, the contribution of the project to wider cumulative impacts would be minor. The project would generate positive impacts, including road network capacity to support Western Sydney Airport as well as wider socio-economic benefits from improved accessibility.

Consultation would be undertaken with local communities potentially affected by the impacts of relevant projects in addition to the project. Where relevant, proponents of other nearby developments would also be consulted to increase the overall awareness of project timeframes, design outcomes and impacts.

Consideration would also be given to the creation of a project working group or equivalent, with the aim of managing project impacts and disruptions through the sharing of relevant project information (ie timing, duration and location of construction activities). The group mandate would also include how pertinent project information is disseminated to stakeholders and communities for transparency and adequate prior notification of local work activities.

The project would contribute a range of positive impacts to the study area and to western Sydney (refer to **Section 5.2** for description of project benefits).

5.5 Conclusion

This environmental assessment has addressed the key issues identified in the SEARs issued under Part 5.2 of the EP&A Act and the relevant provisions of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. The project has been justified in relation to its strategic transport need and its anticipated benefits, taking into account biophysical, economic, social considerations, including ecologically sustainable development and cumulative impacts. The project is considered to best meet the project objectives when compared to all other alternatives and options.

Key environmental issues have been examined throughout the design development process. Consultation has been carried out with affected community and stakeholders to identify key potential impacts at an early stage, and where possible, those impacts have been avoided or appropriate mitigation measures developed. This has resulted in a number of design changes that have mitigated many of the potential impacts. Provided the measures and commitments specified in the EIS are applied and effectively implemented during the detailed design, construction and operational phases, the identified environmental impacts are considered to be acceptable and manageable.

6. References

AS 4970-2009 AMDT 1: Protection of trees on development sites

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NSW EPA (2000) NSW Industrial Noise Policy (INP)

Infrastructure Sustainability Council of Australia (2016) Infrastructure Sustainability rating tool Version 1.2

Interim Construction Noise Guideline (OEH, 2009)

OEH (2014b) Framework for Biodiversity Assessment. Office of Environment and Heritage: Sydney

Roads and Maritime (2016c) Western Sydney Infrastructure Plan. Roads and Maritime Services: Sydney

Roads and Maritime (2016f) Environmental Sustainability Strategy 2015-19. Roads and Maritime Services: Sydney.

Terms and acronyms used in this document

Term / Acronym	Description
ACM	Asbestos containing material
AMP	Asbestos management plan
ARD	Archaeological Research Design
ASSR	Aboriginal Site Salvage Report
BC Act	Biodiversity Conservation Act 2016 (NSW)
BOS	Biodiversity Offsets Strategy
CASA	Civil Aviation Safety Authority
CCTV	Closed circuit television
CEMP	Construction environmental management plan
CCHMP	Construction cultural heritage management plan
CLMP	Contaminated land management plan
CSSI	Critical State Significant Infrastructure
CTMP	Construction traffic management plan
CWRMP	Construction waste resource management plan
DPC	Department of Premier and Cabinet
DPIE	Department of Planning, Industry and Environment
EESG	Environment, Energy and Science Group (EESG) of the DPIE (former NSW Office of Environment and Heritage)
EIA	Environmental impact assessment
EIS	Environmental impact statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FBA	Framework for Biodiversity Assessment
KFH	Key fish habitat
MNES	Matters of national environmental significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999
ONVR	Operational Noise and Vibration Review
PMA	Personal Manager – Acquisition
Roads and Maritime	Roads and Maritime Services

Term / Acronym	Description
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy. A type of planning instrument in NSW
UDLP	Urban Design and Landscape Plan
WSIP	Western Sydney Infrastructure Plan



www.rms.nsw.gov.au/m12
m12motorway@rms.nsw.gov.au



1800 517 155



Roads and Maritime Services
PO Box 973
Parramatta NSW 2124

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