South West Rail Link Glenfield to Leppington Rail Line Project Approval Environmental Assessment

May, 2010

Transport Infrastructure Development Corporation

Parsons Brinckerhoff Australia Pty Limited ABN 80 078 004 798

Ernst & Young Centre,
Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Telephone +61 2 9272 5100
Facsimile +61 2 9272 5101
Email sydney@pb.com.au

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Revision	Details	Date	Amended By
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Author: ..... Emma Dean, Emma Taylor, Adam Moore

Signed: .....

Reviewer: .....Paul Greenhalgh

Signed: .....

Approved by: .....Maria Scolaro

Signed: .....

Date: .....11 May 2010

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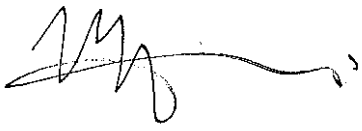
Statement of validity

Submission of Environmental Assessment

Prepared under Part 3A of the *Environmental Planning and Assessment Act 1979*

Environmental assessment prepared by:

Name:	Paul Greenhalgh
Qualifications:	BSc (Hons) Agriculture & Environmental Science; MSc Town & Country Planning
Address:	Parsons Brinckerhoff Pty Ltd Level 27, Ernst & Young Centre 680 George Street Sydney NSW 2001
In respect of:	South West Rail Link Glenfield to Leppington rail line
Applicant name:	Transport Infrastructure Development Corporation
Applicant address:	Level 5, Tower A, Zenith Centre 821 Pacific Highway Chatswood NSW 2067
Proposed development:	TIDC proposes to construct a new 11 kilometre rail line from Glenfield to Leppington in South West Sydney. The project includes two new stations located at Edmondson Park and Leppington, a train stabling facility at Leppington, and construction of the Glenfield South rail flyover superstructure. Development at the two new stations includes bus interchanges and provision for pedestrians, cyclists and commuter car parking. Power supply, substations, sectioning huts, signalling structures, access roads and other infrastructure will also be constructed for the operation and maintenance of the new rail line.
Land to be developed:	Land proposed to be developed is located within the Campbelltown, Camden and Liverpool Local Government Areas in South-western Sydney. The land is generally in rural-residential use at present but is currently being acquired by NSW Department of Planning for the construction of the project.
Environmental Assessment:	An Environmental Assessment is attached that addresses all matters in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979*.
Declaration:	I certify that I have prepared the contents of this Environmental Assessment in accordance with the Minister's Conditions of Approval for the South West Rail Link Concept Plan dated 29 August 2007, and that, to the best of my knowledge, the information contained in the Environmental Assessment is not false or misleading.
Signature:	
Name:	Paul Greenhalgh
Date:	11 May 2010

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Glossary and abbreviations

Term or abbreviation	Definition
AEP	Annual exceedance probability
AHIMS	Aboriginal Heritage Information Management System (Aboriginal heritage database managed by DECCW)
AMBS	Australian Museum Business Services
at grade	at ground level
ATRICS	Advanced Train Running Information Control System
BCA	*Building Code of Australia*
BoM	Bureau of Meteorology
CAMBA	China Australia Migratory Bird Agreement
CBD	Central Business District
CCTV	Closed circuit television
CEMP	Construction Environmental Management Plan
Chainage	Distance along alignment, measured in kilometres from central Sydney
CHL	Commonwealth Heritage List
CO	Carbon monoxide
CNVMP	Construction noise and vibration management plan
Concept Plan	The concept for the SWRL as defined in the *South West Rail Link Concept Plan and Environmental Assessment* (TIDC 2006) as amended by the *South West Rail Link Concept Plan and Environmental Assessment Submissions Report* (TIDC 2007).
Concept Plan Approval	Concept Approval 06_0158 granted by the NSW Minister for Planning on 29 August 2007 for the Concept Plan
Concept Plan EA	*South West Rail Link Concept Plan and Environmental Assessment* (Parsons Brinckerhoff 2006a)
CPTED	Crime Prevention through Environmental Design
CSR	Combined Services Route (an underground co-location of utility and services)
CSIRO	Commonwealth Scientific and Research Organisation
cut	Spoil material excavated for the construction of the project (that can be either used to meet project fill requirements
dBA	A-weighted decibels
DECC	(former) Department of Environment and Climate Change (now DECCW)
DECCW	NSW Department of Environment, Climate Change and Water
DoP	Department of Planning (NSW)
'Down' rail tracks/services	Tracks/services that travel away from Sydney central
EA	Environmental Assessment
ECM	Environmental Control Maps
ECRTN	NSW Government *Environmental Criteria for Road Traffic Noise* (Environmental Protection Authority 1999)
EEC	Endangered ecological community
EMR	Environmental Management Representative
ENCM	*Environmental Noise Control Manual* (Environmental Protection Authority 1994)

Term or abbreviation	Definition
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ESA	Environmental Site Assessment
fill	Spoil material required for construction of the SWRL
GCC	The (former) Growth Centres Commission. Now called the Strategic Land Release Project Office of Department of Planning.
Glenfield to Leppington Rail Line project	Stage B2 works of the South West Rail Link as defined in the Concept Plan. The Stage B2 works are referred to as 'the project', which is the subject of this EA.
Glenfield Southern Flyover	A flyover structure within the vicinity of Bunbury Curran Creek which would carry the SWRL tracks over the Main South Line and the Southern Sydney Freight Line (SSFL) on the existing rail network
Glenfield Transport Interchange	Stage B1 works (as defined in the Concept Plan) which comprises the reconfiguration of Glenfield Station and the construction of a new car parking facility on Roy Watts Road with an initial capacity of approximately 700 spaces. The Concept Plan Approval determined that these works required further assessment under Part 5 of the EP&A Act. The assessment was undertaken in 2008 and 2009, in the form of a Review of Environmental Factors (TIDC 2009), and the activity was determined by TIDC in April 2009. No further planning approvals are required for the Stage B1 works at Glenfield, which have now commenced.
IDW	Integrated Design Workshop
IGANRIP	*Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects* (DECC 2007a)
INP	*Industrial Noise Policy* (Environmental Protection Authority 2000)
JAMBA	Japan Australian Migratory Bird Agreement
kiss-and-ride facility	Passenger pick-up/drop-off facility
KPI	Key performance indicators
L_{A90}	Background noise level, which is the average minimum noise level during the daytime, evening and night-time periods
L_{Aeq}	Background noise level, which is the average minimum noise level during the daytime, evening and night-time periods
LEP	Local environmental plan
LoS	Level of service
LGA	Local government area
Liverpool LEP 2007	*Liverpool Local Environmental Plan 2007*
MCoA	Minister's Conditions of Approval
MNES	Matters of National Environmental Significance
MoT	(former) Ministry of Transport (NSW), now NSW T & I
NES	National environmental significance
NO_x	Nitrous oxides
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
NSW T & I	NSW Transport & Infrastructure
overbridge	A road crossing where the road passes over the railway line
OHW	Overhead wiring

Term or abbreviation	Definition
PoEO Act	NSW *Protection of the Environment Operations Act 1997*
PAD	Potential archaeological deposit
PB	Parsons Brinckerhoff
PM_{10}	Particles with a size of 10 micrometres or less
PMF	Probable maximum flood: an estimate of the largest flood that could conceivably occur and is typically used to consider implications arising from the design of major infrastructure and flood evacuation
Precinct	Spatial unit of land within the SWGC delineated for the purposes of land release and master planning
Precinct planning	The process of land release and planning within the SWGC being undertaken by the Strategic Land Release Project Office of DoP
project	The project that is the subject of this EA is the Glenfield to Leppington section of the SWRL (defined as Stage B2 in the Concept Plan Approval)
project approval	Approval being sought in this EA (approval under Part 3A for of the Glenfield to Leppington section of the SWRL)
REF	Review of Environmental Factors
ROKAMBA	Republic of Korea Australia Migratory Bird Agreement
RTA	Roads and Traffic Authority of NSW
shared use path	Path for pedestrians and cyclists
SCA	Sydney Catchment Authority
SEPP	State Environmental Planning Policy
SoC	Statement of Commitments
SoHI	Statement of Heritage Impact
SHR	State Heritage Register
SO_2	Sulfur dioxide
SSI	Solid State Interlocking (signalling system)
SSFL	Southern Sydney Freight Line project
Stage A (of SWRL)	These works comprise the commencement of early works at the Glenfield North and Glenfield South junctions and the establishment and use of construction work sites (including the establishment of access tracks) at Glenfield and James Meehan Estate, as described in the Concept Plan (Parsons Brinckerhoff 2006a).
Stage A Project Approval	Project Approval 06_0158 granted by the Minister of Planning on 29 August 2009 for Stage A.
Stage B1 (of SWRL)	These works comprise construction and operation of the Glenfield Transport Interchange and associated ancillary infrastructure, including the reconfiguration of Glenfield Station and the construction of a new car parking facility on Roy Watts Road with an initial capacity of approximately 700 spaces. The Concept Plan Approval determined that these works required further assessment under Part 5 of the EP&A Act. The assessment was undertaken in 2008 and 2009, in the form of a Review of Environmental Factors (TIDC 2009), and the activity was determined by TIDC in April 2009. No further planning approvals are required for the Stage B1 works at Glenfield, which have now commenced.
Stage B2 (of SWRL)	These works comprise construction and operation of the SWRL corridor and associated ancillary infrastructure, including construction of the rail line between Glenfield and Leppington, two new stations at Edmondson Park and Leppington and a train stabling facility at Rossmore (referred to as the 'Leppington Train Stabling Facility'). The Concept Plan Approval determined that these works required further assessment under Part 3A of the EP&A Act. The Stage B2 works also cover the Glenfield Southern Flyover (excluding the substructure, which was approved as part of Stage A). The Stage B2 works are referred to as the 'Glenfield to Leppington Rail Line' or 'the project'.

Term or abbreviation	Definition
	This component of work is the subject of this EA.
SWC	Sydney Water Corporation
SWGC	South West Growth Centre; area identified for land release and growth in the Sydney Metropolitan Strategy; also generally known as the South West Sector.
SWSP	*South West Structure Plan* (GCC 2008)
SWRL	South West Rail Link
TIDC	Transport Infrastructure Development Corporation (NSW)
T&I	NSW Transport and Infrastructure
TOD	Transit-oriented development
Track possession	Temporary track closedown
Train stabling facility	Train parking facility
Underbridge	A road crossing where the road passes under the railway line
'Up' rail tracks/services	Tracks/services that travel towards Sydney central
UXO	Unexploded ordinance
VOCs	Polyaromatic hydrocarbons
WSC	Water Servicing Coordinator

Executive summary

This executive summary provides a summary of (and should be read in conjunction with) the *South West Rail Link Glenfield to Leppington Rail Line Project Approval Environmental Assessment* (the remainder of this Environmental Assessment (EA) document).

As detailed below Glenfield to Leppington Rail Line is one component of the wider SWRL project.

Introduction and need

Background

The proposed South West Rail Link (SWRL) comprises Glenfield Junction works, the construction and operation of the Glenfield Transport Interchange and approximately 11 kilometres of rail track (and associated overhead wiring and ancillary infrastructure) between Glenfield and Leppington in Sydney's south-west region. The SWRL also includes the construction and operation of new stations at Edmondson Park and Leppington (including associated bus interchanges, commuter car parks and bicycle facilities), a train stabling (train parking) facility at Rossmore, and a flyover structure within the vicinity of Bunbury Curran Creek (the 'Glenfield Southern Flyover'). This flyover would carry the SWRL tracks over the Main South Line and the Southern Sydney Freight Line (SSFL) on the existing rail network.

The SWRL forms part of the response of the NSW Government to issues of reliability and passenger growth on the metropolitan rail network.

On 29 August 2007, the NSW Minister for Planning granted:

- Concept Plan Approval for the SWRL.
- Stage A Project Approval for Stage A of the SWRL under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Concept Plan Approval and the Stage A Approval were granted following exhibition of the *South West Rail Link Concept Plan and Environmental Assessment* (Parsons Brinckerhoff 2006a, the Concept Plan EA) and preparation of a Submissions Report in early 2007 (Parsons Brinckerhoff 2007).

The Concept Plan Approval covered a high level Concept Plan for the SWRL, which contemplated an ongoing detailed planning phase during which the SWRL would be subject to further detailed design and environmental assessment.

The Stage A Approval authorised the works to be carried out at Glenfield Junction including the construction and operation of Glenfield North Flyover and the partial construction of the Glenfield Southern Flyover subject to conditions.

The Concept Plan Approval was subject to a number of control measures and further requirements for environmental impact assessment of the Stage B components of the SWRL, as follows:

- **Stage B1 works** – comprising the Glenfield Transport Interchange (including the reconfiguration of Glenfield Station and construction of a new car parking facility on Roy Watts Road with an initial capacity of approximately 700 spaces). The approval determined that this required further assessment under Part 5 of the EP&A Act. The assessment was undertaken in 2008 and 2009, in the form of a Review of Environmental Factors (REF) (Parsons Brinckerhoff 2009), and determined by Transport Infrastructure Development Corporation (TIDC) in April 2009. No further planning approvals are required for the Stage B1 works at Glenfield, which have now commenced.

- **Stage B2 works** – comprising the remaining SWRL corridor (including construction of the rail corridor, two new stations and a train stabling facility). The approval determined that this stage required further assessment under Part 3A of the EP&A Act.

A copy of the Concept Plan Approval, including the Minister's Conditions of Approval (MCoA), is contained in Appendix A of this document.

On 9 March 2010 the Minister for Planning declared Stage B2 of the SWRL to be a critical infrastructure project under Part 3A of the EP&A Act.

This EA has been prepared to satisfy assessment and project approval requirements for the SWRL Stage B2 works (which are hereafter referred to as 'Glenfield to Leppington Rail Line' or 'the project') under Part 3A of the EP&A Act. Appendix B of this EA provides the Statement of Commitments (SoCs) for the Concept Plan. Appendix C and D provides information on how this EA has addressed all Concept Plan MCoAs and SoCs relevant to the project.

Importantly, the SWRL is being delivered as a two-stage process, comprising:

- **Glenfield Transport Interchange** – delivery of all components associated with the Stage A and Stage B1 works as defined in the Concept Plan Approval, as well as additional early works approved under Part 5 of the EP&A Act (in separate REF reports).
- **Glenfield to Leppington Rail Line** – delivery of all components associated with the project (defined as Stage B2 works as defined in the Concept Plan Approval). This stage is subject of this EA.

The two key stages and features of the SWRL are shown diagrammatically in Figure E-1. The design and location of the project, including the train stabling facility, do not preclude a potential future extension of the SWRL beyond Rossmore.

Description of the project scope

The project incorporates the following key components of work:

- **Rail lines between the existing rail corridor at Glenfield and the new Leppington Train Stabling Facility at Rossmore** – construction and operation of approximately 11 kilometres of rail lines over lands to the south and west of the existing Glenfield Junction (Main South and East Hills Line) and associated infrastructure:
  - The rail lines and associated infrastructure would generally be within a rail corridor that is generally 40 metres wide between stations and 60 metres wide at the station locations.
  - The proposed horizontal alignment of the rail corridor is generally consistent with that outlined in the Concept Plan EA .
- **Superstructures for the Glenfield Southern Flyover** – construction and operation of southern flyover superstructures to carry the SWRL over the Main South Lines:
  - Piling, pile caps and construction of the substructure for these flyovers form part of Stage A works that have already been granted project approval.
  - The remainder of the Glenfield Southern Flyover works (the superstructures) form part of the Glenfield to Leppington Rail Line project. These structures would cross over the existing Main South Lines and the relocated track of the SSFL.
- **Edmondson Park and Leppington Stations** – construction and operation of two new stations at Leppington and Edmondson Park:
  - Both the stations would be located within cuttings to optimise integration within the new town centre developments and to provide for easy transport interchange.

- Edmondson Park Station would contain an overhead concourse with stairs and a lift, and staff and ticketing facilities. The platform would be a single 170 metre long island platform, with design provision for future extension to 210 metres (see artist impression in Figure E-2).
- Leppington Station would consist of two island platforms served by an overhead concourse with stairs and lifts, and staff and ticketing facilities. The platform would comprise two 170 metre long single island platforms (see artist impression in Figure E-3).
- The new rail stations would include interchange and car parking facilities and other associated infrastructure. Some of these permanent works (i.e. commuter car parks) would be outside the rail corridor.

- **Leppington Train Stabling facility at Rossmore** – construction and operation of a train stabling (train parking) facility (including associated infrastructure, access roads, staff facilities, etc), within an area of land approximately 500 metres long and 200 metres wide:
  - The stabling facility would provide for stabling of 12 eight-car sets on opening, with future provision within the identified footprint to allow for expansion to 20 eight-car in the future.
  - Two machine sidings (i.e. two rows of tracks) would also be provided at the stabling facility to accommodate train maintenance vehicles.
  - Facilities within the yard would include cleaning/light maintenance facilities, amenities, administration offices and staff car parking. The facility would be flood lit and fenced for security. Some of the permanent works would be outside the identified corridor (i.e. access and facilities).
- **Ancillary facilities** – including power supply, substations, sectioning huts, signalling structures, access roads and other infrastructure would be required for the operation and maintenance of the rail services and infrastructure. The majority of the ancillary facilities would be contained within the rail corridor, with the exception of substations proposed at the following locations (shown in Figure 6-1 of the main EA):
  - south of the rail corridor off Cassidy Street, Denham Court
  - to the north of the rail corridor west of Camden Valley Way
  - at the Leppington Train Stabling Facility.

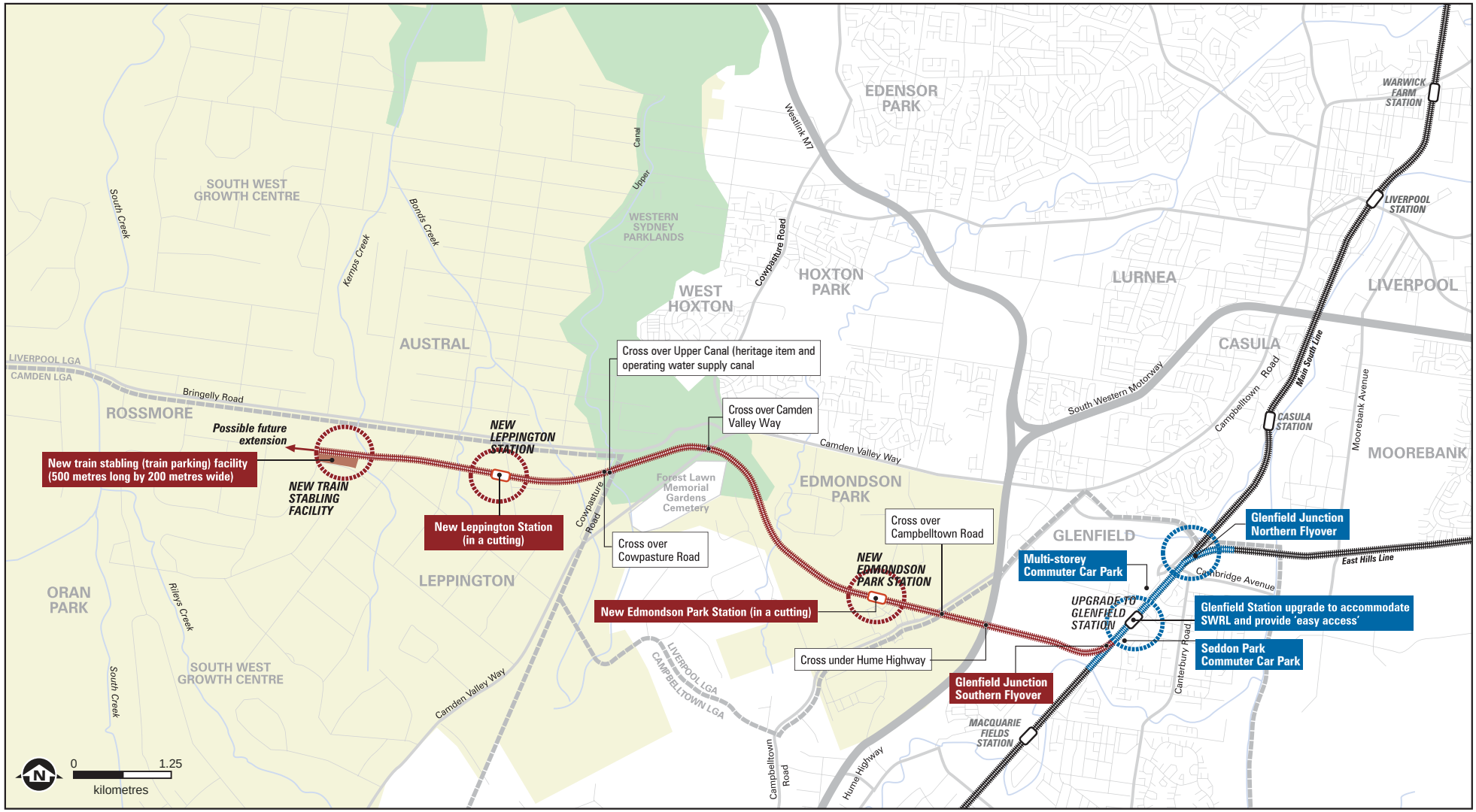
The construction of the project would also require the establishment of construction compounds, stockpiles and access roads (refer Figure 6-18 of the main EA).

The contract timeframe for design, construction, and commissioning of the project is anticipated to commence in 2010 (subject to project approval), with final commissioning by 2016. A more detailed description of the project is provided in Chapter 6.

Potential future extension of the SWRL

Options for a potential future extension of the project beyond Rossmore have been investigated by NSW Transport and Infrastructure (T&I). Any such extension is not part of the scope of works for the current SWRL project or this EA.

The design and location of the project, including the train stabling facility, do not preclude a potential future extension of the SWRL beyond Rossmore. The precise location of any extension or future terminus would be determined by operational needs and the patterns of future development.



SWRL - Glenfield Transport Interchange (includes Stage A and Stage B1 works as defined in Concept Plan plus additional early works approved by separate REFs)

SWRL - Glenfield to Leppington rail line (the project) (includes Stage B2 works as defined in Concept Plan)

Figure E-1 Stages of the South West Rail Link

Note: Indicative only, subject to detailed design

Figure E- 2 Artists impression of Edmondson Park Station

Note: Indicative only, subject to detailed design

Figure E- 3 Artists impression of Leppington Station

Project proponent

For the purposes of this EA, the project proponent is TIDC and its successors or assigns.

TIDC is a statutory State-owned corporation under the *Transport Administration Act 1988,* with the principal function of developing major infrastructure projects on behalf of the NSW Government. TIDC has been commissioned by the NSW Government to deliver the SWRL. On completion, the project would be transferred to RailCorp, who would operate and manage the rail line.

Under s18E(1) of the Act, TIDC may not undertake the development of a major railway system or other major transport project except with the consent of the portfolio Minister and the voting shareholders of the Corporation.

Need for and benefits of the project

The project is located largely within the South West Growth Centre (SWGC) of Sydney, an area of land release and significant growth identified in the NSW Department of Planning's (DoP's) Sydney Metropolitan Strategy (*City of Cities – A Plan for Sydney's Future,* DoP 2005a). The draft SWGC Structure Plan (Department of Planning 2005b) incorporates the SWRL (from Edmondson Park to Leppington) and identifies the project as an integral part of the anticipated urban structure and transport network proposed for the SWGC.

In the next 30 years, it is estimated that 110,000 new homes will be built in south-west Sydney's 'greenfield' areas and another 7,500 homes will be built at Edmondson Park. This is forecast to house approximately 300,000 people.

Key to the sustainable development of the south-west region is the provision of an efficient and reliable public transport system, with frequent and reliable transit links to major centres such as the Sydney CBD, Parramatta and Liverpool, to complement local bus networks.

The project would support transport growth to the region (a high demand corridor) by allowing additional services to operate on the East Hills and Main South Lines, and providing additional train stabling (train parking) facilities for Sector 2 of the Sydney metropolitan rail network (the Airport and East Hills Line, Main South Line (via Granville), Bankstown Line, and the Inner West Line).

RailCorp proposes that passengers would initially be provided with four trains per hour throughout the day and, potentially, up to 12 trains per hour in peak periods. More trains would be provided as the population increases and the need for additional services grows.

The SWRL would provide the following benefits:

- infrastructure, including new stations at Leppington and Edmondson Park, to facilitate sustainable development in Edmondson Park, Leppington and the SWGC by providing for early transit-oriented development
- long-term stabling requirements for Sector 2 of the metropolitan rail network
- congestion relief on the rail network by providing extra capacity on the existing Main South and East Hills Lines
- a direct transport link to and from the south-west region of Sydney and key regional destinations (such as Liverpool)
- curtailment of growth in road network congestion in the south-west region of Sydney.

Overall the key objectives of the project are to:

- direct rail services to the SWGC's projected population of approximately 300,000 people

- provide competitive rail journey times in comparison to other modes of transport between the future Leppington town centre and Central, and to Liverpool and Parramatta (providing a sustainable transport solution)
- meet best practice standards to deliver transport infrastructure to support the establishment of sustainable new communities within the SWGC by providing a framework for early transit-oriented development.

More information on the need and benefits of the project is provided in Chapter 1 of this document.

Community and stakeholder involvement

The community and other stakeholders consulted during the preparation of this EA included participants from earlier planning phases of the SWRL development, stakeholders as identified in the Concept Plan Approval EA process, local residents of Leppington, Edmondson Park and Glenfield, as well as community services and businesses located along the project corridor.

Consultation was also undertaken with government and non-government stakeholders that have an approval, regulatory or other interest in the development of the project, including local councils, the Strategic Land Release Project Office of DoP (formerly the Growth Centres Commission), the Department of Environment, Climate Change and Water (DECCW), RailCorp and the DoP.

To inform and encourage community and stakeholder involvement in the development of the EA and design process for the project, the following community tools/activities were implemented:

- A project webpage, information line, fax number and email address were used to distribute and receive project information.
- A project database was used to manage and record stakeholder issues.
- A newsletter was distributed in early March 2008 to key stakeholders and approximately 4,500 residents/occupants in the vicinity of the project corridor.
- Three community information sessions were held in March 2008 at Edmondson Park, Leppington and Glenfield.
- A project briefing with government agencies and local councils was held on 8 February 2008, with a further project briefing on 29 January 2010.
- A project briefing with non-government stakeholders was held on 18 March 2008.

As a means of integrating environmental and sustainability objectives into the project design, three integrated design workshops (IDWs) were held on 13 March 2008, 22 April 2008 and 2 May 2008. While the first two IDWs were attended by TIDC and project technical advisors, the third workshop (held at the completion of the draft concept design), was also attended by government agencies and local councils.

Key issues raised by the community and stakeholders are analysed in Chapter 3 of this document. The most frequently raised issues related to potential land use and property impacts; Edmondson Park Station planning, future land use around the train stabling facility, car parking, visual impacts and urban design; traffic, transport, parking and access; noise and vibration; and the need for an effective consultation process.

The EA will be publicly exhibited for a minimum of 30 days during which formal written submissions will be invited. These submissions will be analysed and addressed in a Submissions Report (and if required, a Preferred Project Report), which will respond to the issues raised and identify any changes to the project or mitigation measures required.

A series of community information sessions and further meetings with stakeholders are proposed during the exhibition period. More information on these and guidelines for making a submission can be found in Sections 1.4 and 1.5.

Planning approval process

Project Application under Part 3A of the EP&A Act

Key steps in the planning approvals process for the project are shown in Figure E-4.

At the conclusion of the exhibition of the EA, TIDC will review all submissions received by the DoP and prepare a Submissions Report. The report will include consideration of:

- the EA
- all submissions and responses to the issues raised
- any new information concerning the project
- any modifications to the project as a result of submissions raised.

The Submissions Report will additionally contain a summary of mitigation measures and other commitments (in an SoC) made should the project proceed.

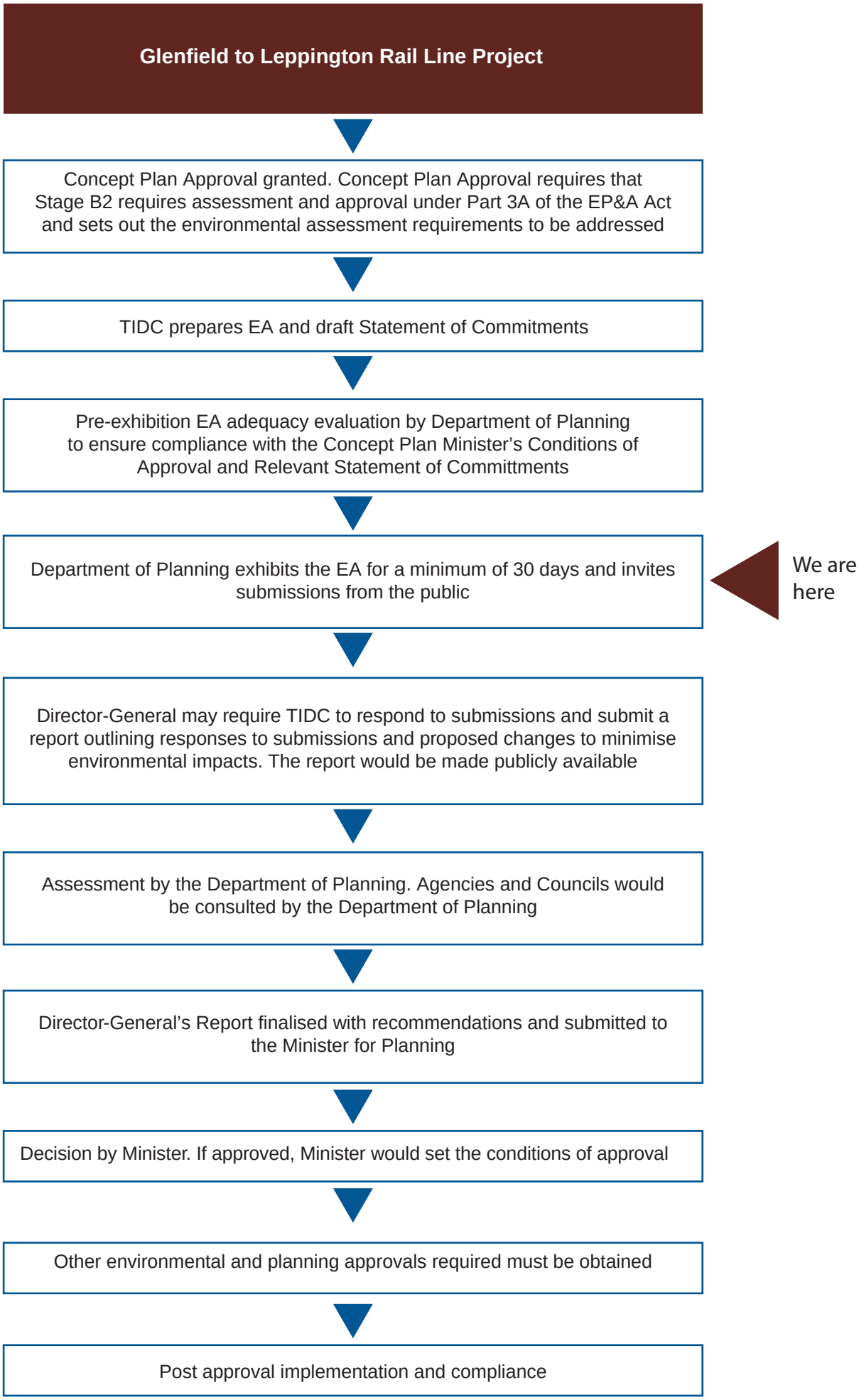
The EA and Submissions Report will be sent to the DoP, together with any advice on any adopted modifications to the project and the SoC, to seek approval from the Minister for Planning. If significant changes are proposed, the DoP may require TIDC to prepare a Preferred Project Report.

The DoP will examine all reports submitted by TIDC and prepare the Director-General's report to the Minister. Acting on that report, the Minister will decide whether or not to approve the project. The Minister may attach conditions to the approval or elect not to grant the approval.

The planning, design and decision process allows for input from public authorities and the community. Assessment of submissions made in response to the exhibition of the EA is an integral part of the assessment process and can result in modifications and improvements to the design of the project in accordance with Part 3A of the EP&A Act.

EPBC Act

The project may also require approval of the Commonwealth Minister for Environmental Protection, Heritage and the Arts under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to impacts on the environment of the Ingleburn Army Camp as Commonwealth land. The Historic Heritage Assessment for the project (refer Chapter 13) notes that the impacts of the project on the Ingleburn Army Camp are potentially significant, notwithstanding that the land is likely to be transferred from Commonwealth to State Government with the intention of wholesale redevelopment. On this basis the project may need to be referred to the Minister for a determination as to whether or not the project is a controlled action under the EPBC Act. Further details are provided in Chapter 2.



** Note: Refers to Stage B2 works as defined in the Concept Plan (the subject of this EA)*

Figure E-4 Approval process for the Glenfield to Leppington Rail Line project

Environmental assessment

Receiving environment

The project traverses numerous property lots with a variety of land uses, including rural-residential properties (5 acre lots) with market gardens and/or light intensity grazing; land owned by the NSW Government (Landcom) that is zoned for future residential development (Edmondson Park); housing and land owned by the Department of Defence; roads; and an existing railway corridor (at Glenfield).

Key features of the existing social and cultural environment include:

- a predominance of rural-residential land uses along the project corridor, which would cross through three local government areas (Liverpool, Camden and Campbelltown)
- other land uses, including established residential areas in Glenfield, Denham Court and Horningsea Park; special uses such as educational uses (particularly at Glenfield), the Forest Lawn Memorial Gardens Cemetery, and the former Ingleburn Army Barracks
- open space areas, including the Western Sydney Parklands (north of Bringelly Road); and some areas of retail/commercial uses, including the Glenfield town centre and rural market gardening businesses in Leppington and Rossmore
- a regional transport network that includes limited bus services, a rail network that only extends as far west as Glenfield, a relatively good regional road network (including the South Western Motorway, the Hume Highway and the M7), and a relatively undeveloped local road network
- an acoustic environment that varies along the length of the project corridor, along with changes to surrounding land uses and the proximity to major roads and the existing rail corridor
- a number of areas of potential archaeological, cultural and social significance to the Aboriginal community, particularly along relatively undisturbed creek lines, low slopes and ridges
- a number of sites and places of historic heritage value, including the Ingleburn Army Camp, the Upper Canal, historic road alignments (Camden Valley Way and Cowpasture Road), the Denham Court viewshed, Hurlstone Agricultural High School and historic fenceline remnants
- a number of important views, including along the historic road alignments and the Denham Court viewshed noted above, views from Macquarie Field House, and views from within the Forest Lawn Memorial Gardens Cemetery and the Western Sydney Parklands
- a range of community profiles, including the established community of Glenfield, the residential area of Denham Court, the relatively new residential area of Horningsea Park (which has a high number of young families), and the predominantly rural-residential areas of Leppington and Rossmore, which have greater numbers of couples without children and people from non-English speaking backgrounds.

The south-west region of Sydney, along with Sydney metropolitan area, the north-west region and the Central Coast, has shown one of the largest increases in population between 1991 and 2004, and this is expected to continue over the next 30 years (Transport and Population Data Centre, TPDC 2006).

The region also has one of the highest rates of private vehicle ownership and use in Sydney. Residents in the south-west of Sydney have the longest commute (on average), and travel longer distances (on average) each weekday compared to those residing in the Sydney CBD.

The remnant vegetation and fauna habitats along the study area have been exposed to a range of past impacts and levels of disturbance and are located within an area of significant proposed development.

Key features of the existing biophysical environment include:

- a number of watercourses and ephemeral creeks that make up parts of the Georges River and Hawkesbury-Nepean River catchments and a number of flood-prone areas
- remnant vegetation, including the Shale Hills Woodland and Shale Plains Woodland sub-units of Cumberland Plain Woodland, which is listed as critically endangered under the *Threatened Species Conservation Act 1995* (TSC Act) and the EPBC Act, and Alluvial Woodland and Riparian Forest, which form part of the TSC Act listed endangered ecological community River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
- 48 threatened fauna species listed under the TSC Act that are known or predicted to occur in the locality, comprising 14 mammals, 25 birds, two reptiles, six frogs and one invertebrate
- six threatened fauna species recorded in the study area, with one additional species not recorded but with the potential to occur based on suitable habitat
- the confirmed occurrence of a population of Cumberland Plain Land Snail (*Meridolum corneovirens*), which is listed as endangered under the TSC Act, and the confirmed occurrence of populations of Grey-headed Flying-fox (*Pteropus poliocephalus*), Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*), Eastern Freetail-bat (*Mormopterus norfolkensis*), Eastern Bent-wing Bat (*Miniopterus schreibersii oceanensis*), Greater Broad-nosed Bat (*Scoteanax rueppellii*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*), all of which are listed as vulnerable under the TSC Act (the Grey-headed Flying-fox is also listed as vulnerable under the EPBC Act.)
- two threatened species of fish and one invertebrate listed under the *Fisheries Management Act 1994* that are known or predicted to occur in the locality: Trout Cod (*Maccullochella macquariensis*), Macquarie Perch *(Macquaria australasica)* and Adam's Emerald Dragonfly (*Archaeophya adamsi*).

Planned future environment

As described above, the project would pass through a number of precincts in the SWGC that are planned for major development in the future. Edmondson Park is likely to be developed first, as the area is already largely planned and has been rezoned to allow for re-development. Some parts of this development are likely to be in place by the time the project is constructed. The Leppington North precinct was released for development by DoP in late 2009, meaning that precinct planning will be progressed through 2010. The timing of its development is as yet unconfirmed, but it would be likely to follow the project construction. Other key planned developments in the vicinity of the project and the wider SWGC include:

- development of the SWGC to accommodate at least 15-20% of Sydney's new housing over the course of the land release program, resulting in the redevelopment and masterplanning of major precincts such as Edmondson Park, Leppington and Leppington East, through which the project would pass
- construction of the SSFL, which would comprise a single dedicated rail freight track, 30 kilometres in length, and extending from south of Macarthur to east of the Sefton Park Junction (The SSFL is currently under construction. It would cross over the Main South Line via a new overpass north of Glenfield and continue through to Sefton on the eastern and southern side of the passenger lines.)
- construction and operation of a 243,600-tonne-a-year Hy-Tec Concrete Batching Plant, office and amenities at Smeaton Grange that would operate 24-hours a day, seven days a week
- remodelling of stabling yards at Liverpool and Campbelltown Stations and an upgrade to Macarthur Station
- Sydney Water expansion plans (water, sewer and recycled water), comprising an integrated water, recycled water and wastewater servicing strategy for the SWGC
- development of the Edmondson Park Town Centre, resulting in cumulative impacts on the former Ingleburn Army Camp area

- widening of the Hume Highway (F5) between Ingleburn and Campbelltown, expanding the Brooks Road to Raby Road section of the F5 from four lanes to eight lanes, expanding the Raby Road to Narellan Road section from four lanes to six lanes and upgrades to Bringelly Road.

The planned and likely future developments in and around the project would have major implications for the future social, cultural and biophysical environment in the area, which have been assessed and addressed in the EA (Volume 1).

Potential impacts

The EA identifies potential environmental impacts of the project and outlines measures that would address and minimise their effects. Key potential construction and operational impacts of the project are summarised in Table E-1.

Table E- 1 Key potential construction and operational impacts

Key issue	Identified key potential impacts	
	Construction	**Operation**
Land use, property and infrastructure planning (refer Chapter 7)	*Construction phase impacts on adjacent land uses* — These would include impacts on noise and vibration amenity (refer Chapter 9), visual amenity (refer Chapter 14), traffic and transport amenity (refer Chapter 8) and business impacts (refer Section 15.2). These issues are considered to be manageable with the effective implementation of standard construction environmental management measures.	*Permanent impacts on directly affected properties and land uses* — The proposed Edmondson Park and Leppington Stations and associated trackworks outside the approved rail corridor (in the Concept Plan) would impact on rural-residential property in Edmondson Park, Leppington and Rossmore, and properties under government ownership (refer Chapter 7). These properties would be acquired (in full or in part) at market rates in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*. These impacts are not considered to be significant in the context of the proposed future development of the area.
Traffic, transport, parking and access (refer Chapter 8)	*Construction phase impacts on local and regional traffic* — Impacts to traffic would be associated with heavy vehicle traffic and increased traffic on local roads. These impacts would be managed through the development of a construction staging plan, which would maximise access along the rail corridor (refer Section 8.9).	*Operational phase impacts on local and regional traffic* — The growth in traffic volumes in the vicinity of the proposed stations at Leppington and Edmondson Park would be caused by the progressive release and development of land, including the development at the proposed stations. The growth in traffic near both railway station precincts would largely be a result of the increased use of rail as a transport mode (refer Sections 8.3 and 8.4). Measures to manage these impacts would be considered further during the detailed design stage of the project.
Noise and vibration (refer Chapter 9)	*Noise and vibration* — Short-term impacts would be associated with general earthworks, trackworks, site specific works and construction traffic, with exceedances in noise criteria goals expected at the nearest receivers (refer Section 9.3). Construction noise and vibration impacts are considered to be manageable with the application of standard noise mitigation measures and the development of a Construction Noise and Vibration Management Plan.	*Noise and vibration* — Adverse noise impacts would be associated with train operations on the SWRL, station operations at Edmondson Park and Leppington and activities at the train stabling facility (refer Section 9.4). These impacts are considered to be manageable with the application of noise mitigation measures (earth mounds/noise walls) and planning controls (such as parks, roads and commercial development planned to separate sensitive users from rail corridor).

Key issue	Identified key potential impacts	
	Construction	**Operation**
Hydrology (refer Chapter 10)	*Water quality* — Water quality may be impacted by the pollution of stormwater run-off with sediments, fuels and other hazardous materials from construction sites, and the uncovering of soils, particularly within the Edmondson Park Release Area. These impacts are considered to be manageable through the implementation of the proposed mitigation measures (refer Section 10.7).	*Water quality* —The project has the potential to cause erosion and sedimentation from cuttings and embankments, scouring downstream of waterway crossings and run-off generated pollutants such as oils, greases and gross matter. These impacts would be manageable through the incorporation of water quality measures into the design of the drainage system, such as the use of grassed swales in lieu of concrete or bitumen lining. *Hydrology* — A number of locations have been identified where there is the potential for significant flood risks in storms larger than the 1% annual exceedance probability (1 in 100 year) event and/or overflows due to a substantial culvert blockage. This is especially relevant to the area around the proposed Edmondson Park Station (Crossings 4 to 6). However, the project works would be unlikely to significantly affect flooding within the project area.
Flora and fauna (refer Chapter 11)	*Impacts to threatened biodiversity* — The impacts on threatened ecological communities (Cumberland Plain Woodland and River-Flat Eucalypt Forest on Coastal Floodplains) and habitat for threatened species (Cumberland Plain Land Snail, Grey-headed Flying-fox and Microbats) are considered to be manageable through the implementation of the proposed mitigation measures, which includes the adoption of biodiversity offsets (refer Section 11.11).	No operational impacts anticipated.
Aboriginal heritage (refer Chapter 12)	*Direct and indirect impacts on Aboriginal heritage items* — The project would have direct impacts on eight sites (MFH#2, SW1. SWRL Site 7, EPCS4, EPCS7, EPCS8, EPCS10, SWRL Site 5). These impacts are considered to be manageable with the implementation of the proposed mitigation measures (refer Section 12.7).	No operational impacts anticipated.
Historic heritage (refer Chapter 13)	*Direct and indirect impacts on historic heritage items* — The project may have impacts on the Upper Canal and Ingleburn Army Camp, the understanding of the original James Meehan Macquarie Fields grant, the rarity of the street layout within Ingleburn Village, the historical and aesthetic values of the Bunya Pines and the historic and technical significance of several local roads. These impacts are generally considered to be manageable with the implementation of the proposed mitigation measures (refer Section 13.7.1), with the exception of the impacts to the Ingleburn Army Camp where the impacts are considered to be significant (refer Section 13.4.2).	Operational impacts would include detrimental impact on the visual amenity of the local environment and the view corridors, especially around the Glenfield Southern Flyover. Mitigation measures such as appropriate landscaping and interpretive signing (refer to Section 13.7.2) would minimise these impacts.

Key issue	Identified key potential impacts	
	Construction	**Operation**
Visual and landscaping (refer Chapter 14)	*Direct and indirect impacts on the visual environment* — Construction may affect visual amenity for surrounding residents and occupants of vehicles using nearby roads during construction. These impacts are considered to be manageable with the implementation of the proposed mitigation measures (refer Section 14.8).	*Direct and indirect impacts on the visual environment* — The rail corridor, stations, stabling facility and new overbridges have the potential to be visually dominant features in the landscape. Visual impacts would be managed through design development by the implementation of urban design and landscape management measures. Visual impacts are also expected to be reduced in the long term as the area is developed.

The project is also expected to have relatively minor potential impacts on the following environmental issues given the implementation of standard management and mitigation measures:

- air quality and greenhouse gases (refer Section 15.1)
- economic and business (refer Section 15.2)
- groundwater and subsurface hydrology (refer Section 15.3)
- geotechnical, contaminated land and hazardous materials (refer Section 15.4)
- public safety (refer Section 15.5)
- disposal of waste (refer Section 15.6)
- services and utilities (refer Section 15.7)
- bushfire risk (refer Section 15.8)
- cumulative impacts (refer Section 15.9).

These issues can be effectively managed through standard management measures, which are proposed to be incorporated into TIDC's Statement of Commitments for the Project.

The measures identified in the EA to mitigate and manage the above environmental impacts have informed the project draft Statement of Commitments (SoC) that TIDC intends to implement as part of the construction phase of the project, and RailCorp would implement during the operation of the project (refer Table 17-1). The draft SoC specifies certain environmental outcomes to be achieved. In some instances, greater detail as to how those outcomes would be achieved is provided in the mitigation and management measures in Chapters 7 to 16.

Importantly, the SoC from the Concept Plan EA (presented in the Submissions Report for the Concept Plan (Parsons Brinckerhoff 2007)) has been considered in the preparation of the draft SoC. Appendix D of this EA demonstrates how those earlier commitments have been addressed to date and, for those commitments that are still to be implemented (i.e. those that relate to future stages of the project), how these have been incorporated into the current SoC. As such, the draft SoC effectively supersedes the SoC associated with the Concept Plan EA and approval. It details those commitments that TIDC proposes to manage the potential environmental impacts associated with the construction phase of the project, as well as relevant commitments for the future operation of the project by RailCorp.

A Construction Environmental Management Plan (CEMP) would be developed prior to the start of construction to define the management measures required to achieve compliance with specific environmental issues. This would include environmental protection practices, resources and the sequence of activities required to comply with relevant environmental legislation and conditions of any applicable licences, approvals and permits.

RailCorp would manage ongoing environmental issues associated with operation and maintenance activities through its established environmental management system and standard operational procedures.

Justification and conclusions

In 30 years, it is estimated that the south-west region of Sydney will house an additional 300,000 people. Fundamental to the sustainable development of the south-west region is the provision of an efficient and reliable public transport system and the infrastructure to support that growth. The project, in conjunction with other components of the overall SWRL, is expected to have environmental, social and economic benefits for both the Sydney south-west region and the wider metropolitan area. By providing sustainable transport to this growing community, the SWRL, including the project, would:

- **improve accessibility** – by providing rail access for the growing south-west region to key employment, education and recreational centres including the CBD, Campbelltown, Liverpool and Parramatta
- **improve capacity** – by providing for increases in the number and reach of train services to meet future growth in the south-west
- **improve reliability and on-time running** – by providing train stabling facilities and extra capacity within Sector 2.

However, the nature of the project means that some potential adverse impacts, including some potentially significant impacts, are unavoidable. Through the adoption of mitigation measures, the benefits of the project, associated with meeting the objectives of the NSW Government to address issues of reliability and growth on the metropolitan rail network, are considered to outweigh the adverse impacts.

The next key steps for the project include:

- exhibition of the EA for a minimum of 30 days and invitation for the community and stakeholders to learn more about the project and make submissions
- preparation of a Submissions Report by TIDC and, if required, a Preferred Project Report and final SoC
- provision of the Submissions Report, together with advice on any adopted modifications to the project and SoC to the DoP to seek approval of the project by the Minister for Planning. The Minister would then determine the project and the modifications sought to conditions 1.1 and 1.2 of the Concept Plan Approval and the Stage A Approval
- if approved, Minister's Conditions of Approval (MCoA) would be set by the Minister outlining control measures and any further assessment requirements.

1. Introduction

Chapter 1 provides an introduction to this Environmental Assessment (EA) report prepared to assess the component of the South West Rail Link (SWRL) between Glenfield and Leppington (as defined in the Concept Plan).

The chapter includes a brief description of the wider SWRL and the previous assessment undertaken for the SWRL Concept Plan and the status of the assessments for the other stages of works.

This chapter also identifies the structure of this document and lists the key issues that are addressed in detail in later chapters.

1.1 The South West Rail Link

The proposed SWRL comprises Glenfield Junction works, the construction and operation of the Glenfield Transport Interchange and approximately 11 kilometres of rail track (and associated overhead wiring and ancillary infrastructure) between Glenfield and Leppington in Sydney's south-west region. The SWRL also includes the construction and operation of new stations at Edmondson Park and Leppington (including associated bus interchanges, commuter car parks and bicycle facilities), a train stabling (train parking) facility at Rossmore (referred to as the 'Leppington Train Stabling Facility'), and a flyover structure within the vicinity of Bunbury Curran Creek (the 'Glenfield Southern Flyover'). This flyover would carry the SWRL tracks over the Main South Line and the Southern Sydney Freight Line (SSFL) on the existing rail network.

The SWRL is being delivered by the Transport Infrastructure Development Corporation (TIDC) on behalf of the NSW Government. Post-construction, the project would be managed and operated by RailCorp.

1.1.1 Background

On 29 August 2007, the NSW Minister for Planning granted:

- Concept Plan Approval for the SWRL (the Concept Plan Approval)
- Project Approval for the SWRL Stage A works (the Stage A Approval) under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

These approvals were granted following exhibition of the *South West Rail Link Concept Plan and Environmental Assessment* (prepared by Parsons Brinckerhoff for TIDC 2006a) and the *South West Rail Link Submissions Report* (prepared by Parsons Brinckerhoff for TIDC 2007).

The Concept Plan Approval was subject to a number of conditions (the Minister's Conditions of Approval (MCoA)) that outline:

- potential control measures that must be undertaken to mitigate potential impacts
- details for further environmental assessment and consultation requirements
- the three stages of the project in terms of future approval.

The Stage A Approval authorised the works to be carried out at Glenfield Junction including the construction and operation of Glenfield North Flyover and the partial construction of the Glenfield South Flyover subject to conditions.

The Concept Plan Approval determined that further assessment under Parts 5 and 3A of the EP&A Act was required for the Stage B components, as follows:

- **Stage B1 works** – These works comprise construction and operation of the Glenfield Transport Interchange and associated ancillary infrastructure, including the reconfiguration of Glenfield Station and the construction of a new car parking facility on Roy Watts Road with an initial capacity of approximately 700 spaces. The Concept Plan Approval determined that these works required further assessment under Part 5 of the EP&A Act. The assessment was undertaken in 2008 and 2009, in the form of a Review of Environmental Factors (TIDC 2009), and the activity was determined by TIDC in April 2009. No further planning approvals are required for the Stage B1 works at Glenfield, which have now commenced.
- **Stage B2 works**– These works comprise construction and operation of the SWRL corridor and associated ancillary infrastructure, including construction of the rail line between Glenfield and Leppington, new stations at Edmondson Park and Leppington and a train stabling facility at Rossmore. The Concept Plan Approval determined that these works required further assessment under Part 3A of the EP&A Act. The Stage B2 works also cover the Glenfield Southern Flyover (excluding the substructure, which was approved as part of Stage A) – see Section 1.1.3.
- On 9 March 2010 the Minister for Planning declared development for the purposes of Stage B2 to be a critical infrastructure project under Part 3A of the EP&A Act.

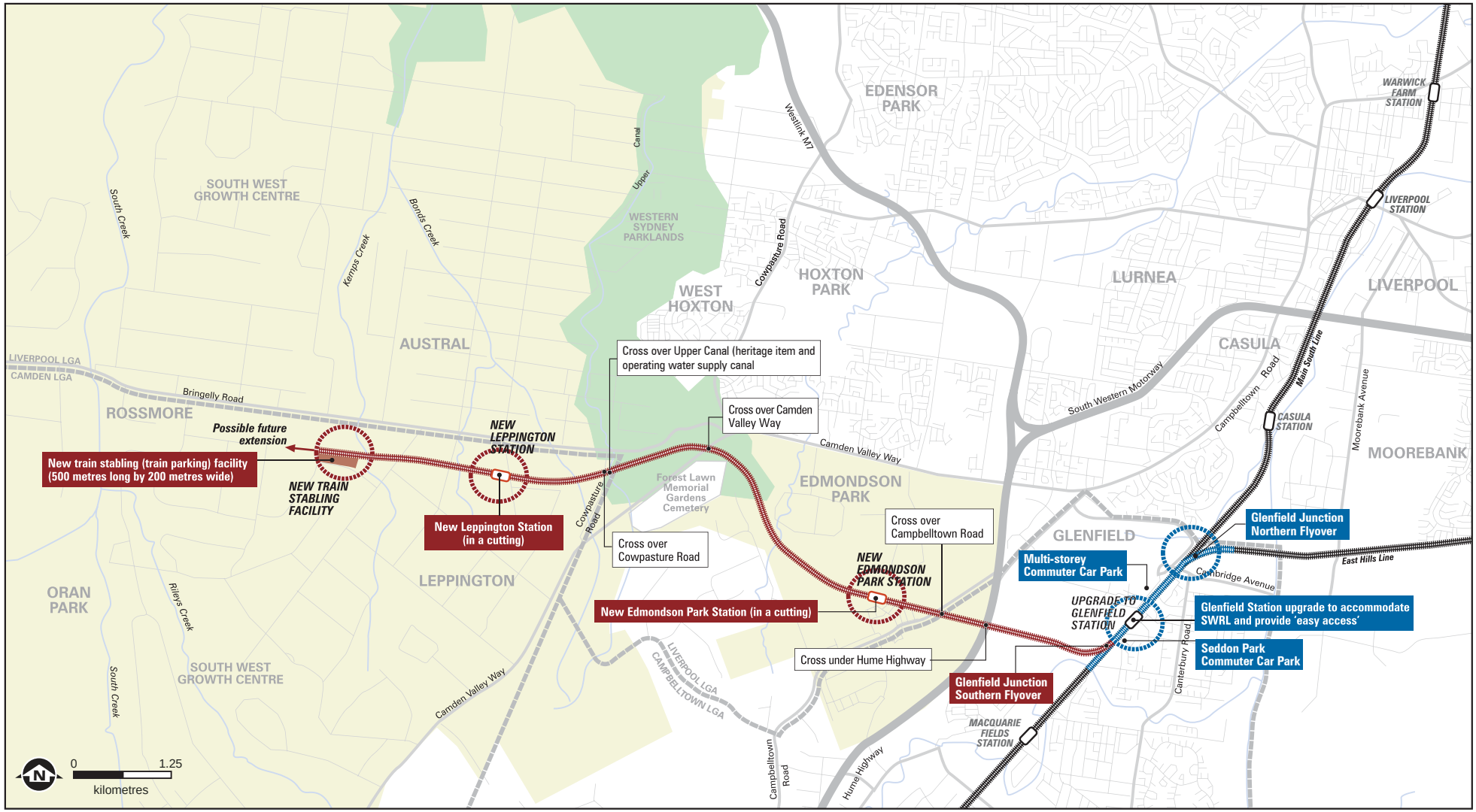
This EA has been prepared to satisfy the assessment and project approval requirements for the project under Part 3A of the EP&A Act.

Importantly, the SWRL is being delivered as a two-stage process, comprising:

- **Glenfield Transport Interchange** – delivery of all components associated with the Stage A and Stage B1 works as defined in the Concept Plan, as well as additional early works approved under Part 5 of the EP&A Act (in separate Review of Environmental Factors reports).
- **Glenfield to Leppington Rail Line** – delivery of all components associated with the Stage B2 works as defined in the Concept Plan. The Stage B2 works are hereafter referred to as the 'Glenfield to Leppington Rail Line' or 'the project'. This component of work is the subject of this EA.

The key stages and features of the SWRL are shown diagrammatically in Figure 1-1. A more detailed description of the project is provided in Section 1.1.3 and in Chapter 6.

A copy of the Concept Plan Approval, including the MCoA, is contained in Appendix A. The Statement of Commitments (SoC) for the Concept Plan is contained in Appendix B. Appendix C and D provides information on how this EA has addressed all Concept Plan MCoAs and SoCs relevant to the project.



SWRL - Glenfield Transport Interchange (includes Stage A and Stage B1 works as defined in Concept Plan plus additional early works approved by separate REFs)

SWRL - Glenfield to Leppington rail line (the project) (includes Stage B2 works as defined in Concept Plan)

Figure 1-1 Stages of the South West Rail Link

1.1.2 Need for and benefits of the SWRL

During the next 30 years, it is estimated that 110,000 homes will be built in south-west Sydney's 'greenfield' areas and another 7,500 homes will be built at Edmondson Park (NSW Government 2007). These dwellings are forecast to house approximately 300,000 people.

The *Metropolitan Strategy, City of Cities — A Plan for Sydney's Future* (DoP 2005a) (Metropolitan Strategy) was released in December 2005 to provide a framework to plan for and to manage this growth. The main aims of the Metropolitan Strategy are:

- to provide stronger cities and centres around residential developments
- to increase and concentrate jobs in western Sydney and along the global economic corridor
- to ensure that access to a diversity of housing, jobs, services and open space is more equally distributed
- to safeguard resource lands
- to improve environmental outcomes; and to improve transport connections.

The Metropolitan Strategy provides objectives for the Greater Sydney Metropolitan Region to meet these aims. In March 2010, the NSW Government announced that it was undertaking a five year review of the Metropolitan Strategy to guide Sydney's growth in response to revised expected growth forecasts and issues that have emerged since the release of the Metropolitan Strategy in 2005. This review will build on the original aims and themes of the Metropolitan Strategy. The first stage in the review process is centred on the public discussion paper *Sydney Towards 2036* (NSW Department of Planning 2010). The Metropolitan Strategy review is described further in Section 2.4.

Key to the sustainable development of the south-west region of Sydney is the provision of an efficient and reliable public transport system with frequent and reliable transit links to major centres (to complement local bus networks), such as the Sydney Central Business District (CBD), Parramatta and Liverpool.

The *Metropolitan Transport Plan – Connecting the City of Cities* (NSW Government 2010a) (the Metropolitan Transport Plan) was released by the NSW Government in February 2010. The main focus of the Metropolitan Transport Plan is to effectively link Sydney's land use planning with its transport network. The plan will be integrated with the Metropolitan Strategy. The Metropolitan Transport Plan identifies a number of projects that the NSW Government proposes to commence over the next decade. These projects include the completion of the SWRL by 2016 to service the new growth areas between Glenfield and Leppington via Edmondson Park.

The SWRL would support transport growth to the region (a high demand corridor) by providing for additional services to operate on the Main South and East Hills Lines and additional stabling facilities for Sector 2 of the Sydney metropolitan rail network (the Airport and East Hills Line, Main South Line (via Granville), Bankstown Line, and the Inner West Line). The SWRL would be designed and constructed to accommodate up to 12 trains per hour.

The SWRL would provide the following benefits:

- infrastructure, including new stations at Leppington and Edmondson Park, to facilitate sustainable development in Edmondson Park, Leppington and the South West Growth Centre (SWGC) by providing a framework for early transit-oriented development
- long-term stabling requirements for Sector 2 of the Sydney metropolitan rail network (the Airport and East Hills Line, the Main South Line (via Granville), the Bankstown Line, and the Inner West Line)
- congestion relief on the rail network by providing extra capacity on the existing Main South and East Hills Lines
- a direct transport link to and from the south-west region of Sydney and key regional destinations (such as Liverpool)
- reduced growth in road network congestion in the south-west region of Sydney.

The desired outcomes of the SWRL are to:

- direct rail services to the SWGC's projected population of 300,000 people
- provide competitive rail journey times in comparison to other modes of transport, between (the future) Leppington town centre and Central Station, and to Liverpool and Parramatta
- meet best practice standards to deliver transport infrastructure to support the establishment of sustainable new communities within the SWGC by providing a framework for early transit-oriented development.

1.1.3 Key components of the Glenfield to Leppington Rail Line

The project incorporates the following key components:

- construction of rail lines between the existing rail corridor at Glenfield and Rossmore, approximately 11 kilometres to the west
- new stations at Edmondson Park and Leppington, which would include interchange and car parking facilities and other associated infrastructure
- a train stabling facility at Rossmore, which would provide for stabling (overnight parking) of 12 eight-car train sets on opening, with provision within the identified footprint to allow for expansion to 20 eight-car sets in the future
- construction of the Glenfield Southern Flyover that would cross over the existing Main South Line and the relocated track of the SSFL
- provision of ancillary facilities, including power supply, substations, sectioning huts, signalling structures, access roads and other infrastructure for the operation and maintenance of the rail services and infrastructure.

More details of the scope of the project are provided in Chapter 6 of this EA.

1.1.4 Potential future extension of the SWRL

Options for a potential future extension of the project beyond Rossmore have been investigated by NSW Transport and Infrastructure (T&I); however, any such extension is not part of the scope of works for the current SWRL project or this EA.

The design and location of the project, including the train stabling facility, do not preclude a potential future extension of the SWRL beyond Rossmore. The precise location of any extension or future terminus would be determined by operational needs and the patterns of future development.

1.1.5 The Role of TIDC

TIDC is a State-owned corporation under the *Transport Administration Act 1988,* with the principal function of developing major railway systems and other major infrastructure projects. TIDC has been commissioned by the NSW Government to deliver the SWRL. On completion, the project would be transferred to RailCorp, who would operate and manage the rail line.

Under s18E(1) of the Act, TIDC may not undertake the development of a major railway system or other major transport project except with the consent of the portfolio Minister and the voting shareholders of the Corporation.

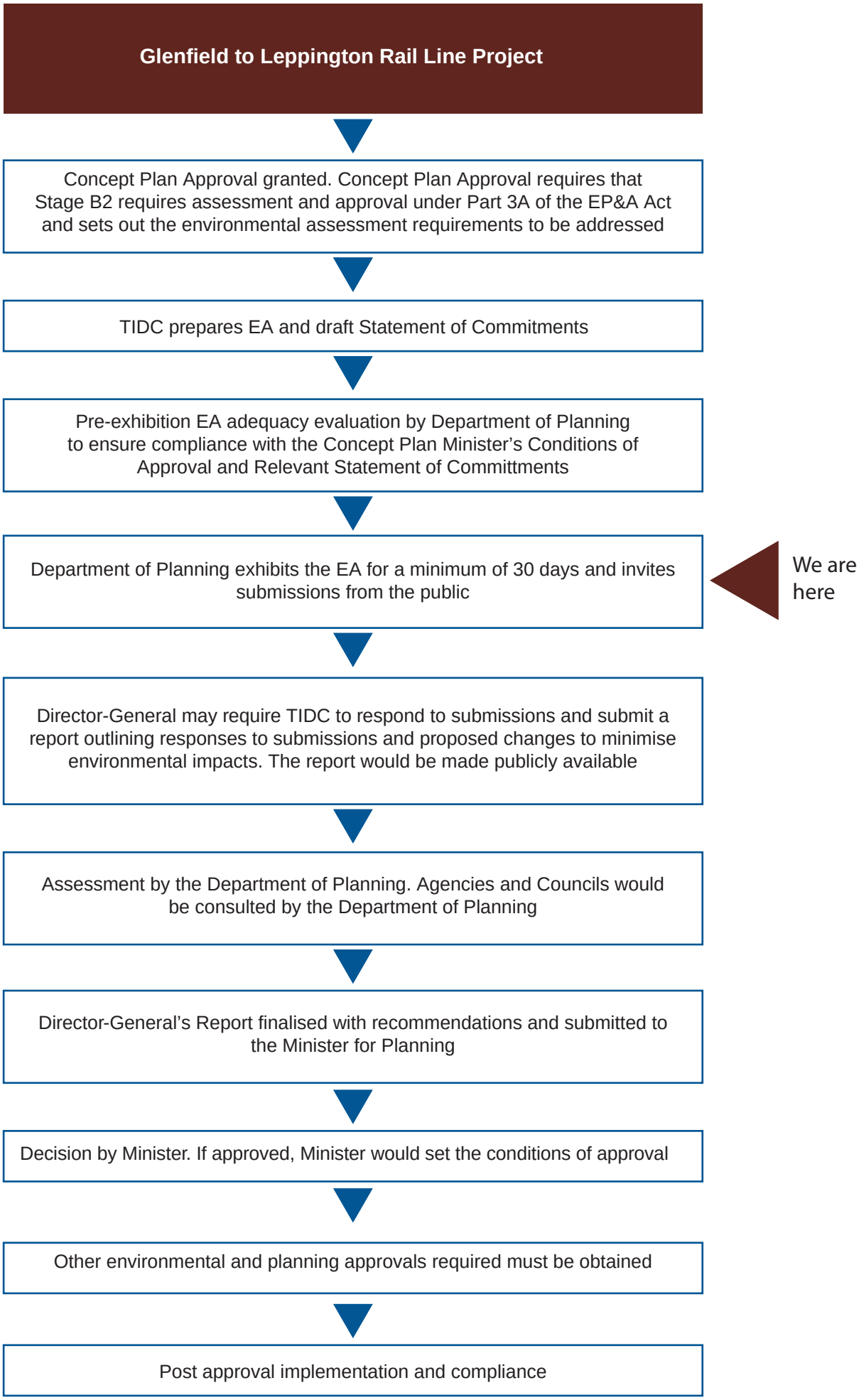
Construction of the SWRL would be carried out by TIDC. On completion of construction, the SWRL would be managed and operated by RailCorp.

1.1.6 Planning approvals process

The planning approvals process for the project is shown overleaf (Figure 1-2). The project is subject to assessment and project approval under Part 3A of the EP&A Act.

As a result of the further community and stakeholder involvement and detailed design and environmental assessment undertaken since the Concept Plan Approval and the Stage A Approval were granted, some relatively minor changes are proposed to the project from that outlined in the Concept Plan EA (see Section 6.1.2 for details). TIDC has requested under Section 75W of the EP&A Act that conditions 1.1 and 1.2 of the Concept Plan Approval and the Stage A Approval be modified to reflect these relatively minor changes. The modifications proposed to the Concept Plan Approval and the Stage A Approval are assessed as part of this EA.

The project may also require approval of the Minister for Environment Protection, Heritage and the Arts under the Commonwealth *Environment, Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to impacts on the environment of the Ingleburn Army Camp as Commonwealth land. The Historic Heritage Assessment for the project (refer Chapter 13) notes that the impacts of the project on the Ingleburn Army Camp are potentially significant, notwithstanding that the land is likely to be transferred from Commonwealth to State Government with the intention of wholesale redevelopment. On this basis the project may need to be referred to the Minister for a determination as to whether or not the project is a controlled action under the EPBC Act. Further details are provided in Chapter 2.



** Note: Refers to Stage B2 works as defined in the Concept Plan (the subject of this EA)*

Figure 1-2 Approval process for the Glenfield to Leppington Rail Line project

1.2 Environmental Assessment

1.2.1 Role of the EA

The aim of the EA process is to consider all relevant environmental matters, and to undertake stakeholder and community engagement during the development of the project and the impact assessment.

This EA report quantifies and assesses potential adverse impacts and identifies the benefits of the project. It also outlines the type of environmental management measures available to reduce adverse impacts, and identifies opportunities created by the project that would result in increased benefits. The information in the EA also provides a basis for future monitoring of the environmental performance of the project.

This EA builds on the assessment of the SWRL concept in the SWRL Concept Plan EA (Parsons Brinckerhoff 2006a) and the associated Submissions Report (Parsons Brinckerhoff 2007) and addresses the following:

- requirements set out in the MCoA for the Concept Plan relating to further assessment (see Appendix A)
- requirements set out in the final SoC for the Concept Plan (contained as Appendix B)
- guidelines published in the NSW Government Gazette.

The MCoA and SoC for the Concept Plan are addressed in individual assessment chapters of the EA. Appendix C and D provides a summary of the project's compliance with the MCoA and SoC, respectively.

This EA also includes project approval SoC (refer to Chapter 17) identifying the measures considered necessary to mitigate and manage existing and potential environmental impacts. These would be incorporated into the project.

1.2.2 Design development

Design development has been undertaken in parallel with the EA process as part of the project. Key objectives of this process were for the project to meet all operational requirements while providing the best environmental and sustainability outcomes, including:

- minimisation or avoidance of impacts on environmentally sensitive areas (including native vegetation and areas of Aboriginal cultural heritage significance) through reductions in the project footprint and construction planning to avoid sensitive sites
- design of watercourse crossings to maintain riparian habitat and the hydrological regime
- design of the vertical alignment to minimise its gradient and reduce operational energy requirements
- incorporation of mitigation measures to minimise noise impacts on existing and future surrounding communities
- provision of a high standard of urban and landscape design to minimise visual impacts
- compliance with the Concept Plan MCoA and SoC.

Environmental and sustainability design outcomes were optimised through the following mechanisms:

- three Integrated Design Workshops (at the project commencement, during the interim and towards the completion of the concept design phase in 2008) to allow environmental and sustainability specialists, the project design team and other internal and government stakeholders to agree appropriate objectives for the project and reduce environmental risks (described further in Section 5.3.1.)
- engagement of a dedicated Sustainability Advisor to work with the project team and provide advice, establish sustainability goals and objectively evaluate the effectiveness of the project design in meeting those goals
- ongoing feedback from environmental specialists (including ecology, visual, noise, heritage, hydrology and traffic specialists) on environmental constraints faced by the design team
- ongoing consultation with the community and key government stakeholders to understand their feedback and concerns and to meet their objectives as far as possible (This is discussed further in Chapter 3).

Following the recommencement of detailed planning for the Glenfield to Leppington Rail Line works in late 2009, additional design and risk workshops were held so that the project reflects current best practice and stakeholder requirements, where possible. A number of design features were confirmed at this stage as documented in Section 6.1.2.

A government stakeholder briefing and meetings with key government agencies were also held to identify key engineering, environmental or planning issues that may affect the delivery of the EA.

A number of design investigations are ongoing, and would be further addressed as part of the project Submissions Report or, where necessary, at detailed design stage, following project approval. These investigations comprise:

- detailed construction planning, which would be undertaken following appointment of a construction contractor
- further design of noise mitigation measures to be used in the project
- design of the train stabling facility, which may require additional noise mitigation depending on the final land uses proposed for land adjacent to the proposed facility
- further site planning and design of commuter car parking
- site planning and design of proposed electrical substations
- continued evaluation of station interchanges at Edmondson Park and Leppington to integrate with town centre planning.

If approval is granted, environmental and sustainability appraisals would be ongoing through the detailed design, construction and operation of the project.

1.2.3 Sustainability in project development

TIDC would seek to develop and deliver the SWRL as a catalyst to sustainable development throughout the SWGC and would continue to work closely with the community and key stakeholders to identify and deliver sustainable initiatives for the project.

To assist in this process, TIDC has developed core sustainability principles for the SWRL (ARUP 2008), covering the themes set out in the Concept Plan SoC (energy, greenhouse emissions, water, community and stakeholder involvement, biodiversity, recycling / waste minimisation and resources). In addition to these, TIDC has identified sustainability principles that apply to the categories of governance, community benefit, climate change adaptation and economic vitality. Sustainability principles have been incorporated into the design, construction and, ultimately, the operation of the SWRL. These principles would be further embedded in later stages of design using TIDC's Sustainability Design Guidelines as a compliance framework.

1.2.4 Project team

Parsons Brinckerhoff (PB) prepared this EA on behalf of TIDC. The assessment was based on concept design documentation prepared by the appointed Technical Advisors for the project, which includes the Glenfield Junction Alliance (GJA) for the Glenfield Southern Flyover and the Aurecon/AECOM Joint Venture (2010) for the SWRL (west of the Glenfield Southern Flyover). In addition to this, a number of specialist technical studies were undertaken for the project.

The project team comprised the following:

- EA – PB
- concept design (SWRL) – Aurecon/AECOM (formerly Global Arc)
- concept design (Glenfield Southern Flyover) – GJA
- noise and vibration – Heggies Pty Ltd
- traffic and transport – PB
- hydrology and surface water – WMA Water / GJA
- biodiversity – PB
- Aboriginal and historic heritage – Australian Museum Business Services (AMBS)
- visual and landscaping – Hassell (as part of the Aurecon/AECOM Joint Venture)
- Arup has advised on sustainability issues for the SWRL.

1.3 Structure and content of this document

The EA is presented in two volumes. Volume 1 identifies and analyses the key environmental issues based on the requirements outlined in the Concept Plan MCoA (refer Appendix A) and SoC, outcomes of the community consultation process and the results of the detailed environmental studies. It also presents a detailed description of the project. The structure and content of Volume 1 (this document) are summarised in Table 1-1.

Table 1-1 Structure and content of the EA

Chapter/Appendix	Description
Chapter 1 – Introduction	Outlines the previous approvals for the SWRL, the structure of the EA and the approvals process for project approval of Stage 2 of the SWRL.
Chapter 2 – Planning and statutory requirements and compliance of the project	Outlines the planning strategies, policies and legislation that apply to the project. . Discusses the compliance of the project with the Concept Plan Approval, MCoA, SoC, statutory planning instruments and other legislation.
Chapter 3 – Community and stakeholder engagement	Outlines how the community and stakeholders have been and will be involved in the project development, assessment and construction phases; and summarises the issues raised by the community/stakeholders.
Chapter 4 – Review of baseline environment	Reviews the existing biophysical and social environment along the proposed SWRL corridor alignment; and details how this environment is expected to change with planned future development in the SWGC and other areas within the region.
Chapter 5 – Development of the project since Concept Plan	Provides an overview of the SWRL Concept Plan; as well as an outline of the development of the SWRL design assessed as part of this EA. Also outlines how environmental input and sustainable development were integrated into the SWRL design.
Chapter 6 – The SWRL project	Provides a description of the physical works that make up the SWRL; how the SWRL would be operated; and the construction plan for the project.
Chapter 7 – Land use, property and infrastructure planning	Describes the potential impact of the project on land use, property and infrastructure and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 8 – Traffic, transport, parking and access	Describes the potential impact of the project on traffic, transport, parking and access and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 9 – Noise and vibration	Describes the potential impact of the project on noise and vibration and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 10 – Hydrology	Describes the potential impact of the project on hydrology and surface water and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 11 – Flora and fauna	Describes the potential impact of the project on flora and fauna and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 12 – Aboriginal heritage	Describes the potential impact of the project on Aboriginal heritage and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 13 – Historic heritage	Describes the potential impact of the project on Historic heritage and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 14 – Visual and landscaping	Describes the potential impact of the project on the visual and landscape environment and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 15 – Other environmental issues	Describes the potential impact of the SWRL on other (non-key) environmental issues and outlines measures recommended to avoid remedy or mitigate those impacts.
Chapter 16 – Environmental management and mitigation	Outlines the environmental management system; details the Construction Environmental Management Plans (CEMPs) to be prepared and compliance monitoring; and summarises the proposed mitigation measures.

Chapter/Appendix	Description
Chapter 17 – Draft SoC	Details the proposed SoC (the various environmental management and mitigation measures considered necessary to manage existing and potential environmental impacts).
Chapter 18 – Conclusions	Outlines key conclusions of this document and details the next steps.
Appendix A – Concept Plan Approval	Provides a copy of the Concept Plan approval.
Appendix B – SoC for the Concept Plan	Provides a copy of the SoC for the Concept Plan.
Appendix C - Compliance of the project with the Minister's Conditions of Approval	Discusses the compliance of the project with the Concept Plan MCoA.
Appendix D - Compliance of the project with the Concept Plan Statement of Commitments	Discusses the compliance of the project with the Concept Plan SoC.

Volume 1 is supported by seven technical papers in Volume 2 (Technical Papers), providing detailed information on the background to the project, assessment methods used and the results of the specialist studies.

Volume 2a of the EA comprises the following technical papers:

- Technical Paper 1 Noise and Vibration
- Technical Paper 2 Biodiversity.

Volume 2b of the EA comprises the following technical papers:

- Technical Paper 3 Hydrology
- Technical Paper 4 Traffic and Transport
- Technical Paper 5 Landscape and Visual
- Technical Paper 6 Aboriginal Heritage
- Technical Paper 7 Historic Heritage.

The specialist reports have been used to inform the EA contained in Chapters 7 to 15 of this document. In particular, the mitigation and management measures suggested in the specialist reports have been taken into account in developing the recommended mitigation measures and further investigations for the project as a whole. These measures have informed the draft Statement of Commitments (SoC) that TIDC intends to implement as part of the construction phase of the project, and RailCorp would implement during the operation of the project (refer Table 17-1).

Importantly, the SoC from the Concept Plan EA (presented in the Submissions Report for the Concept Plan (Parsons Brinckerhoff 2007)) has been considered in the preparation of this draft SoC. Appendix D of this EA demonstrates how those earlier commitments have been addressed to date. Where these are still to be implemented (i.e. where they relate to future stages of the project), these have been incorporated into the current SoC. As such, the draft SoC effectively supersedes the SoC associated with the Concept Plan EA and approval. It details those commitments that TIDC proposes to manage the potential environmental

impacts associated with the construction phase of the project, as well as relevant commitments for the future operation of the project by RailCorp.

The draft SoC may be revised in response to public submissions to this EA and/or design changes made before final submissions to the DoP. The final SoC will be considered by the DoP in assessing the project. Should approval be granted by the Minister for Planning, approval conditions would take into account the final SoC.

1.4 Public exhibition and comment

The EA will be on public exhibition for a minimum period of 30 days and is available at local councils, nominated council libraries, TIDC and DoP offices. The document can be downloaded from the TIDC and DoP websites (www.tidc.nsw.gov.au and www.planning.nsw.gov.au), or made available on CD (by phoning 1800 684 490). A full list of display locations during the public exhibition is available on the TIDC website.

Public authorities, interested groups and organisations and the general community will be invited to make written submissions in response to the assessment.

As far as possible, submissions should include the following, where appropriate:

- the nature of the writer's or organisation's interest in the project
- the writer's or organisation's opinion of the project
- suggestions for alternatives or improvements to the project
- errors or omissions in the information presented in the EA
- additional factual information available (and its source)
- any other aspects considered to be relevant to the project and its determination.

Written submissions on the EA quoting Application Number MP 10_0045 should be sent to:

Director
Major Infrastructure Assessments
Department of Planning
GPO Box 39
Sydney NSW 2001

All submissions received by the DoP are regarded as public documents and any information contained in them can be published in subsequent assessment documents. DoP may send copies of the submissions received on the project to TIDC and/or other interested parties. If the information is not to be distributed, this should be clearly stated in the submission.

1.5 Preparation of a Submissions Report

At the conclusion of the exhibition of the EA, TIDC will review all submissions received by the DoP and prepare a Submissions Report. The report will include consideration of:

- the EA
- all submissions and responses to the issues raised
- any new information concerning the project
- any modifications to the project
- a summary of mitigation measures and other commitments made should the project proceed.

The Submissions Report will be made available through the TIDC and DoP websites and also available as a CD-Rom on request.

1.6 Making a decision

TIDC will forward the Submissions Report, together with advice on any adopted modifications to the project and draft SoC to the DoP and seek approval from the Minister. If significant changes are proposed, the DoP may require TIDC to prepare a Preferred Project Report, which would be made available to the public.

The DoP will examine all reports submitted by TIDC and prepare the Director-General's report to the Minister. Acting on that report, the Minister will decide whether or not to approve the project and the modifications sought to conditions 1.1 and 1.2 of the Concept Plan Approval and the Stage A Approval. The Minister may attach conditions to the approval or elect not to grant the approval.

The planning, design and decision process allows for input from public authorities and the community. Assessment of submissions made in response to the exhibition of the EA is an integral part of the assessment process and can result in modifications and improvements to the design of the project. Should the project be approved, the relevant agencies and the local community would continue to be involved in the detailed design of the project and during construction.

1.7 Post-determination activities

Should the project be approved, the following documents would be publically available:

- Minister for Planning Approval and any MCoA
- Submissions Report
- Preferred Project Report, if required
- Assessment Report of the Director-General of the DoP.

The local community would be notified of the decision to proceed with the project by correspondence, newspaper notices and/or newsletters. This would include an indication of the anticipated timing of construction works and contact details for further information.