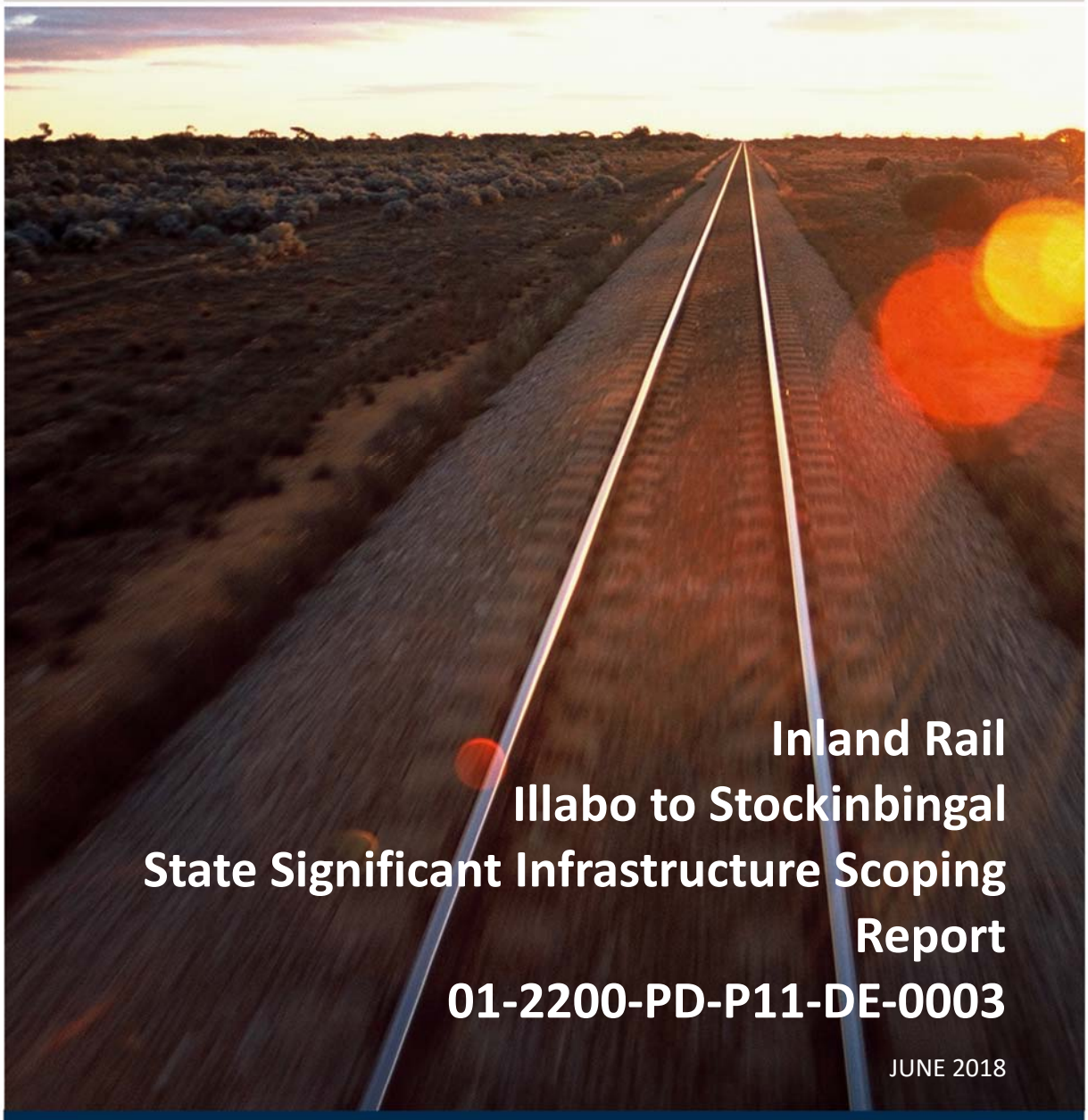
ARTC InlandRail

The Australian Government's priority freight rail project



Inland Rail
Illabo to Stockinbingal
State Significant Infrastructure Scoping Report
01-2200-PD-P11-DE-0003

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GLOSSARY

TERM	DEFINITION
Culvert	A small channel, pipe or drain that allows water to pass under a road/rail line
Crossing loop	A separate section of track that is used to allow one train to safely pass another
Cutting	A form of deep excavation in soil or rock
Embankment	A structure where the rail line is above the natural surface
Emission	A substance discharged into the air
Inland Rail programme (Inland Rail)	The Inland Rail programme encompasses the design and construction of a new inland rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba. The route for Inland Rail is about 1,700 km in length. Inland Rail will involve a combination of upgrades of existing rail track and the provision of new track.
Level crossing	A place where rail lines and a road cross at the same elevation
Proposal	The construction and operation of the Illabo to Stockinbingal section of Inland Rail
Proposal site	The area that would be directly affected by construction works (also known as the construction footprint). It includes the location of proposal infrastructure, the area that would be directly disturbed by the movement of construction plant and machinery, and the location of storage areas and ancillary facilities, that would be used to construct that infrastructure.
Rail infrastructure	Infrastructure required for the operation of a rail network, which includes tracks, wiring, signalling, stations etc.
Rail sidings	A short stretch of railroad track used to store rolling stock or enable trains on the same line to pass
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals
Signalling	Rail traffic lights and operational signage to allow for the safe operation of trains
Turn outs	A mechanical installation that enables railway trains to be guided from one track to another
Wheel squeal	A screeching train-track friction sound, most commonly occurring on sharp curves or as a result of heavy breaking

LIST OF ABBREVIATIONS

TERM	DEFINITION
AHIMS	Aboriginal Heritage Information Management System
ARTC	Australian Rail Track Corporation Ltd
EEC	Endangered ecological community
EIS	Environmental impact statement
EPA	NSW Environment Protection Authority
EP&A Act	(NSW) *Environmental Planning and Assessment Act 1979*
EP&A Regulation	(NSW) *Environmental Planning and Assessment Regulation 2000*
EPBC Act	(Commonwealth) *Environment Protection and Biodiversity Conservation Act 1999*
Infrastructure SEPP	(NSW) *State Environmental Planning Policy (Infrastructure) 2007*
LEP	Local environmental plan
LGA	Local government area
NPW Act	(NSW) *National Parks and Wildlife Act 1974*
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
POEO Act	(NSW) *Protection of the Environment Operations Act 1997*
Roads Act	(NSW) *Roads Act 1993*
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
BC Act	(NSW) *Biodiversity Conservation Act 2016*

1. INTRODUCTION

1.1. Background

The Australian Government has committed to delivering the Inland Rail Programme, which is a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland.

Inland Rail is a major nation-building programme that will enhance Australia's existing national rail network and serve the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres long, involves:

- Using the existing interstate rail line through Victoria and southern NSW.
- Upgrading about 400 kilometres of existing track, mainly in western NSW.
- Providing about 600 kilometres of new track, mainly in northern NSW and south-east Queensland.

The Inland Rail consists of 13 projects, seven of which are located within NSW. Each of these projects (and, in some cases as appropriate, separate work sites within a project) will be subject to an assessment and, if required, approval under the relevant planning or project laws in the relevant jurisdictions. Each assessment will also take into account its part in the Inland Rail programme.

One of the projects is the **Illabo to Stockinbingal project** ('the proposal'), consisting of about 37 kilometres of new track and associated infrastructure and facilities.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Illabo to Stockinbingal section of Inland Rail.

Investigations, surveys, tests and sampling (including, for example, related drilling and excavations), for any purposes, including (for example) geotechnical, biodiversity, heritage, contamination and utilities and services investigations, where the investigations, surveys, tests and sampling are in connection with assessment or detailed design for the project is excluded from this application.

The proposal is subject to environmental assessment under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The capital investment value of the proposal is estimated to be in excess of $50 million, and as a result the proposal is State Significant Infrastructure under *State Environmental Planning Policy (State and Regional Development) 2011*. The proposal requires approval from the NSW Minister for Planning under Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). In addition, ARTC is seeking to have the proposal declared Critical State Significant Infrastructure under Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011*.

1.2. Overview of the proposal

The proposal passes through agricultural and rural properties of central NSW and generally follows the existing cadastral boundaries and roads between the towns of Illabo and Stockinbingal. Further refinement of the track from Illabo to Stockinbingal and tie in works to the Stockinbingal to Parkes line will be required due to the complex crossing of Burley Griffin Way and potential property severance issues. The proposal site therefore includes a broad corridor to allow for an optimal alignment to be further refined during the design process, as shown in

Figure 1.1.

The land requirement for the Inland Rail will comprise a corridor with an average width of 40 metres (m), with some variation to accommodate particular infrastructure and to cater for local topography. The corridor will be of sufficient width to accommodate the infrastructure currently proposed for construction, as well as future expansion, including possible future requirements for 3,600 m long trains. There will be a requirement for subdivision of land, dedication of land as road reserve where road deviations are required and further property rationalisation as a result of the construction and operation of the Proposal.

Project construction will be a single track railway, with one crossing loop to accommodate double stacked freight trains initially up to 1,800 m long. Components of the construction will include infrastructure to accommodate possible future augmentation and upgrades of the track as discussed above. However, the future upgrades to the track would be subject to their own planning, assessment and approval considerations. Clearing of the corridor would be required to allow for construction and to maintain the safe operation of the railway.

The operational phase will be of a single track with a crossing loop to accommodate double stacked freight trains up to 1,800 m long. Impact assessment will be undertaken for rail traffic and associated activities projected at the year 2040. Inland Rail train specifications and operation of the proposal is described in section 5.

1.2.1. Key features

The key features of the proposal, as currently designed, are included below and are subject to further design and refinement:

- Construction of about 37 kilometres of new, single track standard-gauge railway.
- Installation of 43 new culverts and five new bridges.
- Two turnouts.
- One crossing loop.
- Installation of 13 road/level crossings.
- Tie-in works to the existing rail line north of Illabo and at Stockinbingal.

The estimated number of culverts, bridges and level crossings have been provided above and would be subject to further refinement in the design process.

Associated works would include signalling and communications, signage, fencing, services and utilities. The construction and operation of the proposal would also require the following works:

- Construction access roads and access tracks.
- Permanent and temporary changes to the road network.
- Construction compounds and storage areas.

In addition to the above proposal key features and subject to further feasibility analysis and design definition, the following may form part of the project scope and, if so, will be assessed in the EIS:

- Mobile Batch plant.
- Camp accommodation for construction workers.
- Construction water supply and storage.
- Rail sidings.

Investigations, surveys, tests and sampling (including, for example, related drilling and excavations), for any purposes, including (for example) geotechnical, biodiversity, heritage, contamination and utilities and services investigations, where the investigations, surveys, tests and sampling are in connection with assessment or detailed design for the project is excluded from this application.

1.2.2. Timing and program

Construction is anticipated to commence in mid-2021 and is expected to take about 24 months to construct.

1.2.3. Operation

The Illabo to Stockinbingal section is expected to have an average weekly demand of up to 94 trains per week (2025) with a peak demand of 136 (2040). The new rail line will be a faster, more efficient route that bypasses the Sydney rail network and will enable the use of double stacked trains along its entire length.

Trains would operate 24 hours per day and would be up to 1800 m in length; carry double stacked containers; and require a clearance of 7.1 m.

1.2.4. Capital investment value

The estimated capital investment value of the proposal is estimated to be in excess of $50 million. Costing is to be finalised during the detailed design stage.

1.3. The proponent and future operator

1.3.1. The proponent

The Australian Rail Track Corporation (ARTC) is the proponent of the proposal and has been tasked with developing a program to deliver Inland Rail, under the guidance of the Department of Infrastructure, Regional Development and Cities. ARTC was created after the Australian and State governments agreed in 1997 to the formation of a 'one stop shop' for all operators seeking access to the national interstate rail network. Across its network, ARTC is responsible for:

- Selling access to train operators.
- Development of new business.
- Capital investment in the corridors.
- Management of the network.
- Infrastructure maintenance.

Further information on ARTC can be found at http://www.artc.com.au.

1.3.2. Future operator

The proposal would form part of the rail network managed and maintained by ARTC. ARTC does not operate trains. Train services would be provided by a variety of operators.

1.4. Purpose and structure of the report

This document contains a preliminary assessment of the proposal and its likely environmental impacts to support the preparation of the Secretary's environmental assessment requirements (SEARs) under section 5.16 of the EP&A Act. The SEARs will be prepared by the Secretary of the NSW Department of Planning and Environment (DP&E) in consultation with other relevant government agencies. The structure of the report is as follows:

Section 1 – Introduction: outlines the key elements of the proposal, and the purpose of this report.

Section 2 – Strategic context and justification: outline of why the proposal is required and alternatives considered.

Section 3 – Site description: overview of the regional context of the proposal site.

Section 4 – Planning and assessment process: outline of the statutory approvals framework for the proposal, including applicable legislation and planning policies.

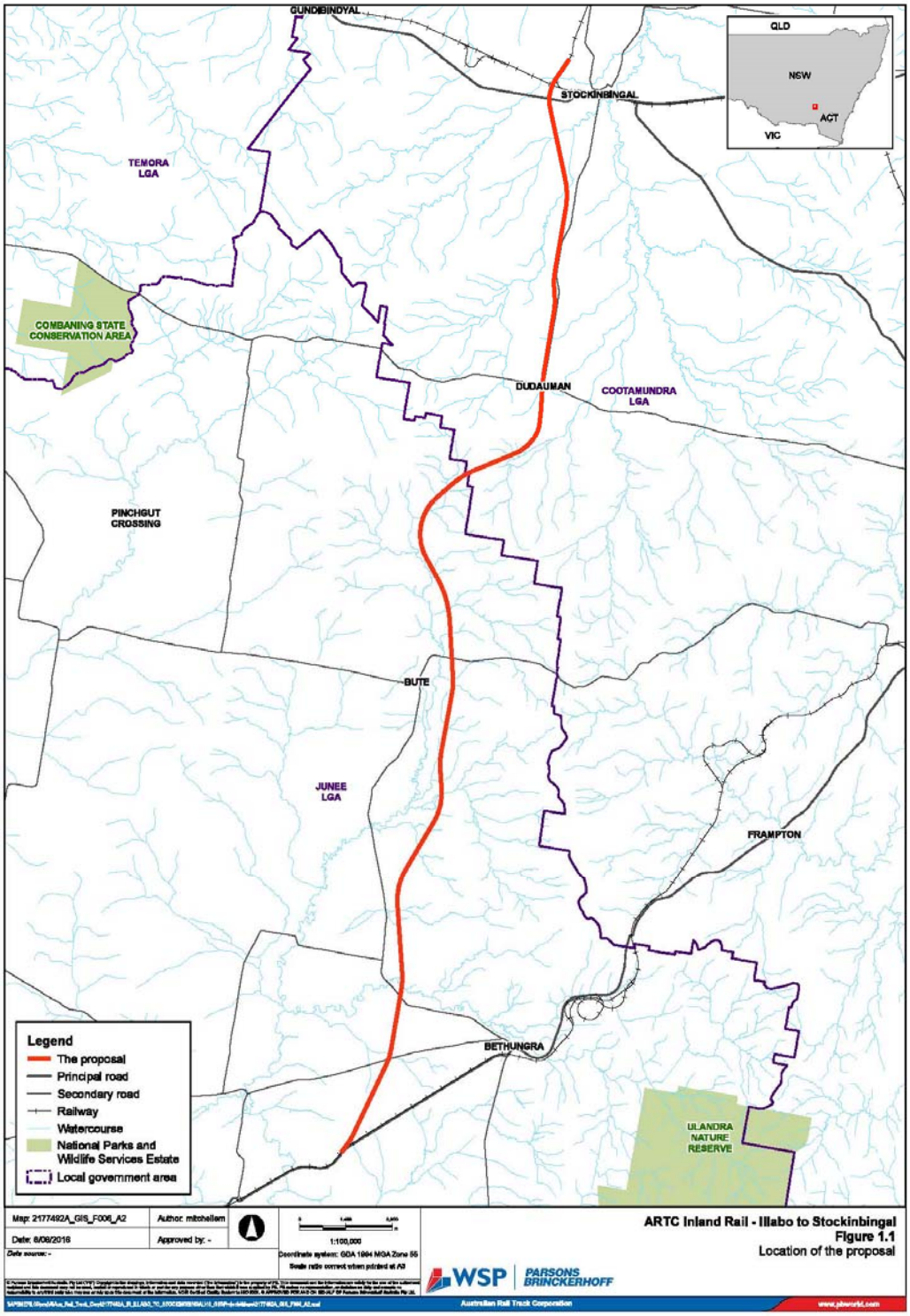
Section 5 – The proposal: outlines the scope of works, timeframe and likely activities involved with the proposal.

Section 6 – Environmental constraints: preliminary assessment of the potential impacts of the proposal on the environment.

Section 7 – Consultation: includes consultation undertaken to date and what is proposed during the preparation of the EIS.

Section 8 – Conclusion: outlines the conclusions of the document and the next steps in the process.

Figure 1.1 Location of the proposal



2. STRATEGIC CONTEXT AND JUSTIFICATION

2.1. Existing rail infrastructure

At present, the only north–south rail corridor in eastern Australia runs from Melbourne to Albury, then through Sydney and to Brisbane, generally along the coast. The concept of an inland railway from Melbourne to Brisbane has been subject to significant analysis due to a number of challenges facing freight transport infrastructure in eastern Australia, including:

- The existing north–south coastal route will reach capacity in the medium term, and additional capacity will be required to service future rail freight demand for interstate and regional freight.
- Rail efficiency and service quality is currently impacting on freight productivity, resulting in higher freight transport costs for consumers.
- Road freight transport has a competitive advantage over rail, making it difficult for rail to increase its market share, with resultant potential for safety, congestion and environmental costs as a result of increased heavy vehicles on roads.
- Rail paths on the coastal route through Sydney are shared between passenger and freight trains, impacting on the reliability of the rail freight supply chain and constraining opportunities for expansion of passenger services.

2.2. Inland Rail development history and options considered

Two major studies have been undertaken in relation to the development of an inland rail route between Melbourne and Brisbane. The first study, completed in 2006, considered potential corridors for the rail line to determine which route would deliver the best economic and financial outcome. This study identified that a 'far western corridor' through Parkes would be the best option.

The second study, the Melbourne–Brisbane Inland Rail Alignment Study (ARTC, 2010), examined the far western corridor in detail. The current Inland Rail alignment is shown in Figure 2.1.

2.2.1. Melbourne–Brisbane Inland Rail Alignment Study

The commencement of the Melbourne–Brisbane Inland Rail Alignment Study ('the study') was announced by the then Minister for Infrastructure, Transport, Regional Development and Local Government in March 2008. The stated purpose of the study was to determine the optimum alignment, economic benefits and likely commercial success of a new single track standard-gauge inland railway between Melbourne and Brisbane. The study short-listed and analysed a number of route options, and the final report (released by ARTC in August 2010) identified that the proposed alignment:

- Comprises a 1,731 km long alignment between Melbourne and Brisbane:
- Melbourne to Parkes – 670 km of existing Class 1 track and 37 km of greenfield track from Illabo to Stockinbingal bypassing Cootamundra and the Bethungra Spiral.
- Parkes to North Star – 307 km of upgraded track and 291 km of greenfield track from Narromine to Narrabri.
- North Star to Acacia Ridge – 271 km of greenfield construction, 119 km of existing track upgraded from narrow gauge to dual gauge and 36 km of the existing coastal route.

The conclusions of the study include:

- There is demand for an inland railway.
- The route for the inland railway would be more than 100 kilometres shorter than the existing coastal route.
- The preferred alignment could achieve an average Melbourne to Brisbane transit time (terminal to terminal) of less than 24 hours.
- The inland railway would free up rail and road capacity through Sydney.
- The inland railway would achieve a positive economic net present value between 2030 and 2035, and if demand volumes grow more strongly than forecast, viability could be reached sooner.

2.2.2. Work undertaken to date

In November 2013, the Minister for Infrastructure and Regional Development announced that the Australian Government had committed $300 million to enable the development of Inland Rail to commence. This process began with pre-construction activities such as detailed corridor planning, environmental assessments and community consultation. This funding was subsequently confirmed in the 2014–15 Federal Budget paper entitled Building Australia's Infrastructure.

In 2015, ARTC produced a Programme Business Case to demonstrate the viability, benefits, costs and risks associated with Inland Rail to the Australian Government for endorsement and for further approval to proceed with the delivery of the Inland Rail programme.

In conjunction with the Programme Business Case, the Inland Rail Implementation Group in 2015 recommended some variations to the corridor from that previously recommended in the 2010 Inland Rail Alignment Study. The report supported the development of Inland Rail and recommended that the Australian Government commit further funding in the 2016-17 Budget for the project.

The Australian Government has committed a total of $9.3 billion to deliver Inland Rail.

2.3. Strategic planning context

The proposal is consistent with a number of state and federal strategic planning documents. These include:

- National Freight Strategy, Commonwealth of Australia, 2012.
- NSW: Making it Happen, 2015.
- NSW Long Term Transport Master Plan, Transport for NSW, 2012.
- NSW Freight and Ports Strategy, 2013.
- Rebuilding NSW – State Infrastructure Strategy, 2014.
- Murray-Murrumbidgee Regional Transport Plan, Transport for NSW, 2013 and 2014-15 update.
- Australian Infrastructure Audit – Our Infrastructure Challenges, Infrastructure Australia, 2015.

The EIS will provide further information on relevant strategies and the relationship to the proposal.

2.4. Need for Inland Rail

Freight transport is an essential part of Australia's economic prosperity and competitiveness and a crucial part of many Australian businesses. Freight transport in Australia has quadrupled in the last four decades and is predicted continue to increase to nearly double the 2010 levels by 2030 (National Land Freight Strategy, Commonwealth of Australia, 2012). This growth presents a number of challenges but also opportunities for government, industry and the community.

The 2010 Inland Rail Alignment Study report, which was prepared to determine the optimum alignment and economic benefits of Inland Rail, identified that there is demand for an inland railway and that such a railway would achieve a positive economic net present value between 2030 and 2035.

The 2010 Inland Rail Alignment Study and the *National Land Freight Strategy* also identify a number of constraints that face the current rail line and road freight system, including:

- The existing Sydney–Brisbane route is anticipated to reach capacity by 2052.
- Rail efficiency and service quality is inadequate and passing on higher costs to consumers.
- Inadequate rail services are also encouraging a shift to road freight causing increased congestion, maintenance, safety and environmental issues for roads and highway.
- Priority is given to passenger modes over freight modes in urban transport corridors, adding to delays in freight rail movements.

These constraints on the current infrastructure coupled with the forecast increasing demand for freight transport indicate a clear need for Inland Rail to provide adequate and efficient freight transport across the east Australian states.

2.5. Need for the proposal

The Illabo to Stockinbingal section of the Inland Rail route provides a reduction of 30 kilometres in the total route distance by creating a direct link from the Main South Line to the Stockinbingal to Parkes line and bypassing Cootamundra. This provides a shorter travel time for this section of track which assists the Inland Rail programme in achieving an average Melbourne to Brisbane transit time (terminal to terminal) of less than 24 hours.

The proposal avoids the Bethungra Spiral which introduces a significant grade increase and height clearance constraints. The Bethungra Spiral does not accommodate double stacking, which is a key requirement of the Inland Rail train specifications (refer to section 5.1.1).

Furthermore, the 2015 Inland Rail Implementation Group report named the Illabo to Stockinbingal alignment as one of the key missing-link projects in NSW for the successful implementation of Inland Rail.

2.6. Key benefits of Inland Rail

Inland Rail will complete a significant section of the national inland rail freight network between Melbourne and Brisbane. By providing a shorter interstate route for freight that does not include travel through the congested Sydney rail network, Inland Rail will save up to 10 hours of travel time between Melbourne and Brisbane.

Trains travelling on this new, more direct route would travel at speeds up to 115 kilometres per hour, and would use significantly less fuel. Furthermore, carbon emissions will be reduced by 750,000 tonnes which is a third of that used for road freight. As a result, Inland Rail would offer a road-competitive freight service that would attract existing and new freight to rail, providing a safe, efficient and sustainable alternative to road transport. By reducing train operating costs and improving service standards, Inland Rail will be an important contributor to national productivity.

It is estimated that, by 2050, Inland Rail will remove 200,000 truck movements from roads each year. The reduction in trucks using the interstate road network would improve road safety, ease congestion and assist local councils through reduced local road maintenance requirements. In addition, by providing a second rail link between Queensland and the southern states, Inland Rail will provide additional resilience and redundancy for the existing rail network.

In summary, Inland Rail will provide the following key benefits:

- Reduction in travel time between Melbourne and Brisbane by up to 10 hours.
- A faster, cheaper, safer, less carbon intensive, more environmentally sustainable alternative to road freight.
- Provision of capacity to meet increasing freight demand.
- Creation of carryover benefits, including cost and time savings, to businesses and consumers that rely on freight.
- Creation and growth of businesses.
- Improvements to road safety, reduced road maintenance costs and reduced congestion through reduction of road freight on interstate highways.

2.7. Key benefits of the proposal

The key benefits associated with the Illabo to Stockinbingal section of Inland Rail include:

- Reduced distances travelled - 30 kilometre reduction in rail distance between Illabo and Stockinbingal by bypassing the existing rail line via the Bethungra Spiral and Cootamundra. The reduction in distances travelled also reduces the amount of fuel required and emissions generated.
- Improved reliability and shorter travel times by avoiding the Bethungra Spiral, which imposed height and grade constraints and therefore would not allow double stacking on trains or 21 tonne axel loads.
  all of which directly support the benefits outlined in section 2.6 for the proposal itself and for Inland Rail more broadly.

2.8. Options considered

The Illabo to Stockinbingal proposal involves developing a direct route between Illabo and Stockinbingal in NSW. During early alignment identification, undertaken as part of the 2010 Inland Rail Alignment Study, ARTC developed a Base Case option, which heads in a north easterly direction from Illabo. The Base Case as presented in the 2010 Inland Rail Alignment Study was developed to avoid the Bethungra Spiral and its grade and structure clearance constraints between Bethungra and Cootamundra while also offering significant travel time improvements. The Illabo to Stockinbingal route section is approximately 37 kilometres. It diverges from the Main South line between Illabo and Bethungra and continues north toward Stockinbingal.

In 2015, ARTC undertook an alignment refinement assessment. The assessment reviewed four options between Illabo and Stockinbingal, including the Base Case. . From this, assessment improvements were shown to be shifting away from the 2010 alignment. Further engineering and environmental investigation in early 2016 resulted in an additional alignment option (Option 5) to be developed which was selected as the preferred option using a multi-criteria analysis (MCA) to evaluate each alignment in comparison to the 2010 base case. Option 5 provided better environmental outcomes and reduced property severance.

In late 2016 further flooding, engineering, environmental investigations (including additional field surveys) and community consultation were undertaken on the preferred option. The information obtained during consultation activities, field surveys and desktop studies fed into further options analysis and refinement. The analysis considered environmental, engineering constraints and property impacts as well as community concerns raised during consultation.

The additional options developed have been designed to:

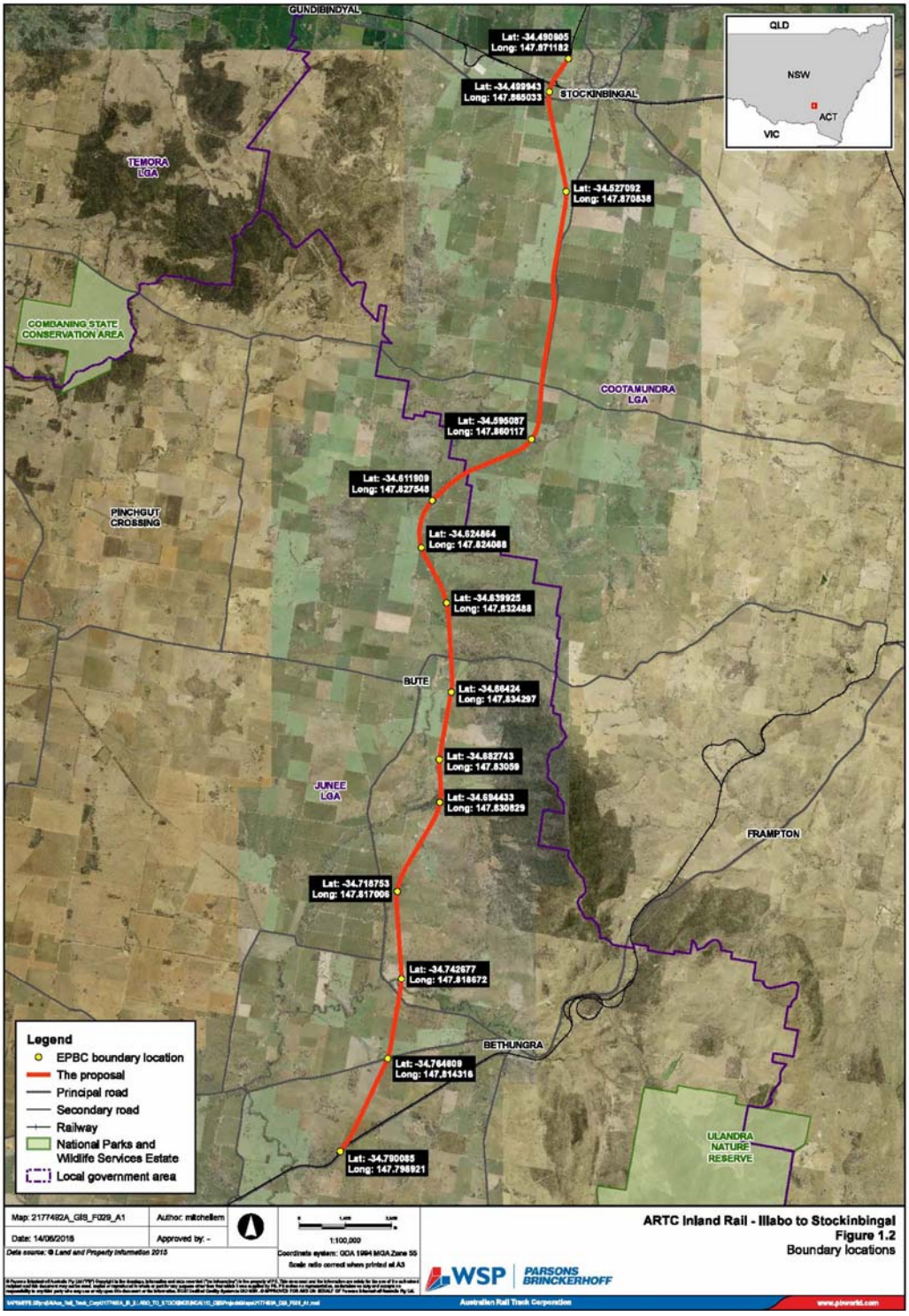
- Minimise interaction with Ironbong Creek.
- Reduce property impacts.
- Improve road crossing locations.

- Improve earthworks balance.

As a result, a proposal site has been selected which will further be refined in the design process to a preferred alignment to achieve optimal tie in locations to the existing rail line, reduce environmental and property impacts and address community concerns raised during consultation. The proposal site is shown in

Figure 1.1.

Figure 2.1 Inland Rail alignment



3. SITE DESCRIPTION

This section provides a description of the proposal site and its regional context within central NSW (refer to section 3.2 and 3.1). The existing rail infrastructure and its operation is described in section 3.4.

3.1. Regional context

In May 2016 the Cootamundra Shire and Gundagai Shire formed a new council, Cootamundra-Gundagai Regional Council. The proposal site is situated in the South West Slopes region of NSW between the towns of Illabo and Stockinbingal. The proposal crosses two local government areas (LGAs), Junee Shire and the former Cootamundra Shire(refer to Figure 3.1). The land through the LGAs is predominantly rural land used for agriculture and grazing.

Illabo is a small town located at the southern end of the proposal, 16 kilometres north-east of Junee and 32 kilometres south-west of Cootamundra. The town is located on the Olympic Highway between Junee and Bethungra. At the 2006 census, Illabo had a population of 190, in 2011 the town was included in the Bethungra locality which was recorded to have a population of 414.

Stockinbingal, at the northern end of the proposal in the Cootamundra LGA, had a population of 244 at the 2011 census. The town is located on Burley Griffin Way between Temora and Harden, 19 kilometres north-west of Cootamundra. As of the 2011 census the Junee Shire LGA had a population of 5,879 and the former Cootamundra LGA had a population of 7,334 people. These numbers are expected to remain fairly stable over the next fifteen years in the Junee Council area, and to potentially decrease in the former Cootamundra Shire (Department of Planning and Environment, 2014).

The major towns surrounding the proposal are Wagga Wagga to the south, Young to the north-east and Cootamundra to the east.

3.2. Description of the proposal site

The proposal would join the towns of Illabo, at the southern end of the proposal, and Stockinbingal, at the northern end of the proposal. The alignment would branch out from the existing rail line north-east of Illabo and travel approximately 37 kilometres to join the Stockinbingal to Parkes rail line west of Stockinbingal (refer to

Figure 1.1). The route would travel entirely through undeveloped land predominantly used for agriculture.

The proposal site crosses through a number of local and private roads, creeks and privately owned properties. There are no major towns located along the proposal site between Illabo and Stockinbingal.

3.3. Land ownership

Full or partial acquisition of properties would be required to construct and operate the proposal. The majority of the proposal site is privately owned land. Acquisition will be in accordance with the provisions contained within *Land Acquisition (Just Terms Compensation) Act 1991* as amended.

3.4. Existing rail facilities

3.4.1. Overview

The existing rail network in the area includes the Main South line, the Lake Cargelligo line and the Stockinbingal – Parkes line. The Main South line runs from Albury, in a north-east direction, through Illabo to Cootamundra where it continues to Goulburn, Mittagong and Sydney. The Lake Cargelligo line branches off from Cootamundra north to Stockinbingal, continuing to Lake Cargelligo. The Stockinbingal-Parkes line begins at Stockinbingal and runs north to the towns of Forbes and Parkes. The Illabo and Stockinbingal stations are no longer in use as passenger stations. Figure 3.1 shows the existing railway lines surrounding the proposal.

3.4.1.1. Branches

Illabo is located on the existing Main South line that runs from Albury to Liverpool in Sydney. This line is a double non-electrified track along the Macarthur to Junee section, after which it becomes a single track to Albury. ARTC has a lease for the line south of Macarthur until 2064. The station at Illabo served the town between 1878 and the 1970s, however is no longer in use. The Main South line continues north-east from Illabo through the Bethungra Spiral to Cootamundra and continues to Sydney. The Bethungra spiral was built in the 1940s when this section of line was duplicated, to provide an easier grade for northbound trains.

The Lake Cargelligo line branches north-west from Cootamundra and links to Stockinbingal, and continues to Lake Cargelligo. This line was opened in 1917 and was used initially for passenger services and goods freight. Passenger services were ceased in 1983 and the line is now primarily used for grain haulage and freight trains.

The Stockinbingal – Parkes line (also known as the 'Forbes' line) runs north-south joining Stockinbingal to Parkes on the Main West line. This line was completed between Parkes and Forbes in 1893, and Forbes and Stockinbingal in 1918. Passenger services operated on the line between Stockinbingal and Forbes until 1974 and Forbes and Parkes until 1983. No regular passenger services currently use the line, although the Main West line passenger services occasionally divert over the line when track work closes the main route. This line is part of the main route for goods trains travelling between Sydney and Perth as it allows freight to bypass the Blue Mountains from Cootamundra to Parkes.

3.4.2. Passenger services

The Cootamundra and Junee railway stations remain open to passengers travelling on the Main South line, however neither the Illabo or Stockinbingal stations currently service passengers. NSW TrainLink operates two services a day in each direction between Sydney and Melbourne along the line.

Figure 3.1 Regional location

4. PLANNING AND ASSESSMENT PROCESS

4.1. Overview

The proposal is declared to be State significant infrastructure (**SSI**) and will be assessed under Division 5.2 of the EP&A Act. In summary:

- under *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), the proposal is classified as 'development for the purpose of a railway or rail infrastructure on behalf of a public authority' and so may be carried out without development consent under the EP&A Act;
- where development is permissible without consent, it can be declared to be SSI by a SEPP, usually *State Environmental Planning Policy (State and Regional Development) 2011*(SRD SEPP);
- relevantly the SRD SEPP provides two potential avenues for the project to be declared to be SSI:
    - where ARTC is carrying out the proposal and the capital investment value is greater than $50 million (clause 14 and item 3 of Schedule 3 of the SRD SEPP); and
    - where ARTC has formed the opinion that the proposal is likely to significantly affect the environment (clause 14 and item 1 of Schedule 3 of the SRD SEPP);
- ARTC has formed the opinion that both of these situations will apply, and the proposal is therefore declared to be SSI.

The sections below provide more detail on the EP&A Act and its operation in respect of the proposal.

4.2. Environmental Planning and Assessment Act 1979

The EP&A Act and *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) establish a framework for the assessment and approval of developments in NSW. They also provide for the making of environmental planning instruments, including state environmental planning policies (SEPPs) and local environmental plans (LEPs), which determine the permissibility and approval pathway for development proposals and form a part of the environmental assessment process.

4.2.1. Part 5 of the EP&A Act

Part 5 of the EP&A Act defines the assessment process for proposals that do not require development consent. Section 5.5 requires a determining authority to '*examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity*'. ARTC is the determining authority for this project under section 5.1(1) and clause 277 of the EP&A Regulation.

Section 5.7(1) provides that '*a determining authority shall not carry out an activity, or grant an approval in relation to an activity … that is likely to significantly affect the environment (including critical habitat) or threatened species, populations or ecological communities, or their habitats, unless (a) the determining authority has obtained or been furnished with and has examined and considered an environmental impact statement in respect of the activity*'.

In accordance with the requirements of section 5.7, ARTC has formed the opinion that the proposal is likely to significantly affect the environment and, as a result, an EIS is required.

As such the proposal is SSI under Schedule 3 of the State and Regional Development SEPP, as detailed in section 4.1 above. The proposal therefore becomes subject to the assessment and approval process in Division 5.2 of the EP&A Act.

4.2.2. Division 5.2 of the EP&A Act

Division 5.2 of the EP&A Act establishes an assessment and approval regime for SSI. Division 5.2 applies to development that is declared to be SSI by an SEPP.

Under section 5.12(3), development cannot be SSI unless it is of a kind that may be carried out without development consent under Part 4 of the EP&A Act and comprises:

(a) infrastructure, or

(b) other development that (but for this Part and within the meaning of Part 5) would be an activity for which the proponent is also the determining authority and would, in the opinion of the proponent, require an environmental impact statement to be obtained under Part 5.

As indicated in section **Error! Reference source not found.** and 4.2 above, the proposal satisfies these requirements.

Under section 5.14 of the EP&A Act, the approval of the Minister for Planning is required for SSI before it can be carried out. In accordance with section 5.15 (Application for approval of State significant infrastructure):

'(1) The proponent may apply for the approval of the Minister under this Part to carry out State significant infrastructure.

(2) The application is to:

(a) describe the infrastructure, and

(b) contain any other matter required by the Secretary.

(3) The application is to be lodged with the Secretary.'

Under Division 5.2 of the EP&A Act, the planning and approvals process includes the following key steps:

1. Submission of a State Significant Infrastructure application with the supporting document to the Secretary of the DP&E under section 5.15 of the EP&A Act, to seek the Secretary's Environmental Assessment Requirements (SEARs) - this document is the supporting document for the application.
2. Preparation and submission of an EIS under section 5.16(2) of the EP&A Act, addressing the requirements of the EP&A Act and EP&A Regulation and the matters outlined in the SEARs.
3. Public exhibition of the EIS for a minimum of 30 days.
4. Assessment of the application and EIS by the DP&E and preparation of the Secretary's environmental assessment report (section 5.18 of the EP&A Act).
5. Determination of the application by the Minister.

Clause 192 of the EP&A Regulation requires that an application for approval of the NSW Minister for Planning to carry out SSI must include:

- Details of any approval that would, but for section 5.23 of the EP&A Act, be required for the carrying out of the SSI; and
- Details of any authorisations that must be given under section 5.24 of the EP&A Act if the application is approved; and
- A statement as to the basis on which the proposed infrastructure is SSI, including, if relevant, the capital investment value of the proposed infrastructure.

Section 5.16 of the EP&A Act provides for the declaration of critical State significant infrastructure (critical SSI). Critical SSI projects are high priority infrastructure projects that are essential to the State. Section 5.16 of the EP&A Act provides that any SSI may also be declared to be critical SSI, if it is 'of a category that, in the opinion of the Minister, is essential for the State for economic, environmental or social reasons.' As critical SSI, the proposal would be permissible without consent under clause 16(a) of the State and Regional Development SEPP. However, the proposal would remain subject to assessment under Division 5.2 of the EP&A Act and requires the approval of the Minister for Planning.

4.2.3. Land owner's consent

Clause 193(1) of the EP&A Regulation provides that consent of individual land owners would not be required to make the SSI application because the proposal:

- Is on behalf of a public authority, and ARTC is a public authority for the purposes of clause 193; or
- Is for linear transport infrastructure.

However, the proponent must give notice of the application no later than 14 days after the application has been made in accordance with clause 193(4).

4.2.4. State environmental planning instruments

4.2.4.1. State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP aims to assist in the delivery of public infrastructure across the state through consistent planning and assessment regimes for public infrastructure. Clause 79 of the Infrastructure SEPP permits development on any land for 'the purpose of a railway or rail infrastructure' to be carried out on behalf of a public authority without development consent, so the project is permissible without consent.

Typically the provisions of the Infrastructure SEPP prevail over other environmental planning instruments unless the work is located on land reserved under the *National Parks and Wildlife Act 1974* (NPW Act) or is regulated *State Environmental Planning Policy (Coastal Management) 2018* or *State Environmental Planning Policy (State and Regional Development) 2011*. As the proposal is not located on land reserved under the NPW Act, nor under any of the above SEPPs, those exclusions would not apply.

As set out above, the consequence of the proposal being permissible without development consent is that Part 5 of the EP&A Act would apply, subject to the proposal becoming SSI.

4.2.4.2. State Environmental Planning Policy (State and Regional Development) 2011

Clauses 14 and 15 of the SRD SEPP provides for SSI and clause 16 provides for Critical SSI. Clause 14 states that development is SSI if it:

- Is wholly or partly permissible without consent under Part 4 of the EP&A Act, by virtue of operation of a SEPP (such as the Infrastructure SEPP); and
- Meets the definitions provided in Schedule 3 to the State and Regional Development SEPP.

Clause 16 states that development is Critical SSI if it:

- May be carried out without development consent under Part 4 of the EPA Act, and
- Is declared to be SSI for the purposes of the EP&A Act if it is not otherwise so declared, and
- Is declared to be critical SSI for the purposes of the EP&A Act.

The proposal is declared to be SSI for two reasons. First, item 1 of Schedule 3 of the SRD SEPP declares that infrastructure for which the proponent is the determining authority and which would, in the opinion of the proponent, require an EIS to be obtained is SSI. Because the proposal is permissible without consent under the Infrastructure SEPP, ARTC is a determining authority under the EP&A Regulation, and ARTC has determined that the proposal is likely to significantly affect the environment, an EIS would be required to be obtained and, consequently, the proposal falls within item 1 of Schedule 3.

Second, item 3 of Schedule 3 of the State and Regional Development SEPP declares '*development for the purpose of rail infrastructure by or on behalf of the Australian Rail Track Corporation that has a capital investment value of more than $50 million*' to be SSI. The capital investment value of the proposal is estimated to be over $50 million so it is declared to be SSI.

4.2.5. Local environmental planning instruments

The proposal is located on land which is subject to the *Junee Local Environmental Plan 2012* and the *Cootamundra Local Environmental Plan 2013*. As the proposal is being assessed under Division 5.2 of the EP&A Act, the permissibility and consent provisions of these plans do not apply.

4.2.6. Legislation and approvals that do not apply

Section 5.23 of the EP&A Act provides that a number of additional approvals, permits or licences that would otherwise be triggered for development in NSW are not required for an approved State Significant Infrastructure project. The approvals not required for State Significant Infrastructure include:

- Approvals under Part 4 and excavation permits under section 139 of the *Heritage Act 1977*.
- Permits under section 201, 205 and 219 of the *Fisheries Management Act 1994*.
- Aboriginal heritage impact permits under section 90 of the *National Parks and Wildlife Act 1974*.
- Water use approvals, water management approvals and approvals under Section 91 of the *Water Management Act 2000*.
- Bushfire safety authority under section 100B of the *Rural Fires Act 1997*.

4.2.7. Approvals to be applied consistently

The EP&A Act provides that a number of other approvals, if required for an approved SSI project, cannot be refused and must be granted on terms which are substantially consistent with the SSI approval. These approvals include:

- An environment protection licence under Chapter 3 of the POEO Act.
- Consent under Section 138 of the Roads Act.

4.3. Other relevant legislation

4.3.1. Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) establishes, amongst other things, the procedures for issuing environment protection licences specific activities relating to waste, air, water and noise pollution control. EPLs are generally required for scheduled activities or scheduled development work. The definitions of scheduled activities provided in Schedule 1 include:

33 Railway systems activities.

1. This clause applies to railway systems activities, meaning:

(a) The installation, on site repair, on-site maintenance or on site upgrading of track, including the construction or significant alteration of any ancillary works.

(b) The operation of rolling stock on track.

The proposal meets this definition and would therefore require an environment protection licence. ARTC would obtain an environment protection licence for construction of the proposal.

In relation to operation, ARTC currently holds a licence to carry out railway systems activities on other parts of the NSW rail network. . The construction of new track, greater than five kilometres in length, would require a modification to this licence or a new licence to be obtained, due to condition A1.2 of the existing EPL. It may be appropriate to either amend this licence to include the operation of the proposal or to obtain a new licence. This would be considered in consultation with the Environment Protection Authority (EPA) during the EIS process.

4.3.2. Roads Act 1993

Under section 138, Part 9, Division 3 of the Roads Act, a person must not impact or carry out work on or over a public road other than with the consent of the appropriate roads authority. Construction of the proposal may impact on public road reserves under the control of various authorities. The proponent would seek the necessary approvals under the Roads Act. As noted above, section 5.24 of the EP&A Act provides that a permit under section 138 of the Roads Act cannot be refused if it is necessary to carry out a State Significant Infrastructure project.

4.4. Commonwealth legislation

4.4.1. Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government Department of the Environment and Energy (DoEE) for projects, or 'actions', that are likely to have a significant impact on a matter of national environmental significance or the environment on Commonwealth land. The Australian Government Minister for the Environment and Energy determines and whether the approval of the Minister would be required for a referred project. If so, that project is a controlled action under the EPBC Act.

The findings of preliminary environmental investigations carried out to date indicate the potential presence of threatened species and ecological communities listed under the EPBC Act in the study area. ARTC has formed the opinion that the proposal has the potential for significant impacts on protected matters. Therefore, the proposal is being referred to the Australian Government Minister for the Environment and Energy through the preparation of a separate referral.

4.4.2. Native Title Act 1993

The Commonwealth *Native Title Act 1993* provides the legislative framework that:

- Recognises and protects native title.
- Establishes ways in which future dealings affecting native title may proceed, and to set standards for those dealings, including providing certain procedural rights for registered native title claimants and native title holders in relation to acts which affect native title.
- Establishes the National Native Title Tribunal.

The National Native Title Tribunal has a number of functions under the Act including maintaining the Register of Native Title Claims, the National Native Title Register and the Register of Indigenous Land Use Agreements and mediating native title claims. The NSW *Native Title Act 1994* was introduced to ensure that the laws of NSW are consistent with the Commonwealth *Native Title Act 1993*.

5. THE PROPOSAL

5.1. Overview

This section provides a brief description of the proposal, including the infrastructure required, indicative construction activities, and the proposed operation, maintenance, and management arrangements.

To provide the context for the proposal, section 5.1.1 describes the proposed features and specifications of the Inland Rail, an indicative preliminary review of the main construction activities that would be undertaken is provided in section 5.4, along with an outline of the indicative operation and maintenance regime.

The key characteristics that make up the proposal (infrastructure, construction and operation) would continue to be refined and expanded upon following submission of this application. Further developed and updated information would be provided in the EIS.

5.1.1. Inland Rail performance specifications

The minimum operational requirements of the design are specified by the performance specification for Inland Rail. Key elements include:

- Maximum train length of up to 1800 m with capacity for later upgrades to suit trains 3600 m long.
- Maximum design speed of 115 km/h for freight trains.
- 7.1 m clearances for double stacked operation.
- Maximum 21 tonne axle load at 115 km/h, 25 tonnes at 80 km/h, with future proofing for 30 tonnes at 80 km/h.

5.1.2. Proposal timeframe

Construction is anticipated to commence in mid-2021 and is expected to take about 24 months. This is indicative only at this stage. The construction commencement time and construction duration would be firmed up, and may be revised as the assessment of the proposal progresses.

5.2. Scope of works

The land requirement for the Inland Rail will comprise a corridor with an average width of 40 m, with some variation to accommodate particular infrastructure and to cater for local topography. The corridor will be of sufficient width to accommodate the infrastructure currently proposed for construction, as well as future expansion, including possible future requirement for 3,600 m trains. There will be a requirement for subdivision of land, dedication of land as road reserve where road deviations are required and further property rationalisation as a result of the construction and operation of the Proposal.

Project construction will be a single track standard-gauge railway, with one crossing loop to accommodate double stacked freight trains initially up to 1,800 m long. Components of the construction will include infrastructure to accommodate possible future augmentation and upgrades of the track, including possible future requirements described above. Clearing of the corridor will allow for construction and to maintain the safe operation of the railway.

The operational phase at year 2040 will be of a single track with one crossing loop to accommodate double stacked freight trains up to 1,800 m long. Impact assessment will be undertaken for rail traffic and associated activities projected at the year 2040.

5.2.1. Key features

The construction of the proposal would involve the following:

- Approximately 37 kilometres of new standard gauge track.
- Installation of 43 new culverts, two turnouts and five bridges.
- One crossing loops.
- Installation of 13 public /private level crossings
- Tie-in works to the existing rail line north of Illabo and at Stockinbingal.

The estimated number of culverts, bridges and level crossings have been provided above and would be subject to further refinement in the design process.

5.3. Construction of the proposal

Typical construction activities associated with the proposal include:

Pre-construction and enabling

Pre-construction and enabling works are those activities that would typically be undertaken before the start of substantial construction in order to make ready the key construction sites and provide protection to the public. These are works that will be part of the proposal and cannot commence until project approval is granted. Enabling works included in this application include:

- Demolishing buildings and other structures that are not a State or local heritage item.
- Supply of power, water and other services.
- Adjusting, modifying and protecting existing utilities and services.
- Transport network modifications.
- Carrying out heritage investigations, protection and archival recordings.
- Vegetation clearance.
- Establishing ancillary construction facilities (including compounds), and associated mitigation measures.
- Installation of environmental mitigation measures (including erosion and sedimentation control, temporary exclusion fencing for sensitive areas, at-property acoustic treatment).

Excluded works from this application include:

- Geotechnical, contamination and environmental investigations such as but not limited to borehole drilling or excavations, treatment of contaminated sites.
- Other tests, surveys, sampling or investigations of existing buildings, bridges and other third party assets.
- Service relocations that would be of minimal environmental impact.
- Minor vegetation clearance associated with any of the works described above.

These works may be determined as Exempt Development under the provisions of Clause 82 of the Infrastructure SEPP. Otherwise the works may require a separate assessment (eg. REF).

New standard gauge track

The proposed works would involve constructing approximately 37 kilometres of new single gauge track, including provision of:

- New track ballast.

- New heavy duty concrete sleepers.
- New rail tracks.

Earthworks and drainage

Bulk earthworks may be required in some sections of the proposal site. Subject to the outcomes of the concept design process, the earthworks required could vary depending on the extent of modification required to install the new tracks.

Further investigations are currently being undertaken to confirm the extent of works likely to be required to meet the Inland Rail performance specifications. Drainage within the proposal site would be designed to suit the new single gauge track with consideration of appropriate flood immunity when designing all new track formations, embankments and cuttings for the Inland Rail route.

Culverts and bridges

The proposal would require the installation of 43 new culverts and five bridges. A suitable grade separated crossing will be required for both the existing Griffith Line (rail) and Burley Griffin Way (Road).. Crossings over creeks may include Dudauman Creek, Ironbong Creek, Ulandra Creek, Powderhorn Creek, Run Boundary Creek, Isobel Creek, Billabong Creek and other unnamed tributaries and ephemeral creeks would require culvert structures and potentially rail over creek bridges to maintain drainage and flow paths. The estimated number and location of culverts and bridges would be subject to further refinement in the design process.

During the concept design process, all structures will be assessed for compliance with the Inland Rail performance specification. Any existing bridges and culverts that do not comply, have limited life spans, or cannot be feasibly made to comply, would be replaced as part of the proposal.

Level crossings

Public and private level crossings will be required to allow vehicles and pedestrians to cross the railway tracks. This may include the installation of level crossings at public roads which will be intersected by the proposal or the installation of private level crossings to provide access within a private property or between a private property and a public road. The proposal may require 13 level crossings which would include Old Sydney Road, Ironbong Road, Dirnaseer Road, Dudauman Road, Old Cootamundra Road and several other private and unnamed public roads. The estimated number and location of level crossings would be subject to further refinement during the design process.

It is ARTC policy to work with stakeholders to minimise the number of crossings on the Inland Rail route and ARTC has a consistent process for selecting level crossing safety treatments across the programme. The process would consider:

- Selection of level crossing safety treatments taking into account site assessments, road traffic volumes, stakeholder feedback and compliance with the relevant Australian and ARTC standards.
- Road network, access and local traffic implications.
- Opportunities for alternative access arrangements.
- Property acquisition and easement requirements.
- Road closures.
- Estimated implementation costs.

5.3.1. Construction sequence

Construction activities would vary along the length of the proposal depending on the works to be undertaken, local conditions and track operational requirements. A typical construction sequence is as follows:

- Establish construction work sites and environmental controls.
- Undertake enabling works, including the excavation, installation and relocation of services.
- Remove existing structures and vegetation clearing.
- Construct new structures, including:
  - Placement of suitable formation material.
  - Installation of new culverts and associated structures.
- Track works including as required:
  - Construction of cuts and fills.
  - Installation of new track, track components and ballast.
- Installation of signalling infrastructure and other services.
- Commissioning works.
- Site rehabilitation.

The anticipated construction methodology and sequencing will be identified in EIS.

5.3.2. Ancillary facilities

Ancillary works would include works to signalling and communications, signage, fencing, and services and utilities.

During construction, the proposal would require the establishment of construction compounds along the entire length of the proposal. These would be located within the proposal site where practicable; however some may need to be located adjacent to the proposal site where there is insufficient space available or for safety reasons.

Borrow pits would also be required for fill works associated with embankments, bridges and culvert structures during construction. Major compounds would be located preferably on disturbed land, close to major access roads and clear of sensitive environmental areas and residences as far as possible. A number of smaller storage areas would be required at strategic locations along the proposal site, for example near bridges.

In addition to the construction compounds, which are subject to further feasibility analysis and design definition in the EIS, the following may form part of the project scope:

- Batch plants.
- Camp accommodation for construction workers.
- Construction water supply and storage.
- Substantial environmental impact mitigation measures.
- Rail sidings.

The location and impacts of potential ancillary facilities, including the need for the above, will be considered in the EIS and refined during the design process.

It is noted that while construction of the proposal is likely to require storage areas for railway materials, borrow pits and/or quarries, they do not form part of the proposal.

5.4. Operation of the proposal

Projected train movements across the entire Inland Rail Route (round trips, most heavily trafficked section of Inland Rail) is expected to be up to 123 trains per week in 2024-25 with a peak demand in 2049-50 where train numbers are expected to reach up to 174 per week (ARTC, 2015). However, the Illabo to Stockinbingal section is expected to have a much lower frequency with an average weekly demand of up to 94 trains per week (2025) with a peak demand of 136 (2040). The new rail line will be a faster, more efficient route that bypasses the Sydney rail network and will enable the use of double stacked trains along its entire length.

Trains would operate 24 hours per day and would be up to 1800 m in length; and require a vertical clearance of 7.1 m.

5.4.1. Maintenance activities

Standard ARTC maintenance activities would be undertaken during operations. Typically these activities would involve minor maintenance works such as bridge and culvert inspections, through to major maintenance such as reconditioning of track and topping up of ballast as required.

6. ENVIRONMENTAL CONSIDERATIONS

6.1. Overview

This section provides a preliminary assessment of the potential environmental impacts that are likely to be associated with the construction and operation of the proposal. This assessment has been based on the current level of design for the proposal). The impacts described are considered preliminary and may change throughout the design process and environmental impact assessment process, as more information becomes available. Any changes to environmental impacts would be adequately assessed as part of the EIS and associated technical studies.

The environmental impacts identified in this section have been classified as either 'key' or 'other' environmental issues. This classification was based on the likely significance of the identified environmental impacts from the findings of the preliminary environmental risk assessment and field surveys undertaken to date.

The 'Key' environmental issues are defined as those impacts that are considered to require further detailed investigation during the preparation of the EIS as they would result in a moderate to high impact on the environment. These issues are considered in sections 6.2–6.11 and include:

- Biodiversity
- Aboriginal Heritage
- Non-Aboriginal Heritage
- Hydrology, flooding and water quality
- Topography, geology and soils
- Contamination
- Land use, socio-economic and visual impacts
- Noise and vibration
- Air quality
- Traffic and transport

The 'Other' environmental issues are defined as those impacts that are not expected to be as significant and would be manageable through the application of best practice environmental management measures. These issues are considered in section 6.12–6.18 and include:

- Waste and resource use
- Greenhouse gas and energy
- Climate Change
- Hazards and risks
- Utilities and services
- Cumulative impacts

KEY ENVIRONMENTAL ISSUES

6.2. Biodiversity

A desktop study was undertaken in November 2016 to identify known and recorded threatened species, populations, communities and associated habitat listed under the *Biodiversity Conservation Act 1995* (BC), EPBC Act and NSW *Fisheries Management Act 1994* (FM Act) by reviewing published Commonwealth and State ecological records including; Office of Environment and Heritage's BioNet Atlas of NSW Wildlife, Department of the Environment's EPBC Protected Matters Search Tool, PlantNET – NSW FloraOnline and existing vegetation mapping.

The desktop studies were supplemented by undertaking a rapid field survey within the search area in April 2016 and further field verification in October 2016. The rapid surveys targeted areas where gaps in information (i.e. gaps in existing vegetation mapping) and significant remnant vegetation occurred. The surveys sought to verify and refine the presence/absence of ecological constraints within the proposal site, focusing in particular on threatened and endangered ecological communities as well as habitat capable of supporting threatened biota.

6.2.1. Existing Environment

The proposal is mainly surrounded by rural land which has been previously modified and disturbed due to agricultural activities. Native vegetation identified in field surveys within the proposal site include River Red Gum (*Eucalyptus camaldulensis*), Blakely's Red Gum (*Eucalyptus blakelyi*) and Western Grey Box and White box Grassy Woodland (refer to Figure 6.1).

Threatened fauna species known to occur within the search area (10 kilometres from the proposal site) include the Superb Parrot (*Polytelis swainsonii*), Grey Crowned Babbler (*Pomatostomus temporalis*) and Spotted Harrier (*Circus assimilis*). A complete list of threatened flora and fauna identified during desktop searches is provided in Appendix A.

No National Parks land occurs within or adjacent to the proposal site and would not be impacted by the proposal.

6.2.1.1. Flora

6.2.1.1.1. Vegetation communities

Database search results identified three threatened ecological communities listed under the EPBC Act and BC Act which are located within the proposal site.

- The Inland Grey Box Woodland is comprised of White Cypress Pine (*Callitris columellaris*) and Western Grey Box tall grassy woodland (*Eucalyptus microcarpa*) which are found within the NSW South Western Slopes and Riverina Bioregions. The Inland Grey Box Woodland is listed as an endangered ecological community (EEC) under the BC Act and threatened ecological community under the EPBC Act.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland is also present being characterised by White Box (*Eucalyptus albens*), Yellow Box (*Eucalyptus melliodora*) and Blakely's Red Gum (*Eucalyptus blakelyi*). The Woodland is listed as an EEC under the BC Act and listed as critically endangered under the EPBC Act.
- The Weeping Myall Woodlands, identified to potentially occur within the proposal site, is an endangered ecological community listed under the EPBC Act. Weeping Myall Woodlands occur in a range of forms from open woodlands to woodlands, in which Weeping Myall (*Acacia pendula*) trees are the sole or dominant species. The ecological community is also listed as endangered under the BC Act as 'Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions.'

6.2.1.1.2. Threatened flora

Five threatened flora species have been recorded within the search area (refer to Appendix A), including threatened flora species such as Crimson Spider Orchid (*Caladenia concolor*), Spiny Pepper-cress (*Lepidium aschersonii*), *Austrostipa metatoris*, *Tylophora linearis* and Sand-hill Spider-orchid (*Caladenia arenaria*).

6.2.1.2. Fauna

The desktop searches identified 14 threatened fauna species (nine birds, three mammals and two reptile species) within the search area (refer to Appendix A).

Of these, three threatened fauna species were recorded within the proposal site in the field surveys.

- Superb Parrot (*Polytelis swainsonii*) has been recorded to have potential breeding sites within hollow trees, identified in the rapid field survey (potential breeding habitat at Lot 3 DP591854). The species is listed as Vulnerable under the BC Act and EPBC Act.
- Grey Crowned Babbler (*Pomatostomus temporalis*) listed as Vulnerable under the BC Act.
- Spotted Harrier (*Circus assimilis*) also listed as Vulnerable under the BC Act.

Potential habitat for threatened fauna species identified in the rapid field survey include birds of prey (Little Eagle and Black Falcon), blossom feeding nomads (Swift Parrot, Little Lorikeet, Painted Honeyeater and Black-chinned Honeyeater), woodland birds (Brown Treecreeper, Speckled Warbler, Varied Sittella, Flame Robin, Diamond Firetail, Hooded Robin and Turquoise Parrot), and mammals including Grey-headed Flying-fox, Koala and numerous micro bat species (refer to Appendix A).

6.2.1.3. Aquatic species and communities

The proposal site is located within the Lower Lachlan River and Lower Murray River aquatic ecological community boundaries. The desktop searches identified two threatened fish species which may have potential habitat within the search area (refer to Appendix A). This includes the Murray Cod (*Maccullochella peelii*) and Macquarie Perch (*Macquaria australasica*). While these fish species or species habitat may occur within the area it is considered that they are unlikely to occur within the proposal site as a majority of the creeks are ephemeral and are not capable of providing a sustainable habitat.

6.2.1.4. Other matters of National Environmental Significance

No wetlands of International Importance (RAMSAR wetlands) are located near the proposal site. The closest listed wetlands are located more than 400 kilometres north of Stockinbingal and are not expected to be impacted by the proposal.

A search using the Protected Matters Search Tool in November 2016, identified eight migratory species the search area. Of these species, five are considered to have the potential to occur within the proposal site (refer to Appendix A). These include Fork Tailed Swift (*Apus pacificus*), White-throated Needletail (*Hirundapus caudacutus*), Satin Flycatcher (*Myiagra cyanoleuca*), Rufous Fantail (*Rhipidura rufifrons*), and Yellow Wagtail (*Motacilla flava*).

6.2.2. Potential Impacts

The main potential impacts of the proposal during construction include:

- Clearing of vegetation within the proposal site and for ancillary activities.
- Loss of fauna habitat and impacts on threatened species and endangered populations.
- Disturbance to natural waterways and aquatic habitat from the replacement and/or upgrade works of bridges and culverts.
- Habitat fragmentation and connectivity issues for flora and fauna.
- Potential for wildlife to be struck by operating trains.

Other indirect impacts during operation include:

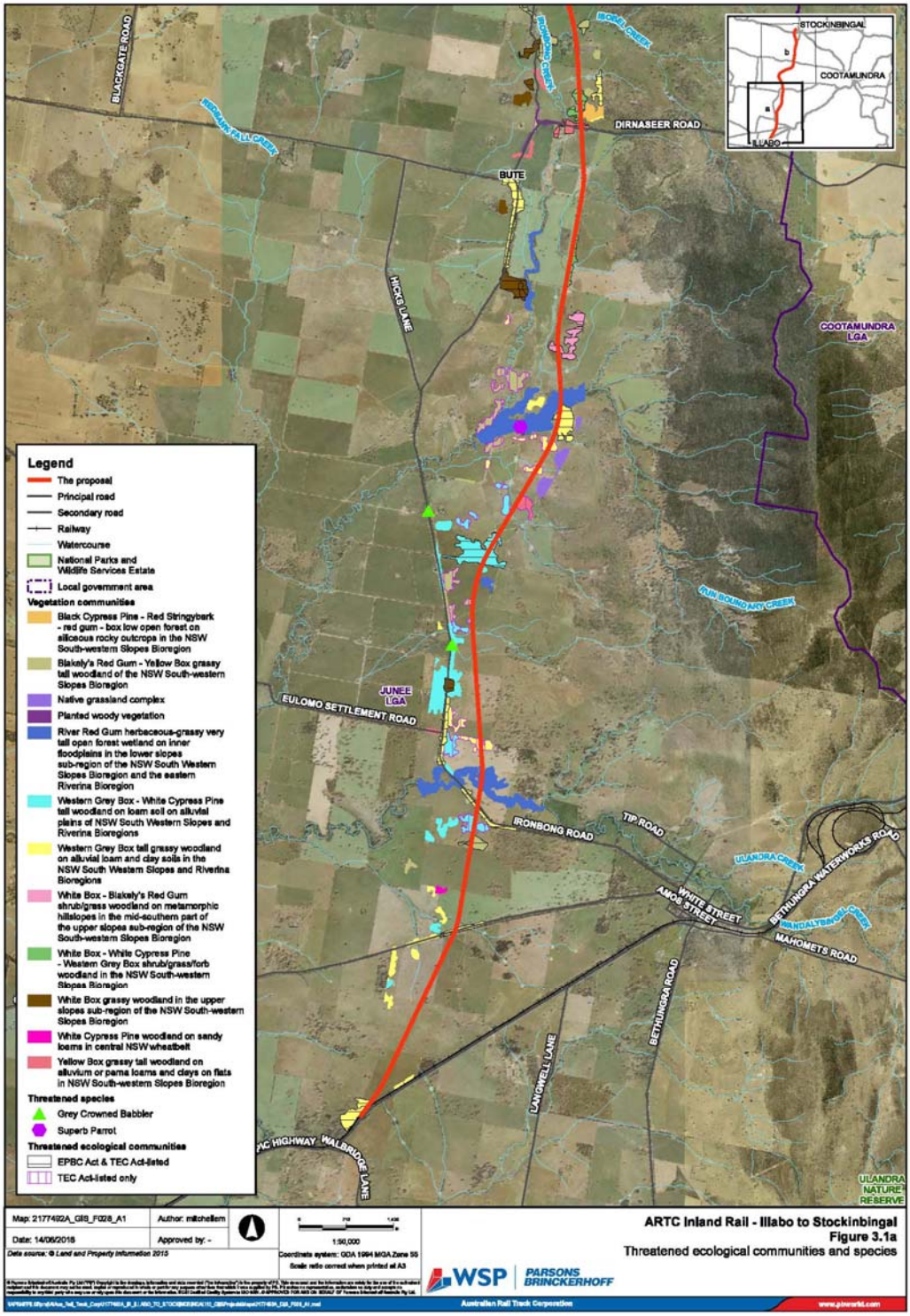
- Dispersion and potential encouraged growth of weeds during construction activities by exposing soil and clearing vegetation.
- Effects on nearby fauna with related construction and operation noise and light impacts.

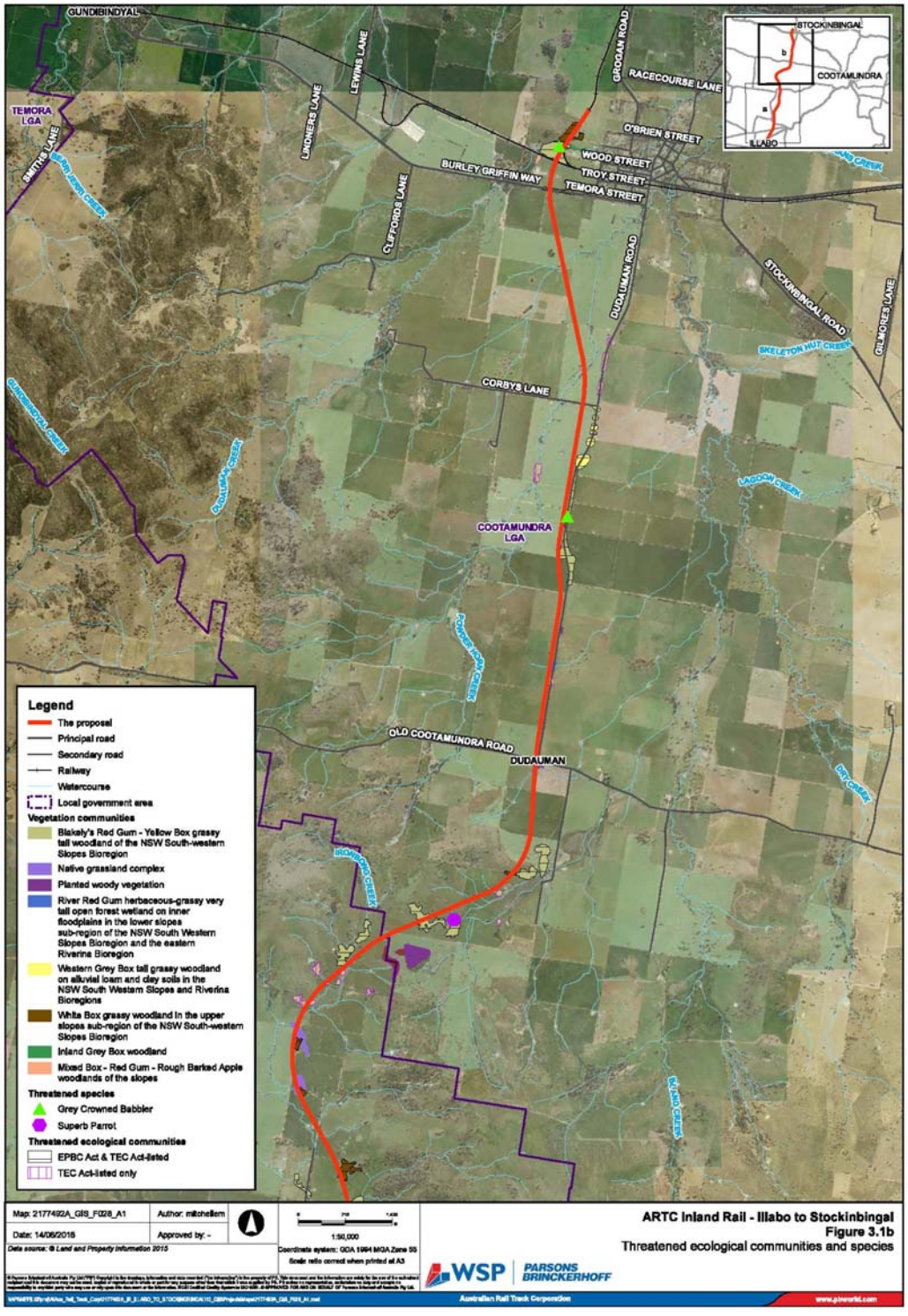
6.2.3. Scope of further assessment

A biodiversity assessment will be undertaken in accordance with the Biodiversity Assessment Method (BAM) as required under the BC Act. This assessment will result in a Biodiversity Development Assessment Report (BDAR) which will identify how ARTC will avoid and minimise impacts, any potential impacts that could be characterised as serious and irreversible according to the specified principles and any offset obligations required to offset the likely biodiversity impacts of the project.

The assessment will also have regard to the extent of any impacts on matters under the EPBC Act.

Figure 6.1 Biodiversity




GUNDIBINDYAL
TEMORA LGA
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LEWINS LANE
GROGAN ROAD
RACECOURSE LANE
O'BRIEN STREET
WOOD STREET
TROY STREET
TEMORA STREET
BURLEY GRIFFIN WAY
CLIFFORDS LANE
DUDAUMAN ROAD
STOCKINBINGAL ROAD
GILMORES LANE
SKELETON HUT CREEK
CORBYS LANE
LAGOON CREEK
COOTAMUNDRA LGA
OLD COOTAMUNDRA ROAD
DUDAUMAN
STOCKINBINGAL
COOTAMUNDRA
ILLABO
Legend
The proposal
Principal road
Secondary road
Railway
Watercourse
Local government area
Vegetation communities
Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion
Native grassland complex
Planted woody vegetation
River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion
Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White Box grassy woodland in the upper slopes sub-region of the NSW South-western Slopes Bioregion
Inland Grey Box woodland
Mixed Box - Red Gum - Rough Barked Apple woodlands of the slopes
Threatened species
Grey Crowned Babbler
Superb Parrot
Threatened ecological communities
EPBC Act & TEC Act-listed
TEC Act-listed only
Map: 2177402A_GIS_F028_A1
Author: mitchellem
Date: 14/06/2018
Approved by: -
Data source: © Land and Property Information 2015
1:50,000
Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3
ARTC Inland Rail - Illabo to Stockinbingal
Figure 3.1b
Threatened ecological communities and species
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6.3. Aboriginal Heritage

A preliminary assessment of Aboriginal Heritage was undertaken by Niche Environment and Heritage Pty Ltd (Niche). The assessment was prepared in line with the NPW Act and Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010) and involved a search of the Aboriginal Heritage Information Management System (AHIMS) within 10 kilometres of the proposal site and identifying areas of moderate-high sensitivity.

6.3.1. Existing Environment

The proposal site is generally characterised by gently undulating land with an elevation ranging between 270–370 m. It features some low ridges and hilltops, interspersed with numerous drainage lines ranging from first-order ephemeral waterways up to fourth-order entrenched creeks. Creeks within the proposal site include Dudauman Creek, Ulandra Creek and Ironbong Creek.

The Wiradjuri Region, in which the proposal is located, comprises of 21 Local Aboriginal Land Council's and represents the largest region in the NSW Land Rights network. The proposal falls within the Wagga Wagga and Young Local Aboriginal Land Council (LALC) areas and is not located on land where a native title determination has been made.

An extensive AHIMS search identified a record of a modified tree (carved or scarred) east of Ironbong Road, Bethungra (refer to Figure 6.2) in the proposal site. In addition to the AHIMS search, an evaluation of landscape features that indicate the potential existence of Aboriginal objects or places was undertaken. These are associated with Dudauman Creek, Ironbong Creek, Ulandra Creek and Powder Horn Creek. The AHIMS search identified four records of modified tree (carved or scarred) east of Ironbong Road, Bethungra (refer to Figure 6.2). The proposal could result in the removal or disturbance of the modified tree identified in the AHIMS search as a result of its location within the proposal site. An artefact was also identified north of Run Boundary Creek within the proposal site.

6.3.2. Potential Impacts

The proposal would require works in previously undisturbed areas and would have the potential to contain Aboriginal cultural heritage as identified in the AHIMS searches. In addition, the predictive model identified a number of areas of medium to high archaeological potential, which could contain unidentified Aboriginal heritage items.

Further archaeological survey work and assessment, including field investigations, will be undertaken during the EIS to ensure that recorded archaeological sites and archaeologically sensitive landforms are assessed and managed appropriately.

6.3.3. Scope of further assessment

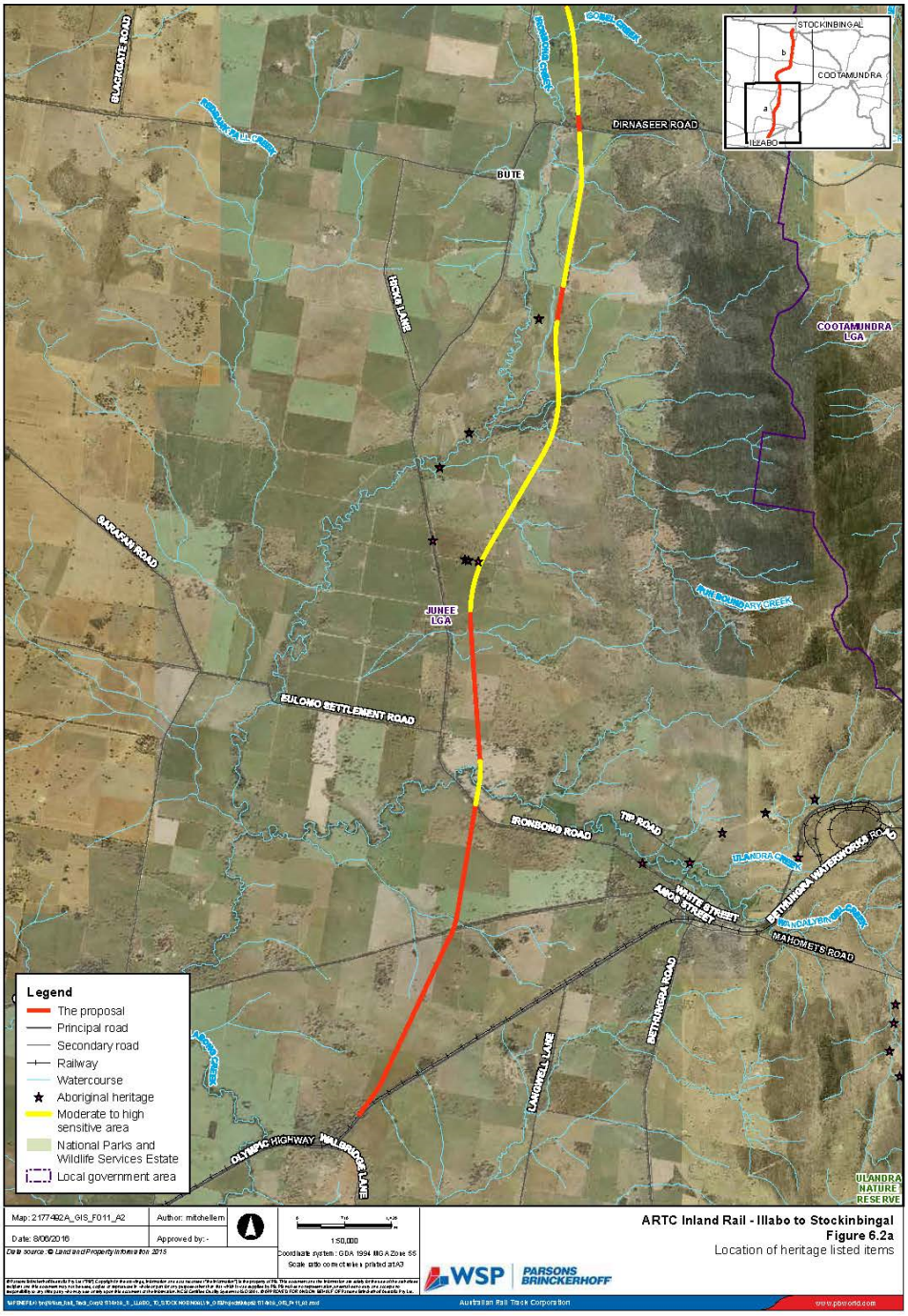
An Aboriginal cultural heritage and archaeology assessment will be prepared as part of the EIS in accordance with the Guide to Investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011) and the following guidelines:

- Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010).
- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011).
- Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a).
- Code of Practice for Investigation of Aboriginal Objects in New South Wales (DECCW, 2010b).

The assessment will include consultation with the relevant Aboriginal stakeholders.

The assessment will describe and assess the significance of any Aboriginal objects and/or places that may be impacted by the proposed works and provide options to avoid, mitigate or manage the harm to those object and/or places.

Figure 6.2 Aboriginal heritage


STOCKINBINGAL
COOTAMUNDRA
ILLABO
BLACKLAND ROAD
DIRNASEER ROAD
BUTE
HICKS LANE
COOTAMUNDRA LGA
SARAWAN ROAD
JUNEE LGA
EULOMO SETTLEMENT ROAD
IRONBONG ROAD
TIP ROAD
ULANDRA CREEK
WHITE STREET
ARGYLE STREET
MAHOMETS ROAD
BETHUNGRA ROAD
LANGWELL LANE
OLYMPIC HIGHWAY
MALBROOK LANE
ULANDRA NATURE RESERVE
Legend
The proposal
Principal road
Secondary road
Railway
Watercourse
Aboriginal heritage
Moderate to high sensitive area
National Parks and Wildlife Services Estate
Local government area
Map: 2177492A_GIS_F011_A2
Author: mitchellem
Date: 8/06/2016
Approved by: -
1:50,000
Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3
ARTC Inland Rail - Illabo to Stockinbingal
Figure 6.2a
Location of heritage listed items
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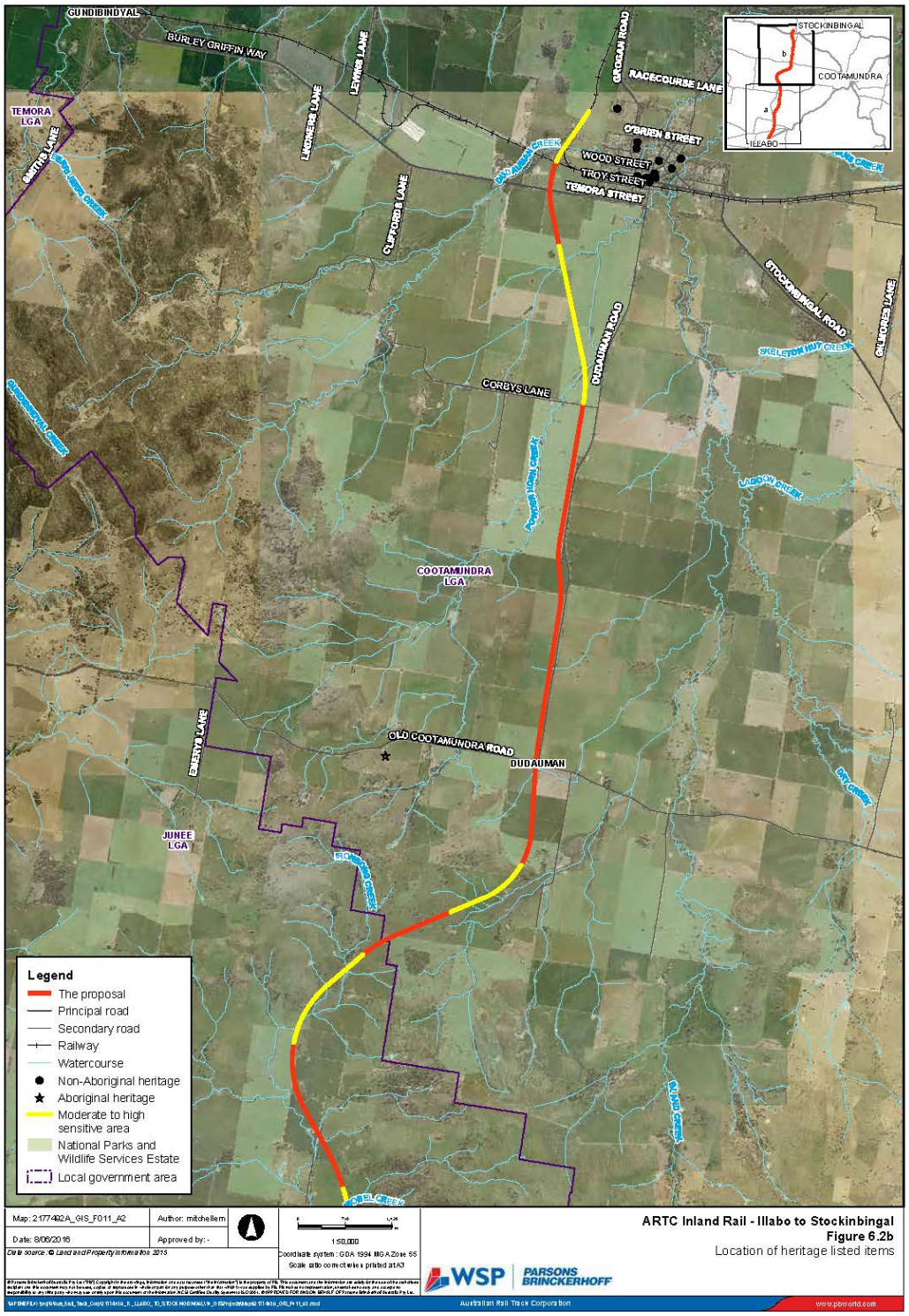
GUNDIBINDYAL
BURLEY GRIFFIN WAY
LEWINS LANE
LINDSMERE LANE
GROGAN ROAD
RACECOURSE LANE
STOCKINBINGAL
COOTAMUNDRA
ILLABO
TEMORA LGA
CARTER LANE
O'BRIEN STREET
WOOD STREET
TROY STREET
TEMORA STREET
CLIFFORDS LANE
STOCKINBINGAL ROAD
SKELETON WAY CREEK
CORBYS LANE
DUDAUMAN ROAD
COOTAMUNDRA LGA
LAGOON CREEK
EMERYS LANE
OLD COOTAMUNDRA ROAD
DUDAUMAN
JUNEE LGA
Legend
The proposal
Principal road
Secondary road
Railway
Watercourse
Non-Aboriginal heritage
Aboriginal heritage
Moderate to high sensitive area
National Parks and Wildlife Services Estate
Local government area
Map: 2177492A_GIS_F011_A2
Author: mitchellem
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Coordinate system : GDA 1994 MGA Zone 55
Scale and coverage when printed at A3
ARTC Inland Rail - Illabo to Stockinbingal
Figure 6.2b
Location of heritage listed items
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6.4. Non-Aboriginal Heritage

The preliminary assessment of non-Aboriginal heritage included a search of the following databases in December 2016:

- State Heritage Register.
- Australian Heritage Places Inventory.
- Australian Heritage Database (including Commonwealth and National heritage lists).
- Cootamundra LEP 2013.
- Junee LEP 2012.

6.4.1. Existing Environment

Searches of the relevant state and local heritage registers identified several local heritage items listed in the Cootamundra LEP within and adjacent to the proposal site in Stockinbingal (refer to Figure 6.2). Local heritage items within the proposal site include Stockinbingal Railway Station, Kurrajong trees and falls within the Stockinbingal Heritage Conservation Area. Other local heritage items located adjacent to the proposal site include Begley's store, Post Office, Powderhorn Museum, Stockinbingal Cemetery and other shops/residences located within the Stockinbingal Heritage Conservation Area.

No heritage items listed on the State heritage register have been identified within the proposal site.

6.4.2. Potential Impacts

Several local heritage items are located within and adjacent to the proposal site as identified in section 6.4.1 and shown in **Error! Reference source not found.**2a and Figure 6.2b. However, the proposal site is sufficiently large enough to provide a buffer around an item of heritage significance which is sufficient to give it adequate protection from the proposal. Visual amenity would be altered during the construction and operation of the proposal, which may detract from the heritage values in Stockinbingal by altering viewpoints, sight lines and reducing the ease of access to these items.

Excavation works in undisturbed areas, in particular surrounding Stockinbingal, may have the possibility of uncovering unidentified archaeological items.

6.4.3. Scope of further assessment

A historical heritage assessment will be prepared in accordance with relevant standards and guidelines, including the *NSW Heritage Manual 1996, Archaeological Assessments and Assessing Heritage Significance* and with consideration of the principles contained in the Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance.

This will include an assessment of the impact of the proposal on any sites, bridges or other structures of potential historical heritage value and the identification of measures where further management or investigation is required.

6.5. Hydrology, flooding and water quality

This section provides a preliminary hydrology, flooding and water quality assessment for the proposal. The assessment included a review of relevant literature such as the Murrumbidgee and Lachlan catchment overview (DPI, 2016) to identify and evaluate existing hydrologic and hydraulic conditions within the proposal site. Cootamundra and Junee LEPs have also been reviewed to identify watercourses, flood prone land and groundwater vulnerability.

6.5.1. Existing Environment

The proposal is located within the Murrumbidgee and Lachlan catchment, which are sub-catchments within the Murray Darling Basin. The catchment divide lies closer to Stockinbingal and therefore most of the proposal site is within the Murrumbidgee catchment.

The proposal site crosses nine creeks including Dudauman Creek, Ironbong Creek, Ulandra Creek, Powderhorn Creek, Run Boundary Creek, Isobel Creek, Billabong Creek and numerous other crossings over small shallow ephemeral creeks and tributaries. The key waterways within the proposal site are shown in Figure 6.3. All of these watercourses are at the top of the catchments for their respective valleys and are likely to only flow during rainfall events. Currently, no water quality testing is documented for these creeks.

Groundwater vulnerability mapping in the Junee LEP has been developed to be used as a guide in determining which areas are more susceptible to groundwater contamination. The proposal overlaps with vulnerable areas to the east of Ironbong Road and north of Dirnaseer Road (refer to Figure 6.3). Groundwater depths vary between 8–150 m, where the shallower regions have been mapped as vulnerable in the Junee LEP.

Groundwater dependent ecosystems (GDEs) are communities of plants, animals and other organisms that depend on groundwater for survival. A GDE may rely on the surface or subsurface presence of groundwater for survival or as a supplementary source of water. A search of the Atlas of GDE's within the proposal site, identified several ecosystems that are dependent on the surface expression of groundwater, however no ecosystems which rely on the subsurface expression of groundwater have been identified. The ecosystems dependent on the surface expression of groundwater include river base flows, floodplains and riparian vegetation associated with the following creeks; Run Boundary Creek, Ulandra Creek, Dry Creek, Ironbong Creek, Bland Creek, Isobel Creek, Dudauman Creek and Billabong Creek.

The Stockinbingal Floodplain Risk Management Plan (FRMP) completed in 2002 (SMEC 2002) documents that the largest floods on record for Dudauman Creek were in 1956 and 1974. The impacts were mainly documented for the town of Stockinbingal with little information on flooding through the rural areas.

No data is available for the flooding of Ironbong Creek. However, it is likely that the area was affected by similar rainfall events to Dudauman Creek in 1956 and 1974.

A review of the Cootamundra and Junee flood planning maps have identified the area associated with Dudauman Creek, adjacent to Stockinbingal, as land at or below the level of a 1:100 ARI (average recurrence interval) flood event (refer to Figure 6.3). The remainder of the proposal site is not classified as being located on flood prone land.

6.5.2. Potential Impacts

6.5.2.1. Water quality

During construction, potential impacts upon water quality would include:

- Erosion of the banks of the creek resulting in sedimentation.
- Leaks or spills from construction equipment and materials entering watercourses.
- Sediment run off from construction activities on the floodplain.
- Potential dryland salinity via the removal of deep-rooted trees resulting in saline discharges.

Increasing the sediment load within the creek would have the potential to impact upon water quality by increasing turbidity and suspended particle levels. Pollutants from construction equipment and materials such as concrete could alter the pH levels within the creek as well as result in an increase in hydrocarbons being released from spills or leaks. The changes in water quality and an increase in sediment load within the creek could impact upon the aquatic ecology and have further implications downstream if appropriate control measures are not implemented.

During operation, the proposal has the potential to impact upon water quality primarily in the following ways:

- Accidental release of oils and lubricants from spills and leaks including hydrocarbons and volatile organic compounds during operational maintenance.
- The 2002 Stockinbingal FRMP indicated that stream erosion was a problem for the Dudauman Creek and Powderhorn Creek. It is therefore possible that many of the creeks in the area would suffer from stream erosion and would be further impacted by the construction and operation of the proposed culverts and bridges.

6.5.2.2. Groundwater

Construction activities such as trenching are not anticipated to impact upon groundwater due to the relatively shallow depth required for trenching in comparison to the depth of the water table. However, construction materials and equipment have the potential to cause contamination of soils which after heavy rainfall will infiltrate groundwater. Furthermore, certain areas of the proposal site have been identified in groundwater vulnerability mapping (Junee LEP, 2012), which occurs along the central and southern sections of the proposal site (refer to Figure 6.3). This could potentially increase the risk of groundwater contamination and would require appropriate management strategies to be implemented during construction and operation of the proposal. Other construction activities that may impact on groundwater is piling for the construction of bridges along the proposal, which can potentially displace water and affect groundwater conditions.

Removal of vegetation in groundwater vulnerable areas could also potentially result in dryland salinity, bringing saline water to the surface which can further impact upon vegetation communities and be discharged into watercourses. Further to this, potentially sodic soils identified south of Stockinbingal in the NSW OEH land and soil information mapping (eSPADE) have an increased potential of salinity occurring due to the soils highly saline nature.

GDE's which rely on the surface expression of groundwater may be impacted by instream construction works such as bridges and culverts, which could alter surface flows and as a result adversely affect the functioning of GDE's. However, this will need to be further investigated in the EIS.

6.5.2.3. Flooding

The proposal site crosses flood prone land surrounding Dudauman Creek at Stockinbingal as well as crossing several watercourses which have the potential to flood under heavy rainfall.

Potential flood impacts include:

- Alteration to the creek banks can alter the geomorphology of the watercourses, potentially increasing flood risk downstream. Structures associated with the proposal such as embankments, culverts and bridges could alter upstream and downstream flood behaviour and lead to scouring downstream of the culverts and sedimentation.
- Altered flooding conditions during operation of the proposal, due to the addition of culverts and associated structures within the creeks.

6.5.3. Scope of further assessment

6.5.3.1. Water quality

A water quality assessment would be conducted for the EIS which would identify potential impacts and control measures for the management of water quality during construction and operation.

6.5.3.2. Groundwater

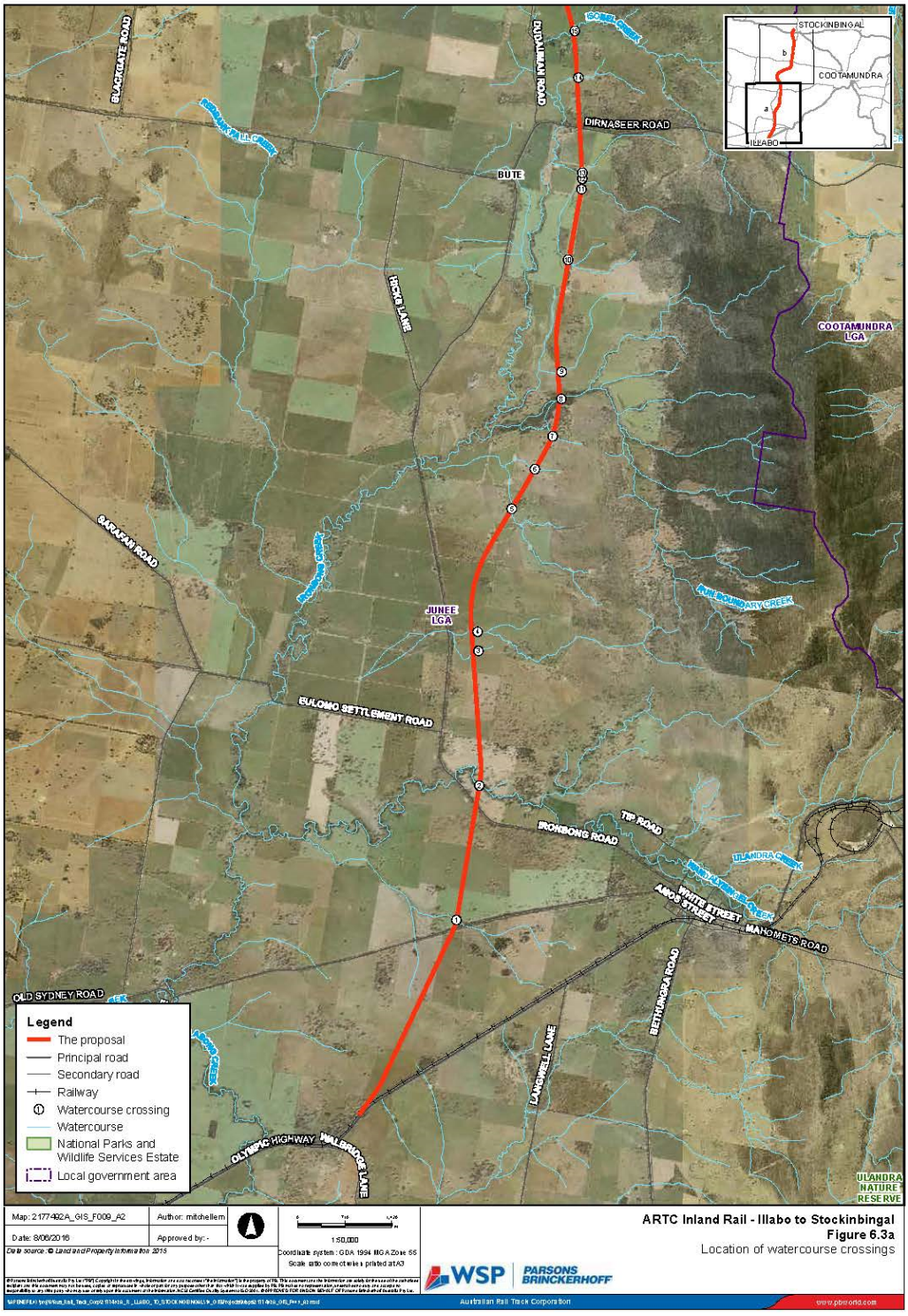
A groundwater assessment will be undertaken to identify the existing groundwater conditions to minimise groundwater contamination during the construction phase. This will involve a desktop review of current hydrogeological conditions to determine the potential construction and operational risks to groundwater. It will include a review of existing data, reports and publicly available information.

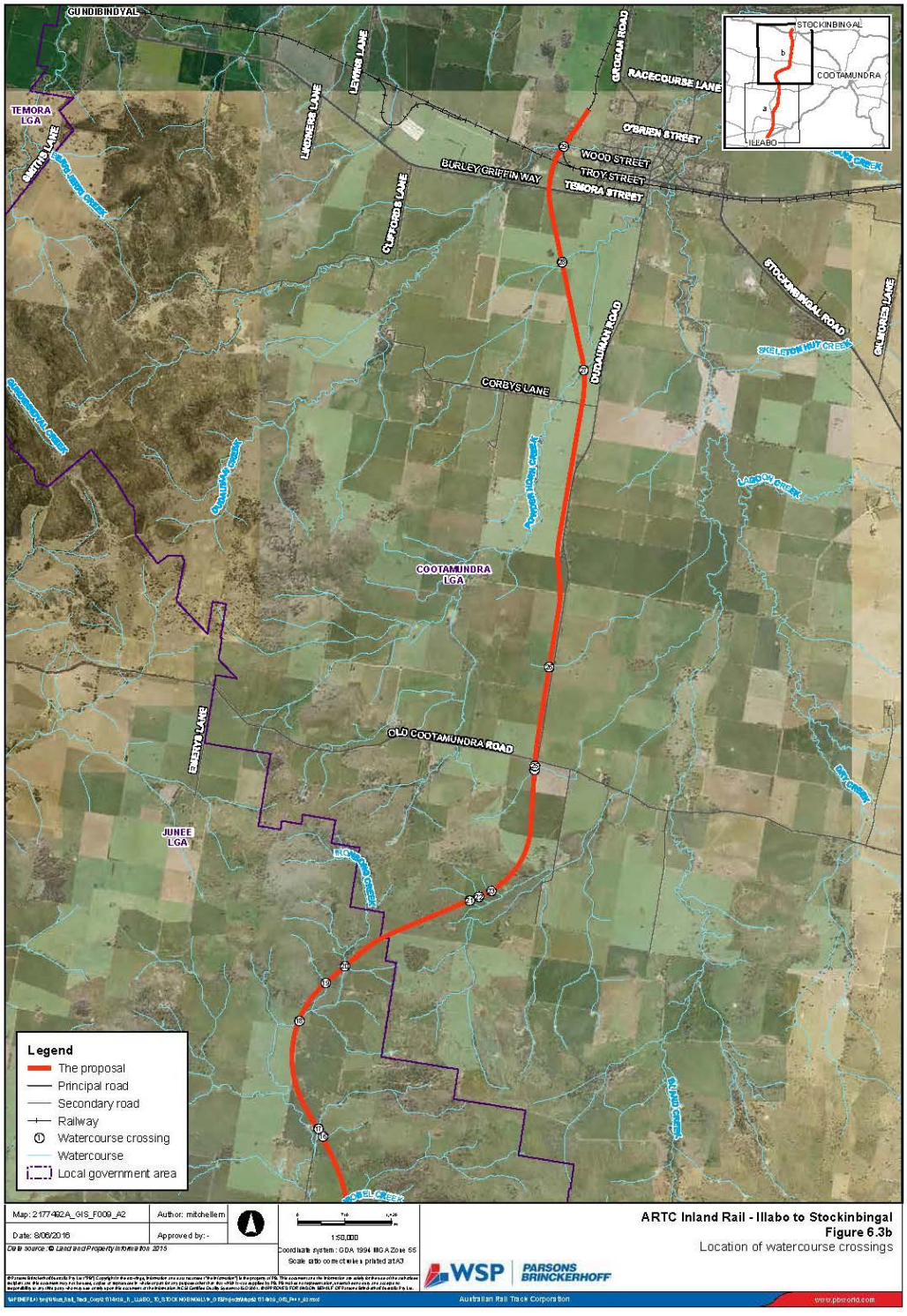
A qualitative groundwater impact assessment will be completed using the information collated from the data review. This will include assessing the potential impacts of the proposal on groundwater levels, GDEs, quality and quantity during construction and operation.

6.5.3.3. Flooding

A flooding assessment will be undertaken for the EIS and will include a quantitative assessment of the potential flood impacts of the proposal. The assessment will quantify the impacts of any structures such as bridges, culverts and embankments on flood levels for a range of flood events.

Figure 6.3 Key waterways and flooding

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STOCKINBINGAL ROAD
CHURCHES LANE
SKELSTON HUT CREEK
CORBYS LANE
OLDTIMERS ROAD
COOTAMUNDRA LGA
LADDON CREEK
OLD COOTAMUNDRA ROAD
EMERYS LANE
JUNEE LGA
STOCKINBINGAL
COOTAMUNDRA
ILLABO
Legend
The proposal
Principal road
Secondary road
Railway
Watercourse crossing
Watercourse
Local government area
Map: 2177492A_GIS_F009_A2
Author: mitchellem
Date: 8/06/2016
Approved by: -
Data source: © Land and Property Information 2015
1:50,000
Coordinate system: GDA 1994 MGA Zone 55
Scale: ratio correct when printed at A3
ARTC Inland Rail - Illabo to Stockinbingal
Figure 6.3b
Location of watercourse crossings
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6.6. Topography, geology and soils

6.6.1. Existing Environment

6.6.1.1. Geology and soils

A desktop assessment was conducted that included a review of the 1:250 000 Cootamundra Geology Map. The 1:250 000 Cootamundra Geology Map indicates that the northern and southern sections of the proposal pass through Quaternary alluvium and colluvial deposits consisting of gravel, sand, silt and clay. The central section of the proposal passes through the Frampton Volcanics which consist of, rhyolite, rhyodacite, dacite, quartz, sandstone, siltstone and conglomerate. Sodic soils have been identified south of Stockinbingal in the NSW OEH land and soil information mapping (eSPADE). Sodic soils have a higher sodium content and therefore increases the chance of salinity occurring in those sections of the proposal.

6.6.1.2. Topography

A review of the 1:50 000 Junee and Sebastopol Topographic Maps and aerial photos was undertaken indicating that the northern section of the proposal between Stockinbingal and Old Cootamundra Road generally passes through gently sloping to level farming land located east of the Dudauman Range. The proposal crosses several creek lines associated with Dudauman and Powder Horn Creek.

The central part of the proposal between Old Cootamundra Road and Ironbong Road passes through moderately undulating terrain west of Lighthouse Hill, the Twins Range and east of the Bethungra Range. The terrain is cut by numerous streams and watercourses associated with Ironbong Creek and its associated tributaries.

The southern part of the proposal between Illabo and Ironbong Road generally passes through gently sloping farming land cut by Ironbong and Ulandra Creeks.

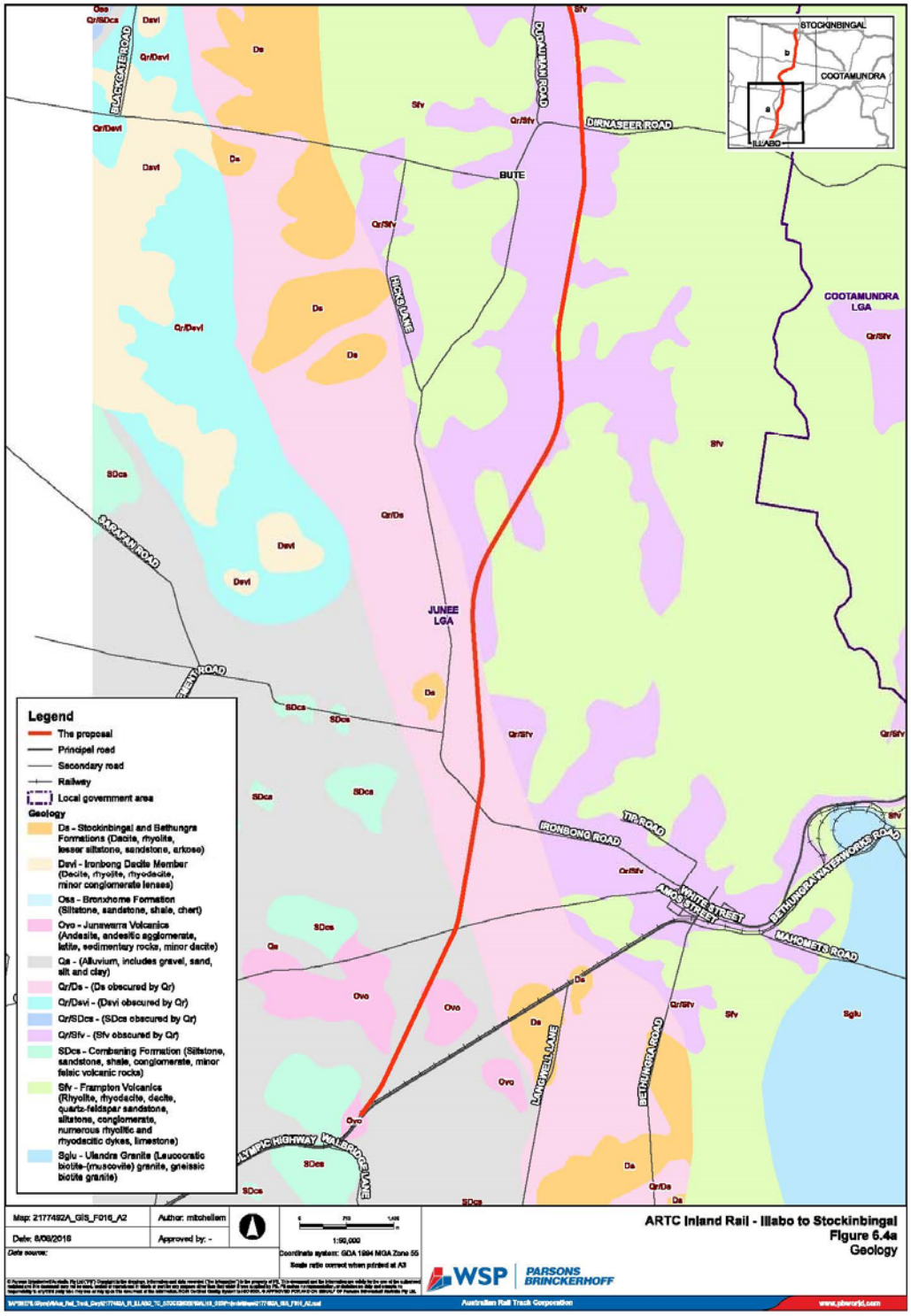
6.6.2. Potential Impacts

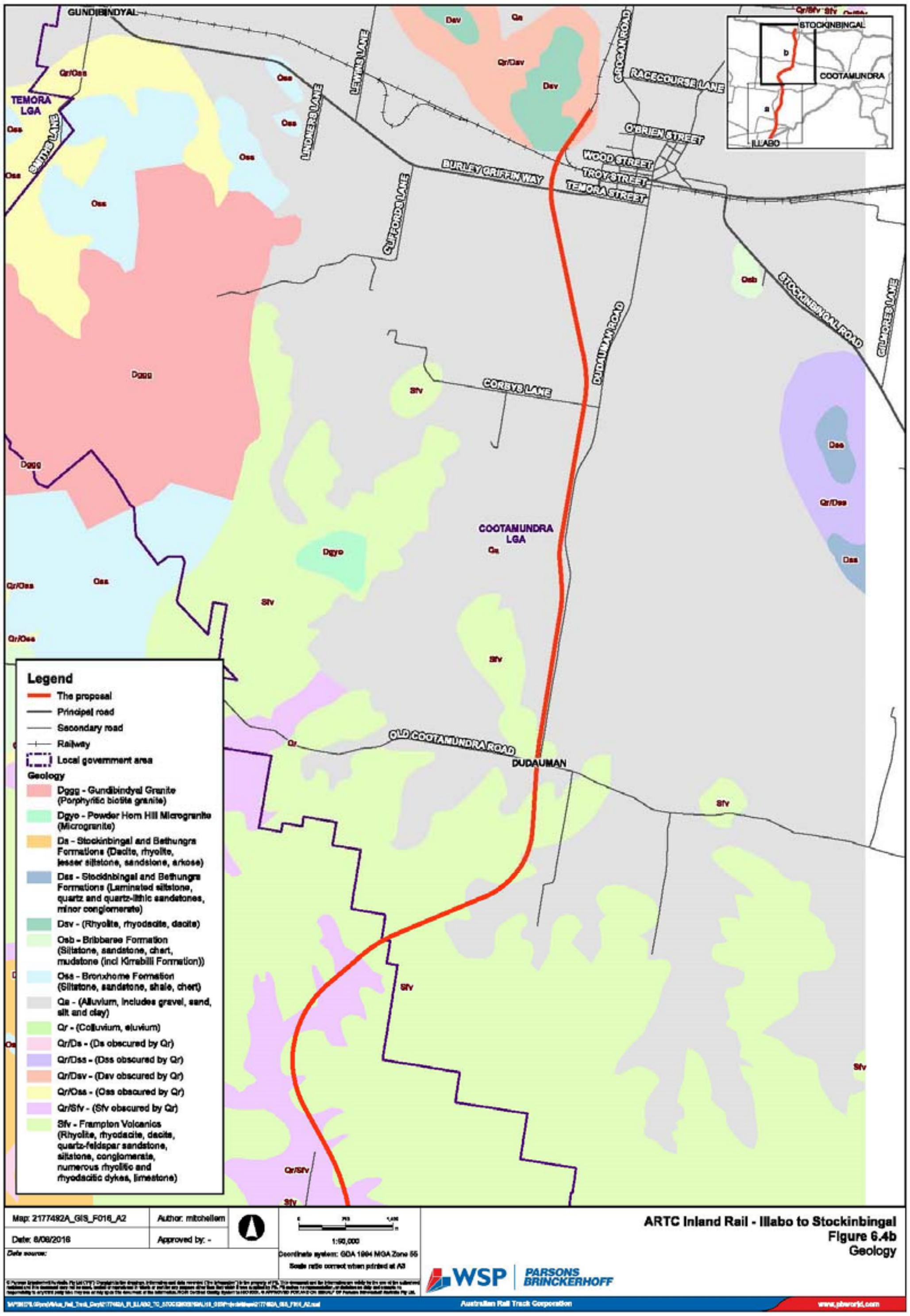
Sheet and gully erosion has been identified north of Illabo with a potential for seasonal waterlogging near Ironbong Creek. However, with implementation of appropriate management measures, no significant impacts associated with soil erosion and water logging during construction is expected. The sodic soils pose a potential salinity risk, particularly in the central and southern section of the proposal site which has been identified with high groundwater vulnerability (refer to Figure 6.4). Mitigation measures would include erosion and sediment control measures, as detailed in the *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

6.6.3. Scope of further assessment

Geotechnical investigations will be undertaken as part of the design development process. Potential impacts from erosion, salinity risk and groundwater vulnerability would be addressed in the assessments described in section 6.5.3.

Figure 6.4 Soil risks

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GILMORES LANE
DUDAUMAN ROAD
CORBYS LANE
OLD COOTAMUNDRA ROAD
DUDAUMAN
STOCKINBINGAL
COOTAMUNDRA
ILLABO
Legend
The proposal
Principal road
Secondary road
Railway
Local government area
Geology
Dggg - Gundibindyal Granite (Porphyritic biotite granite)
Dgyo - Powder Horn Hill Microgranite (Microgranite)
Ds - Stockinbingal and Bethungra Formations (Dacite, rhyolite, lesser siltstone, sandstone, arkose)
Dss - Stockinbingal and Bethungra Formations (Laminated siltstone, quartz and quartz-lithic sandstones, minor conglomerate)
Dsv - (Rhyolite, rhyodacite, dacite)
Osb - Bribbaree Formation (Siltstone, sandstone, chert, mudstone (incl Kirrabilli Formation))
Oss - Bronxhome Formation (Siltstone, sandstone, shale, chert)
Qa - (Alluvium, includes gravel, sand, silt and clay)
Qr - (Colluvium, eluvium)
Qr/Ds - (Ds obscured by Qr)
Qr/Dss - (Dss obscured by Qr)
Qr/Dsv - (Dsv obscured by Qr)
Qr/Oss - (Oss obscured by Qr)
Qr/Sfv - (Sfv obscured by Qr)
Sfv - Frampton Volcanics (Rhyolite, rhyodacite, dacite, quartz-feldspar sandstone, siltstone, conglomerate, numerous rhyolitic and rhyodacitic dykes, limestone)
Map: 2177492A_GIS_F016_A2
Author: mitchellem
Date: 8/06/2016
Approved by: -
Data source:
1:90,000
Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3
ARTC Inland Rail - Illabo to Stockinbingal
Figure 6.4b
Geology
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6.7. Contamination

This section included a review of the NSW EPA Contaminated Land: Record of Notices database and NSW EPA contaminated sites register for the Junee and former Cootamundra LGAs.

6.7.1. Existing Environment

A search of the NSW EPA contaminated sites register for the Junee and former Cootamundra LGAs identified eight contaminated sites. A further search of the NSW EPA Contaminated Land: Record of Notices database was also undertaken. This identified two properties which are currently under investigation to remediate the site. These sites are not located within or adjacent to the proposal site.

6.7.2. Potential Impacts

The potential for encountering contamination during construction is considered to be unlikely as the existing contaminated site registers do not identify any contaminated sites which are within or adjacent to the proposal site. There may be a risk of encountering localised contamination from unregistered landfill and storage of agricultural chemicals. In particular, cattle dips are sources of high Arsenic and DDT contamination.

During construction, the proposal would have the potential to result in contamination as a result of any spills or leaks from construction equipment and site compounds. There is also the potential for contamination to occur during operation, as a result of any fuel or oil spills or leaks from trains.

6.7.3. Scope of further assessment

Based on desktop searches, no contamination testing is required unless significant signs of contamination or different soil conditions are identified during the geotechnical investigations. Samples of any materials that might be considered contaminated will be taken during the geotechnical investigations.

Further sampling for waste classification would be required prior to the off-site disposal of soils. All waste classification will be done in accordance with NSW EPA (2014) Waste Classification Guidelines, Part 1: Classifying Waste.

6.8. Land use, socio-economic and visual impacts

The Junee and Cootamundra LEP maps and Australian Bureau of Statistics (ABS) data have been used in the desktop study to describe the socio-economic characteristics of the area and identify the different land uses across the proposal site.

6.8.1. Existing Environment

6.8.1.1. Land use

The proposal traverses undeveloped rural areas and the surrounding land is used primarily for grazing and agriculture. The major industries in the area include livestock, wool and wheat. A majority of the land within the proposal site has been cleared and disturbed for agricultural activities, however some patches of remnant vegetation remain (refer to section 6.2). As such the land within the proposal site is zoned as RU1 – Primary production.

6.8.1.2. Socio-economic

The proposal site falls within the Junee and former Cootamundra LGAs. The land within both LGAs, is classified as Primary Production and is privately owned. The proposal site does not traverse through any crown land or travelling stock routes. Illabo and Stockinbingal are small towns, identified to have populations of 190 and 244 respectively. Larger towns in the area include Junee (15 kilometres south-west of Illabo) and Cootamundra (33 kilometres north-

east of Illabo) and Wagga Wagga (50 kilometres south-west of Illabo). The main industries in the area are related to agricultural activities, with the towns such as Illabo, Bethungra and Stockinbingal containing smaller local businesses such as a Post Office, General store, bakery and newsagencies.

6.8.1.3. Visual

The area has a rural and agricultural visual character. The land has largely been cleared for agricultural activities, however, with the exception of the existing Main South rail line to the north-east of Illabo, Olympic Highway and Burley Griffin Way which is shown in

Figure 1.1, the landscape is largely free from large infrastructure or urban elements.

6.8.2. Potential Impacts

6.8.2.1. Land use

The proposal would result in changes to land use from its current rural use to railway infrastructure. As the proposal site traverses private properties, full or partial acquisition of a number of properties would be required. Severance and access issues may also be experienced at these properties.

6.8.2.2. Socio-economic

The proposal will have wide ranging economic impacts. It would allow for more direct, efficient and safer freight transport along the east coast of Australia which will have benefits for Australia's economic growth and competitiveness by supporting existing and new businesses. The proposal will also provide benefits by easing road traffic and congestion which will result in greater road safety, lower congestion and pollution from road freight. The construction and operation of the entire Inland Rail project will also contribute to growth in jobs and business regionally and locally.

In the short term, not all of the economic impacts of the proposal are likely to be positive. The construction of the proposal may temporarily negatively affect the day-to-day operation of businesses located near construction work sites in Illabo and Stockinbingal. However, this may be offset through construction activity generating additional local expenditure through local shops and services which would have a positive impact. Depending on the size of the workforce, an influx of workers may also result in an increase in housing demand, and may drive up housing and accommodation costs.

The scope and significance of the social impacts are also likely to vary. Many of the social impacts during the construction phase may be adverse as a result of amenity based impacts such as visual, noise, air quality, and traffic impacts, as discussed in sections 6.8, 6.9, 6.10 and 6.11 respectively. During operation, potential amenity based impacts such as noise and visual amenity are likely to occur in areas where the proposal is situated within close proximity to sensitive receivers (such as residential areas) as discussed in section 6.9.

6.8.2.3. Visual

Construction worksites and construction activities would have the potential to result in visual impacts however these visual impacts would not be expected to be significant as the majority of sites would be located in rural areas away from visual receivers. However works around the towns of Illabo and Stockinbingal would be closer to sensitive receivers.

The completion of the proposal would also introduce a new infrastructure element and would modify the rural character of the landscape.

6.8.3. Scope of further assessment

6.8.3.1. Land use

A land use and property assessment will be undertaken to confirm the specific land uses, properties and owners that would be affected by the proposal. This assessment will also identify the potential impacts of the proposal on existing and future land uses.

6.8.3.2. Socio-economic

A socio-economic assessment will be undertaken to assess the social and economic impacts on the community as a result of the construction and operation of the proposal. This assessment would include details of the local community, their nature and values, details of potential noise, vibration and visual impacts, likely traffic and access impacts to the community.

The assessment will also identify the nature of the community affected, the likely degree of impact and the necessary mitigation to minimise the impacts.

6.8.3.3. Visual

A landscape and visual assessment will be undertaken to identify the potential visual impacts on sensitive receivers from the construction and operation of the proposal. This assessment would include details of the potential impacts on sensitive receivers, viewpoints and amenity impacts during construction.

The existing landscape character and its sensitivity to change will also be described and will identify the impact resulting from the construction and operation of the proposal.

6.9. Noise and Vibration

6.9.1. Existing Environment

The existing environment would experience low background noise levels consistent with the rural character of the area. Noise-generating activities would include agricultural activities, road traffic and rail operations nearing the towns of Illabo and Stockinbingal, which is where the majority of sensitive receivers are located.

6.9.2. Potential Impacts

There would be noise and vibration generated by the construction and operation of the proposal which would alter the existing noise environment.

6.9.2.1. Construction

Potential noise and vibration sources during construction would include:

- Operation of construction plant and equipment.
- Noise associated with construction traffic and vehicle movements.

Noise impacts during construction would have a limited duration due to the linear nature of the proposal. The degree of noise impacts would depend on the proximity of the receivers to the work and their relative exposure.

Vibration generated by construction activities typically dissipates to negligible levels within 50 to 200 m, depending on the type of activity and local geology. Therefore, widespread impacts from construction vibration are not anticipated.

6.9.2.2. Operation

The operation of a railway would result in the generation of noise including:

- Wheel rail interactions.
- High frequency wheel squeal on tight radius curves and brake squeal from freight wagons at low speed.
- Horn noise.
- Maintenance activities e.g. rail grinding, inspections.
- Ground vibration from train movements.

- Idling diesel engine, exhaust system, cooling system and motor system noises.

Many of these noises are dependent on the nature of operation of the trains. The above noise sources would represent a long-term impact on the local environment. However, the proposal would benefit the communities of Bethungra and Cootamundra by diverting freight trains on to the new rail line.

6.9.3. Scope of further assessment

A detailed noise and vibration assessment will be undertaken. The assessment should be undertaken with regard to the Interim Construction Noise Guidelines (DECC, 2009), the Rail Infrastructure Noise Guidelines (NSW EPA, 2013) and the Inland Rail Noise Strategy. The assessment would include:

- Identification of sensitive receivers within the proposal site.
- Assessment of construction noise levels on sensitive receivers and development of mitigation measures to manage impacts.
- Assessment of operational noise levels on sensitive receivers, including typical and high-volume scenarios, and identification of management measures, including any feasible and reasonable measures to mitigate impacts.
- Documenting of design, assessment and modelling assumptions and approaches.
- Identification of opportunities to reduce noise impacts through design or management measures.

6.10. Air Quality

6.10.1. Existing Environment

Ambient air quality in the proposal site would be characteristic of rural areas, which have low particulate matter and pollutants in the air. The main factors affecting the air quality in the proposal site would include road traffic, agricultural activities and prevailing meteorological conditions.

6.10.2. Potential Impacts

Activities with the potential to influence air quality during construction include:

- Excavations, groundworks and storage and transport of spoil.
- Emissions from operation of construction vehicles, plant and equipment.
- Erosion of exposed areas such as cleared vegetation, uncovered stockpiles and haul roads.

Operation of the proposal would result in increased emissions such as greenhouse gases and particulates from the diesel consumption of freight trains using the rail corridor, however this would be offset by the reduction in road freight required.

6.10.3. Scope of further assessment

An air quality impact assessment will be undertaken as part of the EIS. This assessment will include:

- Identification of sensitive receivers within the proposal site.
- Identification of ambient air quality conditions and meteorological conditions.
- Modelling and assessment of the potential emissions from the proposal and their impacts to the local air quality including justification of key design and modelling assumptions and approaches.

6.11. Traffic and transport

6.11.1. Existing Environment

6.11.1.1. Road network

The road network within the proposal site comprises of local and private rural roads which vary between 50 and 80 km/h. The proposal does not traverse any major highways. The Olympic Highway splits from the proposal at Illabo and runs north-east to Cootamundra and joins Burley Griffin Way 28 kilometres to the east of Stockinbingal. Goldfields Way runs north-south, approximately 15 kilometres to the west of the proposal. North of the proposal, Stockinbingal is situated on Burley Griffin Way, a road which runs east-west from the Hume Highway in the east to Griffith in the west. The road network and major highways and roads in proximity to the proposal is shown in

Figure 1.1.

6.11.1.2. Rail network

The existing rail network in the area includes the Main South line, the Lake Cargelligo line and the Stockinbingal-Parkes line. The Main South runs from Albury, in a north-east direction, through Illabo to Cootamundra where it continues to Goulburn, Mittagong and Sydney. The Lake Cargelligo line branches off from Cootamundra north to Stockinbingal, continuing to Lake Cargelligo. The Stockinbingal-Parkes line begins at Stockinbingal and runs north to the towns of Forbes and Parkes. The Illabo and Stockinbingal stations are no longer in use as passenger stations. The existing rail network is described in section 3.4.

6.11.2. Potential Impacts

The proposal would potentially cross several local and main roads which include:

- Old Sydney Road.
- Ironbong Road.
- Dirnaseer Road/Dudauman Road.
- Old Cootamundra Road.
- Corbys Lane.
- Burley Griffin Way.

Level crossings and bridges would need to be provided to allow vehicle access over the rail line. There would also be some traffic and access impacts when the construction of the rail line interfaces with the road. This would potentially result in restricted access and traffic impacts to the local area during construction.

Track possessions would be required for tie in works on the Main South Line north of Illabo and the Stockinbingal-Parkes at Stockinbingal. This would result in some disruptions to existing rail operations during construction.

There would also be increased heavy and light vehicle movements on local roads associated with the construction of the proposal.

No significant impact to traffic volumes is expected from the operation of the proposal due to the low volume of traffic in the area. However, there would be permanent alterations to the local road network and current access arrangements where the proposal interfaces with local and access roads. Maintenance access to the tracks would be provided by corridor access points.

6.11.3. Scope of further assessment

A detailed traffic and access impact assessment will be prepared and will include:

- Identification of vehicle movements and access and haulage routes during construction.
- Identification and assessment of impacts to major roads.
- Identification of traffic and access impacts to the local road networks and private properties.
- Assessment of severance issues associated with agricultural activities including machinery access and rotational grazing.
- Mitigation measures to manage potential adverse impacts from the construction phase.

OTHER ISSUES

6.12. Waste and resource use

Potential sources of waste generation from the construction of the proposal would include:

- Spoil from excavation works.
- Green waste from vegetation clearance.
- Solid wastes including fencing, barriers and offcuts of materials such as concrete, bricks, steel and timber.
- Liquid waste such as oils and chemicals from equipment use and maintenance.
- General waste from construction personnel including food scraps, papers, plastic containers and glass.
- Wastewater run-off during construction including water utilised for dust suppression.

Construction waste would be managed through the waste hierarchy established under the *Waste Avoidance and Recovery Act 2001* (i.e. avoidance of waste, resource recovery, disposal of waste). All waste generated by the proposal would be assessed, classified, managed and disposed of in accordance with the Waste Classification Guidelines (DECCW 2009). Standard environmental management measures would be prepared (based on the Waste Classification Guidelines) prior to construction.

6.13. Greenhouse gas and energy

Activities that would generate greenhouse gas emissions during construction would include:

- Use of heavy machinery and vehicles.
- Electricity use at site compounds and offices.
- Clearing of vegetation.
- Indirect emissions embodied in construction materials including concrete and steel.

Operational greenhouse gas emissions would be associated with the use of diesel to power freight vehicles. However, the completion of the Inland Rail would offer savings in terms of fuel use as it provides a shorter and more efficient route for freight transport. Opportunities to reduce greenhouse gas emissions would be investigated during the design process. A Scope 1 greenhouse gas assessment will also be undertaken, based on the *Australian National Greenhouse Accounts (NGA) Factors 2008,* prepared by the Australian Government Department of Climate Change.

6.14. Climate change

Due to the anticipated timing of the proposal, impacts due to climate change would not be expected to be significant during the construction phase of the proposal. Operationally, potential issues from climate change would include damage and buckling in tracks due to more extreme temperature variations and more extreme weather events. Climate change adaptations would be considered in the design process of the proposal. A climate change risk assessment will be completed and will provide recommendations to minimise the impacts of climate changes.

The following government guidelines will be considered as relevant during the preparation of the climate change risk assessment:

- Commonwealth Scientific and Industrial Research Organisation's *Climate Change in Australia* Technical Report 2007 (this is based on the Intergovernmental Panel on Climate Change's Fourth Assessment Report, 2007).
- *ISO 31000-2009*; Risk Management – Principles and Guidelines.
- *AS 5334* – Climate Change Adaptation for Settlements and Infrastructure.

6.15. Hazards and risks

Hazards and risks associated with the construction of the proposal would include:

- The use and storage of hazardous chemicals.
- The use of heavy machinery.
- Works conducted in an operational rail corridor.
- Works within or adjacent to an operating roadway.

Construction hazards and risks will be managed through the application of standard mitigation measures, which would be developed prior to construction.

Potential operational hazards and risks would include train accidents (including derailment, collision or impact), level crossing collisions, spills from train and equipment (such as oil and cleaning chemicals) and accidents involving hazardous cargo. These risks would be managed through design and the application of education programs, and standard mitigation measures and plans (such as emergency response plans).

6.16. Utilities and services

The proposal would require any intersecting utilities to be relocated or protected. The proposal traverses overhead powerlines and buried telecommunication cables. Due to double stacked clearance requirements it can be assumed that typically all crossings will require the services to be modified. If there is insufficient clearance then raising or relocation of powerlines or undergrounding might be required to provide clearance. A more detailed investigation of existing utilities and services would be undertaken during the design process.

6.17. Sustainability

A sustainability assessment will be undertaken as part of the EIS. The sustainability assessment will be prepared in accordance with the Inland Rail sustainability strategy and the Infrastructure Sustainability (IS) Rating Scheme developed by the Infrastructure Sustainability Council of Australia (ISCA). The assessment will:

- Document how the proposal will address and achieve the principles of ecologically sustainable development.
- Describe the sustainability benefits of the proposal.
- Provide context for the need for sustainable outcomes on the proposal.
- Document opportunities to improve sustainable outcomes on the proposal, including:
  - Opportunities to utilise renewable and local materials in the construction phase.
  - Opportunities to utilise renewable energies and meet other sustainability outcomes.

6.18. Cumulative Impacts

An assessment of the cumulative impacts will include a description of any major projects occurring in the vicinity of the proposal and identify potential cumulative impacts associated with the development and the proposal.

The cumulative impact assessment would also need to provide consideration for other Inland Rail projects, in particular the projects that adjoin the Illabo to Stockinbingal section.

7. CONSULTATION

7.1. Overview

Stakeholder and community consultation for Inland Rail is an integral part of informing scoping investigations for the proposal EIS.

In 2010 the Australian Government completed the Inland Rail Alignment Study to determine if an inland railway line is required. In late 2013, the then Deputy Prime Minister, the Hon Warren Truss MP, established an Inland Rail Implementation Group (IRIG) to develop a delivery programme for the implementation of Inland Rail. The IRIG was chaired by former Deputy Prime Minister, the Hon John Anderson AO, with senior representatives from the Australian, New South Wales, Queensland and Victorian governments, and ARTC.

To support the IRIG investigations, ARTC was tasked with developing a Programme Business Case, including a ten year delivery schedule, cost estimate, development strategy and a detailed analysis of the economic benefits of Inland Rail. The Inland Rail Implementation Group took a consultative approach, engaging with a broad range of stakeholders including potential future users as well as individuals, communities and others who would live and work along the alignment to understand the breadth of issues associated with Inland Rail.

The IRIG delivered the Business Case to the Australian Government in September 2015. At this time, the 2010 Inland Rail Alignment Study was endorsed by the IRIG and is the base case for further work by ARTC.

Key stakeholders for the proposal include (but not limited to):

- Federal and State Members.
- Representatives of local council at Gundagai Regional and Junee Shire Councils.
- Australian and State government departments and agencies (e.g. Roads and Maritime Services, Country Trains), as well as the State Government appointed operator of the Country Rail Network.
- Business, freight and agricultural stakeholders (e.g. NSW Farmers Association, GrainCorp).
- Landowners within and surrounding the proposal site.
- Local Community.
- Environment stakeholders (e.g. Wagga Wagga Local Land Services, Rural Fire Service Region West).
- Community groups (e.g. Illabo Show Society).
- Peak bodies.
- Local Aboriginal Land Councils and cultural knowledge holders.
- Service providers (e.g. telecommunications, utilities, medical and emergency).
- Existing lease agreement holders (lessees) within the rail corridor

7.2. Consultation strategy and objectives

The engagement objectives for the proposal have been to introduce the Inland Rail Programme and Illabo to Stockinbingal project to stakeholders and the local community. The other objective has been to gather a preliminary understanding of the area through local engagement and carrying out preliminary technical investigations across the proposal site.

A community engagement plan has been prepared for the Inland Rail programme that guides the consultation activities for the proposal. ARTC's values documented within the plan commit the organisation to active engagement with stakeholders and the community.

7.3. Consultation to date

7.3.1. Inland Rail Programme

Inland Rail engagement activities have been undertaken since 2014 across all levels of government, peak bodies, potential customers, end users and industry. The consultation activities include:

- Meetings in regional areas from June 2014 including Ipswich, Toowoomba, Narrabri, Dubbo, Parkes, Wagga Wagga and Wodonga to brief local government leaders, stakeholders and industry representatives on Inland Rail, and to seek local insight and feedback.
- Industry information sessions were held in Sydney and Brisbane in September 2014 to inform potential suppliers about upcoming opportunities, including how and when they can potentially get involved with Inland Rail. These sessions were attended by more than 400 representatives from Australian and international construction, engineering and rail companies.
- Extensive one-on-one meetings with local government representatives, peak bodies, potential customers and key state and federal government agencies.
- Attendance at industry forums including Heavy Haul (Newcastle), Rail Freight Futures (Melbourne), the Australian Logistics Council Annual Forum (Melbourne), and Murray Now (Albury).
- Inviting key local councils and businesses to contribute their views in terms of the potential benefits of Inland Rail through a submission process that has been complementary but separate from the Programme Business Case.

7.3.2. The Proposal - informing and scoping investigations

Consultation and engagement activities have focused on engaging with the local community including landowners, Councils and regional community groups. Consultation activities have included providing information and gathering feedback from stakeholders and the local community allowing us to gain an understanding of the issues and opportunities across the proposal site. Engagement has focused on building awareness, understanding and supporting customers, stakeholders, and the community. Engagement activities have involved tools such as newsletters, community information sessions, factsheets, and updates to the Inland Rail website. Engagement with local councils, Federal and State Members of Parliament for the proposal has also been undertaken during this time.

The following table outlines the stakeholder and community engagement carried out with identified stakeholders in 2016 which provided community members and key stakeholders an opportunity to provide feedback on the proposal.

Table 7.1 Consultation summary

Stakeholders	Activity
Katrina Hogkinson MP Michael McCormack MP	Proposal briefings have been carried out with individual representatives since 2015.
Gundagai Regional Council (previously Cootamundra Shire Council) Junee Shire Council	Briefings were held in February, March, April and October 2016 with each of the Councils.
NSW Farmers Federation Rural Fire Service Business Groups GrainCorp (and other ARTC customers)	Meetings and updates have been carried out with these groups at both regional and local levels since 2015.
Gundagai Regional Council Junee Shire Council Junee and Illabo Farmers Federation Wagga Wagga Local Land Services Rural Fire Services Illabo community group	Stakeholder workshop in May 2016. 12 people attended the workshop.
Landowners	One-on-one meetings with landowners with 55 individual meetings held ongoing since 2016.
Broader community (including Illabo, Cootamundra, Dirnaseer, Junee, Junee Reefs and Stockinbingal)	Mail out in November 2016 promoting community information sessions in November to the suburbs of Stockinbingal, Cootamundra, Bethungra, Illabo, Junee, and Junee Reefs. Advertising throughout 2016, prior to community information sessions in the following local papers: Cootamundra Herald, Junee Southern Cross, and Riverina Leader. Community information sessions in November 2016 • 7 November 2016, Illabo Showground Illabo, 2-7pm. • 8 November 2016, Cootamundra Civic Hall, Cootamundra 2-7pm. • 9 November 2016, Junee Public Library, Junee 2-7pm. There were 108 attendees at the sessions held in November 2016. Community information sessions in May 2016 (with 105 attendees) • 30 May 2016, Illabo Showground Illabo, 2-7pm. • 31 May 2016, Cootamundra Civic Hall, Cootamundra 2-7pm.
Roads and Maritime Services Wagga Wagga Local Land Services	Meetings were held in November 2016.
Young Local Aboriginal Land Council Wagga Wagga Local Aboriginal Land Council	Letter correspondence was sent in June 2016 providing awareness of the proposal and opportunity to meet face to face.

7.3.3. Consultation outcomes

During the proposal investigation and scoping phase and through the engagement activities, stakeholders and the community have had the opportunity to view project material, make an enquiry, or put forward feedback. Suggested alignment refinements made by stakeholders and community have been investigated during the investigation and scoping phase.

Table 7.3 outlines a summary of the key feedback received to date and how this will be considered in defining the scope of the environmental impact statement.

Table 7.2 Consultation feedback

Topic	Key issue	EIS
Property impacts	Concern about impacts upon agricultural land uses and existing farming operations.	The environmental impact statement will assess the social and economic impacts of the proposal.
Environment	Concern about flooding impacts.	The environmental impact statement will assess and model the impacts on flood behaviour during construction and operation.
	Concern about impacts upon Travelling Stock Routes.	The environmental impact statement will assess temporary and permanent impacts upon land use.
	Concern about impacts upon the local road network.	The environmental impact statement will assess impacts upon the road network during construction and operation.
	Concern about impacts to water quality during construction.	The environmental impact statement will include an assessment of watercourses impacted by the proposal and how impacts will be managed during construction and operation of the proposal.
	Concerns about the impacts related to vegetation removal and fauna habitat.	The environmental impact statement will assess the biodiversity impacts of the proposal and consider and identify where the design can implement measures to avoid and minimise impacts.

7.4. Consultation during preparation of the environmental impact statement

ARTC and the project team will continue to consult with stakeholders and the community during the preparation of the EIS. Consultation activities which undertaken during the preparation of the EIS are outlined in sections 7.4.1-7.4.4 below.

7.4.1. Inland Rail communications

Inland Rail communications will continue throughout the preparation of the EIS and would include a community information line, email address and website updates (refer to Table 7.3).

7.4.2. Proposal Community Engagement Lead

The Community Engagement Lead dedicated to the proposal will continue their role as a vital link in maintaining close and ongoing contact with local communities and stakeholders during preparation of the EIS. The Community Engagement Lead is the key 'on the ground' project representative and will continue to seek to understand local issues and provide this feedback to the project team.

7.4.3. Stakeholder and community engagement

ARTC will continue to provide project updates and written notification to the councils, state and federal MPs, stakeholder groups, landowners and the local community during the preparation of the EIS and the design phase.

Community updates and an information line will continue to be run by ARTC to allow stakeholders and members of the community to keep up to date with the progress of Inland Rail.

7.4.4. Community contact and information

The community contact details outlined in Table 7.3 will remain in place for the preparation of the EIS and the planning and approval process.

Table 7.3 Community contact and information points available during the planning and approval process

Activity	Detail
Community information line (Toll free)	1800 732 761
Community email address	inlandrailenquires@artc.com.au
Inland Rail website	http://inlandrail.artc.com.au
Postal address	Inland Rail Australian Rail Track Corporation GPO Box 2462, Queen Street, Brisbane, QLD 4000
Community Engagement Lead	A Community Engagement Lead is dedicated to this project.

7.5. Public exhibition of environmental impact statement

Public exhibition of the EIS will be for a minimum of 30 days as stated in section 5.17 of the EP&A Act. Advertisements will be placed in local media giving information regarding the proposal and display of the EIS.

During the exhibition period, government agencies, stakeholders and the community will be able to review the EIS and will have the opportunity to make a written submission to the Department of Planning and Environment for consideration in its assessment of the project.

Consultation activities during the public exhibition of the EIS will include:

- Community Information sessions.
- Local newspaper advertising.
- Inland Rail website updates.
- Stakeholder meetings.
- Government stakeholder engagement.

7.6. Consultation during construction

Should the proposal be approved, ARTC will continue to consult with stakeholders and the community during construction in accordance with the conditions of approval. Further information about the consultation activities and tools during the construction phase will be provided in the EIS.

8. CONCLUSION AND NEXT STEPS

The proposal is subject to assessment under the EP&A Act. The capital investment value of the proposal is estimated to be over $50 million, and as a result the proposal is State Significant Infrastructure under SRD SEPP. The proposal is therefore subject to Division 5.2 of the EP&A Act and an EIS is required as part of the process of seeking the approval of the NSW Minister for Planning.

As part of the first step in the approvals process for the proposal, this document supports an application to DP&E seeking the SEARs for the EIS. The document has provided a brief description of the proposal; its statutory and strategic context; stakeholder and community engagement undertaken to inform the design; and a preliminary assessment of impacts and likely significance.

Upon receipt of the SEARs, ARTC will prepare the EIS and submit it to the Department of Planning and Environment as part of the formal application for approval of the proposal.

The EIS will include the following:

- A detailed description of the proposal including its components, construction activities and potential staging
- A comprehensive assessment of the potential impacts on the key issues including a description of the existing environment, assessment of potential direct and indirect and construction, operation and staging impacts
- Description of measures to be implemented to avoid, minimise, managed, mitigate, offset and/or monitor the potential impacts
- Identify and address issues raised by stakeholders.

The next stage in the environmental assessment would be progressing to an EIS which will be prepared in accordance with the EP&A Act and will meet the minimum form and content requirements set out in clauses 6 and 7 of Schedule 2 of the EP&A Regulation.

An EPBC Act referral will be made to the Australian Government Department of the Environment and Energy to seek a determination on whether the project is a controlled action requiring assessment under the EPBC Act.

9. REFERENCES

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APPENDIX A – EPBC FLORA AND FAUNA LIKELIHOOD OF OCCURRENCE

Appendix A Likelihood of occurrence

Table 1 Matters of National Ecological Significance- EPBC listed Flora Likelihood of Occurrence

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Asclepiadaceae	*Tylophora linearis*		E	Grows in dry scrub in the Barraba, Mendooran, Temora and West Wyalong districts, in the NWS, CWS botanical subdivisions (Royal Botanic Gardens 2005). Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, E. sideroxylon, E. albens, Callitris endlicheri, C. glaucophylla* and *Allocasuarina luehmannii*. Also grows in association with *Acacia hakeoides, A. lineata, Myoporum* species and *Casuarina* species (Department of Environment and Conservation 2005b).	BioNet, PMST	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (study area occurs approx. 50 km to the south of the species known distribution (2008)). Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.
Asteraceae	*Ammobium craspedioides*	Yass Daisy	V	Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region. Found in dry forest, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts (*Eucalyptus blakelyi, E. bridgesiana, E. dives, E. goniocalyx, E. macrorhyncha, E. mannifera, E. melliodora, E. polyanthemos* and *E. rubida*). Apparently unaffected by light grazing, as populations persist in some grazed sites (Department of Environment and Climate Change 2008b).	BioNet	Low. Marginal habitat for the species was recorded within the study area. Although marginal habitat was recorded the species has however not been recorded in the locality (nearest record >30km from study (1987)) and the study area approx. 30-50km east of the species known distribution. Although marginal habitat was recorded evidence of heavy grazing was observed at most sites visited and the species has not been recorded within the locality, therefore it is considered unlikely that the species would occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Asteraceae	*Brachyscome muelleroides*	Mueller Daisy	V	Occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas. Also occurs in north-central Victoria (only along the Murray from Tocumwal to the Ovens River). Grows in damp areas on the margins of claypans in moist grassland with *Pycnosorus globosus, Agrostis avenacea* and *Austrodanthonia duttoniana*. Also recorded from the margins of lagoons in mud or water, and in association with Calotis anthemoides. Victorian collections have generally come from open positions on the Murray River floodplain, swampy River Red Gum (*Eucalyptus camaldulensis*) Forest and damp depressions (Department of Environment and Climate Change 2008b)	BioNet	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (nearest record occurs >50 km west of the study area (1889)) and the study area occurs outside the species known distribution. Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.
Asteraceae	*Brachyscome papillosa*	Mossgiel Daisy	V	Occurs chiefly from Mossgiel to Urana, in south-western NSW, with sites in the Jerilderie area, the Hay Plain, Willandra Lakes district and north to Ivanhoe. A north-western outlier is at Byrnedale Station, north of Menindee. The only known site on South Western Slopes is Ganmain Reserve. Recorded primarily in clay soils on Bladder Saltbush (*Atriplex vesicaria*) and *Maireana aphylla* plains, but also in grassland and in Grey Box (*Eucalyptus microcarpa*) - Cypress Pine (*Callitris* spp.) woodland. Recorded as locally occasional to common in populations (Department of Environment and Climate Change 2008b).	BioNet	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (nearest record occurs >50 km west of the study area (1992)) and the study area occurs outside the species known distribution. Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Asteraceae	*Leucochrysum albicans var. tricolor*		E	In NSW/ACT, it occurs at relatively high elevations in woodland and open forest communities, in an area roughly bounded by Goulburn, Albury and Bega. Herbarium records indicate that the taxa once occurred more widely in inland NSW. In Victoria, it occurs in a small area between Colac, Inverleigh, Ballarat, Ararat and Hamilton, in the Victorian Volcanic Plain Bioregion. In NSW and ACT, it occurs in grasslands, grassy areas in woodlands and dry open forests, and modified habitats, on a variety of soil types including clays, clay loams, stony and gravely soil (Sinclair 2010 in SPRAT). In Victoria, it occurs almost exclusively on acidic clay soils derived from basalt, occasionally on nearby sandy-clay soils derived from sedimentary material (Costin 1999; Costin et al. 2001 in SPRAT).	BioNet	Low. Marginal habitat for the species occurred in the study area in the form of highly modified open grassy woodlands. The species has not however been recorded within the locality (nearest record approx. 50km to the south of the study area (2000)). Given the lack of records and marginal habitat available within the locality, it is considered unlikely that the species would occur within the study area.
Brassicaceae	*Lepidium aschersonii*	Spiny Peppercress	V	Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains). A recent survey has located several populations at Narrabri, from where the species had last been recorded in 1899. Also known from the West Wyalong, Barmedman and Temora areas, although most records are old. Approximately 50% of the total *Lepidium aschersonii* recorded for Australia occurs in NSW. Found on ridges of gilgai clays dominated by Brigalow (*Acacia harpophylla*), with *Austrodanthonia* and/or *Austrostipa* species in the understorey. The species grows as a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense Brigalow, with sparse grassy understorey and occasional heavy litter. Flowers from spring to autumn. Plants in the Narrabri population have been observed producing abundant seed, and as the species is believed to be short-lived and large numbers of plants were present at the site, Lepidium aschersonii appears to be successfully reproducing. Populations have been known to immediately disappear following inundation by flooding, reappearing several seasons later. An apparent increase in numbers during drought conditions has also been observed. The species is reported to be salt tolerant and also grows well under dry conditions. Recorded population sizes vary from 10 to 2000+ plants. Plant numbers decrease with increasing overstorey density, and plants were not found where the Brigalow canopy cover exceeded about 60%. The species is often described as a “weed” where it dominates paddocks (Royal Botanic Gardens 2007).	BioNet, PMST	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (nearest record occurs approx. 30 km north west of the study area in and west of Temora of which the majority of the records are old (1915 and a few scattered records from early 2000’s)) and the study area occurs outside the species known distribution. Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Brassicaceae	*Lepidium monoplocoides*	Winged Peppercress	E	Widespread in the semi-arid western plains regions of NSW. Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *E. largiflorens* (Black Box) or *E. populnea* (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses. Recorded in a wetland-grassland community comprising *Eragrostis australasicus, Agrostis avenacea, Austrodanthonia duttoniana, Homopholis proluta, Myriophyllum crispatum, Utricularia dichotoma* and *Pycnosorus globosus*, on waterlogged grey-brown clay. Also recorded from *a Maireana pyramidata* shrubland. The species is highly dependent on seasonal conditions. Occurs in periodically flooded and waterlogged habitats and does not tolerate grazing disturbance. The number of plants at each site varies greatly with seasonal conditions, but sites tend to be small in area with local concentrations of the plant. Has been recorded as uncommon to locally common with hundreds of plants at sites (Department of Environment and Conservation 2005b).	BioNet	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (nearest record occurs >100 km west of the study area (2004)) and the study area occurs outside the species known distribution. Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.
Cyperaceae	*Eleocharis obicis*	Spike-rush	V	Grows in ephemerally wet situations such as roadside mitre drains and depressions, usually in low-lying grasslands. Sites include depressions with heavy clay soils on the Lachlan River floodplain, with *Eragrostis australasica, Atriplex vesicaria* and *A. nummularia* shrublands, low-lying claypans near an irrigation channel, and a shallow open ditch on a low ridge with *Eucalyptus populnea* in red sandy soil over clay. Recorded as flowering in November. Found to be locally frequent to abundant in western NSW populations (Department of Environment and Conservation 2006).	BioNet	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (nearest record occurs >140 km north west of the study area near Condobolin (1983)) and the study area occurs outside the species known distribution. Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Fabaceae (Faboideae)	*Swainsona murrayana*	Slender Darling Pea	V	Often grows with *Maireana* species on heavy soils, especially in depression (Royal Botanic Gardens 2005). Found throughout NSW, it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. It grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. The species may require some disturbance and has been known to occur in paddocks that have been moderately grazed or occasionally cultivated (Department of Environment and Conservation 2005b).	BioNet	**Moderate.** Suitable habitat for the species was recorded within the study area in the form of open grassy woodland. The species has not been recorded within the locality (nearest record 30km north of the study area (2001) near Temora). Given the availability of suitable habitat and records within the broader locality, it is considered likely that the species has potential to occur within the study area.
Fabaceae (Faboideae)	*Swainsona recta*		E	Found in grassland and open woodland, often on stony hillsides (Royal Botanic Gardens 2004). Before European settlement it occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida* and Long-leaf Box *E. goniocalyx*. Grows in association with understorey dominants that include Kangaroo Grass *Themeda australis*, poa tussocks *Poa* spp. and spear-grasses *Austrostipa* spp. Plants die back in summer, surviving as a rootstocks until they shoot again in autumn (Department of Environment and Climate Change 2008b).	BioNet	Low. Suitable habitat for the species was recorded within the study area in the form of open grassy woodland. The species has not however been recorded within the locality (nearest record is >60km from the study area (1900). Nearest recent record is over 110km from the study area (2000) near Mandurama. Although suitable habitat for the species occurs within the study area the species has not been recorded within the broader locality recently and is therefore considered unlikely to occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Orchidaceae	*Caladenia arenaria*		E	Currently only known to occur in the Riverina between Urana and Narranderra. Grows in woodland with sandy soil, especially that dominated by White Cypress-pine (*Callitris glaucophylla*) (Department of Environment and Climate Change 2008a).	BioNet, PMST	**Moderate.** Suitable habitat for the species was recorded within the study area in the form of open grassy woodland. Much of this habitat has been disturbed as a result of heavy grazing and cropping of which the species is sensitive to. Subsequently habitat for this species is likely to limited to woodland where the groundcover is relatively intact i.e. road reserves or large areas of intact vegetation. The species has been recorded once in the broader locality (1990) approx. 10-15 km from the study area (requires verifying OEH, 2016). Given that suitable habitat occurs within the study area and the species has been recorded within the broader locality the species is considered likely to occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Orchidaceae	*Caladenia concolor*	Crimson Spider Orchid	V	Currently records confined to granite ridge country in the Nail Can Hill Crown Reserve near Albury. The species also occurs at two localities in Victoria near Beechworth and Chiltern. Habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. The dominant trees are Blakely's Red Gum (*Eucalyptus blakelyi*), Red Stringybark (*E. macrorhyncha*), Red Box (*E. polyanthemos*) and White Box (*E. albens*); the diverse understorey includes Silver Wattle (*Acacia dealbata*), Hop Bitter-pea (*Daviesia latifolia*), Common Beard-heath (*Leucopogon virgatus*), Spreading Flax-lily (*Dianella revoluta*) and Poa Tussock (*Poa sieberiana*). It is likely that fire is not a direct requirement of the species, but it may have a positive influence on seedling germination and establishment (Department of Environment and Climate Change 2008b)	BioNet, PMST	**Moderate.** Suitable habitat for the species was recorded within the study area in the form of open grassy woodland. Much of this habitat has been disturbed as a result of heavy grazing and cropping of which the species is sensitive to. Subsequently habitat for this species is likely to limited to woodland where the groundcover is relatively intact i.e. road reserves or large areas of intact vegetation. The species has been recorded twice in the broader locality (1968 and 1991) approx. 10-15 km from the study area. Given that suitable habitat occurs within the study area and the species has been recorded within the broader locality the species is considered likely to occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Orchidaceae	*Prasophyllum petilum*		E	Natural populations are known from a total of five sites in NSW. These are at Boorowa, Captains Flat, Ilford, Delegate and a newly recognised population c.10 k SE of Muswellbrook. It also occurs at Hall in the Australian Capital Territory. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with *Poa labillardieri* (River Tussock), *Eucalyptus aggregata* (Black Gum) and *Leptospermum* spp. (tea-trees) at Captains Flat and within the grassy groundlayer of Box-Gum Woodland at Hall. Apparently highly susceptible to grazing, being retained only at a little-grazed travelling stock reserve (Boorowa) and in cemeteries (Captains Flat and Hall) (Department of Environment and Climate Change 2008b) (OEH profile).	BioNet	Low. The study area contained marginal habitat for the species. The majority of this habitat has been subjected to heavy grazing and cropping regimes of which the species is sensitive to. In addition the species has not been recorded in proximity to the site (nearest record >70km from the study area), it outside the species known distribution and the study area does not encompass any of the five known sites where the species is known to occur. Given the lack of records within the locality and poor quality of habitat, it is considered unlikely that the species would occur within the study area.
Poaceae	*Amphibromus fluitans*	River Swamp Wallaby-grass	V	Native to the south western plains and slopes where it grows mostly in permanent swamps. Also recorded in the southern tablelands (Harden 1993). The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with Potamogeton and Chamaeraphis species (Department of Environment and Climate Change 2008b).	BioNet	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (nearest record occurs approx. 100 km west of the study area (1995)). Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Poaceae	*Austrostipa metatoris*	A spear-grass	V	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include *Eucalyptus populnea, E. intertexta, Callitris glaucophylla, Casuarina cristata, Santalum acuminatum* and *Dodonaea viscosa*. Flowers from October to December, mainly in response to rain. Seed dispersal is mainly by wind, rain and flood events; the awn and sharp point of the floret appear to be an adaptation for burying the seed into the soil; grass seed is traditionally believed to be viable for three to five years, so a long-lived seed bank is considered unlikely for this species. Recorded as common in the Mairjimmy State Forest population (Harden 1993).	BioNet, PMST	Low. Suitable habitat for the species has not been recorded within the study area. The species has also not been recorded from the locality (study area occurs approx. 150 km north west of the species known distribution (1992)). Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.
Poaceae	*Austrostipa wakoolica*	A spear-grass	E	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include *Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha* and *Einadia nutans* (Department of Environment and Conservation 2005b).	BioNet	**Moderate.** Suitable habitat for the species was recorded within the study area in the form of open grassy woodland. The species has not been recorded within the locality (nearest record 50km north of the study area (1992)). Given the availability of suitable habitat and records within the broader locality, it is considered likely that the species has potential to occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Proteaceae	*Grevillea wilkinsonii*	Tumut Grevillea	E	The Tumut Grevillea is found in two areas: one is a 4.5 km stretch of the Goobarragandra River, approximately 18 km south-east of Tumut; the other at a small site near Gundagai. At the Goobarragandra River sites, it grows close to the water, at altitudes between 310 and 340 m. The associated native vegetation includes remnant riverine shrub communities adjacent to open-forest, with the most common tree species being Blakely's Red Gum (*Eucalyptus blakelyi*), Apple Box (*E. bridgesiana*), Yellow Box (*E. melliodora*), and Red Stringybark (*E. macrorhyncha*) and with Kurrajongs (*Brachychiton populneus*) growing in nearby paddocks. Has a high rate of fruit set, though there also appears to be fairly high predation of the ripening fruits and fallen seed. All sites contain individuals of varying ages and numerous seedlings have been observed at some sites in the wild; most healthy adult plants occur in open areas, being rarely found under the canopy of adjacent dense vegetation. Flowers from September to November and individual flower clusters can last for some weeks. Flowers have a strong and rather unpleasant perfume, not unlike the smell of mice; most species of "toothbrush grevilleas" are adapted to bird pollination, but this species has small flowers and they are believed to be insect pollinated. Fruits mature during December and early January (Royal Botanic Gardens 2009).	BioNet	Low. Suitable habitat for this species has not been recorded within the study area. The species has also not been recorded from the locality (study area occurs approx. 70 km north west of the species known distribution (1994)). Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.
Rhamnaceae	*Pomaderris cotoneaster*		E	It has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs. Little is known about the ecology of the species. It is probably killed by fire but plants have been observed to re-sprout from the stem following death of the crown from apparent drought (Department of Environment and Climate Change 2008b).	BioNet	Low. Suitable habitat for this species has not been recorded within the study area. The species has also not been recorded from the locality (study area occurs approx. 100 km north west of the species known distribution (1998)). Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.

FAMILY NAME	SPECIES NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Rutaceae	*Philotheca ericifolia*	-	V	Grows chiefly in dry sclerophyll forest and heath on damp sandy flats and gullies, in the upper Hunter Valley and Pilliga to Peak Hill district (Royal Botanic Gardens 2004). It has been collected from a variety of habitats including heath, open woodland, dry sandy creek beds, and rocky ridge and cliff tops. Associated species include *Melaleuca uncinata, Eucalyptus crebra, E. rossii, E. punctata, Corymbia trachyphloia, Acacia triptera, A. burrowii, Beyeria viscosa, Philotheca australis, Leucopogon muticus* and *Calytrix tetragona*. Noted as being a moisture-loving plant, with plants common on the sides of a particular spur of the Hervey Ranges where soakage from the high background provides sufficient moisture for the plants (Department of Environment and Conservation 2005b).	BioNet	Low. Suitable habitat for this species has not been recorded within the study area. The species has also not been recorded from the locality (study area occurs approx. 50km south east of the species southern known distribution limit (2008)). Given the lack of suitable habitat and records within the locality, it is considered unlikely that the species would occur within the study area.

Table 2 Matters of National Ecological Significance – EPBC listed Fauna Likelihood of Occurrence

SCIENTIFIC NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
AMPHIBIANS					
Litoria booroolongensis	Booroolong Frog	E	Confined to mountain streams of the Great Dividing Range (Cogger 2000). Usually found on or under boulders and debris in and beside the rocky beds of mountain streams; breeds in summer (Anstis 2002).	BioNet	Low. Preferred habitat not present
Litoria raniformis	Southern Bell Frog	V	The Southern Bell Frog is usually found amongst emergent vegetation such as Typha, Phragmites and Eleocharis within or at the edges of still or slow-flowing water bodies such as lagoons, swamps, lakes, ponds, and farm dams (Taylor *et al.* 1997). It also in occurs in irrigation channels and crops, lignum shrublands, black box and river red gum woodlands and at the periphery of rivers. Apart from breeding and foraging habitat, refuge areas for this species may include soil cracks, fallen timber, debris and dense vegetation on low, frequently inundated floodplains (Cogger 2000). Vegetation types in which this species occurs include open grassland (including crops and pastures), open forest, and ephemeral and permanent non-saline marshes and swamps (Department of Environment and Conservation 2005a).	BioNet	Low. Preferred habitat not present
BIRDS					
Anthochaera phrygia (syn. Xanthomyza phrygia)	Regent Honeyeater	EM	Occurs mostly in box-ironbark forests and woodland and prefers wet, fertile sites such as along creek flats, broad river valleys and foothills. Riparian forests with Casuarina cunninghamiana and Amyema cambagei are important for feeding and breeding. Spotted Gum and Swamp Mahogany forests are also important feeding areas in coastal areas. Important food trees include Eucalyptus sideroxylon (Mugga Ironbark), E. albens (White Box), E. melliodora (Yellow Box) and E. leucoxylon (Yellow Gum) (Garnett & Crowley 2000).	BioNet, PMST	**Moderate**. May occur intermittently in woodland remnants in the study area
Apus pacificus	Fork-tailed Swift	M	Breeds in the northern hemisphere, wintering south to Australia. It is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground. It mostly occurs over inland plains but sometimes above foothills or in coastal areas over cliffs, beaches, islands and well out to sea. It also occurs over towns and cities. It mostly occurs over dry and/or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh, grassland, spinifex sandplains, farmland and sand-dunes. It sometimes occurs above forests. It probably roosts aerially, but has occasionally been observed to land (Higgins, P.J. 1999).	BioNet, PMST	Low. Although there is potential for this species to occur over the site on a seasonal basis, it is an aerial species and would not use terrestrial habitats associated with the site.

SCIENTIFIC NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Ardea (Bulbulcus) ibis	Cattle Egret	M	Occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands and very rarely in arid and semi-arid regions. High numbers may occur in moist, poorly drained pastures with high grass; it avoids low grass pastures but has been recorded on earthen dam walls and ploughed fields. It is commonly associated with the habitats of farm animals, particularly cattle, but also pigs, sheep, horses and deer. It is known to follow earth-moving machinery and has been located at rubbish tips. It uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and abundant aquatic flora (Marchant & Higgins 1990; Morton *et al.* 1989).	BioNet, PMST	**Moderate** Potential to occur within or over the site on a seasonal basis.
Ardea alba	Great Egret	M	Great Egrets occur throughout most of the world. They are common throughout Australia, with the exception of the most arid areas. Great Egrets prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands. Great Egrets can be seen alone or in small flocks, often with other egret species, and roost at night in groups. In Australia, the breeding season of the Great Egret is normally October to December in the south and March to May in the north. This species breeds in colonies, and often in association with cormorants, ibises and other egrets. (Australian Museum 2003).	PMST	**Moderate** Potential to occur within or over the site on a seasonal basis.
Botaurus poiciloptilus	Australasian Bittern	E	Occurs in shallow, vegetated freshwater or brackish swamps. Requires permanent wetlands with tall dense vegetation, particularly bulrushes and spikerushes. When breeding, pairs are found in areas with a mixture of tall and short sedges but will also feed in more open territory. (Garnett & Crowley 2000; NSW National Parks and Wildlife Service 2002).	PMST	Low. Preferred habitat not present.
Calidris acuminata	Sharp-tailed Sandpiper	M	Occurs in a variety of habitats: tidal mudflat, mangrove swamps, saltmarshes, shallow fresh, brackish, salt inland swamps and lakes; flooded and irrigated paddocks, sewage farms and commercial saltfields (Pizzey & Knight 2007).	BioNet	Low. Preferred habitat not present. May occur intermittently within the site in response to high inland rainfall events.
Calidris ferruginea	Curlew Sandpiper	M	Occurs in inter-tidal mudflats of estuaries, lagoons, mangrove channels and also around lakes, dams, floodwaters and flooded saltbush surrounding inland lakes (Morcombe 2003).	BioNet	Low. Preferred habitat not present.
Gallinago hardwickii	Latham's Snipe	M	Occurs in freshwater or brackish wetlands generally near protective vegetation cover. This species feeds on small invertebrates, seeds and vegetation. It migrates to the northern hemisphere to breed (Garnett & Crowley 2000).	PMST	Low. Preferred habitat not present. May occur intermittently within the site in response to high inland rainfall events.

SCIENTIFIC NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Gelochelidon nilotica (syn Sterna nilotica)	Gull-billed Tern	M	Prefer shallow, often ephemeral, terrestrial wetlands, either fresh or saline, especially lakes, swamps and lagoons, particularly those with mudflats; sometimes on inundated ground, including saltpans, claypans and saltmarsh or watercourses and associated floodplains. Also occur in sheltered coastal embayments, estuaries and river deltas with tidal sandflats, mudflats or beaches. Inland, often occur well away from water, on dry samphire, grassy plains or even gibber. Usually breed on large, often ephemeral, inland lakes and swamps, on low exposed islands, banks, flats or spits of dry mud, sand or, occasionally, rocks; either bare or vegetated with sparse dry grass, reeds and rushes or scattered samphire (Higgins, P.J. & Davies 1997).	BioNet	Low. Preferred habitat not present. May occur intermittently within the site in response to high inland rainfall events
Grantiella picta	Painted Honeyeater	V	Lives in dry forests and woodlands. Primary food is the mistletoes in the genus Amyema, though it will take some nectar and insects. Its breeding distribution is dictated by presence of mistletoes which are largely restricted to older trees. Less likely to be found in in strips of remnant box-ironbark woodlands, such as occur along roadsides and in windbreaks, than in wider blocks (Garnett & Crowley 2000).	BioNet, PMST	**Moderate**. May occur intermittently in woodland remnants in the study area
Hirundapus caudacutus	White-throated Needletail	M	Occurs in airspace over forests, woodlands, farmlands, plains, lakes, coasts and towns. Breeds in the northern hemisphere and migrates to Australia in October-April (Pizzey & Knight 2007).	PMST	Low. Although there is potential for this species to occur over the site on a seasonal basis, it is an aerial species and would not use terrestrial habitats associated with the site.
Lathamus discolor	Swift Parrot	CE	Breeding occurs in Tasmania, majority migrates to mainland Australia in autumn, over-wintering, particularly in Victoria and central and eastern NSW, but also south-eastern Queensland as far north as Duaringa. Until recently it was believed that in New South Wales, swift parrots forage mostly in the western slopes region along the inland slopes of the Great Dividing Range but are patchily distributed along the north and south coasts including the Sydney region, but new evidence indicates that the forests on the coastal plains from southern to northern NSW are also extremely important. In mainland Australia is semi-nomadic, foraging in flowering eucalypts in eucalypt associations, particularly box-ironbark forests and woodlands. Preference for sites with highly fertile soils where large trees have high nectar production, including along drainage lines and isolated rural or urban remnants, and for sites with flowering Acacia pycnantha, is indicated. Sites used vary from year to year. (Garnett & Crowley 2000),(Swift Parrot Recovery Team 2001).	BioNet, PMST	**Moderate**. May occur intermittently in woodland remnants in the study area

SCIENTIFIC NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Leipoa ocellata	Malleefowl	VM	Ground-dwelling bird found in mallee woodland and other dry scrub in the semi-arid zone of inland Australia. Restricted to semi-arid rangelands and small habitat remnants in the dryland cropping zone of the southwest and centre of NSW. Prefers well drained, light sandy or loamy soils. Habitat usually contains dense but discontinuous canopy which provides abundant leaf litter and dense, varied shrub and herb layers containing food plants, particularly Acacia, Cassia, Bossiaea, Beyeria and some open ground for ease of movement (NSW National Parks and Wildlife Service 1999b).	PMST	Low. Preferred habitat not present
Limosa limosa	Black-tailed Godwit	M	A coastal species found on tidal mudflats, swamps, shallow river margins and sewage farms. Also found inland on larger shallow fresh or brackish waters. A migratory species visiting Australia between September and May (Pizzey & Knight 2007).	BioNet	Low. Preferred habitat not present.
Merops ornatus	Rainbow Bee-eater	M	Usually occur in open or lightly timbered areas, often near water. Breed in open areas with friable, often sandy soil, good visibility, convenient perches and often near wetlands. Nests in embankments including creeks, rivers and sand dunes. Insectivorous, most foraging is aerial, in clearings (Higgins, P.J. 1999).	BioNet, PMST	**Moderate** Potential to occur within or over the site on a seasonal basis.
Motacilla flava	Yellow Wagtail	M	This species occurs in a range of habitats including estuarine habitats such as sand dunes, mangrove forests and coastal saltmarshes. This species also occurs in open grassy areas including disturbed sites such as sports grounds and has been recorded on the edges of wetlands, swamps, lakes and farm dams. This species migrates from Asia to Australia in spring-summer. It has been recorded in the estuarine areas of the Hunter River in Newcastle NSW and in QLD and the north of NT and WA (Higgins, P.J. *et al.* 2006).	PMST	Low. Accidental or rare occurrences within the site in response to high inland rainfall events cannot be entirely discounted.
Myiagra cyanoleuca	Satin Flycatcher	M	Occurs in heavily vegetated gullies, in forests and taller woodlands. During migration it is found in coastal forests, woodlands, mangroves, trees in open country and gardens (Pizzey & Knight 2007).	PMST	Low. Preferred habitat not present.
Pedionomus torquatus	Plains-wanderer	V	Sparse grasslands that have 50 percent bare ground, widely spaced plants up to 10 cm high and remaining standing vegetation less than 5 centimetres in height Occasionally uses cereal stubble but cannot persist in agricultural landscape.. Suitable habitat tends to be restricted to small (50-300 ha) patches that do not support dense pasture growth under any seasonal conditions.	BioNet	Low. Preferred habitat not present. However where pasture conditions are suitable it cannot be entirely discounted.
Plegadis falcinellus	Glossy Ibis	M	It feeds in very shallow water and nests in freshwater or brackish wetlands with tall dense stands of emergent vegetation (e.g. reeds or rushes) and low trees or bushes. It shows a preference for marshes at the edges of lakes and rivers, as well as lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and irrigated cultivation. It less often occurs in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons. Roosting sites are often large trees that may be far from water. The nest is a platform of twigs and vegetation usually positioned less than 1 m above water in tall dense stands of emergent vegetation (e.g. reeds or rushes), low trees or bushes over water (BirdLife International 2009).	BioNet	Low. Preferred habitat not present. May occur intermittently within the site in response to high inland rainfall events

SCIENTIFIC NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Polytelis swainsonii	Superb Parrot	V	Mainly found in the Riverina where they nest in loose colonies in riparian woodland on River Red Gum. On the inland slopes, Superb Parrots both forage and feed within box woodland, mostly nesting in dead trees (Garnett & Crowley 2000).	BioNet, PMST	**Moderate**. May occur intermittently in woodland remnants in the study area.
Rhipidura rufifrons	Rufous Fantail	M	Occurs in a range of habitats including the undergrowth of rainforests/wetter eucalypt forests/gullies, monsoon forests paperbarks, sub-inland and coastal scrubs, mangroves, watercourses, parks and gardens. When migrating they may also be recorded on farms, streets and buildings. Migrates to SE Australia in October-April to breed, mostly in or on the coastal side of the Great Dividing Range (Pizzey & Knight 2007).	PMST	Low. Possible rare passage migrant.
Rostratula australis (syn. R. benghalensis)	Australian Painted Snipe (Painted Snipe)	VM	Inhabits shallow, vegetated, temporary or infrequently filled wetlands, including where there are trees such as Eucalyptus camaldulensis (River Red Gum), E. populnea (Poplar Box) or shrubs such as Muehlenbeckia florulenta (Lignum) or Sarcocornia quinqueflora (Samphire). Feeds at the water's edge and on mudlflats on seeds and invertebrates, including insects, worms, molluscs and crustaceans. Males incubate eggs in a shallow scrape nest (Garnett & Crowley 2000).	PMST	Low. Preferred habitat not present. May occur intermittently within the site in response to high inland rainfall events.
Tringa nebularia	Common Greenshank	M	Occurs in a range of inland and coastal environments. Inland, it occurs in both permanent and temporary wetlands, billabongs, swamps, lakes floodplains, sewage farms, saltworks ponds, flooded irrigated crops. On the coast, it occurs in sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons, occasionally rocky tidal ledges. It generally prefers wet and flooded mud and clay rather than sand (Morcombe 2003).	BioNet	Low. Preferred habitat not present. May occur intermittently over the site on a seasonal basis.
FISH					
Maccullochella peelii	Murray Cod	V	The Murray Cod occurs in lower reaches of the Murray-Darling Basin, where the water temperature is warm. The diverse range of habitats frequented by the Murray Cod includes slow moving rivers, murky billabongs and clear, rocky rivers (Threatened Species Scientific Committee 2011).	PMST	Low. Preferred habitat not present
Macquaria australasica	Macquarie Perch	E	The natural range of Macquarie Perch included the upper and middle reaches of the Murray-Darling basin as well as the Shoalhaven and Hawkesbury Rivers. However, this species has recently been sighted in only a few localities within these river systems. Preferred habitat is deep holes covered with rocks, and spawning occurs above shallow running water. Macquarie Perch is a schooling species (Department of the Environment and Water Resources, 2007).	PMST	Low. Preferred habitat not present
INSECTS					

SCIENTIFIC NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Synemon plana	Golden Sun Moth	Z	Golden Sun Moth occurs between Queanbeyan, Gunning, Young and Tumut, and in nearby areas of Victoria and the ACT. This species occurs where wallaby grasses Austrodanthonia spp. dominate the understory, such as grassy Box-Gum Woodlands or Natural Temperate Grasslands, as larvae feed exclusively on the roots of wallaby grass. Bare ground separating low tussocks of wallaby grass are key microhabitat features for the Golden Sun Moth, as courting behaviour occurs here (Department of the Environment and Water Resources, 2007).	BioNet	Low. Preferred habitat not present. Known populations occur 60 km east of Cootamundra.
MAMMALS					
Dasyurus maculatus maculatus	Spotted-Tailed Quoll (Southern Subspecies)	E	Occurs from the Bundaberg area in south-east Queensland, south through NSW to western Victoria and Tasmania. In NSW, it occurs on both sides of the Great Dividing Range and north-east NSW represents a national stronghold (NSW National Parks and Wildlife Service 1999d). Occurs in wide range of forest types, although appears to prefer moist sclerophyll and rainforest forest types, and riparian habitat. Most common in large unfragmented patches of forest. It has also been recorded from dry sclerophyll forest, open woodland and coastal heathland, and despite its occurrence in riparian areas, it also ranges over dry ridges. Nests in rock caves and hollow logs or trees. Feeds on a variety of prey including birds, terrestrial and arboreal mammals, small macropods, reptiles and arthropods (NSW National Parks and Wildlife Service 1999c, 1999d).	BioNet	Low. Preferred habitat not present
Nyctophilus corbeni (syn. N. timoriensis)	South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)	V	The species has a limited distribution that is restricted around the Murray-Darling Basin in south-eastern Australia (Turbill & Ellis 2006). It occurs in far eastern South Australia, in areas north of the Murray River (Turbill *et al.* 2008). It occurs in a range of inland woodland vegetation types being most abundant in vegetation with a distinct canopy and a dense cluttered shrub layer (Dominelli 2000; Ellis *et al.* 1999){Lumsden, 1994 #3636}(Parnaby 1995; Turbill & Ellis 2006). Roosting and breeding habitat includes in tree hollows and under loose bark in arid and semi-arid Australia (Strahan 1995) and forages in the understorey of woodlands and open savannah and swamps (Churchill 1998).	BioNet, PMST	**Moderate**. Potential habitat within woodland remnants in the study area.
Phascolarctos cinereus	Koala	V	Found in sclerophyll forest. Koalas have been observed to feed on the leaves of in excess of 70 species of eucalypt and 30 non-eucalypt species. However, in any one area, Koalas will feed almost exclusively on a small number of preferred species. The preferred tree species vary widely on a regional and local basis. Some preferred species include Forest Red Gum Eucalyptus tereticornis, Grey Gum E. punctata. In coastal areas, Tallowwood E. microcorys and Swamp Mahogany E. robusta are important food species, while in inland areas White Box E. albens, Bimble Box E. populnea and River Red Gum E. camaldulensis are favoured (NSW National Parks and Wildlife Service 1999a, 2003).	PMST, BioNet	**Moderate**. May occur in woodland remnants in the study area.

SCIENTIFIC NAME	COMMON NAME	EPBC STATUS	HABITAT	DATA SOURCE	LIKELIHOOD OF OCCURRENCE
Pseudomys novaehollandiae	New Holland Mouse	V	The New Holland Mouse is a small, burrowing native rodent. The species is similar in size and appearance to the introduced house mouse (Mus musculus), although it can be distinguished by its slightly larger ears and eyes, the absence of a notch on the upper incisors and the absence of a distinctive 'mousy' odour. Known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes (Threatened Species Scientific Committee 2010).	BioNet	Low. Preferred habitat not present
Pteropus poliocephalus	Grey-headed Flying-fox	V	Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps. Urban gardens and cultivated fruit crops also provide habitat for this species. Feeds on the flowers and nectar of eucalypts and native fruits including lily pillies. It roosts in the branches of large trees in forests or mangroves (Churchill 2008; NSW National Parks and Wildlife Service 2001)	PMST, BioNet	**Moderate**. Potential to occur within and over the study area on seasonal basis.
REPTILES					
Aprasia parapulchella	Pink-tailed Worm Lizard (syn. Pink-tailed Legless Lizard)	V	This lizard is known from four sites in eastern Australia: near Canberra in the ACT, Tarcutta and Bathurst in NSW, and near Bendigo in Vic. In general, lizards occur in open grassland habitats that have a substantial cover of small rocks (Osbourne & Jones 1995). Lizards also show a preference for sunny aspects, avoiding S facing slopes. Some specimens have been collected from grassland sites that appear not to support any native grasses and several animals have been found on the edge of Callitris enlicheri woodland and Eucalyptus macrorhyncha woodland (Barrer 1992). A burrowing species, it is usually found under rocks on well-drained soil and in ant nests, occasionally with several individuals found under the same rock (Swan *et al.* 2004).	BioNet, PMST	Low. Preferred habitat not present
Delma impar	Striped Legless Lizard	V	Until recently, D. impar was thought to inhabit only native tussock grasslands. In recent years, surveys have revealed D. impar in many sites dominated by exotic grasses such as Phalaris aquatica, Nasella trichotoma and Hypocharis radicata (Corrigan *et al.* 1996){O'Shea, 1996 #3729}(Coulson 1990; Kukolic *et al.* 1994; Rauhala 1996). They have also been found in several secondary/derived grassland sites. A relatively dense and continuous structure, rather than the floristic composition of grasslands, may be important in influencing the persistence of D. impar. The key to their survival in rural areas may be the availability of shelter during disturbance events (such as heavy grazing or perhaps even ploughing), from which they may be able to recolonise disturbed sites after the cessation of the disturbance {Dorrough, 1995 #3734}. This shelter may take the form of plant species which are relatively unpalatable to stock, such as Serrated Tussock or Juncus sp., road easements, less disturbed neighbouring land or even soil cracks and arthropod burrows in the short-term (Smith & Robertson 1999).	BioNet, PMST	Low. Preferred habitat not present