Australian Government

BUILDING OUR FUTURE

ARTC InlandRail

Inland Rail – Parkes to Narromine

Submissions Report

February 2018

Submissions Report

Table of contents

Table index

Figure index

Appendices

Abbreviations

Abbreviation	Definition
AEP	annual exceedance probability
AHIMS	Aboriginal Heritage Information Management System
ALCAM	Australian Level Crossing Assessment Model
ANZS	Standards Australia and New Zealand
ARI	average recurrence interval
AS	Australian Standard
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CEEC	critically endangered ecological community
CEMP	construction environmental management plan
DECC	NSW Department of Environment and Climate Change
DECCW	NSW Department of Environment, Climate Change and Water
DPI	NSW Department of Primary Industries
EEC	endangered ecological community
EIS	environmental impact statement
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPL	environment protection licence
ESD	ecologically sustainable development
FM Act	*Fisheries Management Act 1994* (NSW)
GHD	GHD Pty Ltd
ha	hectare
ICNG	*Interim Construction Noise Guideline* (DECC, 2009)
ISCA	Infrastructure Sustainability Council Australia
ISO	International Organisation for Standardisation
km	kilometres
km^2	square kilometres

Abbreviation	Definition
km/h	kilometres per hour
LGA	local government area
m	metres
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
OEH	Office of Environment and Heritage
OEMP	operation environmental management plan
PCT	plant community type
PPV	peak particle velocity
POEO Act	*Protection of the Environment Operations Act 1974* (NSW)
RBL	rating background level
the Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
RING	*Rail Infrastructure Noise Guideline* (EPA, 2013)
SEARs	Secretary's Environmental Assessment Requirements (for the EIS)
SEPP	state environmental planning policy
TEC	threatened ecological community
TSC Act	*Threatened Species Conservation Act 1995* (NSW)
VDV	vibration dose value

Definitions

Term	Definition
Aboriginal object	Defined by the *National Parks and Wildlife Act 1974* (NPW Act) as: 'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains'.
Aboriginal site	A place where physical remains or modification of the natural environment indicate past and 'traditional' activities by Aboriginal people. Site types include artefact scatters, isolated artefacts, burials, shell middens, scarred trees, quarries and contact sites. Includes sites listed on the. Also known as Aboriginal objects.
Aboriginal place	Declared by the NSW Minister for the Environment, in accordance with Section 84 of the NPW Act and by an order published in the Gazette, as a place that, in the opinion of the Minister, is or was of special significance with respect to Aboriginal culture.
Active control (level crossings)	Where the movement of vehicular or pedestrian traffic across a railway crossing is controlled using devices such as flashing signals, gates or barriers (or a combination of these), with the device/s activated prior to, and during, the passage of a train through the crossing
Annual exceedance probability (AEP)	The chance of a flood if a nominated size occurring in a particular year. The chance of the flood occurring is expressed as a percentage and, for large floods, is the reciprocal of the ARI. For example, the one per cent AEP flood event is equivalent to the 100 year ARI flood event.
Average recurrence interval (ARI)	The long term average number of years between the occurrence of a flood of a nominated size
Ballast	Crushed rock, stone etc used to provide a foundation for a railway track. Ballast usually provides the bed on which railway sleepers are laid, transmits the load from train movements, and restrains the track from movement
Biobanking agreement	Landowners enter into a biobanking agreement with the NSW Minister for the Environment to establish a biobank site. A biobanking agreement is a conservation covenant that is attached to the land title. A biobanking agreement specifies the management actions that are required to be undertaken on biobank sites to improve biodiversity values and allow biodiversity credits to be created.
Biobank site	A site to which a biobanking agreement applies
Biodiversity credits	In accordance with the *Framework for Biodiversity Assessment* (OEH, 2014a) the biodiversity credits, which consist of ecosystem credits and species credits, represent the impacts on threatened species as a result of a proposal. A decision support tool, produced by OEH, is used to determine the number of biodiversity credits required to offset the impacts of the development.
Biodiversity offsets	Biodiversity offsets are measures that benefit biodiversity by compensating for the adverse impacts elsewhere of an action, such as clearing for development. Biodiversity offsets work by protecting and managing biodiversity values in one area in exchange for impacts on biodiversity values in another.
Biophysical environment	The physical environment (water, soil etc) as well as the biological activity within it (plants, animals etc)

Term	Definition
Climate	The average weather experienced at a site or region over a period of many years, ranging from months to many thousands of years. The relevant measured quantities are most often surface variables such as temperature, rainfall and wind.
Construction compound	An area used as the base for construction activities, usually for the storage of plant, equipment and materials and/or construction site offices and worker facilities
Crossing loop	A section of track off to the side of the main track/s that allows a train to move to the side so that another train can pass
Culvert	A structure that allows water to flow under a road, railway, track, or similar obstruction
Dangerous goods	Dangerous goods are substances or articles that pose a risk to people, property or the environment, due to their chemical or physical properties. They are usually classified with reference to their immediate risk.
Detailed Design	The stage of design where Proposal elements are designed in detail, suitable for construction.
Ecologically sustainable development	Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased
Ecosystem credit	A biodiversity credit that represents a measurement of the value of EECs, CEECs, and threatened species habitat for species that can be reliably predicted to occur with a specified plant community type. Ecosystem credits measure the loss in biodiversity values as a result of a proposal, and the gain in biodiversity values at an offset site.
Emission	A substance discharged into the air
Existing rail corridor	The corridor within which existing rail infrastructure, subject to works as part of Inland Rail, are located. The existing rail corridor is defined by ARTC to mean everywhere within 15 metres of the outermost rails; or within the boundary fence where boundary fences are provided and are closer than 15 metres; or if the property boundary is less than 15 metres, the property boundary; or a permanent structure such as a fence, wall or level crossing separating the operating rail corridor from other land.
Formation	The earthworks/material on which the ballast, sleepers and tracks are laid
Freight	Goods transported by truck, train, ship, or aircraft
Freight task	The amount of freight transport, usually measured in tonnes or tonne-kilometres
Heritage listed	An item, building or place included on statutory heritage lists maintained by local, State and/or the Australian Government
Infrastructure sustainability	The concept of designing, constructing or operating infrastructure with regard to the environmental, social and economic outcomes of the long term.
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.

Term	Definition
Intermodal	The movement of freight using multiple modes of transport (rail, ship, truck) without handling of the freight itself when changing modes. For a railway this usually refers to the transport of freight in containers which may be double stacked on the wagons carrying them.
$L_{A90(period)}$	The sound pressure level exceeded for 90 per cent of the measurement period, where the specific period in each case is specified in brackets
$L_{Aeq(time)}$	Typically used to described ambient (background) noise levels measured over a specified period of time, where the specific period in each case is specified in brackets
$L_{Aeq(1\ hour)}$	The busiest 1-hour 'equivalent continuous noise level' – it represents the typical LAeq noise level from all the proposal noise events during the busiest 1-hour of the assessment period
$L_{Aeq(9\ hour)}$	The night-time 'equivalent continuous noise level' - it represents the cumulative effects of all the proposal noise events occurring in the night-time period from 10pm to 7am
$L_{Aeq(15\ hour)}$	The daytime 'equivalent continuous noise level' - it represents the cumulative effects of all the proposal noise events occurring in the daytime period from 7am to 10pm
$L_{Aeq(24\ hour)}$	The 'equivalent continuous noise level', sometimes also described as the 'energy-averaged noise level' – it represents the cumulative effects of all the proposal noise events occurring in one day.
L_{Amax}	The maximum sound level recorded during the measurement period.
Landscape	All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure
Landscape character	The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place
Level crossing	A place where rail lines and a road cross at the same elevation
Level crossing protection	The level of control provided at level crossings, which is determined on a case by case basis, and depends on the particular characteristics of a crossing. It generally falls into two categories: passive protection (uses warning signage only) or active protection (uses either signage and flashing lights only, or signage/flashing lights with boom gates)
Level of service	Defined by Austroads as a measure for ranking operating road and intersection conditions, based on factors such as speed, travel time, freedom to manoeuvre, interruptions, comfort and convenience
Local road	Road used primarily to access properties located along the road
Passive control (level crossings)	Where the movement of vehicular or pedestrian traffic across a railway crossing is controlled using signs or devices that are not activated by the approach or passage of a train, relying on the road user to detect the approach or presence of a train by direct observation
Peak particle velocity (PPV)	The instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position
Possession	A period of time during which a rail line is blocked to trains to permit work to be carried out on or near the line

Term	Definition
Proposal	The construction and operation of the Parkes to Narromine 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 the storage areas/compounds sites etc, that would be used to construct that infrastructure.
Rail alignment	The exact positioning of the track, accurately defined both horizontally and vertically, along which the rail vehicles operate
Rail corridor	The corridor within which the rail tracks and associated infrastructure are located
Rail level	The theoretical level of the running surface of the rails
Rating background level (RBL)	The underlying level of noise present in an area once transient and short-term noise events are filtered out
Species credit	A biodiversity credit that represents a measurement of the value of a threatened species that is predicted to occur in an area of land, but cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the threatened species profile database. Species credits measure the loss in the specified species value as a result of a proposal, and the gain in the specified value at an offset site
Spoil	Material generated by construction
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals
Study area	The study area is defined as the wider area including and surrounding the proposal site, with the potential to be directly or indirectly affected by the proposal (for example, by noise and vibration, visual or traffic impacts). The actual size and extent of the study area varies according the nature and requirements of each impact assessment technical report.
Track	The structure consisting of the rails, fasteners, sleepers and ballast, which sits on the formation
Track formation	Refer to the definition of formation
Travelling stock reserves	Travelling stock routes and reserves are parcels of Crown land reserved under the *Crown Lands Act 1989* (NSW) for use by travelling stock
Vibration dose value (VDV)	Combines the magnitude of vibration and the time for which it occurs. It can be a cumulative measurement of the vibration level received over a given period.
Visual amenity	The value of a particular area or view in terms of what is seen
Visual impact	The impacts on the views from residences, workplaces and public places. This can be positive (i.e. benefit or an improvement) or negative (i.e. adverse or a detraction)
View	The visual experience from the viewer's perspective
Waste	Waste is defined in the POEO Act. It includes, among other things, any matter (whether liquid, solid, gaseous or radioactive) that is discharged, emitted or deposited in the environment in such volume, constituency, or manner as to cause an alteration to the environment

1. Introduction

1.1 Inland Rail

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing 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 national project 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 in northern NSW and south-east Queensland.

Inland Rail has been divided into 13 sections, seven of which are located in NSW.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') has developed a ten-year programme to deliver Inland Rail. 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
- developing new business
- capital investment in the corridors
- managing the network
- infrastructure maintenance.

Further information on ARTC and Inland Rail can be found at www.artc.com.au and www.inlandrail.artc.com.au.

1.2 The proposal

The proponent is seeking approval to construct and operate the **Parkes to Narromine section of Inland Rail** ('the proposal'), which consists of 106 kilometres of upgraded rail track and associated facilities. The proposal forms a key component of Inland Rail.

1.3 The assessment and approval process

The proposal is permissible without development consent under *State Environmental Planning Policy (Infrastructure) 2007*. The proposal is also State significant infrastructure under *State Environmental Planning Policy (State and Regional Development) 2011*. As a result, the proposal is subject to assessment and approval by the NSW Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

On 20 October 2017 the proposal was declared to be critical State significant infrastructure by the NSW Minister for Planning under *State Environmental Planning Policy (State and Regional Development) 2011*. The proposal is also a controlled action under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (referral reference 2016/7731), and requires approval from the Australian Government Minister for the Environment and Energy.

An Environmental Impact Statement (EIS) was prepared to support ARTC's application for approval of the proposal in accordance with the requirements of Part 5.1 of the EP&A Act. The EIS was placed on public exhibition by the Department of Planning and Environment for a period of 31 days, commencing on 19 July 2017, and concluding on 18 August 2017.

During the exhibition period, interested stakeholders and members of the community were able to review the EIS online or at display locations (described in section 4.1), participate in consultation and engagement activities (also described in section 4-1), and make a written submission to the Department of Planning and Environment for consideration in its assessment of the proposal.

1.4 Purpose and structure of the report

This report comprises the Submissions Report for the proposal. It has been prepared in accordance with the requirements for State significant infrastructure under Part 5.1 and, more specifically, section 115Z(6) of the EP&A Act. Section 115Z(6) of the EP&A Act specifies that:

> 'The Director-General may require the proponent to submit to the Director-General:
>
> a) a response to the issues raised in those submissions, and
>
> b) a preferred infrastructure report that outlines any proposed changes to the State significant infrastructure to minimise its environmental impact or to deal with any other issue raised during the assessment of the application concerned.'

The responses to submissions are provided in section 6 of this report.

The report is structured as follows:

- an introduction to the report (section 1)
- an overview of the project as exhibited (section 2)
- an overview analysis of the submissions received, including numbers, types of submitters and key issues raised (section 3).
- a description of the actions that were undertaken during the exhibition period, including stakeholder and community consultation, clarifications to the EIS, and further environmental assessment (section 4 and 5)
- a summary of the issues raised in community and government agency/key stakeholder submissions (sections 6 to 7) and responses to the issues raised (section 6 and Appendix B)
- updated mitigation measures and performance outcomes for the project (section 8)
- an updated project evaluation (section 9).

2. Overview of the exhibited proposal

This section provides an overview of the project as described in the EIS. It includes an overview of the key features, the project need and benefits, and the main potential impacts identified by the EIS.

2.1 Overview of the proposal as described by the EIS

2.1.1 Location

The proposal is generally located in the existing rail corridor between the towns of Parkes and Narromine, via Peak Hill. In addition, a new connection to the Broken Hill rail line ('the Parkes north west connection') is proposed outside the existing rail corridor at the southern end of the proposal site near Parkes. The location of the proposal is shown in Figure 2.1.

2.1.2 Key features of the proposal

The key features of the proposal involve:

- upgrading the track, track formation, and culverts within the existing rail corridor for a distance of 106 kilometres between Parkes and Narromine
- realigning the track where required within the existing rail corridor to minimise tight curves
- providing three new crossing loops within the existing rail corridor, at Goonumbla, Peak Hill, and Timjelly
- providing a new 5.3 kilometre long rail connection to the Broken Hill line to the west of Parkes, ('the Parkes north west connection'), including a road bridge over the new section of rail at Brolgan Road ('the Brolgan Road overbridge').

The key features of the proposal are shown in Figure 2.2.

Ancillary work would include works to level crossings, signalling and communications, signage and fencing, and services and utilities within the proposal site.

The land requirement for the proposal would comprise the existing corridor with a typical width of 30 metres, with some variation to accommodate particular infrastructure and to cater for local topography. The corridor would be of sufficient width to accommodate the infrastructure currently proposed for construction, as well as future expansion, including possible future requirement for 3,600 metre long trains.

The proposal would consist of a single-track standard gauge railway, with crossing loops to accommodate double stacked freight trains up to 1,800 metres long. Components of the construction include infrastructure to accommodate possible future augmentation and upgrades of the track. Clearing of the corridor would occur where required to 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 crossing loops to accommodate double stacked freight trains up to 1,800 metres long. Impact assessment will be undertaken for the proposed development described in the *Inland Rail 2015 – Melbourne to Brisbane Inland Rail, Attachment A: ARTC 2015 Inland Rail Programme Business Case* (ARTC, 2015) for rail traffic and associated activities projected at the year 2040.

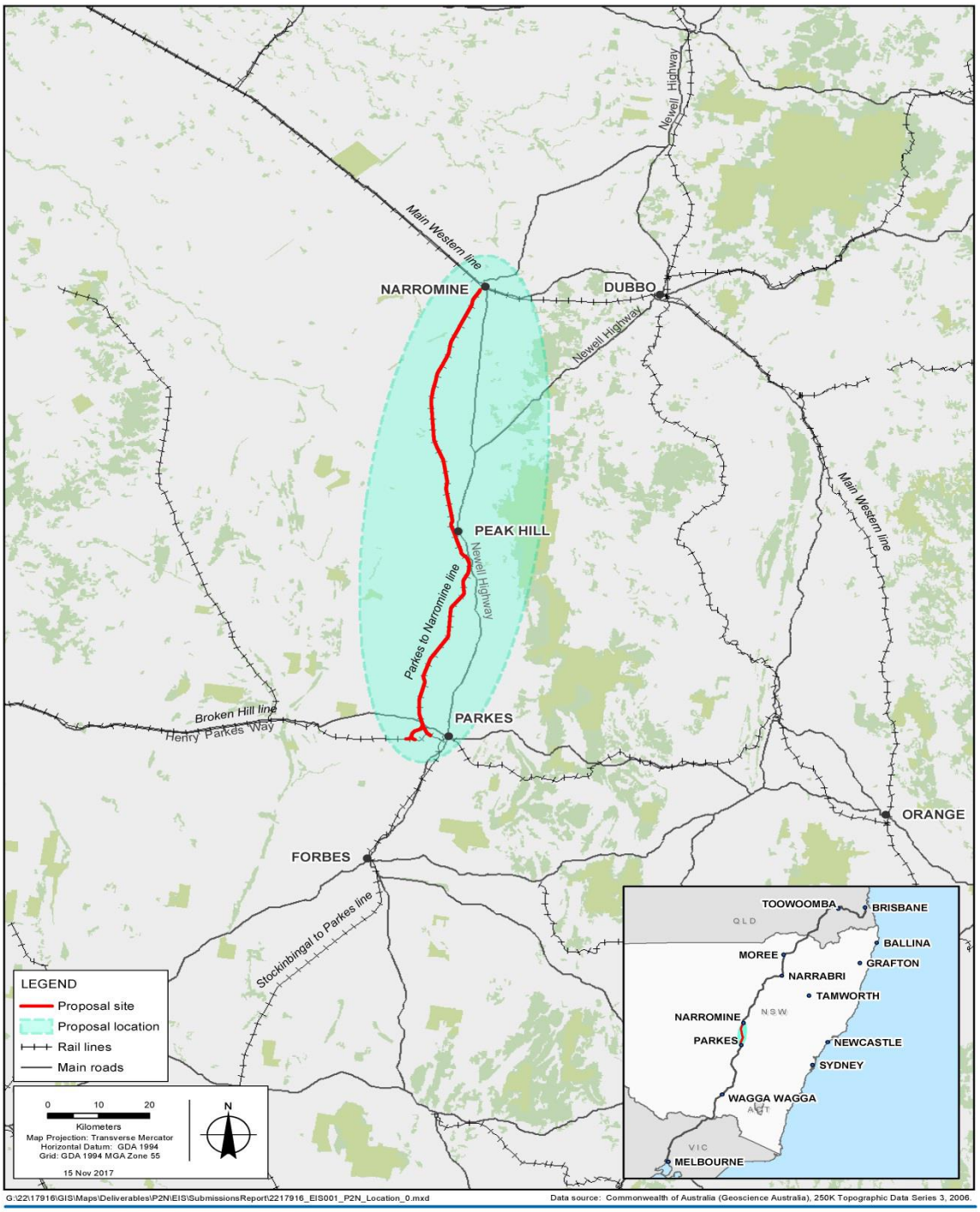

Figure 2.1
Location of the proposal

Figure 2.1 Location of the proposal

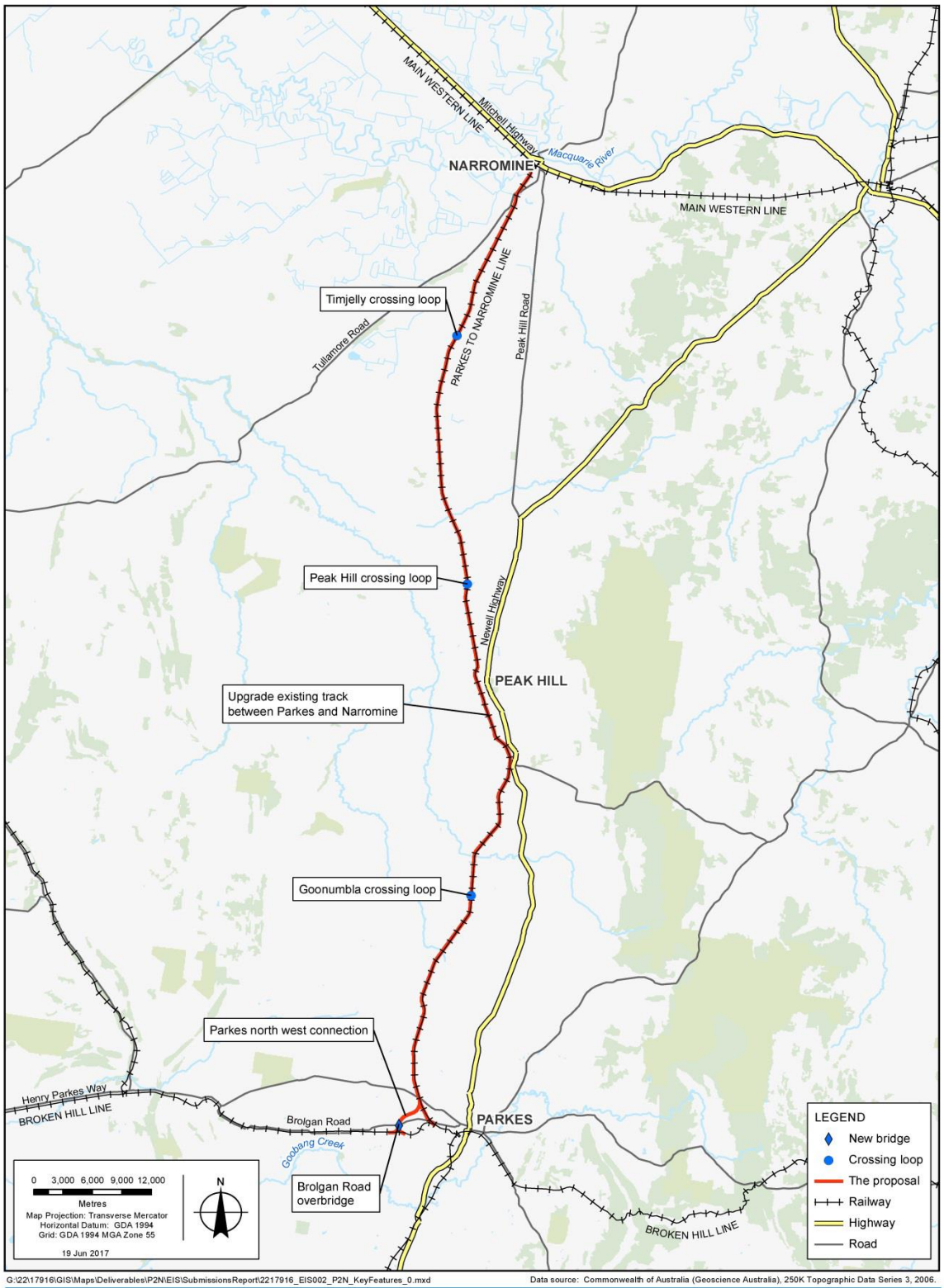

Figure 2.2
Key features of the proposal

Figure 2.2 Key features of the proposal

2.1.3 Timing and operation

Subject to approval of the proposal, construction of the proposal is planned to start in mid-2018, and is expected to take about 18 months. Construction is expected to be completed in late 2019.

The proposal would form part of the rail network managed and maintained by ARTC. Train services would be provided by a variety of operators. Prior to the opening of Inland Rail as a whole, the rail line would be used by existing rail traffic, which includes trains carrying grain and ore at an average rate of about four trains per day.

Existing train operations along the Parkes to Narromine line would continue prior to, during, and following construction. Train numbers are not anticipated to increase until all 13 sections of Inland Rail are complete, which is estimated to be in 2025.

It is estimated that the operation of Inland Rail would involve an annual average of about 8.5 trains per day in 2025, increasing to 15 trains per day in 2040, in addition to the existing rail traffic using the Parkes to Narromine line. The trains would be a mix of grain, intermodal (freight), and other general transport trains. The EIS assessed the operational impacts of the use of the proposal as part of Inland Rail.

2.1.4 Objectives of the proposal and Inland Rail

The objectives of the proposal are to:

- provide upgraded rail infrastructure that meets the Inland Rail specifications, to enable trains using the Inland Rail corridor to travel between Parkes and Narromine, connecting with other sections of Inland Rail to the north and south
- provide new rail infrastructure to connect Inland Rail to the Broken Hill line at Parkes, to enable trains using Inland Rail to connect with destinations in South Australia and Western Australia via the east-west trans-continental rail line
- minimise the potential for environmental and community impacts, by maximising use of the existing rail corridor.

The objectives of Inland Rail as a whole are to:

- provide a rail link between Melbourne and Brisbane that is interoperable with train operations to Perth, Adelaide, and other locations on the standard gauge rail network, to serve future rail freight demand, and stimulate growth for inter-capital and regional/bulk rail freight
- provide an increase in productivity that will benefit consumers through lower freight transport costs
- provide a step-change improvement in rail service quality in the Melbourne to Brisbane corridor and deliver a freight rail service that is competitive with road
- improve road safety, ease congestion, and reduce environmental impacts by moving freight from road to rail
- bypass bottlenecks within the existing metropolitan rail networks, and free up train paths for other services along the coastal route
- act as an enabler for regional economic development along the Inland Rail corridor.

2.2 Need for Inland Rail and the proposal

2.2.1 Need for Inland Rail

There is no direct continuous inland rail link between Melbourne and Brisbane. Interstate rail freight currently travels between Melbourne and Sydney via Albury, and then between Sydney and Brisbane, generally along the coast. About 70 per cent of the freight between Melbourne and Brisbane is carried by road, principally the Newell Highway in NSW, and connecting highways in Victoria and Queensland.

Growth in freight demand

The Melbourne to Brisbane corridor is one of the most important general freight routes in Australia, supporting key population and employment precincts along the east coast and inland NSW. It is estimated that 21 million tonnes of non-bulk and complementary freight moves along this corridor each year. This is expected to grow to over 40 million tonnes per year by 2050.

With the population of the eastern states forecast to increase by 60 per cent over the next 40 years, the need for efficient and effective freight transport will continue to increase. Strong forecast population growth, accompanied by comparable growth in employment, is likely to place significant pressure on existing infrastructure and services.

Existing freight capacity and infrastructure issues

Without the increased use of rail, the growth in freight demand is likely to result in increasing pressure on the road network and associated safety and environmental issues, increased freight costs, and a loss of economic opportunity. The current national infrastructure network cannot support this projected growth, with increasing pressure on already congested roads through Sydney, and increasing use of heavy trucks such as B-doubles and, potentially, B-triples along the Hume-Pacific and Newell Highway corridors.

Rail is generally the most productive and efficient mode for freight travelling from regional areas to export ports and urban destinations. Freight trains travelling along the Melbourne to Brisbane corridor currently travel through the Sydney metropolitan rail network, often experiencing significant delays. Travel time reliability is poor, because of the priority given to passenger services, freight transit curfews in the Sydney metropolitan area, and substandard rail alignments elsewhere. Limited capacity during morning and afternoon passenger peaks restricts freight movements at these times.

Summary of the need for Inland Rail

Inland Rail is needed to improve the efficiency of freight moving between Melbourne and Brisbane. Inland Rail will bypass the Sydney metropolitan area, substantially cut the overall journey time to less than 24 hours, and increase the reliability of services between Melbourne and Brisbane. This is expected to increase the competitiveness of rail transport relative to road transport. The Parkes north west connection also allows train movements between Brisbane and Adelaide/Perth.

In addition, Inland Rail will encourage growth and investment in regional areas along the route through improved freight connections.

As noted by the *Australian Infrastructure Audit* report (Infrastructure Australia, 2015), ‘Rail offers an alternative to road transport and societal benefits in terms of lower emissions, reduced road congestion and increased safety per tonne kilometre, particularly over longer distances or when carrying heavy goods.’

In summary, Inland Rail is needed to respond to the growth in demand for freight transport, and address existing freight capacity and infrastructure issues. The analysis of demands undertaken by ARTC indicated that there would be sufficient demand for Inland Rail.

2.2.2 Need for the proposal

Inland Rail consists of 13 geographically based projects, involving:

- building sections of new or ‘greenfield’ route
- upgrading sections of existing secondary lines to meet Inland Rail’s performance specification
- enhancing sections of existing main lines, mainly to improve vertical and horizontal clearances between infrastructure above the rail corridor and the tracks themselves, to enable trains with double stacked containers to pass safely beneath.

The proposal involves upgrading an existing secondary rail line to meet Inland Rail’s performance specification. Development of both the proposal and the Narrabri to North Star project is required to enable the orderly and economic implementation of Inland Rail.

2.3 Summary of key potential impacts

The key potential impacts identified by the EIS, and updated by recent assessment work (described in section 5) are summarised in Table 2.1 and Table 2.2. Further information on these impacts is provided in chapters 9 to 25 of the EIS and section 0 of this report.

Table 2.1 Summary of key potential construction impacts

Issue	Key potential construction impacts
Traffic, transport and access	▸ Temporary impacts to traffic and access, and an increase in both heavy and light vehicle movements on the local road network, particularly in the vicinity of the Parkes north west connection. ▸ Works on level crossings may result in local traffic disruptions and short term access restrictions. ▸ New temporary access tracks may be required in some locations. ▸ Construction activities would result in temporary impacts on existing rail operations. ▸ Localised minor impacts on Brolgan Road and Coopers Road traffic during construction works on the level crossing.
Biodiversity	▸ Permanent removal or modification (clearing) of about 66.7 hectares of native vegetation, and temporary disturbance of about 35.3 hectares of native vegetation, which includes threatened ecological communities listed under the *Threatened Species Conservation Act 1995* (TSC Act) and/or the EPBC Act. ▸ Impacts on aquatic ecological systems as a result of works to culverts and access across watercourses.
Noise and vibration	▸ Potential for construction noise to exceed the relevant criteria at various receivers along the proposal site.
Air quality	▸ Generation of dust from construction works and the movement of equipment and machinery.
Soils and contamination	▸ Erosion and sedimentation during construction could result in the contamination of soils and surface waters. ▸ The main contaminants that could be exposed during excavation are hydrocarbons and asbestos. ▸ Contamination associated with any leaks and spills.
Hydrology and flooding	▸ Potential for inundation of the works area during flood events. ▸ Temporary changes in flows as a result of construction activities.
Water quality	▸ Erosion and the generation of sediment, particularly during works in watercourses associated with the construction of new culverts and track works. ▸ Impacts on downstream water quality if management measures are not implemented, monitored, and maintained.
Aboriginal heritage	▸ Potential to impact four listed Aboriginal heritage sites. ▸ Impacts on any unexpected finds.

Issue	Key potential construction impacts
Non-Aboriginal heritage	▸ Impacts on the existing Parkes to Narromine line, a potential heritage item considered to be generally of local significance. ▸ Potential for vibration impacts on a dilapidated cottage (referred to as 'Wyanga cottage'), which is considered to be of local heritage significance. ▸ Impacts on any unexpected finds.
Visual and landscape	▸ Visual impacts during construction as a result of the presence of construction works, plant, and disturbance.
Land use and property	▸ Temporary disturbance to land use along the proposal site. ▸ Temporary impacts to agricultural/farming practices. ▸ Minimal acquisition of privately owned land (mainly for the Parkes north west connection), with resultant changes in land use.
Socio-economics	▸ Beneficial impacts during construction including employment (an estimated average workforce of 150 people), training opportunities, and flow on local and regional economic benefits. ▸ Impacts on the local community and/or individual landowners/occupants resulting from changes to traffic, transport and access arrangements. ▸ Impacts on the amenity of the local community, and impacts associated with the inflow of the workforce into the local area, including a requirement for temporary accommodation.
Sustainability and climate change	▸ Material consumption and associated carbon footprint. ▸ Emissions of greenhouse gases. ▸ Discharge to surrounding environment including waste production. ▸ Clearing and land excavations. ▸ Demand for fuel (diesel), water, sand, and aggregate.
Waste	▸ Indicatively, the proposal would generate about 647,807 cubic metres of spoil which would be re-used in track formation/construction (about 19 per cent) and for spoil mounds. ▸ Other waste material would include green waste, sleepers, rail tracks, formation material, fencing, and general soil waste.
Health and safety	▸ Introduction of potential ignition sources and fuel sources could increase bushfire risks. ▸ If inadequately managed, the storage and handling of dangerous goods and hazardous materials could cause leaks and spills, with resultant contamination and health impacts. ▸ Potential rupture of underground utilities during excavation or collision of plant and equipment with aboveground services. ▸ Public health and safety risks during construction.

Table 2.2 Summary of key potential operation impacts

Issue	Key potential operation impacts
Traffic, transport and access	▸ Minor impacts on road travel times as a result of increased train activity at level crossings.
Biodiversity	▸ Increase in train strikes on fauna species.
Noise and vibration	▸ Noise levels at a number of residential receivers have the potential to exceed the redeveloped rail line criteria for operational rail noise.
Air quality	▸ Increase in the number of diesel freight trains has the potential to increase levels of pollutants such as nitrogen oxides and particulate matter. ▸ Decreasing the number of heavy vehicles using major transport routes such as the Newell Highway would have a positive impact on air quality for receivers along these routes.
Soils and contamination	▸ If inadequately managed, maintenance could result in erosion of soils. ▸ Contamination of soils as a result of any accidental spills.
Water quality	▸ Surface runoff, which may contain sediment, traces of fuel, dissolved metals, and other contaminants deposited in the corridor from operation activities, could impact water quality. ▸ Impacts on water quality as a result of any accidental spills.
Hydrology and flooding	▸ Raising the height of the rail formation would impact surface water flows across the floodplain, changing the upstream flooding regime, and resulting in more concentrated flows through culverts that discharge to downstream waterways. ▸ Flood modelling predicts that the proposal would: • reduce the length of overtopping of the existing rail corridor in the proposal site during a one per cent annual exceedance probability (AEP), from about 7,175 metres to 406 metres • reduce the area of upstream flooding for flood events up to and including the two per cent event • increase the extent of flooding in a one per cent AEP event by about 10 per cent.
Visual and landscape	▸ Introduction of new structures in the landscape mainly associated with the Parkes north west connection.
Land use and property	▸ Use of the rail line would intensify once Inland Rail is operational. ▸ Flood modelling predicts that the proposal would result in an increase in the area of land subject to temporary inundation during a one per cent AEP, mainly affecting land subject to cropping and grazing uses.
Socio-economics	▸ Beneficial impacts would include better access to and from regional markets (including via the Parkes intermodal facility), enabler for regional economic development along the Inland Rail corridor, and safety and amenity benefits as a result of the reduction of freight transport on major road corridors.

Issue	Key potential operation impacts
Sustainability and climate change	▸ Potential risk of asset damage or failure in extreme weather events. ▸ Emissions of greenhouse gases from operational energy use and embodied energy in materials. ▸ Reduction in greenhouse gas emissions from transfer of freight from trucks to rail. ▸ Demand for fuel (diesel) and water.
Waste	▸ Minor quantities of green waste, general debris and litter may be generated during maintenance.
Health and safety	▸ Introduction of potential ignition sources could increase bushfire risks. ▸ If inadequately managed, transport of hazardous materials and dangerous goods via rail has the potential to impact the surrounding community and the environment through leaks and spills. ▸ Public health and safety risks including risks to pedestrians and road vehicles as a result of collisions with trains at level crossings, and other safety risks, such as security risks and unauthorised access.

3. Overview of submissions

This chapter provides an overview of the submissions received, including a breakdown of the types of submitters, the number of submissions received, and the key issues raised in submissions.

3.1 Submissions received

During the exhibition period, submissions were invited from the community and other stakeholders. The receipt of submissions was coordinated and managed by the Department of Planning and Environment. Submissions were received and registered by the Department, and uploaded onto the Department's website. Submissions were accepted by electronic online submissions or post, and were forwarded to ARTC for review and consideration.

A total of 23 submissions were received and registered by the Department. A breakdown of submissions by type of stakeholder is provided in Table 3.1.

Table 3.1 Breakdown of submissions received

Submitter type	Number of submissions received
Community member/individual	15[1]
Councils	2
State government departments/agencies	5
Other key stakeholders[2]	1
Total	**23**

Notes 1.Total number of submissions includes a multiple submission from one submitter
2: Defined as a peak group, committee or representative organisation

3.2 Analysis of submissions

3.2.1 Review of community submissions

The analysis of submissions involved identifying the issues raised and coding the issues into key issues (eg construction noise) and sub-issue categories (eg noise from construction compounds). A total of 10 key issue and 15 sub-issue categories were identified and coded during the submission review process. These categories form the basis for the structure of issue specific responses to the issues raised which is provided in section 6 of this report.

An assessment of each submission was undertaken, with each submission individually reviewed to understand the issues raised. The analysis involved identifying the issues raised, and coding them into key issues and sub-issues, as described above.

The issues raised were summarised and grouped according to the key issue and sub-issue categories, and responses to the issues raised are provided in section 6 according to these categories. Where relevant, input to the responses was sought from the specialists who assisted with preparation of the EIS.

Each issue identified in section 6 is presented as a summary of the issues raised by individual submissions. This means that, while the exact wording of a particular submission may not be presented in the summary of the issue, the intent of each individual issue raised has been captured. A response has been provided to each grouped issue summary.

Table A.1 in Appendix A identifies the key issues raised by individual community submissions, according to the submission number, and a reference to where a response to the key issues is provided in section 0.

A breakdown of the key issues raised in community submissions is provided in Table 3.2. As most of the submissions raised more than one issue, the number of issues identified is greater than the total number of submissions received.

A visual breakdown of the key issues raised by submissions is provided in Figure 3.1

Table 3.2 Summary of key issues raised

Key issue category	Sub-issue	Number of submissions identifying issue	Percentage of submissions identifying issue (%)
Proposal features and design	Design	3	7
	Level crossings	5	11
Proposal benefits	n/a	1	2
Traffic, transport and access	Operation impacts – level crossing traffic delays	2	4
Noise and vibration (amenity impacts)	Construction impacts	3	7
	Operation impacts	8	17
	Noise mitigation measures	3	7
Air quality impacts	Construction impacts - dust	1	2
Landscape and visual	Operational impact - visual	1	2
Land use and property	Property values and compensation	9	20
	Property impacts	1	2
Socio-economic	Operational impacts	2	4
Health and safety	Safety at rail and level crossings	5	11
	Maintenance of the existing corridor	1	2
Out of scope	n/a	1	2

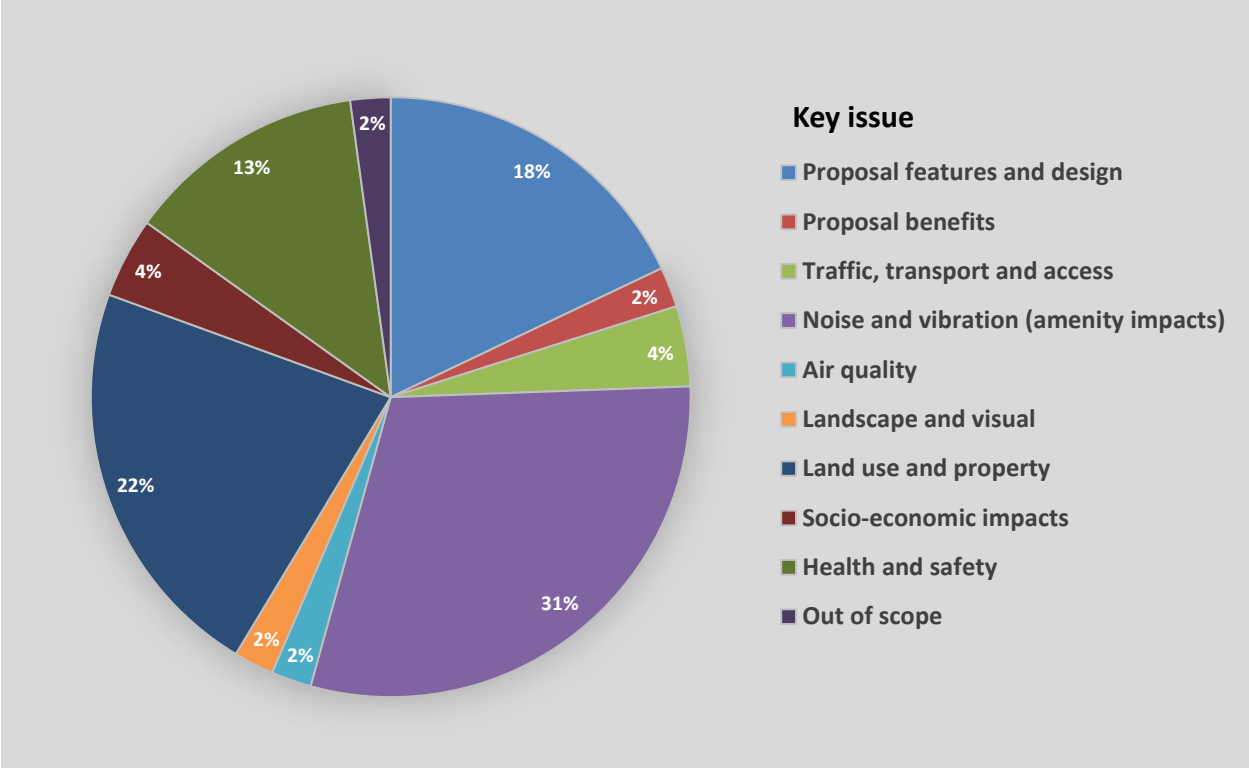

Figure 3.1 Breakdown of the key issues raised in community submissions

3.2.2 Review of agency and key stakeholder submissions

Each agency and other key stakeholder submission was reviewed in detail, and the issues raised categorised according to the main issue categories identified (as described in section 3.2.1). Further information on these submissions is provided in section 7.

4. Consultation undertaken during and after EIS exhibition

This chapter describes the actions undertaken subsequent to finalising the EIS. These actions included community and stakeholder consultation just prior to and during the exhibition period . Other actions included further work and EIS clarifications, including additional environmental assessment.

ARTC's values commit the organisation to active engagement with stakeholders and the community. For Inland Rail, effective communication and stakeholder engagement are fundamental to reducing risk, and reducing the potential for social and environmental impacts as far as possible. ARTC believes that identifying, engaging, and effectively communicating with stakeholders is critical to the successful delivery of Inland Rail.

ARTC's approach to consultation for the proposal is described in section 4.1 of the EIS. The consultation activities undertaken prior to exhibition of the EIS are described in sections 4.2 to 4.3 and Appendix D of the EIS.

The following sections describe the consultation undertaken just prior to public exhibition, consultation undertaken in conjunction with public exhibition, and the consultation that would be undertaken during future project stages.

4.1 Consultation prior to exhibition

Section 4.2 and Appendix D of the EIS describe the consultation undertaken up until 31 December 2016. Subsequent to this date and prior to public exhibition of the EIS, additional consultation was undertaken. As the EIS was being finalised at this time, these activities were not described in the EIS.

Table 4.2 lists the engagement activities undertaken in early to mid-2017, prior to exhibition of the EIS.

Table 4.1 Consultation undertaken in early to mid-2017 prior to public exhibition

Activity	Detail
Project website (https://inlandrail.artc.com.au/Parkes to Narromine)	▸ Information about exhibition of the EIS was included on the project website.
Toll free community information line (1800 732 761) and project email (inlandrailenquires@artc.com.au)	▸ Requests for information (the majority of which were from potential suppliers) were responded to by the community engagement team.
Advertisements	▸ Advertisements were placed in local papers in January 2017 to advise the community that a site light detection and ranging (LiDar) survey would be undertaken in February 2017.
Face to face meetings	▸ Meetings were held with 55 private and public landowners and representatives of Parkes and Narromine councils to provide an update on the proposal and EIS process, and to organise access agreements to facilitate the investigations that would be required during detailed design. ▸ A meeting was held with the Federal Member for the Electorate of Parkes (Mark Coulton MP) on 5 May 2017 to provide an update on the proposal and EIS process.
Other briefings and contacts made	▸ A teleconference briefing was held with the Melbourne Brisbane Inland Rail Alliance on 13 February 2017, to update local government representatives on the proposal and EIS process. ▸ A teleconference briefing was held with the NSW Farmers Association on 28 February 2017 to update the Association on all NSW Inland Rail projects, the proposal, and the EIS process. ▸ Contact with stakeholders, including Roads and Maritime Services (Roads and Maritime), Parkes and Narromine councils, and individual landowners, was made via telephone or email in January 2017 as part of planning for the LiDar survey. ▸ Phone discussions were held with the NSW Member for Orange (Phillip Donato MP) on 1 March 2017, and the Federal Member for the Electorate of Parkes (Mark Coulton MP) on 18 January 2017) to provide an update on the proposal and EIS process. ▸ Phone calls were made, and emails issued, to 25 private and public landowners and/or their representatives, to provide an update on the proposal and EIS process, and obtain access agreements to facilitate the investigations required during detailed design.
Community update – e news	▸ An e news update was issued to all relevant council, NSW and Federal Government representatives to provide information on the LiDAR surveys, and copies of questions/answers and print advertising.

4.2 Consultation during exhibition

The EIS was placed on public exhibition for a period of 31 days between 19 July 2017 and 18 August 2017.

During the display period, government agencies, key stakeholders (including interest groups and organisations), and the community were invited to make written submissions. A summary of the engagement activities and tools used to encourage community and stakeholder participation during the exhibition is provided below.

The EIS was made available to the public at the following locations:

- Parkes Shire Council Administration Centre, 2 Cecile Street, Parkes
- Narromine Shire Council Administration Centre, 124 Dandaloo Street, Narromine
- Peak Hill Library, 98 Caswell Street, Peak Hill
- NSW Department of Planning and Environment, 320 Pitt Street, Sydney
- NSW Department of Planning and Environment, Western Region Office, Information Centre – Area 1, Level 1, 188 Macquarie Street, Dubbo
- Nature Conservation Council of NSW, Level 14, 338 Pitt Street, Sydney.

The EIS was also available on the Department of Planning and Environment's website at: www.majorprojects.planning.nsw.gov.au and the project website at www.inlandrail.artc.com.au.

Table 4.2 Consultation during the EIS exhibition period

Activity	Detail
Project website (https://inlandrail.artc.com.au/ Parkes to Narromine)	▸ Information about public exhibition of the EIS was provided on the project website.
Advertisements	▸ Advertisements were placed in the following local papers to provide information about exhibition of the EIS, display locations, and information sessions: • Parkes Champion - on 26 July 2017 and 2 August 2017 • Narromine News - on 26 July 2017, 2 August 2017 and 9 August 2017 • The Parkes Phoenix - on 28 July 2017 and 4 August 2017 • Peak Hill & District Times - on 2 August 2017 • Koori Mail - on 26 July 2017.
Letter box drop	▸ 221 letters were sent to all landowners/occupants located within 500 metres of the existing rail line and the Parkes north west connection.
Community information sessions	▸ Six community information sessions were held in local venues. The sessions provided information and displays, and were supported by members of the project team and specialists to answer questions. The sessions were held at the following locations: • Parkes - Coventry Room and Cultural Centre, Parkes Shire Council Library, Bogan Street – on 2 and 8 August 2017 • Peak Hill - Ex Services and Citizens Club, Caswell Street – on 2 and 8 August 2017 • Narromine - Soul Food Design Depot, Dandaloo St – on 3 and 9 August 2017. ▸ A total of 121 people attended the community information sessions. ▸ Attendees included Department of Infrastructure and Regional Development representatives.
Other contacts made	▸ 15 agencies and key stakeholders were contacted via telephone or email to encourage attendance at the community information sessions and to promote awareness of the public exhibition and submissions period. Agencies/stakeholders contacted included emergency services representatives, Local Land Services representatives, Parkes Shire Council and Narromine Shire Council representatives, NSW Farmers Federation, Roads and Maritime, and existing rail freight users. ▸ Cultural knowledge holders were invited to attend the community information sessions and were provided with information on the display period. ▸ 40 copies of the EIS were posted to targeted contacts.

Activity	Detail
Fact sheets	▸ A project fact sheet, which included information on how to make a submission, was made available on the project website and at the community information sessions. ▸ A level crossing fact sheet, which included information on what level crossings are and why works on them are proposed, was also made available on the project website and at the community information sessions.

4.3 Ongoing consultation

Consultation plan

As described in section 4.1.2 of the EIS, ARTC has developed a *Communication and Engagement Plan – Parkes to Narromine* to guide engagement with the local community. As defined by the plan, consultation will continue to be undertaken over the next three phases:

- construction
- commissioning and handover
- operation.

The communication and engagement activities are tailored in the plan for each phase, and generally include:

- meetings and briefings
- workshops
- community information sessions
- phone, email and written correspondence
- project website
- distribution of information, including mail outs.

Consultation will continue on a regular basis as guided by this plan. A full list of the activities proposed is provided in Table 4.3.

Table 4.3 Proposed consultation activities

Activity	Timing	Design	Construction	Operation
Advertisements	Relevant milestones	✓	✓	
Community engagement team – Locally based	Ongoing	✓	✓	✓
Community events including sponsorship	Ongoing	✓	✓	✓
Community information sessions	Ongoing	✓	✓	
Construction complaints management system	Prior to construction	✓	✓	
Construction notifications	As required	✓	✓	
Operations complaints				✓

Activity	Timing	Design	Construction	Operation
Advertisements	Relevant milestones	✓	✓	
Community engagement team – Locally based	Ongoing	✓	✓	✓
Community events including sponsorship	Ongoing	✓	✓	✓
Community information sessions	Ongoing	✓	✓	
Construction complaints management system	Prior to construction	✓	✓	
Construction notifications	As required	✓	✓	
management system				
Email and newsletter Updates	Relevant milestones and project information/ updates	✓	✓	
Engagement with landowners	Ongoing	✓	✓	✓
Enquiries hotline and email	Ongoing	✓	✓	✓
Engagement with stakeholders including government, peak bodies, emergency services, suppliers	Ongoing	✓	✓	✓
Fact sheets	Relevant milestones	✓	✓	
Project briefings and presentations	Relevant milestones	✓	✓	
Website	Ongoing	✓	✓	✓

Consultation and community feedback

Consultation with the community and key stakeholders would be ongoing in the lead up to, and during construction of the proposal. The consultation activities would ensure that:

- the community and stakeholders have a high level of awareness of all processes and activities associated with the proposal
- accurate and accessible information is made available
- a timely response is given to issues and concerns raised by the community
- feedback from the community is encouraged
- opportunities for input are provided.

The 1800 phone number and proposal email address would continue to be available during construction, along with a 24-hour construction response line. Targeted consultation methods, such as letters, notifications, signage and face-to-face communications, would continue to occur. The Inland Rail website and social media platforms would also include updates on the progress of the proposal.

The following communication tools and activities would be used during the construction phase:

- proposal email address
- 1800 phone number
- updates to the Inland Rail website

- targeted consultation and notifications as required, including letters, notifications, and face to face communication
- construction signage.

Complaints management

The construction contractor engaged to construct the proposal would be required to implement a complaints management system during construction. This system would be incorporated within the construction environmental management plan (CEMP), which the contractor would be required to prepare and have approved by ARTC prior to construction commencing.

The complaints management procedure would include, at a minimum:

- contact details for a 24-hour project response line and email address, for ongoing stakeholder contact throughout the proposal
- provision of accurate public information signs while work is in progress
- staging of works, developed in consultation with relevant stakeholder groups, to minimise disruption and impacts to community activities and functions
- management of complaints in accordance with ARTC's emergency management procedure, specifically:
  - details of all complaints received will be recorded
  - verbal and written responses will be provided within time limits.

5. Clarifications and additional environmental assessment

5.1 Clarifications

In response to issues raised in the submissions, this section clarifies information included in the EIS, namely:

- the area of permanent and temporary impacts on native vegetation and endangered ecological communities under the TSC Act and the EPBC Act
- closure of Coopers Road
- downstream impacts (hydrology and flooding); and
- the crash data used in the EIS (Technical Report 1).

5.1.1 Further information regarding these clarifications is provided below. Permanent and temporary impacts on native vegetation

Submissions were received requesting further information regarding the potential permanent and temporary impacts of the proposal, and requiring justification of biobanking credit calculations which were undertaken in accordance with the *Framework for Biodiversity Assessment* (OEH, 2014a) and with consideration to the TSC Act.

It should be noted that the *Biodiversity Conservation Act 2016* (NSW) (the BC Act) commenced on 25 August 2017. The BC Act replaces the TSC Act, and introduces a new Biodiversity Offsets Scheme for NSW developments. The Biodiversity Conservation (Savings and Transitional) Regulation 2017 contains arrangements to facilitate the transition to the new scheme. Under the transitional arrangements for major projects, the former TSC Act biodiversity offsets scheme can be used where the environmental assessment requirements of the Secretary of the Department of Planning and Environment were issued, or substantial environmental assessment was undertaken via an EIS, prior to 25 August 2017. Given the SEARs for the proposal were received in November 2016 and public exhibition of the EIS concluded on the 18 August 2017, the proposal is being assessed using the TSC Act under the transitional arrangements.

The potential biodiversity impacts of the proposal were predicted and assessed in the EIS. The full results were provided in Technical Reports 3, 4 and 5, and a summary of the results was provided in chapter 10 of the EIS. The EIS concluded that the proposal would result in permanent impacts to biodiversity due to the removal and clearance of vegetation required to construct the proposal. The proposal also has the potential to result in temporary impacts where construction facilities, such as compounds and temporary access tracks, are located. Native vegetation in these areas is not expected to be fully impacted (ie will not be cleared) but would be subject to some disturbance (e.g. driven over, equipment stored on grassed areas, trees may require targeted pruning etc.) and is expected to recover. It is expected that these areas would regenerate following completion of works/use of these short-term areas. Given this, biobanking credit calculations were undertaken for areas of permanent impacts. The multiple locations in which permanent and temporary impacts were reported in the EIS and technical reports resulted in some minor reporting errors. As a result, the areas of permanent and temporary impacts on native vegetation are confirmed in Table 5.1 and Table 5.2.

Table 5.1 lists the permanent and temporary disturbance areas for native plant community types (PCTs), while Table 5.2 lists the permanent and temporary disturbance area for PCTs that conform with ecological communities listed under the TSC Act and/or EPBC Acts. The proposal's biobanking credit calculations are as per those provided in Technical Report 2 of the EIS.

In the majority of cases, where PCTs conform to threatened ecological communities listed under the TSC Act and/or EPBC Act, not of all the vegetation is of sufficient extent or quality to conform to the relevant threatened ecological community. Therefore, the area of threatened ecological community can be less than the corresponding PCT area.

Table 5.1 Estimated area of each native plant community type that would be impacted

Plant community type		Permanent disturbance area (ha)	Temporary disturbance area (ha)
PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Moderate to good	3.16	0.31
PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion	Moderate to good	0.87	0
	Low generation	0.62	0
PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions	Moderate to good	0.94	0.18
	Derived native grassland	6.13	0.99
PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt	Moderate to good	1.54	0.41
PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Moderate to good	8.58	1.55
	Derived native grassland	23.47	8.59
PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)	Moderate to good	1.41	1.97
	Derived native grassland	1.20	13.25
PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Moderate to good	1.50	0.38
PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	Moderate to good	3.12	0.12
	Derived native grassland	0.46	0.11
PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	Moderate to good	3.40	3.76
	Derived native grassland	10.32	3.64
Total area impacted		**66.72**	**35.26**

Table 5.2 Plant community types recorded in the development site and the corresponding impacts on threatened ecological communities listed under the TSC Act and EPBC Act

Plant community type	Permanent disturbance area (ha) and listing status	Temporary disturbance area (ha) and listing status
PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Includes 3.16 ha of *Myall Woodland EEC* under the TSC Act to be permanently impacted Includes 0.99 ha of *Weeping Myall Woodlands EEC* under the EPBC Act to be permanently impacted	Includes 0.31 ha of *Myall Woodland EEC* under the TSC Act to be to be temporarily impacted Includes 0 ha of *Myall Woodland EEC* under the EPBC Act to be to be temporarily impacted
PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion	Not listed	
PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions	Not listed	
PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt	Not listed	
PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Includes 30.29 ha of *Inland Grey Box Woodland EEC* under the TSC Act to be permanently impacted Includes 31.37 of Grey *Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* under the EPBC Act to be permanently impacted.	Includes 9.1 ha of *Inland Grey Box Woodland EEC* under the TSC Act to be temporarily impacted Includes 10.14 ha of *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC* under the EPBC Act to be temporarily impacted
PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)	Not listed	

Plant community type	Permanent disturbance area (ha) and listing status	Temporary disturbance area (ha) and listing status
PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Includes 1.50 ha of *Fuzzy Box Woodland EEC* under the TSC Act to be permanently impacted Not listed under the EPBC Act	Includes 0.38 ha of *Fuzzy Box Woodland EEC* under the TSC Act to be temporarily impacted Not listed under the EPBC Act
PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	Includes 17.28 ha of *White Box Yellow Box Blakely's Red Gum Woodland EEC* under the TSC Act to be permanently impacted Includes 15.11 ha of *White Box Yellow Box Blakely's Red Gum Woodland CEEC* under the EPBC Act to be permanently impacted	Includes 7.63 ha of *White Box Yellow Box Blakely's Red Gum Woodland EEC* under the TSC Act to be temporarily impacted Includes 7.63 ha of *White Box Yellow Box Blakely's Red Gum Woodland CEEC* under the EPBC Act to be temporarily impacted
PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion		

The actual amount of vegetation with the potential to be directly impacted would be subject to further refinement during detailed design. The estimate of potential clearing would continue to be refined as the design of the project progresses, with the aim of reducing the potential clearing required. Once the detailed design has been completed, and the proposal site extent is refined, the *Framework for Biodiversity Assessment* (OEH, 2014a) credit calculations for the proposal will be revised to generate the final ecosystem and species credit requirements, including temporary impacts. The ecosystem and species credits generated as a result of the proposal would be offset in accordance with the *Framework for Biodiversity Assessment* and the revised biodiversity offset strategy (phase 1) provided in Appendix D of this report.

5.1.2 Crash data

The traffic, transport and access assessment undertaken as part of the EIS (Technical Report 1) used the crash data available at the time of the assessment, for the 2009 to 2013 period. A five-year period was assessed to avoid the variation that can occur from year to year. More recent data is now available for the 2012 to 2016 period), and this data was reviewed to determine whether it would change the outcomes of the assessment undertaken as part of the EIS. This review indicated that, while the data set is different to that used in the original assessment, the outcomes of the traffic, transport and access assessment would not change. The review identified that the location of crash occurrences is generally consistent from one data set to the other. Where crashes have been recorded in one data set but not the other, it is generally only a single crash, and no trends can be determined. Note that the 2009-2013 data was for casualty crashes only (fatal and injury crashes), whereas for the 2012-16 data set includes non-injury crashes. This provides additional depth of detail for the assessment however due to the relatively small number of non-injury crashes and the location of these crashes relative to activities associated with the Proposal, it does not alter any conclusions that have been drawn from the data set used in the EIS assessment. Updated crash data obtained from the Transport for NSW Centre for Road Safety is provided in Table 5.3. This data includes two level crossing crashes that occurred in Narromine, one of which was a fatality at The McGrane Way level crossing in 2015, and the other was a serious injury crash at the Backwater Road level crossing in 2012.

As part of the level crossing strategy (described in section 6.3.3 of the EIS) ARTC would use the Australian Level Crossing Assessment Model (ALCAM) to assess public level crossings. This would consider factors such as future road traffic numbers, vehicle type, train numbers, speeds, and sighting distances. In addition, for public crossings, ARTC would work with the relevant roads authority to take into consideration future development plans and other important local factors. Mitigation measure D2.2 commits ARTC to review all level crossings and the potential treatments in consultation with relevant stakeholders during the detailed design.

Table 5.3 Crash data 2012 – 2016

	Fatal	Serious	Moderate	Minor	Non-injury	Total
Newell Highway						
Dubbo - Tomingley	4	6	8	1	16	**35**
Tomingley - Peak Hill		1	1		4	**6**
Peak Hill (town)		1	1	1	1	**4**
Peak Hill – Alectown		2	3	2	2	**9**
Alectown - Parkes			4	2	3	**9**
Newell Highway Total	4	10	17	6	25	**62**
Other roads						
The McGrane Way	1					**1**
Old Backwater Road		1				**1**
Peak Hill Railway Road			1		1	**2**
Bulgandramine Road					1	**1**
Tomingley Road	2	1	3	2	1	**9**
Alectown West Road					2	**2**
Bogan Road			4			**4**
Henry Parkes Way		2	3	1	1	**7**
Brolgan Road		1	4		1	**6**

5.2 Environmental assessment undertaken following the exhibition period

5.2.1 Noise Assessment

A noise and vibration assessment was undertaken as part of the EIS to determine the potential construction and operation noise and vibration impacts of the proposal. The results of this assessment are provided in Technical Report 5 and chapters 11 and 12 of the EIS. Following exhibition of the EIS,

assessment was undertaken to address some of the noise issues raised in submissions. Assessment was undertaken of the following:

- the potential cumulative noise impact associated with undertaking construction activities concurrently
- vibration impacts to human comfort, using criteria in the *Assessing Vibration: A Technical Guideline* (DEC, 2006a) (AVTG) rather than the *British Standard* (BS) *5228-2:2009 Code of practice for noise and vibration on construction and open sites – Part 2: Vibration* (BS 5228-2:2009) criteria used in the EIS
- sleep disturbance impacts, as opposed to the sleep awakening impacts assessed in the EIS
- noise impacts due to warning bells at level crossings.

A description of the results of this assessment is provided in the following sections.

Cumulative noise impacts

The noise and vibration impact assessment in the EIS (Technical Report 5) assessed construction noise impacts from 14 construction scenarios (S01 to S14). These scenarios are shown in Table 5.4 and each represent different equipment noise levels, providing an indication of how noise levels may change across the proposal site.

Table 5.4 Construction scenarios

Modelling scenario	General tasks
S01	Site establishment works
S02	Track upgrading – skim reconditioning
S03	Track upgrading – track reconstruction
S04	Drainage construction
S05	Level crossings – upgrade to signalised level crossing
S06	Level crossing - upgrade passive protection (give way signs to stop signs)
S07	Level crossing - closure/removal
S08	Culvert removal and replacement
S09	Crossing loop construction
S10	Post construction works (finishing works/reinstatement)
S11	Parkes north west connection – site establishment
S12	Parkes north west connection – earthworks
S13	Parkes north west connection – track works
S14	Brolgan Road rail overbridge construction[1]

[1] The cumulative noise assessment was undertaken in advance of detailed design indicating that the preferred option is to provide a level crossing at Brolgan Road and a level crossing at Coopers Road.

This assessment has been updated to include the cumulative impacts of construction scenarios that may occur concurrently. Construction activities that may occur concurrently are listed below for the different stages of construction.

Stage 1 (Parkes to Goonumbla) - cumulative scenario 1:

- trackworks (S02, S03)
- drainage construction (S04)
- culvert removal and replacement (S08)
- Parkes north west connection construction (S11, S12, S13)
- Brolgan Road overbridge construction (S14).

Stage 2 (Goonumbla to Narwonah) and Stage 3 (Narwonah to Narromine) - cumulative scenario 2:

- trackworks (S02, S03)
- drainage construction (S04)
- level crossing – upgrade to signalised level crossings (S05)
- level crossing – upgrade passive protection (give way signs to stop signs) (S06)
- level crossing – closure/removal (S07)
- culvert removal and replacement (S08)
- crossing loop construction (S09).

These scenarios assume that all the construction activities within them could potentially be undertaken concurrently within a one kilometre section of the proposal site. In reality this is unlikely to be the case, because the majority of the activities would occur sequentially rather than concurrently. Additionally, there are very few locations along the proposal site where all proposed infrastructure is located close to each other, as well as close to a sensitive receiver. The cumulative impact assessment is therefore representative of worst case conditions.

The method used to predict cumulative noise exceedances is consistent with that described in Technical Report 5 (of the EIS), as are all other assumptions and inputs. Activity based noise levels from each of the different construction scenarios within a given cumulative scenario were combined, and input into the noise model. To provide an additional measure of conservatism the maximum noise impacts of these cumulative scenarios was considered to be the worst-case predicted noise impacts.

The predicted noise management level exceedances for the worst-case cumulative scenario are listed in Table 5.5, together with the numbers of receivers where noise would exceed each management level. Construction noise impacts for individual receivers are provided in Appendix C (Table C.1).

Table 5.5 Construction management level exceedances of residential receivers for cumulative scenario

Construction management level (CML)	CML $LA_{eq\ 15min}$	Maximum predicted exceedance of CML (dBA)	Number of exceedances of CML
Highly affected	75	0	0
Proposal specific CML (all periods)	35	36	723

The potential for construction noise impacts at identified non-residential receivers was also assessed; however no exceedances of relevant criteria were predicted to occur.

Based on the results listed in Appendix C (Table C.1), activities undertaken concurrently (as per cumulative scenarios 1 and 2) are predicted to exceed the proposal specific construction management level at the following locations:

- between Parkes and Peak Hill – at 68 receivers, with exceedances up to 30 dBA
- within Peak Hill – at 317 receivers, with exceedances up to 34 dBA
- between Peak Hill and Narromine – at 338 receivers, with exceedances up to 36 dBA.

While the cumulative impact assessment indicates that a large number of receivers would have the potential to be impacted, particularly when compared to the activity-specific assessment undertaken as part of the EIS, the actual potential for these receivers to be impacted due to activities occurring concurrently is low.

This is a linear project, and construction would move progressively along the alignment. This means that any given receiver would only be exposed to noise from construction for a limited amount of time. Additionally, in reality the majority of the construction scenarios used in the cumulative assessment would actually occur sequentially, rather than concurrently. For example, track works would occur before drainage construction, which would occur before culvert replacement etc. Therefore, the assessment findings are considered worst-case.

As described in section 11.5 of the EIS construction would be undertaken in accordance with the Inland Rail NSW Construction Noise and Vibration Framework (provided in Appendix E of this report). The framework identifies the requirement to develop Construction Noise and Vibration Impact Statements, which would be based on a more detailed understanding of the construction methods and detailed reviews of local receivers, if required. Development of the Construction Noise and Vibration Impact Statements would also include assessment of the potential noise and vibration impacts as a result of different construction activities. This would enable consideration of impacts due to realistic cumulative scenarios.

Mitigation measure C4.1 commits ARTC to implementation of the Inland Rail NSW Construction Noise and Vibration Framework, and undertaking construction with the aim of achieving construction noise management levels and vibration criteria identified by the noise and vibration assessment.

Construction vibration impacts

Vibration from construction plant and equipment was predicted and assessed in the EIS. The full results were provided in Technical Report 5, and a summary of the results was provided in chapters 11 and 12 of the EIS. The assessment was undertaken with consideration of relevant guidelines and standards, in particular AVTG, BS 5228-2:2009, and BS 6472:1992.

The assessment of vibration levels from intermittent construction sources is described in AVTG, which is based on BS 6472:1992[2]. The assessment evaluates a vibration dose value (VDV), which incorporates the magnitude of vibration and the length of time the source of the vibration operates. During construction of a project, the vibration impact on a receiver can be measured and compared directly to the AVTG VDV criteria for day and night periods, and for various receiver types.

The exact details of the construction methodology for the proposal, such as operating duration of vibration generating equipment, are not yet known. This information would be determined during detailed design and construction planning. As a result, estimating the VDV values from construction sources requires a broad range of assumptions. The AVTG notes that velocity values can be used as a screening method. In addition, velocity values are widely available for typical construction equipment, and are more likely to be routinely measured based on the more usual concern about potential building damage. Therefore, peak particle velocity (PPV) is adopted as a screening method to assess human comfort impacts from construction vibration. This was assessed by the noise and vibration assessment, with consideration

[2] Human comfort vibration was assessed to Assessing Vibration: A Technical Guideline (DEC 2006) (the AVTG). The AVTG is referenced in the SEARs. The AVTG was developed with reference to BS 6472–1992 and extracts various parts of this standard. While it is acknowledged that BS 6472-1992 has since been updated to BS 6472-2008, the AVTG was considered the relevant guideline for undertaking the vibration assessment in accordance with the SEARs, and this guideline was developed based on BS 6472-1992, therefore the information contained in BS 6472-1992 is applicable for the proposal and used to ensure a consistent approach to assessment.

given to the guidance contained in BS 5228-2.2009, which provides level categories that relate to human perception of vibration.

The assessment for the EIS provided safe-working buffer distances, within which sensitive receivers may be impacted by vibration. As described in the EIS, based on buffer distances provided in BS 5228-2.2009, vibration may be perceptible at certain times within 140 metres of general construction works, and within 120 metres of bored piling.

In response to various submissions regarding noise, the vibration assessment was updated to include human comfort levels in accordance with BS 6742:1992, as per the approach presented in AVTG. Further information regarding the updated noise and vibration assessment is provided in Appendix C. Additionally, the results of the previous assessment, undertaken in accordance with BS 5228-2.2009 were reviewed to determine whether there was an opportunity to minimise the impacts identified in the EIS.

Safe working distances to comply with the human comfort vibration criteria are provided in Table 5.6, in accordance with BS 5228-2.2009 as per the EIS and the BS 6742:1992, as per the updated assessment.

Table 5.6 Vibration buffer distances – intermittent vibration

Equipment	Human comfort BS 5228-2 criteria (1.0mm/s)	Human comfort ACTG criteria, VDV ($m/s^{1.75}$)			
		Day preferred value $0.2m/s^{1.75}$	Day maximum value $0.4m/s^{1.75}$	Night preferred value $0.13m/s^{1.75}$	Night maximum value $0.26m/s^{1.75}$
Roller	90 m	212 m	89 m	156 m	65 m
15 tonne vibratory roller	140 m	303 m	128 m	223 m	94 m
7 tonne compactor	90 m	212 m	89 m	156 m	65 m
Dozer	60 m	128 m	54 m	94 m	39 m
Backhoe	10 m	23 m	9 m	17 m	7 m
Excavator	25 m	57 m	24 m	42 m	18 m
Piling impact)	700 m	1583 m	666 m	1164 m	489 m
Piling (vibratory)[1]	110 m	767 m	101 m	147 m	83 m
Piling (bored)	120 m	275 m	116 m	202 m	85 m

Notes 1: Based on levels derived from BS 5228-2.2009. Vibratory piling based on $d^{-1.2}$ propagation relationship
2: Vibration may be amplified in multi-level buildings through the structure to the upper floors. A doubling of the buffer distances provided in Table 1 would provide a conservative allowance for this possible effect where multi storey buildings are identified.

Works in the rail corridor and at crossing loops

Using the BS 6742:1992 criteria, during general construction works, vibration may be perceptible at certain times within a maximum of 303 metres of the works. Forty-two residential receivers were identified within this distance.

Using the BS 5228-2.2009 criteria, during general construction works, vibration may be perceptible at certain times within 140 metres of the works. Forty-three residential receivers were identified within this distance.

Construction would progress along the proposal site, and vibration impacts would be experienced for relatively short times at most locations. Construction in each work area would be completed within about eight to 10 weeks.

Mitigation

The Inland Rail NSW Construction Noise and Vibration Management Framework (provided in Appendix E) was developed to show how construction noise and vibration will be managed for Inland Rail.

Specifically, the framework identifies the requirements and methodology to develop Construction Noise and Vibration Impact Statements. These would be prepared prior to specific construction activities and based on a more detailed understanding of the construction methods, including the size and type of construction equipment, duration and timing of works, and detailed reviews of local receivers if required. As described in section 11.5 of the EIS and the framework, a Construction Noise and Vibration Impact Statement would include:

- a more detailed understanding of surrounding receivers, including particularly sensitive receivers such as education and child care, and vibration sensitive medical, imaging, and scientific equipment
- application of appropriate noise and vibration criteria for each receiver type
- an assessment of the potential noise and vibration impacts as a result of different construction activities
- minimum requirements in relation to standard noise and vibration mitigation measures
- noise and vibration auditing and monitoring requirements
- additional mitigation measures to be implemented when exceedances to the noise or vibration management levels are likely to occur - these measures are aimed at pro-active engagement with potentially affected receivers, provision of respite periods, and alternative accommodation for defined exceedance levels.

Where sensitive receivers are located within the identified buffer distances, based on the equipment likely to be used, an assessment of the potential vibration impacts would be undertaken and feasible and reasonable noise and vibration mitigation measures would be implemented in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework. Mitigation measure C4.1 commits ARTC to implementing the Inland Rail NSW Construction Noise and Vibration Management Framework and constructing the proposal with the aim of achieving the construction vibration criteria identified by the noise and vibration assessment.

Where short term works are proposed (typically impacting a receiver for less than one week) the AVTG acknowledges the need to balance the level of impact with the duration of the works:

> *"When short-term works such as piling, demolition and construction give rise to impulsive vibrations, undue restriction on vibration values may significantly prolong these operations and result in greater annoyance. Short-term works are works that occur for a duration of approximately one week."*

It may be the case that some receivers near the proposal would be subject to vibratory works of short duration (for instance, during a track possession). This is particularly relevant where works consist of linear activities. As specific construction schedules are not known at this stage, the duration of works and duration of impact in an assessment period (day and night) would be refined and human comfort impacts updated through implementation of the Inland Rail NSW Construction Noise and Vibration Management Framework (refer to mitigation measure C4.1 as per above).

Sleep disturbance impacts

The *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) states that 'where construction works are planned to extend over more than two consecutive nights, the impact assessment should cover the maximum noise level from the proposed works'.

Sleep awakening impacts were assessed in the EIS (Technical Report 5) based on guidance in the *Road Noise Policy* (RNP) (OEH, 2011). The *Environmental Criteria for Road Traffic Noise* (EPA, 1999) acknowledges that, based on the current level of understanding, no absolute noise level criteria have been established that correlate to an acceptable level of sleep disturbance. However, the RNP suggests that internal noise levels below 50 dB(A) $_{LAmax}$ to 55 dB(A) $_{LAmax}$ are unlikely to cause awakening

reactions, and one or two events per night, with internal noise levels of 65 dB(A) $_{LAmax}$ to 70 dB(A) $_{LAmax}$ (inside dwellings) are not likely to significantly affect health and wellbeing.

The sleep disturbance assessment has been updated to include the more conservative sleep disturbance screening method in the application notes of the *NSW Industrial Noise Policy* (INP) (EPA, 2000).

The INP application notes refer to the RNP and suggests that the L_{Amax} or $L_{A1,1min}$ noise level should not exceed the background L_{A90} level by more than 15 dB(A). This value is used as a screening test to identify potential for sleep disturbance (instead of sleep awakening) and is applied outside a sensitive receiver's bedroom window during the night-time period.

Table 5.7 provides a summary of the sleep disturbance and sleep awakening levels.

Table 5.7 Sleep awakening and disturbance criteria

Criteria	L_{AMax} Criteria[1]	Assessment location
Sleep awakening (from the RNP)	55 dB(A)	Internal
Sleep disturbance screening level (from the INP)	RBL[2] +15 dB(A)	External

Notes 1: 55 dB(A) internal level from the RNP. L_{AMax} levels were estimated as 10 dB(A) greater than the LAeq(15minute) levels and external noise levels were assessed as 10 dB(A) above internal levels.
2: Rating background levels (RBL) for all receivers in this project have been set at 30 dB(A).

The assessment has been updated to assess receivers to the INP screening criteria. Potential exceedances of this criteria and the RNP sleep awakening criteria used in the EIS are shown in Table 5.8 for each of the proposed construction scenarios (including the worst-case cumulative scenario). Receivers where exceedances of the INP sleep disturbance criteria or the RNP sleep awakening criteria are predicted are provided in Appendix C (Tables C.5 and C6, respectively).

Table 5.8 Sleep disturbance exceedances

Criteria	Item	Number of predicted exceedances of sleep disturbance criteria											
		Full alignment works: S1, S2, S3, S4, S12	S5: Signalised Crossing	S6: Give Way Crossing	S7: Level Crossing removal	S8: Culvert works	S9: Crossing loops	S10: Post construction	S11: NW Connection Establishment	S12: NW Connection Earthworks	S13: NW Connection Trackworks	S14: NW Connection Overbridge	Cumulative Construction Impacts
INP Sleep Disturbance Screening Criteria	Number of exceedances	294	59	20	9	264	135	99	9	23	9	2	723
	Maximum predicted exceedance, dBA	33	24	21	13	25	18	28	14	18	14	18	36
RNP Sleep awakening criteria	Number of exceedances	13	1	1	0	2	0	7	0	0	0	0	20
	Maximum predicted exceedance, dBA	13	4	1	-	5	-	8	-	-	-	-	16

Based on the results provided in Table 5.8 the following is noted:

- Maximum noise impacts of 36 dBA above the INP screening criteria are predicted to occur during the worst case cumulative activity scenario.
- Maximum noise impacts of 16 dBA above the RNP sleep awakening criteria are predicted to occur during the worst case cumulative activity scenario.

The INP application notes state that disturbance impacts are likely to be encountered during the hours of 10pm to 7am. The primary proposal construction hours are 6.00am to 6.00pm. Therefore, sleep disturbance impacts will generally be restricted to during the morning shoulder period of 6.00am to 7.00am. As described in chapter 8 of the EIS it is anticipated that construction will take about 18 months and would progress from south to north along the length of the proposal. Therefore, sleep disturbance impacts would be experienced for a relatively short time at most locations.

Some minor works may also be undertaken during scheduled rail corridor possession (that is, the times that the movement of trains along the rail corridor are stopped for maintenance or construction). This could include, for example, the connection of the tracks at either end of each stage, and some finishing works. During possessions, works may need to be undertaken on a 24 hour basis.

Given the potential for sleep disturbance impacts, feasible and reasonable noise and vibration mitigation measures would be implemented in accordance the Inland Rail NSW Construction Noise and Vibration Management Framework. Mitigation measure C4.1 commits ARTC to implementing the Inland Rail NSW Construction Noise and Vibration Management Framework and constructing the proposal with the aim of achieving the construction noise management levels and vibration criteria identified by the noise and vibration assessment.

Warning bells at level crossings

Operational noise impacts were assessed in the EIS (Technical Report 5 and chapter 11). As described in Technical Report 5, the operational noise assessment considered track geometry, train speeds and existing and proposed train volumes. Consideration of noise from level crossings was not included in the operational assessment. Therefore, the operational noise assessment has been updated to include noise impacts from warning bells that sound at level crossings. Assumptions made regarding the warning bell noise assessment are as follows:

- Crossing bells will activate 30 seconds prior to train entering level crossing and remain audible throughout train pass-by.
- An indicative source level of 105 dB(A) at 3 metres from the source has been assumed for warning bells at level crossings. This is based on the American Railway Engineering and Maintenance of Way Association (AREMA) Manual *Part 3.2.60 Recommended design criteria for an electro-mechanical crossing bell.*

Updated operational results are provided in Appendix C (Table C.7). With the inclusion of warning bells in the operational model noise impacts increased on average by 0.20 dBA, with a maximum increase of 1.0 dBA. No additional receivers were found to qualify for mitigation consideration based on the updated operational noise assessment. However since the exhibition of the EIS, detailed design has identified the preferred option is the introduction of a level crossing at Brolgan Road (refer to section 5.2.3) and this would may result in 1 additional receiver potentially impacted by noise associated with warning bells.

As described in section 11.5.1 of the EIS, and mitigation measure D4.3, an operational noise and vibration review would be undertaken during detailed design to detail how the predicted operation impacts would be mitigated. The operational noise and vibration review would define the further design work and iterative noise modelling required during detailed design, to identify feasible and reasonable mitigation measures for operational noise (as required). Detailed design of the proposal is currently underway.

As per mitigation measure O4.1, ARTC commits to operating the proposal with the aim of achieving the operational noise and vibration criteria identified by the noise and vibration assessment, the requirements of the conditions of approval, and the relevant EPL.

5.2.2 Hydrology and Flooding

A hydrology and flooding assessment was undertaken as part of the EIS to determine the potential operational hydrology and flooding impacts of the proposal. The results of this assessment are provided in Technical Report 6 and chapter 15 of the EIS.

The hydrologic analysis only considered flood events resulting from rainfall on individual and small groups of catchments immediately upstream of the existing rail corridor. The modelling of local (upstream) catchment flooding was considered to represent the conditions under which the new formation and track would have the greatest influence on flood levels. As such, downstream conditions were not assessed. Primarily it was assumed culverts in the proposal site would be replaced like for like in the locations of existing culverts and flow patterns would be generally maintained. Therefore, changes to flow patterns were not been assessed.

In general, the EIS and technical report identified that the full extent of impacts would be further assessed during detailed design. Specifically, mitigation measure D6 of the EIS commits ARTC to undertake detailed flood modelling.

Since exhibition of the EIS, the detailed design process has commenced

It is now understood that more flow will pass through the culverts than occurred for the existing conditions (all flow up to the 1% AEP flood will flow through the culverts). Concern with scour is an important design consideration and this risk is appropriately considered. The main means of mitigating the risk of scour will involve culvert sizing and the distribution of culvert groups across overland flow paths to ensure that the concentration of flow is acceptable. However in some cases other measures such as outlet scour protection and structural measures such as spreaders may be needed. Since exhibition of the EIS, ARTC has developed a flood design criteria and objectives for the proposal to support the detailed design and detailed flood modelling (provided in Appendix G). Mitigation measure D6 of the EIS commits ARTC to undertake detailed flood modelling during detailed design.

5.2.3 Closure of Coopers Road

The key features of the proposal as identified in chapter 7 of the EIS included providing a new 5.3 kilometre long rail connection to the Broken Hill line to the west of Parkes, (the Parkes north west connection), including a road bridge over the new section of rail at Brolgan Road (the Brolgan Road overbridge). Since exhibition of the EIS, the detailed design has commenced and has indicated that the preferred option is to provide a level crossing at Brolgan Road and install a level crossing at Coopers Road to avoid closure of a section of this road, As such a Minor Consistency Review has been undertaken to assess the proposed change in the design relating to the Brolgan Road overbridge to a level crossing and install a level crossing to avoid closure of Coopers Road (provided in Appendix J).

6. Response to issues raised in community submissions

This section provides a summary of the issues raised by community submissions, and a response to the issues raised.The issues raised were summarised and grouped according to the identified key issues and sub-issues, and responses are provided according to these categories.

6.1 Support/objection

Of the 15 submissions received from the community, two submissions expressed support for the proposal, two submissions objected to the proposal, and 11 submissions provided comments on the proposal.

6.2 Proposal features and design

This section provides responses to issues raised in relation to the design of the proposal and its key features.

6.2.1 Design

Summary of issues raised

Some submissions raised concerns and queries about the design of the proposal and Inland Rail as a whole. Issues raised included:

- Inland Rail should be electric, as electrified rail has a number of advantages including being faster, more powerful, quieter, and having lower operating costs.
- New sections of track (including all tunnels) should be dual tracks to eliminate passing loops and improve safety and speeds.
- Concerned about the proposed overtaking loop in front of their house, and the potential for it to block the only access to their home and farming/grazing property.

Response

Electric trains and dual track

Alternatives and proposal options considered are discussed in chapter 6 of the EIS. Electric traction for railways is widely used for high frequency rail operations such as commuter or intercity services. Its principal drawback is the high capital cost, and ongoing maintenance cost, of the overhead wiring and support structures. As a result, it is not widely used for low frequency main line freight services. Its only current freight applications in Australia is for coal haulage in Queensland. Electric haulage of freight in NSW and Victoria, on lines close to Sydney and Melbourne, ended some years ago.

When consulted about Inland Rail's service offering, rail operating companies emphasised their desire for the rolling stock – locomotives and wagons – to be interchangeable with those used on other interstate lines. Inland Rail trains might arrive in Brisbane from Melbourne, and after unloading the rolling stock could be assigned to a trip along the coastal route to Sydney. Trains from Adelaide and Perth will join Inland Rail at Parkes, and there will be interchange at other points in NSW. Having equipment, particularly locomotives, restricted to the main Inland Rail route would add to operating complexity and therefore cost.

Inland Rail is being designed to meet customer needs, particularly in relation to transit time - less than 24 hours from Melbourne to Brisbane; and reliability – 98 percent on time arrival. These requirements can be met by a single track railway with sufficient loops for trains to pass, and with a sophisticated control system.

As described in section 7.2.3 of the EIS, the proposal includes provision of three crossing loops at Goonumbla, Peak Hill, and Timjelly. This is provided to allow train services which are competitive with road transport in terms of transit time, reliability, and cost. The track structure and bridges on 'new build' or greenfield sections would be built for a 30 tonne axle load, higher than the current standard.

It should be noted that, although the initial operating train length would be 1,800 metres long, a key request of rail operating companies is that Inland Rail should be designed for the future operation of 3,600 metres long trains. Longer trains are a cost-effective way to increase the haulage capacity of the railway. Building a dual track railway, while superficially attractive, would significantly add to the capital cost. The increased capital cost would have to be recovered by higher charges for customers, which would make Inland Rail less competitive with road.

Crossing loop impacts to property

Section 6.3.2 of the EIS discusses the selection process for crossing loops and chapter 7 of the EIS identifies the proposed location of crossing loops within the existing corridor, at Goonumbla, Timjelly, and Peak Hill. The figures provided in chapter 7 illustrate the proposed location and extent of the crossing loops. The existing rail corridor is of sufficient width to accommodate the new crossing loops, and there would not be any impact on existing access to properties via a level crossing.

As described in section 2.2.1 of the EIS, the impact assessment has been undertaken based on activities projected to year 2040, including a single rail track with crossing loops to accommodate double stacked freight trains up to 1,800 metres long.

Sections 9.3.2 and 20.3.3 of the EIS note that construction works may temporarily impact on private access. However, as per mitigation measure D2.1, access to private property would be maintained during construction. Where alternative access arrangements need to be made, these would be developed in consultation with affected property owners/occupants.

6.2.2 Level crossings

Summary of issues raised

Some submissions raised concerns and queries about changes to level crossings, including the upgrade and closure of level crossings. Issues raised included:

- Identified that level crossing 478 in the EIS was marked in the incorrect location and another crossing was missing from the figures.
- Concerned about changes to level crossings, including flashing lights, bells, and boom gates.
- Concerned that the project would consist of bells, flashing lights and lit up crossings at night.
- Concerned about the loss of crossings as their property has a number of level crossings which are used to run their business.
- Concerned about impacts to level crossings and access to property.

Response

Location of level crossings

ARTC acknowledges this submission and will continue to liaise with relevant stakeholders, including landowners, as part of the level crossing strategy.

Changes to level crossings and bells, lights and boom gates

As described in section 7.4.3 of the EIS, 71 level crossings are located along the proposal site. Works at the majority of these crossings are required to ensure they meet relevant Australian and ARTC level crossing design standards. The preferred option for level crossings, developed as an outcome of stage 1 of ARTC's level crossing strategy, involves a mix of retaining/refurbishing existing crossings, considering consolidation of some crossings, upgrading the level of control, or installing a gated crossing.

Upgrades to level crossings may involve the installation of bells, flashing lights and lighting. An assessment of the potential for noise impacts as a result of the operation of warning bells at level crossings is provided in section 5.2.1 of this report. In the context of the proposed rail operations, the contribution to overall rail noise levels from the operation of warning bells is expected to be minor.

The following changes to level crossings are proposed based on stage 1 of the level crossing strategy (refer to section 6.3.3 of the EIS):

- six level crossings on public roads would be updated from passive to active control crossings (inclusion of boom gates)
- five crossings on public roads would be an upgraded form of active control (from flashing lights to boom barriers)
- gated crossings would be provided at two level crossings on private roads
- 19 crossings (two public and 17 private) have been identified as requiring further investigation and consultation in relation to consolidation options – these are mainly private crossings where alternative access is available, or access is no longer required.

As described in section 9.3.1 of the EIS, level crossings not impacted by the proposal (39 crossings) would continue to operate as normal, with warning devices and other controls installed in accordance with ARTC's *Level Crossing Design* standard.

As described in section 7.4.3 of the EIS, ARTC is currently undertaking stage 2 of the level crossing strategy, which involves:

- consulting with stakeholders regarding the preferred option
- reviewing the proposed works for each crossing in detail, taking into account input from stakeholders
- reviewing consolidation options in accordance with the requirements of the *Transport Administration Act 1988*
- preparing detailed design for works
- stakeholder consultation
- finalising the detailed designs for each crossing, taking into account the results of consultation.

Mitigation measure D10.6 commits ARTC to consult with landowners affected by level crossing changes and obtain agreement, where required.

Loss of rail crossings

As described in section 21.3.3 of the EIS, changes to property access roads may be required in some locations as a result of the rationalisation of level crossings. The closure of some level crossings may result in changes to how landholders and livestock move around their property, which in turn might impact agricultural activities and the operation of agricultural businesses. Where an existing access to or within a property is proposed to be removed, altered, or severed, additional works to reinstate access to the property would be undertaken (refer to section 7.4.3 of the EIS).

As described in sections 3.4 and 6.3.3 of the EIS, any closure of level crossings needs to be undertaken in accordance with the requirements of the *Transport Administration Act 1988*. Private level crossings cannot be closed unless there is an alternative means of legal access to the property and the landowner has been consulted with, and agreed to the closure.

As described above, ARTC is currently undertaking stage 2 of the level crossing strategy, which involves consulting with relevant stakeholders (including landowners and road owners) to confirm the preferred approach, and finalise the design for the works at each crossing.

Mitigation measure D10.6 commits ARTC to consult with landowners affected by level crossing changes and obtain agreement, where required.

The majority of the proposed closures relate to private level crossings where discussions have already commenced with the respective landowners. For public roads, in accordance with mitigation measures D2.1 and D2.2, and implementation of ARTC's level crossings strategy, ARTC will gather updated traffic

count information for all level crossings, and review any potential public level crossing closures in consultation with the relevant road manager. The methodology for determining public level crossing treatments is provided in Appendix H.

6.3 Proposal benefits

This section provides responses to issues raised in relation to the benefits of the proposal.

6.3.1 Summary of issues raised

One submission noted that a major rail network cutting through one part of the town would be of no benefit to the small rural community.

6.3.2 Response

As described in chapters 5 and 21 of the EIS, Inland Rail will bring either direct or indirect economic benefit to the towns through which it passes.

Benefits during construction

As described in section 21.3.2 of the EIS, beneficial impacts during construction include employment (an estimated average workforce of 150 people would be required to construct the proposal), training opportunities, and flow on local and regional economic benefits.

Benefits during operation

Section 21.3.3 of the EIS summarises the benefits of the proposal. The stated benefits include the following opportunities, which would be refined as the proposal progresses:

- better access to and from regional markets (including via the Parkes intermodal facility)
- enabler for regional economic development along the Inland Rail corridor
- safety and amenity benefits as a result of the reduction of freight transport on major road corridors.

During consultation on the proposal, representatives of local councils expressed their strong support for the proposal, noting that Inland Rail offers significant potential benefits for the region's productivity and economic development opportunities. The study area is well positioned to leverage economically from Inland Rail as a result of the location of the Parkes intermodal facility. Through the Parkes north west connection, the proposal would provide a more direct rail link between south-east Queensland, Adelaide, and Perth via the Broken Hill line. This connection would deliver immediate interoperability with the high performance east-west trans-continental rail line to Perth.

The *Business Case for Inland Rail* (ARTC, 2015) notes that Inland Rail will enable farmers to move agriculture products more efficiently for domestic use and for export, as it will pass through some of Australia's most productive farming country. The Business Case also recognises further benefits to supply chain efficiencies for commercial freight, and benefits to consumers and regional areas.

6.4 Traffic, transport and access

This section provides responses to issues raised in relation to potential traffic, transport, and access impacts.

6.4.1 Operation impacts – level crossing traffic delays

Summary of issues raised

Two submissions raised concerns about waiting times at level crossings and traffic delays.

Response

The results of the traffic, transport and access assessment is described in chapter 9 of the EIS. Section 9.3.3 of the EIS identifies that the traffic activity at most level crossings in the study area is low, and that the volume of traffic likely to be delayed by train activity is not substantial. The maximum predicted delay, as a worst case scenario, for the majority of level crossings was 122 seconds for a 1,800 metre long train. By 2040, with an increase in line speed, this delay would reduce to 109 seconds per train.

Mitigation measure O2.1 provides for a review of the operation of level crossings that have been subject to changes as part of the proposal, to confirm that the level of protection continues to be appropriate, and that the infrastructure is appropriate for the traffic conditions.

6.5 Noise and vibration (amenity impacts)

This section provides responses to issues raised in relation to potential noise and vibration impacts.

6.5.1 Construction impacts

Summary of issues raised

Some submissions raised concerns and queries about noise and vibration impacts during construction of the proposal. Issues raised included:

- Concerned about increase in noise during construction of the proposal as their residence is located close to the track.
- Concerned about construction noise, including impacts to sleep, as their family works various day and night shifts.
- Concerned about noise impacts on sleep, rest, and relaxation during the proposed extended working hours, especially during the early hours of the morning and 24 hour possession periods as their property is close to three culverts that have been identified to require possession works.

Response

Construction noise impacts

The results of the construction noise and vibration assessment are described in chapter 11 of the EIS. The assessment described in section 11.4.2 of the EIS identified that there is the potential for construction noise to exceed the relevant criteria at various receivers along the proposal site. The potential significance of these impacts would be minimised by the mobile nature of the majority of the construction works. Construction noise would be temporary and localised in nature, and the potential impacts would be managed by implementing the noise control measures provided in the EIS, particularly for those sections of the proposal close to sensitive receivers (less than 50 metres).

Where exceedances of construction management levels are predicted, reasonable and feasible mitigation measures would be implemented to reduce the significance of impacts. As described in section 11.5.1 of the EIS, the Inland Rail NSW Construction Noise and Vibration Management Framework (provided in Appendix E) has been developed in accordance with the Inland Rail Noise and Vibration Strategy, to show how construction noise and vibration will be managed for Inland Rail. It provides a framework for managing construction noise and vibration impacts in accordance with the *Interim Construction Noise Guideline*, to provide a consistent approach to management and mitigation across Inland Rail in NSW.

Specifically, the Inland Rail NSW Construction Noise and Vibration Management Framework identifies the requirements and methodology to develop Construction Noise and Vibration Impact Statements. These would be prepared prior to specific construction activities and based on a more detailed understanding of the construction methods, including the size and type of construction equipment, duration and timing of works, and detailed reviews of local receivers if required. A Construction Noise and Vibration Impact Statement would include:

- a more detailed understanding of surrounding receivers, including particularly sensitive receivers such as education and child care, and vibration sensitive medical, imaging, and scientific equipment
- application of appropriate noise and vibration criteria for each receiver type
- an assessment of the potential noise and vibration impacts as a result of different construction activities
- minimum requirements in relation to standard noise and vibration mitigation measures
- noise and vibration auditing and monitoring requirements
- additional mitigation measures to be implemented when exceedances to the noise and vibration management levels are likely to occur - these measures are aimed at pro-active engagement with potentially affected receivers, provision of respite periods, and alternative accommodation for defined exceedance levels.

Mitigation measure C4.1 provides for works to be undertaken in accordance with the Inland Rail NSW Construction Noise and Vibration Framework and the proposal's Communications Management Plan as follows:

- The Inland Rail NSW Construction Noise and Vibration Management Framework would be implemented, and the proposal would be constructed, with the aim of achieving the construction noise management levels and vibration criteria identified by the noise and vibration assessment.
- All feasible and reasonable noise and vibration mitigation measures would be implemented.
- Any activities that could exceed the construction noise management levels and vibration criteria would be identified and managed in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework and the CEMP.
- Notification of impacts would be undertaken in accordance with the communication management plan for the proposal.

As described in chapter 27 of the EIS, the proposal would be constructed in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework, the CEMP, site-specific Construction Noise and Vibration Impact Statements, the conditions of approval for the proposal, and the construction environmental protection licence (EPL).

Out of hours work and sleep disturbance

As described in section 8.3.2 of the EIS, construction would be undertaken between 6 am and 6 pm, Monday to Sunday. This would include works during the following hours, which are outside the recommended standard hours for construction work provided by the ICNG:

- Monday to Friday: 6 am to 7 am
- Saturday: 6 am to 8 am and 1 pm to 6 pm
- Sundays and public holidays: 6 am to 6 pm
- 24 hours during possessions.

Works outside the standard construction hours would generally include:

- work that meets the relevant noise and vibration criteria described in chapter 11 of the EIS
- where the prescribed noise and vibration levels cannot be achieved, work under a negotiated agreement with affected receivers
- delivery of materials required by the police or other authorities for safety reasons

- work required in an emergency
- work approved through the construction EPL
- work approved through an 'out of hours work protocol' prepared as part of the CEMP, and in accordance with the conditions of approval for the proposal.

Some works may also be undertaken during scheduled rail corridor possession periods (that is, the times that the movement of trains along the rail corridor are stopped for maintenance). This could include, for example, the connection of the tracks at either end of each stage, and some finishing works. During possessions, works may need to be undertaken on a 24 hour basis.

As described in section 11.4.2 of the EIS, the noise assessment indicated that the sleep disturbance criteria is predicted to be exceeded at some receivers during track works, level crossing track works, culvert works, post construction works. Where exceedances of construction management levels are predicted, reasonable and feasible mitigation measures would be implemented to reduce the significance of impacts.

The Inland Rail NSW Construction Noise and Vibration Management Framework (provided in Appendix E) was developed to show how construction noise and vibration will be managed for Inland Rail, this includes strategies for managing out-of-hours work.

6.5.2 Operational impacts

Summary of issues raised

Some submissions raised concerns and queries about noise impacts during operation of the proposal. Issues raised included:

- Concerned about operational noise with doors and windows open, including impacts to sleep as the family works various day and night shifts.
- Concerned about increased noise during operation as a result of additional train movements.
- Concerned about increase in operational noise and vibration from the proposed increase in train frequency and speeds.
- Concerned about increase in operational noise and vibration from the increased operation of boom gates, flashing lights, bells and whistles at level crossings.
- Concerned about noise and vibration (indoors and outdoors) from the operation of the proposal.
- Concerned that their facilities for horse agistment may not be wanted in the future due to excess noise.
- Any noise above the existing situation is extremely concerning.

Response

The operational noise and vibration assessment included assessing the potential impacts from the track design, increased number of trains, and increased operational speeds. Operational rail noise impacts were assessed in accordance with the NSW *Rail Infrastructure Noise Guideline* (the RING) (EPA, 2013). The RING presents non-mandatory noise goals that trigger the need for an assessment to be conducted. If triggered, the operational noise assessment is required to address the potential noise impacts, and consider mitigation measures that may be feasibly and reasonably applied to mitigate the impacts. It should be noted that the RING does not consider commercial premises as a sensitive land use.

ARTC respects the communities in which it operates. ARTC does not discount the fact that people living close to rail lines will experience noise from the operation of rolling stock and maintenance of track. Whilst noise is unavoidable, ARTC's aim is to reduce and manage noise as far as possible.

As described in section 11.5.1 of the EIS, and mitigation measure D4.3, an operational noise and vibration review would be undertaken during detailed design to detail how the predicted operation impacts

would be mitigated. The operational noise and vibration review would define the further design work and iterative noise modelling required during detailed design, to identify feasible and reasonable mitigation measures for operational noise (as required).

As per mitigation measure O4.1, ARTC commits to operating the proposal with the aim of achieving the operational noise and vibration criteria identified by the noise and vibration assessment, the requirements of the conditions of approval, and the relevant EPL.

Where exceedances of criteria for non-residential sensitive receivers have been predicted, this would be verified during detailed design, and would involve further investigation of the façade performance at these receivers.

The predicted noise and vibration levels, and the noise and vibration mitigation measures, would be confirmed during the detailed design.

To validate the predicted noise levels, in accordance with mitigation measure O4.2, monitoring would be undertaken after the commencement of operation of Inland Rail as a whole. Monitoring would confirm compliances with the predicted noise levels, as modified by the review of feasible and reasonable mitigation measures undertaken at the completion of detailed design.

ARTC operates the existing network in accordance with its EPL number 3142. Amongst other things, this requires ARTC to operate a complaints handling service (Enviroline) and encourages residents to contact them so that their concerns can be addressed.

Operational noise from warning bells at level crossings

An assessment for operational noise from warning bells at level crossings against the RING criteria is provided in section 5.2.1 of this report. In the context of the proposed rail operations, the contribution to overall rail noise levels is expected to be minor. Noise impacts with the inclusion of warning bells increased on average by 0.2 dBA, with a maximum increase of one dBA. No additional receivers were found to qualify for noise mitigation based on the results of this additional assessment.

6.5.3 Noise mitigation measures

Summary of issues raised

Some submissions raised queries about noise mitigation measures during operation of the proposal. Issues raised included:

- Question about why their property won't qualify for noise abatement ($L_{aeq\ (night)}$ of 59) while adjoining property would ($L_{aeq\ (night)}$ of 61). Both properties are located at a similar distance from the track and therefore both should qualify for noise mitigation.
- Question about foliage and architectural treatment as possible mitigation measures to reduce noise impacts.
- Question about what measures would be implemented to address the increase in operational noise.

Response

As described in chapter 11 of the EIS and section 6.5.2 above, operational noise impacts were assessed in accordance with the RING. Based on the RING, predicted rail noise levels from the redevelopment of a rail line need to exceed the criteria ('trigger values') to initiate an assessment of noise impacts and mitigation measures.

The noise levels at this property are predicted to have a value of about 61 dB(A) $L_{Aeqnight}$, which is above the RING trigger level of 60 $L_{Aeq(9h)}$ (night) to qualify for consideration of noise mitigation. The adjacent property has predicted noise levels of about 59 dB(A) $L_{Aeqnight}$, which is below the RING criteria for consideration of noise mitigation. Both properties are located about 150 metres from the track.

Structures and buildings in the proposal site have been included in the operational noise modelling based on aerial imagery. Several sheds located between the property in question and the rail line have been included in the operational noise model. These structures provide a small amount of shielding that

accounts for the difference in predicted noise levels between the property in question and the adjoining property.

Verification of buildings and other structures would be completed during detailed design as part of the operational noise and vibration review (mitigation measure D4.3), which would provide a further opportunity to consider and refined any noise mitigation required at this location.

Approach to mitigation and management

As per mitigation measure D4.3, an operational noise and vibration review would be undertaken to detail how the predicted operation impacts would be mitigated. The operational noise and vibration review, which is described in section 11.5.1 of the EIS, would define the further design work and iterative noise modelling required during detailed design to identify feasible and reasonable mitigation measures for operational noise. This would include consideration of the mitigation options described below. The final form of the mitigation options would be determined during detailed design.

The operational noise and vibration review would:

- confirm predicted project noise and vibration levels at sensitive receivers, which may include the results of façade testing for non-residential receivers
- assess feasible and reasonable noise and vibration measures in a hierarchical manner, consistent with the RING
- identify options for controlling noise and vibration at the source and/or receiver, including location, type, and timing of implementation (as described below)
- specify noise and vibration abatement measures for all relevant sensitive receivers
- include a consultation strategy to seek feedback from directly affected stakeholders on the proposed noise and vibration abatement measures
- include a timetable for delivery of abatement prior to operation
- outline post-operational monitoring to verify noise and vibration predictions.

Options for operational noise impact mitigation

Mitigation measures would be required for operational rail noise at affected sensitive receivers. Three main strategies are used to reduce noise and vibration impacts:

- controlling noise and vibration at the source
- controlling noise and vibration on the source to receiver transmission path
- controlling noise and vibration at the receiver.

Strategies would be assessed against a range of issues to determine whether they are feasible and reasonable, including

- cost of construction and ongoing maintenance
- potential environmental, visual and social impacts
- consideration of feedback from relevant stakeholders and landowners.

The RING recommends that control strategies should be considered in a hierarchical manner so that all measures that reduce noise at the source are exhausted before property based measures are considered.

Where predicted noise levels trigger the RING criteria levels, properties would be eligible for mitigation consideration. Mitigation measures would be confirmed as part of the operational noise and vibration review. Indicative noise mitigation measures, which are described in section 11.5 of the EIS, can include:

- rail dampers
- track lubrication
- noise barriers

- earth mounds
- architectural treatment.

Foliage or the planting of trees is not a standard approach to mitigate noise impacts due to the impermanence of planted trees, seasonal variations, and the significant depth and density of trees that would be required to provide effective mitigation.

6.6 Air quality

This section provides a response to an issue raised in relation to potential air quality impacts as a result of dust.

6.6.1 Summary of issues raised

One submission raised concerns about dust impacts during construction on the residence and crop/livestock production.

6.6.2 Response

The air quality assessment described in chapter 13 of the EIS was undertaken in accordance with the Secretary's environmental assessment requirements and relevant guidelines. Based on the findings of the assessment, it is expected that the generation of dust emissions due to construction would be effectively managed by implementing standard construction dust mitigation and management measures.

As described in section 13.5.1 of the EIS, an air quality management sub-plan would be prepared as part of the CEMP and implemented during construction to ensure that air quality impacts do not exceed relevant air quality criteria. The sub plan would include measures to minimise the potential for air quality impacts on the local community and environment, and would address all aspects of construction, including:

- spoil handling
- machinery operating procedures
- soil treatments
- stockpile management
- haulage
- dust suppression
- monitoring.

The air quality management sub-plan would help ensure that dust and emissions are managed in an environmentally sound manner, and in accordance with statutory requirements. Further information on environmental management during construction, including the CEMP, is provided in section 8 of this report.

6.7 Landscape and visual

This section provides a response to an issue raised in relation to the landscape and visual impacts of the proposal.

6.7.1 Summary of issues raised

One submission raised concerns about impacts to rural views as a result of the new rail line across from their property.

6.7.2 Response

The landscape and visual impact assessment is summarised in chapter 19 of the EIS and provided as Technical Report 10. The assessment identifies that the proposal would result in the introduction of some new infrastructure in what is a mainly rural area.

The assessment indicated that during operation, the main features of the proposal with the potential for landscape and visual impacts include:

- replacing the existing track and formation with new materials, including height increases of about 0.3 to one metre
- new sections of track at crossing loops
- new fencing and rail infrastructure in certain areas, including signage and signals
- spoil mounds (up to two metres high) within the rail corridor in some areas
- larger trains operating through the study area
- Parkes north west connection

Given the low profile and horizontal form of most of the proposal, the level of visual modification would be confined to a distance relatively close to the area subject to change. Within the existing rail corridor, the proposal is generally considered to result in a low level of visual modification as it involves upgrading existing rail infrastructure. For the Parkes north west connection, medium to high levels of visual modification are associated with the construction of new infrastructure outside the existing rail corridor.

Mitigation measure D9.1 would be implemented during detailed design to minimise the potential for landscape and visual impacts. This measure commits ARTC to undertake the detailed design in accordance with the design vision, objectives, and principles which underpin the concept design, and to take into account the guidelines listed in section 19.1 of the EIS.

6.8 Land use and property

This section provides responses to issues raised in relation to potential land use and property impacts, including property values and compensation.

6.8.1 Property values and compensation

Summary of issues raised

Some submissions raised concerns and queries about property devaluation and compensation. Issues raised included:

- Concerned about devaluation of property as a result of increased noise, restricted access for stock, crop management, and production impacts.
- Questioned what compensation and measures would be taken for noise impacts.
- Concerned about property devaluation and insufficient compensation.
- Requested compensation due to impacts on property.
- Concerned about impacts on property values.
- Concerned that facilities for horse agistment may not be wanted in the future and questioned if compensation would be provided.

Response

Potential impacts associated with the increase in train movements, including safety, access and amenity impacts, are considered in chapters 9, 11 and 21 of the EIS respectively. Appropriate mitigation measures would be implemented during detailed design, construction, and operation of the proposal to

mitigate the potential impacts on adjacent sensitive receivers. The updated mitigation measures for the proposal are provided in section 8.2 of this report.

Living next to any transport infrastructure comes with the inherent risk of potential increased or decreased rail traffic. The saleability or value of a property is not predetermined on any one characteristic. However, unless the property is affected by an acquisition, there are no grounds for a claim for compensation.

As noted in section 7.5 of the EIS, a limited amount of property acquisition would be required to construct the proposal. Initial and indicative land acquisition requirements are provided in Appendix G of the EIS. At this stage of the design process, it is estimated that land acquisition would partially affect a total of 10 privately owned lots. As per mitigation measure D10.2, all property acquisitions would be undertaken in consultation with landowners and in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) A*ct 1991. The Act sets out the steps to be followed including how compensation is calculated. There will be a preference for acquisition by agreement where practicable.

Homes and businesses identified as 'sensitive receivers' may receive support from ARTC to mitigate noise impacts, which may include mechanisms such as double glazed windows. Noise mitigation is discussed further in section 6.5.3 of this report.

6.8.2 Property impacts

Summary of issues raised

One submission raised concerns about the loss of stock production due to stock not grazing near the rail line, as a result of increased traffic, noise, and speed of trains.

Response

As described in section 20.3.3 of the EIS, the proposal may result in temporary impacts on property during construction. The proposal would not result in direct impacts to properties during operation. Potential impacts associated with the increase in train movements, including safety, access and amenity impacts, are considered in chapters 9, 11 and 21 of the EIS respectively.

ARTC respects the communities in which it operates. ARTC does not discount the fact that people living close to railway lines will experience noise from the operation of rolling stock and maintenance of the track. Whilst noise is unavoidable, ARTC is proposing a range of measures to mitigate noise impacts.

As discussed in chapter 11 of the EIS, and sections 6.5.2 and 6.5.3 of this report, increases in operational rail noise associated with Inland Rail are being assessed in accordance with the RING.

6.9 Socio-economic

This section provides responses to issues raised in relation to potential socio-economic impacts.

6.9.1 Summary of issues raised

Issues raised included:

- Questioned if adequate consideration has been given to residents affected by the proposal.
- Concerned that rural amenity would be removed as a result of the proposal.

6.9.2 Response

Consideration of impacts on residents

The shortlist of route options for Inland Rail was subject to a detailed assessment, and the proposed route was refined based on evaluation of key considerations, including community impacts.

The socio-economic assessment provided in chapter 21 of the EIS and Technical Report 11 has been carried out in accordance with the Secretary's environmental assessment requirements and the relevant guidelines. The assessment included a review of potential direct and indirect impacts on the community

(including residents and businesses), and described measures proposed to be implemented to minimise impacts on the community.

As described in section 21.3.1 of the EIS, potential socio-economic impacts would continue to be avoided by:

- designing, constructing and operating the proposal to minimise the potential for amenity impacts arising from traffic, noise and vibration, air quality, and visual amenity, including the implementation of mitigation measures
- minimising the potential for safety issues by implementing the mitigation measures
- implementing the socio-economic management and mitigation measures
- communicating with local residents and other relevant stakeholders (including Parkes and Narromine councils) to provide advance notice of construction activities and associated impacts, and provide information on the operation of the proposal.

As per mitigation measure D11.1, key stakeholders (including local councils, emergency service providers, public transport providers, the general community, and surrounding land owners/occupants) would continue to be consulted regarding the proposal in accordance with the communication management plan described in chapter 4 of the EIS.

Impacts on rural amenity

As described in section 21.3.3 of the EIS, the main potential for community amenity impacts relates to the increase in train movements along the proposal site.

Changes to access, noise levels, air pollution, and visual changes from the presence of the proposal may impact on the amenity for the surrounding community.

Potential amenity impacts are considered in chapters 9, 11 and 21 of the EIS. Appropriate mitigation measures would be implemented during detailed design, construction and operation of the proposal to mitigate potential impacts on adjacent sensitive receivers. The mitigation measures that would be implemented are provided in section 8.2 of this report.

6.10 Health and safety

This section provides responses to issues raised in relation to health and safety, including safety at level crossings.

6.10.1 Safety at rail and level crossings

Summary of issues raised

Some submissions raised concerns in relation to safely crossing the rail corridor with Inland Rail trains operating, and safety at level crossings. Issues raised included:

- Query regarding the measures to make level crossings safe considering recent fatalities.
- Concern about the safety of school bus stops located close to level crossings or the rail line, and the safety measures that would be implemented.
- The proposed number of train movements and speed would create safety risks for workers and stock movements across the rail line.

Response

Safety at level crossings

ARTC's aim is to maintain or improve safety at crossings along the corridor. To achieve this goal ARTC would:

- assess existing level crossings to ensure they comply with the relevant Australian and ARTC standards
- work co-operatively with landowners to ensure that local issues are considered.

For private crossings, ARTC would consult with landowners during detailed design to consider specific requirements such as farm machinery and/or livestock movements.

For public crossings, ARTC would work with local councils to take into consideration future development plans and other important local factors.

As per mitigation measure D2.3, level crossings would be provided with warning signage, line marking and other relevant controls; in accordance with the relevant national and ARTC standards.

ARTC has a consistent process for selecting level crossing safety improvements. The process includes:

- conducting site visits and assessments
- seeking input from road authority or land owners
- designing a proposed solution (safety treatment)
- seeking feedback from road authority or landowner.

To assess public level crossings, ARTC uses a national system called ALCAM, which considers factors such as road traffic numbers, vehicle type including busses, train numbers, speeds and sighting distances.

Safety improvements may include:

- upgrades of public crossings from passive or flashing lights to boom barriers
- renewal of passive level crossing infrastructure such as signage
- provision of gates at private crossings
- crossing closures
- grade separation (e.g. road and rail bridges).

As discussed in section 7.4.3 of the EIS, ARTC is currently undertaking stage 2 of the level crossing strategy. All level crossings and the potential treatments will be reviewed as part of the design process in consultation with the relevant stakeholders.

Safety issues associated with crossing the rail corridor at other locations

As per mitigation measure D10.6, ARTC commits to consult with property owners and occupants, to ensure that owners/occupants are informed about the timing and scope of activities in their area; and any potential property impacts/changes, particularly in relation to potential impacts to access, services, or farm operational arrangements.

As part of the detailed design, ARTC will develop a number of typical layouts for level crossings. The safe movement of stock and farm machinery across the rail line at private crossings will be considered when developing these typical level crossing layouts.

In addition to engineering solutions, ARTC will continue to support rail safety education programs through its membership of the TrackSAFE Foundation.

As per mitigation measure O8.1, a safety awareness program would be continue to be implemented to educate the community regarding safety around trains. This would focus on community and rural property operators who cross the rail corridor to access their properties.

6.10.2 Maintenance of the existing corridor

Summary of issues raised

One submission raised concerns about the condition of the rail corridor and the associated existing access tracks, which are said to increase fire hazards and make emergency access hazardous.

Response

As discussed in section 2.5.2 of the EIS, maintenance works and other minor works along the Parkes to Narromine line are undertaken by ARTC in accordance with existing ARTC procedures and processes, and relevant State and Commonwealth legislative requirements.

ARTC operates a telephone enquiry line for its existing operational rail network. Concerns regarding ARTC's existing network should be directed to enviroline@artc.com.au or 1300 550 402.

Although this enquiry has been logged with Enviroline, without a specific location, ARTC is unable to address the issue. ARTC encourages the author of the submission to contact ARTC directly regarding the concerns.

6.11 Out of scope

This section provides a response to an issue raised on aspects that fall outside the scope of the proposal.

6.11.1 Summary of issues raised

One submission notes that Inland Rail should also be a services corridor and include a transmission line, water pipeline, and hydrogen pipeline.

6.11.2 Response

The Inland Rail programme provides for rail infrastructure and does not include other infrastructure works, except where necessary or appropriate to deliver the rail infrastructure. ARTC does not have authority with regard to other infrastructure, but is liaising with authorities responsible for other infrastructure in delivering the Inland Rail programme. It is also relevant to note that the proposal is using an existing rail corridor.

7. Agency and key stakeholder submissions

This section provides a high level summary of the submissions received from government agencies. Due to the length and complexity of several of these submissions, the full summaries and responses to issues raised are provided in Appendix B.

7.1 Submissions received

Comprehensive submissions were received from government agencies, including local councils, and a key stakeholder. These submissions raised a variety of issues and made a number of recommendations. Submissions were received from the following agencies:

- Parkes Shire Council
- Narromine Shire Council
- Environment Protection Authority
- Department of Primary Industries
- Office of Environment and Heritage
- Transport for NSW
- WaterNSW (Catchment Protection Planning Manager)
- Siding Spring Dark Sky Committee.

7.2 Summary of issues raised

A high level summary of the submissions received is provided in Table 7.1. Detailed responses are provided in the tables in Appendix B.

Table 7.1 Summary of government agency and key stakeholder submissions

Agency	Issue category	Key issues raised[1]
Parkes Shire Council	Traffic, transport and access	▸ Requested that safe crossing treatments for Coopers Road remain open and to review construction impacts on level crossings
	Land use and property	▸ Stated the need for impacts on public utilities to be fully detailed
Narromine Shire Council	Traffic, transport and access	▸ Identified data that is required including updated crash history data, information for new road train routes and construction traffic impacts on local roads between Peak Hill and Narromine
	Noise and Vibration (amenity impacts)	▸ Noted that noise attenuation measures would need to be considered as a result of raised tracks and associated operational noise impacts and that construction hours should take into account nearby sensitive receivers particularly in rural areas
	Hydrology and flooding	▸ Requested that flood impacts created by spoil mounds be investigated and that consultation with Council be undertaken due to the flood impacts on local roads
	Approval pathway	▸ Noted that subsequent stages of Inland Rail to the north of the proposal should be considered as State significant infrastructure

Agency	Issue category	Key issues raised[1]
Environment Protection Authority	Noise and Vibration (amenity impacts)	▸ Requested justification for works outside recommended standard construction hours and that sleep disturbance be assessed in accordance with the INP
	Vibration (structural impacts)	▸ Requested that vibration criteria from *Assessing Vibration: A Technical Guideline* be used for the vibration assessment
	Water quality	▸ Noted any discharge to water would need to comply with Section 120 of the POEO Act.
	Construction of the proposal	▸ Requested further investigations undertaken into suitability of water if recycled water/treated water from mines is used for construction
	Soils and contamination	▸ Requires a NSW EPA accredited Site Auditor to determine the appropriateness of a management plan
	Air quality	▸ Requested dust generating activities to be managed such that the impact is minimised
Department of Primary Industries	Construction of the proposal	▸ Requested additional information regarding potential water sources to ensure water supply security
	Assessment and approvals	▸ Identified the potential need for additional approvals and licences for water used during construction
	Hydrology	▸ Requires consideration of the *Guidelines for Controlled Activities on Waterfront Land* (NSW Office of Water, 2012) in design of proposal, to mitigate impacts to watercourse stability
Office of Environment and Heritage	Biodiversity	▸ Temporary impacts to biodiversity values and residual impacts need to be justified in accordance with the Framework for Biodiversity Assessment (FBA) and offset accordingly ▸ Native vegetation mapping should be reviewed/updated and the assessment updated accordingly ▸ Questioned the crown separation ratio used in the assessment ▸ Identified inconsistencies in the total area of native vegetation to be cleared in the BAR and BioBanking Credit Calculator ▸ Requested clarification on why PCT 55 and PCT 70 are not considered to be potential koala habitat ▸ Noted that Phase 2 of the Biodiversity Offset Strategy should be submitted to OEH in the Submissions report and that Phase 3 should be finalised to the satisfaction of OEH within 12 months of project approval. ▸ Requested that potential impacts on biodiversity values (temporary and permanent) be finalised prior to Project approval.
	Hydrology and flooding	▸ Requested additional information regarding flood impacts including tail water conditions downstream of culverts, impacts during breakout of the Macquarie River and spoil mounds.

Agency	Issue category	Key issues raised[1]
	Heritage	▸ Does not support proposed archaeological excavations outside the construction footprint and provided guidance regarding the procedure for the discovery of suspected human remains
Transport for NSW	Traffic and Transport	▸ Requested that changes to level crossings including the preferred mitigation approaches be undertaken during the EIS process. ▸ Requested that further assessment be undertaken at key road crossings (four State road crossings and one regional road crossing) to examine the efficiency and safety implications of increased freight rail movements.
	Noise and vibration (amenity impacts)	▸ Suggested that latest data on noise modelling and rolling stock standards could be used to update Technical Report 5.
	General	▸ Identified a number of specific issues throughout the EIS and requested additional information on these issues.
WaterNSW (Catchment protection Planning Manager)	General	▸ Noted that no land, assets or infrastructure owned by WaterNSW would be impacted by the proposal.
Siding Spring Dark Sky Committee	Landscape and visual	▸ Requires the *Dark Sky Planning Guideline: Protecting the observing conditions at Siding Spring* (Department of Planning and Environment, 2016) to be implemented

Note 1: Full issue summaries and responses are provided in Appendix B.

8. Revised mitigation measures and performance outcomes

This section provides the approach to environmental management and mitigation for the project. It includes the revised set of mitigation measures, and updated performance outcomes for the project.

8.1 Approach to environmental management

The approach to environmental mitigation and management for the proposal involves:

- Project design – as described in section 7.1 of the EIS, the proposal incorporates measures to avoid and minimise impacts.
- Mitigation measures – the updated mitigation measures are provided in section 8.2 of this report.
- ARTC's Environmental Management System – would be used to manage the construction and operation of Inland Rail, including the proposal. The management system would provide the framework for implementing the construction and operation environmental management plans described below, and any conditions of other approvals, licences, or permits.
- Inland Rail NSW Construction Noise and Vibration Management Framework – describes how ARTC proposes to manage construction noise and vibration for Inland Rail in NSW as a whole, including management measures, processes, and the approach to additional assessment where required. A copy of the framework is provided in Appendix H of the EIS.
- Proposal specific CEMP and OEMP – prepared to guide the approach to environmental management during construction and operation, as described in sections 8.1.1 and 8.1.2 of this report. The CEMP and OEMP would:
  - outline the environmental management practices and procedures to be followed
  - document processes for demonstrating compliance with the commitments made in this EIS, the submissions report (to be prepared), and relevant approval conditions
  - be prepared in consultation with relevant agencies and in accordance with the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources, 2004).
- Environmental performance outcomes – establishes the intended outcomes to be achieved by the project. The environmental performance outcomes are provided in 8.3.

8.1.1 CEMP

The CEMP would include:

- ARTC's environmental policy, objectives, and performance targets for construction
- reference to all relevant statutory and other obligations, including consents, licences, approvals, and voluntary agreements required
- management policies, procedures, and review processes to assess the implementation of environmental management practices and the environmental performance of the proposal against the objective and targets
- requirements and guidelines for management in accordance with:
  - the conditions of approval for the proposal
  - the mitigation measures specified in this EIS
  - relevant construction management guidelines.
- requirements in relation to incorporating environmental protection measures and instructions in all relevant standard operating procedures and emergency response procedures

- roles and responsibilities of all personnel and contractors to be employed on site
- incident and contingency management procedures
- procedures for complaints handling and ongoing communication with the community
- a monitoring and auditing program, as defined by this EIS and the conditions of the approval.

An updated outline of the CEMP, including the required sub-plans and a guide to the general construction management measures required in each, is provided in Appendix F.

8.1.2 OEMP

The OEMP would include:

- a description of activities to be undertaken during operation
- an environmental risk analysis to identify the key environmental performance issues associated with the operation phase
- statutory and other obligations that the proponent is required to fulfil during operation, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies
- a description of the links with ARTC's Environmental Management System, and the EPL relevant to the proposal
- overall environmental policies, guidelines and principles to be applied to operation
- roles and responsibilities for relevant employees involved in operation, including relevant environmental training and induction requirements
- incident and contingency management procedures
- details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions would be taken to address identified potential adverse environmental impacts.

8.2 Revised mitigation measures

The list of mitigation measures presented in chapter 27 of the EIS has been updated with consideration given to the additional assessment work undertaken and the basis of submissions received. Some new measures have been added, and the wording of existing measures has been adjusted. This table supersedes the mitigation measures presented in the EIS. New mitigation measures or additions to existing mitigation measures are shown in **bold** text, with deletions shown with a ~~strikethrough~~.

The measures are broadly grouped according to the main stage of implementation. However, it is noted that the implementation of some measures may occur across a number of stages.

The conditions of approval would guide subsequent phases of the proposal. Some detailed design work and associated investigations are being undertaken separately from, and in parallel with, the EIS. Post-approval design, as well as construction and operation, would be undertaken in accordance with these measures and conditions of approval.

Table 8.1 Compilation of proposal specific mitigation measures for detailed design/pre-construction

No.	Issue	Post-approval detailed design/pre-construction mitigation measures
D1	**Environmental management**	
D1.1	*CEMP*	▸ A CEMP would be prepared to detail the approach to environmental management during construction, as described in section 8.1 of this report and in accordance with the conditions of approval.
D2	**Traffic, transport and access**	
D2.1	*Traffic, transport and access*	▸ The detailed design of the proposal would minimise the potential for impacts to the surrounding road and transport network, property accesses, and access for emergency vehicles. ▸ Where any legal access to a property is permanently affected and a property has no other legal means of access, alternative access to and from a public road would be provided to an equivalent standard where feasible and practicable. Where an alternative access is not feasible or practicable, and a property is left with no access to a public road, negotiations would be undertaken with the relevant property owner for acquisition of the property in accordance with the provisions of the *Land Acquisition (Just Terms Compensation) Act 1991.* **There will be a preference for acquisition by agreement where practicable.**
D2.2	*Consultation*	▸ Input would be sought from relevant stakeholders (including Parkes Shire Council, Narromine Shire Council, Roads and Maritime Services **and Transport for NSW**) prior to finalising the detailed design of those aspects of the proposal that impact on the operation of road **and other transport** infrastructure under the management of these stakeholders. ▸ The traffic, transport and access management sub-plan would be developed in consultation with (where relevant) Parkes Shire Council, Narromine Shire Council, Roads and Maritime Services, **Transport for NSW**, and local public transport/bus operators.
D2.3	*Level crossings*	▸ Level crossings would be provided with warning signage, line marking and other relevant controls; in accordance with the relevant national and ARTC standards.
D3	**Biodiversity**	
D3.1	*Biodiversity offset strategy*	▸ The biodiversity offset strategy ~~(phase 1)~~ for the proposal would be finalised, in accordance with the requirements of the *Framework for Biodiversity Assessment* (OEH, 2014a) and the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014c). ▸ The offset strategy would be approved by the Department of Planning and Environment prior to the commencement of construction work that would result in the disturbance of relevant ecological communities, threatened species, or their habitat, unless otherwise agreed.
D3.2	*Direct impacts to biodiversity*	▸ Detailed design and construction planning would minimise the construction footprint and avoid impacts to native vegetation as far as practicable.
D3.3	*Riparian vegetation*	▸ Compounds and stockpile sites would be located an appropriate distance from riparian vegetation to avoid impacts on aquatic habitat. This includes (for the proposal site) a minimum of 50 metres for type 2, classes 2 and 3 watercourses (Burrill Creek), and 10 to 50 metres for

No.	Issue	Post-approval detailed design/pre-construction mitigation measures
		type 3, classes 2 to 4 watercourses (other watercourses). ▸ Direct impacts to in-stream vegetation and native vegetation on the banks of watercourses would be avoided as far as practicable.
D3.4	*Fish passage*	▸ Detailed design and construction planning would minimise the potential for impacts to fish passage. To ensure that fish passage is maintained, watercourse crossing structures would be designed in accordance with the guideline *Why do fish need to cross the road? Fish passage requirements for waterway crossings* (Fairfull and Witheridge, 2003) and the minimum design requirements specified in Table 4.1 of Technical Report 3.
D3.5	*Rehabilitation strategy*	▸ A rehabilitation strategy would be prepared to guide the approach to rehabilitation of disturbed areas following the completion of construction. The strategy would include: • clear objectives and timeframes for rehabilitation works (including the biodiversity outcomes to be achieved) • details of the actions and responsibilities to progressively rehabilitate, regenerate, and/or revegetate areas, consistent with the agreed objectives • identification of flora species and sources • procedures for monitoring the success of rehabilitation • corrective actions should the outcomes of rehabilitation not conform to the objectives adopted.
D3.6	*Pre-clearing surveys*	▸ Pre-clearing surveys and inspections would be undertaken prior to construction. The surveys and inspections, and any subsequent relocation of species, would be undertaken and in accordance with the biodiversity management sub-plan in the CEMP.
D4	**Noise and vibration**	
D4.1	*Noise and vibration control*	▸ The proposal would be designed with the aim of achieving the operational noise and vibration criteria identified by the noise and vibration assessment. ▸ Track features such as crossovers, turnouts, and rail joints would be avoided near vibration sensitive structures where practicable.
D4.2	*Construction vibration*	▸ Where vibration levels are predicted to exceed the screening criteria, a more detailed assessment of the structure and vibration monitoring would be carried out in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework, to ensure vibration levels remain below appropriate limits for that structure.
D4.3	*Operational noise and vibration review*	▸ An operational noise and vibration review would be undertaken as described in section 11.5 **of the EIS** to guide the approach to identifying feasible and reasonable mitigation measures to incorporate in the detailed design.
D5	**Soils and contamination**	
D5.1	*Structural integrity*	▸ Foundation and batter design would include engineering measures to minimise operational risks from shrink swell, dispersive, and/or low strength soils.

No.	Issue	Post-approval detailed design/pre-construction mitigation measures
D5.2	*Dilapidated building near site TP33*	▸ Prior to removal of this building (if required), the presence of asbestos would be confirmed, and any removal required would be undertaken in accordance with *How to Safely Remove Asbestos Code of Practice* (Safe Work Australia, 2016).
D6	**Hydrology and flooding**	
D6.1	*Flooding*	▸ The design features listed in section 15.3.1 **of the EIS** would continue to be refined to not worsen existing flooding characteristics, where feasible and reasonable, up to and including the one per cent AEP event. Detailed flood modelling would consider potential changes to: • upstream flood extents • level crossing and road flood levels and extent • overland flow paths and storage effects due to spoil mounds and other proposal infrastructure • flood evacuation routes. ▸ Flood modelling to support detailed design would be carried out ~~in accordance with~~ **having regard to** the guidelines listed in section 15.1.2 of the EIS **and the Guidelines for Controlled Activities on Waterfront Land (NSW Office of Water, 2012).** ▸ Flood modelling and mitigation would consider future floodplain risk management plans, and would be undertaken in consultation with the relevant local council, the Office of Environment and Heritage, and State Emergency Services.
D6.2	*Emergency routes*	▸ Where feasible, facilities and routes identified as being critical to emergency response operations would be protected from the probable maximum flood level.
D6.3	*Downstream watercourse stability*	▸ Further modelling would be undertaken during detailed design to confirm the locations downstream of culverts that require erosion protection, and the extent and type of protection required.
D6.4	*Water usage (private bores and surface water)*	▸ Detailed design and construction planning would aim to minimise the use of potable water during construction. ▸ Appropriate sources for construction water would be determined prior to construction in consultation with relevant stakeholders, and appropriate approvals and agreements would be sought for the extraction of water.
D7	**Water quality**	
D7.1	*Water quality*	▸ The design features listed in section 16.3.1 **of the EIS** would continue to be refined and implemented to minimise the potential impacts of the proposal on water quality.
D7.2	*Surface water monitoring framework*	▸ A surface water monitoring framework would be developed as part of the soil and water management sub-plan in the CEMP. It would identify monitoring locations at discharge points, and selected ~~locations in~~ watercourses where works are being undertaken. ▸ The monitoring framework would include the relevant water quality objectives, parameters, and criteria from Technical Report 7, and specific monitoring locations which have been identified based on the hydrological attributes of the receiving watercourse, in consultation with DPI (Water) and the EPA.

No.	Issue	Post-approval detailed design/pre-construction mitigation measures
D8	**Heritage**	
D8.1	*Avoiding impacts to Aboriginal heritage*	▸ Detailed design and construction planning would avoid direct impacts to the identified items/sites of Aboriginal heritage significance where practicable.
D8.2	*Impacts to Aboriginal heritage outside the proposal site*	▸ Any works outside the proposal site would be subject to further review and assessment to avoid impacts on Aboriginal items.
D8.3	*Non-Aboriginal heritage interpretation*	▸ An interpretation strategy would be developed for the proposal to provide a concept and framework for interpretation of the original rail line and rail infrastructure.
D8.4	*Impacts to Aboriginal sites*	▸ Impacts to AHIMS listed sites 35-3-0206 and 45-3-0111 would be avoided where possible. These sites would be fenced prior to construction and their locations marked on all plans. A buffer of 10 metres around the sites would be applied to all fencing. ▸ If these sites cannot be avoided, salvage of artefacts would be undertaken prior to construction in accordance with the procedures detailed in Technical Report 8. ▸ Impacts to the scarred tree at 35-3-0207 and the artefact scatter at 35-3-0208 would be avoided. The sites would be fenced prior to construction and marked on all plans.
D8.5	*Impacts to potential heritage items*	▸ The detailed design of the proposal would minimise the potential for direct impacts to Wyanga cottage. ▸ The management of potential vibration impacts at the cottage would be undertaken in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework. ▸ Direct impacts to Wyanga cottage would be avoided by the installation of temporary fencing, and marking the cottage as a 'no go' area on plans. ▸ A photographic/archival recording would be undertaken of culverts/underbridges with timber components, former rail station sites (as described in sections 6.4.1 and 6.4.2 of Technical Report 8), and Wyanga cottage, in accordance with **ARTC's Archival Recording Standard.** ~~*Photographic Recording of Heritage Items Using Film or Digital Capture* (NSW Heritage Division, 2006).~~ ▸ The photographic recording would include contextual photographs showing the relationships between the rail line, station sites, and associated grain rail sidings and silos.
D8.6	***Unexpected finds***	▸ **An unexpected finds procedure would be developed and included in the CEMP to provide a consistent method for managing any unexpected Aboriginal and non-Aboriginal heritage items discovered during construction, including potential heritage items or objects, and human skeletal remains.**
D9	**Landscape and visual**	
D9.1	*Landscape character and*	▸ Detailed design would be undertaken in accordance with the design vision, objectives, and principles which underpin the concept design, and

No.	Issue	Post-approval detailed design/pre-construction mitigation measures
	visual impacts	would take into account the guidelines listed in section 19.1 **of the EIS**.
~~D9.2~~	~~*Artist impressions*~~	~~Following completion of detailed design of the Parkes north west connection and Brolgan Road overbridge, artist impressions and perspective drawings would be developed for consultation purposes.~~
D10	**Land use and property**	
D10.1	*Property impacts*	Individual property management agreements would be developed in consultation with landowners/occupants, with respect to the management of construction on or immediately adjacent to private properties. These would detail any required adjustments to fencing, access, farm infrastructure, and relocation of any impacted structures, as required.
D10.2	*Acquisitions*	All acquisitions/adjustments would be undertaken in consultation with landowners and in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991*. **There will be a preference for acquisition by agreement where practicable.**
D10.3	*Access to properties*	Access to properties would be maintained and managed in accordance with the mitigation measures listed under item D2.1 above.
D10.4	*Travelling stock reserves*	Local Land Services would continue to be consulted during detailed design to understand how impacts to travelling stock **reserves** ~~routes~~ can be avoided during construction and operation. Alternative access arrangements would be made as required.
D10.5	*Impacts to services and utilities*	Utility and service providers would continue to be consulted during detailed design to identify possible interactions and develop procedures to minimise the potential for service interruptions and impacts on existing land uses.
D10.6	*Consultation and communication*	Property owners and occupants would be consulted, in accordance with the communication **management** plan for the proposal (described in chapter 4 **of the EIS**), to ensure that owners/occupants are informed about the timing and scope of activities in their area; and any potential property impacts/changes, particularly in relation to potential impacts to access, services, or farm operational arrangements. The results of consultation would be incorporated in the individual property management agreements as appropriate. Consultation would be undertaken with landowners affected by level crossing changes and agreement obtained, where required.
D10.7	*Biosecurity risks*	The **biodiversity management plan** ~~weed management plan~~ included in the CEMP would detail measures to minimise the potential for biosecurity risks during construction.
D11	**Socio-economics**	
D11.1	*Communication*	Key stakeholders (including local councils, emergency service providers, public transport providers, the general community, and surrounding land owners/occupants) would continue to be consulted regarding the proposal in accordance with the communication plan described in chapter 4 **of the EIS**.
D11.2	*Local access to Inland Rail*	ARTC would continue to work with relevant stakeholders, including Parkes Shire Council, to identify opportunities to facilitate local access to Inland Rail via the Parkes intermodal facility.

No.	Issue	Post-approval detailed design/pre-construction mitigation measures
D11.3	*Accommodation*	▸ A temporary workforce housing and accommodation plan would be developed and implemented during construction. This would include a requirement for consultation to be undertaken with local accommodation providers and councils regarding the availability of accommodation, and the need to maintain some availability for non-workforce accommodation.
D12	**Sustainability**	
D12.1	*Sustainability management plan*	▸ The potential sustainability initiatives identified for the proposal would be reviewed and updated during the detailed design ~~stage~~. ▸ A sustainability management plan would be developed to guide the design, construction, and operation of the proposal, to achieve an 'excellent' rating according to the ISCA infrastructure sustainability rating tool. ▸ The sustainability management plan would incorporate the updated sustainability initiatives, and the review and reporting requirements necessary to demonstrate how sustainability has been incorporated into the proposal during design, construction, and operation.
D13	**Climate change**	
D13.1	*Climate change impacts*	▸ The climate change risk assessment would continue to be refined as the design of the proposal progresses. ▸ The adaptation measures identified for the proposal would be reviewed and final measures would be incorporated into the design where practicable.
D14	**Waste**	
D14.1	*Waste management*	▸ Detailed design would include measures to minimise excess spoil generation. This would include a focus on optimising the design to minimise spoil volumes, and the reuse of material on-site.
D15	**Health and safety**	
D15.1	*Public safety*	▸ A hazard analysis would be undertaken during detailed design to identify risks to public safety from the proposal, and how these can be mitigated through safety in design.
D15.2	*Services and utilities*	▸ The location of utilities, services and other infrastructure would be identified prior to construction to determine requirements for access to, diversion, protection and/or support.

Table 8.2 Compilation of proposal specific mitigation measures for construction

No.	Issue	Construction mitigation measures
C1	**Environmental management**	
C1.1	*CEMP*	▸ Construction of the proposal would be undertaken in accordance with the approved CEMP.
C2	**Traffic, transport and access**	
C2.1	*Access ~~to properties~~*	▸ ~~Property access would be maintained throughout the construction period, with suitable alternative access arrangements provided where required.~~

No.	Issue	Construction mitigation measures
		▸ **Access to individual residences, services and businesses, and access for livestock across the rail corridor, would be maintained during construction. Where alternative access arrangements need to be made, these would be developed in consultation with affected property owners/occupants.**
C2.2	*Emergency vehicle access*	▸ Access for emergency vehicles would be maintained along key emergency access routes throughout the construction period, with suitable alternative access arrangements provided where required.
C2.3	*Rail traffic diversions*	▸ Diversions of existing rail traffic would be undertaken in consultation with relevant stakeholders, and alternative arrangements would be provided.
C2.4	*Consultation*	▸ Consultation with relevant stakeholders would be undertaken regularly to facilitate the efficient delivery of the proposal and to minimise congestion and inconvenience to road users. Stakeholders would include the relevant local council, bus operators, Roads and Maritime Services, emergency services, and affected property owners/occupants. ▸ The community would be notified in advance of any proposed road and pedestrian network changes through signage, the local media, and other appropriate forms of communication. ▸ Where changes to access arrangements are required, ARTC would advise property owners/occupants and consult with them in advance regarding alternative access arrangements.
C3	**Biodiversity**	
C3.1	*Avoidance of impacts*	▸ Areas of biodiversity value outside the proposal site would be marked on plans, and fenced or signposted where practicable, to prevent unnecessary disturbance.
C3.2	*Weed management*	▸ Noxious weeds would be managed in accordance with the *Noxious Weeds Act 1993*. Weeds of national environmental significance would be managed in accordance with the *Weeds of National Significance Weed Management Guide*. ▸ **Any herbicides would be applied such that impacts on surrounding agricultural properties are avoided.**
C3.3	*Rehabilitation*	▸ Rehabilitation of disturbed areas would be undertaken progressively and in accordance with the rehabilitation strategy.
C4	**Noise and vibration**	
C4.1	*Noise and vibration management*	▸ The Inland Rail NSW Construction Noise and Vibration Management Framework (**provided in Appendix E)** would be implemented, and the proposal would be constructed, with the aim of achieving the construction noise management levels and vibration criteria identified by the noise and vibration assessment. ▸ All feasible and reasonable noise and vibration mitigation measures would be implemented. ▸ Any activities that could exceed the construction noise management levels and vibration criteria would be identified and managed in accordance with the Inland Rail NSW Construction Noise and

No.	Issue	Construction mitigation measures
		Vibration Management Framework and the CEMP. ▸ Notification of impacts would be undertaken in accordance with the **communication management plan** ~~consultation plan~~ for the proposal.
C4.2	*Work outside primary proposal construction working hours*	▸ An out-of-hours work protocol would be developed to guide the assessment and management of works outside primary proposal construction hours.
C5	**Air quality**	
C5.1	*Construction activities and earthworks that may cause dust impacts*	▸ Where sensitive receivers are located within 150 metres of construction works, or visible dust is generated from vehicles using access roads, road watering would be implemented.
C6	**Hydrology and Flooding**	
C6.1	*Flooding*	▸ Construction planning and the layout of construction work sites and compounds would be carried out with consideration of overland flow paths and flood risk, avoiding flood liable land and flood events where possible.
C6.2	*Water usage* ***(private bores and surface water)***	▸ Monitoring would be undertaken during extraction to ensure volumes stipulated by licence requirements and/or private landholder agreements are not exceeded.
C7	**Water quality**	
C7.1	*Monitoring*	▸ Water quality would be monitored during construction in accordance with the surface water monitoring framework.
C7.2	*Discharge to surface water*	▸ Discharge to surface water would be undertaken in accordance with the construction EPL, and would consider the hydrological attributes of the receiving watercourse.
C7.3	*Dewatering of excavations*	▸ **If groundwater is encountered during excavation and requires dewatering the following procedure would be followed:** • **Groundwater would be pumped into a holding tank or water truck. Pump out events would be supervised at all times, and the pump would be positioned to prevent the discharge of sediment-laden water settled at the bottom of the trench.** • **Groundwater for discharge to surface water would be tested prior to discharge. Conditions of discharge are likely to include:** • **No visible sheen or odour is noted.** • **Water pH is between 6.5 and 8.5.** • **Total suspended solids are less than 60 mg/L (approximately equivalent to a turbidity level of 50 NTU). Water may be dosed with gypsum, alum or a similar product to reduce sediment levels if required.** • **All litter and debris must be filtered out and removed prior to discharge.**

No.	Issue	Construction mitigation measures
		• **Water quality would be checked regularly during discharge events to ensure the pH and suspended solids remain within the allowable levels.** • **Consideration would be given to the hydrological attributes of the receiving water body prior to discharge (ie is sufficient water present to allow mixing etc).** • **Waste water that does not meet the criteria in the EPL would be disposed of off-site by a licensed liquid waste contractor in accordance with the *Waste Classification Guidelines* (EPA, 2014).**
C8	**Heritage**	
C8.1	*Unexpected finds* ***and human skeletal material***	▸ **If potential Aboriginal or non-Aboriginal archaeological remains, relics, items, or human remains are uncovered, works within the immediate area of the item would cease, and the unexpected finds procedure would be implemented.** ~~▸ In the event that unexpected archaeological remains, relics, or potential heritage items are discovered during construction, all works in the immediate area would cease, and the remains and potential items would be assessed by a qualified archaeologist or heritage consultant. If necessary, the Heritage Division of OEH would be notified in accordance with the requirements of section 146 of the Heritage Act 1977.~~ ~~▸ If potential Aboriginal items are uncovered, works within 10 metres of the item would cease. The item would then be assessed and managed by a suitability qualified person in accordance with the unexpected finds procedure in the construction heritage management plan.~~ ▸ During pre-work briefings, employees would be made aware of the unexpected finds procedures and obligations under the *National Parks and Wildlife Act 1974.*
~~C8.2~~	~~*Human skeleton material*~~	~~▸ In the event that a potential burial site or potential human skeletal material is exposed during construction, the procedure recommended by the historic heritage impact assessment would be followed in accordance with the *Policy Directive – Exhumation of Human Remains* (NSW Department of Health, 2008), *Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977* (NSW Heritage Office, 1998), and the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (NPWS, 1997).~~
C9	**Landscape and visual**	
C9.1	*Light spill*	▸ Temporary lighting would be designed and sited to avoid light spill into residential properties and identified sensitive receivers. ▸ Temporary and any permanent lighting would designed and sited to comply with: • *AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting* • *Dark Sky Planning Guideline: Protecting the observing conditions at Siding Spring* (Department of Planning and Environment, 2016).

No.	Issue	Construction mitigation measures
C9.2	*Spoil mounds*	▸ Spoil mounds would be shaped to reduce their angular profile and ensure that they are integrated within the landscape. Sharp transition angles in the surface profile would be avoided, and rounded profiles would be used to provide a more natural form. Grass cover would be established over the surface area in accordance with the rehabilitation strategy.
C10	**Land use and property**	
C10.1	*Communication*	▸ Property owners/occupants would continue to be consulted during construction, in accordance with the requirements of item D10.6.
C10.2	*Rehabilitation*	▸ The rehabilitation strategy (item D3.5) would include measures to restore disturbed sites as close as possible to the pre-construction condition or better, or to the satisfaction of landowners. ▸ Rehabilitation of disturbed areas would be undertaken progressively, consistent with the rehabilitation strategy and Individual property management agreements (where relevant).
C11	**Socio-economics**	
C11.1	*Communication*	▸ Local residents, businesses and other stakeholders would be notified before work starts in accordance with the communication **management** plan, and would be regularly informed of construction activities.
C11.2	~~*Access*~~	▸ ~~Access to individual residences, services and businesses would be maintained during construction. Where alternative access arrangements need to be made, these would be developed in consultation with affected property owners/occupants.~~
C11.**2**	*Workforce*	▸ Where practicable, the workforce would include workers sourced locally, and opportunities for training potential local employees would be provided. This would include exploring opportunities for local Indigenous participation in consultation with local Indigenous service providers. ▸ A zero tolerance policy relating to anti-social behaviour would be adopted for work sites.
C11.**3**	*Demands for goods and services*	▸ Local suppliers would be identified and approached for procurement of goods and services where practicable.
C12	**Sustainability**	
C12.1	*Procurement*	▸ Procurement would be undertaken in accordance with the *Sustainable Procurement Guide* (Department of Sustainability, Environment, Water, Population and Communities, 2013) and the *NSW Government Resource Efficiency Policy* (OEH, 2014d).
C12.2	*Reporting*	▸ Sustainability reporting (and corrective action where required) would be undertaken during construction in accordance with the sustainability management plan.
C13	**Waste**	
C13.1	*Waste management*	▸ Waste segregation bins (colour coded as listed in Table 24.7 **of the EIS**) would be located at key construction compounds where practicable, to facilitate segregation and prevent cross contamination.

No.	Issue	Construction mitigation measures
C14	**Health and safety**	
C14.1	*Storage and handling of dangerous goods*	▸ Hazardous materials and dangerous goods would be stored, handled, and transported in accordance with relevant regulatory requirements and relevant Australian Standards, including SEPP 33 thresholds. This would include a requirement to provide a minimum bund volume of 110% of the largest single stored volume within the bund. ▸ A risk management strategy would be developed to manage the potential for risks in situations where the minimum distance from sensitive receivers cannot be achieved, or the quantity of hazardous materials exceed SEPP 33 threshold levels.

Table 8.3 Compilation of proposal specific mitigation measures for operation

No.	Issue	Operation mitigation measures
O1	**Environmental management**	
O1.1	*OEMP*	▸ An OEMP would be prepared to detail the approach to environmental management during operation, as described in section 8.1.2 of this report and in accordance with the conditions of approval. ▸ The proposal would be operated in accordance with the approved OEMP.
O2	**Traffic, transport and access**	
O2.1	*Level crossings*	▸ The operation of level crossings that have been subject to changes as part of the proposal would be reviewed after the proposal commences operation to confirm: • that the level of protection continues to be appropriate • that the infrastructure is appropriate for the traffic conditions.
O3	**Biodiversity**	
O3.1	*Fish passage*	▸ Culverts would be regularly inspected and maintained to ensure functionality and minimise blockage of fish passage.
O3.2	*Weed management*	▸ Annual inspections would be undertaken for weed infestations and to assess the need for control measures. ▸ Any outbreak of noxious and/or weeds of national environmental significance would be managed in accordance with the *Noxious Weeds Act 1993,* the *Weeds of National Significance Weed Management Guide*, and the requirements of relevant authorities.
O4	**Noise**	
O4.1	*Operational noise and vibration*	▸ The proposal would be operated with the aim of achieving the operational noise and vibration criteria identified by the noise and vibration assessment, the requirements of the conditions of approval, and the relevant environment protection licence.
O4.2	*Monitoring*	▸ Once Inland Rail has commenced operation, operational noise and vibration compliance monitoring would be undertaken at representative locations to compare actual noise performance against that predicted by the noise and vibration assessment.

No.	Issue	Operation mitigation measures
		▸ Compliance monitoring requirements would be defined as part of the operational noise and vibration review. ▸ The results of monitoring would be included in an operational noise and vibration compliance report, prepared in accordance with the conditions of approval.
O5	**Air quality**	
O5.1	*Rail vehicle emissions*	▸ The proposal would be managed in accordance with the air quality management requirements specified in the environment protection licence.
O5.2	*Impacts during maintenance*	▸ Maintenance service vehicles and equipment would be maintained and operated in accordance with the manufacturers' specifications.
O6	**Soils and contamination**	
O6.1	*Soil erosion and sedimentation*	▸ During any maintenance work where soils are exposed, sediment and erosion control devices would be installed in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).
O6.2	*Contamination*	▸ ARTC's existing spill response procedures would be reviewed to determine applicability and suitability during operation. The adopted procedure would include measures to minimise the potential for impacts on the local community and the environment as a result of any leaks and spills.
O7	**Water quality**	
O7.1	*General water quality management*	▸ The proposal would be managed in accordance with the water quality management requirements specified in the environment protection license for ARTC and ARTC's Environmental Management System.
O8	**Socio-economics**	
O8.1	*Community safety*	▸ A safety awareness program would be developed and implemented to educate the community regarding safety around trains. This would focus on community and rural property operators who cross the rail corridor to access their properties.
O9	**Sustainability**	
O9.1	*Sustainability*	▸ Prior to operation commencing, the sustainability management plan would be reviewed and updated, and relevant initiatives would be implemented during operation.
O10	**Climate change**	
O10.1	*Climate change*	▸ The recommended adaptation measures would be reviewed, and a final list of adaptation measures for implementation during operation would be confirmed and implemented. ▸ Operational management and maintenance procedures would include measures relating to potential climate change risks, as listed in chapter 23 **of the EIS**. ▸ Emerging opportunities to manage potential climate change impacts on the proposal would continue to be monitored.

No.	Issue	Operation mitigation measures
O11	**Waste**	
O11.1	*Waste management*	▸ The waste management measures listed in Table 24.8 **of the EIS** would be implemented where practicable during operation.
O12	**Health and safety**	
O12.1	*Bushfire, storage and handling of dangerous goods, other health and safety risks*	▸ Operation would be undertaken in accordance with ARTC's standard operating procedures.

8.3 Compilation of performance outcomes

The SEARs identify a number of desired performance outcomes for the proposal. These outcomes outline the broader objectives to be achieved in the design, construction, and operation of the proposal. Based on the environmental impact assessment summarised in the EIS, and the implementation of the proposed mitigation measures, environmental performance outcomes for the project were provided in section 27.4 of the EIS.

These outcomes have been reviewed based on the design clarifications, additional assessment, and submissions received. No changes are proposed. The final proposal specific environmental performance outcomes are listed in Table 8.4. The first and second columns provide the key issue and desired performance outcome from the SEARs, and the third column provides the proposal specific environmental performance objectives to achieve the desired outcome.

Future design development and any design changes would be considered against these environmental performance outcomes.

Table 8.4 Compilation of environmental performance outcomes

Key issue (as listed in the SEARS)	SEARS desired performance outcomes	Proposal specific environmental performance outcomes
5. Air quality	The project is designed, constructed and operated in a manner that minimises air quality impacts (including nuisance dust and odour) to minimise risks to human health and the environment to the greatest extent practicable.	The proposal is designed to minimise the potential for vegetation clearance and associated dust impacts. The proposal is constructed and operated in accordance with the requirements of the *Protection of the Environment Operations Act 1974* (POEO Act) and relevant EPLs. Dust generated during construction will not exceed the relevant criteria in the *National Environment Protection (Ambient Air Quality) Measure* (NEPC, 1998) and the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2005).
6. Biodiversity	The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity. Offsets and/or supplementary	The proposal is designed to minimise the surface footprint and impacts on biodiversity. Potential impacts on biodiversity are managed in accordance with relevant legislation, including the EP&A Act, TSC Act, FM Act,

Key issue (as listed in the SEARS)	SEARS desired performance outcomes	Proposal specific environmental performance outcomes
	measures are assured which are equivalent to any remaining impacts of project construction and operation.	EPBC Act, and the *Noxious Weeds Act 1993*. The biodiversity outcome is consistent with the *Framework for Biodiversity Assessment* (OEH, 2014a). Offsets are provided in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014c).
7. Climate change risk	The project is designed, constructed and operated to be resilient to the future impacts of climate change.	Climate change risks are considered throughout the design and development process. The proposal is designed to maximise climate change resilience while minimising costs, community, and environmental impacts. The climate change risk assessment is maintained in line with updated global climate models and regional projection data. The proposal is designed, constructed, and operated in accordance with relevant climate change legislation and guidelines.
8. Flooding	The project minimises adverse impacts on existing flooding characteristics. Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, or dam failure.	Construction is undertaken in a manner that minimises the potential for adverse flooding impacts, through staging of works and the implementation of mitigation measures. Structures such as spoil mounds are designed and located such that flows are not significantly impeded. The proposal reduces the length of overtopping of the existing rail corridor. The proposal reduces or does not significantly increase the area subject to flooding.
9. Health and safety	The project avoids, to the greatest extent possible, risk to public safety.	Construction targets zero safety incidents. All dangerous goods are stored, handled and transported in accordance with relevant regulatory requirements and Australian Standards.
10. Heritage	The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage and Aboriginal objects and places. The design, construction and operation of the project avoids or	The proposal is designed to minimise the surface footprint. The design is sympathetic to the historic significance of the existing rail corridor and the heritage significance of surrounding listed heritage items, and where practicable, avoids and minimises impacts to heritage. Impacts on heritage are managed in accordance with relevant legislation, including

Key issue (as listed in the SEARS)	SEARS desired performance outcomes	Proposal specific environmental performance outcomes
	minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and Aboriginal objects and places.	the EP&A Act, the *Heritage Act 1977*, and relevant guidelines. The potential impacts identified are mitigated by photographic/archival recording.
11. Noise and vibration – amenity	Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on acoustic amenity. Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the proposal are effectively managed to protect the amenity and well-being of the community.	The proposal minimises impacts to the local community by: ▸ controlling noise and vibration at the source ▸ controlling noise and vibration on the source to receiver transmission path ▸ controlling noise and vibration at the receiver ▸ implementing practicable and reasonable measures to minimise the noise and vibration impacts of construction activities on local sensitive receivers.
12. Noise and vibration – structural	Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on the structural integrity of buildings, items including Aboriginal places and environmental heritage, and nearby road infrastructure. Increases in noise emissions and vibration affecting environmental heritage as defined in the *Heritage Act 1977* during operation of the proposal are effectively managed.	The proposal minimises impacts to structures by: ▸ controlling vibration at the source ▸ controlling vibration on the source to receiver transmission path ▸ implementing practicable and reasonable measures to minimise vibration impacts of construction activities on structures.
13. Protected and sensitive lands	The project is designed, constructed and operated to avoid or minimise impacts on protected and sensitive lands.	The proposal does not impact on protected and sensitive lands as defined by the SEARs.
14. Socio-economic, land use property, agriculture and biosecurity	The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities. The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of	The proposal minimises impacts to the local community and businesses. As part of Inland Rail as a whole, the proposal provides for the development of an efficient and sustainable route for the transport of freight between Brisbane and Melbourne. The proposal provides opportunities for regional economic development, by enabling local and regional businesses to access Inland Rail via regional transport hubs. Impacts to existing land use and properties are

Key issue (as listed in the SEARS)	SEARS desired performance outcomes	Proposal specific environmental performance outcomes
	displacement of existing land use activities, dwellings and infrastructure.	minimised, where practicable. The proposal is appropriately integrated with adjoining land uses, and access to private properties is maintained. The proposal is appropriately integrated with local and regional land use planning strategies.
15. Soils	The environmental values of land, including soils, subsoils and landforms, are protected. Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination.	Site-specific soil, subsoil and landform characteristics are taken into consideration during detailed design and construction. Any contamination is managed in accordance with relevant regulatory requirements. Any soil waste is assessed, classified, managed and disposed of in accordance with the *Waste Classification Guidelines* (EPA, 2014).
16. Sustainability	The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources. Conservation of natural resources is maximised.	The design process targets an 'excellent' rating in accordance with the ISCA rating tool. Sustainability considerations are integrated throughout the design, construction, and operation phases of the proposal. The proposal contributes to one of the desired outcomes of Inland Rail – to have more than 750,000 fewer tonnes of carbon, one-third less fuel consumption, and reduced truck volumes in over 20 regional towns.
17. Traffic, transport and access	Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts. The safety of transport system customers is maintained. Impacts on network capacity and the level of service are effectively managed. Works are compatible with existing infrastructure and future transport corridors.	The proposal provides for more efficient and productive freight rail operations. Impacts to traffic and transport are minimised, where practicable. Motorist, pedestrian and cyclist safety will be maintained or improved. The proposal contributes to one of the desired outcomes of Inland Rail – to have reduced truck volumes on the road network, improving road safety. Safe access to properties is maintained. The proposal is integrated with existing and future local and regional transport infrastructure and planning strategies.
18. Visual amenity	The project minimises adverse impacts on the visual amenity of the built and natural environment (including public open space) and capitalises on opportunities to	Vegetation providing screening to the rail corridor is retained where practicable. The proposal is designed to have regard to the surrounding landscape and visual environment.

Key issue (as listed in the SEARS)	SEARS desired performance outcomes	Proposal specific environmental performance outcomes
	improve visual amenity.	The proposal incorporates features to minimise the potential visual impacts where visual receptors are concentrated. The proposal makes a positive contribution to the quality of the visual environment in the vicinity of the Parkes north west connection. The proposal is visually integrated with its surroundings.
19. Waste	All wastes generated during the construction and operation of the proposal are effectively stored, handled, treated, reused, recycled and/or disposed of lawfully, and in a manner that protects environmental values.	Waste is managed in accordance with the POEO Act and the *Waste and Resource Recovery Act 2001*. Waste is assessed, classified, managed, and disposed of in accordance with the *Waste Classification Guidelines* (EPA, 2014). Reusable spoil is beneficially reused in accordance with the project spoil reuse hierarchy.
20. Water - hydrology	Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised. The environmental values of nearby, connected and affected water sources, groundwater and dependent ecological systems including estuarine and marine water (if applicable) are maintained (where values are achieved) or improved and maintained (where values are not achieved). Sustainable use of water resources.	The proposal avoids long term impacts to surface water. Opportunities to reuse water resources are considered during the design process. The use of water during construction is minimised.
21. Water – quality	The project is designed, constructed and operated to protect the NSW Water Quality Objectives where they are currently being achieved, and contribute towards achievement of the Water Quality Objectives over time where they are currently not being achieved, including downstream of the project to the extent of the project impact including estuarine and marine waters (if applicable).	The proposal is designed and constructed such that changes to water flows in watercourses are minimised. Water discharged does not exceed the ANZECC 2000 guidelines for protection of aquatic ecosystems or water quality trigger values. Impacts to water quality during construction and operation are minimised.

9. Proposal evaluation

This section provides the final evaluation of the project. It includes the project justification and conclusion of the environmental impact assessment process.

9.1 Justification of the proposal

9.1.1 Summary of proposal justification

Australia's freight task is set to experience significant growth over the coming decades. The existing freight infrastructure cannot support this projected growth, with increasing pressure on already congested roads and rail lines through Sydney, and increasing use of heavy trucks such as B-doubles and, potentially, B-triples along the Hume-Pacific and Newell highway corridors.

Inland Rail will address the growing freight task by helping to move freight off the congested road network, and moving interstate freight off the congested Sydney suburban rail network. It provides a reliable road-competitive solution to the freight task, and enables the commercial and social benefits of rail to be leveraged to meet Australia's long-term freight challenge.

Inland Rail will connect key production areas in Queensland, NSW and Victoria with export ports in Brisbane and Melbourne, and provide linkages between Melbourne, Brisbane, Sydney, Adelaide and Perth. It will reduce freight transit times, reduce congestion on rail and road networks, and enable the movement of larger freight volumes via rail, by making the movement of longer and double stacked trains possible.

Inland Rail will provide the backbone infrastructure necessary to significantly upgrade the performance of the east coast rail freight network to better serve future freight demands, while also diverting demand from the constrained road freight and rail passenger network.

In summary, as described in chapter 5 of the EIS, Inland Rail is needed to respond to the growth in demand for freight transport, and address existing freight capacity and infrastructure issues. The analysis of demands undertaken by ARTC indicated that there would be sufficient demand for Inland Rail.

The proposal is a critical component of Inland Rail, and has been designed to maximise use of the existing rail corridor, while still contributing to the overall efficiency of Inland Rail. Through the Parkes north west connection, the proposal would assist in connecting south-east Queensland more directly with Adelaide and Perth (via Parkes), delivering immediate interoperability with the high performance east–west trans-continental line.

9.1.2 Summary of proposal benefits

The proposal is a key component of Inland Rail, which would:

- Boost the Australian economy – Inland Rail is expected to increase Australia’s gross domestic product by $16 billion during its construction and first 50 years of operation.
- Create jobs – it is estimated that construction of Inland Rail would require a workforce of up to 16,000 people at the peak of construction, and an average of 700 additional jobs per year over the construction period.
- Improve connections within the national freight network – Inland Rail will enhance the National Land Transport Network by creating a rail linkage between Parkes and Brisbane, providing a connection between Queensland and the southern and western states, and a connection to the east–west trans-continental line.
- Provide better access to and from regional markets – Inland Rail will make it easier for freight to move from farms, mines, and ports to national and overseas markets.
- Reduce costs – it is estimated that rail costs for intercapital freight travelling between Melbourne and Brisbane will reduce by $10 per tonne. Highway maintenance costs will reduce.
- Offer better transit time and reliability – Inland Rail will allow a transit time of less than 24 hours between Melbourne and Brisbane and a reliability of 98 per cent – matching current road levels.

- Increase the capacity of the transport network – Inland Rail will increase the capacity for freight and passenger services by reducing congestion along the busy coastal transport route, and allow for growth in passenger services, particularly in the Sydney region.
- Reduce distances travelled – with Inland Rail, the rail distance between Melbourne and Brisbane will reduce by 200 kilometres, and the distance between Brisbane and Perth, and Brisbane and Adelaide will reduce by 500 kilometres.
- Improve road safety – it is estimated that each year, there will be up to 15 fewer serious crashes, avoiding fatalities and serious injuries.
- Improve sustainability – carbon emissions will reduce by 750,000 tonnes.
- Improve community amenity – truck volumes and road congestion on some of Australia's busiest highways will reduce, which will also mean a reduction in trucks travelling through more than 20 regional towns. This will lead to corresponding reduction in amenity impacts associated with the movement of freight by road, including noise and air emissions.
- Provide an alternative north-south freight link – Inland Rail will provide a second link between Queensland and the southern states, making Australia's national freight rail network less vulnerable to disruptions, for example from extreme weather events.
- Promote complementary supply chain investments – Inland Rail will be a catalyst for complementary private sector investments, such as fleet upgrades, new metropolitan and regional terminals, and integrated freight precincts.

9.1.3 Consequences of not proceeding

The proposal is a section of Inland Rail as a whole, and Inland Rail cannot proceed if the proposal does not proceed. This would mean that the benefits of Inland Rail would not be realised.

9.1.4 Environmental considerations

Environmental investigations were undertaken during preparation of the EIS to assess the potential impacts of the proposal. These included specialist assessments of terrestrial and aquatic biodiversity; heritage; traffic and transport; hydrology, flooding and water quality; noise and vibration; soils; landscape and visual amenity; air quality; sustainability and climate change; socio-economics; and waste. The EIS documented the potential environmental impacts of the proposal, considering both potential positive and negative impacts, and identifies mitigation measures to protect the environment where required. Some additional investigations were undertaken during and following public exhibition of the EIS. These are described in section 5.2 of this report.

The main potential impacts of the proposal are as follows:

Biophysical environment

The main potential impacts of the proposal on the biophysical environment include:

- direct impacts to biodiversity as a result of clearing of areas of native vegetation
- potential indirect flora and fauna impacts
- water quality impacts during construction
- geomorphological impacts to watercourses as a result of the construction of new culverts
- an increase in the extent of upstream flooding in a one in 100 year event by about 10 per cent.

Cultural

The main potential impacts of the proposal on the cultural environment (including land use, heritage, and socio-economics) include:

- minor changes to access arrangements as a result of the proposed consolidation of some level crossings
- disturbance of items with potential heritage significance
- visual impacts as a result of the introduction of new permanent structures in the landscape
- amenity related impacts during construction and operation (for example, noise, dust, traffic)
- acquisition of land
- minor impacts to surrounding agricultural land uses
- employment and associated economic benefits during construction
- contribution to the benefits of Inland Rail, as summarised in section 9.1.2 of this report
- local and regional benefits via the opportunities presented by the Parkes intermodal facility.

Addressing the potential impacts

As described in chapters 7, 8 of the EIS and section 8 of this report, the proposal would incorporate environmental management and design features to ensure that potential impacts are managed and mitigated as far as practicable. The majority of the potential construction related impacts would be effectively mitigated by the implementation of best practice construction management, including the implementation of the environmental management approaches and mitigation measures described in section 8.

The biodiversity offset strategy would be finalised and implemented to address the residual impacts of the proposal on biodiversity values, according to the requirements for Part 5.1 projects under the EP&A Act, and to offset impacts on EPBC Act matters.

9.1.5 Ecologically sustainable development

The EP&A Act adopts the definition of ecologically sustainable development contained in the POEO Act 1991. As per the POEO Act the principles of ecologically sustainable development are summarised as follows:

- Precautionary principle – if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation,
- Inter-generational equity – the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- Conservation of biological diversity and ecological integrity – conservation should be a fundamental consideration.
- Improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services.

An assessment of the proposal against the principles of ecologically sustainable development as per clause 7(4) of Schedule 2 of the Regulation 2000 is provided below.

Precautionary principle

A range of environmental investigations, as described in Part C of the EIS, have been undertaken during the development of the proposal and the environmental assessment process, to ensure that potential impacts are understood with a high degree of certainty. The assessment of the potential impacts of the proposal is considered to be consistent with the precautionary principle. The assessments undertaken are consistent with accepted scientific and assessment methodologies, and have taken into account relevant statutory and agency requirements. The assessments have applied a conservative approach with regard to construction and operational arrangements, and the modelling used.

The proposal has evolved to avoid impacts where possible and to reflect the findings of the studies undertaken. The route for the proposal has been selected to minimise the potential environmental impacts, particularly the amount of vegetation clearing that would be required, by maximising the use of existing rail corridors.

A number of safeguards have been proposed to minimise potential impacts. These safeguards would be implemented during construction and operation of the project. No safeguards have been postponed as a result of lack of scientific certainty.

Principle of inter-generational equity

Construction of a long linear infrastructure project such as the proposal has the potential for some degree of environmental and social disturbance. These disturbances include the clearing of vegetation; some disturbance to private properties during construction; potential disturbance of some heritage sites; and localised impacts. However, the potential for environmental and social disturbance as a result of construction has to be balanced against the long term benefits of the Inland Rail overall.

Should the proposal not proceed, the principle of intergenerational equity may be compromised, as future generations would experience the increased environmental and safety impacts associated with the transport of large volumes of freight via the Newell Highway. The strategic planning studies summarised in chapter 5 of the EIS have identified a strong need and justification for Inland Rail. The proposal would, as part of Inland Rail, benefit future generations by providing a safer, more efficient, means of freight transport.

Conservation of biological diversity and ecological integrity

Ecological studies have been undertaken to identify potential adverse impacts on biodiversity. Where potential impacts cannot be avoided, mitigation measures would be implemented to reduce the impact as far as practicable.

The proposal would result in the clearing of some vegetation associated with threatened plant communities. Mitigation measures are proposed to minimise and manage the significance of the impact on native vegetation and flora and fauna. Biodiversity offsets would be implemented to address the impacts that cannot be avoided.

Improved valuation and pricing of environmental resources

The assessment has identified the environmental and other consequences of the proposal, and identified mitigation measures where appropriate to manage potential impacts. If approved, the construction and operation of the proposal would be in accordance with relevant legislation, the conditions of approval, and the construction and operation environmental management plans. These requirements would result in an economic cost to the proponent. The implementation of mitigation measures would increase both the capital and operating costs of the proposal. This signifies that environmental resources have been given appropriate valuation.

The concept design for the proposal has been developed with an objective of minimising potential impacts on the surrounding environment. This indicates that the concept design has been developed with an environmental objective in mind.

9.1 Concluding statement

The proposal involves upgrading the existing rail line and associated works between Parkes and Narromine, and operating the new/upgraded section of rail line as part of Inland Rail. The proposal is needed to support the development of Inland Rail, and to provide a connection between Inland Rail and the east-west trans-continental rail line via the Broken Hill Line.

Potential impacts resulting from the proposal are considered manageable through the implementation of the proposed mitigation measures.

The detailed design for the proposal is being developed with the objective of reducing potential impacts on the local and regional environment, and the local community. The design and construction

methodology would continue to be developed with this overriding objective in mind, taking into account the input of stakeholders.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures that would be implemented during construction and operation of the project. Section 8.2 of this report summarises the mitigation measures that would be implemented. The environmental performance of the project would be managed by the implementation of the CEMP and OEMP. These plans would also ensure compliance with relevant legislation and any conditions of approval.

With the implementation of the proposed mitigation and management measures the potential environmental impacts of the proposal would be adequately managed.

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