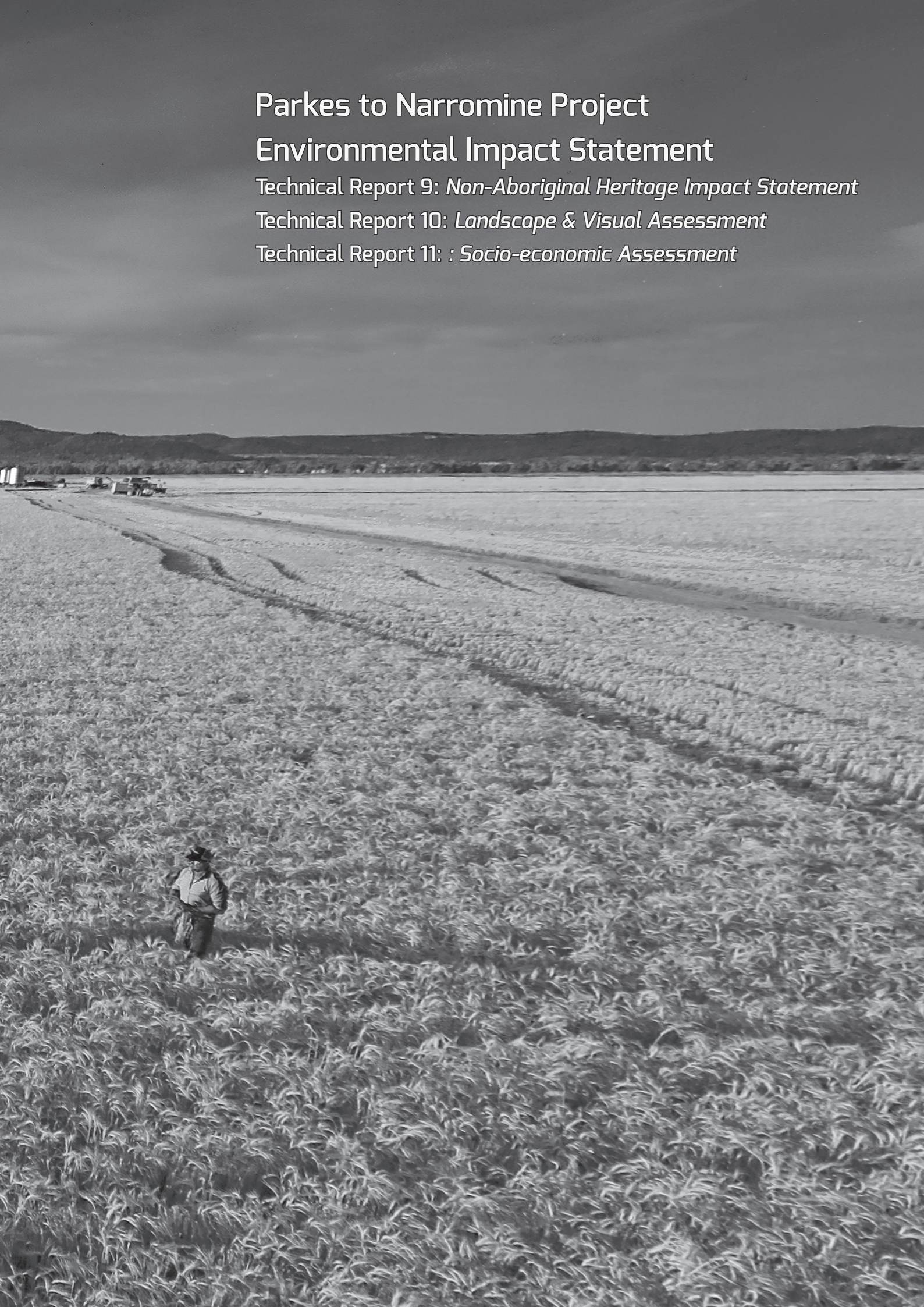
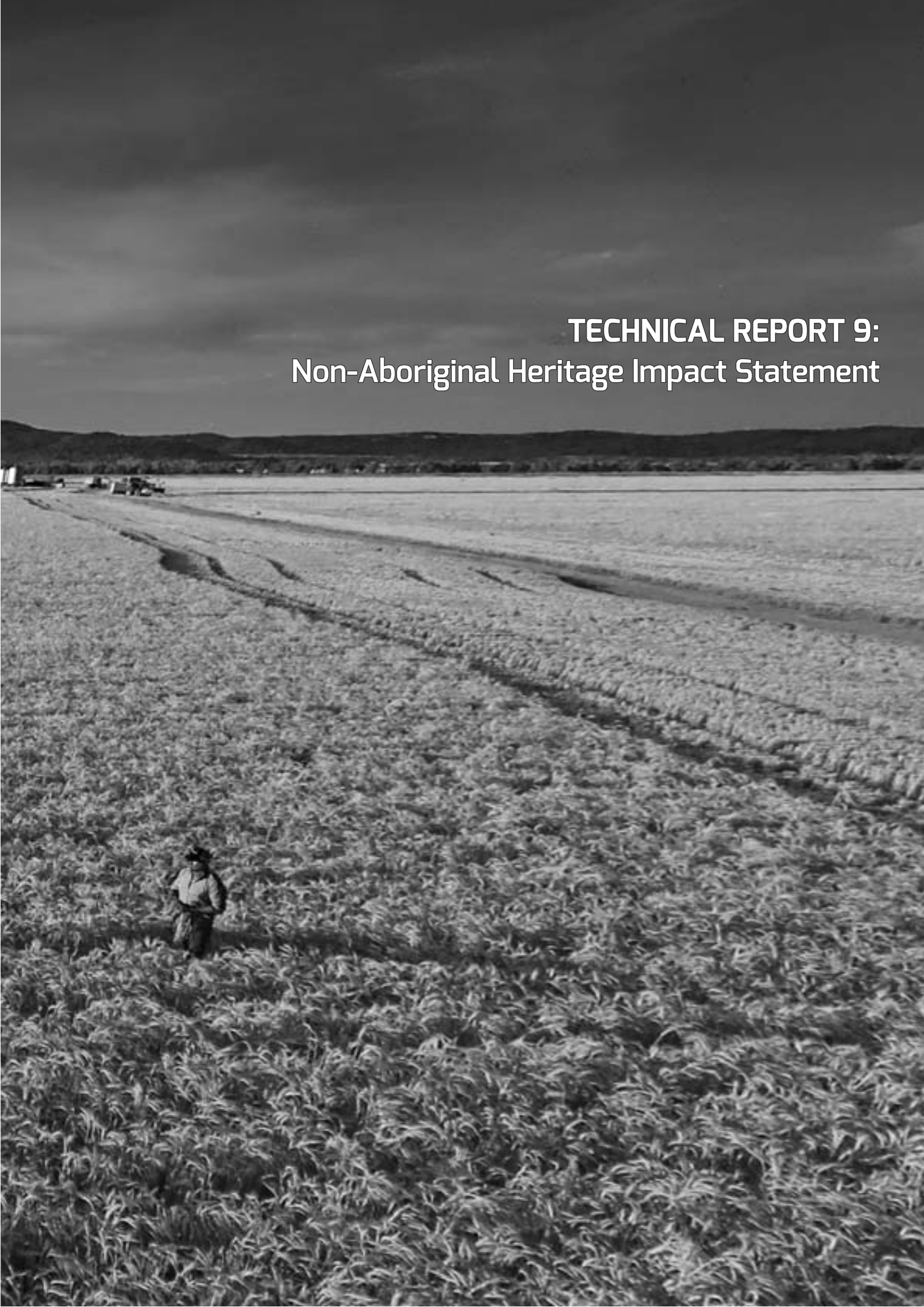
Parkes to Narromine Project
Environmental Impact Statement

Technical Report 9: *Non-Aboriginal Heritage Impact Statement*

Technical Report 10: *Landscape & Visual Assessment*

Technical Report 11: *: Socio-economic Assessment*





TECHNICAL REPORT 9:
Non-Aboriginal Heritage Impact Statement

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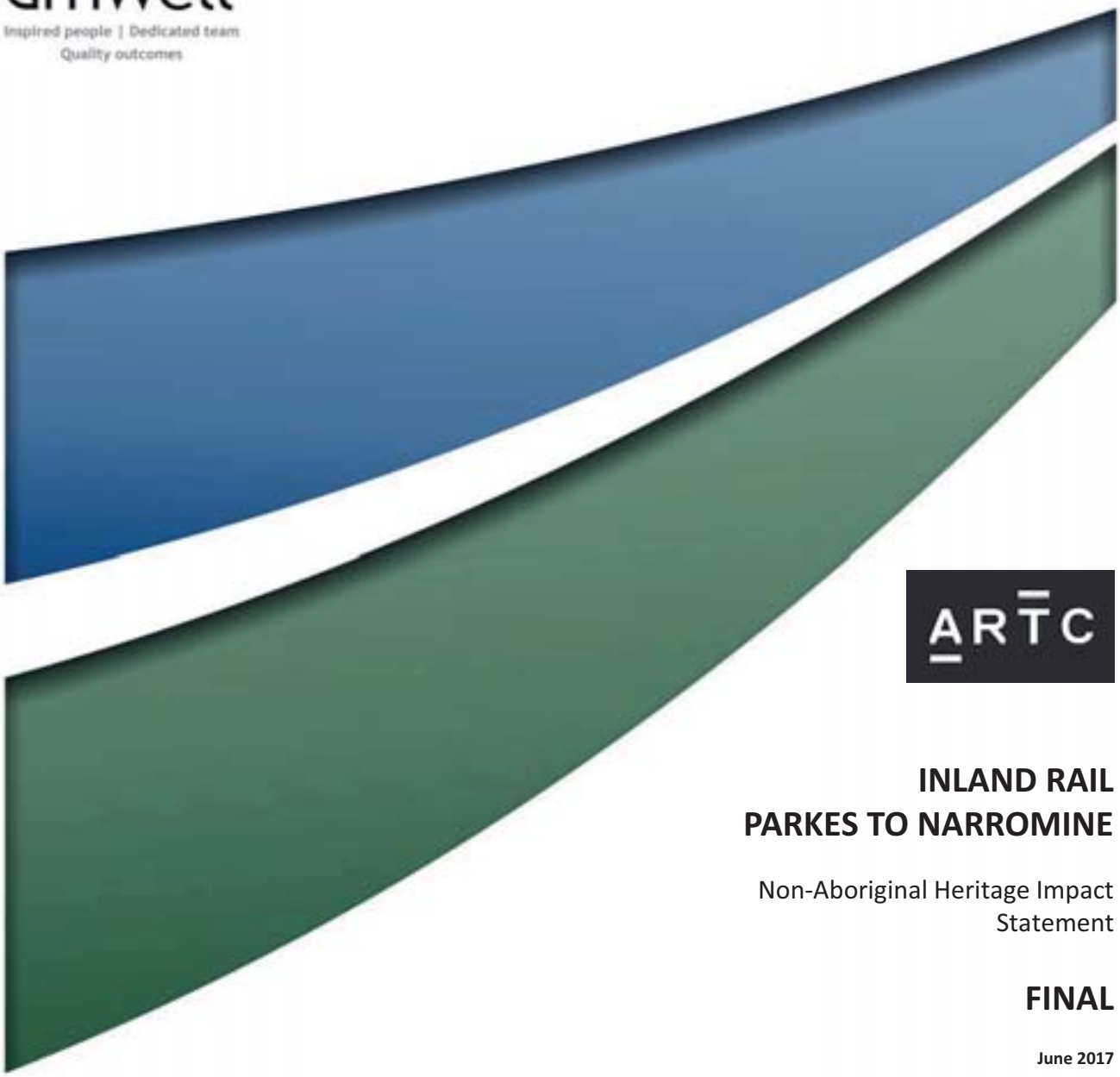

ARTC

INLAND RAIL
PARKES TO NARROMINE

Non-Aboriginal Heritage Impact Statement

FINAL

June 2017

INLAND RAIL
PARKES TO NARROMINE

Non-Aboriginal Heritage Impact Statement

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
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Report No.	3606/R05/FINAL
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This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Executive Summary

This report details an assessment of the non-Aboriginal heritage impacts of the Parkes to Narromine section of Inland Rail ('the proposal').

The proposal would involve upgrading the existing rail line between Parkes and Narromine, including new crossing loops, some track realignment and replacement of culverts. The proposal also includes a new north to west connection between Inland Rail and the Broken Hill line (Parkes north west connection). Ancillary works will include upgrading, closing or consolidating level crossings, upgrading signalling and communications, establishing new fencing or upgrading existing fencing along the rail corridor, and relocating/protecting services and utilities.

This report has been prepared as a part of the environmental impact assessment of the proposed Parkes to Narromine Inland Rail project under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Parkes to Narromine section of Inland Rail ('the proposal').This report has been prepared to address the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 17 February 2016.

The proposal is generally located in the existing rail corridor between the towns of Parkes and Narromine via Peak Hill (refer to **Figure 1.1**).

The relevant database searches indicate there are no heritage listed items within the proposal site. However, five listed items were identified within the vicinity (within 1 kilometre) of the rail corridor.

The potential non-Aboriginal heritage resources of the proposal site generally reflect the documented history of the surrounding region (discussed in **Section 3.0**) and the extant Parkes to Narromine rail alignment.

The rail line which essentially comprises the proposal site was originally constructed between Peak Hill and Narromine in 1910 before being extended to Goobang Junction immediately north of Parkes in 1914. It was constructed as a Pioneer Line which, as a result of the success of the wheat industry, has been continually upgraded following the same alignment as the original 1910 to 1914 constructed line.

The potential non-Aboriginal heritage resource, and likely absence of any archaeological resource, is considered to be typical of a rail line and includes the rail formation itself with culverts and underbridges of varying construction materials and age, evidence of the former stations and other rail related structures and infrastructure. The grain rail sidings and landmark grain silos dominate the landscape immediately adjacent to the proposal site.

The proposal comprises a former (now redundant) Pioneer Line constructed with the aim of establishing access to wheat and wool growing areas in regional NSW. It demonstrates and contributes to an important part of the history of the pattern of settlement and development in the region. The current rail line demonstrates the role of Pioneer Lines in encouraging settlement and agricultural and pastoral development in rural NSW at the beginning of the twentieth century and in the region between Parkes and Narromine particularly. As a result, the proposal site, and its individual surviving component elements such as the extant timber constructed underbridges and remnant evidence of former stations, is considered to generally be of local significance. With the exception of the rail line and its associated structures, evidence of stations and other infrastructure, the proposal site itself is unlikely to contain significant non-Aboriginal heritage or archaeological remains associated with the development history of the area.

In general the impact of the proposal can be considered to comprise the removal of the existing rail line, including rails, sleepers and ballast, and its associated culverts and the construction of a new rail line within the same rail corridor. As such the rail line will remain as an easily understood rail line in regional western NSW.

Retaining all evidence of the former rail line, culverts and stations etc. as extant today is not feasible as significant upgrades to the formation are required as part of the proposal in order for the rail line to comply with the Inland Rail required performance specifications. No identified original elements of the Pioneer Line survive intact that would warrant consideration of preservation.

The majority of the former stations have been previously removed with only occasional earthen embankments or loading banks remaining as evidence of their former locations. The rail line itself has been continually upgraded as required since its construction as a Pioneer Line and no original features (with the possible exception of some of the timber components of a number of underbridges) have been identified or are expected to be found. Statements of Heritage Impact and management recommendations are provided in **Sections 6.2**, **6.3** and **6.4** for the listed and unlisted heritage Items potentially impacted by the proposal.

It is not appropriate, feasible or practical to record the entire Parkes to Narromine section of rail line prior to its removal. Where appropriate in terms of significance and level of proposed impacts, photographic recording has been recommended for certain sites/items as detailed in **Section 6.0**.This recording would be considered to comprise an adequate and appropriate photographic recording of the rail line and its associated elements and will ensure that a full understanding and record of the former Pioneer Line will be available for future generations. The photographic recording will be undertaken with consideration of Heritage Division, OEH guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006). Consideration should also be granted to the development of an Interpretation Strategy.

In the event that unexpected archaeological remains or potential heritage items (including a burial site or human skeletal material) not identified as part of this report are discovered during the construction all works in the immediate area should cease, the remains and potential impacts should be assessed by a qualified archaeologist or heritage consultant and, if necessary, the Heritage Division, OEH notified in accordance with Section 146 of the *Heritage Act 1977* (New South Wales (NSW)). In the case of a burial site or human skeletal material being exposed the local police, OEH and the Heritage Branch should be contacted and the remains inspected by a physical or forensic anthropologist to make a determination of ancestry. The management of the remains would then be determined through liaison with the appropriate stakeholders (New South Wales Police Force, forensic anthropologist, OEH, Heritage Division, registered Aboriginal parties etc.) and in accordance with the *Public Health Act 1991*.

Glossary

AHC	Australian Heritage Commission (now Australian Heritage Council)
ARHS	Australian Railway Historical Society
ARTC	Australian Rail Track Corporation Ltd
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection Biodiversity Conservation Act 1999*
Heritage Act	*Heritage Act 1977* (NSW)
Heritage Council	NSW Heritage Council
Heritage Division	Heritage Division, Office of Environment and Heritage
IR	Inland Rail
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
Proposal	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 Corridor	Area generally defined by fences located approximately 20 metres either side of the rail line. In some sections where fences are not present the rail corridor may be wider, extending out to 30 to 40 metres from the rail line
Rail line	Existing rail line within rail corridor
SEARs	Environmental assessment requirements of the Secretary of the Department of Planning and Environment
SSI	State Significant Infrastructure

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1.0 Introduction

1.1 Overview

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. The Inland Rail programme (Inland Rail) involves the design and construction of a new inland rail connection, about 1700 kilometre long, between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail would enhance Australia's existing national rail network and serve the interstate freight market.

Australian Rail Track Corporation Ltd (ARTC) 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 requires approval from the NSW Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal is also a controlled action under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act), and requires approval from the Australian Minister for the Environment and Energy.

This report has been prepared by Umwelt (Australia) Pty Limited (Umwelt) as part of the environmental impact statement (EIS) for the proposal. The EIS has been prepared to accompany the application for approval of the proposal, and addresses the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 8 November 2016.

1.2 The Proposal

1.2.1 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 1.1**.

1.2.2 Key Features

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 the radius of 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 existing rail corridor at Brolgan Road ('the Brolgan Road overbridge').

The key features of the proposal are shown in **Figure 1.2** with towns and local government areas shown in **Figure 1.3**.

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

Further information on the proposal is provided in the EIS.

1.2.3 Timing

Subject to approval of the proposal, construction is planned to start in early to mid 2018, and is expected to take about 18 months. The proposal is expected to be operational in 2020. Inland Rail as a whole is expected to be operational in 2025.

1.2.4 Operation

Prior to the opening of Inland Rail as a whole, the proposal would be used by existing rail traffic, which includes trains carrying grain and ore at an average rate of about four trains per day. 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. The trains would be a mix of grain, intermodal (freight), and other general transport trains.

1.3 Purpose and Scope of this Report

This report summarises the results of the non-Aboriginal heritage impact assessment of the proposal. It addresses the non-Aboriginal heritage specific requirements of the SEARs, as listed in **Table 1.1**. It also addresses the requirements of Office of Environment and Heritage (OEH), as listed in **Table 1.2**.

Specifically, this assessment:

- describes the identified and potential historic heritage items within and in the vicinity of the proposal site
- assesses the historic heritage significance of listed and non-listed heritage items
- assesses the potential of impact to heritage significance by the proposal
- provides management and mitigation strategies for the proposed impacts.

This report does not include an assessment or consideration of any Aboriginal archaeological values or Aboriginal cultural heritage values related to the proposal. Aboriginal archaeological values and cultural heritage values are assessed in *ARTC Inland Rail – Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment* (Umwelt 2017).

Table 1.1 Relevant SEARs

Requirement for Non-Aboriginal Heritage	Where addressed in this report
1. The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of: **(c) environmental heritage, as defined under the Heritage Act 1977** **(d) items listed on the National and World Heritage lists.**	Throughout this report
2. Where impacts to State or locally significant heritage items are identified, the assessment must: **(a) include a statement of heritage impact for all heritage items (including significance assessment)**	**Sections 5.0** and **6.0**
(b) consider impacts to the item of significance caused by , but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant)	**Section 6.0**
(c) outline measures to avoid and minimise those impacts in accordance with the current guidelines	**Section 6.0**
(d) be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria).	**Section 1.4.2**

Table 1.2 summarises the OEH recommendations that were provided to inform the SEARs.

Table 1.2 OEH Assessment Recommendations for Non-Aboriginal Heritage

OEH Environmental Assessment Requirements - Heritage	Where addressed in this report
The EIS must provide a heritage assessment including but not limited to an assessment of impacts to State and local heritage including conservation areas, natural heritage areas, places of Aboriginal heritage value, buildings, works, relics, gardens, landscapes, views, trees should be assessed. Where impacts to State or locally significant heritage items are identified, the assessment shall:	Throughout this report
a. outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) generally consistent with the NSW Heritage Manual (1996),	**Section 6.0**

OEH Environmental Assessment Requirements - Heritage	Where addressed in this report
b. be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria),	**Section 1.4.2**
c. include a statement of heritage impact for all heritage items (including significance assessment),	**Sections 5.0** and **6.0**
d. consider impacts including, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment (as relevant), and	**Section 6.0**
e. where potential archaeological impacts have been identified develop an appropriate archaeological assessment methodology, including research design, to guide physical archaeological test excavations (terrestrial and maritime as relevant) and include the results of these test excavations.	Not applicable to the proposal as no archaeological impacts have been identified

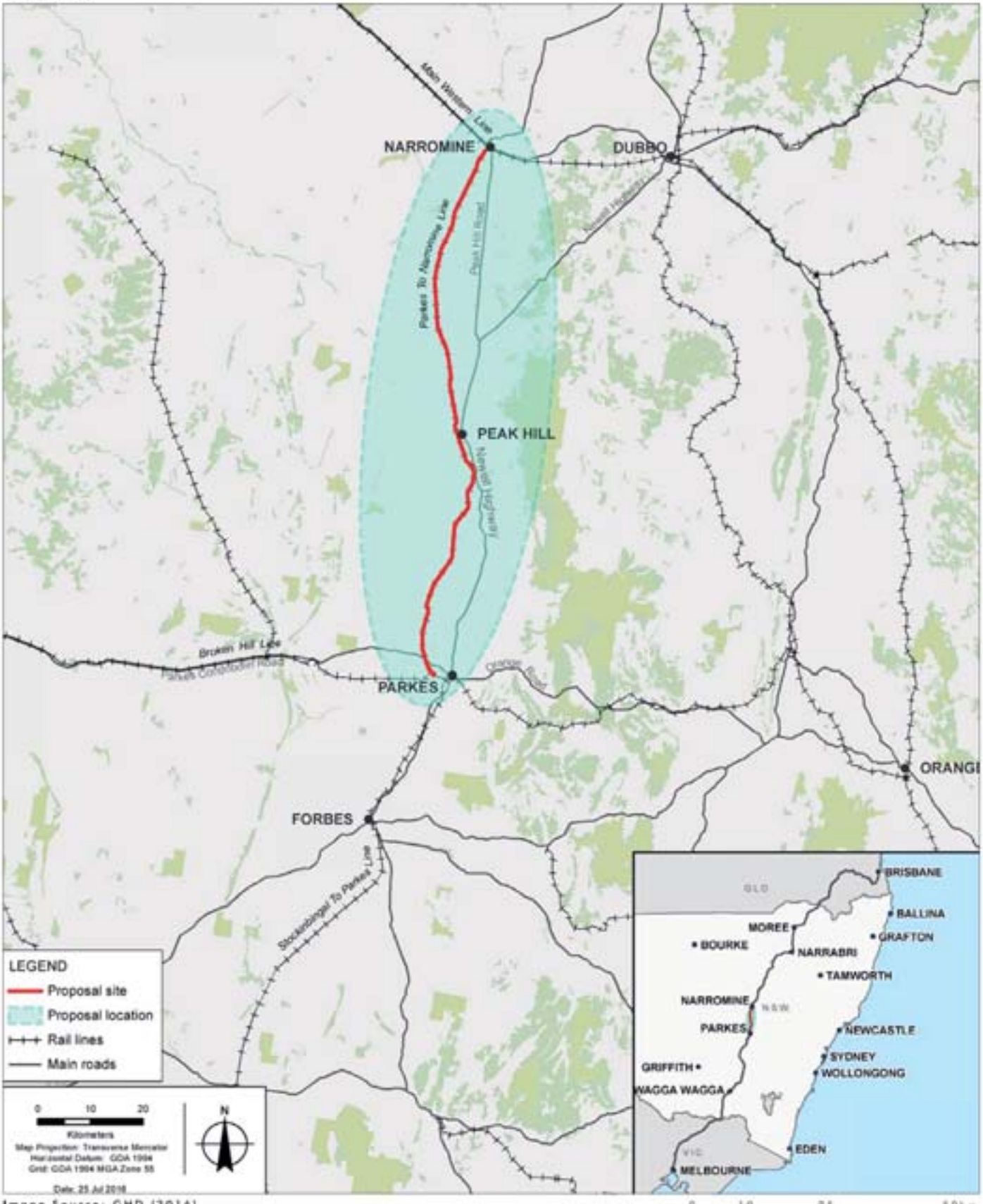


Image Source: GHD (2016)

FIGURE 1.1

Location of the Proposal

1.4 Proposal site information

For the purposes of this Non-Aboriginal Heritage Impact Statement, the proposal site represents the area of impact within and surrounding the existing rail corridor. This includes permanent and temporary disturbances as outlined in **Section 6.0**.

The proposal site is the area that would be directly impacted by construction of the proposal and includes the location of operational infrastructure. The majority of works associated with the proposal would be undertaken within the existing rail corridor for the Parkes to Narromine rail line (shown in **Figure 1.1**). The proposal site also includes the proposed location of the Parkes north west connection.

For the purposes of this report, the proposal site is considered to have a width of 30 metres, providing for a 15 metre buffer on each side of the alignment centreline. The proposal site is assumed to include all the required track infrastructure, cess drains, haul roads, culverts, level crossings, spoil mounds, and the Brolgan Road overbridge. The proposal site also includes the location of construction compounds.

The following additional assessment areas outside the proposal site have also been considered for the non-Aboriginal heritage assessment – an approximate 60 metre buffer around culverts; and an approximate 120 metre buffer around level crossings.

1.4.1 Methodology

As outlined in the OEH recommendations, this assessment has been undertaken in accordance with guidelines set out in the *NSW Heritage Manual 1996* (Heritage Office and Department of Urban Affairs & Planning), including *Archaeological Assessments*, *Assessing Heritage Significance*, *Statements of Heritage Impact* and *Heritage terms and Abbreviations* and with consideration of the principles contained in *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999* (Australia ICOMOS. 2013) and the Historical Archaeology Code of Practice (2006).

Key components in the preparation of this report included:

- reviewing relevant heritage databases
- researching, reviewing and compiling the historical context of the proposal site
- undertaking targeted site inspection of the proposal site
- completing an assessment of the significance of the proposal site
- preparing a heritage impact statement for the proposal site
- developing a management strategy for the proposal site.

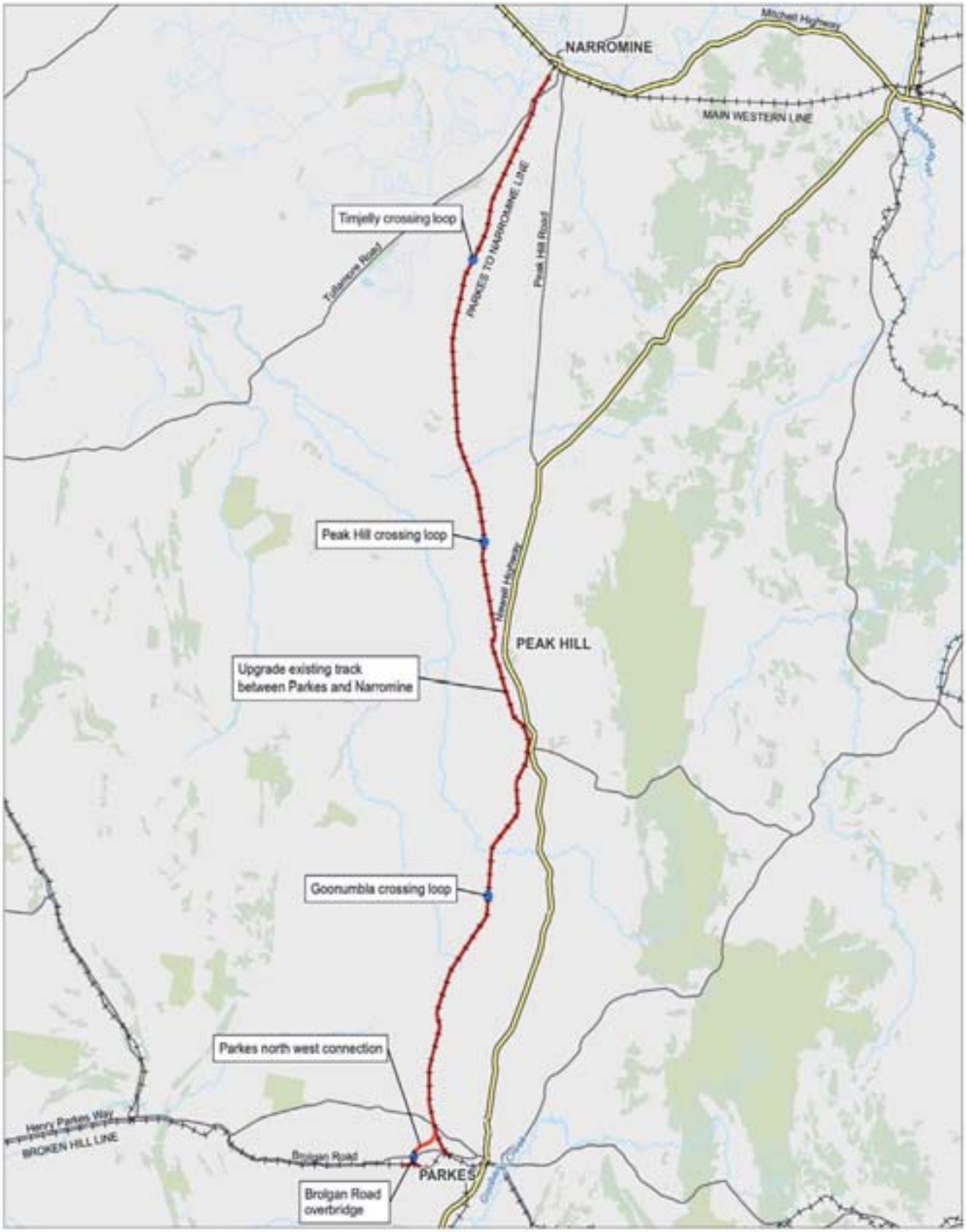
1.4.2 Report Preparation

This report was prepared by Tim Adams (Principal Archaeologist), Amanda Reynolds (Senior Archaeologist) and Alison Lamond (Archaeologist). Field surveys were led by Nicola Roche (Principal Archaeologist) and Franz Reidel (Senior Archaeologist). Tim and Franz both meet the NSW Heritage Council's criteria for Excavation Directors.

1.5 Structure of this Report

The structure of this report is outlined below.

- Section 1 – provides an introduction to the report
- Section 2 – provides the statutory heritage overview and discusses heritage listings
- Section 3 – provides a historical context for the proposal site
- Section 4 – provides the physical context for the proposal site including results of research and site inspections
- Section 5 – provides the statement of significance for the proposal site
- Section 6 – provides the heritage impact statement and management strategy for the proposal site.



LEGEND

- New bridge
- Crossing loop
- The proposal
- Railway
- Highway
- Road

0 2.5 5 10 15
Kilometers
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

FIGURE 1.2

Key Features of the Proposal

Image Source: GHD (2017)

File Name (A4): 805/3606_133.dgn
20170620 13:53

Image Source: Google Earth (2013)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 5 10 20km
1:500 000

Legend

- Proposal Site
- Local Government Area

FIGURE 1.3

Parkes to Narromine Route

2.0 Statutory Overview

The *Heritage Act 1977* (NSW) (the Heritage Act) and the *Environmental Planning and Assessment Act 1979* (EP&A Act) are the primary statutory controls protecting non-Aboriginal (historical/European) heritage within NSW.

The proposal will require approval under Part 5.1 of the EP&A Act. The proposal is declared to be development that is State Significant Infrastructure and the Minister for Planning will be the consent authority for the proposal and the relevant approval provisions of the Heritage Act and local planning instruments established under the EP&A Act do not apply.

However, for the purposes of environmental assessment an environmental impact assessment is required to be prepared in accordance with the SEARs. This report comprises the Non-Aboriginal Heritage Impact Statement prepared as part of environmental impact assessment.

2.1 Heritage Listings

In order to identify if any statutory listed non-Aboriginal heritage items are located within or in the immediate vicinity of the proposal site, desktop searches were conducted of the following heritage registers and local planning instruments:

1) ARTC Section 170 register

2) State Heritage Inventory (including State Heritage register)

3) Australian Heritage Database (including Commonwealth and National heritage lists)

4) Australian Heritage Places Inventory

5) Parkes Local Environmental Plan 2012

6) Narromine Local Environmental Plan 2011.

The searches indicate there are no heritage listed items within the proposal site. However, several listed items were identified within the vicinity (within 1 kilometre) of the rail corridor. These are listed in **Table 2.1** and detailed on **Figures 2.1A** and **2.1B.**

Table 2.1 Listed Heritage Items located within the vicinity of the proposal site

Item Name	Location	Listing and Significance	Distance to proposal site
Narromine District Hospital	Bound by Dandaloo, Cathundral and Tremain Streets Narromine	Department of Health S170 Heritage & Conservation Register	Approximately 900 metres to east
Peak Hill Courthouse	Derribong Street	Department of Justice S170 Heritage & Conservation Register	Approximately 775 metres to east

Item Name	Location	Listing and Significance	Distance to proposal site
Peak Hill Fire Station	130 Caswell Street	Fire & Rescue NSW S170 Heritage & Conservation Register	Approximately 975 metres to east
Peak Hill Police Station and Official Residence	80 Derribong Street	NSW Police Force S170 Heritage & Conservation Register	Approximately 750 metres to east
St. James Roman Catholic Church	Narra Street Lots 17-20 DP 758832	Parkes LEP 2012 Local significance	Approximately 950 metres to east

Note that while there are additional listed items in the broader areas of Peak Hill and within Parkes and Narromine town centres, these are all located over one kilometre away from the proposal site and as such are not relevant to this report.

The *ARTC Parkes to Narromine Inland Rail Noise and Vibration Assessment* (GHD 2017) identified that the expected magnitude of ground vibration resulting from general construction activities is not expected to be sufficient to cause damage if the equipment operates at distances greater than 35 metres from heritage buildings and structures'. Piling activities have the potential to exceed structural vibration values for 'heritage structures at distances of 180 metres from the activity for impact piling, 50 metres for vibratory piling and 35 metres for bored piling'(GHD 2016). Operational vibration resulting from the proposal is not expected to result in any structural damage and vibration is predicted to remain within acceptable levels (GHD 2016). As such there are not considered to be any potential direct or indirect impacts to any statutorily listed heritage items as a result of the proposal and the statutorily listed heritage items listed in **Table 2.1** are not discussed further in this report. Further discussion regarding indirect impacts such as vibration is presented in **Section 6.1.2.**

2.2 Consultation

General consultation has been undertaken by GHD / ARTC with government authorities (including the Heritage Division, OEH), local Councils and community stakeholders in relation to the proposal (refer to Parkes to Narromine Environmental Impact Statement (EIS) 2016).

The potential non-Aboriginal heritage impacts associated with the proposal and the recommendations of this report have been broadly discussed with Paul Samaras, ARTC Heritage Manager Enterprise Services. Where appropriate, in terms of significance and level of potential proposal impacts, the photographic recording of certain elements of the proposal site was discussed as an adequate and appropriate method of recording the rail line and any significant associated elements to ensure that a full understanding and record of the former Pioneer Line will be available for future generations.

Information kindly provided by the Australian Railway Historical Society (ARHS) has been utilised and reproduced within this report.

Image Source: Google Earth (2013)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 2.5 5.0 10.0km
1:250 000

Legend

- Proposal Site
- Local Government Area
- Listed Heritage Item

FIGURE 2.1A

Listed Heritage Items within 1 km of the Proposal Site

Image Source: Google Earth (2013)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 2.5 5.0 10.0km
1:250 000

Legend

- Proposal Site
- Local Government Area
- Listed Heritage Item

FIGURE 2.1B

Listed Heritage Items within 1 km of the Proposal Site

3.0 Context

As part of NSW heritage assessment procedures it is essential to have a full understanding of a site, item or area based on its historical and physical context. This section of the report provides a historical context for the proposal site and its broader locality to provide an understanding of the significance of any non-Aboriginal heritage or archaeological sites or items within the proposal site.

3.1 European Contact

According to Tindale's (1974) map of Aboriginal Australia, the proposal site extends over the country of the Wiradjuri people and the Wongaibon people. Tindale's map indicates that the section of the proposal site from Parkes to Alectown is within the country of the Wiradjuri and that the country of the Wongaibon included the 'headwaters of Bogan River; on Tigers Camp and Boggy Cowal creeks'. This includes the portion of the proposal site between Alectown and Narromine.

The earliest historical records relating to Aboriginal people in the proposal site date from 1817 when John Oxley, Surveyor General of NSW from 1812, camped on the Bogan River during his exploration of the area (refer to **Section 3.2**). The expedition noted the presence of deposits of freshwater mussel shell and stone artefacts and identified the existence of a spring on Gundong Creek that was utilised by Aboriginal people (referenced in OzArk 2011).

A 1935 expedition to the area by Thomas Mitchell, Surveyor General from 1828 (following John Oxley's death), relied heavily upon guidance from local Aboriginal people. Mitchell frequently referenced the excellent navigation skills of his Aboriginal guides along the Bogan River, particularly in relation to their knowledge of the location of reliable water sources. Mitchell later recognised that the limited European settlement that occurred over the 10 years following his expedition had resulted in impacts to the landscape; in particular to the water courses (Umwelt 2016). He noted that

> *…had I been an aboriginal native, should have felt and regretted that change.*

Subsequent records of Aboriginal people living or working within or in the vicinity of the proposal site are relatively limited until the modern period, with generalised accounts of interactions between Aboriginal people, pastoralists and (subsequently) gold miners (refer to English et al 1998). The annual return for the Aboriginal Protection Board in 1891 records that 261 Aboriginal people lived in the Dubbo district, which included Peak Hill and Narromine (English et al 1998:50), with many Aboriginal men employed on pastoral stations (Umwelt 2016). The majority of other records are those relating to the establishment of Aboriginal missions and subsequent documents (such as those produced by the Australian Inland Mission) that document aspects of mission life. The Bulgandramine Mission was formally established in 1907 and was located on the Bogan River 22 kilometres northwest of Peak Hill (to the west of the proposal site). The mission remained in existence until 1941, with many Aboriginal people from the broader region relocated to live in this area (Umwelt 2016).

Further details and discussion relating to the ethnohistoric context of the proposal site are provided in *ARTC Inland Rail – Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment* (Umwelt 2017).

3.2 Early Exploration

The wider area is dominated by the Lachlan River and its tributary the Bogan River. The Lachlan River region was first discovered in 1815 by Surveyor George Evans. In 1817 John Oxley further explored the Lachlan Plain including the areas of Forbes, Bogan Gate, Parkes and Peak Hill.

In 1835 and 1836 Thomas Mitchell explored the region including the mapping of the Bogan and Lachlan Rivers (Heritage Office 1996:98). Mitchell's expedition 'sealed the future of the inland for pastoral occupancy' as his route became the basic supply route for squatting activity (Tindall 1982:6).

The map of Mitchells's expeditions '*Map of Australia showing the routes taken by Sir T.L. Mithchell in his expeditions into the interior of New Holland'* shows Mitchell's 1835 route along the Bogan River to the area of present day Bogan and his 1836 route along the Lachlan River (refer to **Plate 3.1**).

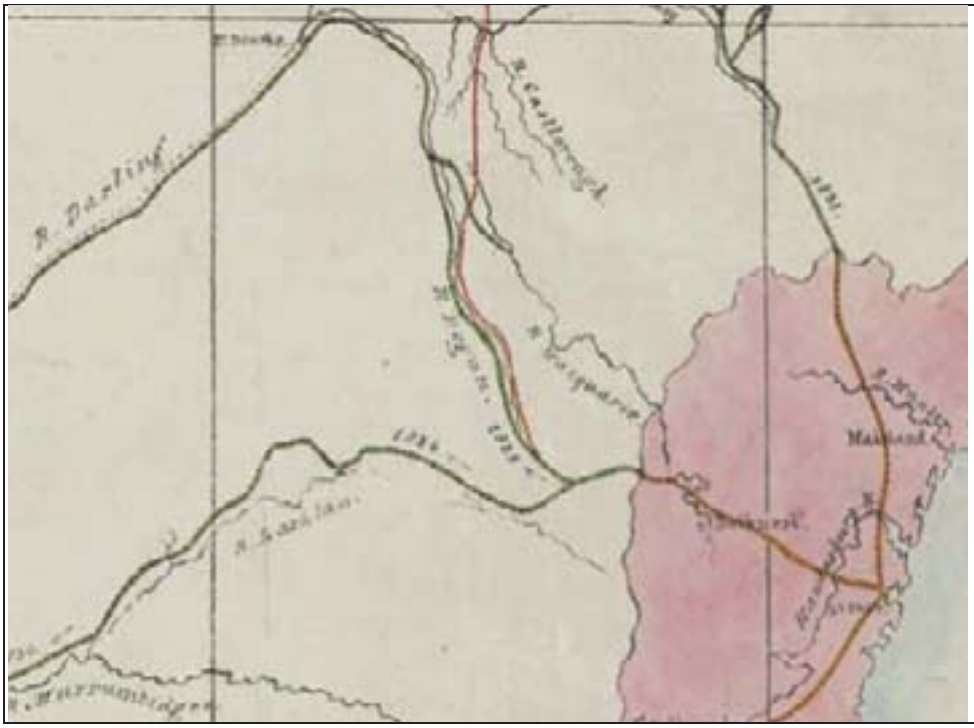


Plate 3.1

Detail of map showing routes taken by Mitchell.

Shows 1835 route along the Bogan River and 1836 route along the Lachlan River

Source: State Library of NSW

3.3 Early Settlement and Land Administration

When European settlers arrived in NSW in the nineteenth century the colonial government claimed all lands for the Crown, with the governor of NSW having exclusive authority to make land grants. Although the Lachlan Plain area was not officially opened up for settlement until the 1840s, the grazing potential of the area was recognised in the early 1800s (Heritage Office 1996:98).

The Australian Agricultural Company (AA Co.) was established in 1824 by an Act of the British Parliament which granted the Company one million acres with the primary purpose of producing wool and other crops for export. The AA Co. also entered the coal industry in the Newcastle area with the intention of exporting coal to India for use by the steamers of the East India Company. The AA Co. held its monopoly over the coal mining industry in the Newcastle area until 1847 when the Company agreed to abandon its protected position in the coal industry in return for the right to sell its estates.

From the 1820s the occupation of Crown land without legal title was a widespread practice and land administration became one of the most important tasks overseen by the colonial government. The colonial authorities attempted to contain settlement by limiting unlicensed occupation inland. In 1826 the Limits of Location were established in NSW by Governor Darling which comprised the geographical limits beyond which settlers would not be permitted to go in search of the land and land grants could only be issued within these boundaries making it illegal to settle the land outside the newly established boundaries. Before 1826, land grants were given exclusively by the Governor. Grants of land were free until 1825 and could consist of up to 30 acres.

The reasoning behind limiting the area available for settlement in the vast regions 'beyond the protection of the military' was given as the vulnerability of squatters to attack by Aboriginal people, drought, flood and starvation (Tindall 1982:5). However, pastoralists had been bringing their cattle onto western rural NSW since John Oxley's explorations of the Lachlan Plains in 1817. The continued push west by pastoralists led Sir Ralph Darling (Governor of NSW from 1825 to 1831) to issue a Government Order in 1829 extending the boundaries of settlement (the Limits of Location) to encompass the existing Nineteen Counties surrounding Sydney. The Nineteen Counties effectively became the Limits of Location (refer to **Plate 3.2**); which defined

> *...the limits of location to the settled areas or districts, and proclaiming that the 19 counties then existing were considered ample for the requirements of the penal settlement (Tindall 1982:5).*

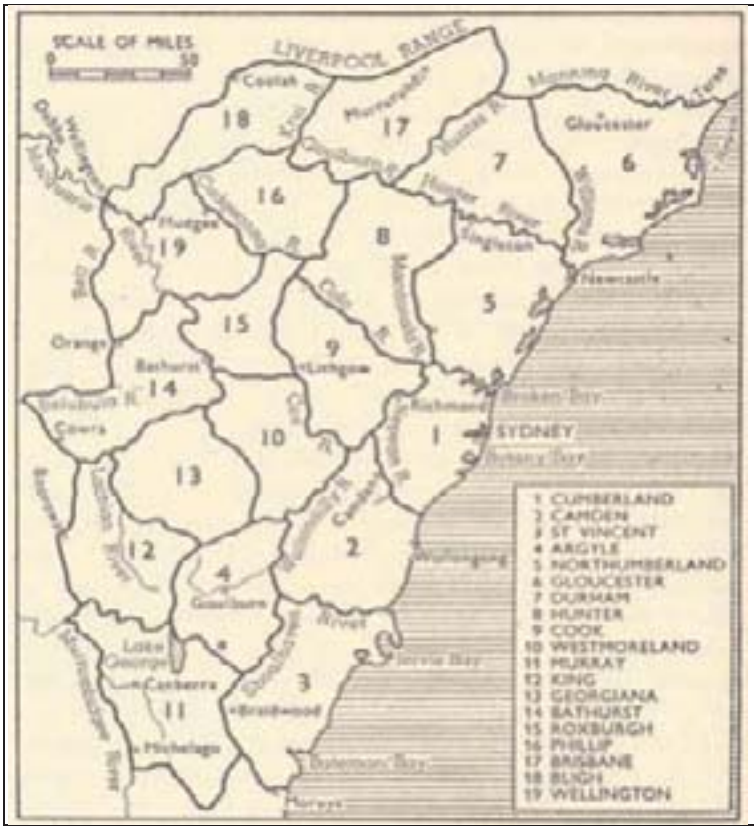


Plate 3.2

Nineteen Counties Map 1958

However, pastoralists wanting to take advantage of the inland grass country did not restrain themselves by the 'limit of location'. They were given the title 'squatters', a term that came to refer to those who extended their activities across the arbitrary boundaries established by the colonial government and became holders of vast tracts of country and wealth (Tindall 1982:5). In 1831 Governor Darling admitted that

> *...setting the precise boundaries beyond which settlers were not allowed to receive grants or to lease land did not get away with the problem of cattle being grazed beyond the limits (Tindall 1982:6)*

Governor Darling's successor, Sir Richard Bourke (Governor of NSW from 1831 to 1837), declared that unauthorised occupation must not be permitted to continue whilst it created any title to the land for the occupier (Tindall 1982:6). Pastoralists began moving into the Darling Plains area from the Hunter Valley in the south or the Liverpool Plains in the west. When the AA Co. took over fertile land in the Liverpool Range in 1832 squatters were driven into the New England and Darling Plains areas, with pastoral runs out to Wee Waa and Moree in existence by 1836 (Heritage Office 1996: 80). The land along the Macquarie River was taken up through the 1830s. The south-western pastoral runs were predominantly sheep, while the north and east runs were cattle (Heritage Office 1996:80).

3.3.1 Squatters Map

The term 'squatter' (first appearing in 1828) soon came to refer to a person of high social prestige who grazed livestock on a large scale; often having no legal title to the land beyond being the first European to settle on it. Successful squatters were among the wealthiest class of people in the colony and came to be described as the 'squattocracy'. The expanding market for meat due to population growth in NSW and the demand for grazing land to meet the needs of the developing sheep industry, provided impetus for the increased squatting activity during the 1830s.

In 1837, Robert Dixon, an assistant surveyor working in the Surveyor General's Department in Sydney, produced a unique map of NSW which attempted to record the spread of settlement across the colony. It was Dixon's intention to show exactly who owned land in NSW and exactly where that land was, and each property (each piece of 'appropriated land') was annotated with the name of the landholder. As such it shows the acreages of land granted and sold in the colony up to June 1836.

Dixon's map (full title: *Exhibiting the Situation and Extent of the Appropriated Lands, including the Counties, Towns, Villages, Reserves, Compiled from Authentic Surveys*) is commonly known as 'the Squatter's Map' and comprises the earliest documented attempt to show who owned what land in NSW. Dixon (1800-1858) was an explorer and surveyor born in Durham in 1800 who came to NSW in 1821. From 1826 he was the assistant surveyor in the Surveyor-General's Department. The 1837 map was produced while Dixon was on leave in London and is reported to have been made using other surveys and documents. Surveyor General Major Thomas Mitchell, who had produced his own less informative map of NSW in 1834 is reported to have been offended by Dixon's 1837 map and refused to reappoint Dixon on his return to Sydney after nearly 15 years of service (Warden 2010:16-17).

The limits of Dixon's map generally reflect the western boundaries of the Nineteen Counties, with no granted land shown to the west of the Bell River; approximately 70 kilometres east of the proposal site (refer to **Plate 3.3**).

Plate 3.3

Detail of Robert Dixon's 1837 Map of the Colony

Map shows no settlement west of the Bell River. Mount Canobolas is shown at the bottom left of the image.

3.4 Early Pastoralism and Land Administration

Thomas Kite is recognised as likely being the first squatter in the wider Parkes area. Kite followed the expedition tracks of Mitchell and established a station on the Goobang Creek in 1835, a few kilometres northeast of Parkes. The first non-Aboriginal settlement in the Parkes area is mentioned in Mitchell's diaries. In September of 1835 he recorded that on his return trip through the Central West, while camped at the Goobang Creek, a stockman rode up to him reporting that his employer, named "Pike" had established a cattle station a few miles from where his party was camped. It is possible that Thomas Kite and Pike were the same person due to the similarity of the names (Parkes Shire Council nd).

In 1833 an *Act for Protecting the Crown Lands of the Colony from Encroachment, Intrusion and Trespass* was passed. The Act authorised the Governor to appoint Commissioners of Crown lands. However, the 1833 Act appears to have had little or no impact on the unauthorised occupation of Crown Land. As a result Governor Bourke sought to legalise and regulate squatting through further legislation in 1836 which led to the issuing of licences to settlers to depasture their stock on the vacant Crown lands beyond the Limits of Location. The 1836 Act imposed a £10 licence fee for depasturing on lands beyond the Nineteen Counties. The Act also provided for the appointment of full-time Commissioners of Crown Lands to the districts beyond the 'limits of location' (NSW State Records. nd). These commissioners administered the licensing. However, the imposition of the license fee implied approval for squatting (NSW State Records: Squatters and Graziers nd.).

The concept of areas within and outside the Nineteen Counties was discontinued in 1847. After this time NSW was divided into three areas: Settled (the former Nineteen Counties), Intermediate and Unsettled. Pastoral leases were available in these three areas for one, eight and fourteen years respectively (State Library: Agriculture nd.).

In nineteenth century Australia, the method for establishing a pastoral run or station required the grazier to pay a certain price per head for the number of sheep or cattle on the property which was generally situated on Crown-owned land, and thereafter pay the government an annual rental for the lease on the property, which varied according to the situation and quality of the country, and ranged from £10 to £100 per block of 100 square miles. By May 1880, depending to the quality of the run and the stock, the usual price for a station with 10,000 sheep was about £10,000 and about £3000 for a property with 1000 or 1500 head of cattle. Freehold estates could also be purchased outright in the settled districts near towns and railways from £1 to £5 pounds per acre.

Cattle runs were granted 10 acres per head, while sheep were granted 4 acres per head. There were more cattle runs than sheep stations in the region, with more sheep owners settling further north in New England. The early runs were owned by absentee landowners and this, along with temporary licence restrictions is the reason for the lack of early impressive houses. Ex-convicts and stock keepers were living in huts on the land (Heritage Office 1996: 81). Owners began living on their stations after 1847, meaning better houses began to be built. Cattle stations would employ two to four men, while sheep stations could employ up to 20 men, with neighbours co-operating at annual muster time.

Large pastoral runs, varying from 11,000 to 25,000 hectares were opened in the Lachlan River region between 1835 and 1858. In 1839 the Lachlan Pastoral District was established, over the land between the Lachlan and Murrumbidgee Rivers. The land north of the Lachlan River was within the Wellington Pastoral District. The grazing potential of the Lachlan plains was noticed early and attracted attention even before it was opened to settlers in 1840. The Lachlan River is located at the western extent of early exploration and although it was discovered in 1815 it was not explored until John Oxley explored the area in 1817. Despite the land not being opened for settlement, pastoralists were bringing their cattle onto the plains; with one family, the Woods, occupying over 68,000 hectares of the south-east plains prior to 1840.

By 1848 NSW was subdivided into large pastoral runs (Heritage Office 1996: 80). By 1849 there were up to 50 runs in the area with frontages to the Lachlan River. Thomas Kite was one of the more significant of the early settlers with land totalling over 60,000 hectares on either side of the Lachlan River (Heritage Office 1996:99). However, in the 1840s the largest station in the area was Benjamin Boyd's who had 60,000 hectares around present Condobolin to the west of Parkes. Boyd's station was broken up after 1849 because of financial difficulties.

The larger squatters exploited the £10 licence fee and legislation was tightened to obtain additional fees. Although Boyd had occupied nine runs in the wider area and 30 runs in all in the region, he had only paid £140 in licensing fees. The big squatters, including Boyd who was the president of the newly formed Pastoralists' Association, protested the increase in fees. They demanded fixity of tenure for land beyond the Limit of Location over which they held leases. The resulting *Land Act of 1847* granted a leasehold of 14 years with provisions for compensation on eventual resumption at the assessed value for any improvement made. Under this act rent was paid based on a per acre basis. The Act was seen as a triumph for squatters who had previously had no title to any improvements to the land they occupied which had resulted in most improvements (likely just stockyards and living quarters for stockmen) being of a rough and temporary nature (Tindall 1982:21). The provision for compensation of all improvements allowed a better quality and more permanent buildings to be constructed along with fencing, dams and tree clearing (Tindall 1982:25).

By 1848 1745 runs had been applied for (Tindall 1982:6-7) and there were four major stations that leases had been taken out on:

- Coobang – 38,400 acres (owned by Thomas Kite)
- Coradgery – 23,040 acres
- Burrawang – 35,200 acres (owned by Thomas Kite)
- Gunningbland – 16,000 acres.

The principal purpose of the early stations was to raise cattle, and the majority of the Lachlan Pastoral District runs had no sheep at all. However, this changed from the late 1850s when Hanbury Clements settled at Eugowra to the southeast of Parkes. Clements brought sheep with him from Bathurst and by 1878 there were 12,000 sheep at Eugowra. Other landowners soon followed suit and in the 1860s and 1870s the wooden shearing sheds that are now such a feature in the region were being constructed (Heritage Office 1996:100).

3.4.1 Robertson Land Acts

In 1861 Crown land management was reformed with two pieces of new legislation, which included the introduction of Sir John Robertson's scheme of 'free selection before survey'. The *Crown Lands Alienation Act 1861* dealt with the sale of land and the *Crown Lands Occupation Act 1861* allowed for the leasing of Crown Land (NSW State Records: Archives In Brief nd.).

In 1856 Sir John Robertson was invited to run for (and won) the seat of Phillip, Brisbane and Bligh at the first parliamentary elections. With farmers excluded from leasing and generally in a much inferior position to the squattocracy Robertson was determined to implement land reform and considered the key to basic social reform was change in land policy and the need that settlers, mainly agricultural and with minimum capital, should have ready access to land, even if occupied by lease-holding squatters (Nairn, 1976).

At the June 1859 general election Robertson retained his seat, now the Upper Hunter and became leader of the Opposition. On 30 September 1859 the Lands Department was established, with Robertson as the first Secretary for Lands. By September he had his new land legislation ready and brought down the Crown Lands Alienation Bill and the Crown Lands Occupation Bill, embodying free selection before survey; both bills passed their second reading, but in committee in October the vital clause was defeated 33 to 28. With his parliamentary resources exhausted Robertson obtained a dissolution and prepared to fight a general election on the issue in December. The resulting elections were a triumph for Robertson as out of 53 candidates favouring his land bills, 35 were elected. All 14 candidates who openly opposed the bills were defeated. Robertson retired from the premiership on 9 January 1861 to concentrate on carrying his legislation in both assembly and council. He resubmitted his bills on 16 January and they were eventually passed on 24 October (Nairn, 1976).

From 1861, the Robertson Act opened all Crown Land for selection until the law changed again in 1884. During this period, land parcels of between 40 and 320 acres could be conditionally purchased without a survey, as long as the purchaser had the funds to improve the land acquired and the intention to occupy it for at least three years. Previously land in settled districts had been sold by auction while vast areas of unsettled grazing lands were leased and licensed to mainly pastoralists. The new legislation made all leasehold land in the Colony available for selection and sale. The legislation also abolished land distinctions used in the Colony, such as settled and unsettled districts, and introduced new land divisions, such as town land, suburban land, first class settled districts and second class settled districts (State Library: Agriculture nd.).

3.5 Discovery of Gold

The discovery of gold in the region signalled a new period of the area's history. The majority of the major towns in the Lachlan plain area were established primarily as a result of gold. These include Forbes, Parkes, Peak Hill, Wyalong, West Wyalong and Lake Cargelligo. Only Bogan Gate, Condobolin and Ungarie were established as a result of the needs of farmers for a market and social centre. The earliest gold rush in the area was at present day Forbes in 1861. Approximately 28,000 miners were soon living in a tent town, quickly followed by stores, banks and even two theatres, resulting in the establishment of the township of Forbes (Heritage Office 1996:100).

In 1863 and 1864 gold mines opened at Curragong, just north of present day Parkes, bringing approximately 10,000 prospective miners to the canvas town of Curragong. By 1867 the initial gold rush had finished but the early 1870s saw the beginning of the alluvial goldrush when gold was discovered on 18 July 1870 and the area renamed Bushmans (located two kilometres south of the current centre of Parkes). The township soon became a stock and trades crossroads and other mines in the immediate area like Welcome, Tearaway and Great Northern contributed to the population of approximately 5,000 active miners in 1873 (Butel and Thompson 2008:209). Other areas to benefit from the gold rush included Grenfell (1867) to the south, Lake Cargelligo (1873) to the west, Peak Hill (1889) to the north and Wyalong (1893) to the southwest (Heritage Office 1996:101-102).

The first gold discovery in the Peak Hill area was at Tomingley in 1881 when gold was identified in quartz veins. It took another eight years for gold to be discovered at Peak Hill itself (only 16 kilometres away from Tomingley) in 1889. This discovery generated another gold rush and within a few months approximately 2,000 people were working around the boom town of Peak Hill which was described as being '...regularly and well laid out' (Frost and Robinson, 1981:74).

In his December 1889 report the mining warden, Mr W.S. Caswell reported that

> *I have traced 911 oz 12 dwt 2 gr to the various banks, the value of which was about £4,082 133s4d. A private individual also sent over 250oz of gold to the mint worth about £1,000. This is a fair return for four months work, especially as the greater proportion of those assembled were speculators, tradespersons or loafers (Frost and Robinson, 1981:74).*

3.6 1884 Land Acts and Rural Settlement

The end of the Lachlan Plain gold rushes coincided with important legislative changes regarding land purchases and thus rural settlement and land exploitation in the area as two new Land Acts were passed in 1884 controlling all Crown Land alienation and occupation. NSW was divided into three Divisions, the Eastern, Central and Western Divisions. The proposal site is within the Central Division. The Acts allowed for pastoral leases, annual and special leases, scrub leases and conditional leaseholds. Free selection was still possible but the maximum area was enlarged by permitting the applicant to take up three-quarters of their selection as a Conditional Lease, with the provision that it could later be converted into a Conditional Purchase.

Pastoral landholders were required to divide their land into two sections, the Leasehold area and the Resumed area. The Leasehold area was leased to the runholder for fixed periods. The Resumed portion could be held by them under an annual lease only. It was liable to be resumed for settlement by the Department of Lands. A re-assessment of the nature of pastoral holdings was the central principle enshrined in the new Act. All pastoral land in NSW had to be re-evaluated by the Department. The 1884 Crown Lands Act meant Pastoral Holdings, all of which were given a record number, replaced Pastoral Runs.

Scrub Leases were created by the 1884 Act. These provided for the leasing of areas less than 10,240 acres (4,144 ha) as scrub lands. A new condition was attached to Scrub Leases by the 1895 Lands Act. Scrub Leases had been available for land wholly or partly covered by scrub and could be leased by auction, tender or application for terms up to 21 years. The term was extended to 28 years by the 1895 Act. The holder had to destroy the scrub or noxious weeds and keep it free. In the final year of the lease the lessee could apply to convert it to a homestead grant of 640 acres.

The Improvement Lease was also created by the 1895 Lands Act and allowed the leasing of scrub land not suitable for settlement, up to 28 years. Land classified as scrub or inferior could be taken up under this tenure. They were offered by auction or tender and were available up to a maximum of 20,480 acres. The term was 28 years. Conditions included improving the land under conditions drawn up for each case and the holder had tenant rights to any improvements. There was no compulsory residence requirement.

The Settlement Lease was also created by the 1895 Lands Act. A Settlement Lease could be taken up for agriculture or grazing with a maximum of 1,280 acres for agricultural use and 10,240 for agriculture plus grazing. The term was 28 years later extended to 40 years. The holder had to reside on the lease for the whole term, enclose the holding within 5 years, and comply with conditions about noxious animals, scrub etc. The holder could apply to convert it to a homestead selection in the final year with an area of 1,280 acres (Kass 2011).

3.7 Pastoralist's Maps

William Hanson compiled the 1889 book *Pastoral possessions of NSW* following the 1884 Land Act and the creation of the three divisions. He intended the document to form a summary of NSW's

> *...immense pastoral resources, and to be a guide to all who are or may become interested in the further development of this almost terra incognita of New South Wales; in short to afford reliable data on the subject of our possessions not heretofore available to the public at large...The volume may also be acceptable to the capitalist as demonstrating the solid foundation upon which our public securities stand, and the certainty of a steady revenue being derivable from the Pastoral Possessions of the colony (Library of Congress nd).*

Hanson's book is divided into the three sections established by the 1884 Land Acts: the Eastern division, the Central division and the Western division.

There are a number of nineteenth century maps that provide information regarding pastoral runs in nineteenth century NSW. **Figures 3.1** and **3.2** shows the rail alignment overlaid onto an 1860 and 1880s pastoralists map respectively. Used in conjunction with William Hanson's *Pastoral possessions of NSW* names and areas of runs can be determined along with ownership details and information regarding license fees, annual rents etc.

The 1860s map (**Figure 3.1**) comprises *Reuss and Browne's Map of New South Wales and part of Queensland showing the relative positions of the pastoral runs, squattages, districts, counties, towns, reserves etc.* The 1886 map (**Figure 3.2**) comprises the *Index map of New South Wales shewing pastoral holdings* prepared by Surveyor General's Office. The rail alignment has been overlaid onto these maps; however it should be noted that the location of the rail alignment (especially on the 1860s map) is approximate due to the scale and limited common detail with modern mapping available on the early maps.

Table 3.1 lists the likely names and areas of runs in the area through which the rail alignment passes from the north to the south. Ownership details and information regarding license fees and annual rents are also noted.

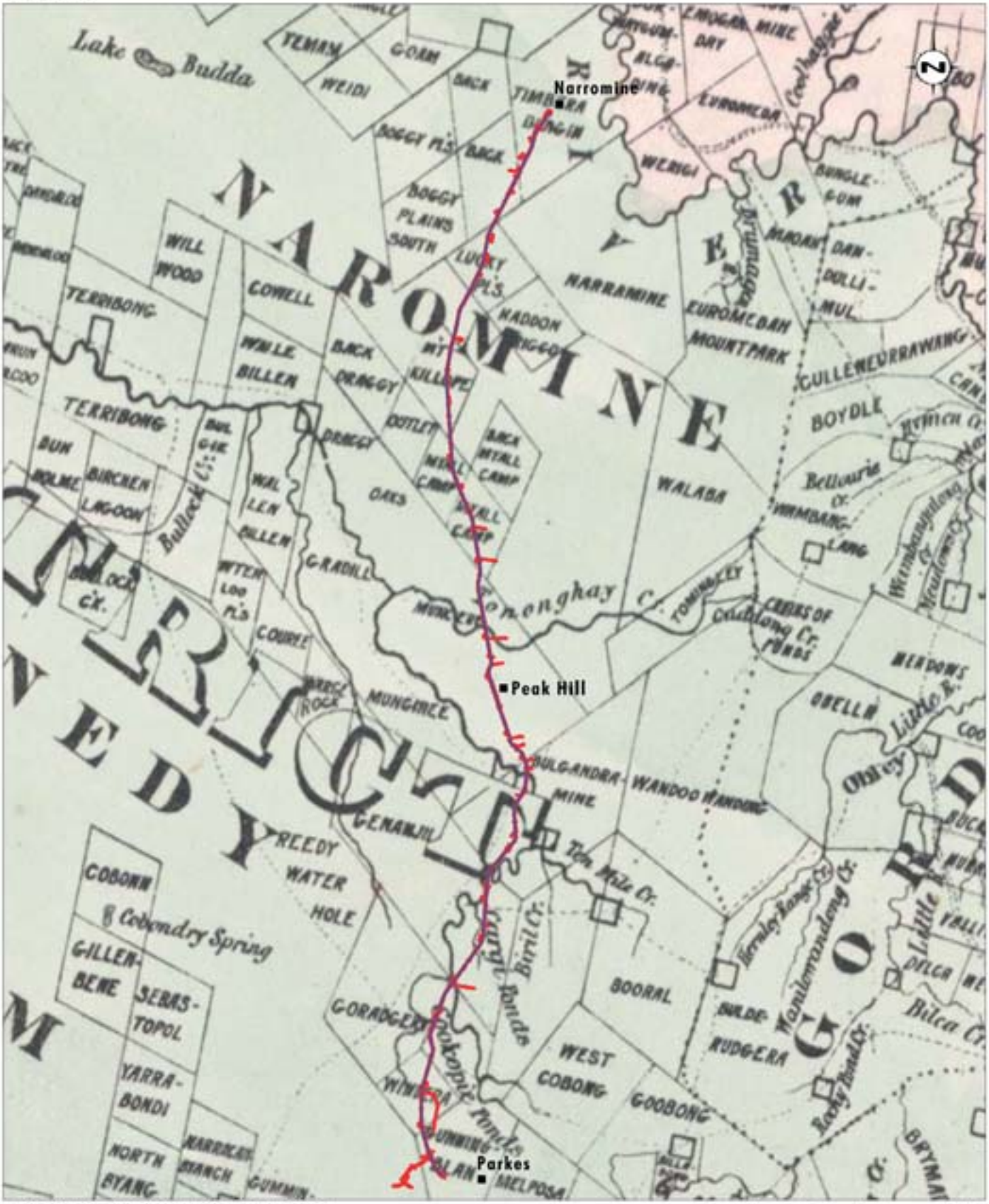


Image Source: National Library of Australia
Data Source: ARTC (2016)

0 5 10 20km
1:500 000

Legend

- Proposal Site
- Parkes to Narromine Rail Alignment
- Town Location

FIGURE 3.1

Detail of Reuss & Browne's 1860s Map of New South Wales

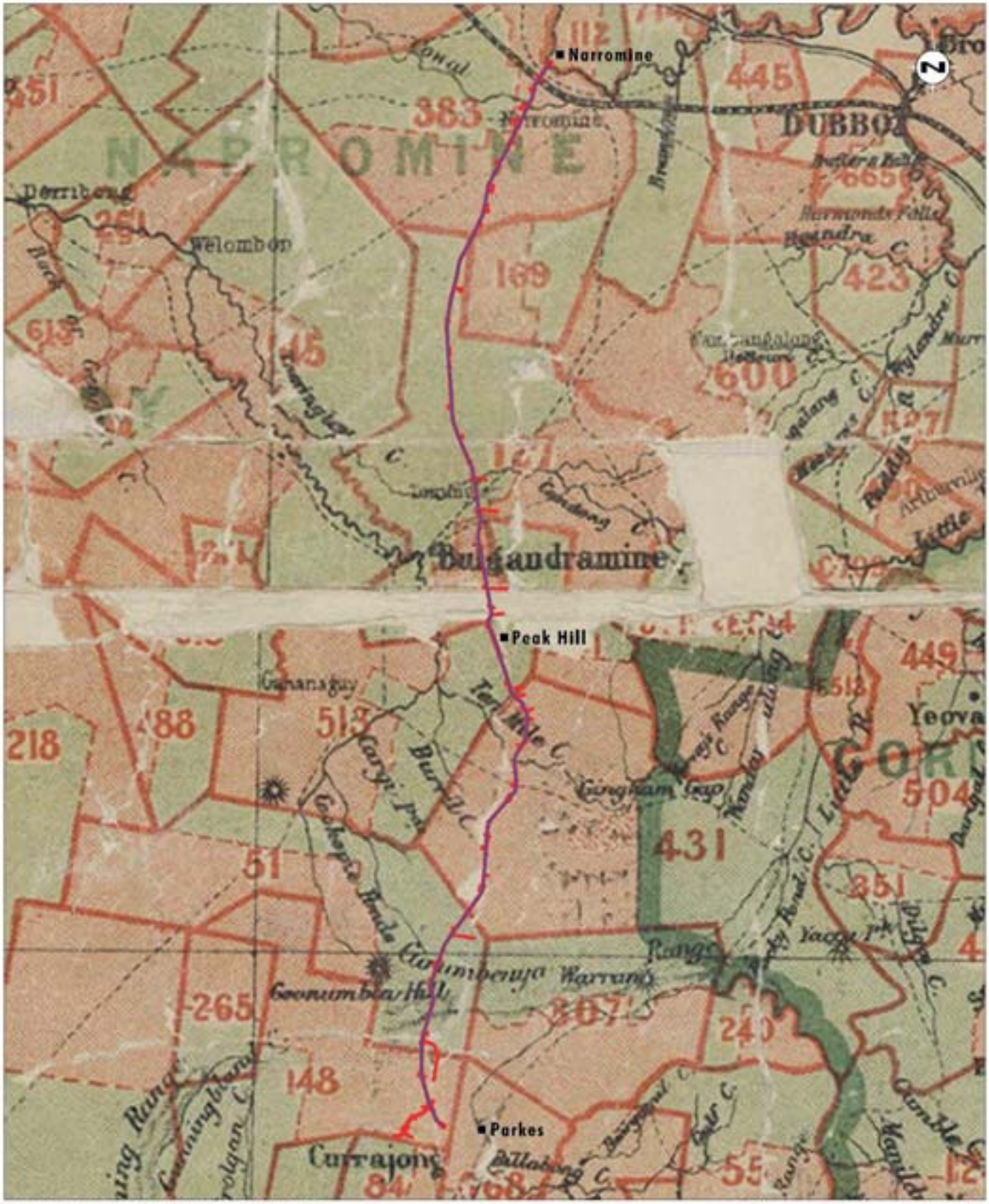


Image Source: National Library of Australia
Data Source: ARTC (2016)

0 5 10 20km
1:500 000

Legend

- Proposal Site
- Parkes to Narromine Rail Alignment
- Town Location

FIGURE 3.2

Detail of Surveyor General's Office 1886 Map of New South Wales

Table 3.1 Pastoral runs formerly located along the Proposal site

Pastoral Holding	Holding Number	Runs	Holder	Leasehold Area	Resumed Area
Narromine	383	Narromine Gum Swamp Bogie Plains South Bogie Plains North	Franks Mack Sydney Austin	28,618 acres	32,983 acres
Bulgandramine	127	Myall Camp North Myall Camp South Mungery East Bulgandramine Tomingley Tomingly North Dinner Gilgies	Robert Newell Gilmour	90,092 acres	79,928 acres
Genanagie	513	Tolma Reedy Waterhole Genanigie Barrabadean	Hon. John Brown Watt William Oswald Gilchrist	73,240 acres	39,974 acres
Bulderudgera	431	Bulderudgera Booral Ten-mile Creek	Australian Joint Stock Bank (leaseholder) Charles Smith McPhillamy (Licensee)	78,731 acres	21,323 acres
Goobang	307	Goobang West Goobang	Australian Mortgage, Land and Finance Company	37,366 acres	33,270 acres
Gunningbland	148	Back Blowclear East Gunningbland Upper Dalhunty Back Milpose Brogan Plains Back	Richard Frederick Horsley	41,670 acres	29,016 acres

3.8 Agricultural Training

As early as the 1820s Australia was being promoted as a land of opportunity for settlers with the publication of books and pamphlets regarding farming and land selection designed to help new emigrants and emancipated convicts with the basics of farming. Stories of successful settlers helped promote NSW as the land of opportunity.

By the late nineteenth century the NSW government began to consider providing formal learning for farmers and other agricultural workers. In 1891 the Agricultural Branch of the Department of Mines and Agriculture was established to be responsible for research, education and advice. The Hawkesbury Agricultural College was opened in April 1896 as a college and model farm to provide technological agricultural education. Experimental farms were established in Moree, Bathurst, Wagga Wagga and Wollongbar to test new and modified varieties of crops, new techniques in irrigation or fertilisation and new farm implements (State Library: Agriculture nd.).

New immigrants to Australia and returning soldiers were two of the largest target groups in the first half of the twentieth century. Following World War I the Commonwealth and State Governments cooperated to initiate programs to enable returned soldiers to settle on their own farms or secure their own homes (under the War Service Homes Act of 1918 and soldier settlement schemes). While most land made available to returning soldiers was former Crown land, some freehold land was purchased by the Crown and then made available to returned soldiers. Blocks secured by returned serviceman from World War I that had been surrendered to the Crown under the Act were known as Settlement Purchase Areas (SPA).

3.9 Wheat Industry

The Australia wheat industry began early in the Colony's life, with Governor Philip establishing a 40 acre government farm at Parramatta in November 1788. The First Fleet brought several types of grain, unsure of what might grow successfully. The harsh soils and lack of farming knowledge of the convicts meant the first crops were unsuccessful. Convict James Ruse requested land to farm near Parramatta and when his crop was successful was granted a 30 acre grant which he named Experiment Farm (State Library: Agriculture). By 1799 there were more than 6,000 acres under cultivation (ABS, 2007).

As settlement around the country grew, especially in Victoria, South Australia and Western Australia, the area of cultivation grew from eight hectares in 1838 to 7,592 hectares by 1844 (ABS, 2007). Irregular wheat exports began in 1845. The AA Co. moved its headquarters to Goonoo Goonoo in the 1840s but retained the bulk of its land; creating a barrier to the small farmers on some of the best wheat growing land (Heritage Office 1996: 81).

The land between the Liverpool Range and Piligra Scrub, running west out to Dubbo consisted of fertile, well-watered land. As such selection of land in the wider area became popular after 1861, even more so after the 1884 Land Act which broke the squatters' hold on the land (Heritage Office 1996: 82).

In 1865 the first crop of wheat was successfully grown in the Parkes area approximately 3.5 kilometres north of Parkes. It was reported that Mr Cooke

> *...storekeeper at Currajong had obtained a few bushels of 'White Lammas' wheat and made a share agreement with Joseph Harris who owned a small block of land, to sow two acres of wheat, the former supplying the seed and half the expenses, the latter to supply the land and labour. The crop yielded well, about 70 bushels being harvested from two acres, and this was transported to the nearest flour mill, Daltons Brothers at Orange. The wheat yielded five pounds more flour per bushel than wheat grown in the colder Orange district (Parkes Shire Council nd).*

Harry Henry Cooke came to the area in the early to mid 1860s with the opening of the goldmines at Currajong. Having established himself in business he stayed on despite the decline in the reef mining by 1866. Cooke owned the Trelowarren mine which was alongside and to the south of his home and business premises. He became postmaster at Currajong in 1868 and from 1871 operated a bakery at Currajong; delivering to miners both morning and evening. In 1873 Cooke founded the Parkes and Forbes Gazette and became the first mayor of Parkes (Parkes Shire Council nd).

The growth of the wheat industry was improved by the gold rush and the later construction of the inland railways (State Library: Australian Wheat nd.). The invention of machinery such as the scrub roller and the header harvester allowed for the clearing and preparation of large tracts of land, as well as harvesting large areas of crops. Research also improved the industry with wheat varieties more suitable to Australia's environment, mechanical harvesting and more disease resistance crops. In the late 1880s William Farrer bred numerous new wheat varieties, including a drought and disease resistant variety named 'Federation'.

By the early twentieth century experimentation by William Farrar with new varieties of wheat resulted in hardier, pest and rust resistant crops (SLNSW 2013). After arriving in Australia in 1870 Farrer became a tutor at George Campbell's sheep station, Duntroon. Unable to financially buy a pastoral property he qualified as a surveyor in July 1875 and until 1886 worked in the Dubbo, Nyngan, Cobar and Cooma districts with the Department of Lands. Farrer soon focused his interests on wheat-growing believing that the wheat industry's problems were based on the unsuitability of the types sown to Australian conditions. In 1886 he first tried cross-breeding to improve wheat in Australia; at the time cross-breeding was only being attempted in Europe and America. In 1898 he was appointed as wheat experimentalist to the Department of Agriculture. Farrar's Federation variety became the most widely grown of his wheats. Its rapid spread was '*the result of sheer ability to yield well, despite an unattractive appearance in the field*'. Although Federation compromised his wish never to release any wheat that was not of top grain quality, it did fulfil his aim to produce a wheat with a short, strong straw suited to Australian methods of harvesting. From 1910 to 1925 Federation was the leading variety for the whole continent. In 1914 twenty two of the twenty nine varieties of wheat being grown across the pastoral districts of NSW were Farrer wheats. His wheats were largely responsible for the extension of wheat-growing into drier or rust-prone districts, while in established areas yields and quality were improved. This resulted in a four-fold increase for the NSW between 1897 and 1915 (Wrigley 1981).

The 1884 Land Act encouraged smaller leases of mixed farming and the 1895 Homestead Selection Act encouraged wheat cultivation. This caused a shift in production to wheat, wool and lambs; which was also later boosted by the railway. While the 1884 Land Act began the reduction of the huge pastoral stations, the resumptions policy of 1895 meant that grants of 10,000 acres replaced the stations of hundreds of thousands of acres. This subdivision turned may leases into wheat-sheep farms, which cover the centre and east of the region (Heritage Office 1996: 82). Soldier settlement after the World War I and private subdivision of land allowed wheat to become a key crop. Early subdivisions were often as small as 200 acres, however twentieth century technological innovations meant that wheat-sheep farms could now be up to 20,000 acres (Heritage Office 1996: 84).

Bulk handling was first phased in during the 1920s and meant that wheat grain did not need to be bagged before being stored and shipped, leading to substantial savings of time and money as well as protection from pests (ABS, 2007). In NSW bulk handling used vertical concrete and steel silos, which had high operating costs during lean years and could not handle large crops of exceptional years. The first country grain silo to be completed in NSW was at Peak Hill in 1918, however drought meant it was not filled until an exceptional crop in 1920 (NSW silos, nd.).

In 1915 the Government established a wheat pooling scheme, administered by the Australian Wheat Board (AWB), to assist growers and ensure supply during World War I (ABS 2007). Under the scheme returns from all the crops was pooled and shared fairly among all growers. The AWB ceased operation in 1921, however small regional schemes continued, usually managed by farmer cooperatives. The AWB was established as a statutory authority at the beginning of World War II to handle all matters concerned with wheat disposal during the War. Legislation was passed in 1948 to establish the board during peace time, and it continued until 1999 (ABS, 2007). With the increase in farm mechanization following World War II and the new hardy varieties available wheat become Australia's single most valuable agricultural product.

By 1933 over one-third of the region around Parkes was cleared for agriculture. The area under wheat cultivation fluctuated between 84,000 and 120,000 hectares in the 1930s, with yields between 20 and 23 bushels per acre being grown. The increase in wheat cultivation led to more clearing being undertaken, often by Chinese ring-barkers. Wheat-sheep farms gradually declined in number because of increased acreage turned to wheat cultivation. Wheat growing, in turn, led to the development of flourmills. By the 1870s many towns had their own mills, with approximately 500 mills producing flour across Australia. The small steam-mills that had been present since the mid-nineteenth century in the region were replaced in the 1890s and early 1900s with machine mills at Forbes, Parkes and Condobolin. Flour exports were an important part of the wheat industry until around the 1930s. After World War II, many of Australia's export partners began setting up their own flour industries and demand for the Australian flour decreased.

3.10 Urban development

Urban development prior to 1850 was limited due to a sparse and poor population. While small villages grew up, travellers recount that the remote country was covered by numerous isolated inns, some of which grew into towns, while others ceased operation and collapsed into ruins (Heritage Office 1996: 81). The Australian writer Henry Lawson described the towns along the rail line as 'consisting of a public house and a general store, with a square tank and a school- house on piles' (Heritage Office 1996: 80).

Settlement and growth came to the region in the later part of the nineteenth century. The towns of Parkes and Peak Hill were created and grew as a result of the 1870s discovery of gold. Mines at Currajong, immediately north of Parkes, opened in 1863 and 1864, however by 1867 were replaced by orchards and vineyards (Heritage Office, 1996: 101). Gold was discovered around Tomingley in the mid 1880s and at Peak Hill in 1889. A town promptly appeared where previously only sheep runs were present. Ten thousand miners arrived by 1890 and five mines were opened (Heritage Office, 1996: 102).

The construction of an inland railway was a very significant development in the late nineteenth century leading to the establishment and survival of villages and towns (refer to **Figure 1.2**). The prosperity and growth of villages and towns depended on whether a rail line linked the settlement with the wider NSW.

3.10.1 Parkes

As discussed in **Section 3.5** Parkes was originally known as Currajong and Bushmans. Henry Parkes visited the township on 19 August 1873; his visit marking a turning point in the history of the town. Shortly after his visit local politicians like Henry Harry Cooke petitioned to have the name of the town changed from Bushmans to Parkes. As mines developed on the outskirts of the town and people and business moved into the town centre, Bushmans was officially renamed Parkes on 1 December 1873 (Butel and Thompson 2008:209).

A Court of Petty Sessions had been established in the town as early as 1864. This court was abolished in 1865 and re-established in 1872. The Parkes Courthouse was designed by the Colonial Architect James Barnet in 1875 (OEH Parkes Courthouse Listing Sheet nd.). The Police Station Offices building was also originally designed by the Colonial Architect in 1884 for use as a Residence and Police Station (OEH Parkes Police Station Offices Listing Sheet nd.).

The 1894 Town Map of Parkes illustrates the size of Parkes in the late nineteenth century (refer to **Plate 3.4**)**.** The rail line and station were constructed to the south of the Town Map shown in **Plate 3.5**.

Plate 3.4

1894 Town Map of Parkes

3.10.2 Goonumbla

Limestone Plains was the name of George and John Palmers pastoral property in 1866. The town was located approximately 2.5 kilometres from the railway station which opened as Limestone Plains in 1914 and was renamed Goonumbla in 1915.

Goonumbla was proclaimed a village on 5th May 1916. A provisional school operated in the village from September 1905 to June 1910 and a Public School from July 1910 to March 1949 (NSW Department of Education and Communities). When the school closed in 1949 the pupils went by bus to the Coradgery school further down the road. Coradgery had a provisional school from May 1933 to November 1957 and a public school from November 1957 to December 1967 (NSW Department of Education and Communities). Goonumbla post office opened February 1916 (Forsyth 2002:84).The census of 1933 indicates the population of Goonumbla was 225. The census also indicates that fossicking was still being undertaken at all of the mine workings in the area at that time.

Plate 3.5

Detail of 1913 Parish Map of Limestone

Map shows the former village of Goonumbla with the rail line and station on the east side of the former village

3.10.3 Alectown West

Alectown West area was first named Alec's Flat after the original prospectors in the area; Alexander Whitelaw, Alexander Cameron and Alexander Patton. The town of Alectown is located approximately 6 kilometres east of the rail line and Alectown West railway station. A school opened in Alectown in1890 and closed in 1974 (the year passenger rail service to Alectown West station discontinued). In 1889 a post office opened at Alec's Flat but changed its name to Alectown in 1891 (Forsyth 2002:8).

3.10.4 Mickibri

A school opened at Mickibri as Burril School in March 1916, changed its name to Mickibri in May 1916 and closed in October 1920 (Forsyth 2002:137).

3.10.5 Trewilga

A school opened at Trewilga named Mingelo in January 1892, it changed its name to Trewilga in October 1912 and closed July 1951. A post office opened there as Menello in June 1889, was renamed Mingelo in August 1891 and then changed to Trewilga in January 1913. The post office closed on 31 December 1976 following the discontinuation of the rail service to Trewilga Station (Forsyth 2002:243).

3.10.6 Peak Hill

As discussed Peak Hill developed as a town in 1889 when gold was discovered in the area and two open-cut goldmines were established. The name Peak Hill appears to be that of a prominent hill in an otherwise flat landscape. The town is located on the land holding of J Gilmore. In 1888 gold mining leases were taken out by 'Messrs' Bland, Batten, Stapleton, Eagley and Willoughby in the area (Forsyth 2002:72). A Court of Petty Sessions was established in Peak Hill in 1890 and a school opened the same year. The first courthouse was a wooden structure which was used between 1890 and 1898 before the current brick courthouse, designed by Colonial Architect Walter Liberty Vernon, was built in 1898. A post office was also opened in 1889. A police service was also provided at the end of the nineteenth century with the Lockup and police office also being designed by Vernon in 1898 (OEH Peak Hill Courthouse Listing Sheet nd.). Peak Hill was incorporated as a municipality in 1894 and the railway arrived in 1910 (refer to **Plate 3.6**). The economic activity of the gold mining town drew people, as well as the miners, to take up land and agricultural enterprises were subsequently established. In 1918 Peak Hill became the site of the first public upright grain silo constructed in NSW (refer to **Section 3.12**).

Plate 3.6

1909 Town Map of Peak Hill.

The rail line is shown along the west side of the town

3.10.7 Tomingley West

A school opened in Tomingley West in January 1921 and closed in 1951. In 1928 a post office opened but closed in 1952 (Forsyth 2002:234).

3.10.8 Wyanga

A school opened in Wyanga in January 1919 and closed in February 1941. A post office opened in May 1915 and closed July 1973 (Forsyth 2002:360-361).

3.10.9 Narwonah

A school opened at Narwonah in August 1914 called Craiglea but closed May 1916. In November 1900 a post office opened as Craig Lea, changed its name to Ingalba in 1905 and closed in 1910 (Forsyth 2002:15).

3.10.10 Narromine

In 1835 William Charles Wentworth and Captain Raine are thought to have settled on 'Narromine Station', with other settlers following soon after. The Village of Timbrebongie was established on the Macquarie River approximately 10 kilometres north of the location of present day Narromine (refer to **Plate 3.7**). Timbrebongie was an important crossing place over the Macquarie River by coaches from Bathurst and Dubbo to Bourke, via Warren and by 1866 the Timbreabungy Hotel was open.

In 1879 William O'Neill is reported to have opened a hotel on the site of what became Narromine Village on the south side of the Macquarie River. O'Neill became the first person to grow wheat for grain in Narromine in 1880. In 1883 Narromine Railway Station was opened as the rail line was extended through the area and the first school also opened that year. The Village of Narromine was laid out in 1883 with the first auction for town allotments held in 1884. In 1885 the Village of Narromine was proclaimed (refer to **Plate 3.8**). The first police station was established in 1890 and Narromine Municipal Council formed in 1898. Colonial Architect Vernon designed the current police station as a Lockup Keeper's Residence in 1908 (Macquarie Regional Library nd).

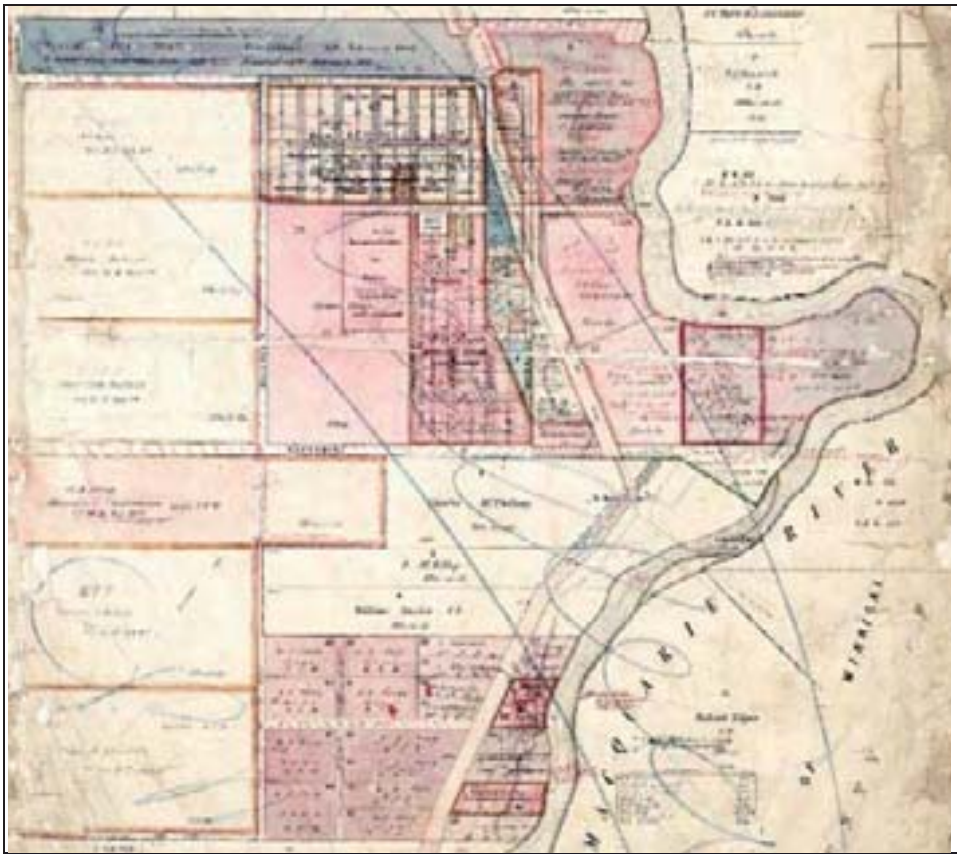


Plate 3.7

1882 Town Map of the former village of Timbrebongie

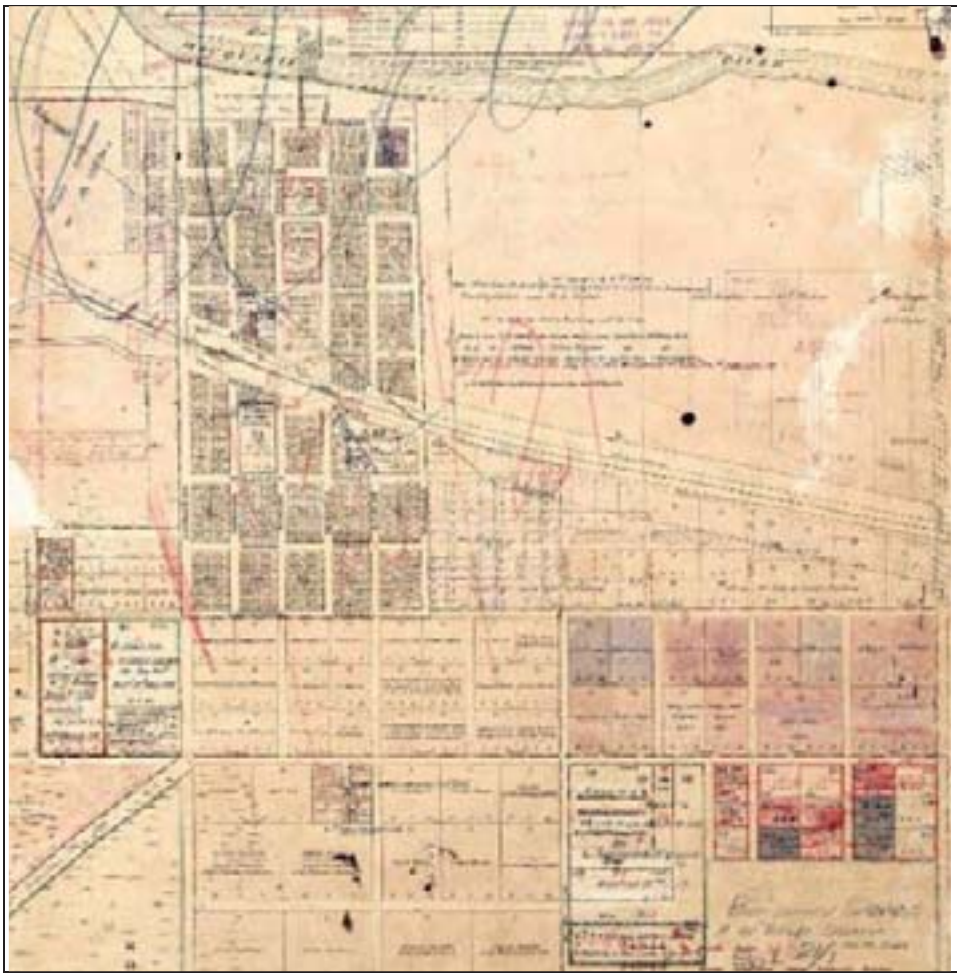


Plate 3.8

1900 Town Map of Narromine

The rail line runs through the centre of the town

3.11 Railway

Although the first steam railway between Sydney and Parramatta opened in 1855, the extension west was delayed with the engineering issues presented by the Blue Mountains. Bathurst and Orange were finally reached by rail in the 1870s and the extension of the line to Molong served as the railhead for Parkes and the western districts until the 1890s.

The railways in NSW were built to 2 main standards: main line and branch line / Pioneer Lines. In the period 1910 to 1930 a large number of branch railway lines were constructed through western and north western NSW with the aim of establishing access to wheat growing areas and also reaching the edge of the productive wool growing areas. These branch lines were known as Pioneer Lines (refer to **Section 3.11.1**) which had a cheaper railway construction method than the main rail lines. While larger towns were established independent of (and not dependant on) the railway (Dubbo), urban centres were established as the railway extended through the Darling Plains region (Moree and Narrabri) and smaller towns were created specifically by the arrival of the railway (Bellata) (Heritage Office 1996:80-87). The development of the railway through the region enabled the bulk transportation of wheat and was a major factor in encouraging agricultural expansion through the district as it reduced or eliminated 'the long and costly haul by slow horse transport to distant railheads' (Tindall 1982:28). The railway runs through the heart of the NSW wheat belt.

3.11.1 Pioneer Lines

The economic depression of 1889 to 1894 dramatically slowed railway construction in NSW and when expansion of the rail system resumed, it was under a new era of austerity. The most dramatic feature of the change was the advent of the Pioneer Line. These lines were an innovation that represented a shift away from British railway practices to those used in the United States.

Freight rail traffic was considered to be seasonal and not justify the expense of not being utilised for much of the year. In 1894, Chief Railway Commissioner Edward Eddy and Henry Deane, the Engineer-in-Chief for Railway Construction, considered the options available for the construction of branch railway lines. Deane visited North America and Europe to investigate cheaper methods of railway construction. Practices in the USA particularly interested him because of the similar conditions there. Deane noted that it was common to construct lines initially without using ballast. Ballast could be added later as an improvement when the rail line had earned sufficient profits to warrant the added expense. Deane subsequently recommended that the American practices, including limited earth works, a reduced number of sleepers, light rails, the absence of ballast and a 20mph speed limit, were subsequently adopted in NSW (Fraser 2015:54-57, McKillop 2009:46).

The routes (known as Pioneer Lines primarily to serve agricultural areas) were selected to be located where possible beside or between the major inland rivers to minimise the need for construction of expensive bridges. The rail lines were constructed using light rails and low-quality sleepers with no ballast. Rail traffic was kept at a minimum except for the heavy seasonal demand dictated by the agricultural and pastoral industries. Train speeds were initially restricted to 15 miles per hour; which while being acceptable for goods trains was suitable for passenger trains who expected similar speeds to those on the main lines. As a result upgrade works commenced a few years after construction to increase the speed of trains to 30 miles per hour. Railway buildings were austere and of timber construction with station buildings being little more than sheds with minimal public facilities. Any bridges were to be simple short-span timber girder bridges as the cheapest way of water crossing. Deane and his engineers redesigned the timber girder bridge which contributed to the low costs of the Pioneer Lines. The new design changed John Whitton's timber girder bridge design (which had ballasted track supported by deck planks resting on four timber girders) to have an open deck or transom-top (a transom comprises timber laid across girders to attaché rails)eliminating the need for heavy ballast and allowed only three timber girders to be used (Fraser 2015:54-57, McKillop 2009:46). The inexpensive Pioneer Lines were upgraded if they proved to be profitable. The continued success of wheat growing ensured that most of the rail lines were upgraded.

The first Pioneer Lines were completed to Berrigan and Bogan Gate in 1896; essentially to support the wheat industry. The Pioneer Line from Jerilderie to Berrigan (a distance of 34.8 kilometres), opened on 14 October 1896 at a cost of £2036 per mile (McKillop 2009:46).

3.11.2 Parkes to Narromine Railway Line

The Parkes to Narromine line is currently a redundant rail line located between the Main Western line and the Broken Hill line. The rail line from Narromine to Peak Hill opened 12 December 1910 as a single track. The contract for its construction was awarded to G. C. Murdock on 5 May 1909. Rail passenger service discontinued 13 October 1974 (Forsyth 2002:72). The extension of the line from Parkes to Peak Hill opened on 30 September 1914 as a single track. Construction of the track was undertaken by the Public Works Department and commenced on 7 May 1912. The '*Instructions to Station Masters, Guards, Drivers, and all other concerned*' included the following details about the line:

> *This line is unfenced, therefore Drivers must keep a sharp look-out for live stock that may be straying...It is classed as a 'Pioneer' line, and the maximum speed of trains and light engines must not exceed 20 miles per hour during daylight, and 15 miles per hour during dark...(New South Wales Railways Circular No. 251)*

Telephone connections were provided at Parkes, Limestone Plains (Goonumbla), Alectown West, Trewilga and Peak Hill. Specific limits were set on loads and the number of vehicles that could be hauled. **Table 3.2** indicates the existing rail line proposed to be upgraded by ARTC as part of the proposal and the dates the lines opened.

Table 3.2 Parkes to Narromine Line

Rail Line	Extent	Date Opened
Parkes to Narromine	Goobang Junction to Peak Hill	1914
	Peak Hill to Narromine	1910

Table 3.3 indicates the stations opened along the Parkes to Narromine rail line and the dates the stations opened and closed (refer to **Figure 3.3**). Details of the stations and associated facilities are discussed in **Table 3.4**.

Table 3.3 Parkes to Narromine Stations

Station	Main Facility	Distance from Sydney (km)	Dates
Goobang Junction	Junction – in use	448.300	In use
Nanardine	Station - closed	457.900	1914 - 1976
Goonumbla	Station -closed	465.600	1914 – 1976
Alectown West	Station - closed	473.600	1914 - 1974
Mickibri	Station - closed	482.362	1914 - 1974
Trewilga	Station - closed	490.916	1914 - 1974
Peak Hill	Station - closed	498.400	1910 - ?
Myaroo – loop only	Loop - closed	513.860	1941 - 1976
Tomingley West	Station - closed	516.100	1910 - 1976
Wyanga	Station - closed	528.990	1910 - 1974
Fairview	Station - closed	539.200	1923 - 1974
Narwonah	Station - closed	547.050	1910 - 1974
Narromine	Station - closed	497.554	1883 - ?

Information sourced from NSW silos nd, NSW rail nd and Forsyth 2002.

Image Source: Google Earth (2013)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 5 10 20 km
1:500 000

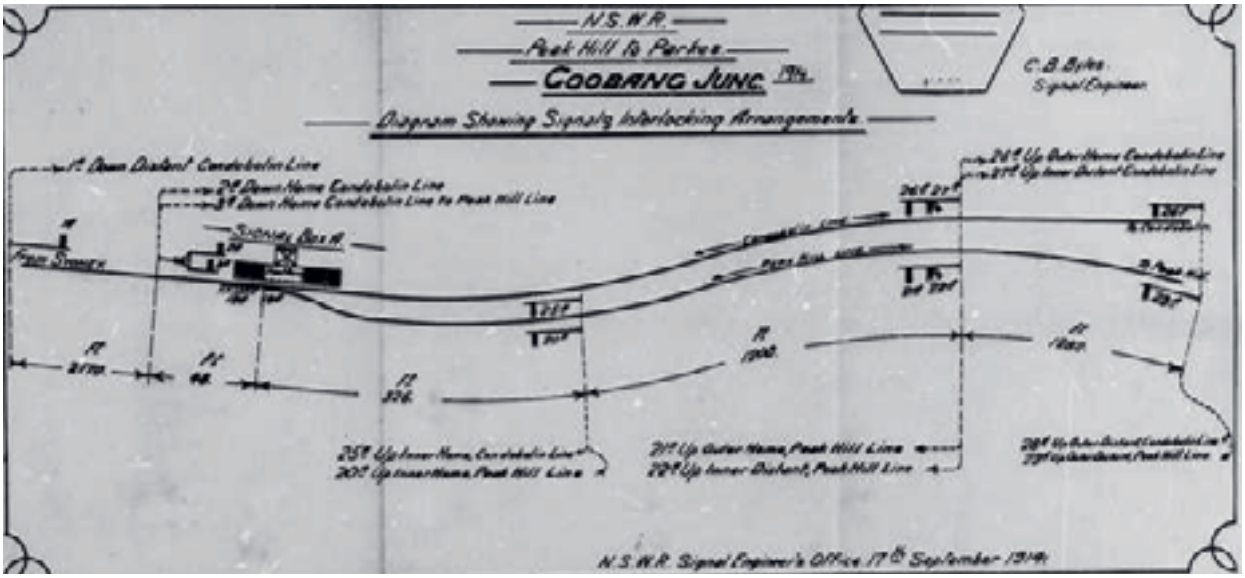
Legend

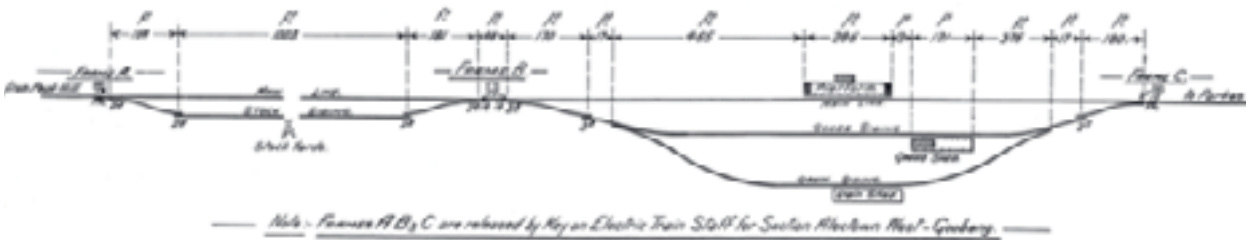
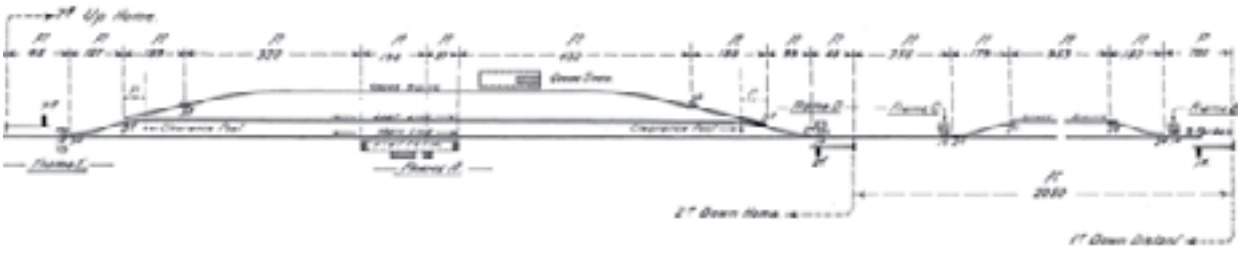
- Proposal Site
- Local Government Area
- Railway Station

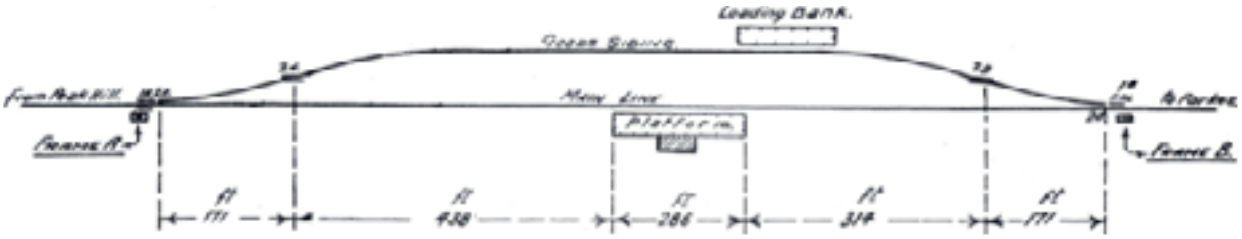
FIGURE 3.3

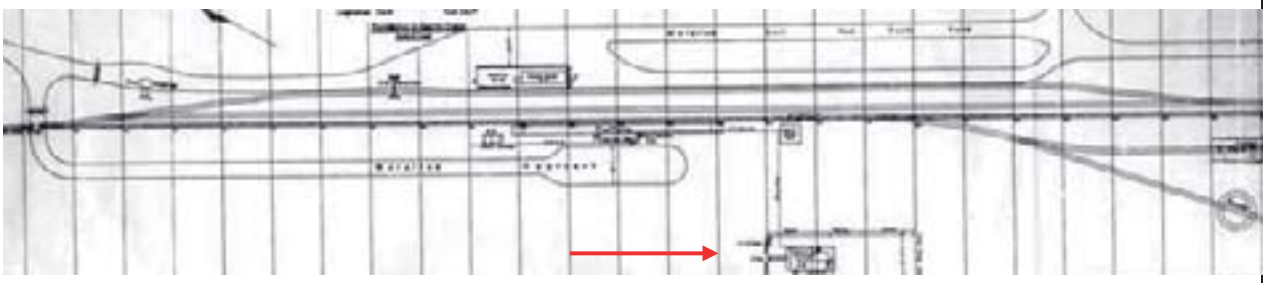
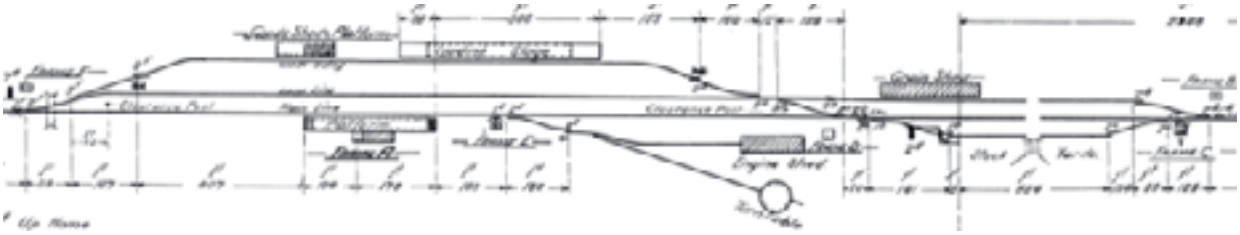
Parkes to Narromine Route Railway Station Locations

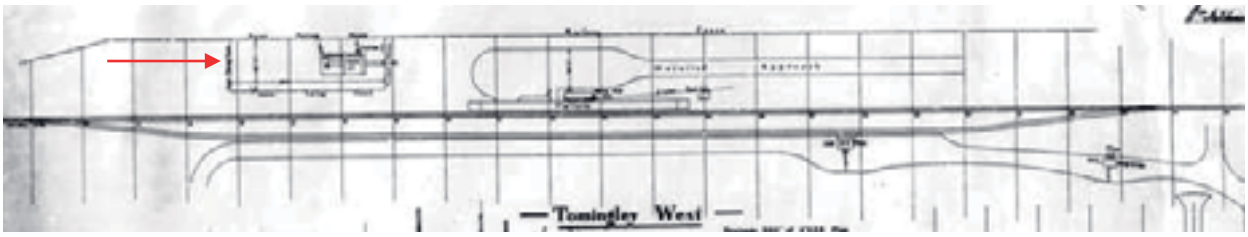
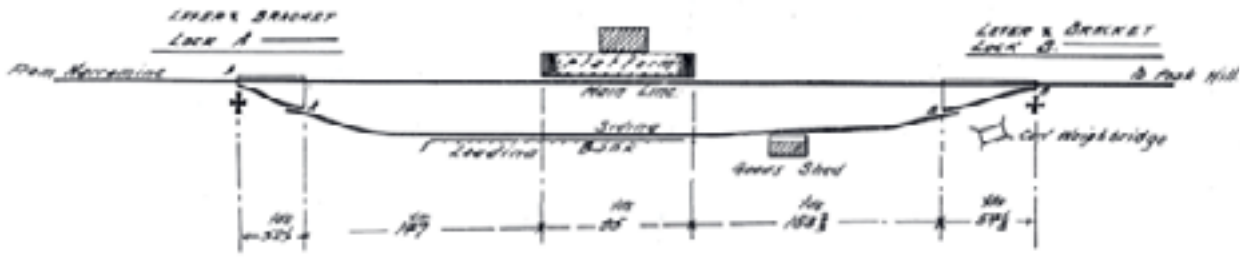
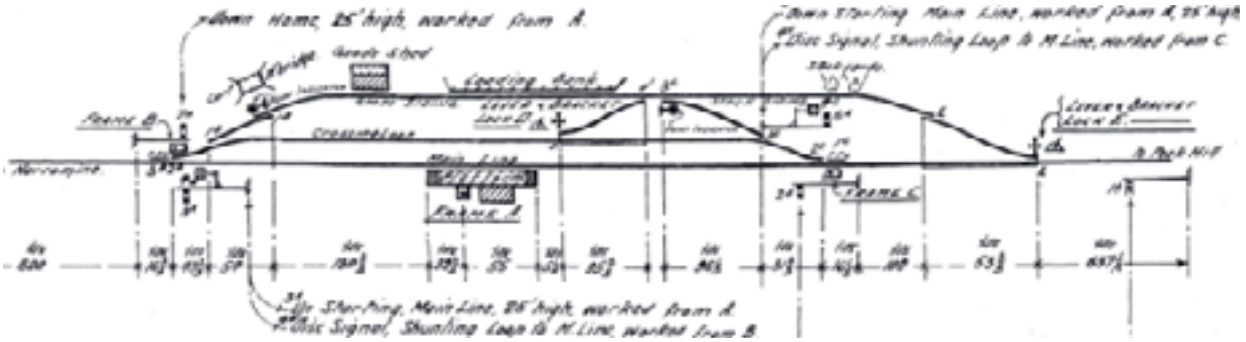
Table 3.4 Parkes to Narromine Railway Stations

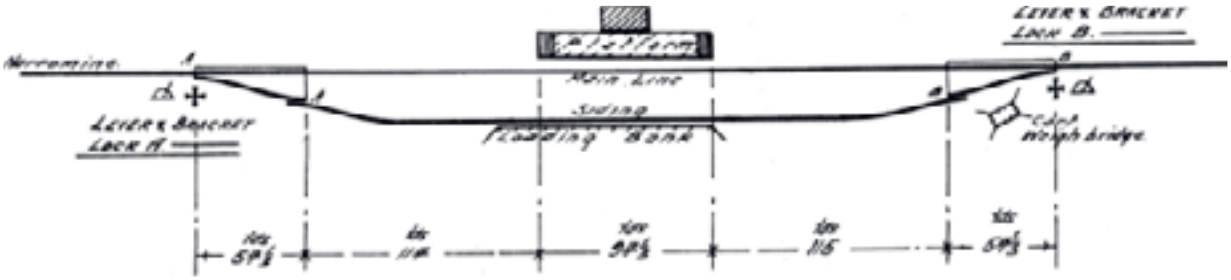
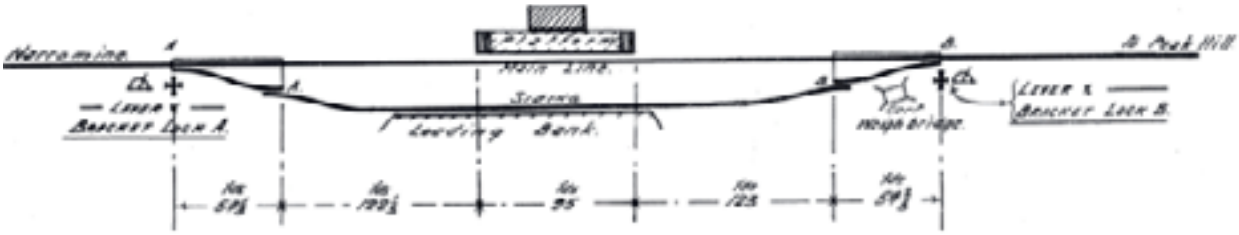
Station	Discussion
Goobang Junction	Goobang Junction is located immediately north of Parkes and until recently was considered to form part of Parkes Station. It has always been a junction and is still in use.
1914 plan of Goobang Junction 	
Nanardine	Nanardine Station opened 30 September 1914 and closed 5 June 1976. Platform constructed on the down side (west side) of the line with a standard station building and toilet. A goods siding was located on the up side (east side) of the line with a goods shed. In January 1916 a cart weighbridge was installed. In 1942 a crossing loop was constructed. In May 1956 the goods siding and loading bank closed.
1914 plan of Nanardine Station 	

Station	Discussion
Goonumbla	Goonumbla Station opened as Limestone Plains 30 September 1914. Renamed Goonumbla 1 June 1915. The station closed 26 April 1976. Platform (28 metres long) constructed on the up side (east side) of the line and a goods and stock siding on the down side (west side) of the line. The station had a standard (station building constructed of concrete units, a toilet, an officer's residence, a 18.20 by 4.80 metre good shed, a loading bank, cattle and sheep races, a grain shed and a grain silo. Although not shown on the plan a station officer's house was built on the east side of the rail line against the boundary of the rail corridor. In January 1918 a 152 metre by 12.10 metre wheat storage site was established. In August 1918 a siding was added for the removal of wheat. In 1930 the concrete grain silos were added.
1914 plan of Limestone Plains Station 	
Alectown West	Alectown West Station opened 30 September 1914. Rail passenger, parcel and goods service discontinued 23 November 1974. Timber platform constructed on the down side (west side) of the line and a loop, goods and stock siding on the up side (east side) of the line. A timber station building was constructed by the Public Works Department with only a waiting room. A second building is reported to have 4 rooms. The station also had a 5 tonne yard crane, a 20 tonne road weighbridge, a 18.2 by 4.8 metre standard G3 goods shed, a standard J3 Station Master's residence. A loading bank, sheep races and a 381 metre crossing loop. In 1930 a grain silo was constructed and in 1959 a wheat depot was added with a capacity of 9259 tonnes.
1914 plan of Alectown West Station 	

Station	Discussion
Mickibri	Mickibri Station opened 30 September 1914 and closed 23 November 1974. Rail passenger service discontinued 23 November 1974. Platform and station building constructed on the down side (west side) of the line and a goods siding on the up side (east side) of the line. There was a goods yard containing a 20 tonne road weighbridge, a loading bank, wheat silo, a small goods shed, sheep races, and a 522 metre long goods loop on the up side (east side of line). In 1933 a concrete grain silo was constructed. In 1968 a wheat depot was added with a total capacity of 30,250 tonnes.
1914 plan of Mickibri Station  	
Trewilga	Trewigla Station opened 30 September 1914 and closed 23 November 1974. Rail passenger service discontinued 23 November 1974. The construction name for Trewilga Station was Mingelo West. Platform constructed on the down side (west side) of the line and a goods siding on the up side (east side) of the line. A number of standard station buildings were constructed including A3 station buildings, C1 toilets and G2 goods shed. In 1971 the goods siding was removed.
1914 plan of Trewilga Staion  	
Peak Hill	Peak Hill Station opened 12 December 1910. The station had a platform and station building on the down side (west) of the line and a grain siding with platform, goods shed and grain shed on the up side (east) (see plans below). An engine shed and turntable were also added on the west side of the line. In 1909 there was also a standard J.2. Station Officer's House constructed on the west boundary of the rail corridor (refer to 1909 plan below – marked with red arrow). In 1911 a rest house was constructed. In 1915 its engine shed was transferred to Tullamore by the Public Works Department. In 1915 a wheat stacking site was provided and in 1918 the grain silo was constructed (refer to **Section 3.12**). In 1941 a 90 kl double tier tank and a 304 millimetre bore water column were installed for defence work. In 1956 the turntable siding was removed. In 1979 the stock siding was removed and in 1982 the goods shed was demolished.

Station	Discussion
1909 plan of Peak Hill Station 	
1914 plan of Peak Hill Station 	
Myaroo – loop only	Myaroo was a crossing loop 519 metres long opened on the down side (west) of the line 2 June 1941 with two telephone and signals.
1941 plan of Myaroo Loop 	
Tomingley West	Tomingley West Station opened 12 December 1910 and closed 26 April 1976. Rail passenger service discontinued 13 October 1974. The station had a platform and station building (waiting shed) on the up side (east) of the line and a grain siding with loading bank, goods shed and cart weighbridge on down side (west) (see plans below). In 1909 there was also a standard J.1 Station Officer's House constructed on the east boundary of the rail corridor (refer to 1909 plan below – marked with red arrow). In 1920 a wheat stacking site was provided which by 1926 allowed for 100,000 bags of wheat. In 1930 a grain silo was constructed and in 1969 a wheat depot added at the station.

Station	Discussion
1909 plan of Tomingley West Station 	
1914 plan of Tomingley West Station 	
Wyanga Opened as Washington. Renamed Wyanga 1911.	Wyanga Station opened as Washington Station on 12 December 1910. It was renamed Wyanga 1 March 1911 and closed 23 November 1974. Rail passenger service discontinued 13 October 1974. The station had a platform and station building (waiting shed) on the down side (west) of the line and a crossing loop, grain and goods siding with loading bank, goods shed, cart weighbridge and stockyards on up side (east) (see plans below). In 1910 a wheat stacking site was provided. In 1914 the station office was damaged by fire. In 1929 a grain silo was constructed followed in 1951 by a wheat bulkhead. An additional wheat bulkhead was constructed in 1964.
1914 plan of Wyanga Station 	
Fairview	Fairview Station opened on 12 December 1910 and closed 23 November 1974. The station had a platform (15 metres long) and station building (timber waiting shed) on the up side (east) of the line and a goods/grain siding with loading bank and cart weighbridge on down side (west) (see plan below). In 1920 a wheat stacking site was provided. In 1973 the goods siding closed.

Station	Discussion
1914 plan of Fairview Station 	
Narwonah	Narwonah Station opened on 12 December 1910 and closed 23 November 1974. Rail passenger service discontinued 13 October 1974. The station had a platform and station building (waiting shed) on the up side (east) of the line and a goods/grain siding with loading bank and cart weighbridge on down side (west) (see plan below). In 1920 a wheat stacking site was provided. In 1956 the length of the platform was increased to 30.48 metres at the Parkes end. In 1966 a wheat depot opened.
Undated Plan of Narwonah Station 	
Narromine	Narromine Station opened as Narramine Station on 20 October 1882. It was renamed Narromine 1 October 1889. Narromine Station is located over 1 kilometre northeast of northern limit of proposal site. As such it is not considered in detail in this report.

Information in Table 3.4 provided by the Australian Railway Historical Society, Railway Resource Centre

3.12 Grain Silos and Sidings

The first country silo constructed in NSW was at Peak Hill. Although other silos were under construction at the same time, Peak Hill was the first silo to begin operating in 1918. Little wheat was delivered to the silo until 1920 as the previous two years were very dry with only 12 to 14 inches of rain recorded (NSW silos nd). An article from The Sydney Mail August 14 1918 reports:

> *A satisfactory trial was recently made at Peak Hill (writes our correspondent) of the first of the completed silos for the bulk handling of wheat. Many farmers were present from the neighbouring districts, as well as from distant parts of the state and from Victoria, to witness the demonstration. Two truckloads of wheat were brought up for the test, and about a dozen wheat lumpers were instructed to take the bags from the trucks, cut them open, and empty the contents into what is called the receiving grating of the elevator leg. The machinery was driven by a Ronaldson oil engine. It soon became apparent that although the men were going as fast as they could possibly go, the receiving grating, was eating up the wheat faster than they could put it in, notwithstanding that the*

engine was only going at a medium rate of speed. A number of farmers then took a hand at opening the bags with pocket-knives. The truck of 200 bags was put through in 18 minutes, at a rate of about 2000 bushels an hour. It is estimated with a greater engine speed, 2300 bushels per hour could be handled. The elevator leg mentioned is part of the machinery to be installed in the future, when the grain will be received in bulk and emptied direct into the leg grating. It will also be necessary, one day to load grain in bulk from the silo to the trucks, and with a leg of this capacity, four trucks per hour, will be easily loaded (NSW silos, nd.).

Although railway stations along the rail line between Parkes and Narromine were opened progressively from 1910 (refer to **Table 3.3**) grain silos were generally not constructed until the late 1920s and early 1930s. Until the silos were constructed, wheat was loaded direct from the farmers' wagons or bagged and stored at the station (refer to **Plate 3.9**). By the 1920s wheat stacking sites were provided at many of the stations (refer to **Table 3.4**). Loading direct from the farmers' wagons was first used at the Goonumbla siding:

Mr. W. E. Tayler, of Adavale, Parkes, writes, describing the wheat-loading method now being used at Goonumbla siding, where there are no silos...16-ton bulk trucks, he says, are being loaded daily direct from the farmers' wagons, and despatched to the terminal silo. "The process is simple in the extreme. Wagons are drawn on to the dump alongside the trucks, bags are put on to a plank that runs across the truck, opened, and emptied in, and the empty bags thrown back on to the wagon to be weighed with it to arrive at the correct tare, thus giving the exact net weight of the wheat put into the trucks.

Mr. Tayler adds that it is estimated that instead of about 80,000 bags of wheat being stacked at Goonumbla, which would be the case without bulk trucking, if the supply of trucks is kept up, no more than 20,000 bags will have to be stacked (SMH Wednesday 14 December 1921: from NSW silos, nd.).

However, there was soon dissatisfaction at the methods of handling wheat at railway stations without silos:

Complaints are still being made that the bulk handling of the wheat, both at the silos and in the allocation "of bulk trucks for non silo sidings, is not being conducted efficiently. Mr. T. I. Campbell, secretary of the Farmers and Settlers' Association, stated yesterday.....

Corroborating and supplementing some of those complaints, Mr. George Tanswoll, a well-known wheat-grower and grazer, of Coradgory, referred Io the experience at Goonumbla siding, on the Parks-Peak Hill line. It was at Goonumbla that the first experiments in transferring farmers' wheat into bulk trucks were conducted, and from that time onwards local growers have been in the forefront in suggesting Improvements.

Mr. Tanswoll said that wheat farmers had on several occasions been given to understand that trucks would be available at all sidings where there were no silos. In spite of this insurance there had been no bulk trucks at Goonumbla for three or four weeks. During that time bulk trucks had passed Goonumbla to load up at Peak Hill silos (SMH Tuesday 20 January 1925: NSW silos, nd.).

The lack of available trains at stations like Goonumbla led to wheat being carted to Parkes which resulted in additional costs for the farmer. Wheat was alternatively being left out on the property which also resulted in heavy losses.

Plate 3.9

1940 photograph of bagged wheat being loaded onto rail wagons at Trewilga

Once the silos were built the typical layout of a station with a grain siding would be the main line with a grain siding, grain silos (for example the 2400 tonnes capacity silos at Goonumbla built in 1930), a bulkhead, grain shed, goods shed, weigh bridge, passenger station building (waiting shed) and station officer's (SO) house. Refer to **Plate 3.10** for a detail of Goonumbla Station in 1917 before the grain silos were built. The silos at Goonumbla were constructed in the location of the grain shed.

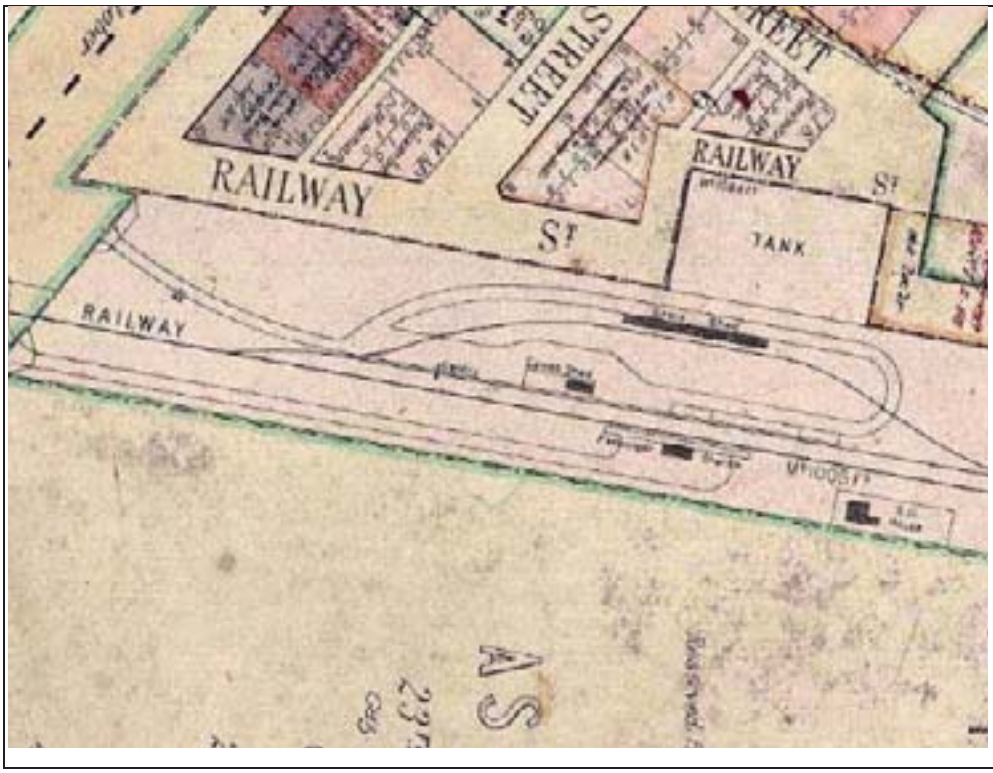


Plate 3.10

Detail of 1917 Town Map of Goonumbla

3.13 Historical Themes

A historical theme is a research tool, which can be used at the national, state or local level to aid in the identification, assessment, interpretation and management of heritage places (AHC 2001:1). Nine national historical themes have been identified by the Australian Heritage Commission (AHC now Australian Heritage Council). The Heritage Division, OEH has identified thirty-five historical themes for understanding the heritage of NSW. The development of the proposal site is broadly reflective of the history of the local region, and can be assessed in the context of the broader historic themes defined by the Heritage Division, OEH and AHC. In accordance with the Heritage Division and AHC framework of historic themes, the themes in Table 3.2 are relevant to the proposal site and locality.

Table 3.5 Historical Themes Relevant to the Proposal site and Locality

National	National Sub Themes	NSW Themes	Local Themes	Examples
Peopling Australia	Living as Australia's earliest inhabitants Adapting to diverse environments Migrating Promoting settlement	Convict Migration	Activities relating to incarceration, transport, reform, accommodation and working during the convict period in NSW. Activities associated with the resettling of people from one place to another and the impacts of such movements	Landscapes of control, convict built structure.
Developing local, regional and national economies	Surveying the continent	Exploration	Looking for overland stock routes Looking for land with agricultural potential Laying out boundaries	Explorers routes Early mapping

National	National Sub Themes	NSW Themes	Local Themes	Examples
Developing local, regional and national economies	Developing Primary Production	Pastoralism	Activities associated with the breeding, raising, processing and distribution of livestock for human use.	Rural landscape, hay barn, dairy, vineyard, farmstead, fencing, shed, orchard.
		Agriculture	Activities relating to the cultivation and rearing of plant and animal species, usually for commercial purposes.	Pastoral landscape, homestead, fencing, well, water trough, shearing shed.
		Mining	Activities associated with identification, extraction, processing and distribution of mineral ores.	Mining field or landscape, mine, quarry, processing plant, miner's office, collier, mine shaft.
Developing local, regional and national economies	Moving Goods and People	Transport Building and maintaining railways	Activities associated with moving goods and people from one place to another, and systems for the provision of such services.	Highway, lane, stock route, bridge, footpath, aerodrome, horse yard. Rail lines and stations.

National	National Sub Themes	NSW Themes	Local Themes	Examples
Building settlements, towns and cities	Making settlements to serve rural Australia Supplying Urban Services	Land Tenure Utilities Accommodation	Activities and processes for identifying forms of ownership and occupancy of land. Activities associated with the provision of services, especially on a communal basis. Activities associated with the provision of accommodation, and particular types of accommodation.	Fence, survey mark, subdivision pattern, stone wall. Bridge, culvert, weir, well, cess pit, reservoir, dam. Homestead, cottage, house site (archaeological site).
Governing	Governing Australia as a province of the British Empire Governing Australia's colonial possessions Administering Australia	Government and administration	Activities associated with the governance of local areas, regions, the State and the nation. Activities associated with maintaining, promoting and implementing criminal and civil law and legal processes.	Land administration and legislation
Educating	Training people for the workplace	Education	Activities associated with teaching	Agricultural training

4.0 Physical Context

This section discusses the potential heritage items present within, and in the vicinity, of the proposal site, identified through a search of relevant heritage registers, previous heritage studies in the area, historical research and archaeological survey. This information, in conjunction with the historical context (refer to **Section 3.0**), forms the basis of the significance assessment (refer to **Section 5.0**) and management strategy (refer to **Section 6.0**).

4.1 Physical Context of the Rail Corridor

As discussed in **Section 1.4** the proposal will generally be located along the existing rail alignment within the rail corridor between Parkes and Narromine (refer to **Figure 1.2**). The rail corridor is generally defined by fences located approximately 20 metres either side of the rail line, however in some sections where fences are not present the rail corridor may be wider, extending out to about 30 to 40 metres from the rail line. At locations where construction works compounds are proposed the development footprint will extent outside of the rail corridor.

The southern extent of the proposal (at Parkes) is situated in the Lachlan River basin and north of the Lachlan River, with the nearest named watercourse being Goobang Creek. The northern extent of the proposal is situated in the Macquarie River floodplain. The proposal crosses 29 waterways including major creeks (such as Burrill Creek, Stanfords Creek, Barrabadeen Creek, Tomingley Creek and Yellow Creek) and other watercourses, some of which are ephemeral.

The majority of the proposal site has been heavily modified by past and ongoing rail disturbances, including clearance and maintenance of the rail corridor, and surrounding agricultural activities.

4.2 Site Survey

4.2.1 2014 Field Survey

A targeted survey was conducted over the course of five (5) days from 10 September 2014 to 14 September 2014 as part of the preparation of the *Melbourne to Brisbane Inland Railway Parkes to Narromine and Narrabri to North Star Historical and Aboriginal Cultural Heritage Evaluation* (Umwelt 2014). The inspections, which covered the whole of the Parkes to Narromine alignment, were undertaken with the intention of inspecting and undertaking preliminary recordings of the location, nature and current condition of:

- any sites (both Aboriginal and non-Aboriginal) identified during the database and literature review
- any additional sites (both Aboriginal and historical) identified during the field survey
- broad scale evaluation of landscape with reference to potential cultural heritage considerations.

Field survey was completed for the existing section of the rail line from south to north, commencing at Parkes and concluding at Narromine.

All watercourses and associated culverts and underbridges along the existing rail line were inspected to identify any that have the potential for any heritage significance (refer to **Section 4.5**).

4.2.2 2016 Field Survey

An additional targeted field inspection was undertaken on the 23 May 2016 along the whole of the Parkes to Narromine alignment focusing on the former railway stations located along the rail line. Field survey was again completed for the existing section of the rail line from south to north, commencing at Parkes and concluding at Narromine.

4.3 Statutorily Listed Heritage Items

As discussed in **Section 2.1** no sites/items with a statutory heritage listing were identified within or in the vicinity of the proposal site with the potential to be subject to either direct or indirect impacts.

As such, the listed heritage items in the vicinity of the proposal site are not considered to be at any risk of impact resulting from the proposal and are not discussed further in this report.

4.4 Potential Non-Aboriginal Heritage Items Within and In Vicinity of the Proposal site

Table 4.1 discusses the broad range of potential (non-listed) heritage items identified within and in the vicinity of the proposal site. These are discussed in more detail below.

Table 4.1 Potential heritage items within and in the vicinity of the proposal site

Item	Location	Description
Rail line	Along entire proposal site	Rail line and associated underbridges / culverts
Rail stations and associated rail infrastructure	Along entire proposal site	Station platforms and buildings, loading banks, station signs, landmark signals, rail signage, rail crossings, communication lines
Grain rail sidings located adjacent to existing rail corridor	Outside but adjacent to proposal site - particularly at station locations	Grain rail sidings including grain silos and associated sheds, loading banks and other infrastructure
Buildings and rural structures and infrastructure located adjacent to existing rail corridor	Occasional locations along rail line – particularly in vicinity of station locations	Houses, shearing sheds, cattle yards, loading ramps and other rural infrastructure
Towns / villages and former village locations	Outside but adjacent to proposal site - particularly at station locations	Towns / villages and former village locations along rail line

All of the potential heritage items identified during the surveys are shown on **Figure 4.1a** and **Figure 4.1b.**

Image Source: Google Earth (2013)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

Legend

- Proposal Site
- Local Government Area
- Potential (non-listed) Heritage Item

FIGURE 4.1A

Potential Heritage Items within 1 km of the Proposal Site

Image Source: Google Earth (2013)
Data Source: Geoscience Australia (2009), Parsons Brinckerhoff (2014)

0 2.5 5.0 10.0km
1:250 000

Legend

- Proposal Site
- Local Government Area
- Potential (non-listed) Heritage Item

FIGURE 4.1B

Potential Heritage Items within 1 km of the Proposal Site

4.5 Rail Line, Underbridges and Culverts

The Parkes to Narromine rail line was originally constructed between Peak Hill and Narromine in 1910 before being extended to Goobang Junction immediately north of Parkes in 1914. It was constructed as an inexpensive Pioneer Line with the intent of upgrading the line if it proved profitable. The line existing today comprises a much upgraded rail line following the same alignment as the original 1910 to 1914 Pioneer Line, with upgraded culverts and underbridges, and track side signage.

Underbridges are considered to comprise structures supporting the rail track that pass over waterways and include culvert structures. During the design process for the proposal all underbridges were assessed for compliance with the Inland Rail performance specification. Any underbridges and culverts that did not comply, were identified as having limited life spans, or cannot be feasibly made to comply, are proposed to be replaced as part of the proposal.

As such there are numerous underbridges along the rail alignment that are proposed to be replaced. The majority of these underbridges / culverts are various types of metal pipe or concrete box structures comprising examples of typical utilitarian rural rail underbridges that would have originally been constructed of timber but have been modified as part of past maintenance works. These are not considered to have any potential heritage significance and are not considered further in this report. There are a number of underbridges surviving along the alignment which still have timber components in addition to early concrete modifications or are entirely constructed of timber. These in general are likely to be more representative of the earlier types of underbridges constructed along the rail line and are detailed in **Table 4.2**.

Table 4.2 Underbridges with timber and concrete components

Location and Underbridge ID (chainage)	Description	Photograph
Goobang Junction 453.403	4 concrete piers supporting timber girder/beam. Vertical concrete abutments.	

Location and Underbridge ID (chainage)	Description	Photograph
Goobang Junction 454.844	17 concrete or timber piers supporting timber girder/beam. Some piers have timber headers. Vertical concrete abutments – with corrugated metal wing walls	
Goonumbla (culvert) 459.676	Low vertical concrete abutments supporting timber girder/beam supporting timber girder/beam.	
Goonumbla 460.698	4 piers (2 timber with timber header, 1 timber, 1 concrete) supporting timber girder/beam. 1 vertical concrete abutment. 1 vertical corrugated metal abutment.	

Location and Underbridge ID (chainage)	Description	Photograph
Goonumbla **461.157**	7 concrete piers with timber headers supporting timber girder/beam. 1 vertical concrete abutment. 1 vertical timber constructed abutment	
Goonumbla **468.565**	5 timber piers with timber headers supporting timber girder/beam. Cut rails used to support / brace piers. Vertical corrugated metal abutments with wing walls.	
Mickibri **478.262**	8 concrete piers with timber headers supporting timber girder/beam. Vertical concrete abutments.	

Location and Underbridge ID (chainage)	Description	Photograph
Mickibri **484.829**	4 timber piers with timber headers supporting timber girder/beam. 1 vertical concrete abutment. 1 vertical timber constructed abutment.	
Peak Hill **498.870**	3 low concrete piers supporting timber girder/beam. Low concrete abutment.	
Peak Hill **503.599**	11 timber piers (2 on concrete footing) with timber headers supporting timber girder/beam. Vertical timber abutment – constructed from horizontal timber planks with wing walls.	

Location and Underbridge ID (chainage)	Description	Photograph
Peak Hill **505.502**	15 timber piers with timber headers supporting timber girder/beam. Cut rails used to support / brace piers. Timber abutments with wing walls.	
Peak Hill **509.64**	5 timber piers with timber headers supporting timber girder/beam. Vertical timber abutment – constructed from horizontal timber planks	
Tomingly West **513.671**	3 low timber piers (2 on concrete footing) piers supporting timber girder/beam. Low vertical corrugated metal abutments.	

Location and Underbridge ID (chainage)	Description	Photograph
Tomingly West **515.011**	10 timber piers with timber headers supporting timber girder/beam. Cut rails used to support / brace piers. Vertical corrugated metal abutments.	
Tomingly West **515.601**	9 timber piers (3 on concrete footing) piers supporting timber girder/beam. Vertical corrugated metal abutments with wing walls.	
Tomingly West **519.224**	3 piers (2 timber , 1 concrete) with timber headers supporting timber girder/beam. Cut rails used to support / brace piers. Vertical corrugated metal abutments	

Location and Underbridge ID (chainage)	Description	Photograph
Wyanga **528.54**	1 piers (timber?) supporting timber girder/beam. Timber abutments.	
Wyanga **529.768**	15 timber piers (with occasional concrete footing) with timber headers supporting timber girder/beam. Vertical corrugated metal abutments	
Narwonah **546.542**	12 piers (2 concrete , 10 timber) with timber headers supporting timber girder/beam. Cut rails used to support / brace piers. Vertical corrugated metal abutments with wing walls.	

All photographs in Table 4.2 © Umwelt, 2014/2016

4.6 Railway Stations

There are 10 former railway stations and one former loop (Myaroo) located within the proposal site and one station and a junction located within the vicinity of the proposal site (Goobang Junction and Narromine). All the stations are closed and in general there is limited remaining evidence of the stations themselves with the exception of raised earthen embankments indicating former station platform or rail siding loading banks. Goobang Junction is still in use, however it has always been a junction with no station structures ever constructed. **Table 4.3** lists the former railway stations located within and adjacent to the proposal site and discusses what physical evidence of the former stations can be identified today with consideration of the evidence provided by the station layout plans discussed in **Table 3.4**.

Table 4.3 Former railway stations within and in vicinity of the Proposal site

Station	Description	Photographs
Goobang Junction **In use** **Outside proposal site**	View to southeast of Goobang Junction. Diagram board and signal box on south side of rail line (background) point levers in foreground Photograph taken at chainage 448.220 south of commencement of proposal site	
Nanardine **Station closed** **Within proposal site**	View to south showing raised earthen embankment indicating former location of loading bank on east side of rail line. No evidence of associated goods shed. No evidence of platform formerly located on west side of line.	

<table>
<tr><th>Station</th><th>Description</th><th>Photographs</th></tr>
<tr><td>Goonumbla
Station closed
Within proposal site</td><td>View to south showing location of main line and grain silos.
No evidence of station platform or station officer’s house formerly located on east side (left of photograph).
Siding rail line is to right of grain silos.</td><td>  </td></tr>
<tr><td rowspan="3">Alectown West
Station closed
Within proposal site</td><td colspan="2">Photograph below is a view to north showing main rail line, loading bank and grain silos. Grain rail siding line is to right of grain silos.
No evidence of timber built station platform likely formerly located in the area of trees centre of photograph.</td></tr>
<tr><td colspan="2">  </td></tr>
<tr><td>View to south showing main line (right of photograph), concrete footing (likely to base of a tank) and grain silos. Rail siding is to left of grain silos.
Station platform was likely located in the area of trees on right of photograph.</td><td>  </td></tr>
</table>

Station	Description	Photographs
Mickibri **Station closed** **Within proposal site**	View to north of weigh bridge. Main line and rail siding on left of photograph. All structures at Mickibri to east of main and siding lines – away from Proposal site.	
	View to north showing slightly raised earthen embankment area (centre of photograph), main line and grain rail siding (with train) and grain silos. Main line is immediately adjacent to (to left of) rail siding with train. No evidence of station platform formerly located in area centre of photograph.	
	Photograph below is a view to north showing weigh bridge and corrugated iron shed located northeast of grain silo. Main line and rail siding on left of photograph. All existing structures at Mickibri to east of main line and rail siding – outside the main corridor works of the proposal site	
		

Station	Description	Photographs
Trewilga **Station closed** **Within proposal site**	View to northeast showing main line with raised earthen embankment (former loading bank of goods siding) to east of rail line. No evidence of station platform formerly to left of photograph	
	View to south showing main line (far right of photograph) with raised earthen embankment to west of rail line – the former location of station platform	
	1940 photograph of former location of Trewilga Station. Earthen embankment comprises only evidence of its location (refer to photograph above). *Photograph: NSWrail.net*	
Peak Hill **Station closed** **Within proposal site**	View to northeast showing main line (foreground), grain rail siding immediately adjacent to main line and loading bank (background)	

Station	Description	Photographs
	View to east showing main line, grain rail siding immediately adjacent to main line, timber faced loading bank (background) and remains of rail related utility services (foreground) possibly related to tank and bore installed in 1941 for defence work.	
	1986 photograph of the former Peak Hill Station. Station building has been relocated to Lindner Oval, Boori Street, Peak Hill. No evidence for platform, sheds or station officer's house remain. *Photograph: NSWrail.net*	
	2006 photograph of the former Peak Hill Station (with chimneys removed) relocated in Lindner Oval, Boori Street, Peak Hill. *Photograph: NSWrail.net*	

Station	Description	Photographs
Myaroo **Loop closed** **Within proposal site**	General view to northwest of main line at Myaroo. No evidence of Myaroo loop found.	
Tomingley West **Station closed** **Within proposal site**	View to south towards junction of main line (on left of photograph) and rail siding (on right of photograph). Old timber cottage on private land adjacent to Tomingley West Road (red arrow) on right of photograph approximately 100 metres to west of main line.	
	Approximately 2000 photograph looking north. Former station located in distance on right of photograph. No evidence of former station or platform survives. *Photograph: NSWrail.net*	

Station	Description	Photographs
	1986 photograph of former Tomingley station with shelter and station sign. No evidence of former station or platform survives today. *Photograph: NSWrail.net*	
	View to southwest showing old cottage on Tomingley West Road (left of photograph – red arrow), rail siding and weigh bridge (right of photograph) Several corrugated iron constructed utilitarian structures on west side of siding line such as weigh bridge and sheds – over 80 metres from main line away from proposal site	
Wyanga **Station closed** **Within proposal site**	2007 photograph looking south. Wyanga Station platform was located on right of photograph before the trees. No evidence of former station or platform survives. *Photograph: NSWrail.net*	

Station	Description	Photographs
	1986 photograph of former Wyanga Station – platform and sign present at time of photograph. No evidence of former station or platform survives. *Photograph: NSWrail.net*	
	View to south of Wyanga grain silos and grain rail siding (left of photograph), location of former siding loading bank (centre of photograph) and derelict cottage adjacent to main line (red arrow).	
	View to southwest of location of former siding loading bank (centre of photograph), main line and derelict cottage adjacent to main line (red arrow).	
	View to southwest of main line and derelict cottage located to south of former station location (refer to **Section 4.8.1**)	

Station	Description	Photographs
Fairview **Station closed** **Within proposal site**	View to north showing raised earthen embankment and remains of communication line – location of former loading bank and loop siding. Main line on right of photograph. No evidence for former station location located out of shot on right (east) of main line.	
Narwonah **Station closed** **Within proposal site**	View to north showing main line, grain siding line and grain silos. No evidence for former station and platform other than very slight rise east of main line (nswrail.net)	
Narromine **Station closed** **Outside proposal site**	View to east showing Narromine. Over 1 kilometre northeast of northern limit of proposal site	

Station	Description	Photographs
	View to east showing Narromine. Over 1 kilometre northeast of northern limit of proposal site	

All photographs in Table 4.3 © Umwelt, 2014 & 2016 unless indicated otherwise

4.7 Grain Rail Sidings

Existing grain rail sidings with grain silos and associated structures and other infrastructure are generally immediately adjacent to, but outside, the proposal site and as such are not expected to be impacted by the proposal. No proposed compounds located outside the rail corridor / main corridor works are located within the area of a grain siding. In places existing overhead powerlines are proposed to be replaced within the general areas of the grain sidings, however these works are not expected to result in any impacts to the grain sidings or silos.

Note that in 2003 the State Library of NSW commissioned the photographic recording of every grain silo across country NSW. The photographs are located in the NSW State Library archives and available online at http://nswsilos.com.au/. The State Library's intent was also to collect historical and cultural information on these landmark structures.

4.8 Other Buildings and Rural Structures in the vicinity of the Proposal site

In general, with the exception of the cottages at Wyanga and Tomingley West, there are no other identified rail (or grain siding) related structures or items within or in the vicinity of the proposal site.

4.8.1 Wyanga Cottage

The cottage at Wyanga comprises a derelict weatherboard cottage with three brick chimneys. The cottage is in a serious state of disrepair and has some internal props supporting the roof (refer to **Plate 4.1**). The structure is located immediately adjacent (approximately 15 metres to the west) to the main rail line and is likely located to the immediate south of the former station location; outside the current rail corridor boundaries.

Plate 4.1

Derelict cottage at Wyanga

4.8.2 Tomingley West Road Cottage

The timber cottage located on private property along Tomingley West Road was not inspected as part of the preparation of this report. It is located outside the proposal site approximately 100 metres to the west of the main rail line. As a result of its distance from the rail line and proposal site there are no expected impacts to the building as a result of the proposal and as such the building is not considered further in this report.

4.9 Villages and Towns

As discussed in **Section 3.10** the construction of an inland railway was a very significant development in the early twentieth century leading to the establishment and survival of villages and towns. The proposal site, and in particular the main corridor works, are within the existing rail corridor outside any existing, or former (for example Goonumbla), villages or towns. The proposal site passes immediately to the west of Peak Hill; however the closest listed heritage item is the Peak Hill Police Station and Official Residence located at 80 Derribong Street approximately 750 metres to east of the proposal site.

As previously discussed, the proposal site comprises the existing Parkes to Narromine rail line and the proposal entails upgrading the rail line to ensure it meets the required Inland Rail performance specification. The upgrading of the existing rail line results in no, or only very minor, change to its overall alignment, location and function. As a result, the proposal is not expected to result in any non-Aboriginal heritage impacts to any part of the town of Peak Hill or the other town and villages (or former village locations) located in the vicinity of the rail line. As such existing, or former, village and towns in the vicinity of the proposal site are not discussed further in this report except in relation to the historical context and significance of the rail line and proposal site in general.

4.10 Summary of Historical, Archaeological and Physical Contexts

The potential non-Aboriginal heritage resource of the proposal site generally reflects the documented history of the surrounding region (discussed in **Section 3.0**) and the extant Parkes to Narromine rail alignment.

The rail line which essentially comprises the proposal site was originally constructed between Peak Hill and Narromine in 1910 before being extended to Goobang Junction immediately north of Parkes in 1914. It was constructed as a Pioneer Line which, as a result of the success of the wheat industry, has been continually upgraded following the same alignment as the original 1910 to 1914 constructed line.

The potential non-Aboriginal heritage resource, and likely absence of any archaeological resource, is considered to be typical of a rail line and includes the rail formation itself with culverts and underbridges of varying construction materials and age, evidence of the former stations and other rail related structures and infrastructure. The grain rail sidings and landmark grain silos dominate the landscape immediately adjacent to the proposal site.

5.0 Significance

5.1 Introduction

An assessment of significance is undertaken to explain why a particular place is important and to enable appropriate site management to be determined. In accordance with the SEARs for the proposal, this section comprises a significance assessment of the non-Aboriginal heritage items within and in the vicinity of the proposal site.

The Australian ICOMOS Burra Charter 1999 (the Burra Charter) defines cultural significance as meaning 'aesthetic, historic, scientific or social value for past, present or future generations' (Article 1.2). The Burra Charter was written to explain the basic principles and procedures that should be followed in looking after important places. Cultural significance is defined as being present in the 'fabric, setting, use, associations, meanings, records, related places and related objects'. The fabric of a place refers to its physical material and can include built elements, sub surface remains and natural material (Australia ICOMOS 2013).

5.2 Basis of Assessment

The NSW Heritage Manual (1996), published by the then NSW Heritage Office and Department of Urban Affairs and Planning, sets out a detailed process for conducting assessments of heritage significance. The manual provides a set of specific criteria for assessing the significance of an item, including guidelines for inclusion and exclusion.

The seven criteria defined by the Heritage Division, OEH, and used by the NSW Heritage Council as an assessment format within NSW are outlined below:

Criterion (a) an item is important in the course, or pattern, of NSW's cultural or natural history;

Criterion (b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

Criterion (c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Criterion (d) an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

Criterion (e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

Criterion (f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history; and

Criterion (g) an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.

The following significance assessment is based upon the above seven criteria.

As a component of the holistic concept of significance, archaeological significance has been described as a measure by which a site may contribute knowledge, not available from other sources, to current research themes in historical archaeology and related disciplines (Bickford and Sullivan, 1984 19-26). Archaeology is concerned with material evidence and the archaeological record may provide information not available from other sources. An archaeological study focuses on the identification and interpretation of material evidence to explain how and where people lived, what they did and the events that influenced their lives.

Considerations material to the study of the archaeology include:

- whether a site, or the fabric contained within a site, contributes knowledge or has the potential to do so. If it does, the availability of comparative sites and the extent of the historical record should be considered in assessing the strategies that are appropriate for the management of the site

- the degree and level at which material evidence contributes knowledge in terms of 'current research themes in non-Aboriginal archaeology and related disciplines'.

Following Bickford and Sullivan's work on archaeological significance (1984, 19-26) the following questions can be used as a guide to assessing the significance of an archaeological site:

- Can the site contribute knowledge that no other resource can?

- Can the site contribute knowledge that no other site can?

- Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?

The Heritage Council of NSW recognises four levels of significance for heritage in NSW: Local, State, National and World. An item has local heritage significance when it is important to the local area. An item has state heritage significance when it is important in NSW. Most heritage in NSW is of local significance.

5.3 Significance of the Potential Heritage Items/Sites within and in the immediate vicinity of the Proposal site

5.3.1 Statement of Significance

The significance of the potential heritage sites/items located within and in the vicinity of the proposal site (refer to **Section 4.0**) and the proposal site itself is assessed in **Table 5.1** below.

Table 5.1 Assessment of significance of potential heritage sites/items

Heritage Division Standard Criteria	Significance Assessment
Criterion (a) **Historical**	The proposal site essentially comprises the existing rail corridor of the Parkes to Narromine rail line which was opened between 1910 and 1914 as one of the low cost NSW Pioneer Lines constructed through western and north western NSW. These lines were constructed with the aim of establishing access to wheat growing areas and also reaching the edge of the productive wool growing areas. As such the proposal site demonstrates the pattern of land use and development in the area and has associations with the broader development of the region including its early exploration, settlement, and exploitation for pastoral and agricultural purposes. The stations located along the rail line, in addition to the rail line itself (including underbridges and associated rail infrastructure), have historical association with the expansion of the NSW rail network through the region and its role in encouraging agricultural and pastoral development. Underbridges can provide examples of the differing and changing construction techniques used to raise the rail line. Although outside the rail corridor the derelict house at Wyanga located between the main rail line and Peak Hill Railway Road is likely to be related to the rail line and may comprise a former Rail Officer's House which in a more urban setting would generally comprise a Station Master's House. The grain rail sidings, grain silos and associated other structures and infrastructure located immediately adjacent to the proposal site are closely associated with the rail line. The grain silos comprise significant landmark features throughout the region. The locations of towns, small villages and former village locations (for example Goonumbla) adjacent to the rail line contribute to the history of the development of the area as the rail line led to the establishment and survival of a number of these villages and towns. With the exception of the rail line and its associated structures, evidence of stations and other infrastructure, the proposal site itself is unlikely to contain significant non-Aboriginal heritage or archaeological remains associated with the development history of the area.
Criterion (b) **Associative**	Although the proposal site can be considered to have associations with the people who constructed and worked on the railway in addition to the agriculturalists and pastoralists who depended on it, the proposal site is not known to have any strong or special associations of particular significance. As discussed this report does not consider any Aboriginal historic associations with the proposal site, refer to *ARTC Inland Rail – Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment* (Umwelt 2017) for consideration of any such associations or connections. Accordingly, in general the potential heritage sites/items identified within the proposal site do not meet this criterion.

Heritage Division Standard Criteria	Significance Assessment
Criterion (c) **Aesthetic**	The proposal site may demonstrate some aesthetic significance as an example of a pioneer rail line with adjacent associated grain rail sidings and landmark grain silos crossing a rural landscape; however there are many other similar examples of Pioneer Lines with associated grain rail sidings throughout NSW.
Criterion (d) **Social**	It is considered unlikely that the potential non-Aboriginal) heritage resource of the proposal site would have a strong or special association with any previous or contemporary particular community or group. As the existing rail line comprises a Pioneer Line constructed with the aim of establishing access to wheat and wool growing areas, the proposal site demonstrates an important and integral part of the history of the pattern of settlement and development in the area from the early to mid nineteenth century, and is typical of a rail line crossing a large rural landscape within the wider regional area. A detailed stakeholder engagement program including consultation with local landholders and other stakeholders, has been prepared as part of the EIS for the proposals. As discussed this report does not consider any Aboriginal social, cultural or spiritual associations with the proposal site, refer to *ARTC Inland Rail – Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment* (Umwelt 2017) for consideration of any such associations with both traditional and modern Aboriginal ways of life. Accordingly, in general the potential heritage sites/items identified within the proposal site do not meet this criterion.

Heritage Division Standard Criteria	Significance Assessment
Criterion (e) **Scientific**	As the proposal site comprises an extant redundant Pioneer Rail line constructed across an area with little known previous development with the potential to result in an archaeological resource, there are unlikely to be any intact non-Aboriginal archaeological remains within the proposal site. A high degree of intactness in the archaeological resource is necessary before a substantive contribution can be made to the research potential and hence, the ability of the archaeological resource to answer research questions for the site. Any archaeological evidence associated with the pre rail use and development of the proposal site (such as for early settlement, grazing, agriculture and land clearing) is likely to be patchy at best, and it would be impossible to specify what such remains may entail and where they would be located. In general the existing Parkes to Narromine rail line formation (including extant 'early' underbridges, former station locations, former loading banks, disused communication lines and power poles etc) comprises a typical example of a rural rail line. The extant underbridges comprise examples of typical utilitarian rural rail underbridges that would have originally been constructed of timber but have been modified as part of past maintenance works. Many of the underbridges on the rail line have been partially, or entirely replaced, with the use of other construction materials such as concrete. The extant underbridges with surviving timber components provide examples of the differing and evolving construction techniques and materials formerly used to raise the rail line. Station layout plans provide evidence of what was likely constructed at each station in terms of platforms, station buildings and loading banks. In general there is limited extant evidence of the stations themselves. Platforms and embankments would have comprised simply constructed earthen embankments faced with timber (for example at Peak Hill) or concrete (for example at Tomingley West – refer to 1986 photograph in Table 4.3). With the exception of the previously removed station building at Peak Hill, station buildings would have been simple functional structures built to standard railway design plans (for example at Tomingley West – refer to 1986 photograph in Table 4.3). Any evidence of the former locations of platforms or loading banks is at best in the form of existing earthen embankments which would not be considered to comprise 'relics' under the Heritage Act and as such have no archaeological significance. There would not be expected to be any archaeological resource associated with the rail line itself which is currently, and since its construction in the early twentieth century always has been, a rail line. The level of ongoing works within the rail corridor which has for the most part removed all evidence of stations and associated platforms is likely to have removed all evidence of station officer's houses that may have been located at station areas along the line (for example at Goonumbla, Peak Hill and Tomingley West Stations - refer to **Table 3.4**). Any surviving evidence would likely be highly disturbed and confirm the former building location rather than have any research potential. Station Officer's houses were built to standard plans, for example the standard J.2 Station Officer's House constructed at Peak Hill or the standard J.1 Station Officer's House constructed at Tomingley West.

Heritage Division Standard Criteria	Significance Assessment
	It is possible however that the derelict house at Wyanga is a former Station Officer's house. While the proposal site does demonstrate the use and historical development of the area, in particular its use as a rail line, in general the proposal site is considered to have little research potential and is unlikely to provide further information regarding the history and development of the area not already known.
Criterion (f) **Rarity**	The rail line itself and associated potential heritage sites/items identified within the proposal site, including remains of former rail loading banks, platforms and underbridges, are typical of structures found associated with rail lines throughout NSW and are unlikely to meet these criteria. The potential heritage resources associated with the proposal site are not associated with an unusual or remarkable aspect of the region's history. Although any heritage resource within the proposal site is part of an ever decreasing resource, in general the resource does not meet these criteria.
Criterion (g) **Representativeness**	The potential heritage sites/items identified within the proposal site are generally representative of the structures items/sites typically found associated with a Pioneer rail line in regional NSW.

5.3.2 Archaeological Significance

Archaeological significance is directly linked to the archaeological (or scientific) research potential of an archaeological site or resource. An archaeological site comprises below ground archaeological 'relics' which can be broadly described as physical evidence of building foundations, occupation/archaeological deposits, features and artefacts (Heritage Office and DUAP, 1996b:2).

The Heritage Act defines a 'relic' as any deposit, object or material evidence that:

- relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement
- is of State or local heritage significance.

The research already undertaken as part of this proposal has included an evaluation of available documentary evidence which provides information regarding the use and development of the area. It is considered unlikely for any substantial intact archaeological remains to be present within the proposal site.

Rail tracks (both existing and former) and associated extant rail related earthen embankments comprising locations of former platforms and loading banks would be considered to comprise works or structures rather than 'relics' as defined by the Heritage Act.

As discussed, the level of ongoing works within the rail corridor which has for the most part removed all evidence of stations and associated platforms is likely to have also removed all evidence of station officer's houses that may have been located at station areas along the line (for example at Goonumbla, Peak Hill and Tomingley West Stations - refer to **Table 3.4**). No evidence of former house locations was identified within the main works corridor during site inspections. Any surviving evidence would likely be highly disturbed and confirm the former building location rather than have any research potential. Station Officer's houses were built to standard known plans, for example the standard J.2 Station Officer's House constructed at Peak Hill or the standard J.1 Station Officer's House constructed at Tomingley West.

The cottage at Wyanga is located outside the rail corridor and will not be physically impacted by the proposal.

As such, in general no potential non-Aboriginal archaeological resource has been identified within the proposal site. As a result, the three questions derived from Bickford and Sullivan's work on archaeological significance (discussed in **Section 5.2**) are not discussed further and archaeological significance in general is not discussed further in this report.

5.3.3 Condition and Integrity of Sites within the Proposal site

This section addresses matters that combine with the assessment of significance to allow a formal Heritage Impact Statement to be appropriately validated. The condition and integrity of sites/items is considered as part of the assessment of heritage significance.

The Parkes to Narromine rail line comprises an intact redundant rail line originally constructed as a Pioneer Line between 1910 and 1914. A heritage item is said to have integrity if its fabric is still largely intact. The rail line itself and associated culverts and underbridges are largely intact and in good condition. However in general any other potential non-Aboriginal heritage resource within the proposal site, for example stations and loading banks, is in a poor physical condition represented by the locations of former stations and other rail structures / infrastructure with varying degrees of intact fabric. The majority of station platforms and loading banks have been removed or are evident only as a raised earthen bank.

5.3.4 Summary Statement of Significance

The existing rail line comprises a former (now redundant) Pioneer Line constructed with the aim of establishing access to wheat and wool growing areas in regional NSW. As such the proposal site demonstrates and contributes to an important part of the history of the pattern of settlement and development in the region.

As a result of its strong historical relationship with the construction of Pioneer Lines in rural NSW at the beginning of the twentieth century and its role in encouraging settlement and agricultural and pastoral development in the region the proposal site, and its individual surviving component elements such as the extant timber constructed underbridges and remnant evidence of former stations, is considered to generally be of local significance.

6.0 Heritage Impact Statement and Management Strategy

This section provides a heritage impact statement and management strategy for the heritage sites/items within and where relevant within the vicinity of the proposal site. The heritage impact statement identifies the potential impacts from the proposal on known and potential heritage sites/items identified within, and where relevant within the vicinity of, the proposal site. The impacts are assessed against the significance of the respective elements.

The Burra Charter's options for managing non-Aboriginal heritage include maintenance, preservation, restoration, reconstruction, adaptation and interpretation, or a combination of these (Australia ICOMOS. 2013).

As discussed in **Section 1.2** the proposal is generally located in the existing rail corridor between the towns of Parkes and Narromine in NSW and involves the upgrading of the existing rail line between Parkes and Narromine (refer to **Figure 1.1**).

The proposal would involve upgrading the existing rail line between Parkes and Narromine. Refer to **Section 1.1** for details.

6.1 Potential Impacts of the Proposal

The proposal has the potential for impacts on both heritage items within the proposal site and items in the vicinity. Direct impacts affect heritage items located with the proposal site, while indirect impacts can occur both inside and outside the proposal site. Types of direct and indirect impacts along with the potential impacts of this proposal are discussed below.

6.1.1 Direct Impacts

Direct heritage impacts are considered to be those that may arise as a primary consequence of a project or change of use of an area (note that this is not relevant to the proposal as the use of the proposal site will remain a rail line).

Direct impacts can result in the physical loss of part or all of an item or place, and/or changes to its setting. Setting is considered to include the surroundings of an item or place, its local context and can include present and past relationships to the surrounding landscape. Direct impacts resulting in physical loss are usually permanent and irreversible; they generally occur as a consequence of construction and are usually confined within the development footprint. Direct impacts that affect setting may occur as a consequence of construction or operation of a development and may have an effect some distance from the development. Assessment of impacts on setting refers to perceptible visual and aural (noise) effects that can be appreciated at a given time. Such impacts may be temporary or permanent, reversible or irreversible depending on the extent to which the cause of the impact can be removed. Impacts may also be transient where occurrence is sporadic or of limited duration, for example, related to hours of operation or the frequency of passage of vehicles (ICOMOS 2011).

The majority of the main corridor works (upgrading the existing track and track formation) fall within the existing rail corridor (generally approximately 15 metres from outer rail).

No listed heritage items or potential (non-listed) heritage items have been identified within or in the immediate vicinity of the Parkes north-west connection proposal site.

Existing high voltage overhead power lines require alteration where they currently cross the rail corridor. This is due to the increases in clearances from the rail due to the double stacking arrangement that is a fundamental performance criteria of the Inland Rail strategy. Works include dropping the existing lines and erecting new lines with greater clearance. As such there are not expected to be any additional power poles required or any impact as a result of works associated with replacing overhead powerlines.

In general the impact of the proposal can be considered to comprise the removal of the existing rail line, including rails, sleepers and ballast, and its associated culverts and the construction of a new rail line within the same rail corridor. As such the rail line will remain as an easily understood rail line in regional western NSW.

Retaining all evidence of the former rail line, culverts and stations etc. as extant today is not feasible as significant upgrades to the formation are required as part of the proposal in order for the rail line to comply with the Inland Rail required performance specifications. No identified original elements of the Pioneer Line survive intact that would warrant consideration of preservation.

The majority of the former stations have been previously removed with only occasional earthen embankments or loading banks remaining as evidence of their former locations. The rail line itself has been continually upgraded as required since its construction as a Pioneer Line and no original features (with the possible exception of some of the timber components of a number of underbridges) have been identified or are expected to be found.

Statements of Heritage Impact are provided in **Section 6.2**, **6.3** and **6.4** for the listed and unlisted heritage items potentially impacted by the proposal and summarised in **Table 6.2** (**Section 6.5**).

6.1.2 Indirect Impacts

Indirect impacts are considered to be those that may arise as a secondary consequence of construction or operation of a project, and can result in physical loss or changes to the setting of an item or place beyond a project area.

Indirect impacts relevant to the proposal include vibration and visual impacts which have the theoretical potential to damage/destroy/disturb or dominate/detract from a non-Aboriginal heritage items or place or its setting.

ACARP Report (No. C14057) Effect of Blasting on Infrastructure recommends ‘safe’ vibration limits for heritage structures such as those used by British Standard BS7385. Annex A of the British Standard BS7385:Part2:1993 for the Evaluation and Measurement for Vibration in Buildings states that:

> *...the age and existing condition of a building are factors to consider in assessing the tolerance to vibration. If a building is in a very unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other ground-borne disturbance British Standard BS7385:7.*

The British Standard BS7385 further discusses that ‘a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive’ (British Standard BS7385:5). The German standard DIN 4150: Part 3 Effects of Vibration on Structures includes a building type ‘Particularly Sensitive’ which is assigned vibration limits of 3 mm/s (at less than 10Hz), 3 to 8 mm/s (at 10-50Hz) and 8 to 10 mm/s (at 50-100Hz). Swiss Standard SN640 312:1978 also includes a ‘Particularly Sensitive’ structural type which is assigned vibration limits of 3 mm/s (at 10 to 30Hz) and 3 to 5 mm/s (at 30 to 60 Hz).

Australian Standard AS 2187.2-2006 Explosives—Storage and use Part 2: Use of Explosives no longer references 'sensitive or heritage structure'. The previous AS 2187.2-1993 indicated a conservative vibration level of 5 mm/s should be assigned to 'sensitive or heritage structures'. In the absence of a current Australian Standard which refers to structural vibration in buildings or heritage structures specifically, or any building specific assessment of the relevant sites/items considered in this report, a conservative peak particle velocity limit of between 3 to 5 mm/s is considered to be appropriate when assessing heritage structures. Note however, heritage type structures should also be considered on an individual basis in terms of their structural integrity; as an abandoned semi-derelict and dilapidated structure would likely be more sensitive to vibration induced damage than a well maintained and regularly utilised building.

As discussed in **Section 2.1** general construction activities are not expected to be sufficient to cause damage if the equipment operates at distances greater than 35 metres from heritage buildings and structures'. With the exception of impact piling typical vibration limits resulting from the construction and operation of the rail line are expected to be less than 3 mm/s at a conservative distance of 50 metres away from the proposal site (GHD 2017). As discussed there are no statutorily listed heritage items within 700 metres of the proposal site, which will continue to be used as a rail line, and as such there are not expected to be any impacts to any listed heritage in the vicinity of the proposal site. Potential heritage items such as station buildings and sidings are located within, and in the vicinity of, the proposal site. With consideration to structural damage resulting from vibration impacts caused by general construction activities, the expected magnitude of ground vibration should not be sufficient to cause damage if the equipment operates at distances greater than 35 metres from any potential heritage buildings and structures. It is recognised that there are items located within this 35 metre buffer, however levels measured on other similar projects indicate that vibration limits are not expected to exceed 3 mm/s and vibration damage is not expected for structures immediately adjacent to construction activities (GHD 2017).

All of the heritage items (both listed and unlisted) are currently located in proximity to a rail corridor and in many cases the heritage items existence is due to past and current associations with the railway line. The proposal comprises the removal of the existing rail line and the construction of a new rail line within the same rail corridor. As such, it is considered likely that the associations, setting, vistas and curtilage of the heritage items (both listed and unlisted) in relation to the rail line will essentially remain the same and as such will not be impacted. The proposal does create the potential for intermittent visual impacts as a result of the increased traffic on the railway line; however these are again related specifically to the continued and ongoing use of the railway line. As a result, the upgrade of the existing line does not change the setting or character of these heritage items and in general has at most a low visual impact.

The *Australian Rail Track Corporation Inland Rail – Parkes to Narromine Landscape and Visual Impact Report* (Urbis 2017) identifies that the visual impact of the proposal is generally low and does not identify any visual impacts in terms of the non-Aboriginal heritage of the proposal site.

6.2 Potential Non-Aboriginal Heritage Items within the Proposal site

This section addresses the potential impacts resulting from the proposal to the elements identified within the proposal site as being of significance as part of the former Pioneer Line and proposes a management strategy to mitigate any impacts.

The proposal proposes to upgrade the existing Parkes to Narromine rail line. The proposal has no proposed impacts to existing grain sidings and associated landmark grain silos. As such, apart from temporary impacts during construction, there are no known impacts to the function and setting of the proposal site or its past and present relationships to the surrounding landscape.

6.2.1 Underbridges

Heritage Impact Statement

As discussed in **Section 4.5**, during the design process for the proposal all underbridges were assessed for compliance with the Inland Rail performance specification. Any underbridges and culverts that did not comply, were identified as having limited life spans, or cannot be feasibly made to comply, are proposed to be replaced as part of the proposal.

As such, there are numerous underbridges along the rail alignment that are proposed to be replaced. The majority of these underbridges / culverts are various types of metal pipe or concrete box structures comprising examples of typical utilitarian rural rail underbridges that would have originally been constructed of timber but have been modified as part of past maintenance works. In general these are not considered to have any potential heritage significance. There are a number of underbridges surviving along the alignment which are entirely constructed of timber or have timber components in addition to early concrete modifications. These in general are likely to be more representative of the earlier types of underbridge constructed along the rail line (refer to **Table 4.2** for details). Note that none of the existing underbridges with timber components are considered to comprise examples of intact original timber girder underbridges designed by Henry Deane (refer to **Section 3.11.1.1**). The proposal will impact all of the surviving timber underbridges and underbridges with timber components, therefore impacting the significance of these items. However these impacts to heritage significance will be mitigated by following the recommendations provided below.

Recommendation

A photographic/archival recording is recommended for the underbridges listed in **Table 4.2** prior to the commencement of construction. The photographic recording will be undertaken with consideration of Heritage Division, OEH guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006).

The proposed photographic recording will ensure that a full understanding and record of the former Pioneer rail line and its associated infrastructure is documented and will be available for future generations. The report would include photographs of the rail line itself in the locations of the underbridges and any other rail related infrastructure such as former communication line / power poles etc, station locations (refer to **Section 6.2.2**) and as such comprise a detailed record of the former Pioneer Line and its surviving component elements.

6.2.2 Main Rail Line Former Station Areas

Heritage Impact Statement

As a result of the proximity of the earthen embankments / loading banks etc that in general comprise the only remaining evidence of the former railway stations, it is likely that any remaining evidence will be impacted to some extent as part of the main corridor works.

Recommendation

A photographic/archival recording is recommended for remaining evidence of the former stations located along the Parkes to Narromine rail line prior to the commencement of any works with the potential to impact the former station areas. The photographic recording will be undertaken with consideration of Heritage Division, OEH guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) and form part of a photographic recording report produced for the proposal which will include the

station areas and underbridges. The photographic recording will include contextual photographs showing relationships between the rail line, station areas and associated grain rail sidings and silos.

If possible the intact timber faced loading bank located at Peak Hill should be retained in situ as an example of loading banks constructed as part of the rail line and associated grain rail sidings. The loading bank is approximately 15 metres east of the main rail line; immediately adjacent to 'buffer' boundary of main corridor works.

Table 6.1 considers the impacts at each station location and recommends any management (for example photographic recording) specific to that location.

Table 6.1 Impacts and Recommended Management Measures for Railway Stations

Station	Remains	Impact	Recommended Management
Nanardine	Main rail line. Raised earthen embankment (former location of loading bank or platform) on east side of rail line.	Main rail line removed as part of main corridor works. Raised earthen embankment likely impacted as part of main corridor works.	Photographic recording
Goonumbla	Main Rail line. No evidence of former station.	Main rail line removed as part of main corridor works. Note former Goonumbla Village location outside Proposal site.	No management required
Alectown West	Main rail line. Loading bank and concrete pier footings.	Main rail line removed as part of main corridor works. Loading bank approximately 10 metres east of main rail line. Potential impacts as part of main corridor works. Concrete footings likely impacted as part of main corridor works.	Photographic recording
Mickibri	Main rail line. Earthen embankment area (former platform).	Main rail line removed as part of main corridor works. Raised earthen embankment likely impacted as part of main corridor works.	Photographic recording

Station	Remains	Impact	Recommended Management
Trewilga	Main rail line. Raised earthen embankments to east (former station platform) and west (loading bank) of rail line.	Main rail line removed as part of main corridor works. Raised earthen embankments likely impacted as part of main corridor works.	Photographic recording
Peak Hill	Main rail line. Grain rail siding immediately adjacent to main line. Loading bank with timber facing. Remains of rail related utility services - possibly related to tank and bore installed in 1941 for defence work.	Main rail line and former utility services removed as part of main corridor works. Loading bank approximately 15 metres east of main rail line – immediately adjacent to 'buffer' boundary of main corridor works.	Photographic recording. If possible the intact timber faced loading bank should be retained *in situ* as an intact example of loading banks constructed as part of the rail line and associated grain rail sidings.
Myaroo Loop	Main rail line	Main rail line removed as part of main corridor works.	No management required
Tomingley West	Main rail line. Utilitarian sheds etc associated with grain siding.	Main rail line removed as part of main corridor works. Utilitarian sheds etc associated with grain siding outside proposal site.	No management required
Wyanga	Main rail line. Raised earthen embankment (former loading bank).	Main rail line removed as part of main corridor works. Former loading bank likely removed as part of main corridor works.	Photographic recording
Fairview	Main rail line. Raised earthen embankment (former loading bank).	Main rail line removed as part of main corridor works. Former loading bank likely removed as part of main corridor works.	Photographic recording
Narwonah	Main rail line	Main rail line removed as part of main corridor works.	No management required

6.3 Identified Sites within the Immediate Vicinity of the Proposal site

6.3.1 Grain sidings and associated infrastructure

Heritage Impact Statement

The existing grain rail sidings with their landmark grain silos and associated structures are generally located immediately adjacent to, but outside, the proposal site and as such are not expected to be impacted by the proposal. No proposed compounds or access roads, located outside the rail corridor, are expected to impact the area of a grain siding or grain silo. In certain locations existing overhead powerlines are proposed to be replaced within the general areas of the grain sidings, however these works are not expected to result in any impacts to the grain sidings or silos (refer to **Section 6.1**).

This report does not include detailed consideration of the structural integrity of the grain silos however there are not expected to be any impacts to the grain sidings and associated silos as a result of vibration associated with the construction or operation of the proposal. Vibration levels resulting from the construction and operation of the proposal are not expected to exceed those already experienced as a result of the Parkes to Narromine rail line.

As the proposal would upgrade the existing rail line, apart from temporary impacts during construction, there are no expected impacts to the setting of the grain silos and their landmark silos as a result of the proposal.

The State Library of NSW commissioned photographic recording of NSW grain silos comprises an existing valuable and important photographic record of NSW grain silos; including those within close proximity to the proposal site.

Recommendation

The proposed photographic recording of elements of the existing rail line discussed above (including station areas) will include contextual photographs showing relationships between the rail line, its stations and the grain rail sidings and silos.

6.4 Wyanga Cottage

Heritage Impact Statement

The cottage located to the south of the former location of Wyanga Station is approximately 15 metres from the centre line of the rail line (refer to **Figure 4.1b**). Although the cottage has no known statutory heritage listing, it is considered to be of local significance as a result of its likely association with the construction of the rail line and potential use as a Station Officer's house.

Wyanga Cottage has likely always been associated with the rail line and as such its location immediately adjacent to the rail line is directly associated with its construction and use (potentially as a Station Officer's house). The proposal comprises the removal of the existing rail line and the construction of a new rail line within the same rail corridor. As such, it is considered likely that the associations, setting, vistas and curtilage of Wyanga Cottage in relation to the rail line will essentially remain the same and as such will not be impacted.

The cottage is in a serious state of disrepair and at risk of collapse. Although located immediately outside the current boundaries of the rail corridor and not proposed for demolition or disturbance there are potential indirect impacts, caused by vibration, as a result of the construction and operation of the proposal. The noise and vibration assessment of the proposal (GHD 2017) concluded that the cottage is located within the buffer distance where vibration levels from construction activities may cause impacts, therefore mitigation measures are recommended to minimise the potential for any impacts. The management of vibration in the vicinity of the cottage would be undertaken in accordance with the approach defined by the *Inland Rail Construction Noise and Vibration Management Framework*. Potential management actions could include a dilapidation survey and careful selection of construction techniques in the vicinity of the cottage. Further information on the framework with respect to the management of vibration is provided in the noise and vibration assessment.

Recommendation

In addition to the implementation of vibration management measures in accordance with the *Inland Rail Construction Noise and Vibration Management Framework*, it is recommended that a photographic/archival recording be undertaken of the cottage prior to the commencement of any works in the area. The photographic recording (including a base/floor plan) will be undertaken with consideration of Heritage Division, OEH guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) and form part of the proposed photographic recording report produced for the proposal which will include the station areas and underbridges.

Site specific archaeological assessment should also be undertaken if any ground disturbance is proposed.

6.5 Summary of Management and Mitigation Recommendations

A summary of the proposed management and mitigation recommendations detailed in **Section 6.0** is provided in **Table 6.2**.

Table 6.2 Summary of Management and Mitigation Recommendations

Item	Report Section	Management/Mitigation Recommendations
Goobang Junction 453.403 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Goobang Junction 454.844 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Goonumbla 459.676 Culvert	Section 6.2.1	• Undertake photographic archival recording.
Goonumbla 460.698 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Goonumbla 461.157 Underbridge	Section 6.2.1	• Undertake photographic archival recording.

Item	Report Section	Management/Mitigation Recommendations
Goonumbla 468.565 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Mickibri 478.262 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Mickibri 484.829 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Peak Hill 498.870 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Peak Hill 503.599 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Peak Hill 505.502 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Peak Hill 509.64 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Tomingly West 513.671 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Tomingly West 515.011 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Tomingly West 515.601 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Tomingly West 519.224 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Wyanga 528.54 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Wyanga 529.768 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Narwonah 546.542 Underbridge	Section 6.2.1	• Undertake photographic archival recording.
Nanardine Station	Section 6.2.2	• Undertake photographic archival recording.

Item	Report Section	Management/Mitigation Recommendations
Alectown West Station	Section 6.2.2	• Undertake photographic archival recording.
Mickibri Station	Section 6.2.2	• Undertake photographic archival recording.
Trewilga Station	Section 6.2.2	• Undertake photographic archival recording.
Peak Hill Station	Section 6.2.2	• Undertake photographic archival recording. • If possible the intact timber faced loading bank should be retained *in situ* as an intact example of loading banks constructed as part of the rail line and associated grain rail sidings.
Wyanga Station	Section 6.2.2	• Undertake dilapidation survey • Undertake photographic archival recording.
Fairview Station	Section 6.2.2	• Undertake photographic archival recording.
Grain Silos and sidings	Section 6.3.1	• Photographic archival recording of elements of the existing rail line discussed above (including station areas) will include contextual photographs showing relationships between the rail line, its stations and the grain rail sidings and silos
Wyanga Cottage	Section 6.4	• Undertake photographic archival recording. • If the vibration assessment identifies the risk of the cottage collapsing, then a detailed Statement of Heritage Impact will be required to assess the entire structure including internal and external fabric.

6.6 Photographic Recording

A photographic recording comprises an archival record of a heritage place or object which may include sites, buildings, structures and movable items of heritage significance. The purpose of a photographic recording is to document a heritage item for future generations; as making a photographic record of a heritage place or object documents it for the future, before it is lost or changed, either by progressive alterations or by the ravages of time (Heritage Office 2006). The photographic recording will be undertaken with consideration of Heritage Division, OEH guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006).

It is not appropriate, feasible or practical to record the entire Parkes to Narromine section of rail line prior to its removal. Table 6.2 lists all items where it is recommended that photographic recording be undertaken. It is assessed that this will comprise an adequate and appropriate photographic recording of the rail line and its associated elements and will ensure that a full understanding and record of the former Pioneer Line will be available for future generations.

6.7 Interpretation

As discussed, the Burra Charter's options for managing non-Aboriginal heritage include maintenance, preservation, restoration, reconstruction, adaptation and interpretation, or a combination of these (Australia ICOMOS. 2013).

The long linear nature of the proposal site and its location in a rural environment makes interpretation problematic, however the proposal site does form a significant part of the history of the pattern of settlement and development in the region. Pioneer Lines were constructed in rural NSW at the beginning of the twentieth century; encouraging settlement and agricultural and pastoral development throughout the region. The proposal site, and its individual surviving component elements such as the extant timber constructed underbridges and remnant evidence of former stations, is considered to generally be of local significance.

While in general the proposal comprises upgrading the existing track, any remaining evidence related construction of the Pioneer Line will be removed. As discussed, undertaking photographic recording of elements of the rail line is considered to comprise an adequate and appropriate recording of the rail line and its associated elements and will ensure that a full understanding and record of the former Pioneer Line will be available for future generations. However, consideration should be given to developing an Interpretation Strategy for the proposal.

The Heritage Division, OEH identifies interpretation as an integral part of the conservation and management of NSW's heritage. An Interpretation Strategy would provide a concept and framework for the interpretation of the existing rail line and associated features in order to communicate its significance to all stakeholders.

6.8 Unexpected Finds

6.8.1 Section 146 Heritage Act 1977 (NSW)

In the unlikely event that unexpected archaeological remains or potential heritage items not identified as part of this report are discovered during construction, all works in the immediate area should cease, the remains and potential impacts should be assessed by a qualified archaeologist or heritage consultant and, if necessary, the Heritage Division, OEH notified in accordance with Section 146 of the *Heritage Act 1977* (NSW).

If an archaeological relic is located as part of the proposal, a S146 Discovery of a Relic notification form must be completed and submitted to the Heritage Division, OEH.

6.8.2 Human Skeletal Material

In the unlikely event that a potential burial site or potential human skeletal material is exposed within the proposal site, the following procedure should 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):

- as soon as remains are exposed, work is to halt immediately to allow assessment and management
- contact local police, OEH and the Heritage Division

- a physical or forensic anthropologist should inspect the remains *in situ*, and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or forensic)
- if the remains are identified as forensic the area is deemed as crime scene
- if the remains are identified as Aboriginal, the site is to be secured and OEH and all registered Aboriginal parties are to be notified in writing
- if the remains are non-Aboriginal (historical) remains, the site is to be secured and the Heritage Division is to be contacted.

The above process functions only to appropriately identify the remains and secure the site. From this time, the management of the remains is to be determined through liaison with the appropriate stakeholders (NSW Police Force, forensic anthropologist, OEH, Heritage Division, registered Aboriginal parties etc) and in accordance with the Public Health Act 1991.

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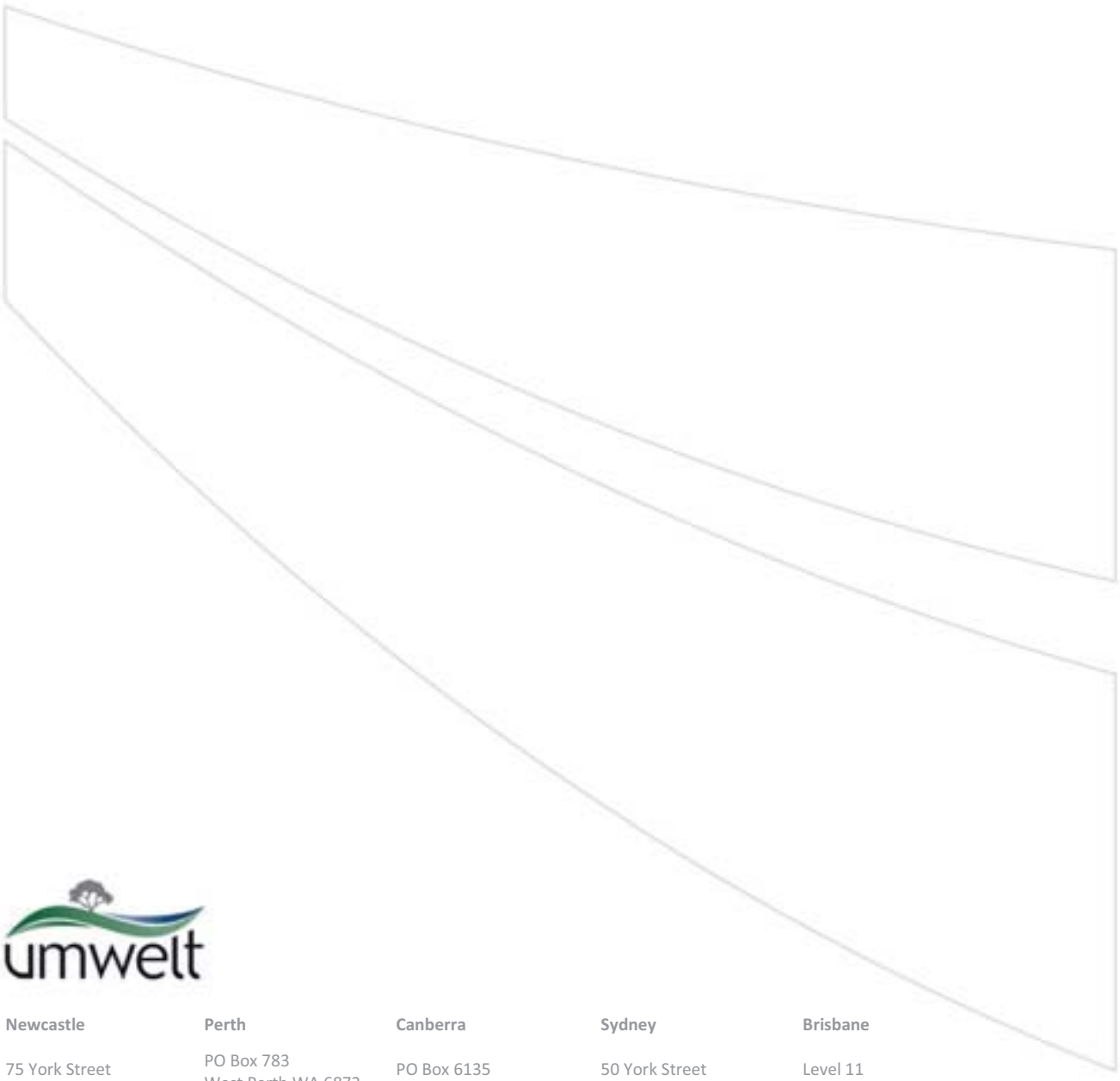

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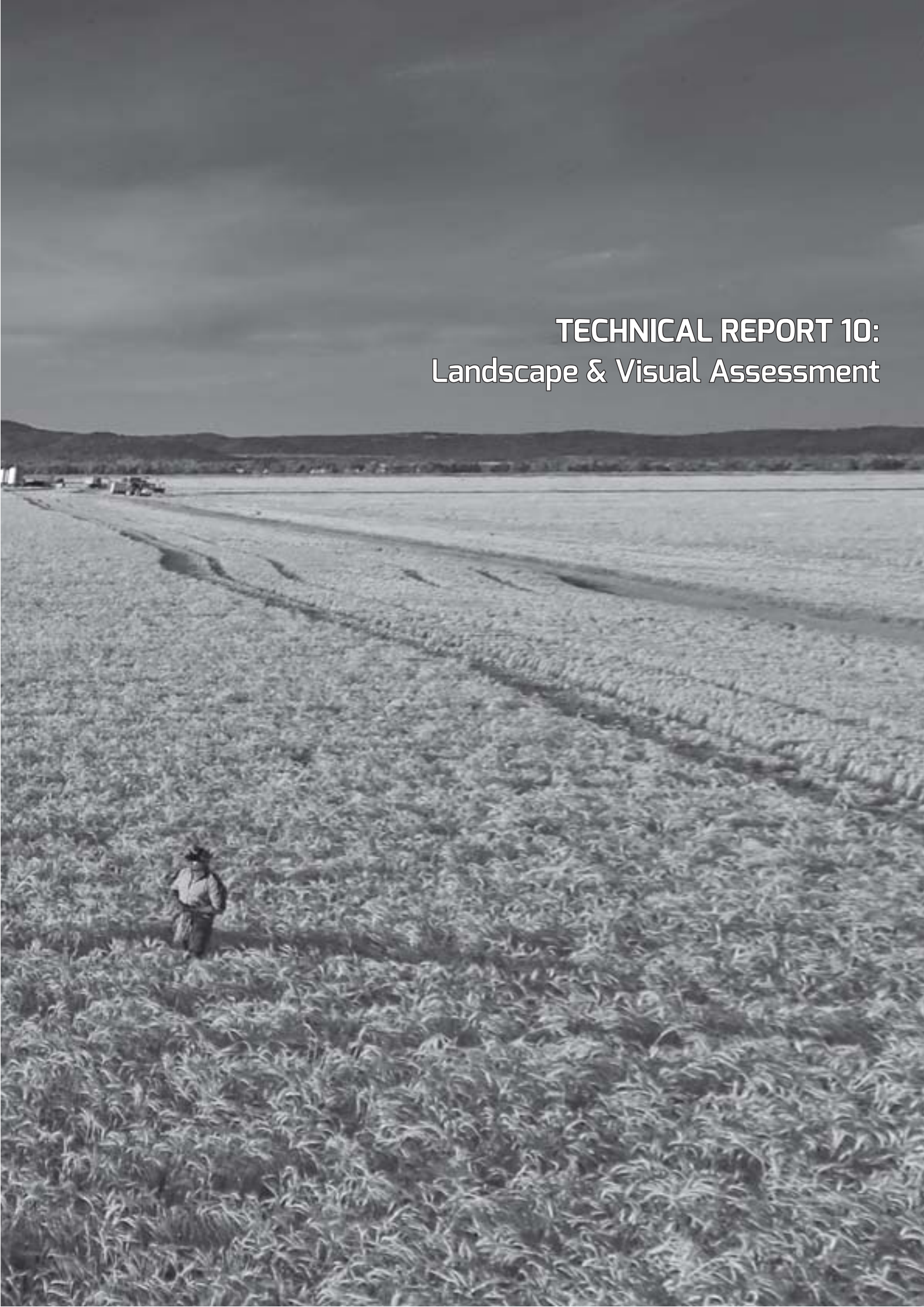
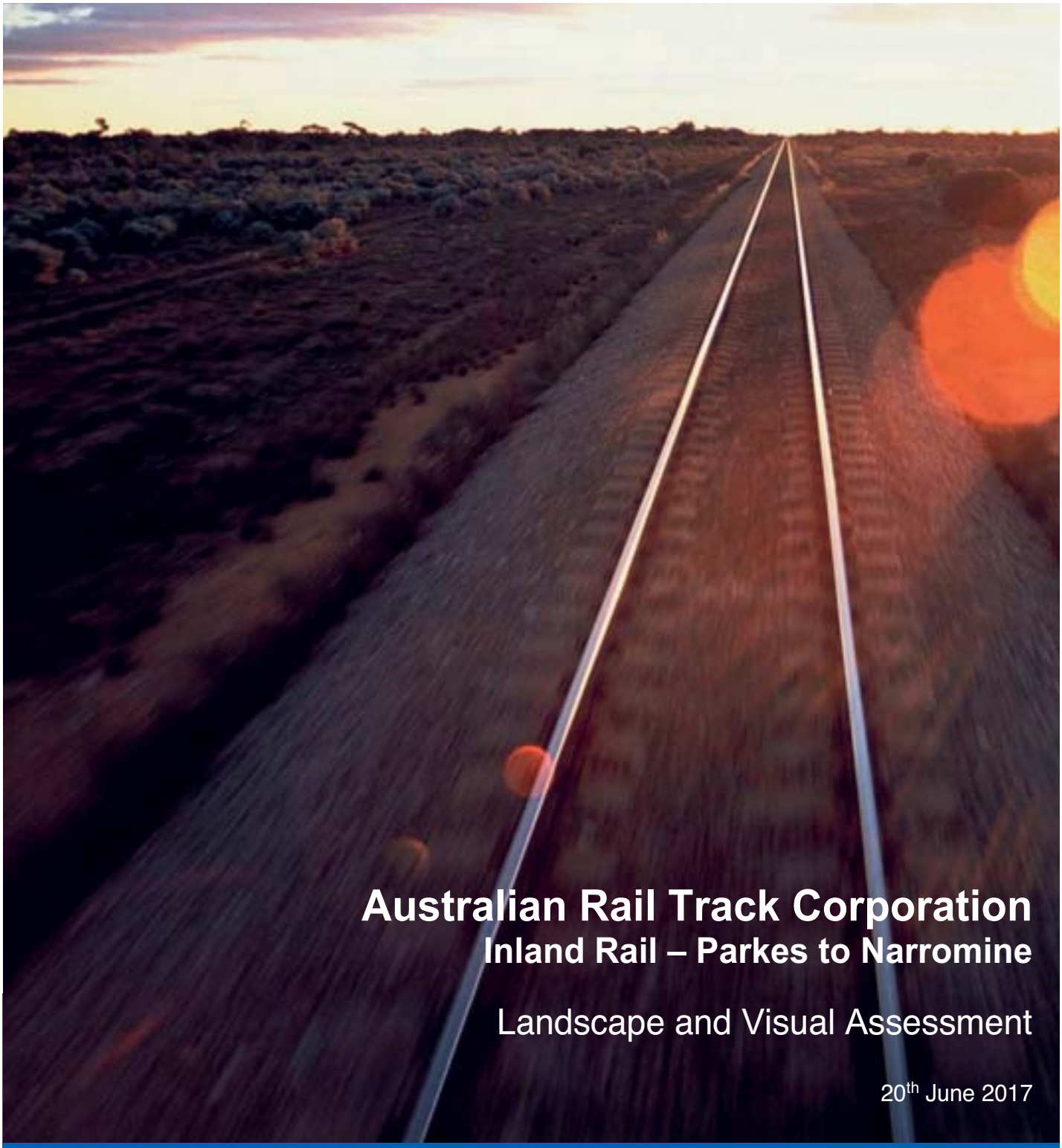


TECHNICAL REPORT 10:
Landscape & Visual Assessment



Australian Rail Track Corporation
Inland Rail – Parkes to Narromine

Landscape and Visual Assessment

20th June 2017

urbis

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Executive summary

This Landscape and Visual Impact Assessment has been prepared by Urbis Pty Ltd as part of an Environmental Impact Statement for the Inland Rail Project between Parkes to Narromine in New South Wales. The Inland Rail project ('Inland Rail') is a major national project that will enhance Australia's existing national rail network and serve the interstate freight market.

The proposal would involve upgrading the existing rail line between Parkes and Narromine, including new crossing loops, some track realignment and replacement of culverts. The proposal also includes a new north to west connection between Inland Rail and the Broken Hill line (Parkes north west connection). Ancillary works would include upgrading, closing or consolidating level crossings, upgrading signalling and communications, establishing new fencing or upgrading existing fencing along the rail corridor, and relocating/protecting services and utilities.

The elements of the proposal that are relevant to this assessment include the:

- Upgrade of existing track, track formation and culverts within the existing rail corridor.
- Establishment of three new crossing loops within the existing rail corridor, at Goonumbla, and Timjelly.
- Implementation of a new 5.3 kilometre long rail connection between Inland Rail and the Broken Hill Line to the west of Parkes.
- Installation of a new road bridge over the existing rail corridor at Brolgan Road up to 9 metres high, including two road tie-ins.
- Creation of permanent spoil mounds with a maximum height of 2 metres (about 1 metre above the height of the rails).
- Presence of double stacked trains, with a height of 6.5 metres.

The proposal begins north of the centre of the township of Parkes and travels north to Narromine via the village of Peak Hill. Between these settlements, the proposal traverses a landscape that has historically been subject to change, experiencing high levels of clearing and cultivation as a result of agricultural activities.

The land across the entire proposal site is generally flat or low rolling hills and flood plains, resulting in no overlooking or vantage points within the 1 kilometre visual extent of the assessment. The proposal crosses 29 waterways, which includes creeks such as Burrill Creek, Stanfords Creek, Barrabadeen Creek, Tomingley Creek and Yellow Creek and other watercourses, some of which are intermittent.

The highest impact locations are:

- Residential outskirts of north-west Parkes.
- Scattered residences along the proposal site.
- Peak Hill.
- Residential outskirts of Narromine.
- Newell Highway.
- Regional roads.

While the urban areas and outskirts of Parkes, Peak Hill and Narromine contain the highest visual impact locations, given they are mostly comprised of sensitive residential uses, there are few highly sensitive viewpoints located between these locations. Outside of the urban areas, residences and homesteads are scattered in single holdings or comprised of small, sparse clusters of three to four dwellings.

Generally, the visual impact will be low throughout the vast expanses of agricultural areas that comprise the proposal site. The level of visual modification resulting from the proposal is very low to low, due to much of the proposal occurring within the existing rail corridor. Additionally, it is located through agricultural areas which are of very low to low visual sensitivity. Spoil mounds that are proposed to sit adjacent to large expanses of the proposal will also provide a level of natural screening to project elements, contributing to the low level of visual modification.

Moderate levels of visual impact were recorded when one, or a number of residences were located within the local setting (0 – 0.35 kilometres). This was a result of the generally low level of visual modification occurring in conjunction with a high visual sensitivity level.

High levels of visual impact were recorded for high sensitivity viewpoints where the level of visual modification was moderate to high. The proposed crossing loop at Timjelly recorded a high visual impact due its moderate level of visual modification in conjunction with the close proximity of a high sensitivity residence within the local setting.

The longest section of the proposal subject to a high visual impact is the proposed Parkes north-west connection adjacent to the urban area of Parkes. This section proposes the construction of new track and associated facilities, including a grade separated road over rail, outside the existing rail corridor. A high level of visual impact results due to the high level of visual modification and a high level of sensitivity associated with the presence of residents.. Whilst this area records the highest visual impact, it should be noted that there are only four to five residences within this relatively small, confined area adjacent to the new link.

Proposed upgrades of the existing rail infrastructure include increases in the elevation of tracks by 250-400mm and the construction of crossing loops adjoining existing railway infrastructure. Generally, a low level of visual impact will result due to a low visual modification level occurring in conjunction with typically low levels of visual sensitivity. The proposed north-west link will result in a high level of landscape impact as it requires the clearing of canopy trees and earthworks.

Views would be possible from both agricultural and urban areas towards 6.5 metre high, double stacked trains. However, these would be transient and experienced at speeds up to 110 kilometres per hour.

Overall, it is unlikely that the proposal would result in a high visual impact during operation given the fact the majority of the works entail the replacement of an existing rail corridor. The proposal to primarily upgrade existing railway tracks, would result in minor changes to the existing landscape setting which would be difficult to recognise or be perceived within the surrounding landscape setting.

Glossary of abbreviations/technical terms

TERM	DEFINITION	ABBREVIATION
Absorptive capability	Absorptive capability relates to the ability of the landscape character zones to absorb the proposal within the existing landscape setting.	
Background	The area that forms the most visibly distinct setting for the proposal with a distance typically greater than 2 kilometres. Also referred to as the regional setting.	
Canopy tree	A tree with a minimum height of approximately 10 metres with an average crown spread of at least 8 metres to 10 metres in width.	
Chainage	A distance measured along the centreline of the rail corridor.	
Foreground	The area that immediately surrounds the proposal up to a distance of 0.5 kilometres. Also, referred to as the local setting.	
Landscape	Is about the relationship between people and place. Landscapes are recognised as special or valuable and can range from wastelands to mountain ranges.	
Landscape and visual impact assessment	The assessment of the impacts of the proposal on landscape and visual features.	**LVIA**
Landscape character assessment	The process of mapping, describing and evaluating landscapes on the basis of the presence and arrangement of various landscape features and includes reference to policy or designations as an indicator of recognised value, including specific features or characteristics that justify the designation of the area.	**LCA**
Local government authority		**LGA**
Middleground	An intermediate area that is 0.5 kilometres to 2 kilometres' distance from the proposal. Also, referred to as the sub-regional setting.	

Mitigation	The ability to reduce the visual impact of a development through siting design colour or screening.	
Modification level	The degree to which a development contrasts or blends with its setting	
Narrabri to North Star	Narrabri to North Star section of the Inland Rail	
Parkes to Narromine	Parkes to Narromine section of Inland Rail ('the proposal').	
Receptor	A location or type of user for which views of the proposal may be possible.	
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	
Secretary Environmental Assessment Requirements	Environmental assessment requirements issued by the Secretary of the Department of Planning and Environment	**SEARs**
Significant landscape	The designation of a particular landscape as special or important arising from its cultural landscape values, including aesthetic values (both visual and non-visual) historic, environmental, scientific, social or other values such as economic.	
Viewer perception	The way in which people respond to what they are seeing as influenced by things other than purely visual, for example noise and economic benefits.	
Viewpoint	Views to the construction process or components of the proposal may be possible.	
Viewshed	The area visible from a particular viewing location.	
Visual amenity	The qualities of a landscape setting that are appreciated and valued by a viewer.	

Visual impact	The result of assessing the sensitivity level of a viewer and the modification level of a proposal.	
Visual sensitivity	The degree to which various user groups would respond to change based on their expectation of a particular experience in a given setting for example the expectation of a high level of visual amenity in a national park.	
Zone of visual influence	The likely (or theoretical) extent of visibility of the proposal.	

1 Introduction

1.1 Overview

The Australian Government has committed to delivering a major piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor. The Inland Rail programme (Inland Rail) involves the design and construction of a new inland rail connection, about 1,700 kilometre long, between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail would enhance Australia's existing national rail network and serve the interstate freight market.

Australian Rail Track Corporation Ltd (ARTC) has sought approval to construct and operate the proposal.

The proposal requires approval from the NSW Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report has been prepared by Urbis Pty Ltd (Urbis) as part of the environmental impact statement (EIS) for the proposal. The EIS has been prepared to accompany the application for approval of the proposal, and address the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 8 November 2016 and the terms of the assessment bilateral agreement between the Commonwealth and the State of New South Wales under the EPBC Act.

1.1.1 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 1***.

1.1.2 Key features

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 the radius of 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 existing rail corridor at Brolgan Road ('the Brolgan Road overbridge').

The key features of the proposal are shown in ***Figure 2***.

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

Further information on the proposal is provided in the EIS.

1.1.3 Timing

Subject to approval of the proposal, construction is planned to start in early to mid 2018, and is expected to take about 18 months. Existing train operations along the Parkes to Narromine line would continue prior to, during, and following construction. Inland Rail as a whole would be operational once all 13 sections are complete, which is estimated to be in 2025.

1.1.4 Operation

Prior to the opening of Inland Rail as a whole, the proposal would be used by existing rail traffic, which includes trains carrying grain and ore at an average rate of about four trains per day. 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. The trains would be a mix of grain, intermodal (freight), and other general transport trains.

1.2 Purpose and scope of this report

The purpose of this report is to assess potential landscape and visual impact issues from the operation and construction of the proposal, and where required, identify feasible and reasonable mitigation measures.

This report summarises the findings of the Landscape and Visual Impact Assessment of the proposal. It addresses the visual amenity specific requirements of the SEARs, summarised in **Table 1**.

TABLE 1 – RELEVANT SEARS

REQUIREMENTS FOR VISUAL AMENITY	WHERE ADDRESSED IN THIS REPORT
1. The Proponent must assess the visual impact of the proposal and any ancillary infrastructure on:	
(a) views and vistas;	Sections 5 and 6
(b) streetscapes, key sites and buildings;	Sections 5 and 6
(c) heritage items including Aboriginal places and environmental heritage; and	Sections 5 and 6
(d) the local community.	Sections 5 and 6
2. The Proponent must provide artist impressions and perspective drawings of the proposal to illustrate how the proposal has responded to the visual impact through urban design and landscaping.	These would be provided for consultation purposes as an outcome of the detailed design of the proposal – see section 19.4 of the EIS.

Evaluation objective

The evaluation objective for visual amenity is to minimise adverse impacts on the built and natural environment (including public open space) and capitalise on opportunities to improve visual amenity.

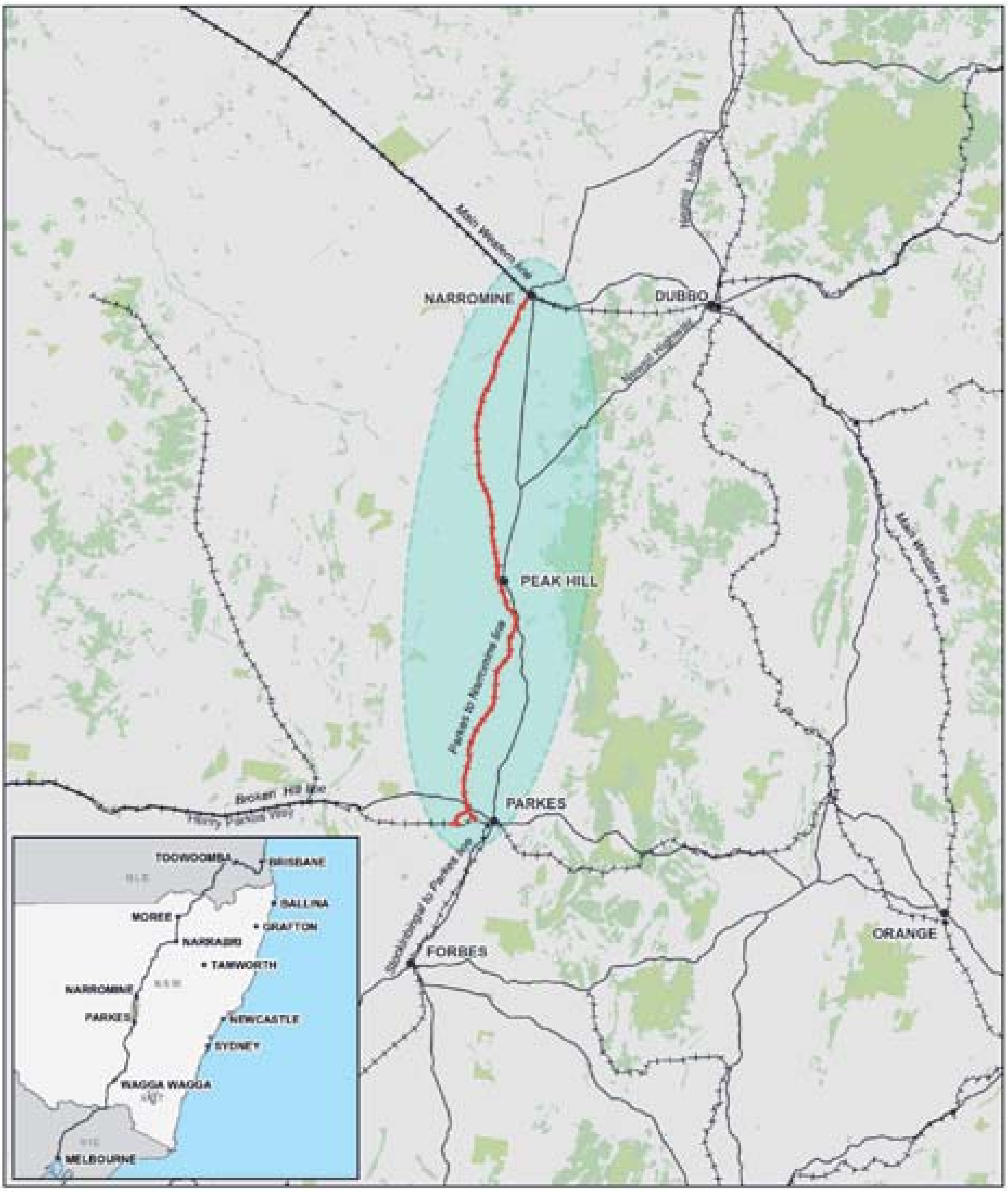
The relevant SEARs encompass some aspects and potential impacts that are not directly related to landscape and visual issues. Although interactions have occurred across applicable technical specialists such as biodiversity, historical heritage, land use planning, noise and vibration (surface), social, surface water and drainage and transport, the full details are addressed in separate studies, with the interdependences managed through the overall EIS process.

1.3 Structure of this report

The structure of the report is outlined below.

- Section 1 – provides an introduction to the report
- Section 2 – describes the methodology for the assessment
- Section 3 – identifies relevant landscape and visual policy and legislation pertinent to the proposal

- Section 4 – describes the proposal's features and operation
- Section 5 – describes the landscape of the setting
- Section 6 – assesses the visual impacts of the proposal
- Section 7 – summarises the assessment findings
- Section 8 – identifies mitigation actions to reduce initial impacts.
- Section 9 – the conclusion provides a high-level overview of key findings.



LEGEND

- Proposal site
- Proposal location
- Rail lines
- Main roads

Paper Size A4

0 5 10 20 30

Kilometers

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation

Inland Rail Track Alignment

Job Number 2217316

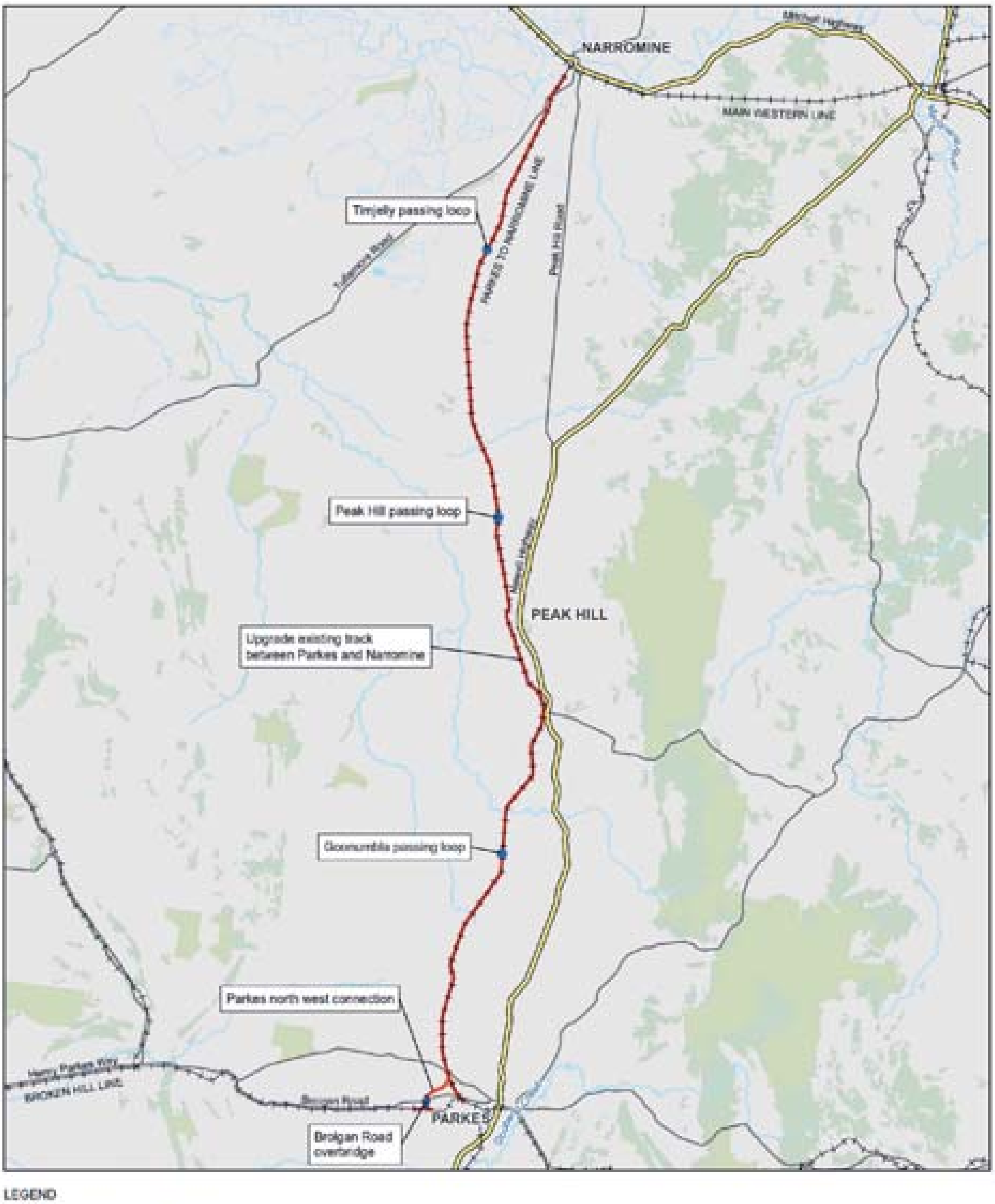
Revision 0

Date 27 Apr 2017

Location of the proposal

Figure 1

Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006



LEGEND

- New bridge
- Passing loop
- The proposal
- Railway
- Highway
- Road

Paper Size A4

0 2.5 5 10 15

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail Track Alignment

Job Number | 2217316
Revision | 0
Date | 27 Apr 2017

Key features of the proposal

Figure 2

2 Assessment approach and methodology

The methodology for carrying out the landscape and visual assessment of the proposal was drawn from the *Guidelines for Landscape and Visual Impact Assessment*. 3rd Edition (2013)[1].

2.1 Existing conditions assessment

The initial step in any landscape or visual assessment is to review the existing landscape and visual resource in the vicinity of the proposed development – that is the baseline landscape and visual conditions. The data collected forms the basis from which the estimate of magnitude and significance of the landscape and visual effects of the development may be identified and assessed. The purpose of a baseline study is to record and analyse the existing landscape features, characteristics, the way the landscape is experienced, and the value or importance of the landscape and visual resources in the vicinity of the proposal. This requires research, classification and analysis of the landscape and visual resources as follows:

- Research/survey involving both desktop and field studies to assemble basic information
- Classification entailing sorting the landscape into units or groups of distinct and recognisable type and character
- Analysis involving the detailed examination of the constituent parts of the landscape and visual resources in order to understand how they are made up and experienced. It can also include the process of ascertaining the relative importance of various aspects of the landscaped and visual resource

2.1.1 Desktop study

A desktop study was undertaken to explore patterns and scale of landform, land cover and built development, to give guidance on the general landscape character of the zone of visual influence. Any special values that may apply, such as designated landscapes, and specific potential sensitive visual receptors and important components of the landscape, as well as locations of residences and visitors travelling through the area, were noted.

2.1.2 Landscape character assessment

Landscape character assessment, and particularly the stage of characterisation, is the basic tool for understanding the landscape and is the starting point for baseline surveys. The baseline study provided a concise description of the existing character of the proposal and its surrounding landscape and the classification of the landscape into distinct character areas or types, which share common features and characteristics. The condition of the landscape i.e., the state of an individual area of landscape was described as factually as possible and a judgement made on the value or importance of the affected landscape. The assessment of landscape importance includes reference to policy or designations as an indicator of recognised value, including specific features or characteristics that justify the designation of the area. This information establishes why the landscape is considered to be of value at a national, regional or local level (refer to ***Section 5***).

2.1.3 Absorptive capability

Absorptive capability relates to the ability of the landscape character zones to absorb the proposal within the existing landscape setting. Opportunities for screening the proposal within the landscape through vegetation, undulating landforms and integration within previously modified settings were considered in determining the absorptive capability level (refer to ***Section 5***).

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[1] The Landscape Institute and Institute for Environmental Management and Assessment LIIEMA, (2013). Guidelines for Landscape and Visual Impact Assessment. Routledge 3rd Edition.

2.1.4 Identification of the sensitive receptors

The sensitivity of visual receptors is dependent on:

- The location and context of the viewpoint
- The expectations and occupation or activity of the receptor
- The importance of the view (which may be determined with respect to its popularity or numbers of people effected, its appearance in guide books, on tourist maps, and in the facilities provided for its enjoyment and reference to it in literature or art)

High sensitivity receptors typically include:

- Users of all outdoor recreational areas whose attention or interest may be focused on, or dependant on the landscape for their experience
- Communities where the proposal results in changes in the landscape setting or to the value of views enjoyed by the community
- People using tourist roads
- Occupiers of residencies with views affected by the proposal.

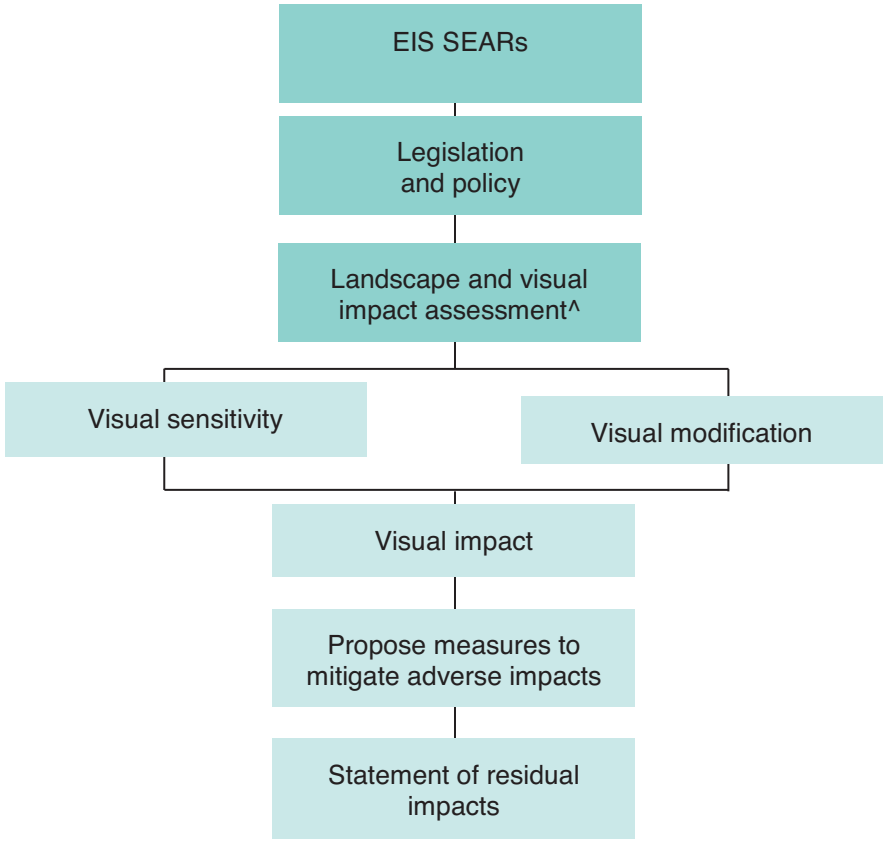
Other sensitive receptors include people engaged in outdoor sport and recreation, people travelling through or past the affected landscape in cars, on trains or other transport routes, and people at their place of work. The least sensitive receptors are likely to be people at their place of work, or engaged in similar activities whose attention may be focused on their work or activity, and who therefore may be potentially less susceptible to changes in the view (refer to ***Section 6***).

2.2 Visual impact

The visual impact of the proposal was determined by evaluating the degree of visual modification resulting from the proposal in the context of the visual sensitivity of surrounding land use areas from which the proposal may be visible. Once the visual impact is established, appropriate mitigation can be identified and the residual impact determined.

Figure 3 Illustrates the assessment methodology applied in ***Section 6***.

FIGURE 3 – LVIA METHODOLOGY PROCESS



^ Visual assessment methodology approach to the determination of visual sensitivity is consistent with the visual management system (United States Department of Agriculture Forest Service, 1995), *Landscape Aesthetics – A Handbook for Scenery Management*, Agricultural Handbook No. 701.

The visual impact resulting from the combination of visual modification and visual sensitivity is illustrated in ***Table 2***. Where an impact falls between two levels, between L and M for example, the sensitivity levels defines the final rating, i.e., if visual modification is M and visual sensitivity is L, the final visual impact rating will be L.

TABLE 2 – VISUAL IMPACT DETERMINATION MATRIX

Visual Modification \ Visual Sensitivity	H	M	L	VL
H	H	H	M	L
M	H	M	L	VL
L	M	L	L	VL
VL	L	VL	VL	VL

VL = Very low
L = Low
M = Moderate
H = High
Level of Visual Impact

2.2.1 Visual modification

The degree of visual modification of the proposal is the expression of the visual interaction between the proposal and the existing visual environment. It can also be expressed as a level of visual contrast that will result from the proposal with the visual setting within which it is placed. This level of contrast is defined by the interaction between the appearance of the proposal, the absorptive capability of the landscape setting in which the proposal is positioned and the distance from which the proposal is viewed.

A high degree of visual modification will result if the proposal is a major element and contrasts strongly with the existing landscape. This contrast is likely to occur if there is little or no natural screening or integration created by vegetation or an undulating topography such as an open plain.

A moderate degree of visual modification will occur if the proposal is visible and contrasts with the landscape or if similar elements are present but is integrated with it to some degree. This will happen if the surrounding vegetation and/or topography provide some measure of visual screening, background or other forms of visual integration of the proposal within the setting.

A low degree of visual modification occurs if there is minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the proposal and the environment. This will occur if there is a high degree of visual integration of the proposal into the existing landscape or a low level of visual modification of the existing visual setting is achieved.

A very low level of modification will occur where the proposal will be aligned through an environment that is heavily modified (as the result of an existing rail corridor). In such a scenario, the proposal may be barely noticeable and does not markedly contract with the existing landscape.

Throughout the proposal site, the degree of modification is highly dependent on the distance from which the proposal will be viewed. As the distance from the proposal to various viewing locations increases, the proposal will be less prominent, and will therefore modify the existing visual setting less.

Viewing locations or points include homesteads and roads (rural, local and regional) as outlined under visual sensitivity.

Given the low profile and horizontal form of most of the proposal, the level of visual modification will be confined to a distance relatively close to the area subject to change. The effect of distance on modification levels is incorporated into this assessment applying different modification ratings to foreground (0 to 0.35 kilometres), middleground (0.35 to 0.7 kilometres) and background (0.7 to 1 kilometre) views. The visual modification rating resulting from the proposal will be highest in the foreground, except where foreground vegetation screens the proposal.

Visual modification is also affected by the angle from which the proposal site is viewed (i.e. when the view to the proposal is at a right angle, different elements of the proposal will be visible than when the view is parallel, e.g., the railway track is generally less prominent when the view location is at right angles). The effect of viewing angle is incorporated into this assessment through applying different modification ratings to right angle and parallel views for each visual modification condition.

2.2.2 Visual sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape will be viewed from surrounding land use areas. Different activities undertaken within the landscape setting have different sensitivity levels. For example, tourists who are using the surrounding landscape as a part of the holiday experience will generally view changes to the landscape more critically than agricultural or industrial workers in the same setting. Similarly, individuals will view changes to the visual setting of their residence more critically than changes to the visual setting of the broader setting in which they travel or work. The approach to the visual assessment to determine the visual sensitivity is consistent with the visual management system (United States Department of Agriculture Forest Service, 1995)[2].

[2] Landscape Aesthetics – A Handbook for Scenery Management, Agricultural Handbook No. 701

The visual sensitivity of the development depends on a range of viewer characteristics. The primary characteristics used in this assessment are:

- Land use.
- Distance of the proposal from viewers.
- Its visibility from critical viewing areas.
- View angle.

The visual sensitivity of land uses was assessed to assist in determining the visual impact of the proposal. As distance from the viewer to the proposal increases, the level of sensitivity reduces ie the reduction of the impact. As such, the potential visual impact of the proposal would not be prominent at distances greater than one kilometre. The visual sensitivity levels are defined in ***Table 3***.

TABLE 3 – LEVELS OF VISUAL SENSITIVITY OF LAND USES

VISUAL USE AREA	FOREGROUND	MIDDLEGROUND	BACKGROUND
	Local Setting	Sub-Regional Setting	Regional Setting
	0 – 0.35 kilometres	0.35 – 0.7 kilometres	0.7 - <=1 kilometres
Residential / Homestead	H	H	H
Parks and recreational areas	H	H	H
Townships and villages	H	H	M
Newell Highway	M	M	M
Local roads	M	L	L
Rural roads	L	L	VL
Agricultural areas	VL	VL	VL

2.2.3 Mitigation Measures

Mitigation measures are recommended for each assessed viewpoint and are described in ***Section 8***. These actions have been considered in the assessment of the residual impact for representative viewpoints as well as the whole of the proposal site.

A base level mitigation action relating to “making good” or replacing removed vegetation applies to the entire proposal, in addition to specific viewpoint mitigation actions. Site rehabilitation measures are described in ***Section 8***.

2.2.4 Residual impact

The residual impact of the proposal is the impact that results following the implementation of mitigations measures. Where vegetation screening is recommended, a period of 10 years’ growth post planting has been determined as appropriate for the purposes of the assessment of residual impact. The residual impact would be lower than the impact immediately following construction.

2.3 Whole of route assessment

The overall assessment was based on a range of typical modification conditions or visual interactions that occur between the proposal and adjacent landscapes and land uses, which have been described and assigned differing levels of visual modification. The range of typical visual modification conditions of the proposal are defined in ***Figure 4***.

The portion of the route to be assessed has been identified by chainage and the visual modification level defined (as determined by the modification condition). The level of visual modification is then considered in term of sensitivity level and the visual impact assigned.

The overall assessment has employed the following process to identify visual impact:

- Identification of the portion of the route to be assessed by chainage (kilometres)
-
- Determination of the proximity between sensitive viewing points within this portion of the railway track to the proposal
- Identification of the modification condition and the corresponding level of visual modification
- Definition of the level of visual sensitivity for this viewpoint
- Identification of the resulting level of visual impact (consistent with ***Table 2***).

2.4 Stakeholder consultation

At this point in time no stakeholder engagement has been undertaken as part of this assessment.

2.5 Limitations and Assumptions

2.5.1 Limitations

The limitations associated with this LVIA are:

- This LVIA is based on the proposal.
- The impact assessment has focussed on the current land uses and zoning.

2.5.2 Assumptions

The methodology adopted for this landscape and visual impact assessment assumes that any change to the landscape or views from sensitive receptor locations arising from the proposal would be negative. This is in recognition that people's perception of the visual impact of the proposal would differ both amongst individuals and over time. Accordingly, this report conservatively assumes that all change would generally be regarded as negative.

Furthermore, a full night time visual assessment has not been undertaken, Trains currently operate at night along the existing rail corridor and the likely impact from the proposal is assessed to be negligible.

FIGURE 4 – PROPOSAL VISUAL MODIFICATION CONDITIONS

VISUAL MODIFICATION CONDITIONS FOR PARKES TO NARROMINE ARTC INLAND RAILTRACK ALIGNMENT

CONDITION 1

NEW PASSING LOOP WITH NO, OR MINIMAL, CLEARING REQUIRED IN LIGHTLY TREED AGRICULTURAL SETTING.

VISUAL MODIFICATION	FOREGROUND	MIDDLEGROUND	BACKGROUND
	0 - 0.35KM	0.35 - 0.7KM	0.7 - <= 1KM
PARALLEL	M-H	M	L
PERPENDICULAR	L-M	L	VL

CONDITION 2

RE-INSTATEMENT OF EXISTING TRACK THROUGH OPEN AGRICULTURAL LAND.

VISUAL MODIFICATION	FOREGROUND	MIDDLEGROUND	BACKGROUND
	0 - 0.35KM	0.35 - 0.7KM	0.7 - <= 1KM
PARALLEL	L	L	VL
PERPENDICULAR	L	VL	VL

VISUAL MODIFICATION CONDITIONS FOR PARKES NORTH-WEST CONNECTION

CONDITION 1

GRADE SEPARATION (BROLGAN ROAD) IN LIGHTLY TREED AGRICULTURAL LAND.

*ALIGNMENT RELATES TO ROADWAY

VISUAL MODIFICATION	FOREGROUND	MIDDLEGROUND	BACKGROUND
	0 - 0.35KM	0.35 - 0.7KM	0.7 - <= 1KM
PARALLEL	H	H	M
PERPENDICULAR	H	H	M

CONDITION 2

NEW TRACK ALIGNMENT THROUGH OPEN AGRICULTURAL LAND WITH EARTHWORKS AND PROPERTY IMPACTS.

VISUAL MODIFICATION	FOREGROUND	MIDDLEGROUND	BACKGROUND
	0 - 0.35KM	0.35 - 0.7KM	0.7 - <= 1KM
PARALLEL	H	M-H	L
PERPENDICULAR	M	M	L

CONDITION 3

NEW TRACK ALIGNMENT THROUGH SCATTERED WOODLAND WITH LOCAL ROAD IMPACT AND TREE REMOVAL.

VISUAL MODIFICATION	FOREGROUND	MIDDLEGROUND	BACKGROUND
	0 - 0.35KM	0.35 - 0.7KM	0.7 - <= 1KM
PARALLEL	H	H	M
PERPENDICULAR	M	M	L

VISUAL MODIFICATION CONDITIONS FOR PARKES NORTH-WEST CONNECTION

CONDITION 4

RE-INSTATEMENT OF EXISTING TRACK THROUGH OPEN AGIRCULTURAL LAND.

VISUAL MODIFICATION	FOREGROUND	MIDDLEGROUND	BACKGROUND
	0 - 0.35KM	0.35 - 0.7KM	0.7 - <= 1KM
PARALLEL	L	L	VL
PERPENDICULAR	L	VL	VL

3 Legislation and policy

The following guidelines referenced in the SEARs are identified as being of relevance to the Landscape and Visual Assessment.

Current guidelines identified in the SEARs:

- AS4282-1997 Control of the obtrusive effects of outdoor lighting
- Beyond the Pavement: urban design policy, procedures and design principles (RMS, 2014)
- Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW (RMS, 2012)
- NSW Sustainable Design Guidelines Version 3.0 (TfNSW, 2013)
- Technical guideline for Urban Green Cover in NSW (OEH, 2015).

4 The proposal

This section provides an overview of the key features of the proposal site and the proposal with respect to the landscape and visual assessment.

4.1 The proposal site

The landscape and visual environment of the proposal site is characterised by its generally rural/agricultural nature, with areas of more concentrated urban development located in towns and villages (Parkes, Peak Hill, and Narromine).

The southern end of the works within the existing rail corridor is located just to the west of Parkes near where Brolgan Road crosses the railway, about 3.5 kilometres from Parkes Station at Goobang Junction. The new section of rail line connecting Inland Rail with the existing Broken Hill Line via the existing Parkes to Narromine Line (the Parkes north west connection) is proposed at this location, to the west of the Parkes urban area.

For much of the proposal site, the existing rail track and associated rail infrastructure forms the main visual feature in the landscape (shown in ***Picture 1***). Features contributing to the visual appearance of the rural/agricultural areas include open rural land interspersed with scattered development, dwellings, buildings and sheds; small stands of native vegetation and scattered trees; watercourses (typically ephemeral); road and rail infrastructure; and agricultural infrastructure such as grain silos. Features contributing to the visual environment of the urban areas include a mix of older commercial and residential buildings among new developments, and general urban infrastructure.

The Parkes north west connection located in a greenfield area (shown in ***Picture 2***) dominated by rural land with scattered properties.

From the northern end of the Parkes north west connection, the proposal site extends through rural lands along the existing rail corridor. The proposal site passes through the western outskirts of Peak Hill to the west of the main residential area. The northern end of the proposal site is located just south of where Old Blackwater Road crosses the railway 500 metres west of the town, and 1.1 kilometres south west of Narromine Station.

PICTURE 1 – EXISTING RAIL TRACK

PICTURE 2 – INDICATIVE VIEW OF LOCATION FOR THE PARKES NORTH WEST CONNECTION

4.2 The elements of the proposal

The main visible elements of the proposal are summarised below.

4.2.1 Construction

Construction would result in the following changes and activities, which would be visible to the sensitive visual receivers described in ***Section 6***:

- exposure of soils where excavation is required
- removal of some vegetation within the proposal site, including some mature trees
- movement of plant and equipment
- presence of partially constructed infrastructure/proposal features
- use of lighting for any night works.

4.2.2 Operation

The following features of the proposal would be visible during operation:

- upgraded track (including rails, sleepers, and ballast), track formation, and culverts within the existing rail corridor for a distance of 106 kilometres
- three new crossing loops within the existing rail corridor, at Goonumbla, Peak Hill, and Timjelly
- spoil mounds, involving stockpiled excavated material shaped into mounds along sections of the existing rail corridor, with a maximum height of two metres (about one metre above the height of the tracks
- works to some level crossings
- new signalling and communications, signage, and fencing
- the Parkes north west connection, involving:
  - 5.3 kilometres of new track and formation at the southern end of the proposal site near Parkes

  - embankments and a cutting of six metres to the north of Brolgan Road
  - three turnouts to provide connections to the Broken Hill line and the Parkes to Narromine line
- the Brolgan Road overbridge, involving:
  - a new road bridge to the north of Brolgan Road to enable Brolgan Road to cross cross the Parkes north west connection
  - single 22 metre long span super T girders, supported on cast insitu reinforced concrete piers/abutments, and founded using reinforced concrete bored piles
  - the maximum bridge height would be nine metres, which would provide a minimum clearance above Inland Rail trains of 6.5 metres
  - reinforced soil wall abutments with a maximum height of 10 metres
  - throw screens on both sides of the bridge.
- movement of double stacked freight trains up to 1,800 metres long, with a height of 6.5 metres (as shown in Picture 3.

PICTURE 3 – EXAMPLE OF DOUBLE STACKED TRAIN

5 The existing landscape

This section describes the existing landscape and defines the ability of the varying landscape units to absorb change. The identification of sensitive viewpoints is included within ***Section 6***.

5.1 Land use and zoning

The proposal site traverses a predominately rural area dominated by agricultural and grazing uses with substantial cotton, wheat and livestock production, as illustrated in ***Figure 5***.

Most of the proposal site is located within the existing rail corridor, dominated by railway uses and is zoned under the Local Environmental Plans as Infrastructure (SP2). The surrounding area, within 1 kilometre of the proposal, is zoned Primary Production (RU1) as illustrated in ***Figure 6(a-f)***.

Rural properties are located adjacent to the proposal for most of its length. Other key features/land uses near the proposal include:

- a number of grain storage and handling facilities located in various locations adjacent to the proposal;
- the former Peak Hill Open Cut Gold Mine situated about 1.5 kilometres east of the proposal at Peak Hill; and
- Goobang National Park located about 7.6 kilometres to the east of the proposal, near Peak Hill.

5.2 Topography and landform

As seen in ***Figure 7***, the southern half of the proposal site is generally elevated at a level of between 260 and 330 metres Australian Height Datum (AHD). The northern extent is generally lower across the floodplain, located between 240 and 260 metres AHD.

The vertical alignment of the existing rail corridor closely follows the general shape of the ground surface, with an elevation between about 240 (near Narromine) to 330 metres AHD (near Parkes).

5.3 Landscape features

Watercourses

The southern extent of the proposal site is situated in the Lachlan catchment, within which the Lachlan River is the dominant river system. Rising near Gunning in the east, the Lachlan River is about 1,400 kilometres in length. Land use within the Lachlan catchment is dominated by agriculture comprised predominately of livestock grazing and dryland cropping.

The northern extent of the proposal site is situated in the Macquarie-Bogan catchment, within which the Bogan River and the Macquarie River are the dominant river systems. Land use in the Macquarie-Bogan catchment is dominated by agricultural grazing. Dryland cropping occurs predominantly in the middle and lower parts of the catchment.

The proposal crosses 29 waterways of varying stream order. These include creeks (such as Burrill Creek, Stanfords Creek, Barrabadeen Creek, Tomingley Creek and Yellow Creek) and other watercourses, some of which are intermittent.

Geology and soils

The proposal site is located within the Central Lachlan Fold Belt. Thick reactive brown and grey clay soils are predominantly associated with the near level terrain north of Peak Hill while moderately thick red and brown sandy and silty clay soils are typically associated with the undulating terrain south of Peak Hill (GHD, 2014).

Vegetation and biodiversity

The proposal site has been subjected to disturbance as a result of the construction of the existing rail infrastructure, as well as by activities on the surrounding rural land. Consequently, the majority of the proposal site has been cleared of the original vegetation. There are scattered pockets of remnant native vegetation in various locations, primarily in the vicinity of watercourses. Patches of native vegetation within the proposal site are generally comprised of woodland communities with the dominant canopy species of Bimbil Box (*Eucalyptus populnea*), Grey Box (*Eucalyptus microcarpa*), Fuzzy Box (*Eucalyptus conica*) and Yellow Box (*Eucalyptus melliodora*) as well as indigenous grassland. Patches of Weeping Myall (*Acacia pendula*) also occur. These patches of vegetation provide potential habitat for a range of threatened flora and fauna species.

No conservation areas or large areas of native remnant vegetation occur adjacent to the proposal site.

A number of threatened ecological communities and flora species were recorded from desktop searches in proximity to the proposal site. At least five threatened ecological communities and three threatened flora species were identified as likely to occur within the proposal site: Refer to Umwelt, 2017, *ARTC Inland Rail – Parkes to Narromine Biodiversity Assessment Report.*

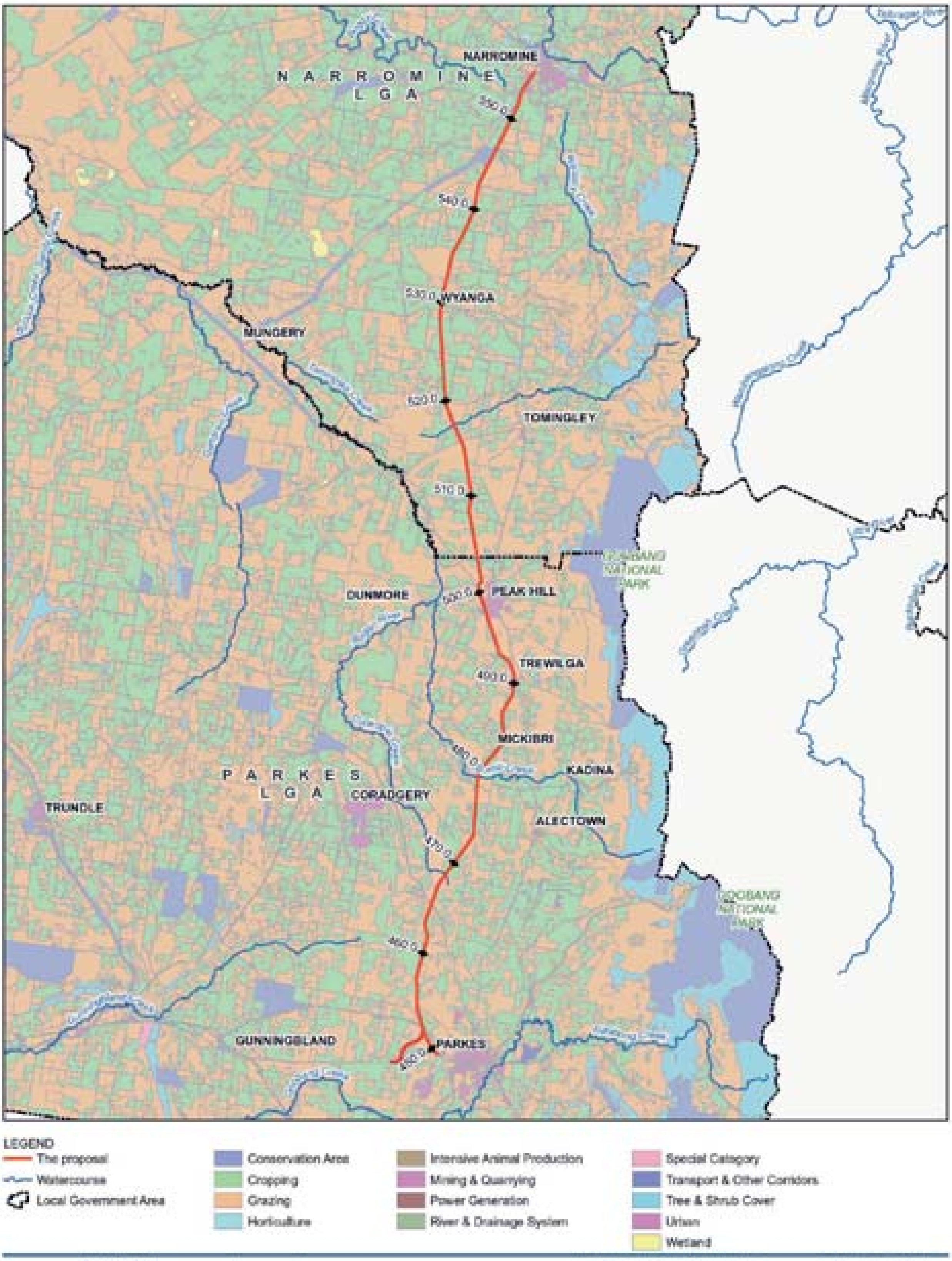
for further details.

Aboriginal heritage

A search of the OEH AHIMS database undertaken by Umwelt as part of the Aboriginal cultural heritage and archaeological assessment for a 1 kilometre radius of the proposal site identified 19 recorded Aboriginal sites within 50 metres of the proposal site. The sites consisted predominantly of artefact scatters/isolated artefacts, with one stone quarry and two scarred trees. Of these 19 sites, 10 sites that were mapped outside the proposal site and 4 sites that were mapped within the proposal site were not visible during the field survey undertaken by Umwelt in July 2016. Refer to the *Umwelt, 2017, ARTC Inland Rail – Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment* for further details.

Non-Aboriginal heritage

The desktop assessment identified no heritage listed items within or in the vicinity of the proposal site. The nearest listed items are situated in the townships of Parkes, Peak Hill and Narromine.


NARROMINE
NARROMINE LGA
550.0
540.0
530.0
WYANGA
MUNGERY
520.0
TOMINGLEY
510.0
GOOBANG NATIONAL PARK
DUNMORE
500.0
PEAK HILL
TREWILGA
490.0
MICKIBRI
480.0
KADINA
PARKES LGA
CORADGERY
TRUNDLE
ALECTOWN
470.0
460.0
GUNNINGBLAND
PARKES
450.0
LEGEND
The proposal
Watercourse
Local Government Area
Conservation Area
Cropping
Grazing
Horticulture
Intensive Animal Production
Mining & Quarrying
Power Generation
River & Drainage System
Special Category
Transport & Other Corridors
Tree & Shrub Cover
Urban
Wetland
Paper Size A4
0 2 4 8 12 16
Kilometres
N

Australian Rail Track Corporation
Inland Rail- Parkes to Narromine

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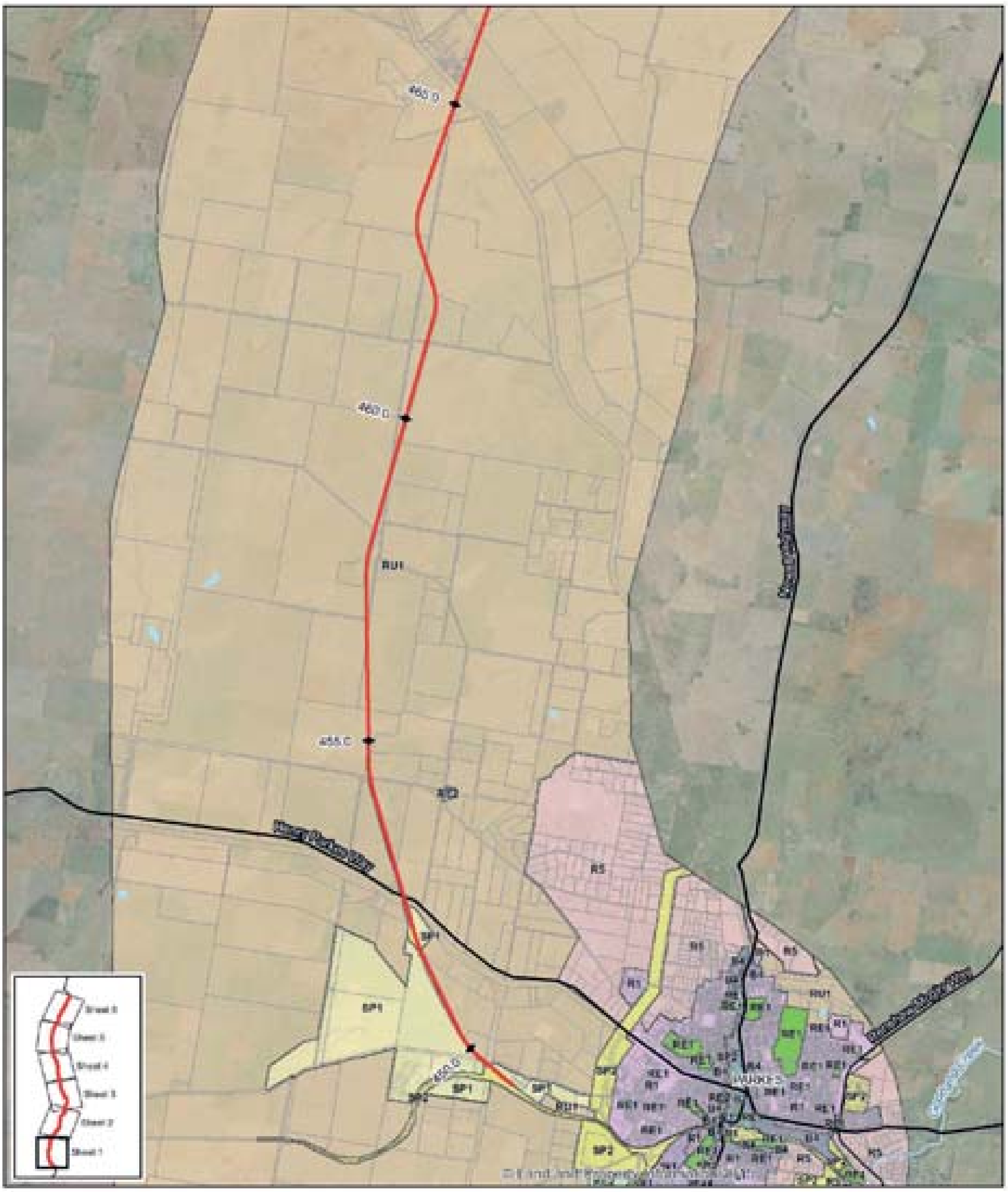
Revision 0
Date 27 Apr 2017

Land Use - Whole of Proposal Site

Figure 5



LEGEND

— The proposal

LEP ZONING

- B2 Local Centre
- B4 Mixed Use
- IN1 General Industrial
- R1 General Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- SP1 Special Activities
- SP2 Infrastructure

Paper Size A4

0 0.5 1 2 3

Kilometres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

GHD

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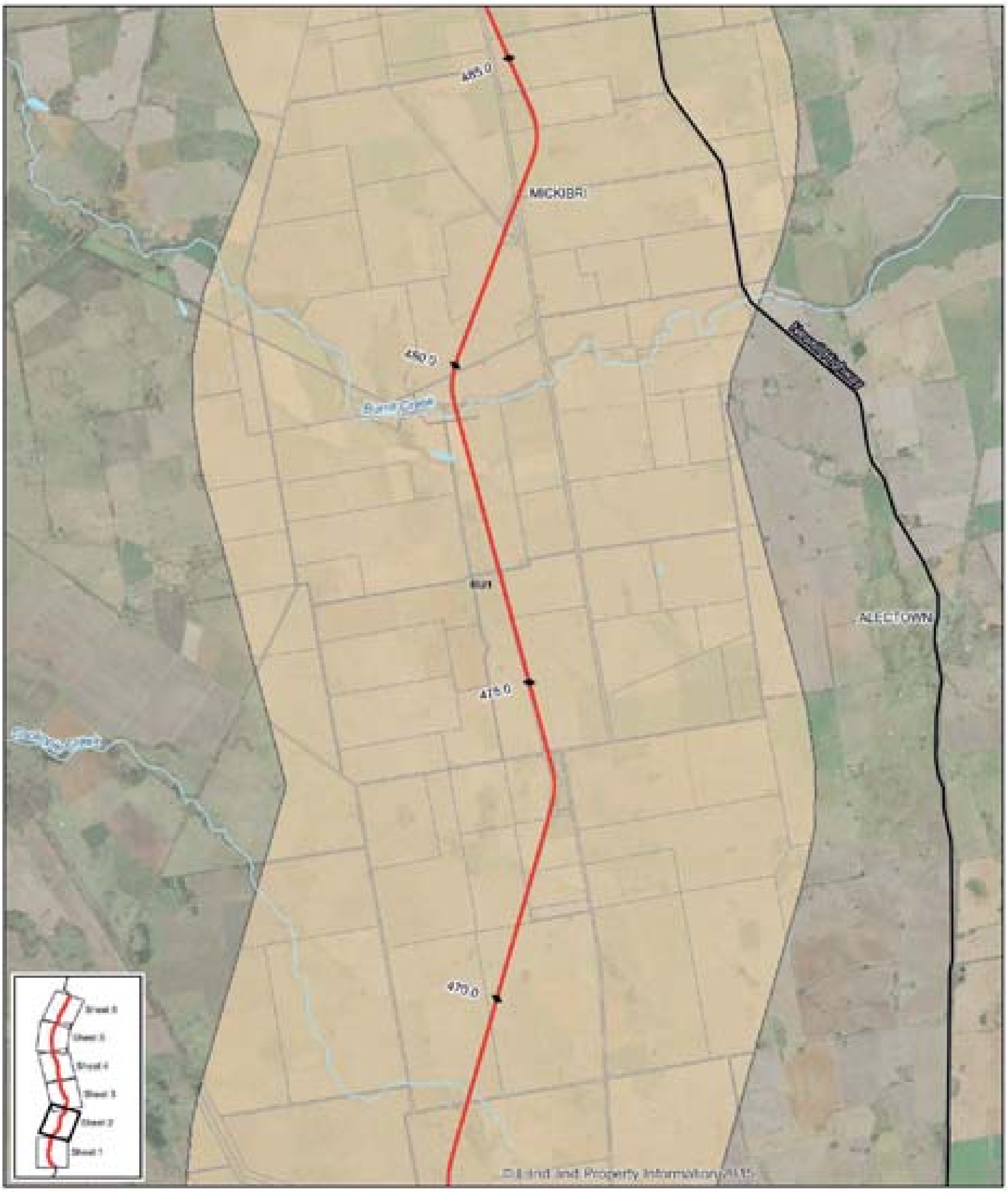
Date 27 Apr 2017

Land Use

Figure 6a



LEGEND

The proposal

LEP ZONING

RU1 Primary Production

Paper Size A4

0 0.5 1 2 3

Kilometres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

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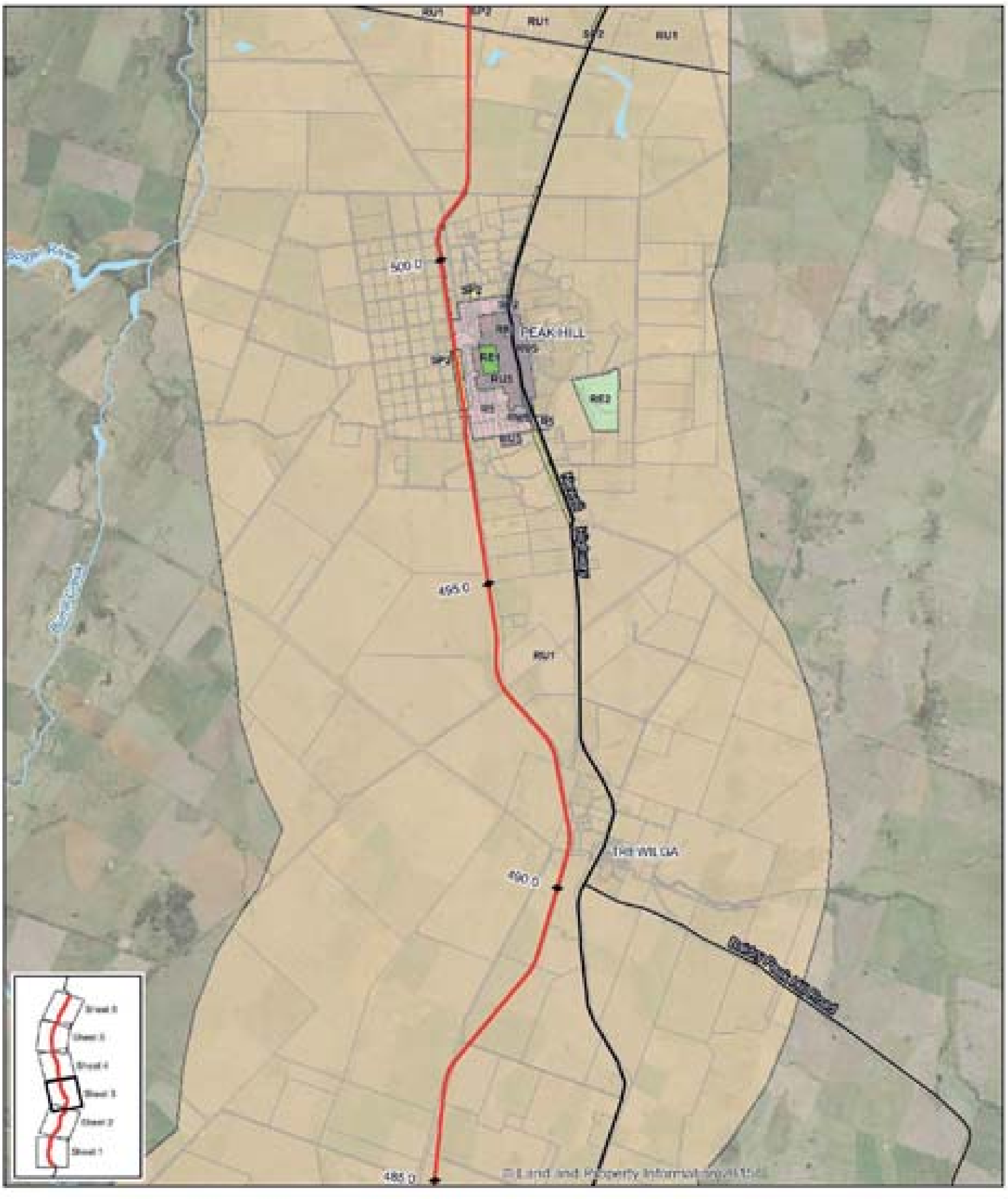
Land Use

Figure 6b

Data source: DoP&I: Land Zoning, 2013. LPI, DCDB, Imagery, 2015. Created by: gmcdermott, mkenton, kjoeks



LEGEND
The proposal

LEP ZONING

- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU5 Village
- SP2 Infrastructure

Paper Size A4

0 0.5 1 2 3

Kilometres

Australian Rail Track Corporation
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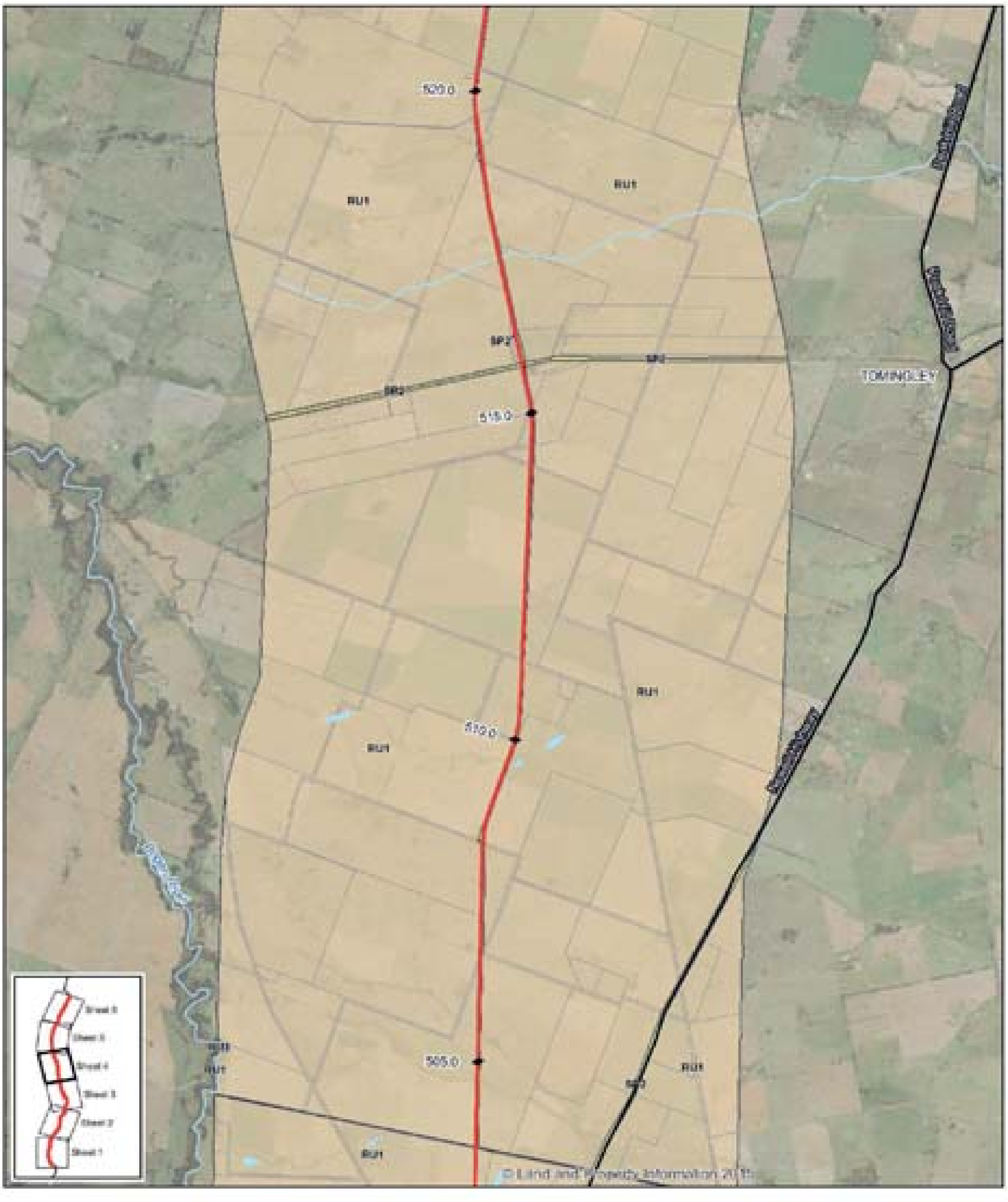
Revision 0
Date 27 Apr 2017

Land Use

Figure 6c



LEGEND

The proposal

LEP ZONING

RU1 Primary Production

SP2 Infrastructure

Paper Size A4

0 0.5 1 2 3

Kilometres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

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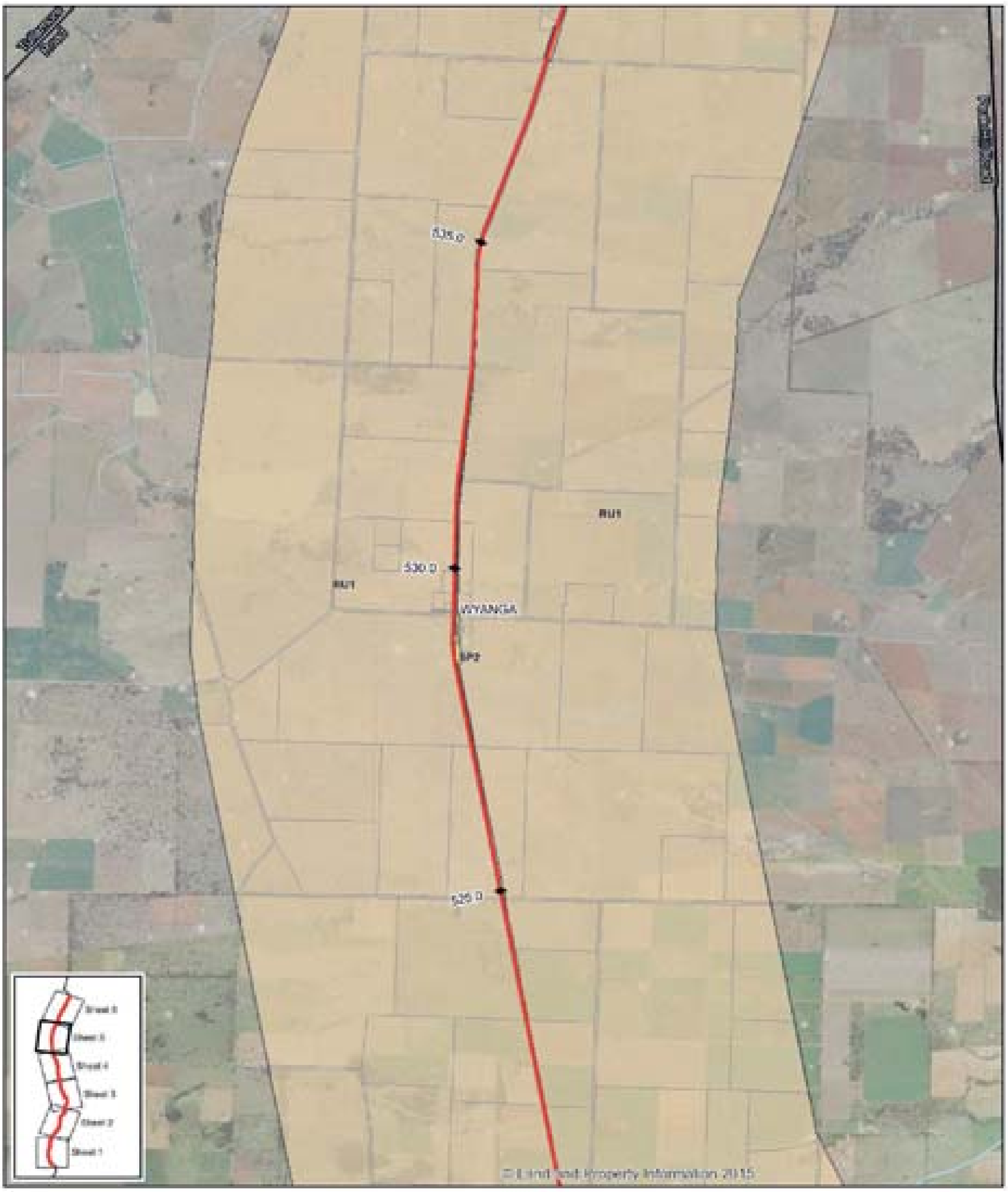
Land Use

Figure 6d

Data source: DoPlat: Land Zoning, 2013. LPI, DCDB, Imagery, 2016. Created by: gmacdermid, mwelton, kjasiska



LEGEND

The proposal

LEP ZONING

RU1 Primary Production

SP2 Infrastructure

Paper Size A4

0 0.5 1 2 3

Kilometres

Australian Rail Track Corporation
Inland Rail- Parkes to Narromine

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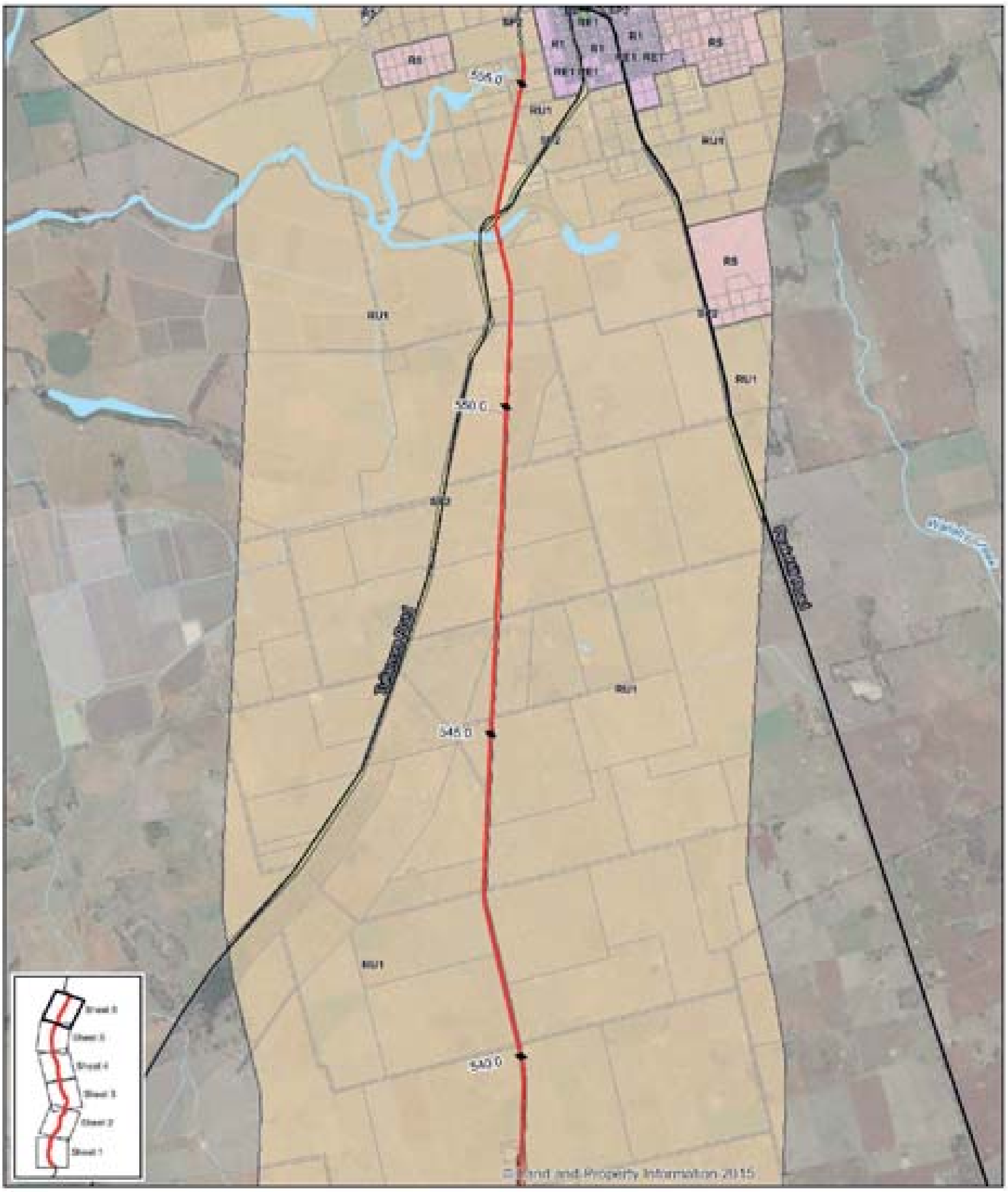
Date 27 Apr 2017

Land Use

Figure 6e



LEGEND

The proposal

LEP ZONING

- B2 Local Centre
- R1 General Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RU1 Primary Production
- SP2 Infrastructure

Paper Size A4

0 0.5 1 2 3

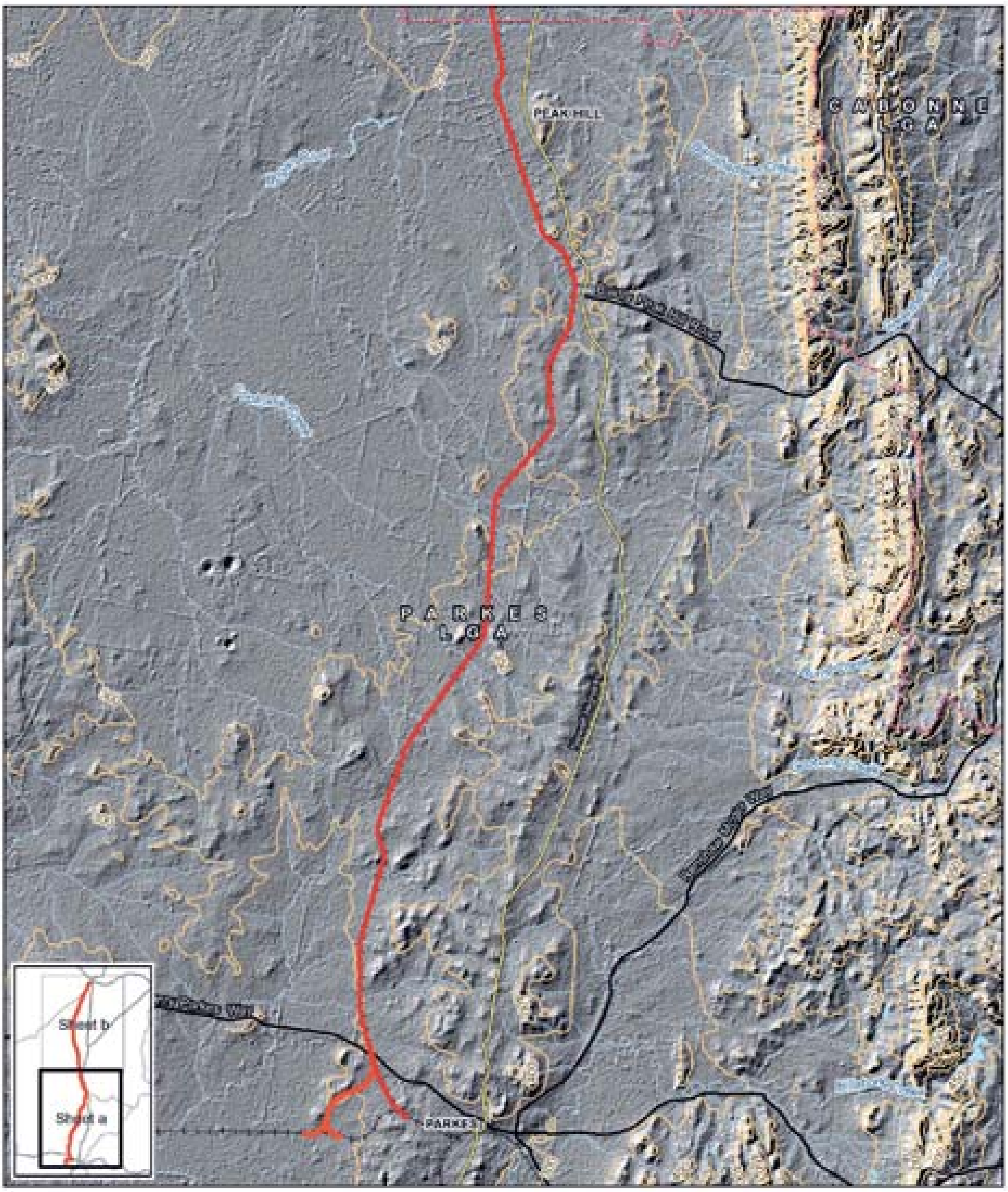
Kilometres

Australian Rail Track Corporation
Inland Rail- Parkes to Narromine

Job Number | 22-17916
Revision | 0
Date | 27 Apr 2017

Land Use

Figure 6f



LEGEND

The proposal

Local Government Area

Watercourse

Paper Size A4

0 1 2 4 6 8

Kilometres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation

Inland Rail - Parkes to Narromine

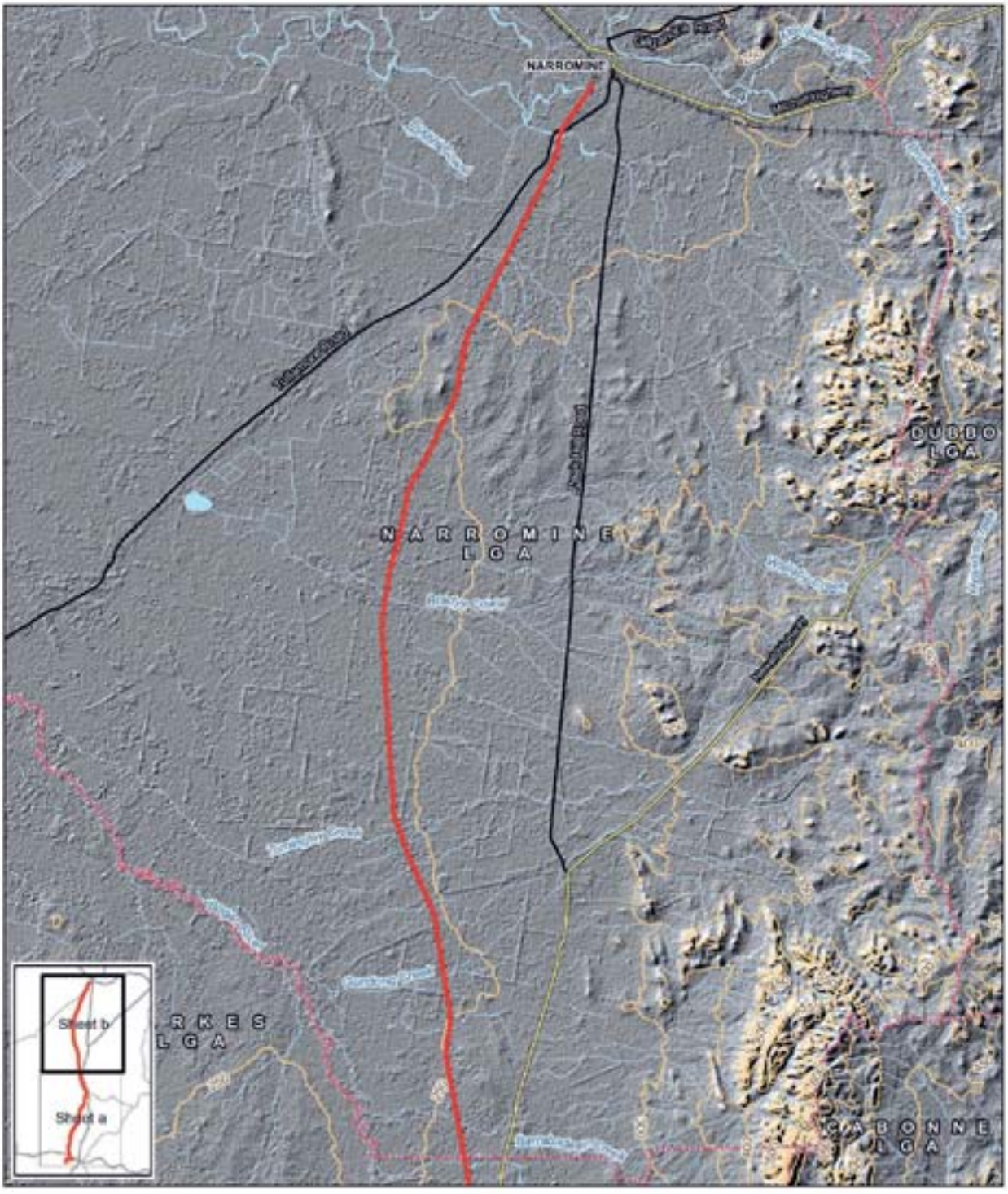
Job Number 22-17916

Revision 0

Date 27 Apr 2017

Topography

Figure 7a



LEGEND

The proposal

Watercourse

Local Government Area

Paper Size A4

0 1 2 4 6 8

Kilometres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

N

GHD

Australian Rail Track Corporation

Inland Rail - Parkes to Narromine

Job Number 22-17516

Revision 0

Date 27 Apr 2017

Topography

Figure 7b

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E nlmail@ghd.com W www.ghd.com.au

Data source: Geoscience Australia, 2016. Topographic Data Series 3; LPI, Imagery, 2016. Created by: gmcdiarmid, tmorton, kpandav

5.4 Landscape character zones

This section identifies and describes the landscape character zones for the proposal site and assesses the ability of the landscape character zones to absorb the proposal within the existing landscape setting.

There are two primary landscape character types comprising Settlement and Agricultural Landscape Character Zones identified within the proposal site. These primary character zones have been further analysed into sub-character units which are illustrated in ***Figure 8***. The landscape character for each sub-character unit has been identified and assessed within the extent of visual influence using the following characteristics:

- land use and built form
- topography and landform
- vegetation patterns
- natural elements
- cultural elements
- national, regional and local landscape significance.

5.4.1 Settlement Landscape Character Zone

5.4.1.1 Township

Parkes has a population of 11,491 people (2014 census) comprises various uses such as residential, industrial, recreation, commercial and infrastructure.

The proposal site begins on the north-western outskirts of Parkes in agricultural land with disbursed residences. Whilst not within the urban setting of Parkes, there are residences located along Henry Parkes Way and Brolgan Road.

Within the extent of visual influence, land use activities throughout Parkes are generally limited to rail, freight and road infrastructure facilities. However, pockets of residential and commercial activity occur closer to the town centre.

General residential, low density detached dwellings (see ***Picture 4***) occur north of the industrial precinct, confined by the rail corridor and Newell Highway. This pocket also includes the public recreational facility in McGlynn Park and the former brick pit, now used as a stormwater storage basin.

The proposal site terminates as it approaches the southern outskirts of Narromine through agricultural land and an area of large lot residential land. The density of houses begins to increase towards the end of the proposal site, but the proposal does not extend to the civic centre of the township.

PICTURE 4 – PARKES RESIDENTIAL

Narromine has a population of 3,789 people and is composed of similar civic, residential and industrial uses to the township of Parkes.

Overall the finger-like settlement pattern dictates the character of the zone with recreational and open space reserves predominately located on the outer edges of the township (***Picture 5***).

PICTURE 5 – NARROMINE RESIDENTIAL

5.4.2 Village

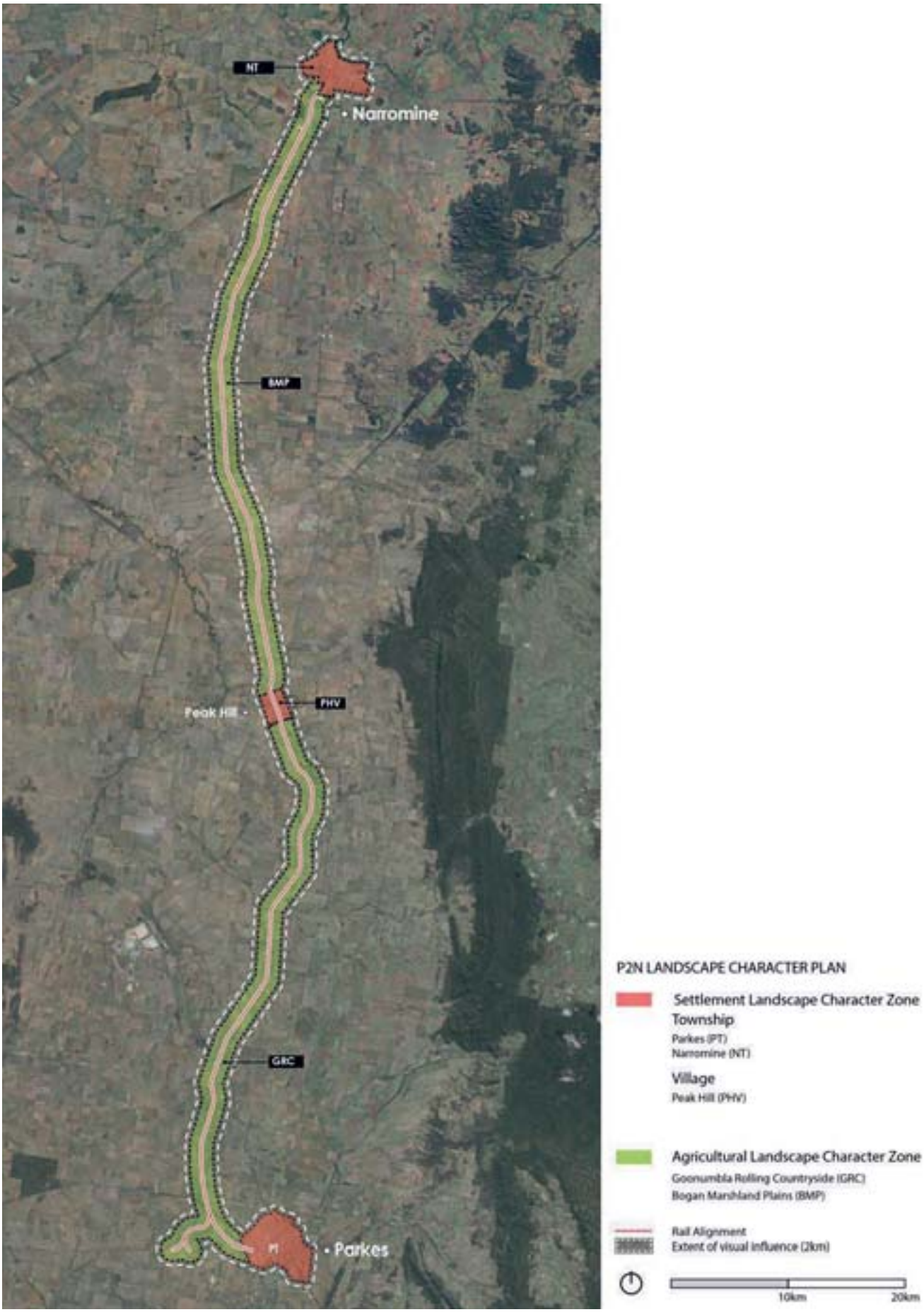
Peak Hill has a population of (1,353 people, (2011 census) and Narromine has a population of 3,789 people (2011 census).

The proposal straddles the western edge of Peak Hill through land reserved for rail infrastructure. The village centre, located to the east, is surrounded by grid-like pattern low density residential development, on relatively large land parcels (as shown in ***Picture 6***).

Overall, the settlement pattern dictates the character of the zone and does not provide for any distinguishable landscape features.

PICTURE 6 – PEAK HILL RESIDENTAIL AREA

FIGURE 8 – LANDSCAPE CHARACTER PLAN



5.4.3 Agricultural landscape character zone

5.4.3.1 Goonumbla rolling countryside

As the existing rail corridor exits Parkes the land use transitions from residential to agricultural uses until Peak Hill. Farming residences are dispersed across the landscape, which are generally accessed from local or rural roads. There is also historical rail infrastructure located along this stretch of the existing rail corridor including Alectown West and Mickibri stations that are accompanied by large grain silos (see ***Picture 7***) and storage facilities.

The central to southern extents of the existing rail corridor are located in the South Western Slopes bioregion, which are comprised of undulating and hilly ranges with small peaks set in wide valleys. The geology is composed of Ordovician to Devonian folded and faulted sedimentary sequences with interbedded volcanic rocks and large areas of intrusive granite. The Lower Slopes are characterised by larger areas of Tertiary and Quaternary alluvium (NSW Office of Environment & Heritage, 2016).

The landscape as described by Mitchell (2002) in the southern extent towards Parkes (Goonumbla Hills) is one of rounded low hills with a general elevation of 290 - 350 metres. The land further north through to Bimbi Plains is lower with an elevation ranging between 200 metres – 250 metres.

North of Goonumbla, the existing rail corridor traverses the Bogan Alluvial Plains where Mitchell (2002) describes the landform as partly scalded, higher level plains with a distinct presence of narrow, defined drainage lines and swamps. Towards Parkes (Goonumbla Hills), Mitchell (2002) describes the vegetation as extensively cleared, grazed and cultivated, refer to ***Picture 8***. Vegetation in the area includes open forests of Grey Box, White Cypress Pine with Bimble Box in the creeks and Red Ironbark with shrubs on the gravels.

Whilst generally highly cultivated, the distribution of vegetation across the landscape character area ranges from scatterings and small clusters of trees (see ***Picture 9***) to lineal distributions along main roads and paddock edges as shelter belts. A distinct feature in the landscape is the dense lining of trees along Burill Creek, between Goonumbla and Mickibri, which is prominent in what is otherwise are extensive areas of clearings and cultivation.

The nearest watercourse to Parkes is Goobang Creek which crosses the existing rail corridor approximately 7 kilometres south of the township, with Stanfords Creek crossing approximately 1 kilometre south of Trewilga. The creek passes beneath roads and the watercourse forms a distinct change in landscape character to the surrounding highly cultivated area. Further north at Trewilga, an intermittent segment of Ten Mile Creek crosses the existing rail corridor, before a far more active profile of the creek meanders alongside the existing rail corridor before diverting westward as it reaches Peak Hill.

PICTURE 7 – GRAIN SILO [1]

PICTURE 8 – GOONUMBLA – OPEN GRASSLANDS [2]

PICTURE 9 – TREWILGA – SCATTERINGS OF VEGETATION [3]

5.4.3.2 Bogan Marshland Plains

Like the Goonumbla Rolling Countryside the land use is agricultural up to Narromine. Farming residences are dispersed across the landscape, which are generally accessed off local or rural roads. There is rail infrastructure at stations and large farming facilities such as grain receivers, distribution and silo structures.

The Bogan Marshland Plains is typical of the landscape occupying most of the Darling Riverine Plains, with a relatively flat landform with river channel and floodplain features dominating the landscape. The northern extent located on the Bogan-Macquarie/Darling Riverine Floodplains has a history of being subject to flooding (refer to ***Picture 10***).

North of Peak Hill, the existing rail corridor passes through the Bogan Channels and Floodplains landscape which is defined by marginal extensive scalded floodplains of sinuous perennial ephemeral tributaries of the Bogan River. Geologically, the land is primarily composed of deep, cracking grey clays, clay loams and isolated areas of red-brown texture-contrast soils (Mitchell, 2002).

This area contains some of the most extensively cleared land of the proposal site (see ***Picture 11***). Whilst there are some locations where trees line main roads and shelter belts traverse paddocks, limited trees straddle watercourses such as Bulldog and Burrabadine creeks. An exception to this is Tomingley Creek, where a distinct corridor of vegetation and trees align the banks.

The remaining northern extent of this landscape character area begins to see the existing rail corridor pass through the Narromine Hills landscape which is described by Mitchell (2002) as shaped by low rounded hills standing above the alluvial plain. The land lies at elevations between 240-290 metres. The geology of the Narromine Hills is typically composed of Ordovician and Devonian quartz sandstone, siltstone, chert and phyllite.

The density of vegetation and tree covering in this area increases slightly between Wyanga and Narwona, with small to moderate clusters of woodland patches located in the landscape, particularly along Tullamore-Narromine Road approximately 3 kilometres west of the proposal. The low rounded hills

generally are host to scattered woodlands of grey box, yellow box, Dwyer's mallee gum and white cypress pine.

Between Narwona and Narromine, the existing rail corridor traverses through Boggy Cowal Allusive Plains which has a landscape character more distinct from the central and southern extent of the proposal. With Bradys Cowal and Backwater Cowal meandering across the existing rail corridor, the landscape is defined by extensive grasslands and wetlands surrounding the creeks. Types of vegetation include scattered strands of myall, bimblebox, black box and belah, refer to ***Picture 12***.

The most distinctive creek present within this landscape character unit is Tomingley Creek. Lined with a high density of vegetation and an active flow of water, Tomingley Creek is distinctive within the landscape.

PICTURE 10 – TOMINGLEY – BOGGY LANDSCAPE [4]

PICTURE 11 – CLEARED LAND – SOUTH WESTERN SLOPES BIOREGION [5]

PICTURE 12 – BETWEEN PEAKHILL AND NARROMINE – EXTENSIVE GRASSLANDS [6]

5.5 Absorptive Capability

The absorptive capability relates to the ability of the landscape character zones to absorb the proposal within the existing landscape setting. Opportunities for screening the proposal within the landscape through vegetation, undulating landforms and integration within previously modified settings are considered in determining the absorptive capability level.

Table 4 outlines the absorptive capability of each landscape character zone to accommodate the proposal.

TABLE 4 – ABSORPTIVE CAPABILITY OF THE LANDSCAPE CHARACTER ZONES

LANDSCAPE CHARACTER ZONE	ABSORPTIVE CAPABILITY	COMMENT
Settlement landscape character zone		
Township	High	The flat topography, built form and street trees associated with the urban fabric and residential canopy coverage provide opportunities for changes to be absorbed in the existing landscape setting. Furthermore, the distance to the proposal site would mean the proposal would be perceived as a small part within the wider landscape.
Village	High	The flat topography, built form, street trees associated with the urban fabric and residential canopy coverage provide opportunities for changes to be absorbed in the existing landscape setting. The proposal is to upgrade existing railway tracks with height increases of only 200-400 millimetres which would be difficult to perceive within the wider landscape.
Agricultural landscape character zone		
Goonumbla rolling countryside	Moderate to High	Although this landscape is low lying of open grassland plains there is minimal canopy coverage which provides limited opportunities for changes in the existing landscape setting to be absorbed. The proposal is to upgrade existing railway tracks with height increases of only 200-400 millimetres and crossing loops adjoining existing railway infrastructure which would be difficult to recognise or perceived as a small component within the wider landscape.
Bogan marshland plains	Moderate to High	Although this landscape is low lying of open floodplains there is minimal canopy coverage which provides limited opportunities for changes in the existing landscape setting to be absorbed. The proposal is to upgrade existing railway tracks with height increase of only 200-400 millimetres and crossing loops adjoining existing railway infrastructure which would be difficult to recognise or perceived as a small component within the wider landscape.

6 Visual assessment

The following section outlines the visual impact of the proposal and tables the findings of the visual impact assessment with associated mapping. A discussion of these results is provided in ***Section 7***.

6.1 Determining visual impact

The process that has been applied to the assessment of visual impacts is consistent with the methodology as described in ***Section 2*** and involves the following tasks:

- Identify higher sensitivity view points for each kilometre length. These are typically rural residences, townships and villages, highways and local roads.
- Determine the distance between each closest sensitive view point and the proposal.

Ascertain the level of visual sensitivity for identified close proximity viewing point by applying land use and distance (refer to ***Table 3***). Record the visual sensitivity of the highest rating viewpoint (the most sensitive) in order to determine the visual impact.

Assess the type of vegetation cover within the proposal site and zone of visual influence for each kilometre length (chainage) and check the extent of development existing within the proposal site to determine the development condition (refer to ***Figure 4***). Ascertain the visual modification rating by applying the viewing angle and minimum distance between the most sensitive view point and the proposal to the development condition.

Ascertain the visual impact for the most sensitive viewpoint relating to a particular chainage of the proposal by combing the visual modification rating with the visual sensitivity rating, consistent with ***Table 2***. Where the sensitivity and modification ratings are identical for consecutive kilometre lengths of the proposal, the lengths have been assessed together. In most cases, rural residences have been assessed separately.

The following ***Table 5*** and ***Table 6*** records the findings of the visual assessment for each chainage length, chainage runs from south to north.

The appropriate modification condition number, minimum distance, level of visual modification, visual sensitivity rating and visual impact is recorded for each chainage length.

Figure 9 and ***Figure 10*** depicts the chainage, modification condition and viewpoints (and the uses associated with these viewpoints) for the length of the proposal.

6.2 Visual impact assessment

TABLE 5 – SUMMARY OF VISUAL IMPACTS FOR PARKES TO NARROMINE ARTC INLAND RAIL TRACK PROPOSAL

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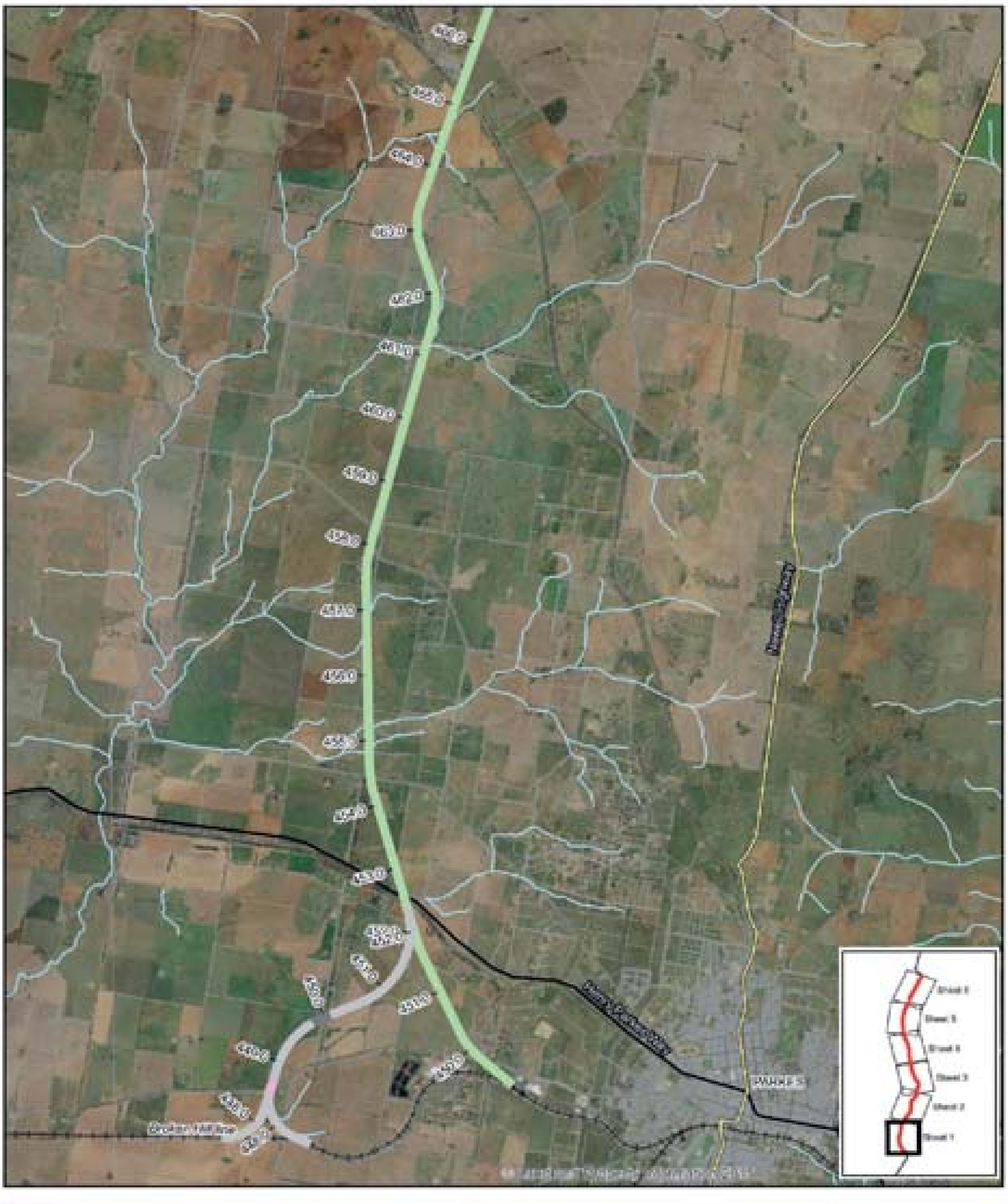
Summary of Visual Impacts for Parkes to Narromine ARTC Inland Rail Track Alignment

Chainage (km)	Development Condition #	Distance to most sensitive viewpoint	Most Sensitive Viewpoint	Level of visual modification	Visual sensitivity	Visual impact	Comments
449-458	2	0.10km	Residential / Homestead	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
458 - 462.5	2	0km	Local Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
462.5 - 465	2	0.64km, 0.93km	Residential / Homestead	VL	H	L	Culvert and track replacement only raised approx. between 250-400mm
465 - 467.5	2	0km	Local Road	L	M	L	Culvert and track replacement only raised approx. between 250-400mm
467.5 - 469.5	2	0.30km	Residential / Homestead	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
469.5 - 471.5	2	0km	Agricultural Area	L	VL	VL	Culvert and track replacement only raised approx. between 250-400mm
471.5 - 472.5	2	0.80km	Residential / Homestead	VL	H	L	Culvert and track replacement only raised approx. between 250-400mm
472.5 - 474	2	0km	Rural Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
474 - 476.5	1	0.95km	Residential / Homestead	VL	H	L	Crossing loop at Alectown West
476.5 - 477.5	2	0km	Agricultural Area	VL	VL	VL	Culvert and track replacement only raised approx. between 250-400mm
477.5 - 484.5	2	0.50km, 0.73km, 0.68km, 0.35km	Residential / Homestead	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
484.5 - 487	2	0.03km	Rural Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
487 - 488	2	0.80km	Residential / Homestead	VL	H	L	Culvert and track replacement only raised approx. between 250-400mm
488 - 489	2	0.50km	Rural Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
489 - 503	2	0.12km - 0.90km	Residential / Homestead	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
503 - 508.5	2	0km	Agricultural Area	L	VL	VL	Culvert and track replacement only raised approx. between 250-400mm
508.5 - 511.5	1	0km	Agricultural Area	L-M	VL	VL	Crossing loop at Peak Hill
511.5 - 514.5	2	0km	Local Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
514.5 - 517	2	0.15km, 0.57km	Residential / Homestead	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
517 - 519.5	2	03km	Rural Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
519.5 - 525.5	2	0.18km, 0.22km, 0.26km	Residential / Homestead	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
525.5 - 528.5	2	03km	Rural Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
528.5 - 530.5	2	0.25km	Rural Road	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
530.5 - 535.5	2	0km	Rural Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
535.5 - 538	1	0.30km	Residential / Homestead	L-M	H	H	Crossing loop at Timjelly
538 - 538.5	2	03km	Rural Road	L	L	L	Culvert and track replacement only raised approx. between 250-400mm
538.5 - 549.5	2	0.43km, 0.90km, 0.44km, 0.80km, 0.30km, 0.95km, 0.77km, 0.23km	Residential / Homestead	VL	H	L	Culvert and track replacement only raised approx. between 250-400mm
549.5 - 552.5	2	0.35km	Local Road	L	M	L	Culvert and track replacement only raised approx. between 250-400mm
552.5 - 555	2	0km	Residential / Homestead	L	H	M	Culvert and track replacement only raised approx. between 250-400mm
	#1	New crossing loop with no, or minimal, clearing required in lightly treed agricultural land.					
	#2	Replacement of existing track through open agricultural land.					

TABLE 6 – SUMMARY OF VISUAL IMPACTS FOR PARKES TO NARROMINE ARTC NORTH-WEST LINK

Chainage (km)	Development Condition #	Distance to most sensitive viewpoint		Level of visual modification	Visual sensitivity	Visual impact	Comments
453-452.4	4	0km	Local Road	L	H	M	Culvert and track replacement only raised approx. between 250-400mm. (Refer to Figure 18 & PhotoA1, Appendix A)
452.4-450.1	2	0.38km	Residential / Homestead	M	H	H	
450.1-449.8	3	0.22km	Residential / Homestead	M	H	H	Removal of native canopy trees, crosses over Millers Lookout Road (rural road)
449.8-448.7	2	0.22km	Residential / Homestead	M	H	H	
448.7-448.5	1	0.45km	Residential / Homestead	H	H	H	Brolgan Road grade separation
448.5-447.4	2	0.40m	Residential / Homestead	M	H	H	south-west arm
448.5-448	2	0.50km	Residential / Homestead	M	H	H	south-east arm
448-447.8	3	0.68km	Residential / Homestead	H	H	H	Coopers Road closure
447.8-447.4	2	0.80km	Residential / Homestead	M	H	H	
	#1	Grade separation in lightly treed agricultural setting.					
	#2	New track alignment through open agricultural land with earthworks and property impacts.					
	#3	New track alignment through open agricultural land with local road impact and tree removal.					
	#4	Replacement of existing track through open agricultural land.					



LEGEND

- 1- Grade separation in lightly treed agricultural setting
- 2- Earthworks and property impacts
- 3- Tree removal and local road impact
- 2- Re-instatement of existing track through open agricultural land
- Cadastre

Paper Size A4

0 500 1,000 2,000 3,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

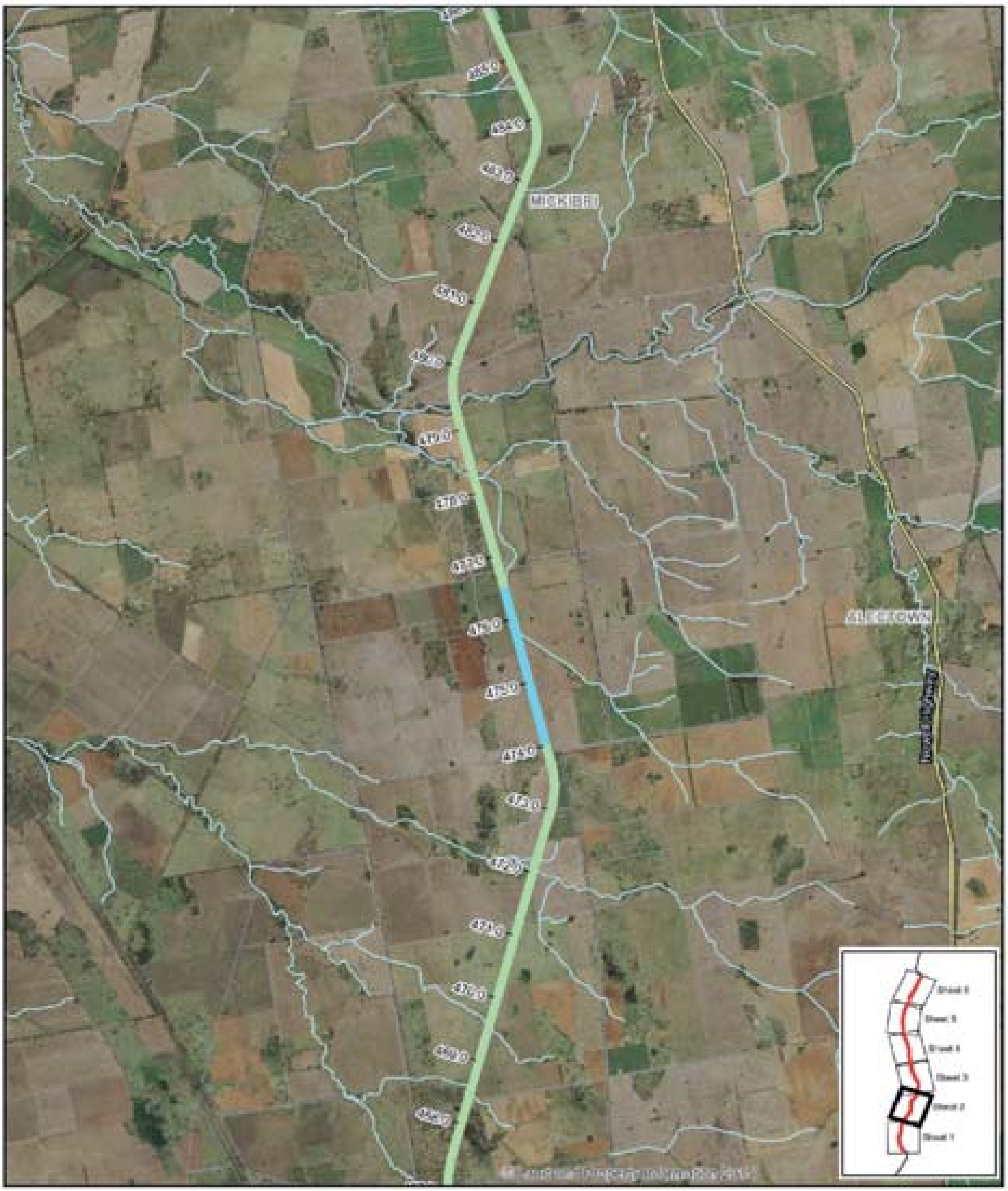
N

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number	22-17916
Revision	0
Date	19 Jun 2017

Development conditions - Sheet 1

Figure 9



LEGEND

1- New crossing loop with no, or minimal, clearing required in lightly treed agricultural land

2- Re-instatement of existing track through open agricultural land

Cadastre

Paper Size A4

0 500 1,000 2,000 3,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

GHD

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Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number	22-17916
Revision	0
Date	19 Jun 2017

Development conditions - Sheet 2

Figure 9

LEGEND

2- Re-instatement of existing track through open agricultural land

Cadastre

Paper Size A4

0 500 1,000 2,000 3,000

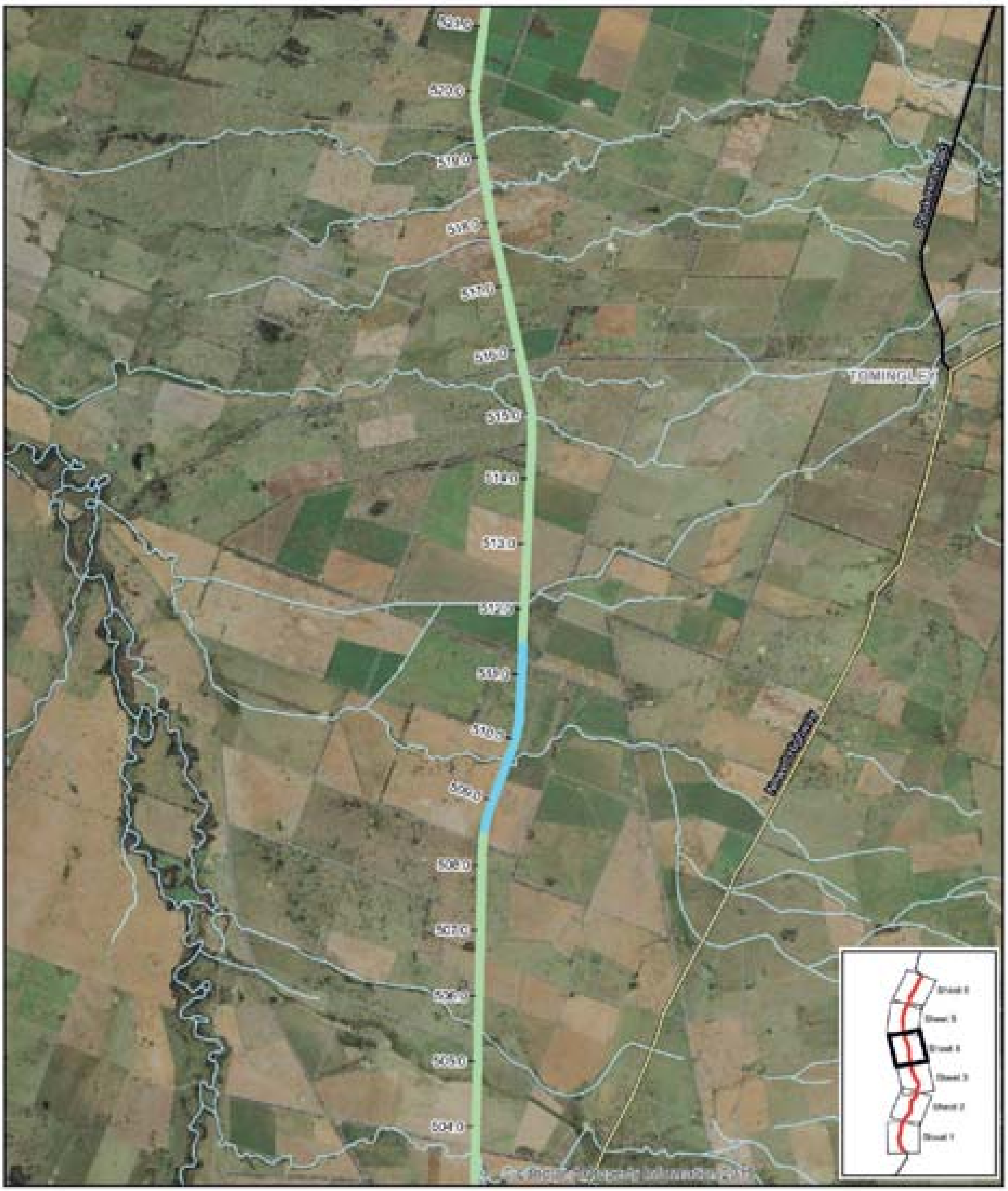
Metres

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number 22-17916
Revision 0
Date 19 Jun 2017

Development conditions - Sheet 3 **Figure 9**

Data source: LPI, DCDB, Imagery, 2015. Urbis, Visual Impact, 2016. Created by: gmcdiarmid, tmorton, kpericha



LEGEND

1- New crossing loop with no, or minimal, clearing required in lightly treed agricultural land

2- Re-instatement of existing track through open agricultural land

Cadastre

Paper Size A4

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Metres

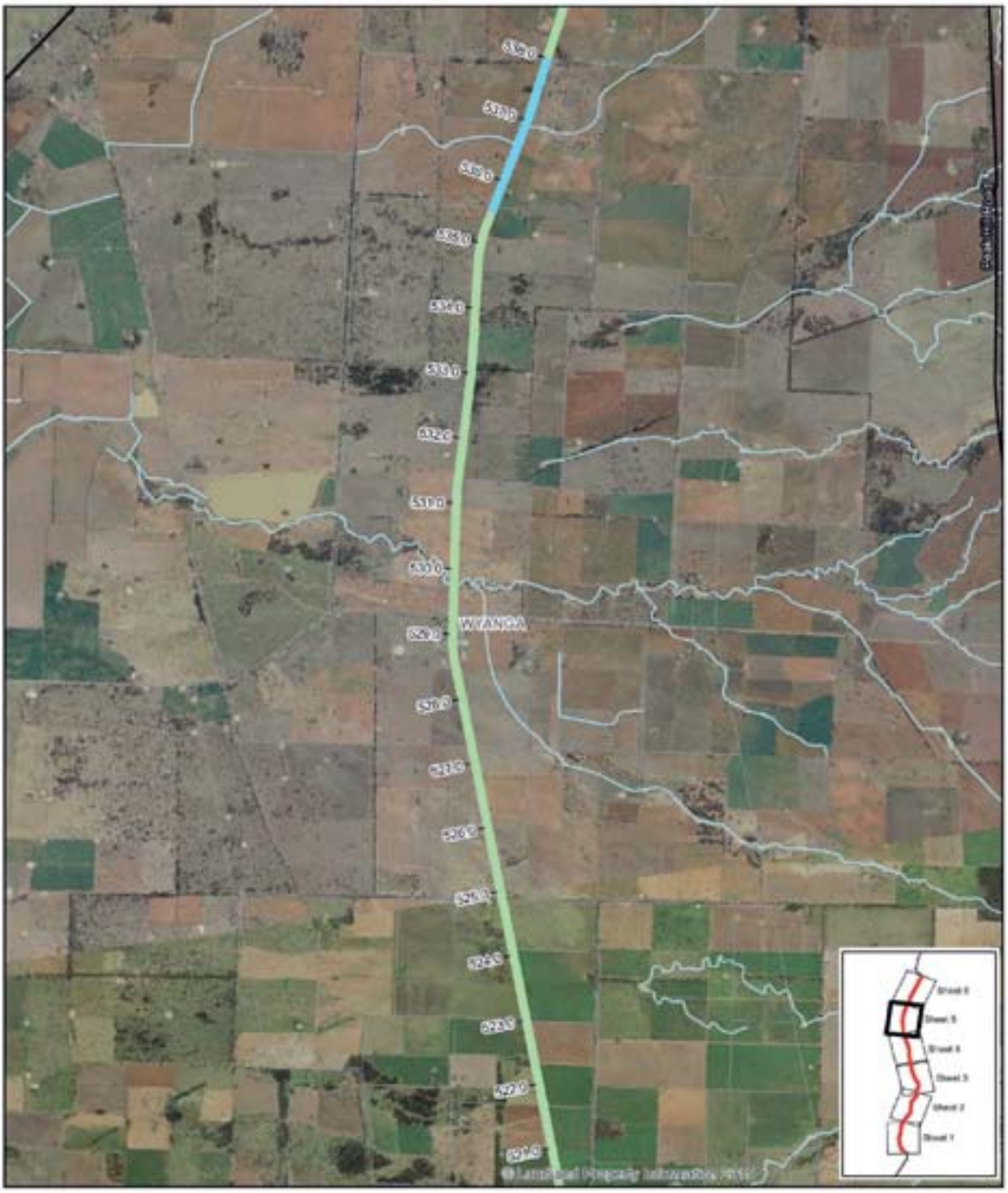
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number 22-17916
Revision 0
Date 19 Jun 2017

Development conditions - Sheet 4

Figure 9



LEGEND

1- New crossing loop with no, or minimal, clearing required in lightly treed agricultural land

2- Re-instatement of existing track through open agricultural land

Cadastre

Paper Size A4

0 500 1,000 2,000 3,000

Metres

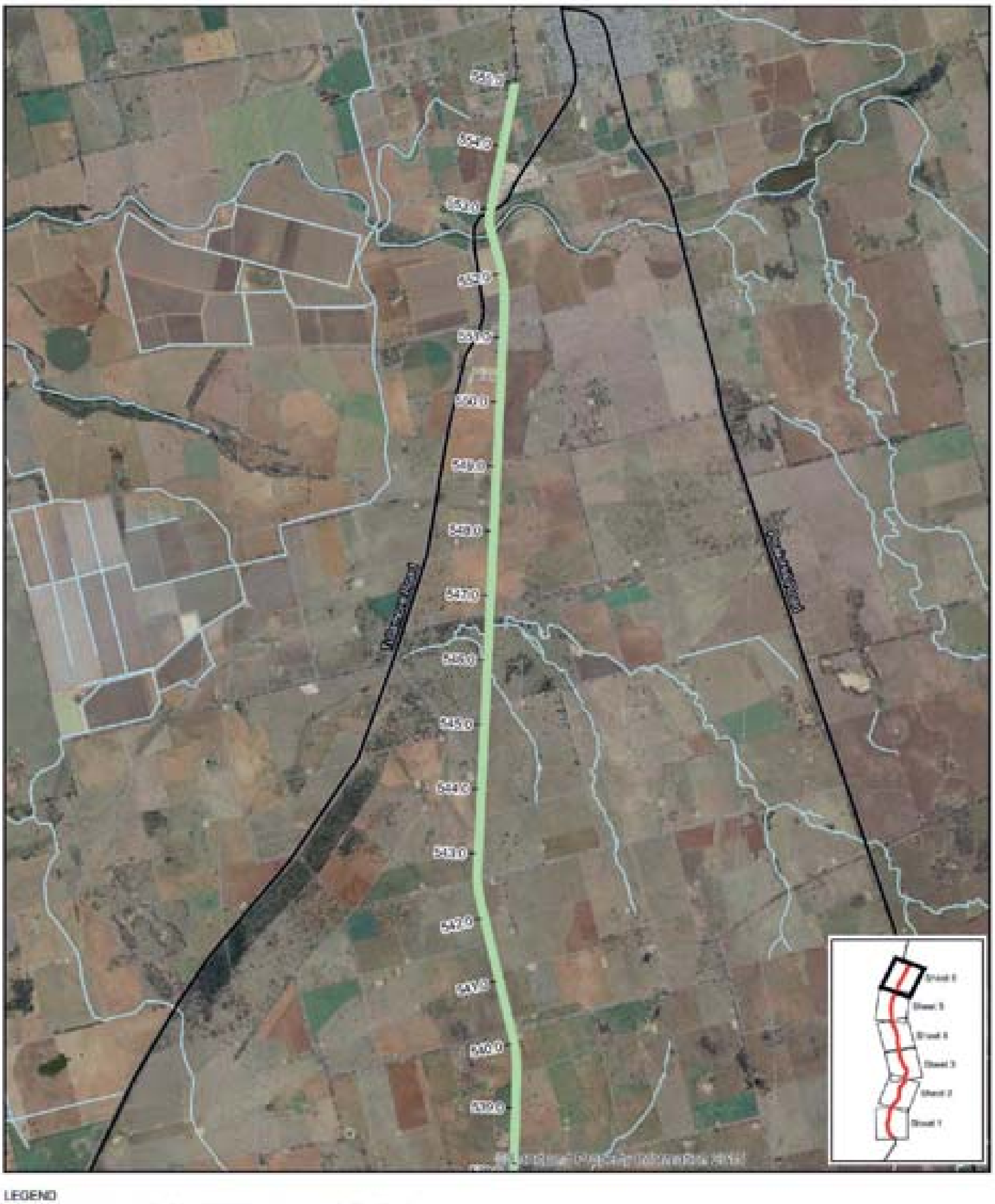
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number 22-17916
Revision 0
Date 19 Jun 2017

Development conditions - Sheet 5 Figure 9

Data source: LPI, DCDB, Imagery, 2015; Urbis, Visual Impact, 2016. Created by: gmcdiarmid, kneilan, kgarcia



LEGEND

2- Re-instatement of existing track through open agricultural land

Cadastre

Paper Size A4

0 500 1,000 2,000 3,000

Metres

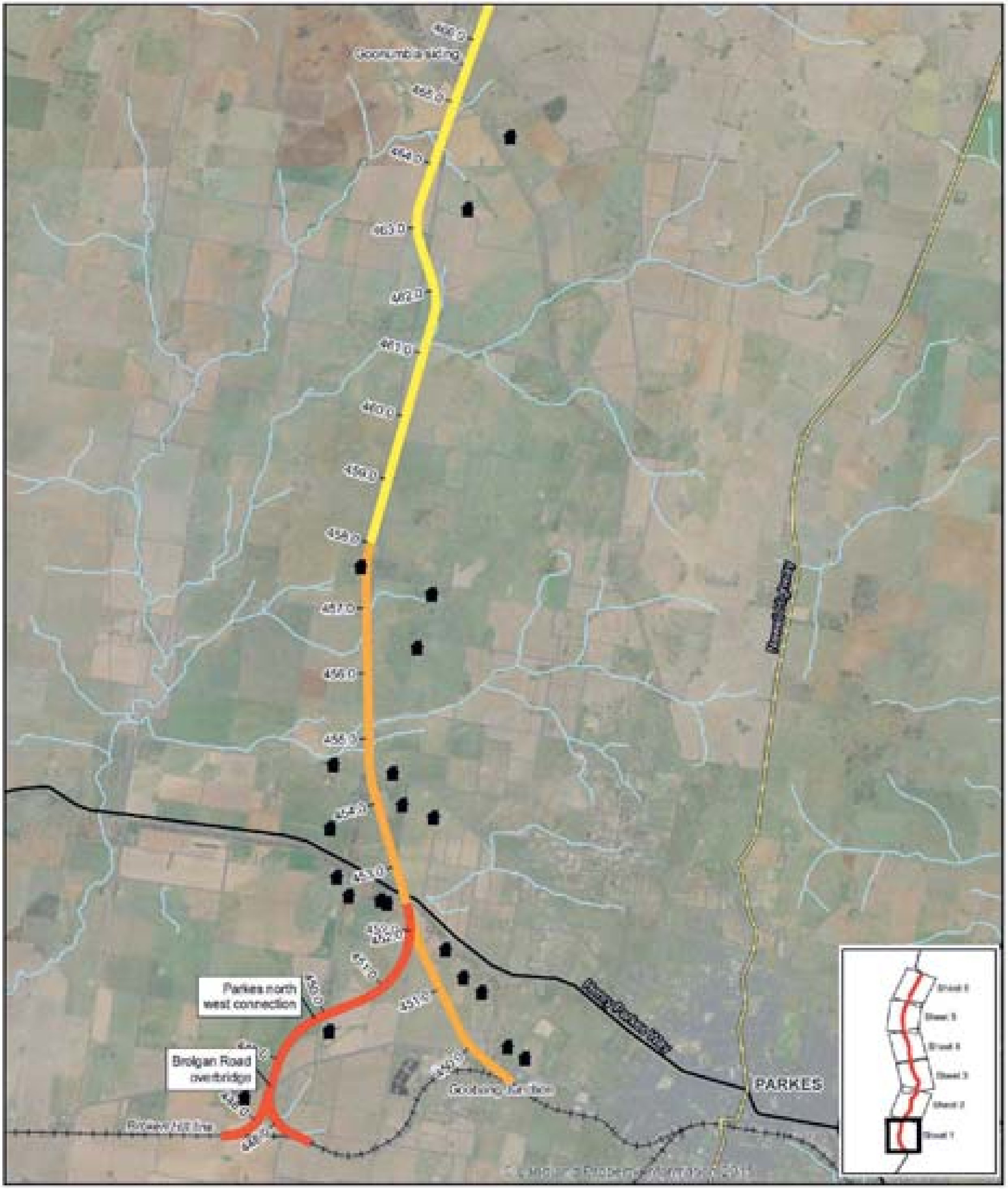
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number	22-17916
Revision	0
Date	19 Jun 2017

Development conditions - Sheet 6 Figure 9

Data source: LPI, DCDB, Imagery, 2015. Urbis, Visual Impact, 2016. Created by: gmcdiarmid, tmorton, kpericha



LEGEND

- Residences
- Cadastre
- Watercourse
- H
- M
- L

Paper Size A4

0 500 1,000 2,000 3,000

Metres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number	22-17916
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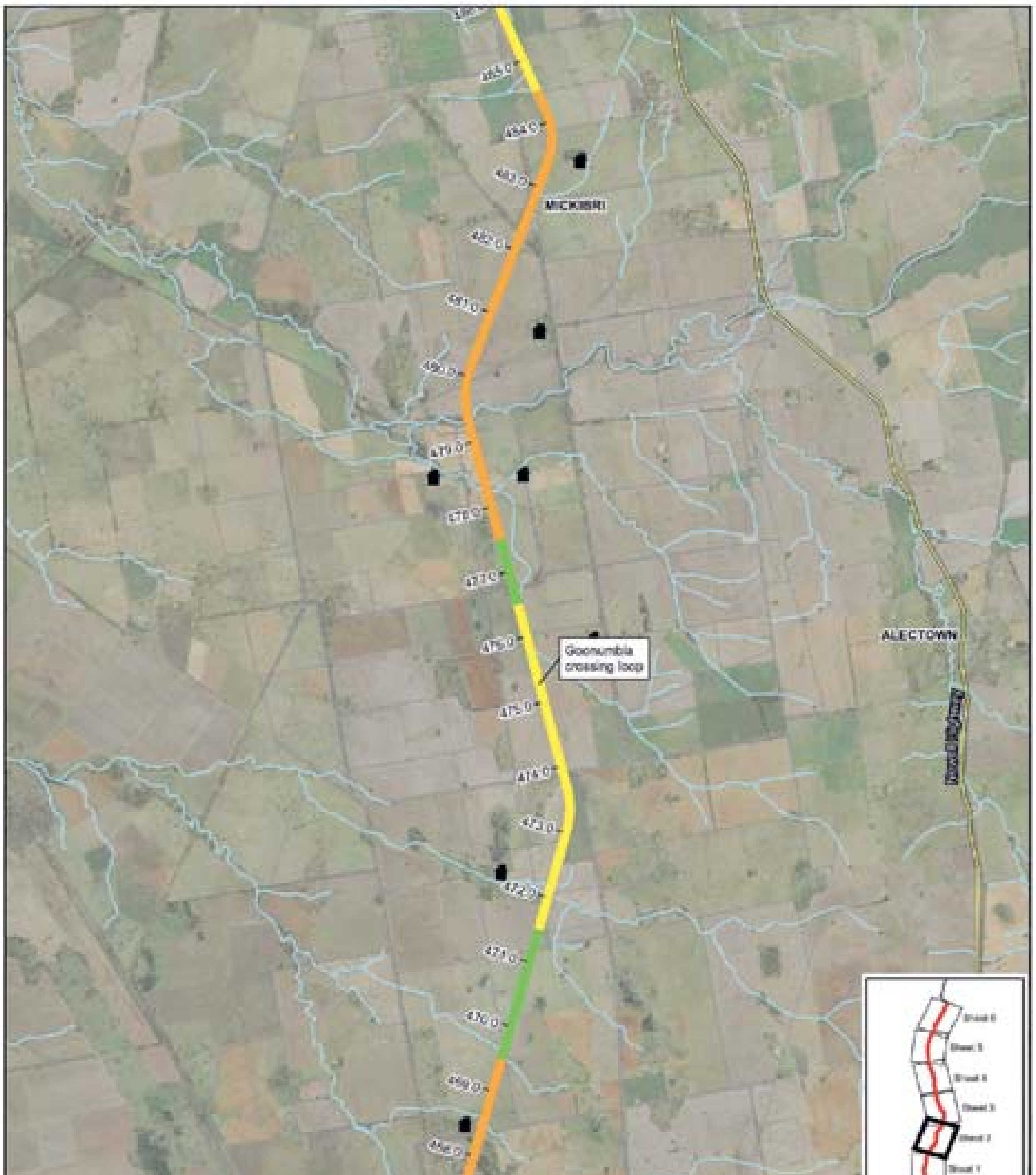
Date	19 Jun 2017

Visual Impact - Sheet 1

Figure 10



LEGEND

- Residences
- Cadastre
- M
- Watercourse
- L
- VL

Paper Size A4

0 500 1,000 2,000 3,000

Metres

Map Projection: Transverse Mercator

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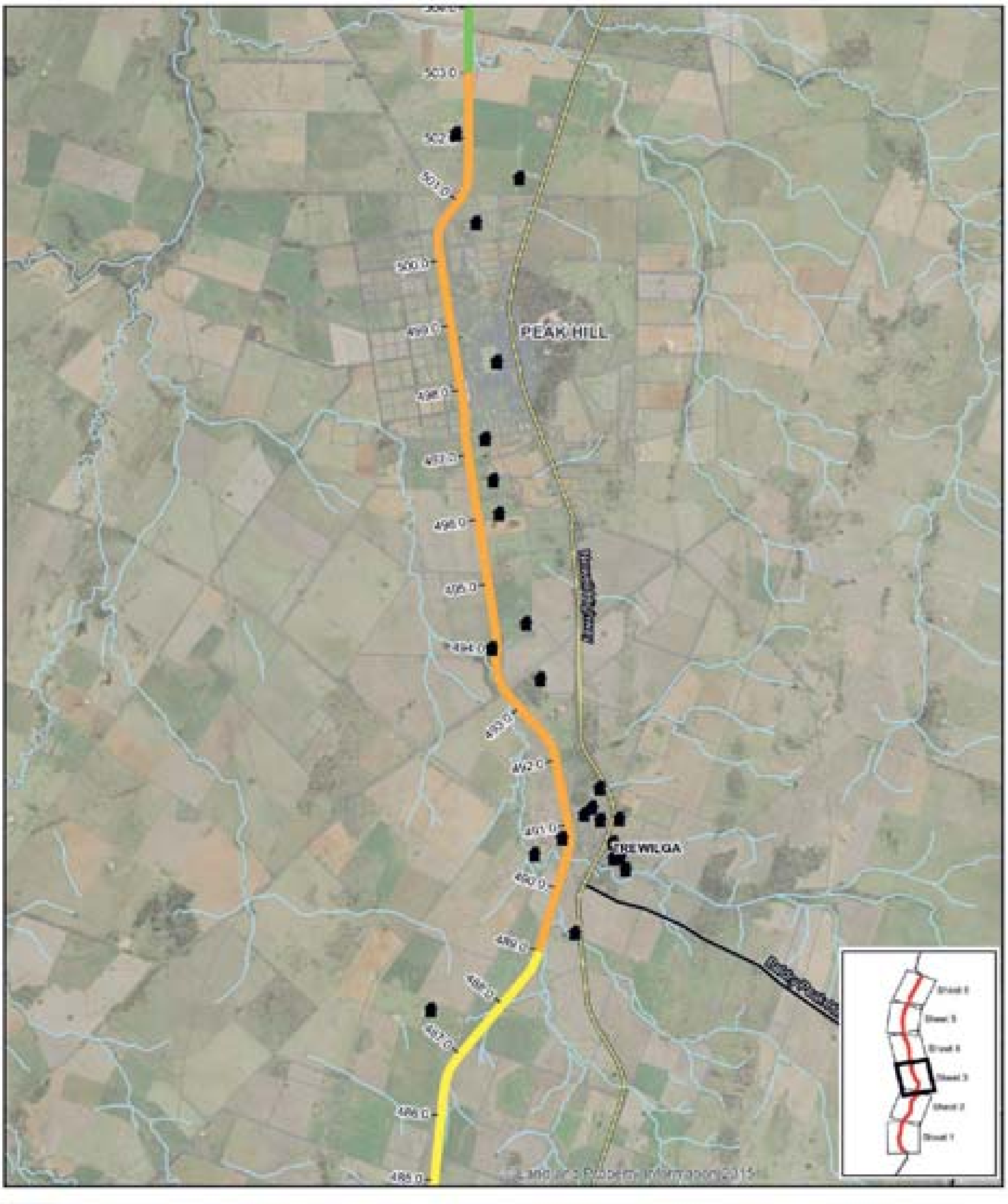
Date 19 Jun 2017

Visual Impact - Sheet 2

Figure 10



LEGEND

- Residences
- M
- L
- VL
- Cadastre
- Watercourse

Paper Size A4

0 500 1,000 2,000 3,000

Metres

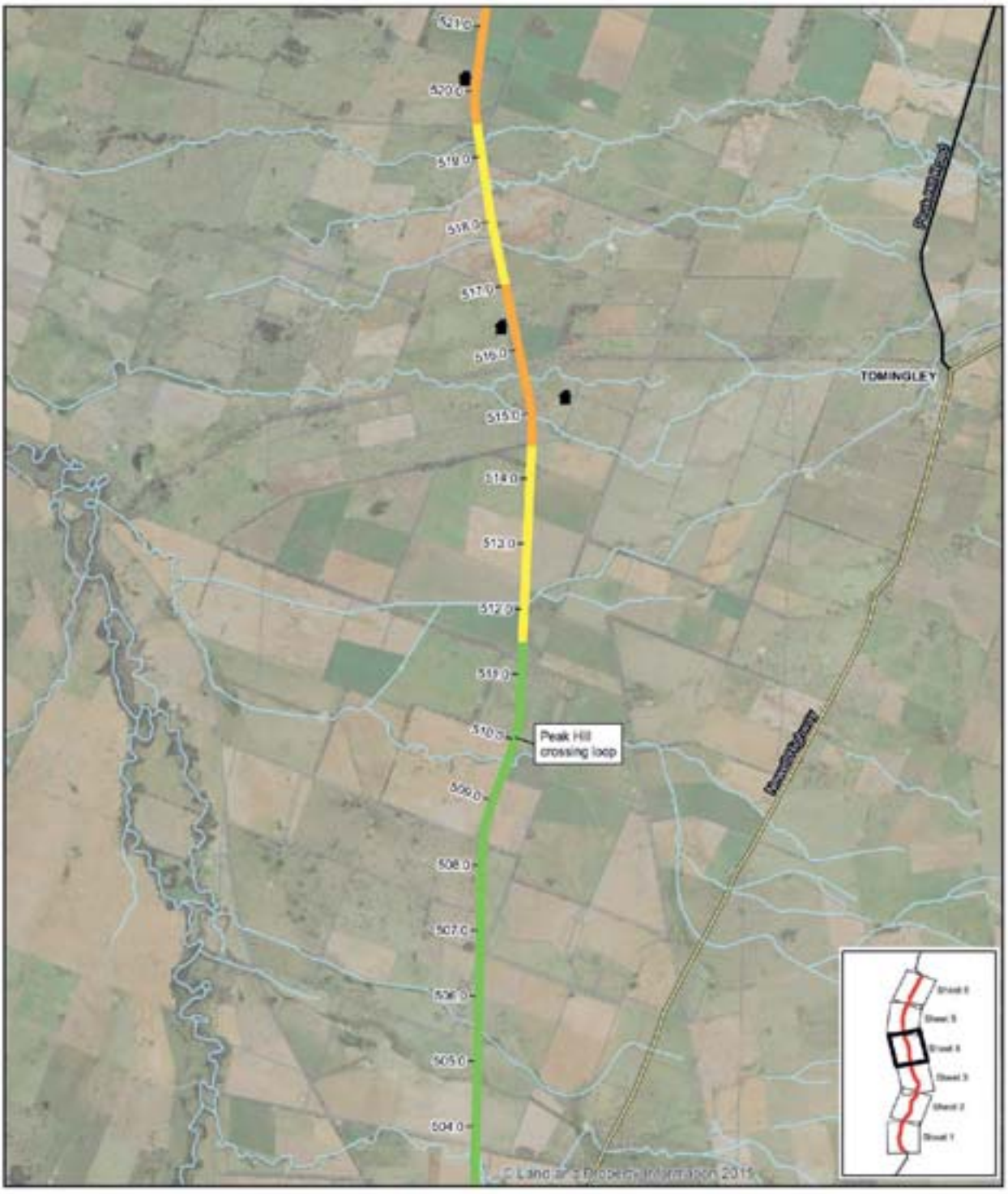
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number 22-17916
Revision 0
Date 19 Jun 2017

Visual Impact - Sheet 3

Figure 10



LEGEND

- Residences
- M
- L
- L-VL
- VL
- Cadastre
- Watercourse

Paper Size A4

0 500 1,000 2,000 3,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

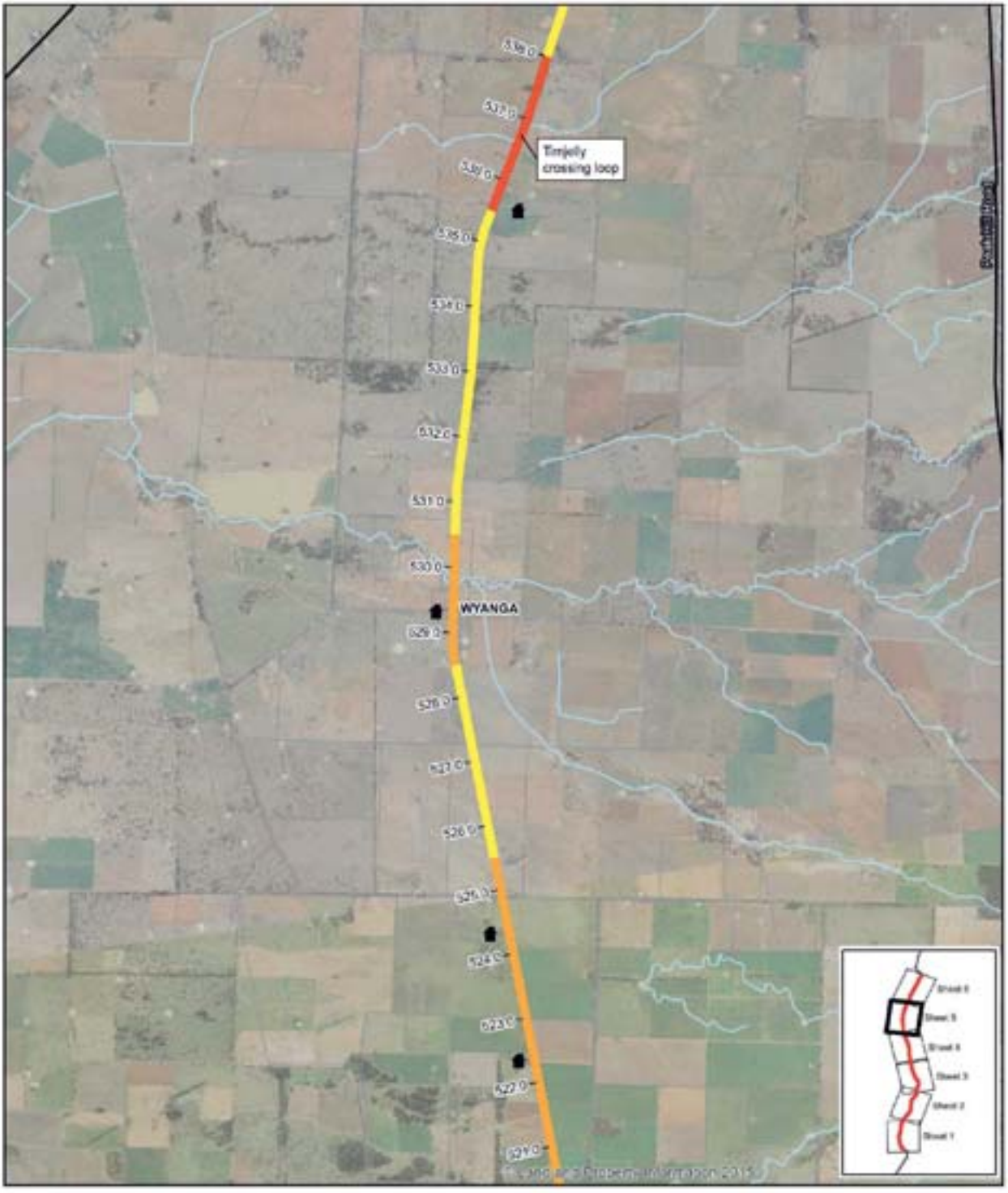
Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number 22-17916
Revision 0
Date 19 Jun 2017

Visual Impact - Sheet 4

Figure 10

Data source: LPI, DCDB, Imagery, 2015; Urbis, Visual Impact, Residences, 2016. Created by: gmcfarlane, rmelton, kjacobs



LEGEND

Residences
Cadastre
H
Watercourse
M
L

Paper Size A4

0 500 1,000 2,000 3,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

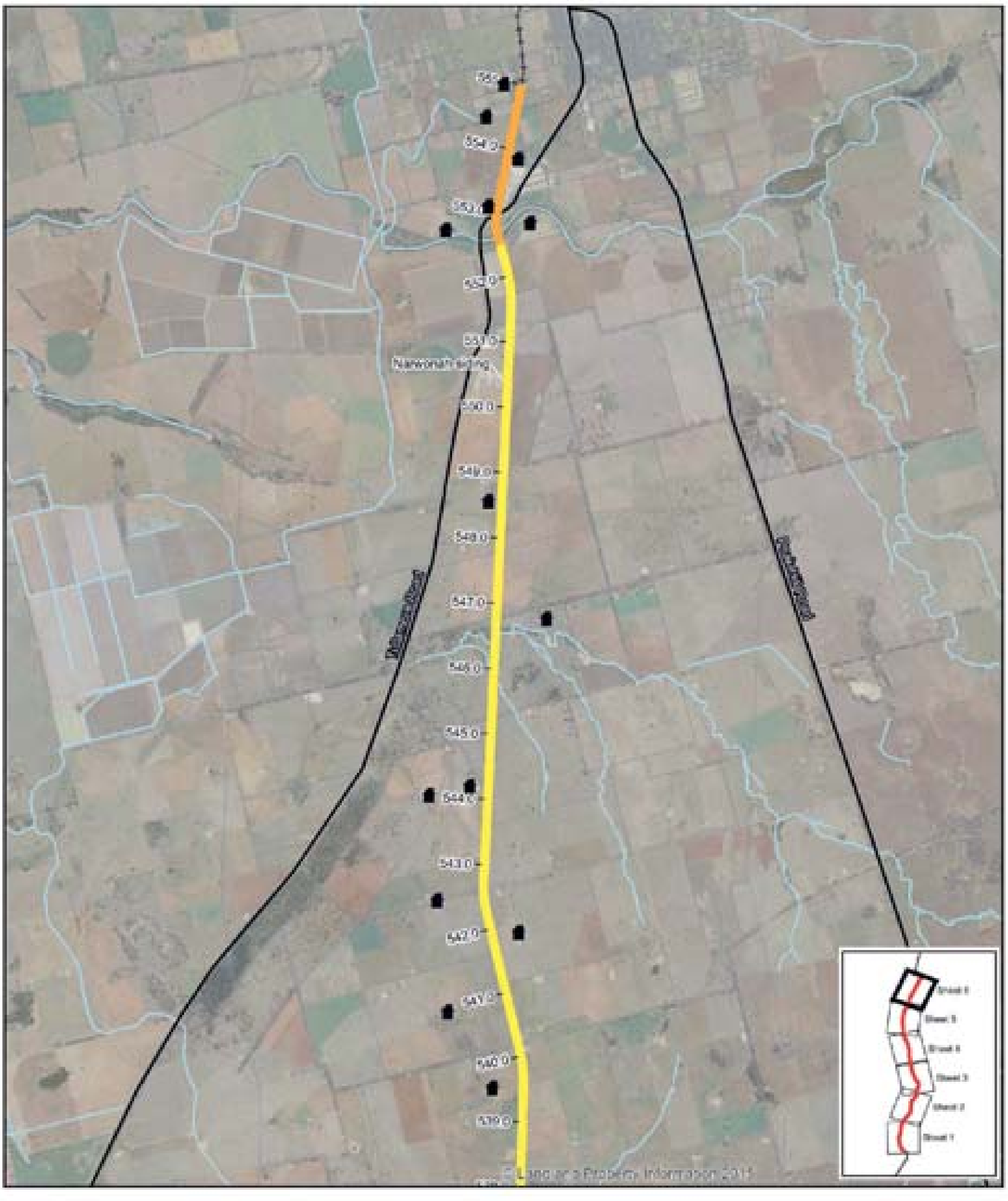
Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number 22-17916
Revision 0
Date 19 Jun 2017

Visual Impact - Sheet 5

Figure 10

Data source: LPI, DCDB, Imagery, 2015; Urbis, Visual Impact, Residences, 2016. Created by: gmcdiarmid, rmelton, kjacobs



LEGEND

- Residences
- Watercourse
- M
- L
- Cadastre

Paper Size A4

0 500 1,000 2,000 3,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail - Parkes to Narromine

Job Number 22-17916
Revision 0
Date 19 Jun 2017

Visual Impact - Sheet 6

Figure 10

7 Discussion of proposal impact

7.1.1 Visual sensitivity

Whilst the proposal primarily passes through broad acre agricultural land, the sparsely scattered rural residences generally result in a relatively limited number of highly sensitive receptors being located either in the local or sub-regional settings of the proposal. As a result, the generally low visual modification level of the proposal in these agricultural areas contributes to an overall low visual impact.

As the existing rail corridor has historically serviced the agricultural industry of this area, the townships of Parkes, Narromine and Peak Hill and smaller settlements are sparsely located within close proximity to the proposal. Therefore, these areas are assessed as having a high visual sensitivity due to residential land uses.

Areas assessed as being visually sensitive were located within proximity of the proposed Parkes north west connection, where higher visual modification levels were accompanied by higher visual sensitivity receptors, primarily residences, mostly occurring in the local and sub-regional context of the proposal. Whilst a high visual impact would result in this area, it should be noted there are only nine houses within 1 kilometre of the proposal.

Areas assessed as having a very low visual sensitivity level occur where the proposal passes through predominantly agricultural land with an absence of residences and major roads, or where roads occur only in the regional setting. Areas of moderate visual sensitivity occur where the proposal intersects main roads, such as Brolgan Road near Parkes, whilst typically gravel local roads have been assessed as having a low visual sensitivity level. Main roads within the proposal site are often lined with canopy trees offering visual and wind protection to properties throughout the agricultural landscape. Consequently, views from these roads are either filtered of screened by vegetation.

7.1.2 Visual modification

Between Parkes and Narromine the proposal is generally considered to result in a low level of visual modification due to the components of the proposal primarily consisting of the replacement of existing track and culverts. By comparison, moderate to high levels of visual modification levels are associated with the construction of new infrastructure outside the existing rail corridor.

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Examples of similar infrastructure, providing an indication of the visual appearance of these features, are included in **Pictures 13** to **15**. Once the detailed designs of the Parkes north west connection and the Brolgan Road overbridge have advanced to a sufficient level of detail, artist impressions would be prepared and used to support ongoing community consultation.

PICTURE 13 – EXAMPLE OF SIMILAR INFRASTRUCTURE – A RAIL LINE WITH ROAD OVERBRIDGE

PICTURE 14 – EXAMPLE OF SIMILAR INFRASTRUCTURE –ROAD OVERBRIDGE PAVEMENT VIEW

PICTURE 15 – EXAMPLE OF SIMILAR INFRASTRUCTURE –ROAD OVERBRIDGE SIDE VIEW

Whilst most of the proposal occurs where rail infrastructure already exists, there is a proposed increase in the elevation of the proposal vertical alignment by, in general, between 0.3 metres and 1.0 metre. Additionally, the replacement of old, weathered track with new hardware is likely to initially cause a visible change in the setting such as reflectivity and colour contrast of new materials. The re-instatement of existing track through open agricultural land will generally result in a low to very level of visual modification.

Ameliorated or rehabilitated spoil mounds will have an influence on the visual modification level of proposed track upgrades and crossing loops. At a maximum height of two metres, spoil mounds would provide visual screening of the proposed elements when viewed from the perpendicular. Whilst cess drains and spoil mounds will run adjacent to long expanses of the proposal, there will be gaps to allow water to drain away from the rail formation. Additionally, spoil mounds will range in height and, in some cases, may not occur on both sides of the proposal. Additionally, they will not be located in flood prone areas. Given the variability of height and location of spoil mounds, the visual modification level of the proposal has been assessed as “worst case” scenario and assumed that mounds would be visible in both parallel and perpendicular views. Detailed location, sizing and design of the mounds would be determined during the detailed design phase.

Generally, a crossing loop would result in a moderate visual modification level as a new parallel track is required to be constructed adjacent to existing tracks. However, in the case of the existing crossing loop near Alectown West, a very low visual modification level would result due to the most sensitive viewpoint being a single residence located 950 metres perpendicular to the proposal.

In the case of the Parkes north west connection, the resulting visual modification level would be generally moderate to high level due to it being a new rail connection, requiring vegetation removal and the construction of a new bridge structure at Brolgan Road providing grade separation for the link. With these major works occurring within close proximity to an urban setting, the visual modification level here will be higher than the remainder of the proposal, where generally limited visual change would occur, resulting in an overall high visual impact for the proposed Parkes north west connection.

7.2 Discussion of visual impact

The visual impact of the proposal between Parkes and Narromine is generally low, with a higher visual impact recorded at the south of the proposal due to the Parkes north west connection. Whilst considerable lengths of the proposal traverse a predominantly agricultural setting, a number of isolated sensitive viewpoints, for which a moderate visual impact results, occur where the proposal is located near rural residences or major or local roads.

Views towards double stacked trains, with a height of 6.5 metres, would be experienced from both agricultural and urban areas. However, these would be transient and experienced at speeds up to 110 kilometres per hour. The overall generally low level of visual impact has been derived from the low level of visual modification resulting from minor changes to an existing rail corridor, and a mix of typically low visual sensitivity levels given the rail corridor passes through a range of vast open agricultural land and small villages or townships.

During construction, the presence of spoil mounds with their raw earth coloured appearance will result in an increased level of visual modification. However, following mitigation and the establishment of a grassed covering, they are likely to contribute to visual screening of the proposal. As a result, the visual modification level will reduce and, consequently, also the level of visual impact.

7.3 Discussion of landscape impact

The existing conditions analysis of the landscape traversed by the proposal, classified the main landscape types as Settlement Landscape Character Zones or Agricultural Landscape Character Zones. As the scale of settlements varies, resulting in different characters at various settlements, characters were categorised as Township, encompassing Parkes and Narromine, or Village, describing the landscape of Peak Hill. The primarily agricultural landscape between the townships or settlements was classified as either Goonumbla Rolling Countryside or Bogan Marshland Plains (refer to ***Table 7***).

TABLE 7 – SUMMARY OF LANDSCAPE IMPACT

CHARACTER ZONE	SENSITIVITY OF USES	KEY WORKS IN ZONE	IMPACT SUMMARY	MODIFICATION TO THE SETTING	IMPACT RATING
Township	High	Culvert and track replacement generally raised between 0.3 metres and 1.0 metre.	Due to works occurring in an existing rail corridor, the proposal will have little impact to the landscape character of this zone.	Low	Low
Village	High	Culvert and track replacement generally raised between 0.3 metres and 1.0 metre.	Due to works occurring in an existing rail corridor, the proposal will have little impact to the landscape character of this zone.	Low	Low
Goonumbla Rolling Countryside	Low	Culvert and track replacement generally raised between 0.3 metres and 1.0 metre. Earthworks and	Generally, the landscape of this zone will experience a low landscape impact with little to no trees or vegetation needing clearing to accommodate track and	Moderate	Low to Moderate

		property impacts. Tree removal and local road impacts. Crossing loop at Goonumbla.	culvert replacement along an existing rail corridor or the new crossing loop. However, the Parkes north west connection component of the proposal will cause a moderate impact to the landscape, with the clearing of canopy trees required for the construction of the Brolgan Road overbridge.		
Bogan Marshland Plains	Low	Culvert and track replacement generally raised between 0.3 metres and 1.0 metre. Crossing loops at Peak Hill and Timjelly.	The magnitude of change in areas of track and culvert replacement will be low, due to change occurring along an existing rail corridor. Vegetation and tree clearing will result in a moderate impact to accommodate new crossing loops.	Low to Moderate	Low to Moderate

7.3.1 Settlement landscape character zone

7.3.1.1 Township

The landscapes of the townships are typically flat and comprised of buildings, associated structures and infrastructure and street trees. Consequently, the landscape has a high absorptive capability as ground level views are typically screened and there are limited opportunities for overlooking. Given most of the proposal occurs within an existing rail corridor, particularly at Narromine, a low landscape impact would result. Where present, canopy trees lining a number of main roads near townships, such as Henry-Parkes Way, provide further buffering through visual screening of urban areas along the rail corridor.

Within the Township setting, the main landscape impact occurs at the Parkes north west connection, such as the removal of canopy trees at Millers Lookout Road. With the trees removed, views of the Brolgan Road overbridge, a new urban structure in this rural landscape, would be possible, resulting in a noticeable change to the landscape setting in this area.

7.3.1.2 Village

With a landscape setting generally similar to that of the townships within the proposal site, and with a low visual modification level resulting from works occurring to an existing rail infrastructure, Peak Hill will also experience a low landscape impact. The landscape within this location has a high absorptive capability as the proposal traverses land already utilised for rail infrastructure.

Ultimately, the landscape character of the settlements will not experience a high landscape impact as the proposal will only result in a 250-400 millimetre increase in the vertical alignment of the rail formation. Such a limited amount would be difficult to perceive in the wider landscape. The existing rail corridor is a key element of the landscape in this character zone, with to the proposal resulting in a very low landscape impact.

7.3.2 Agricultural landscape character zone

7.3.2.1 Goonumbla rolling countryside

The Goonumbla Rolling Countryside consists of cleared and cultivated resulting in large expanses of flat, open plains with no important vantage points. The proposal in this zone will require minimal vegetation clearing. Therefore, a low landscape impact will result on the Goonumbla Rolling Countryside.

7.3.2.2 Bogan Marshland Plains

The Bogan Marshland Plains consist of a greater distribution and higher densities of vegetation. Clearing will be required to accommodate proposal, particularly the Peak Hill crossing loop.

The Peak Hill crossing loop is surrounded by low density, scattered vegetation while the site of the crossing loop closest to Narromine contains the most vegetation. The clearing of trees and vegetation would result a higher landscape impact.

Overall for this character zone, the generally low visual modification level will result in a minimal landscape impact.

8 Mitigation

The following recommended measures to mitigate visual impacts in the vicinity of viewpoints subject to high visual impact are outlined below.

8.1 Inland Rail – Parkes to Narromine existing rail corridor

8.1.1 New crossing loop with no, or minimal clearing required in lightly treed agricultural setting

As the proposal results in minimal changes to the existing character throughout this area, the mitigation action would be to replace existing vegetation, both surface, tree and shrub cover, where possible, within the proposal site.

8.1.2 Replacement of existing track through open agricultural land

Where the track is to be replaced, there will be no noticeable visual change to the setting. The views to the proposal will remain the same as at present and therefore, mitigation would not be necessary. However, as a minimum, where possible, existing ground surface vegetation disturbed by construction activities should be reinstated.

8.1.3 Treatment of spoil mounds

Spoil mounds resulting from the construction of cess drains should be shaped to reduce their angular profile and to ensure that they are better integrated within the landscape of the surrounding setting. Sharp transition angles in the surface profile should be avoided and rounded profiles used to provide a more natural form. Grass cover should be established over the entire spoil mound surface area.

8.2 Parkes north west connection

8.2.1 Grade separation in lightly treed agricultural land

For a relatively short section, the formation would result in a prominent new elevated structure in the landscape. These involve onsite amenity planting on the embankment and bridge approach, in conjunction with offsite screen planting within residential properties, subject to landowner agreement, to offset the background view which would reduce the degree of visual impact.

8.2.2 New track alignment through open agricultural land with earthworks and property impacts

Through some areas, the proposal would have a high visual impact. In areas where properties are impacted, both on and off site planting may be necessary.

As a minimum, on site screening in close proximity to the proposal would be necessary which would reduce the degree of visual impact.

In these instances, an offer could also be made to the land owner where foreground screening may assist in additionally screening views to the proposal.

8.2.3 New track alignment through scattered woodland with local road impact and tree removal

Any road realignment as a result of Parkes north west connection would be determined during the detailed design phase where further investigations and consultation with stakeholder will be undertaken.

While not a major visual issue, removal of trees at the Parkes north west connection would result in local landscape impacts and it is recommended to plant new trees to offset those that have been removed to facilitate the proposal.

8.2.4 Treatment of spoil mounds

Spoil mounds resulting from the construction of cess drains should be shaped to reduce their angular profile to ensure they are integrated within the landscape of the surrounding setting. Sharp transition angles in the surface profile should be avoided and rounded profiles used to provide a more natural form. Grass cover should be established over the entire spoil mound surface area.

9 Conclusion

9.1 Overview

Historically, a freight rail corridor has existed between Parkes and Narromine and, therefore, railway infrastructure has long been an element within the landscape setting and one with which local residents would have a high degree of familiarity with.

The majority of the proposal is located within an existing rail corridor, which will see 106 kilometres of existing track upgraded. Outside of this, the Parkes north west connection requires the construction of 5.3 kilometres of new track, formation and a grade separated road over rail.

There would be views experienced from both agricultural and urban areas towards double stacked trains, with a height of 6.5 metres. However, these would be transient and experienced at speeds up to 110 kilometres per hour.

9.2 Visual Impacts

Due to the relatively flat topography of the setting of the proposal, high visual impacts would be primarily confined to the local and sub-regional settings. Generally, the settlement landscape character areas record the highest levels of visual impact due to their proximity to the proposal within the local setting. Throughout the expansive agricultural landscape, the level of visual impact would generally be low due to the low density of rural residences, and their distance from the proposal.

Where isolated residences exist proximate to the proposal, these viewpoints would occasionally experience a high visual impact where the visual modification level is high to moderate.

The proposal entails the replacement of existing track and culvert replacement. In three instances, new crossing loops require minimal clearing of vegetation. With the crossing loops requiring the construction of an immediately adjacent parallel track, a higher level of visual modification would result than for the replacement of an existing track. The crossing loop near Timjelly would result in a high level of visual impact due to a nearby sensitive residence.

The Parkes north west connection will be located outside of the existing rail corridor, consequentially resulting in a high visual modification level. With 5.3 kilometres of new track located through agricultural land, and in some cases scattered woodland, a higher level of visual modification would result than for the proposal further north. Additionally, the proposed grade separated road over rail is the most visually prominent feature of the proposal, resulting in a high level of visual impact. However, despite the primarily high level of visual impact recorded for the Parkes north west connection, the recommended mitigation actions will gradually result in a reduction of impact over time.

In addition to the recommended mitigation actions, it is likely that sections of the proposal between Parkes and Narromine would receive a degree of visual screening as a result of the rehabilitation of the surface of spoil mounds with grassing. Over time as the grassed cover is established, the spoil mounds would assist in the proposal being absorbed into the wider landscape. As the extent of spoil mounds is not as yet known, it has been assumed that they will occur along the majority of the proposal.

Generally, low, with occasional isolated areas of moderate to high visual impact would result for proposal site.

9.3 Landscape Impacts

Similarly, to the visual impact of the proposal, there will be a generally low landscape impact for the majority of the proposal site, including villages or townships where no crossing loops are proposed.

With a variety of built form, vegetation and trees within a relatively flat landscape, the settlement character areas have been assessed as having a high level of absorptive capability. It is unlikely that height increases of 250-400 millimetres will be perceivable in townships and villages, ultimately not impacting the landscape setting.

A low to moderate landscape impact on the agricultural areas would occur due to the construction of three new crossing loops which, in some cases will require a small amount of vegetation clearing and earthworks to create a new rail embankment and accompanying cess drains and spoil mounds. However, the proposal, consisting primarily of the upgrading of existing tracks, would result in changes in the landscape setting that would be difficult to recognise, given they are relatively minor horizontal components in the wider landscape.

The proposed Parkes north west connection is likely to result in the highest landscape impact, with the proposal located outside of the existing railway corridor. The construction of new track and accompanying spoil mounds will result in a moderate landscape impact, while the proposed grade separation over Brolgan Road would result in high landscape impact. A small amount of canopy tree clearing would be required to accommodate the proposal in this location.

9.4 Mitigation

The recommended mitigation would result in a reduction of visual impact over time for the most sensitive viewing locations. With a generally low visual impact recorded throughout the expanses of agricultural land, which contains an existing rail corridor, the requirement for mitigation would be limited. However, where possible, new ground surface vegetation would reduce visual impacts resulting from the proposal.

The proposed Parkes north west connection, which contains an elevated structure, would require mitigation to screen proposal elements from sensitive viewing locations, including residences and regional roads.

9.5 Residual impacts

Table 8 summarises the visual impacts that are assessed as having a moderate or high residual impact ratings. These locations generally result in a reduction of visual impact due to the proposed mitigation.

TABLE 8 – SUMMARY OF RESIDUAL IMPACT

PROJECT COMPONENT	VISUAL IMPACT	RESIDUAL IMPACT
Crossing loop near Timjelly	High	Moderate
Parkes north west connection	High	Moderate

10 References

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Umwelt, 2016, ARTC Inland Rail – Parkes to Narromine Biodiversity Assessment Report

Photography and mapping credits:

(1-3) – Google Earth Street View

(4) and (5) –Inland Rail, Parkes to Narromine Historical Heritage Impact Assessment, p53

(6) –Inland Rail, Parkes to Narromine Historical Heritage Impact Assessment, p55

(7) –Inland Rail, Parkes to Narromine Historical Heritage Impact Assessment, p50

(8) – Inland Rail, Parkes to Narromine Biodiversity Assessment Report, p65

(9) – Photos from GHD

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TECHNICAL REPORT 11:
Socio-economic Assessment

Australian Rail Track Corporation

Inland Rail - Parkes to Narromine

Socio-economic Assessment

June 2017

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

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Executive summary

The proposal

Australian Rail Track Corporation Ltd (ARTC) is seeking approval to construct and operate the Parkes to Narromine section of Inland Rail ('the proposal').

The proposal would involve upgrading the existing rail line between Parkes and Narromine, including new crossing loops, some track realignment and replacement of culverts. The proposal also includes a new north to west connection between Inland Rail and the Broken Hill line (Parkes north west connection). Ancillary works will include upgrading, closing or consolidating level crossings, upgrading signalling and communications, establishing new fencing or upgrading existing fencing along the existing rail corridor, and relocating/protecting services and utilities.

This report

The proposal would result in both socio-economic benefits and impacts during the construction and operation periods. This social impact assessment (SIA) report identifies these benefits and impacts and recommends a range of best practice management and mitigation measures.

Benefits and impacts

Key social benefits would potentially include:

- Increased employment opportunities through demand for construction and operation workforce and business opportunities through demand for goods and services mainly during construction phase.
- Potential of reduced freight road traffic along regional and local roads as freight would be transported by rail during operation.

Adverse social impacts would include:

- Impacts on properties and landholders due to property acquisition and land access required during construction.
- Perceived or real anti-social behaviour of single, male, non-resident construction workers may be a concern for local communities. Anti-social behaviour has the potential to increase crime and adversely affect community perceptions of safety.
- Amenity impacts due to changes in noise levels, air quality, views and landscape during construction and operation are expected to be experienced by residents close to the proposal site especially at Parkes and Peak Hill and would reduce with increasing distance from the proposal.
- Impacts on community access and connectivity. However, given the proposal is located outside the larger towns of Narromine and Parkes, and to the west of Peak Hill, overall impacts on community access and connectivity during construction and operation are expected to be minor. Any potential traffic diversions or delays are expected to be experienced by very few community members.

Recommendations

It is recommended that the following measures be implemented to mitigate the potential socio-economic impacts of the proposal:

- Development and implementation of a local business and industry procurement plan that would include opportunities for local procurement and suppliers.
- Development and implementation of a workforce management plan to manage local and regional sourcing of the workforce and workers code of conduct.
- Development of individual property management agreements to manage potential construction impacts on landholders, where relevant.
- Development of a workforce housing and accommodation plan and consultation with accommodation providers and councils to manage accommodation availability.
- Development of a traffic, transport and access management sub-plan as part of the CEMP, in consultation with relevant stakeholders.
- Development and implementation of a safety awareness program to educate the community regarding safety around trains.
- Ongoing stakeholder engagement during detailed design, construction and operation.

1. Introduction

1.1 Overview

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. The Inland Rail programme (Inland Rail) involves the design and construction of a new inland rail connection, about 1,700 kilometres long, between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail would enhance Australia's existing national rail network and serve the interstate freight market.

Australian Rail Track Corporation Ltd (ARTC) has sought approval to construct and operate the proposal.

The proposal requires approval from the NSW Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report has been prepared by GHD Pty Ltd (GHD) as part of the environmental impact statement (EIS) for the proposal. The EIS has been prepared to accompany the application for approval of the proposal, and address the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 8 November 2016 and the terms of the assessment bilateral agreement between the Commonwealth and the State of New South Wales under the EPBC Act.

1.2 The proposal

1.2.1 Location

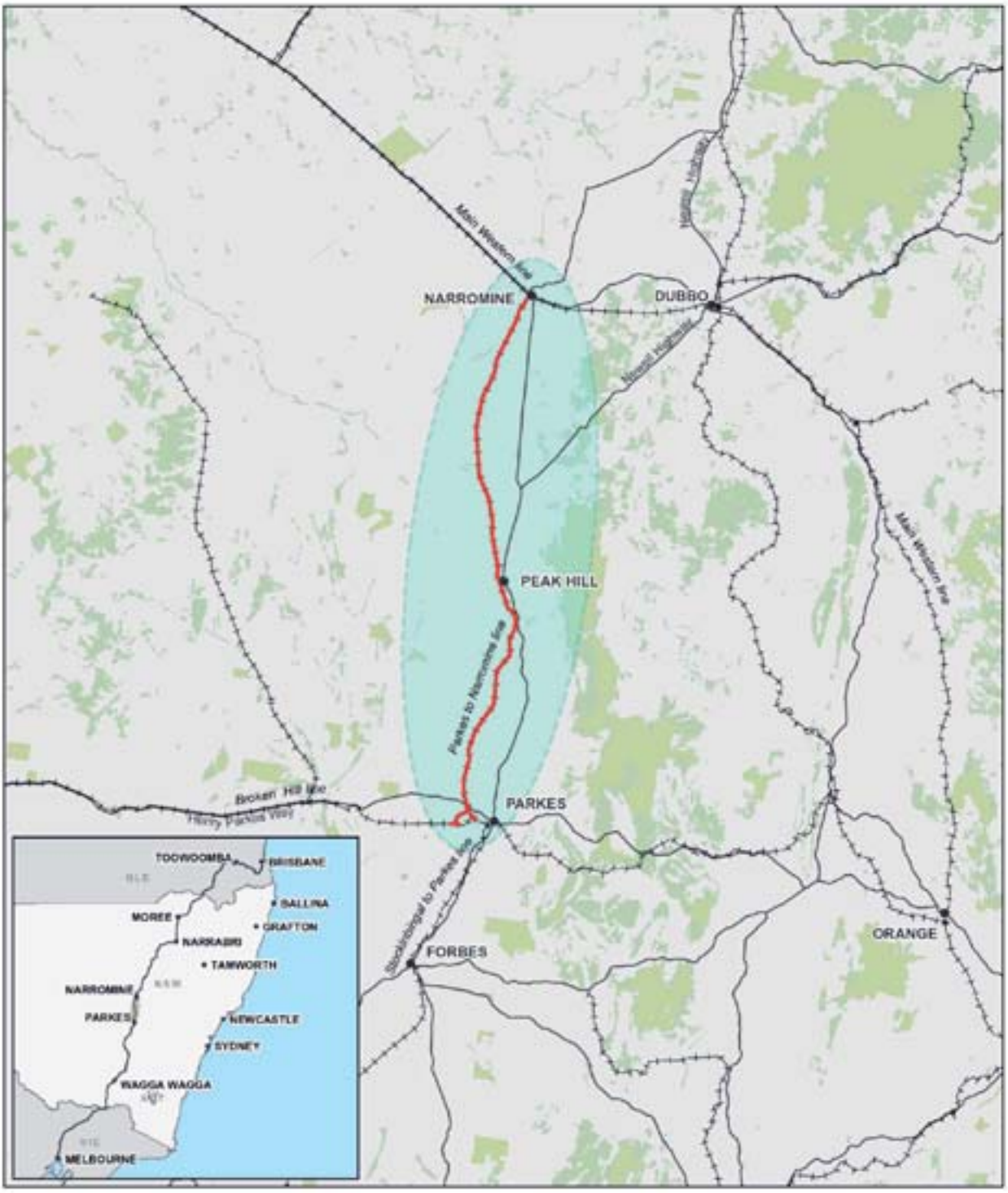
The proposal is generally located in the existing rail corridor between the towns of Parkes and Narromine, via Peak Hill. In addition, a new connection to the Broken Hill rail line ('the Parkes north west connection') is proposed outside the existing rail corridor at the southern end of the proposal site near Parkes. The location of the proposal is shown in Figure 1-1.

1.2.2 Key features

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 the radius of tight curves
- Providing three new crossing loops within the existing rail corridor, at Goonumbla, Peak Hill, and Timjelly
- Providing a 5.3 new 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 existing rail corridor at Brolgan Road ('the Brolgan Road overbridge').

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



LEGEND

- Proposal site
- Proposal location
- Rail lines
- Main roads

Paper Size A4

0 5 10 20 30

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

Australian Rail Track Corporation
Inland Rail Track Alignment

Job Number 2217516
Revision 0
Date 30 Nov 2016

Location of the proposal

Figure 1-1

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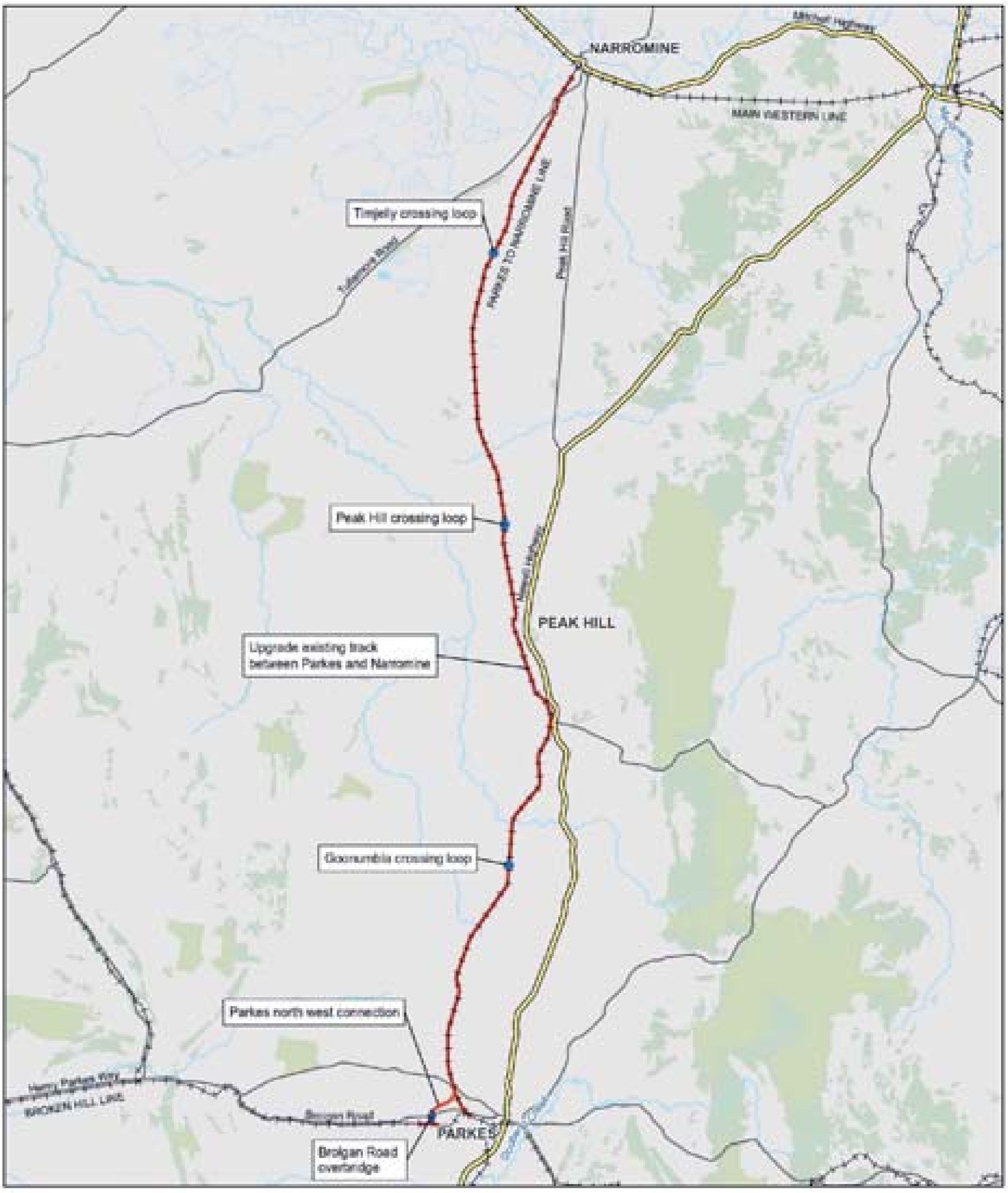
Data source: Commonwealth of Australia (Geoscience Australia), 1:500 K Topographic Data Series 3, 2006



LEGEND

- New bridge
- Crossing loop
- The proposal
- Railway
- Highway
- Road

Paper Size A4

0 2.5 5 10 15

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Australian Rail Track Corporation
Inland Rail Track Alignment

Job Number 2217516
Revision 0
Date 19 Jun 2017

Key features of the proposal

Figure 1-2

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

Further information on the proposal is provided in the EIS.

1.2.3 Timing

Subject to approval of the proposal, construction is planned to start in early to mid 2018, and is expected to take about 18 months. Existing train operations along the Parkes to Narromine line would continue prior to, during, and following construction. Inland Rail as a whole would be operational once all 13 sections are complete, which is estimated to be in 2025.

1.2.4 Operation

Prior to the opening of Inland Rail as a whole, the proposal would be used by existing rail traffic, which includes trains carrying grain and ore at an average rate of about four trains per day. 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. The trains would be a mix of grain, intermodal (freight), and other general transport trains.

1.3 Purpose and scope of this report

This report documents the process and outcomes of the socio-economic impact assessment (SIA) of the proposal. It addresses the socio-economic specific requirements of the SEARs, which requires (item 14) the proponent to 'assess social and economic impacts in accordance with the current guidelines'. The socio-economic impact assessment was undertaken in accordance with the guidance provided by the *Environmental Planning and Impact Assessment Practice Note: Socio-economic Assessment* (Roads and Maritime, 2013) (copy provided in Appendix A).

Specifically, this assessment:

- Establishes a social baseline for the social area of influence of the proposal, to understand the existing environment and form the basis to measure change or impacts.
- Identifies and assesses potential social and economic benefits and issues/impacts that may arise as a result of the construction and operation of the proposal.
- Proposes measures to avoid, minimise or mitigate the impacts and enhance the benefits.

1.4 Structure of this report

The structure of the report is as follows:

- Chapter 1 provides an introduction to the report.
- Chapter 2 describes the methodology and the policy and legislative context for the assessment.
- Chapter 3 describes the existing social and economic conditions of the social area of influence of the proposal.
- Chapter 4 identifies and describes the potential social impacts arising from the construction and operation of the proposal.
- Chapter 5 outlines the impact mitigation and management measures for the identified impacts.
- Chapter 6 provides a conclusion to the report.

2. Assessment methodology and policy context

2.1 Methodology

2.1.1 Overall approach

The SEARs require the SIA to be undertaken in accordance with *Environmental Impact Assessment Practice Note – Socio-economic Assessmen*t (Roads and Maritime, 2013) ('the Practice Note').

According to the Practice Note, the overall concerns of the SIA are mainly related to the following social indicators:

- How people live, work, play and interact with one another on a daily basis.
- How people move about their area for personal or business purposes.
- People's culture, including shared beliefs, customs and values, attachment to land and places, and sense of belonging.
- People's community, including the level of community cohesion, local character and sense of place.
- People's access to and use of community services, facilities and social networks.
- People's physical and psychological health and wellbeing, including stress levels, happiness and sense of security.
- People's fears and aspirations, including perceptions about safety and their fears about, and aspirations for, the future of their community.
- People's assets, such as property, housing or business.
- People's personal or business income and expenses.
- Employment, including location, availability and types of employment and labour force availability.
- People's environment, including the quality of the air and water people use, the level of hazard or risk, dust and noise they are exposed to and their physical safety.

It is acknowledged that the list above provides a generic overview of social indicators to be considered, however only those social indicators identified in the scoping and risk assessment for this SIA are deliberated further in this report through Sections 3, 4 and 5.

2.1.2 Detailed methodology

The tasks involved in the SIA are described below.

Identification of the social study area

The socio-economic benefits and impacts are often not contained within the proposal boundaries. Various factors are considered while determining the social area of influence. They include, but are not limited to:

- Areas that may experience adverse impacts from the proposal such as noise, dust and visual changes.
- Areas that may experience land use changes.

- Areas that may potentially supply goods and services and workforce to the proposal.

To capture the socio-economic influences of the proposal the social study area was defined as:

- Proposal site – includes the area shown in Figure 1-1, which is predominantly within the existing rail corridor.
- Social study area – this includes the local government areas (LGA) of Parkes and Narromine which are traversed by the proposal, with particular focus on the towns of Parkes, Peak Hill and Narromine, which are located close to the proposal site. The study area also includes Dubbo as it is a major regional centre located close to the proposal site (the regional context is shown in Figure 2-1).

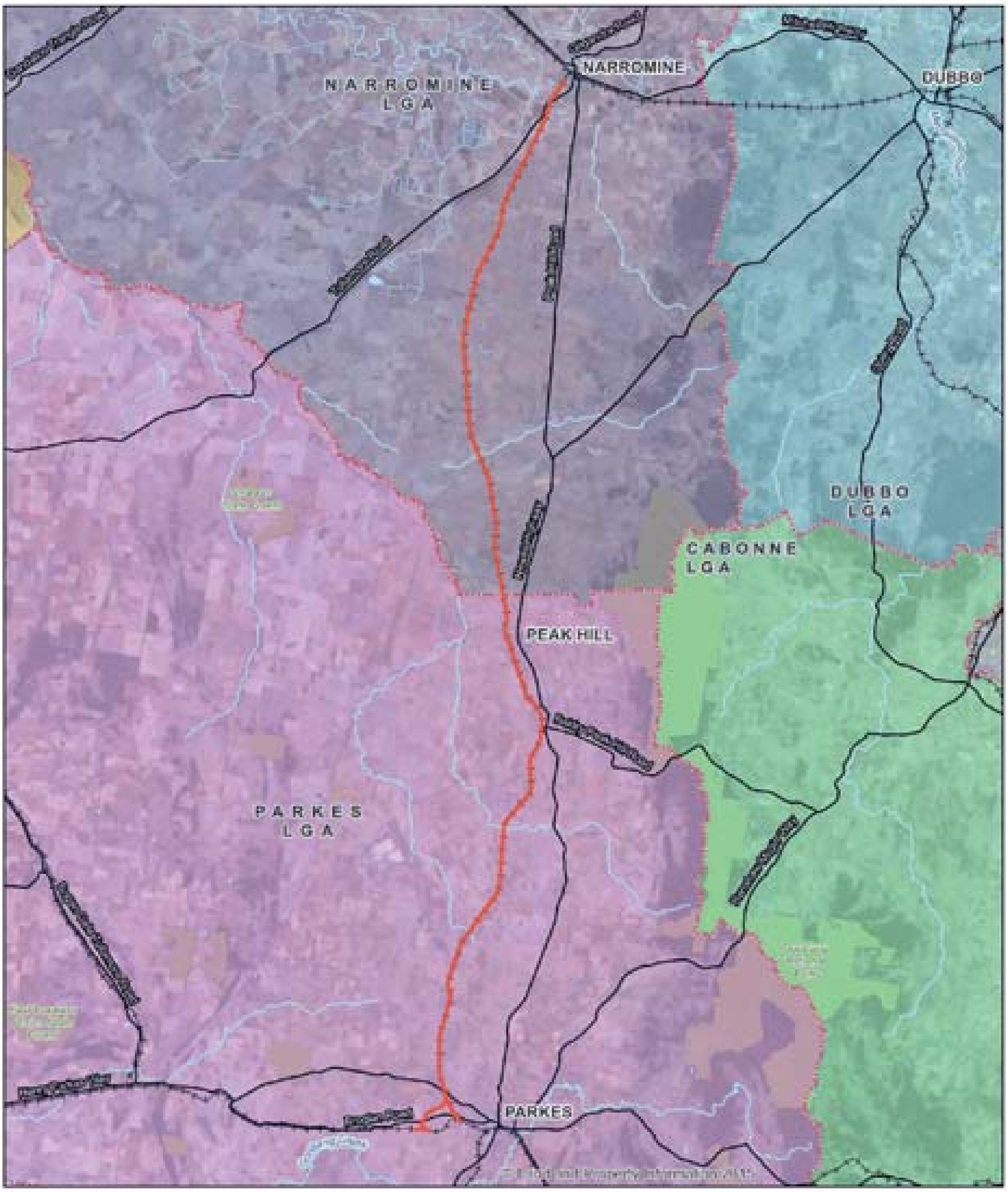
Scoping of socio-economic issues

To provide a framework for the SIA, an initial list of social issues and potential benefits relevant to the proposal was developed to inform the research and consultation. These impacts were based on an understanding of the proposal, other projects, and Practice Note (Roads and Maritime, 2013). The initial list of issues was augmented as other impacts were identified during the later stages of the SIA.

Literature review

The following documents were reviewed:

- The environmental impact statement (EIS) guidelines and legislative framework.
- Strategic plans and community plans for the study area (summarised in Section 2.2).
- The proposed Inland Rail (Parkes to Narromine) EIS.
- ARTC 2015 A Business Case for Inland Rail.
- Examples of socio-economic studies undertaken for other similar projects.
- Technical studies undertaken as part of the EIS:
  - *ARTC Inland Rail – Parkes to Narromine Hydrology and Flooding*, GHD 2017a.
  - *ARTC Inland Rail – Parkes to Narromine Water Quality Assessment*, GHD 2017b.
  - *ARTC Parkes to Narromine Inland Rail Noise and Vibration Assessment*, GHD 2017c.
  - *Australian Rail Track Corporation Inland Rail – Parkes to Narromine Traffic, Transport and Access Assessment*, GHD 2017e.
  - *ARTC Inland Rail – Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment,* Umwelt 2017a.
  - *ARTC Inland Rail – Parkes to Narromine Aquatic Ecology Assessment,* Umwelt 2017b.
  - *ARTC Inland Rail – Parkes to Narromine Biodiversity Assessment Report,* Umwelt 2017c.
  - *Australian Rail Track Corporation Inland Rail – Parkes to Narromine Landscape and Visual Assessment*, Urbis 2017.



LEGEND

- The proposal
- Railway
- Reserves
- Cabonne LGA
- Dubbo LGA
- Lachlan LGA
- Narromine LGA
- Parkes LGA

Paper Size A4

0 2.5 5 10 15

Kilometers

Australian Rail Track Corporation
Inland Rail Track Alignment

Job Number | 2217016
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Regional context

Figure 2.1

Developing the social baseline

A description of the existing social characteristics and community dynamics was compiled to form the basis for predicting or measuring the potential social benefits and impacts of the proposal. The existing social environment (also referred to as the social baseline) was developed for the social study area. The social baseline describes the following community characteristics and issues:

- Community lifestyle, values and aspirations.
- Demographic characteristics, including population, age and gender, indigenous population, family composition, housing, full-time equivalent worker population and per cent of non-resident workers, occupation and industry of employment, income.
- Social and community infrastructure, including health services and facilities, community support services, education and training facilities.

Data and information for the social baseline were gathered from the following sources:

- Australian Bureau of Statistics (ABS) Census 2011 data.
- Websites and publications of councils in the social study area.
- NSW Government agencies.
- Information from stakeholder consultation, site visits, and information from other technical studies undertaken as part of the EIS.

Population projections were sourced from the NSW Department of Planning and Environment forecasts for each LGA. These projections are based on assumptions taking into account recent and current trends for births, deaths, and migrations.

SIA stakeholder consultations

Stakeholder consultation with relevant agencies were undertaken by ARTC. Consultation took place with staff responsible for social and economic planning/development, development/ maintenance of open spaces and recreational areas, and urban planning, at Narromine Shire Council and Parkes Shire Council. GHD also consulted with Narromine Shire Council on 20 June 2016 and Parkes Shire Council on 27 June 2016 to further inform this SIA. The outcomes of this consultation are incorporated into this SIA.

Identification and assessment of social benefits and impacts

In this SIA, the definition of social impacts is based on the Practice Note. This defines social impacts as issues associated with a planned intervention that affect or concern people due to actual or perceived social changes invoked by the intervention. It includes any aspect of human life and its environs as long as it is valued or considered important by people who would directly or indirectly experience the change.

It should be noted that perceived impacts are as important as actual (measurable) impacts, as people may modify their behaviours or experience discomfort simply because of a perceived impact. Therefore, references to social impacts throughout this assessment refer to both actual impacts and perceived impacts.

To predict social benefits and impacts, this SIA adopts the precautionary and uncertainty principles (IAIA, 2015). With regards to the precautionary principle, this means that even though some impacts were not fully confirmed, they were still considered as part of the assessment. By adopting the uncertainty principle, there is recognition that the predicted impacts may change from place to place and people to people over time, due to ever-changing social processes and as knowledge of these social processes increases.

The predicted impacts were identified based on the social conditions (including trends and forecasts) in the social study area at the time the SIA was undertaken (May-November 2016). It is recognised that the predicted social impacts and their assessment may change with any alterations to the socio-economic and political context, or as stakeholder perceptions change over time as more information about the proposal is available. The social impacts may also change once the proposal is being constructed, and when it begins operation.

In light of the variables described above, the process of impact prediction was made robust through data triangulation, in which the SIA team used multiple sources of information to identify the social impacts. Impact identification was informed by:

- Using the outcomes of the ARTC stakeholder consultation.
- Proposal information available at the time, the social baseline of the study area, and the scoping of social issues carried out by the SIA team.
- A literature review of social impact assessments of similar projects, community and regional plans for the study area, and relevant information/documents shared by stakeholders.
- Other technical studies prepared for the EIS, as listed in literature review section (Section 2.1.2).

The impact categorisation and risk rating was based on the environmental risk assessment process for the EIS. As per this process, social risks were identified and then categorised as:

- Positive impact/benefits – where the impacted stakeholders would be 'better off' or would benefit due to the proposal.
- Negative impacts – where the impacted stakeholders would be 'worse off' due to the proposal.

The benefits and impacts were then further assessed to determine their significance, using the 'impact likelihood and consequence' framework (refer to the EIS for further information). Those risks that were identified to be 'moderate' to 'high' are detailed in Section 4. Some perceived risks of lower rating are also discussed in Section 4.

Social impact management strategies

The social impact management strategies outlined in this report seek to both enhance the benefits for stakeholders and communities, and mitigate negative impacts from the proposal. The SIA also draws upon the various EIS technical studies (as listed in the literature review Section 2.1.2) for mitigation/management of specific impacts.

The management strategies were developed using adaptive management principles recognising that impacts may change over time, and that ongoing monitoring of impacts would provide the flexibility to accommodate such changes.

2.2 Planning and policy context

There are a number of statutory and non-statutory regional and community plans relevant to the social study area that provide strategic advice and guidance to regional development. These plans were reviewed to provide an understanding of the broader context of the region. The results of the review are summarised below.

2.2.1 Economic planning

The social study area is covered by two regional development plans prepared by Regional Development Australia: *Central West Regional Plan 2013 – 2016* (RDA Central West, 2013) and the *Orana Regional Plan 2013 – 2016* (RDA Orana, 2015). The Central West Regional Plan is also supported by the *NSW Central West Freight Study* (RDA Central West, 2014).

The NSW Government's *Economic Development Strategy for Regional NSW* (NSW Department of Trade and Investment, 2015) also applies to the study area.

At a local level, economic development is considered within the community strategic plans for the Parkes and Narromine LGAs.

2.2.2 Community planning

Community Strategic Plan: Narromine Shire 2023

In the *Community Strategic Plan: Narromine Shire 2023* (Narromine Shire Council, 2013), the shared vision is stated as: "a highly desirable place to live, work and conduct business, and where shire residents care for one another and the natural environment". Council values support and guide this vision, which include:

- Encouraging new business development
- Not competing with commercial service providers
- Being willing to consult with the community
- Maintaining the safety of Shire residents and visitors
- Placing a high value on the proper management, protection and restoration of the natural environment.

The plan also responds to a number of significant future challenges such as climate change, an ageing population, changes in the agricultural industry, and State and federal government policy changes.

Community consultation was undertaken in 2008 for the Community Strategic Plan. The consultation showed that the people of Narromine Shire are interested in improvements to intra-shire governance and events, such as by developing the showground and by holding regular meetings with town committees. Waste, water and land management were also seen as key to developing local business and agriculture.

Parkes Shire Council: Community Strategic Plan 2022

The Parkes *Community Strategic Plan 2022* (Parkes Shire Council, 2013) provides a vision for Parkes Shire and recommends strategic objectives and future directions to meet this vision.

As per the Plan, by 2022, Parkes Shire aims to be 'a progressive regional centre, embracing a national logistics hub with vibrant communities, diverse opportunities, learning and healthy lifestyles'.

To achieve this vision, eight future directions were developed for the community:

1. Develop education and lifelong learning opportunities.
2. Improve health and wellbeing, including maximising public safety.
3. Promote, support and grow our communities.
4. Grow and diversify the economic base.
5. Develop Parkes as a national logistics hub.

6. Enhance recreation and culture.

7. Care for the natural and built environment in a changing climate.

8. Maintain and improve the Shire's assets and infrastructure.

Of particular relevance to this proposal is future direction five. Parkes Shire Council views the development of Inland Rail as beneficial in helping Parkes develop as a national logistics hub. The transfer of freight volumes from road to rail is seen as a key benefit of the proposal.

2.2.3 Land use and transport planning

Draft Central West and Orana Regional Plan

The *Draft Central West and Orana Regional Plan* (Department of Planning and Environment, 2016) (the draft plan) is a consolidated strategic plan prepared for the 20 local government areas in the Central West and Orana region, and includes the Parkes and Narromine LGAs.

The draft plan outlines a number of challenges facing the region, such as its ageing population, increasing freight volumes and climate change. A regional vision is presented of a sustainable future based on diverse economic industries, helping to service a healthy environment and strong, resilient communities.

The draft plan presents four goals with associated actions to help achieve this vision. These goals are:

- A growing and diverse regional economy.
- A region with strong freight transport and utility infrastructure networks that support economic growth.
- A region that protects and enhances its productive agricultural land, natural resources and environmental assets.
- Strong communities and liveable places that cater for the region's changing population.

Central West Regional Transport Plan, 2013

Key relevant points presented in the plan include:

- Implications for the transport network due to the specific population, employment and land use characteristics of the region including: slowly growing population, ageing population, employment clustered in major centres, existing and future freight movements, social disadvantage, dispersed population, road safety, and seasonal tourism.
- Regional initiatives are already underway. These include: Traffic Management Road Safety Program, Country Passenger Transport Infrastructure Grant Scheme, Transport Access Program and Better Boating Program.
- Investing in rail freight facilities and infrastructure is identified as an action. At the time the plan was published, ARTC was undertaking the feasibility study for Inland Rail to support the efficient movement of rail freight through the Central West region and avoid freight having to use coastal routes.

Other actions focus on investing in the road network and upgrades, and improving road safety, passenger rail and bus services. Improving pedestrian and cycling opportunities within centres and towns is also a key focus of the plan.

Other relevant strategic planning documents are described in the EIS.

3. Existing environment

3.1 Proposal site

With the exception of the Parkes north west connection, the majority of the proposal would be undertaken within the existing rail corridor for the Parkes to Narromine line.

The southern end of the proposal site starts just west of Parkes near where Brolgan Road crosses the existing rail corridor, about 3.5 kilometres from Parkes Station and the town centre. The Parkes north west connection is proposed at the southern end of the proposal site, near Parkes and the proposed Parkes Logistics Hub. This would provide a connection between the existing Broken Hill line and the existing Parkes to Narromine line.

From the northern end of the Parkes north west connection, the proposal site extends through rural lands along the existing rail corridor. It follows a roughly north–south direction for a distance of about 51 kilometres through the localities of Nanardine, Goonumbla and Trewilga (near the Newell Highway) to Peak Hill. The existing rail corridor passes through the western outskirts of Peak Hill to the west of the main residential area and about 90 metres from the main street of Peak Hill. It is located about 980 metres west of the Newell Highway (which passes through the eastern side of the town).

From Peak Hill, the proposal site extends through rural lands along the existing rail corridor. It follows a roughly north–south direction for a distance of about 58 kilometres through the localities of Tomingley West and Wyanga to Narromine.

The northern end of the proposal site is just south of where Old Blackwater Road crosses the existing rail corridor about 500 metres west of the town, and about 1.1 kilometres south west of Narromine Station. Dubbo city is a major regional centre located close to the proposal.

The proposal site is located in a rural/agricultural landscape, with areas of concentrated urban development in nearby towns and villages. Residents of rural and agricultural areas around the proposal and in the social study area enjoy a quiet rural lifestyle and rural landscape.

3.2 Land use in the social study area

The social study area is dominated by agricultural land uses, with significant cotton, wheat, and livestock industries. The proposal site traverses a predominately rural area, and is surrounded by large rural properties that are used for agriculture and grazing. In the Parkes and Narromine LGAs, 90 per cent of land use is dedicated to agriculture, with cropping and grazing the main land uses. Natural areas and forestry make up the remainder along with mining, residential, commercial, and utility usage.

Cropping consists of both dry-land and irrigated agriculture with the main crop being wheat. Grazing land is split between improved pasture and other pasture types with just under half being sown to improved pastures. Beef cattle and sheep (prime lambs and wool) are the main livestock enterprises. A number of grain storage and handling facilities are located in various locations along (adjacent to) the proposal site.

The majority of the study area has been cleared of the original vegetation. Scattered patches of remnant vegetation remain, mainly in the vicinity of watercourses. There are scattered paddock trees in various locations throughout the study area.

Other key features and land uses in the vicinity of the proposal site are:

- Parkes National Logistics Hub, which adjoins the southern end of the proposal site.
- Grain storage and handling facilities along (adjacent to) the proposal site.
- The former Peak Hill Open Cut Gold Mine situated about 1.5 kilometres east of the proposal site.
- Goobang National Park located about nine kilometres east of the proposal site (near Peak Hill), which includes walking trails, campgrounds, amenities, barbecues and picnic facilities.

3.3 Transport in the social study area

The road network consists mainly of local roads and private rural roads. The main roads include the Newell Highway and Henry Parkes Way. There are 71 level crossings (33 public and 38 private) located along the proposal site.

A small number of passenger rail services travel through the southern end of the study area. The Indian Pacific travels between Sydney and Perth and stops at Parkes twice a week. The Broken Hill Outback Explorer service, run by NSW TrainLink, travels to Broken Hill from Sydney on Mondays and from Broken Hill to Sydney on Tuesdays.

The Parkes to Narromine line is used by grain trains at an average rate of two to three trains per day. Annually, these trains carry about two million tonnes of grain per year. Trains using the line have a maximum length of 1800 metres. Train speeds are limited to a maximum of 90 to 100 kilometres per hour, with local speed restrictions due to limitations associated with the existing track.

Parkes is strategically located at the intersection of the Inland Rail north–south and east–west links (Parkes Shire Council, 2016b). To maximise the potential economic benefits from Inland Rail, Parkes Shire Council has developed the Parkes National Logistics Hub, a multi-modal transport facility. The Parkes Hub is designed to operate 24 hours a day, seven days a week to meet future freight needs. It comprises 516 hectares of agricultural and industrial land on the western edge of the town with an additional reserve of over 100 hectares.

3.4 Proximity to Dubbo

Dubbo, which is located about 45 kilometres west of Narromine, is a regional service centre for the Central West and Orana regions. Dubbo services a catchment of over 120,000 people which may include communities within the social study area (Dubbo Regional Council, 2013). In 2012, Dubbo had a population of 40,491 persons.

In addition to traditional rural industries, other industries in Dubbo include retail, health services, manufacturing, tourism, education and professional services. Dubbo has a number of regional community facilities, in particular health facilities, that may be accessed by towns within the study area such as Narromine and Peak Hill (71 kilometres south). These include Dubbo Base Hospital, Lourdes Hospital, and Dubbo Community Health Centre.

Dubbo City Regional Airport provides over 180 flights each week to and from Dubbo, Sydney, Brisbane, Melbourne, Newcastle, Cobar and Broken Hill (Dubbo City Regional Airport, 2016). Communities within the study area and the future Inland Rail workforce would likely access this airport to connect to major cities.

Dubbo has approximately 70 accommodation facilities with 4,500 beds, which cater to the tourism industry as well as overflow demand for temporary workforce in the region. Dubbo City Council and accommodation providers in Dubbo have formed an informal network that the Council facilitates, to discuss upcoming projects and events.

3.5 Key socio-economic characteristics

3.5.1 Narromine local government area

Narromine LGA covers about 5,224 square kilometres and has an estimated resident population of 6,822 (as of 2015). The population lives across the three urban centres of Narromine (3,500), Trangie (800), and Tomingley (50) as well as surrounding rural areas (REMPLAN, 2016).

Economy

Based on the *Community Strategic Plan: Narromine Shire 2023,* the Narromine LGA's major industry is agriculture, representing over 28 per cent of economic output, with citrus farming grain crops, livestock, wool and cotton (Narromine Shire Council, 2013). Rental, hiring and real estate services, manufacturing and wholesale trade are the next largest industries, representing 11.6, 8.1 and 7 per cent of economic output respectively (REMPLAN, 2016).

In terms of employment generated, agriculture is also the largest industry, generating 32 per cent of jobs, whilst healthcare and social assistance, retail trade, and education and training each generate a greater proportion of employment than economic output, representing 10.8, 10 and 9.7 percent of employment, respectively (REMPLAN, 2016).

The output generated by the Narromine economy is estimated at $597.8 million in 2015. Narromine represents 4.2 per cent of the $14 billion in output generated in Orana, and 0.06 per cent of the $1 trillion in output generated in New South Wales. Agriculture, forestry and fishing is the largest industry in terms of economic output at $169 million and employment, with a quarter (25 per cent) of the LGA's workers employed in the industry (Narromine Shire Council, 2013).

In addition to its agricultural industry, Narromine is also known for being a centre of aviation. The first plane landed in Narromine in 1919 and the town hosts Australia's oldest aviation club. In World War Two (WWII) the RAAF established the No. 5 Elementary Flying Training School at the Narromine Aerodrome. Since that time, Qantas has used Narromine as a training centre for many of its pilots (Narromine Aviation Museum, 2010).

Natural features

Major features of the LGA include Goobang National Park, the Bogan River, the Macquarie River, and several State forests.

Roads

The Shire is served by the Mitchell Highway and the Newell Highway.

Narromine town

Narromine has a population of 3,789 people and is the biggest commercial centre within Narromine Shire (Narromine Shire Council, 2013). In addition to agriculture (25.4 per cent), industries such as healthcare (11 per cent) and retail (9.2 per cent) are common employers, as are education and training (8.7 per cent), construction, and transport, postal and warehousing (both 5.8 per cent).

Table 3-1 provides a demographic overview of Narromine town and the Narromine LGA as at the 2011 census.

Table 3-1 Narromine town and LGA demographic overview

Data type	Narromine town, 2011	Narromine LGA, 2011
Population	The population was 3,789 people, comprising 57.5% of the LGA population. Narromine's population increased by 190 people from 2006.	Narromine LGA's population increased slightly from 2006 by 77 people (6,508 to 6,585). In 2015, REMPLAN estimated that the population of Narromine LGA was 6,822 people. The projected population is 6,200 by 2036 (DPE, 2016) representing a declining population from 2015.
Age and gender	The gender divide was about even at 48.0% male and 52.0% female, similar to the LGA. The median age was 38 years, similar to the LGA. The proportion of school aged residents (19.2 %) and older residents (24.3 % aged 60 years and over) is comparable with that of the LGA The town had a similar age profile to the LGA.	There was an even gender divide of 50.0% male and 50.0% female. The median age was 39 years. The proportion of school aged residents was 19.4 % and older residents was 23.8 % (aged 60 years and over).
Indigenous population	The indigenous population of 915 people comprised 24.1% of the population, slightly greater than the LGA.	Indigenous people represented 19.6% of the population. State-wide and nationally, indigenous people make up 2.5% of the population.
Family composition	Family households were the dominant household type at 68.5%, similar to the LGA. There were 993 families within Narromine. Similar to the LGA, couple families with and without children were the dominant family types, comprising 36.4% and 37.6% of all families in Narromine, respectively. There was a slightly greater proportion of single parent families within Narromine than the LGA at 24.3%. This was higher than in wider Australia, where one-parent families comprised 15.9% of all families.	Family households were the dominant household types at 69.7%. Couple families with and without children were the dominant family types comprising 38.1% and 40.3% in the LGA respectively. The proportion of single parent families was 20%.
Housing	There was a slightly lower proportion of dwellings owned outright, compared to the Narromine LGA at 36.7%. The proportion of dwellings owned with a mortgage was 30.5% for Narromine, similar to the LGA. 30.5% of all privately occupied dwellings were rented in Narromine, similar to the LGA. The median monthly mortgage repayment in Narromine was $1,092, slightly higher than the LGA. Residential vacancies in October 2016 in the Narromine post code were at 1.1 % with 7 available properties (SQM Research, 2016). Weekly rent was higher in Narromine than the LGA at $168.	40.0% of dwellings were owned outright. 29.8% of dwellings were owned with a mortgage. 29.8% of all privately occupied dwellings were rented. The median monthly mortgage repayment was $1,083. Weekly rent was $145.

Data type	Narromine town, 2011	Narromine LGA, 2011
Full time equivalent worker population (FTE)	There was a similar full-time labour force participation to that in the LGA at 62.1%. The total employed population was 1,477 workers, both full-time and part-time. Unemployment in 2011 was 7.6%, considerably higher than for the LGA at 5.9%.	Full-time labour force participation in the LGA was 65.0%. The total employed population was 2,997 workers, both full-time and part-time in the LGA. At June 2016, unemployment in the LGA was recorded as 4.6% (Department of Employment, 2016)
Occupation and industry of employment	There were similar proportions of workers employed as technicians and trades people (15.6%), professionals (14.2%) and labourers (14.0%) in Narromine and the LGA. However, significantly more people were employed as managers in the LGA than in Narromine at 24.1% and 12.7% respectively. Healthcare and social assistance (14.0%) and retail trade (12.0%) were the dominant industries within Narromine. Within the LGA, lower proportions of workers were employed in these industries. Compared to the LGA, there was a significantly lower proportion of workers employed in agriculture, forestry and fishing in Narromine (9.7%).	The most common industry of employment in the LGA was agriculture, forestry and fishing, which employed 25.4% of all workers. 12.2% of workers were employed as technicians and trades people, 13.0% were professionals, and 12.6% were labourers. 11.0% and 9.2% of workers were employed in healthcare, social assistance and retail trade industries.
Education	12.2% of residents aged over 15 were studying at technical or tertiary institutes, either full or part time. However, 55.9 percent of adults did not have a post school qualification in Narromine town.	Narromine LGA had lower rates of post school students with 10.9% of residents aged over 15 studying at technical or tertiary institutes, either full or part time, and comparable rates of adults who did not have a post school qualification (54.9%).
Income	The median individual income was $465 per week, less than the LGA.	The median individual income was $492 per week.

Accommodation and community facilities

Multiple accommodation facilities are located in Narromine, including the Narromine Tourist Park (11 cabins and 36 powered sites), three hotels, two motor inns, a bed and breakfast, and a farm stay.

A range of local community facilities and services are located in the town, including education and childcare, parks and recreation facilities, library, emergency services, and other community facilities such as shops and medical services, including the Narromine hospital and community health centre.

People from Narromine may also access regional facilities in the regional centre of Dubbo, such as Dubbo Base Hospital, Lourdes Hospital, Dubbo Community Health Centre, and Macquarie Regional Library. Table 3-2 identifies some community facilities that may be used by the construction workforce for the proposal.

Table 3-2 Community facilities within or near Narromine town

Facility type	Name	Address
Place of worship	St Mary's Anglican Church	146 Dandaloo Street
	Narromine Baptist Church	46 Dandaloo Street
	St Andrew's Uniting Church	61 Meryula Street
	Generosity Church Narromine	45-51 Dandaloo Street
Emergency services	Narromine Police Station	Burraway Street
	Narromine Rural Fire District	39 Burraway Street
	NSW Ambulance	15 Dandaloo Street
Health	Narromine Hospital and Community Health	128 Cathundril Street
	Narromine Shire Family Health Centre	127 Dundaloo Street
	Dubbo Base Hospital	Myall Street, Dubbo
	Lourdes Hospital	4 Tony McGrane Place, Dubbo
	Dubbo Community Health Centre	2 Palmer Street, Dubbo
Community and cultural venues	Narromine Library	31 Dandaloo Street
Sport and recreation	Narromine Sport and Fitness Centre	12A Meringo Street
	Narromine Swimming Pool	Burroway Street
	Narromine Golf Club	Warren Road
	Narromine Bowling Club	158 Dandaloo Street

3.5.2 Parkes local government area

Economy

Parkes LGA covers 5,957 square kilometres and has a population of 15,337 as of 30 June 2015 (Parkes Shire Council Profile id n.d.).

Parkes has a broad employment base with agriculture (representing 15.1 per cent), retail (10.2 per cent), healthcare and social assistance (9.1 per cent), mining (8.1 per cent), construction (7.9 per cent), and educational and training (7.8 per cent) being the most prominent industries of employment in Parkes. Sheep and cattle grazing and wheat growing form key parts of the agriculture industry (Parkes Shire Council Profile id n.d.). The tourism industry is centred on the region's gold rush history, natural scenery and the landmark CSIRO Parkes Radio Telescope, better known as 'the Dish'.

By contrast, the generators of the largest economic output in the LGA are mining (19.4 per cent), construction (13.1 per cent) and agriculture, forestry and fishing (11.4 per cent) (Parkes Shire Council Profile id n.d).

Parkes town

Parkes is located 120 kilometres south of Dubbo and 100 kilometres west of Orange. It is the principal town within Parkes Shire.

Parkes is a commercial centre with its major industries including agriculture, transport, mining, and tourism (Parkes Shire Council, 2016a). The CSIRO Parkes Radio Telescope is a key tourist attraction, as is the Parkes Elvis Festival, which attracts about 20,000 visitors each year.

Table 3-3 provides a demographic overview of Parkes town and the Parkes LGA as at the 2011 census.

Table 3-3 Parkes town and LGA demographic overview

Data type	Parkes town, 2011	Parkes LGA, 2011
Population	The population was 10,026, comprising about 68.7% of the LGA population. Parkes' population increased by 297 people from 2006.	The LGA population increased slightly from 2006 by 311 people (14,281 to 14,592). In 2015, profile.id estimated that Parkes LGA had a population of 15,337. The projected population is 15,700 by 2036 (DPE, 2016) representing an increasing population from 2015.
Age and gender	There was a roughly even gender divide of 48.5% male and 51.5% female, similar to the LGA. The median age was 38 years, similar to the LGA. The urban centre and LGA had a similarly proportioned composition of age groups. The proportion of school aged residents (19.6 percent) and older residents (23.3 per cent aged 60 years and over) is comparable with that of the LGA	There was a roughly even gender divide of 49.3% male and 50.7% female. The median age was 39 years. The proportion of school aged residents was 19.9 percent and older residents was 23.6 per cent aged 60.
Indigenous population	The indigenous population of 765 people represented 7.6% of the population, slightly greater than the LGA. This was significantly greater than the State and national percentages (indigenous people consist of 2.5% of the State and national populations).	Indigenous people represented 8.3% of the LGA population.
Family composition	Family households were the dominant household types within Parkes at 67.6%, similar to the LGA. There were 2,545 families within Parkes. Similar to the LGA, couple families with and without children were the dominant family types, comprising 39.6% and 39.0% of all families in Parkes, respectively. There was a slightly greater proportion of single parent families within Parkes at 20.2% than the LGA. This was higher than in wider Australia, where one parent families comprised 15.9% of all families.	Family households were the dominant household types at 69.1%. Couple families with and without children were the dominant family types at 40.2% in both categories. The proportion of single parent families was 18.4%.
Housing	A slightly lower proportion of dwellings within Parkes were owned outright at 34.2%, compared to the LGA. Similar proportions were owned with a mortgage at 32.1% for Parkes, compared to the LGA.	39.2% of dwellings were owned outright. 30.9% of dwellings were owned with a mortgage.

Data type	Parkes town, 2011	Parkes LGA, 2011
	33.6% of all privately occupied dwellings were rented in Parkes, similar to the LGA. The median monthly mortgage repayment in Parkes was $1,387, higher than the LGA. Weekly rent was also higher in Parkes than the LGA at $165. Residential vacancies in October 2016 in the Parkes post code were at 1.2 % with 19 available properties (SQM Research, 2016), with a declining trend over recent years.	29.9% of all privately occupied dwellings were rented. The median monthly mortgage repayment was $1,300. Weekly rent was $150.
FTE population and % of non-resident workers	There was a similar full-time labour force participation at 55.5% to that of the LGA. The total employed population was 4,102 workers, both full-time and part-time. 63.6% of workers in Parkes were employed full-time, similar to the LGA. Unemployment in 2011 was 4.9%, in both the town and the LGA. At June 2016, unemployment in the Parkes town and immediate surrounds was recorded as 7.7%, compared with a rate of 10.5% for largely the balance of the LGA (Department of Employment, 2016), a significant increase from 2011.	The labour force participation rate was 56.1%. 63.8% of workers were employed full-time. The total employed population was 6,030.
Occupation and industry of employment	Technician and trades people (15.8%) followed by professionals (14.5%) were the dominant occupations within Parkes, contrasting to the LGA where manager was the most common occupation. Retail trade (12.0%) was the dominant industry, and was more common than in the LGA. However, significantly fewer Parkes workers (2.5%) worked within the agriculture, forestry and fishing industry than those in the broader LGA.	11.6% of workers were employed in retail trade. 11.3% worked within the agriculture, forestry and fishing industry.
Education	13.4% of residents aged over 15 were studying at technical or tertiary institutes, either full or part time. 52.2% of adults did not have a post school qualification in Parkes town.	Parkes LGA had marginally lower rates of post school students with 12.8% of residents aged over 15 studying at technical or tertiary institutes, either full or part time. Parkes LGA also marginally lower rates of adults who did not have a post school qualification (54.9%).
Income	The median individual income in Parkes was $485 per week, higher than the LGA.	The median individual income was $456 per week.

Accommodation and community facilities

Multiple accommodation facilities are located in Parkes, including four caravan or cabin parks, seven hotels, 15 motels and five bed and breakfasts, with approximately 1500 bed spaces. Preliminary consultation with operators of some of these providers indicates that frequent and/or longer term cabin/unit rental is common with workers of nearby mines and of the current Newell Highway upgrading project, and that demand is currently exceeding supply, with over half of this demand from mining workers.

The town has a range of community facilities and services, including education (TAFE Western Institute campus) and childcare, parks and recreation facilities, emergency services, shops, and medical services (including the newly built Parkes Hospital).

As the principal town within Parkes Shire, people from surrounding areas such as Peak Hill may access the facilities in Parkes, such as Parkes Hospital and Parkes Community Health Centre. Table 3-2 identifies some facilities that may be used by the construction workforce for the proposal.

Table 3-4 Community facilities in Parkes town

Facility type	Name	Address
Place of worship	Community Baptist Church Parkes	Back Trundle Rd
	Parkes Baptist Church	Church Street
	Presbyterian Church	Gap Street
Emergency services	NSW Ambulance	19 Bushman Street
	Parkes Police Station	3 Court Street
	Parkes Fire Station	1 Court Street
Health	Parkes Community Health Centre	18 Coleman Road
	Ochre Health Medical Centre Parkes	335 Clarinda Street
	Parkes Hospital	2 Morrissey Way
	Currajong Street Medical Centre	61 Currajong Street
Community and cultural venues	Cooke Park and Community Centre	Welcome Street
	Parkes Library	Bogan Street
Sport and recreation	Parkes Bowling & Sports Club	6 Cecile Street
	Parkes Olympic Swimming Pool	33-35 Dalton Street
	McGlynn Sporting Complex	Baker Street
	Northparkes Oval	Alexandra Street
	Pioneer Oval	Alexandra Street
	Spicer Oval	Albert Street
	Harrison Park	Eugowra Road
	Cheney Park	Station Street
	Parkes Skate Park	Hooley Street
	Memorial Hill and Rotary Park	Bushman Street

Peak Hill

Peak Hill is 55 kilometres south of Narromine within Parkes LGA. It is a small town with a population of around 755 people. The town is centred on the Newell Highway.

A mineral rich area, settlement of Peak Hill began in 1889 following the discovery of gold. Copper and gold mining were key industries in Peak Hill (Peak Hill, 2012). Today, cropping and grazing are key industries, with tourism also forming part of the local economy.

Table 3-5 provides a demographic overview of Peak Hill, compared to the Parkes LGA as at the 2011 census.

Table 3-5 Peak Hill and Parkes LGA demographic overview

Data type	Peak Hill, 2011	Parkes LGA, 2011
Population	The population was 755, comprising about 5.2% of the LGA population. Peak Hill's population decreased by 191 people from 946 in 2006. The projected population is 776 by 2031 – an increase of 21 people at a rate of 0.1% per annum.	The LGA's population increased slightly from 2006 by 311 people (14,281 to 14,592). In 2015, profile.id estimated that Parkes LGA had a population of 15,337.
Age and gender	There was a roughly even gender divide of 48.2% male and 51.8% female, similar to the LGA. Peak Hill had an older population than the LGA, with higher proportions aged over 60 (28.6 per cent), a lower proportion of school aged residents (18.4 per cent) and a higher median age of 45 compared to 39 years in the LGA.	There was a roughly even gender divide of 49.3% male and 50.7% female. The median age was 39 years. The proportion of school aged residents was 19.9 percent and older residents was 23.6 per cent aged 60.
Indigenous population	The indigenous population of 202 represented 26.8% of the population. This is significantly greater than in the wider LGA (8.3%) and Australia as a whole (2.5%).	Indigenous people represented 8.3% of the LGA population.
Family composition	Family households were the dominant household types, at 60.3% of all households. This was lower than the LGA. There was a greater proportion of lone person households in Peak Hill (38.4%) than the LGA.	Family households were the dominant household types at 69.1%. Couple families with and without children were the dominant family types at 40.2% in both categories for the LGA. The proportion of single parent families was 18.4%. The proportion of lone person households was 28.9%.
Housing	A higher proportion of dwellings within Peak Hill are owned outright at 48.0% compared to the LGA. However, only 20.7% are owned with a mortgage, lower than the LGA. 31.3% of all privately occupied dwellings were rented in Peak Hill similar to the LGA. The median monthly mortgage repayment in Peak Hill was $900, significantly lower than the LGA. Weekly rent was also lower in Peak Hill than the LGA at $110. Residential vacancies in October 2016 in the Peak Hill post code were at 1.1 % with only 2 available properties (SQM Research, 2016), with a declining trend over recent years.	39.2% of dwellings were owned outright. 30.9% of dwellings were owned with a mortgage. 29.9% of all privately occupied dwellings were rented. The median monthly mortgage repayment was $1,300. Weekly rent was $150.

Data type	Peak Hill, 2011	Parkes LGA, 2011
FTE population and % of non-resident workers	Peak Hill has a low labour force participation rate at only 41.8%. Labour force participation in the LGA is 56.1% and in Australia is 61.4%. Total employed population of 227 workers, both full and part-time. 54.6% of workers in Peak Hill were employed full-time, less than the LGA. Unemployment in Peak Hill in 2011 was 11.3%,2016 data was not available.	The labour force participation rate was 56.1%. 63.8% of workers were employed full-time. The total employed population was 6,030 workers, both full-time and part-time in the LGA workers, both full-time and part-time in the LGA.
Occupation and industry of employment	Similar proportions of workers were employed as managers in Peak Hill (16.2%) to the LGA. Community and personal service was the dominant occupation within Peak Hill consisting of 17.5% of workers, higher than the LGA. Prominent industries within Peak Hill significantly differ to the LGA. In Peak Hill, healthcare and social assistance is the most common industry (13.5%) followed by accommodation and food services (10.9%), and education and training (10.9%). These were all higher than the LGA (11.3%, 7.4% and 7.3% of the workforce respectively). Only 9.6% and 9.2% of the Peak Hill workforce worked in retail trade and agriculture, forestry and fishing respectively. This was lower than the LGA. Only 2.6% of the Peak Hill workforce worked in mining, significantly lower than the LGA.	17.7% of workers were employed as managers. 9.6% worked in community and personal services. Prominent industries were retail trade (11.6%) and agriculture, forestry and fishing (11.3%). Mining comprised 7.2% of the workforce.
Education	14.8 % of residents aged over 15 were studying at technical or tertiary institutes, either full or part time, considerably higher than in the LGA, with the bulk of these at technical or further education institutes. 57.1 % of adults did not have a post school qualification in Peak Hill, also higher than the LGA.	Parkes LGA had marginally lower rates of post school students with 12.8 % of residents aged over 15 studying at technical or tertiary institutes, either full or part time. Parkes LGA also marginally lower rates of adults who did not have a post school qualification (54.9 %).
Income	The median individual income in Peak Hill was $341 per week, significantly lower than the LGA.	The median individual income was $456 per week.

Accommodation and community facilities

There are two caravan parks that are currently at capacity (with some mine workers but a predominance of road workers). The operators currently report regularly turning away workers for the Newell Highway upgrade that are seeking accommodation.

Key facilities include Peak Hill Central School, St Joseph's Primary School, James Catholic Church, and a range of local shops and medical services. As a small town within Parkes Shire, people from Peak Hill may access facilities in the larger towns of Parkes and Dubbo, such as hospitals and community health centres. Table 3-2 identifies some facilities in Peak Hill which may be used by the construction workforce for the proposal.

Table 3-6 Community facilities in Peak Hill

Facility type	Name	Address
Place of worship	St James' Catholic Church	153 Caswell St
Emergency services	Peak Hill Fire Station	130 Caswell Street
	Peak Hill Police Station	Dugga Street
Health	Peak Hill Hospital	111 Newell Highway
	Peak Hill Medical Centre	93 Euchie Street
	Peak Hill Aboriginal Medical Service	51 Caswell Street
	Parkes Hospital	2 Morrissey Way, Parkes
	Parkes Community Health Centre	18 Coleman Road, Parkes
	Dubbo Base Hospital	Myall Street, Dubbo
	Lourdes Hospital	4 Tony McGrane Place, Dubbo
	Dubbo Community Health Centre	2 Palmer Street, Dubbo
Community and cultural venues	Southern Cross Community Centre	113 Caswell Street
Sport and recreation	Lindner Oval	89 Boori Street
	Peak Hill Memorial Pool	Boori Street
	Peak Hill Memorial Park	Corner Caswell and Ween Streets
	Peak Hill NSW Golf Course	Golf Club Road
	Peak Hill Bowling Club	52 Caswell Street

3.6 Stakeholder consultation outcomes

3.6.1 Social study area wide consultations undertaken by Inland Rail

In mid-2015, the Inland Rail team conducted a series of meetings and workshops prior to beginning formal consultation and fieldwork. Local councils and State and federal Members of Parliament were invited to attend these sessions as a form of early engagement. Key issues raised provide an understanding of the communities, their values and issues relevant to the Inland Rail. These issues are as follows:

- Communities and stakeholders are interested in the regional and local economic opportunities of the proposal, particularly the cotton and grain industries, which are major industries in the area.
- There is community action in the area related to coal seam gas operations in the Pilliga, with people concerned about the future of farming in the region.
- Aboriginal communities include the Kamilaroi and Gamilleroi people.
- Narromine is known for its aviation activities, and aviation is Narromine's point of difference. It has a strong gliding community and hosts major gliding events. The aerodrome is a major asset and Council would seek to avoid close proximity of the existing rail corridor to the Aviation Precinct.

- Changes will be made to regional planning. As of 2016, Narromine Council has remained a member of the Orana Regional Organisation of Councils. Consultation indicated that other previously involved councils would move to other regional organisations.

3.6.2 SIA consultations – Narromine Shire Council

On 20 June 2016 GHD conducted a phone interview with a number of staff from Narromine Shire Council. Key issues raised are as follows:

- Due to this section of the proposal terminating to the south of Narromine town it is unlikely that the increased frequency of trains would have an impact.
- Community values captured in the *Community Strategic Plan: Narromine Shire 2023* regarding agricultural production and the aviation history are correct.
- The residents are very community minded and have a strong affiliation with sport.
- Opportunities associated with the proposal include future development, increased production in Narromine and the removal of heavy vehicles from the road network.

3.6.3 SIA Consultations – Parkes Shire Council

On 27 June 2016 GHD and a representative of the Inland Rail team conducted a phone interview with a number of staff from Parkes Shire Council. Key issues raised are as follows:

- Mining is the largest contributor to the Parkes economy, and provides a skilled workforce base to the town. Based on profile.id (n.d [b].), mining is the most productive industry contributing 21.9 per cent to Parkes Shire's Gross Regional Product.
- Other industries in the town include agriculture (7.9 per cent of the GRP), public sector agencies (6.5 per cent) and a large retail sector (6 per cent) (profile.id, n.d.[b]).
- There is a positive view of the proposal throughout the community.
- There is some concern regarding severance caused by level crossings and increased frequency of trains.
- Existing accommodation in town should have the capacity to cater for the workforce associated with construction of the proposal.
- Development of the National Logistics Hub at Parkes in conjunction with Inland Rail would bring many economic opportunities to the area. The design and configurations of the proposal should consider the National Logistics Hub.
- Traffic and transport movements in Parkes are currently inefficient. There is significant traffic congestion, with over 1,400 heavy vehicle movements per day through town, while rail freight on the existing rail corridor through Parkes sees a daily delay for vehicles travelling east to west on the Newell Highway.

Council is a key stakeholder for the proposal and expects to be included in planning and procurement to ensure that benefits are delivered locally, for example through the use of local suppliers.

3.6.4 Accommodation providers

Brief telephone interviews were conducted with a number of accommodation providers in Narromine, Parkes, Peak Hill and Dubbo[1] on 25 November 2016 to ascertain current vacancies and trends and the nature and source of guests. The consultation indicated that:

- Availability of accommodation for construction workers will be dependent on other concurrent project in the area. The current Newell Highway upgrade works may continue to require accommodation until end 2017 to mid-2018.
- Workers create demand for accommodation facilities and not for housing leases.
- There is some capacity in the Narromine tourist park as road workers are not seeking accommodation here, but seasonal harvesting workers are common.
- Caravan parks in Peak Hill are at capacity and the operators are regularly turning away enquiries from road workers seeking accommodation. Some workers have purchased caravans and are using powered sites as there is availability for these. All workers are required to vacate their bookings during the Elvis Presley festival in January.
- Caravan parks, though full, are reserving some cabins to continue to have availability for tourists so as to not risk a “boom and bust” when current demand concludes.
- In some cases, road workers make up 90 per cent of current cabin guests, and in others guests are exclusively mine workers. In Parkes, this means only approximately 36 of the existing 86 units would be available for proposal staff (assuming the Newell Highway upgrade works conclude before commencement of this proposal in mid 2018).
- Caravan parks regularly refer clients to motels.
- If the timing of the conclusion of the Newell Highway upgrade work and commencement of the proposal align, the proposal could offer significant benefit to accommodation providers with a continued stimulated demand for accommodation.
- With adequate engagement with the accommodation providers, some operators could plan for expansion to better cater for meet the demand during construction.
- Dubbo, a 30-minute drive from Narromine, has 70 accommodation providers delivering 4,500 beds, and regularly accommodates overflow demand for temporary workforces in the region.
- Accommodation in Dubbo generally has capacity but tends to fill up during April, September and special events, at which time Narromine, Parkes and Peak Hill often accommodate overflow demand. Providers are currently accommodating workers for many large infrastructure projects.

[1] Conversation undertaken with staff of Narromine Tourist Park, Spicer Park Caravan Park Parkes), Currajong Cabin park (Parkes), Peak Hill Caravan Park, Double D Caravan Park, Ray White Real Estate Parkes, Dubbo Tourist Info and Dubbo Regional Council.

4. Impact assessment

4.1 Construction impacts

4.1.1 Employment and regional economic benefits

Potential employment and economic benefits are expected to occur during construction at a local, regional and national level. While the *Business Case for Inland Rail* (ARTC, 2015) provides a detailed analysis of the potential national economic benefits, a local level analysis for this proposal has not been undertaken. The assessment of potential local and regional economic benefits is therefore based on a qualitative assessment.

Local benefits

During construction a variety of workers would be required, including labourers, tradespeople, machinery operators, engineers, surveyors and site supervisors. An average workforce of 150 FTE would be required over the proposed 18 months of the construction period. Preference would be given to locally/regionally based workers where practicable. It is therefore likely that some proportion of the workforce may be sourced from the social study area, including the Parkes, Narromine and Dubbo LGAs, and some would be non-residents.

The proportion of the resident and non-resident workforce would depend on a number of factors, such as availability of appropriately skilled workers in the region, proposal timeframes, and the location of contractors engaged during construction. Data from the social baseline (Section 3.1) and stakeholder consultation undertaken for the SIA indicates that a suitable workforce is potentially available within the social study area.

Consultation undertaken for this SIA and by ARTC (ARTC, 2015) indicate that both Parkes Shire Council and Narromine Shire Council expressed an interest in construction contractors ensuring local purchasing and employment and using the existing workforce. There is also an interest in using the proposal as an opportunity to provide training for local people, particularly young people. The social baseline (Section 3.3.) shows there are high unemployment rates across both LGAs. There is also a reasonable population of young people in Parkes, and a high proportion of Indigenous people in Narromine and Peak Hill who would benefit from local training and employment opportunities during construction.

The proposal would also offer opportunities for local businesses supplying goods and services to the non-resident workforce. The non-resident workforce would create some demand for local food and beverages, accommodation, bus and coach drivers, and recreation services.

Both Narromine and Parkes councils identified that the economic opportunities generated by the additional non-resident workforce would have a positive impact on the local economy. In particular, it is likely there would be a short term positive economic impact for Parkes, Peak Hill and Narromine, where non-resident workers are likely to be accommodated. This is discussed further in Section 4.1.3.

Wider benefits

The *Business Case for Inland Rail* (ARTC, 2015) estimated that Inland Rail would increase Australia's gross domestic product (GDP) by $16 billion during its construction and first 50 years of operation, and up to 16,000 new jobs are estimated at the peak of construction.

The Business Case notes that during construction there would be a stimulatory impact in the construction sector in each region it is being built. This would trigger an expansion in the construction sector and support an additional flow-on demand in the economy through the construction industry supply chain and additional expenditure in the region.

4.1.2 Property impacts

During construction it is expected that private landholders along the proposal site would experience property impacts resulting from changes to infrastructure and utilities within their properties, establishment of compound sites, and the need to gain access to some private properties. These impacts may interrupt daily activities for the landholders/lessees, including their personal lives and agricultural activities. In particular, frequent access to properties for construction purposes can be stressful for landholders, and may cause or exacerbate personal and interpersonal issues.

The establishment of compound sites along the length of the existing rail corridor may require some private property lease arrangements. In these circumstances, landowners could be impacted through loss of productivity due to loss of land or loss of time required to engage with the proposal, damage to access tracks and poor rehabilitation. The details of these arrangements would be addressed through property agreements with landholders.

While the work associated with the proposal is largely contained within the existing rail corridor, at this stage of the design process, it is estimated the proposal would require partial land acquisition from 10 privately owned lots. All acquisitions would be undertaken in consultation with landowners and in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991*.

Property acquisition would mostly affect land with existing rural or agricultural uses. Areas that are proposed to be acquired may include open grazing land, land used for cropping, scattered vegetation, and farm buildings. Where it is considered that an intolerable impact would occur at a property, then consideration would be given to acquiring the entire property.

Impacts on properties may also include flooding on properties and difficulty in responding to hazards such as bushfires on the other side of the proposal site. There is the potential for the proposal to exacerbate bushfire risk (as a result of the storage of dangerous goods, and construction site issues such as smoking or hot works), therefore accessing properties on the other side of the proposal site may be an issue. The hydrology and flooding assessment (GHD, 2017b) has also identified that there would be some flooding on properties within the proposal site which could temporarily inundate cropping and grazing land. However, the duration of flooding in these additional areas under most flood events is likely to be in the order of a few hours, which would be insufficient to determinately affect crops, and flooding would generally only impact properties already affected by flooding. Additional discussions would be undertaken with the landowners of the affected properties to determine the consequences of the expected impacts and, where necessary, further refine mitigation measures to reduce the impacts.

4.1.3 Impacts of non-resident workforce on nearby communities

As identified in Section 4.1.1 the construction workforce would comprise a mixture of local/regional and non-resident workers, with the proportion of the resident and non-resident workforce depending on a number of factors. Relevant social issues associated with a non-resident construction workforce are:

- Demographic changes to communities, behaviour of the non-resident workforce, and demand for local goods and services.

- Demand for housing and accommodation facilities in the region, and associated impacts on housing affordability and availability in nearby towns.
- The transportation of workers between the workers' accommodation and the proposal site during construction.

These issues are considered in further detail.

Demographic change

Assuming that a larger proportion of the workforce would be residents from the social study area, it is likely that the construction workforce may cause a negligible temporary increase in the non-residential population of the nearby towns such as Narromine, Parkes and Dubbo. The proportion of increase in non-resident population would be determined when the source of workers is confirmed. Construction workforces are typically dominated by young, single, male workers, which may potentially lead to minor changes in the age and gender profile of communities, with a likely increase in the transient male population aged between 18 to 49 years.

Anti-social behaviour

SIA consultation identified that perceived or real anti-social behaviour of single, male, non-resident workers may be a concern for local communities. Anti-social behaviour has the potential to increase crime and adversely affect community perceptions of safety. SIA consultation with the Narromine Shire Council and Parkes Shire Council revealed that the region has experienced a number of large infrastructure projects and mining activity over the past few years, and the accommodation in towns has catered for non-resident workforces. With workforce management measures in place, communities have not experienced any noticeable anti-social impacts from such projects. The perceived behaviour impact from the non-resident workforce was therefore considered to be minimal. ARTC would develop and implement a workforce management plan for Inland Rail including a worker's code of conduct and behaviour management, which would be applicable to the proposal workforce.

Transportation of workers

Workers are likely to be transported to the construction work areas either by bus, from local towns or from various collection points. The location of accommodation of workers and collection points is yet to be determined. In terms of traffic impacts, using a bus to transfer the workforce would increase the daily number of buses on local roads but limit the increase in private vehicles. The location of collection points in relation to areas of high pedestrian activity (such as town centres, roads around childcare centres and schools) should be considered to maintain pedestrian and road safety, and maintain access for motorists and cyclists. Collection points should be located close to accommodation of workers to reduce the need for private vehicle use.

Increased demand for services

The presence of non-resident workforce is likely to increase demand for local goods and services, such as food, eateries other daily services, increasing trading opportunities for local businesses. Also, non-resident workers are likely to potentially increase demand for community support and health services. SIA consultation with both Narromine and Parkes Shire Councils confirmed that the existing community support and health services have the capacity to accommodate such minor increase in demand from the non-resident workforce of the proposal.

Increased demand for housing and accommodation

The anticipated small proportion of the non-resident workforce required for construction is likely to generate a small demand for accommodation and housing facilities in the nearby towns. Based on the SIA consultation with Narromine and Parkes Shire Councils, Dubbo City Council and some accommodation services providers (Sections 3.5 and 3.6) it can be inferred that depending on the timing of the start of construction of the proposal and likely conclusions of construction of other projects such as the Newell Highway upgrade it is likely that there would be suitable temporary accommodation available within the nearby towns including Dubbo. However, there is potential for an increase in demand for accommodation to increase housing rents and accommodation prices in the short to medium term. ARTC would develop a workers housing and accommodation plan for the Inland Rail which would be applicable to the proposal. Availability of accommodation specific to the proposal would be reviewed prior to construction. The review would include consultation with respective councils and accommodation providers in the social study area and consider maintaining vacancies for other local usage.

4.1.4 Local amenity and community values

Visual amenity and loss of privacy

The rural amenity associated with a quiet rural lifestyle may be impacted due to an increase in construction related activities. It is anticipated that this would be most noticeable around the construction compound locations. Details on the indicative location of construction compounds is provided in the EIS. However, due to the linear nature of the proposal, construction activities would move as construction progresses, hence visual amenity impacts are anticipated to be temporary and short term.

Residents of rural areas often enjoy views of rural landscape from their homes. Construction sites may have the potential to temporarily change these views to construction sites. However, this issue is unlikely to be significant as the townships of Parkes, Narromine and Peak Hill and smaller settlements are sparsely populated near the proposal site, which would be mainly contained within the existing rail corridor. However, it is likely that visual changes to the rural landscape near the construction site for the Parkes north west connection could be perceived as significant, due to the greenfield nature of the proposal site in that area. Landscape and visual impacts are assessed in the *Inland Rail, Parkes to Narromine Landscape and Visual Assessment* (Urbis, 2017).

During construction some residents may experience loss of privacy due to the presence of a construction workforce in and around private properties, which may also generate perceived safety concerns for the nearby residents. Construction activities would be restricted within fenced areas of the proposal site and construction traffic would be limited to designated routes and/or as agreed with landholders when working on or near private properties.

Noise and vibration

Generally, people living in rural and agricultural areas value a quiet and peaceful lifestyle. Changes to noise levels can sometimes cause disruption to daily activities, such as interrupt conversations or listening to radio or television; lead to lifestyle alternations such as promoting people to close doors and windows to keep the noise out, cause sleep disturbance due to noise from activities outside of standard working hours, and may result in stress and anxiety associate with increased noise levels. The significance of impact from the proposal's construction noise would depend on the proximity to residential areas, community facilities and businesses; timing of the construction activities, and the type and duration of construction activities in the area. Since the proposal would be linear, it is expected that noise and vibration impacts on community members would be experienced for limited periods.

The proposal would be generally located more than 200 metres from most residences. It is likely that noise and vibration impacts would affect residential areas close to the proposal site, such as within the main towns and villages.

Vibration generated by construction activities typically dissipates to negligible levels within 50 to 200 metres, depending on the type of activity and local geology. Therefore, widespread impacts are not anticipated. However, residents located close to the existing rail corridor may experience increased frequencies of noise and vibration in the short term.

The potential noise and vibration impacts of the proposal are assessed in the *Inland Rail, Parkes to Narromine Noise and Vibration Assessment* (GHD, 2017c). Based on the findings of the noise and vibration assessment, it is considered that the noise and vibration impacts associated with the construction of the proposal can be satisfactorily managed through the implementation of the mitigation measures outlined in the report.

Air quality

As noted in the EIS, construction activities would generate additional dust, which has the potential to settle on agricultural crops, cattle, sheds, farm machinery and houses close to the existing rail corridor. Properties close to the construction site compounds may experience short term dust impacts. These are expected during site establishment only. Prior to their stabilisation, spoil mound sites may also generate minor dust impacts on nearby properties. Increased dust may alter people's usual rural residential lifestyle by prompting them to close doors and windows to avoid dust from settling inside their homes or work spaces. In some instances, it may also increase people's usual work load requiring cleaning and washing of surfaces.

Further information on the potential for air quality impacts, and recommended mitigation measures, are provided in the EIS.

Aboriginal heritage

As established in the baseline, the social study area has a notable Aboriginal population. The regional community values its Aboriginal cultural heritage.

The *Inland Rail, Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment* (Umwelt, 2017a) identified that there are seven listed Aboriginal sites within or close to the proposal site (scattered artefacts and a scarred tree). As per the assessment the majority of works would be undertaken within the previously disturbed rail corridor where the archaeological potential is low.

Non-Aboriginal heritage

The regional community values its non-Aboriginal heritage and strong links to the history of the towns.

The potential impacts on non-Aboriginal heritage were assessed in the *Inland Rail, Parkes to Narromine Non-Aboriginal Heritage Impact Statement* (Umwelt, 2017d). No sites or items with a statutory heritage listing, with the potential for direct or indirect impacts, were identified within or in the immediate vicinity of the proposal site.

However, the assessment concluded that the rail line and the remains of a cottage (Wyanga cottage) are potentially locally significant. The proposal would impact on the rail line, and it has the potential to impact on the cottage. These impacts are assessed in the historic heritage assessment, which provides suitable measures to mitigate the potential significance of the impacts.

Consultations undertaken for the proposal in 2015 identified that a cemetery near Trewilga, north of Parkes, is culturally important. It would be important to ensure that construction activities close to this site are conducted sensitively.

4.1.5 Access and connectivity

The potential social and economic impacts related to access and connectivity during construction have been identified by the *Inland Rail – Parkes to Narromine Transport and Traffic Impact Assessment* (GHD, 2017a).

Given the proposal is located outside the larger towns of Narromine and Parkes, and to the west of Peak Hill, impacts on community access and connectivity overall during construction are expected to be minor. Any potential traffic diversions or delays are expected to be experienced by very few community members. Access to Narromine, Parkes and Peak Hill and their various community facilities and services is therefore not expected to be impacted during construction. The potential impacts are discussed further below.

Community access and connectivity

Potential temporary detours at local roads or crossings as a result of the proposal construction may lead to some increased travel times and disruption of journeys for community members including landholders close to the existing rail corridor.

The following roads may require realignment due to construction of the Parkes north west connection:

- Coopers Road – an unsealed local road that intersects with Brolgan Road to the north, London Road about midway along, and Watts Lane to the south. Brolgan Road and London Road provide access to Parkes, and Watts Lane connects to the Newell Highway.
- Millers Lookout Road - the northern section of Millers Lookout Road is an unsealed local road, and the southern section is a narrow unsealed track that intersects with Brolgan Road via an access gate.

An overbridge is proposed to enable Brolgan Road to cross the Parkes north west connection with sufficient clearance for double stacked Inland Rail trains to pass beneath. The overbridge will be constructed offline to enable continued use of Brolgan Road during construction. The overbridge will be constructed at the same time construction of the proposal and Parkes north west connection. Construction of the overbridge over the Parkes north west connection may have localised impacts on Brolgan Road traffic, including access to Coopers Road, although the new bridge will be primarily constructed on a separate alignment which will minimise disruption.

It is unlikely there would be any material increased travel times for community members who currently use Coopers Road and Millers Lookout Road. If access across the rail line is not available, there may be some extended journeys for a very few local community members including:

- Coopers Road - one or two landholders may experience an increased distance to Parkes of up to 2.1 kilometres.
- Millers Lookout Road – the southern section which would be impacted is a locked access gate, therefore very minimal traffic is expected to travel via this road.

Considering a 'worst-case' scenario of closure for these roads it is unlikely that access and connectivity would be significantly impacted for the majority of the community because these roads are local, are likely used by very few community members, and community members often travel distances in rural areas. The small number of local community members who currently use these roads may experience a minor permanent increase in travel distance to access Parkes.

Construction would result in temporary impacts to traffic and access within the study area, and an increase in both heavy and light vehicle movements on the local road network. The *Inland Rail – Parkes to Narromine Traffic, Transport and Access Assessment* (GHD, 2017a) found that, based on a worst case scenario, the greater road network is not expected to be significantly impacted by the construction activities. This is because the roads have sufficient capacity to absorb the increased traffic, and delays or closure at crossings will have localised affect only due to the low volumes on affected roads. Potential impacts on community access and connectivity would depend on the location of the works, however they are expected to be minor and temporary.

Proposed works on level crossings may also result in disruptions to local traffic and temporary access restrictions to private property. Where this occurs, alternative access arrangements would be provided and/or appropriate traffic controls implemented. These would be detailed in a traffic, transport and access management sub-plan prepared as part of the CEMP. Potential access impacts to private properties are therefore expected to be temporary and be experienced by specific landholders during the construction period.

Pedestrian and cyclist accessibility

Given the low volume of pedestrian and cyclist activity in the study area, and the location of the proposal, significant impacts on pedestrian and cyclist accessibility and connectivity are not expected during construction.

Connectivity for bus passengers

Bus passengers travelling on coaches between Parkes and Condobolin and other public bus passengers may experience slight delays in the short term due to construction works and construction traffic. This may impact a small number of passengers given the relatively small number of bus services in the area. School bus services which use level crossings along the proposal may be similarly affected, resulting in the potential for a minor delay to these services. Traffic impacts are not expected to impact other public transport services. As part of the traffic, transport and access management sub-plan consultation would be undertaken with the public transport and school bus providers to inform them of potential access changes or delays.

Emergency response and safety

Given the location of the proposal outside of the centres of Narromine and Parkes and the town of Peak Hill, emergency response times are not expected to be significantly impacted. Increased traffic and proposed level crossing works could cause disruptions. Emergency services providers would be consulted during detailed design and construction and would be informed of potential changes to access routes or delays along existing routes.

Increased traffic could impact on pedestrian and road safety, particularly near access points to the proposal site.

Business impacts

Overall, businesses within Parkes, Narromine and Peak Hill are not expected to be impacted during construction due to access issues. Potential delays caused by increased traffic and level crossing works may lead to minor, temporary impacts for businesses. For example, disrupted freight deliveries for businesses.

4.2 Operation impacts

4.2.1 Economic impacts

The *Business Case for Inland Rail* (ARTC, 2015) provides a detailed analysis of the potential national economic benefits, a local level analysis for this proposal has not been undertaken. The assessment of potential local and regional economic benefits is therefore based on a qualitative assessment.

Inland Rail would have the potential for wide economic benefits, including enhanced efficiencies and increased freight capacity along the interstate rail network (ARTC, 2015). The benefits would generally be experienced at a regional and national level. Economic benefits experienced at a local level are expected to be felt by those industries that rely on rail freight.

Local benefits

Connectivity to market has been identified as a key challenge for businesses in the Central West region of NSW (RDA Central West, 2014).

During consultation on the proposal, representatives of Parkes Shire Council and Narromine Shire Council 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 proposal has the potential to improve productivity and economic efficiency for regional economies by providing a more reliable service and ability to move increased freight volumes. Businesses that would have previously transported their freight by road along the coast would be able to use the rail network. Businesses are expected to save on time and operating costs due to these improvements, especially if the freight services are accessible to the local regions.

The study area is well positioned to leverage economically from Inland Rail as a result of the location of the Parkes Hub. The Parkes north west connection would facilitate connections between Inland Rail and the Broken Hill rail line. To take advantage of this, Parkes Shire Council is facilitating development of the Parkes Hub.

It is noted that no stop facilities form part of the proposal at this stage. The stopping patterns for Inland Rail trains continue to be firmed up, and would be finalised in consultation with regional stakeholders, including Parkes Shire Council.

The proposal would allow longer trains with larger loads, further providing cost savings to regional businesses. The proposal would also reduce the overall travel distance, which would lower the risk of rail accidents and disruptions to regional freight movements.

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.

By providing a more efficient freight option, the proposal is expected to reduce heavy vehicle volumes on roads while increasing freight volumes and reducing environmental impacts and costs to regional communities.

Wider benefits

The proposal would reduce the volumes of heavy vehicles on the road (Inland Rail Implementation Group, 2015), which would limit future road congestion. This would further reduce economic costs relating to road maintenance and social costs related to safer roads and decreased chances of accidents.

Wider economic impacts would also relate to the generation of economic multipliers due to investment in a major new form of public infrastructure, as well as the direct and indirect generation of local and regional employment and service opportunities.

As part of the overall Inland Rail, the proposal has the potential to contribute to wider economic and community benefits, including the following (ARTC, 2015):

- Strong benefit cost ratio – it is estimated that Inland Rail will have an economic benefit cost ratio of 2.62.
- 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 an average of 700 additional jobs would be created during operation.
- Improve connections within the national freight network – Inland Rail enhances 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.
- 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. It is estimated that two million tonnes of agricultural freight will switch from road to rail.
- Reduce costs – Transport costs for freight travelling between Melbourne and Brisbane will reduce by $10 per tonne.
- Increased capacity of the transport network – Inland Rail will increase capacity for freight and passenger services by reducing congestion along the busy coastal route and allow for growth in passenger services particularly in the Sydney region.
- Improve road safety – It is estimated that each year, Inland Rail will remove 200,000 truck movements from roads and reduce truck volumes in 20 regional towns; and reduce the number of serious crashes, avoiding fatalities and serious injuries.

As noted by the *Australian Infrastructure Audit Report* (Infrastructure Australia, 2015) 'Rail offers… 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.'

4.2.2 Amenity impacts

Once operational, the proposal will increase the number of train movements from the existing average of four trains per day to an average of 12.5 trains per day in 2025 (8.5 associated with Inland Rail), increasing to the estimated maximum of 19 trains per day in 2040 (15 associated with Inland Rail). Since the majority of the proposal is within the existing rail corridor amenity impacts due to the operation of the proposal are anticipated to be minimal, and are discussed below.

Visual amenity

Only limited views of the operational line would be available from surrounding receivers except where close to residential areas. Views of new infrastructure (such as culverts) would be minimal as they would be located within rural areas away from receivers and in the existing rail corridor for the majority of the proposal site. The *Inland Rail Parkes to Narromine Landscape and Visual Assessment* (Urbis, 2017) predicts that overall the proposal will generate low visual and landscape impacts for the 106 kilometres stretch of existing track, particularly in the case of settlements where no crossing loops are proposed. With a range of built form, agricultural landscape, vegetation and trees across a relatively flat landscape, the settlement character areas have a high absorptive capability.

Noise and vibration

The proposal would allow for an increase in train volumes, lengths and speeds along the rail line, all of which would result in an increase in noise levels. Although overall rail noise is expected to increase, which may particularly impact the nearest sensitive receivers or community around Peak Hill, Parkes and Narromine, there may also be potential to reduce local sources of noise (such as wheel-squeal) through the straightening of some curves as part of the proposal. The *Inland Rail Parkes to Narromine Noise and Vibration Assessment* (GHD, 2017c) predicts that noise levels at non-residential noise receiver (such as schools, places of worship and outdoor recreational areas in the nearby communities and for noise receivers along the Parkes to north west connection would not exceed the noise criteria determined for the proposal.

Air quality

The proposal would generate low emission levels during operation and will operate through a rural area with few sensitive receives close to the existing rail corridor. An increase in the number of trains would increase dust generation, which may settle on agricultural crops, cattle, sheds, farm machinery and houses.

Air quality impacts are expected to be minimal and directly associated with the increase in train services. The impacts on air quality would relate to the types of goods being transported, such as cotton as opposed to coal, and the type of diesel and exhaust fumes from the trains. Impacts decrease significantly with greater distance from the existing rail corridor. Air quality impacts are assessed in the EIS.

4.2.3 Access and connectivity

The potential social and economic impacts related to access and connectivity during operation have been identified through an assessment of the *Inland Rail – Parkes to Narromine Traffic, Transport and Access Assessment* (GHD, 2017a).

Given the proposal is located outside the larger towns of Narromine and Parkes, and to the west of Peak Hill, impacts on community access and connectivity overall during operation are expected to be minor. The potential impacts are discussed further below.

Overall community access and connectivity

The key traffic impact of the proposal will be impacts on travel time for road users as a result of increased train activity at level crossings. The duration of delays will in some cases be reduced due to the increased train speeds that will be possible with Inland Rail. Based on the model used, the delay may reduce from 122 seconds in existing conditions, to 109 seconds per train by 2040.

The frequency of trains, and therefore likelihood of being delayed, will however increase over time as the freight task grows. Given the local nature of most affected roads, this impact is expected to affect a small number of community members. Those who are most likely to be impacted are expected to include those community members living on properties to the west of Peak Hill. As discussed in Section 4.1.5, a very small number of community members may experience changed access to Parkes due to the realignment of Coopers Road and Millers Lookout Road. Further consultation would be undertaken with key stakeholders regarding the need for road alignment at Millers Lookout Road and Coopers Road.

The potential for queued vehicles to impact on adjacent intersections is also considered to be very low, even allowing for the additional length of road trains and other heavy vehicles that may use some of the affected roads. On the busier roads crossed by the proposal, such as Henry Parkes Way, there is sufficient room for traffic to queue without obstructing any major junctions.

Level crossings and private property access

Changes to some property access roads and the local road network may be required in some locations as a result of the rationalisation of level crossings. There are 33 public level crossings and 38 private level crossings within the study area. The proposal may result in the permanent closure of some level crossings that are either not frequently used or where suitable alternative access exists.

These changes may result in slightly longer journeys for some community members however these are expected to be minor increases and impact a small number of community members. The loss of private level crossings may result in changes in how landholders move around their property, which in turn might impact agricultural activities and the financial viability of agricultural businesses. Consultation with potentially affected landowners would continue during the detailed design stage, and closures would only be undertaken if an alternative means of access exists and agreement with the road owner has been obtained.

Pedestrian and cyclist accessibility

Given the low volume of pedestrian and cyclist activity in the study area, and the location of the proposal, significant impacts on pedestrian and cyclist accessibility and connectivity are not expected during operation.

Public transport connectivity and service

Bus passengers travelling on coaches between Parkes and Condobolin and other public bus passengers may experience delays at level crossings. Delays would be minor when considered in the context of the distances travelled. This may impact a small number of passengers given the relatively small number of bus services in the area. School bus services which use level crossings along the proposal will be similarly affected, resulting in the potential for a minor delay to these services.

In addition, the proposal as part of Inland Rail as a whole, has the potential to result in improved customer outcomes for rail passengers in Sydney and Brisbane due to unused freight paths on the coastal route being returned to passenger services. The increased frequency of services would reduce average wait times and crowding on these services, which would benefit users (Inland Rail Implementation Group, 2015).

Emergency response and safety

During operation, emergency vehicles may experience delays at level crossings. Given the level crossings are primarily local roads outside of each town centre, overall emergency response times are not expected to significantly impacted. Consultations with local emergency services during detailed design would ensure emergency service providers are aware of accessible routes during operation, particularly alternate routes in the case of level crossing delays.

An increase in the number of trains may impact on community safety, as there would be an increase in the potential for a pedestrian or cyclist to encounter a train. However, the likelihood of an incident occurring is very low.

There is the potential for some drivers, observing a train approaching, to take additional risks in order to avoid being delayed. Risks include speeding or ignoring warning controls at level crossings. This behaviour is most likely to occur at remote level crossings, where active controls are not present and fewer road users are present.

The proposal, as part of Inland Rail as a whole, has the potential to reduce the volume of intercity freight trucks on the Newell Highway. This would provide a long term benefit to the community by improving travel times and road safety, with, potentially, up to 15 fewer serious crashes on the road, and therefore fewer fatalities and serious injuries (ARTC, n.d.).

Parking impacts

Community members are not expected to experience any accessibility impacts as a result of changes to car parking provision. This is because there is no existing parking provision that would be lost during operation, and no expected increase in parking demands as a result of the freight trains.

5. Mitigation and management

5.1 Employment and regional economic benefits

To maximise opportunities for the local and regional communities, at a wider program level ARTC will develop the following plans that would apply to ARTC and contractors engaged for the proposal:

- Local business and industry procurement plan – would include (but not limited to) opportunities for local procurement and suppliers across the social study area for the proposal. Skills and up-skilling opportunities would be provided to ensure that training and apprentice/trainee development are encouraged by the proposal, subject to regulatory and associated restrictions.
- Workforce management plan including an indigenous participation plan – would include (but not limited to) opportunities for local and regional sourcing of workforce, workers code of conduct, zero tolerance policy regarding drugs and alcohol at work sites, induction and training, worker support programs and indigenous participation through training and apprenticeship opportunities.
- Workforce housing and accommodation plan – the workforce accommodation specific to the proposal would be developed in consultation with the local councils and accommodation services providers within the social study area. Consideration would be given to maximise business opportunities for local and regional accommodation facilities, ensuring there are enough vacancies within the accommodation facilities left for other usual usage.

5.2 Property impact management

The impacts on properties would be significantly reduced and managed by:

- Effective construction design and planning.
- Implementation of the property management strategy that would be prepared for Inland Rail. This strategy would provide the framework for the development of individual property management agreements. 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. Property management agreements would be developed in consultation with landowners/lessees who would be directly impacted during construction. They would include (but not limited to) specific agreements with landholders regarding:
  - process and timeframes for permissions to enter and access different parts of the property
  - speed of vehicles on private properties
  - protocols relating to weed and seed management where appropriate
  - temporary access requirements and locations of any relevant ancillary infrastructure and agreement to occupy land with a commercial arrangement
  - management of loss or damage to property
  - compensation for any impacts caused by the proposal including property acquisition.
- Minimising the need for local road and access closures.
- Providing alternative access arrangements in the event that access closures are necessary.

- Consultation with individual landowners to identify individual concerns, and develop and document strategies to address these concerns.
- Ongoing communication.
- A number of other mitigation measures specified in the EIS and other technical reports to manage land use, construction traffic within and outside properties, hydrology and flooding on properties, health and safety, biodiversity, stakeholder consultation would also assist in managing impacts on properties.

5.3 Stakeholder engagement

Engagement with stakeholders is an important component in managing and monitoring the potential social impacts and opportunities of the proposal. A communications management plan would be developed for Inland Rail to ensure this process is managed appropriately and will include stakeholder feedback and grievance management mechanism.

5.4 Managing impacts from non-resident workforce

Community values - a workforce management plan would be put in place including a code of conduct for the construction workforce to manage perceived impacts on community safety (community values) related to workforce anti-social behaviour, including a zero tolerance policy regarding drugs and alcohol at work sites.

Accommodation impacts - ARTC would prepare and implement a workforce housing and accommodation plan. With respect to the proposal consultation would be undertaken with local accommodation providers and councils in Narromine, Parkes and Dubbo, and consideration will be given to availability of housing and accommodation in the nearby towns and the need to maintain vacancies for other usual usage.

5.5 Traffic, access and connectivity

A traffic, transport and access management sub-plan would be prepared as part of the construction and environment management plan (CEMP), and construction of the proposal would be undertaken in accordance with this plan. The sub-plan would include a detailed list of the measures that would be implemented during construction to minimise the potential for impacts on the community and the operation of the surrounding road and transport environment. It would address all the aspects of construction relating to the movement of vehicles, pedestrians and cyclists, and the operation of the surrounding road network, including:

- Construction site traffic control, parking and access arrangements.
- Construction material, equipment and spoil haulage, including arrangements for oversize vehicles.
- Road pavement and access road condition management.
- Management of impacts to public transport, including school buses, pedestrian and cyclist access, and safety.
- Management of impacts to access for surrounding residents and business owners/ operators.
- Arrangements for level crossings during construction.
- Road and driver safety.

- Access to and within properties. Where changes to access arrangements are necessary, ARTC would advise property owners/occupiers and consult with them in advance regarding alternate access arrangements.

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, and public transport/bus operators. 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, emergency services, and affected property owners/occupants.

A safety awareness program would be developed and implemented to educate the community regarding safety around trains. Based on the rural setting of the majority of the proposal site, the education program would target those areas where residential districts are located near the rail line, such as at Parkes, Narromine and Peak Hill.

The community would be notified in advance of any proposed road network changes through signage, the local media, and other appropriate forms of communication.

All operational activities would be undertaken in accordance with ARTC's standard operating procedures and the environmental protection licence relevant to the proposal.

Further details on traffic management and road safety are provided in the EIS.

5.6 Amenity impacts

Measures to mitigate social amenity impacts are detailed in the EIS in the relevant chapters for noise and vibration, air quality, landscape and visual and heritage management.

5.7 Summary of impact mitigation/management measures

A range of mitigation and management measures developed in various technical studies and chapters in the EIS together will assist in avoiding and/or managing social impacts identified and described in Section 4. Additional recommended measures are summarised in Table 5-1.

Table 5-1 Summary of social impact management measures

Category	Mitigation or management
Employment and regional economic benefits	Employment and regional economic benefits would be managed through development and implementation of: • Local business and industry procurement plan – would include opportunities for local procurement and suppliers across the social study area region for the proposal. Consideration would be given to the requirements of the *Sustainable Procurement Guide* (Australian Government, 2013) and the *NSW Government Resource Efficiency Policy* (OEH, 2014). Support skills and up-skilling opportunities would be provided to ensure that training and apprentice/trainee development are encouraged by the proposal, subject to regulatory and associated restrictions • Workforce management plan including an indigenous participation plan – would include (but not limited to) opportunities for local and regional sourcing of workforce, workers code of conduct, zero tolerance

Category	Mitigation or management
	policy regarding drugs and alcohol at work sites, induction and training, worker support programs and indigenous participation through training and apprenticeship opportunities
Property impacts	Impacts on properties would be managed through: • effective construction design and planning • implementation of the property management strategy to be prepared for Inland Rail. This strategy would provide the framework for the development of individual property management agreements • minimising the need for local road and access closures • providing alternative access arrangements in the event that access closures are necessary • consultation with individual landowners to identify individual concerns, and develop and document strategies to address these concerns • ongoing communication through the construction phase.
Workforce impacts	Impact of a non-resident workforce would be managed through: • implementation of a workforce management plan including code of conduct for the construction workforce to manage perceived impacts on community safety (community values) related to workforce anti-social behaviour, including a zero tolerance policy regarding drugs and alcohol at work sites. • implementation of a workforce housing and accommodation plan. With respect to the proposal consultation would be undertaken with local accommodation providers and councils in Narromine, Parkes and Dubbo, and consideration would be given to availability of housing and accommodation in the nearby towns and the need to maintain vacancies in each town for other usual usage.
Local amenity, safety and community values	Implement the mitigation measures proposed in: • *ARTC Parkes to Narromine Inland Rail Noise and Vibration Assessment*, GHD 2017c. • *Australian Rail Track Corporation Inland Rail – Parkes to Narromine Traffic, Transport and Access Assessment*, GHD 2017e. • *ARTC Inland Rail – Parkes to Narromine Aboriginal Cultural Heritage and Archaeological Assessment,* Umwelt 2017a.

Category	Mitigation or management
	• *Australian Rail Track Corporation Inland Rail – Parkes to Narromine Landscape and Visual Assessment,* Urbis 2017. A safety awareness program would be developed and implemented to educate the community regarding safety around trains. Based on the rural setting of the majority of the proposal site, the education program would target those areas where residential districts are located near the rail line, such as at Parkes, Narromine and Peak Hill.
Access and connectivity	Access and connectivity impacts would be managed through: • implementation of the traffic, transport and access management sub-plan which would include consultation with the public transport, school bus providers and emergency services providers to inform them of potential access changes or delays • the plan would provide alternate access arrangements if closure of access routes is required • further consultation would be undertaken with key stakeholders regarding the need for road alignment at Millers Lookout Road and Coopers Road.
Stakeholder engagement	Ongoing stakeholder engagement would be undertaken as part of the communications management plan

6. Conclusion

Inland Rail between Parkes and Narromine has the potential to generate social and economic benefits as well as adverse impacts on the social study areas.

Key benefits would potentially include:

- Increased employment opportunities through demand for construction and operation workforce and business opportunities through demand for goods and services mainly during construction phase.
- Potential of reduced freight road traffic along regional and local roads as freight would be transported by rail during operation.

Adverse social impacts would include:

- Impacts on properties and landholders due to property acquisition and land access required during construction.
- Perceived or real anti-social behaviour of single, male, non-resident construction workers may be a concern for local communities. Anti-social behaviour has the potential to increase crime and adversely affect community perceptions of safety.
- Amenity impacts due to changes in noise levels, air quality, views and landscape during construction and operation are expected to be experienced by residents close to the proposal site especially at Parkes and Peak Hill and would reduce with increasing distance from the proposal.
- Impacts on community access and connectivity. However, given the proposal is located outside the larger towns of Narromine and Parkes, and to the west of Peak Hill, overall impacts on community access and connectivity during construction and operation are expected to be minor. Any potential traffic diversions or delays are expected to be experienced by very few community members.

Through the implementation of the proposed mitigation and management measures outlined in Section 5 it is anticipated that the potential benefits would be enhanced and the potential impacts on properties and communities would be minimised.

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Appendices

Appendix A – Environmental Impact Assessment Practice Note – Socio-Economic assessment

Transport Roads & Maritime Services

Environmental Impact Assessment

Practice Note

Socio-economic assessment

EIA-N05

Contents

Introduction

Background

RMS is required by the NSW planning system to consider impacts upon the socio-economic environment in the development and assessment of projects. In addition, the 2012-2016 Corporate Strategy commits RMS to delivering customer focussed projects. The legislative and policy context of socio-economic impact assessments is outlined in **Appendix A**.

The socio-economic practice note forms part of the common procedures under the Roads and Maritime Services (RMS) environmental impact assessment (EIA) guidelines. The practice note is divided into two parts:

- **Part 1: Project managers** briefly outlines the purpose of a socio-economic impact assessment. This section also provides guidance on determining the need for and level of assessment and engaging contractors. The interface between socio-economic impact assessments and RMS communications activities is explained.
- **Part 2: Contractors** provides guidance on RMS' expectations for a socio-economic impact assessments.

Purpose

Road and maritime projects have the potential to produce both positive and negative socio-economic impacts for communities and businesses, through such things as changes in accessibility, local amenity and connectivity, and impacts on properties, local industry and employment. Socio-economic impacts, and how they are managed, may also influence how a customer perceives RMS and its activities.

This practice note provides a framework for assessing socio-economic impacts of road and maritime projects undertaken by or on behalf of RMS to ensure impact assessments are carried out consistently, to a high standard, and are properly integrated with other environmental assessments, design development and management processes.

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PART ONE:

Overview and steps

1. Overview of socio-economic impact assessment

This section provides an overview of the scope of a socio-economic impact assessment.

1.1. What is a socio-economic impact assessment?

Socio-economic impact assessment involves analysing, monitoring and managing the social and economic consequences of development. It involves identifying and evaluating changes to or impacts on, communities, business and industry that are likely to occur as a result of a proposed development, in order to mitigate or manage impacts and maximise benefits.

In particular, socio-economic impact assessment is concerned with changes to such things as:

- How people live, work, play and interact with one another on a daily basis.
- How people move about their area for personal or business purposes, including by vehicle, walking, cycling or public transport.
- People's culture, including shared beliefs, customs and values, attachment to land and places, and sense of belonging.
- People's community, including the level of community cohesion, local character and sense of place.
- People's access to and use of community services, facilities and social networks.
- People's physical and psychological health and well-being, including stress levels, happiness and sense of security.
- People's fears and aspirations, including perceptions about safety and their fears about, and aspirations for, the future of their community.
- People's assets, such as property, housing or business.
- People's personal or business income and expenses.
- Employment, including location, availability and types of employment and labour force availability.
- People's environment, including the quality of the air and water people use, the level of hazard or risk, dust and noise they are exposed to and their physical safety (International Association of Impact Assessment, 2003).

> ***Social impact assessment*** *includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment (International Association of Impact Assessment, 2003).*

Socio-economic impacts may be experienced by individuals and communities as positive, neutral or negative, depending on individual circumstances, vulnerabilities and attitudes in relation to particular changes. Socio-economic impacts can also:

- Be direct or indirect.
- Result in temporary or permanent changes to the socio-economic environment.
- Occur at various project stages, including planning and development, construction, and operation and maintenance.
- Be cumulative, decreasing or intensifying due to interaction with other projects' impacts.

Direct impacts include changes directly related to a project, such as property impacts, changes to public transport, changes in local access, or changes in road traffic noise. Indirect impacts include secondary or 'flow on' effects of a project, such as changes to employment and income in a region due to impacts on land use and improved connectivity.

Cumulative impacts include the incremental effects of an action when added to other past, present or reasonably foreseeable future actions. Cumulative impacts can result from actions that individually would be minor but collectively could result in significant changes to the socio-economic environment of local and regional communities.

Social and economic impacts are also closely linked with other biophysical impacts, such as those relating to traffic and transport, land use and planning, heritage, noise and vibration, air quality and flora and fauna. As such, socio-economic impact assessment is informed by a range of other studies and environmental investigations.

1.2. Outcomes of a socio-economic impact assessment

The primary outcome of a socio-economic impact assessment will be a report containing the following information:

- **Description of the existing socio-economic conditions**, including the baseline conditions of potentially affected groups or communities, to provide a basis for predicting likely changes and future monitoring of impact management strategies.
- **Impact assessment**, including identifying and analysing the likely benefits or impacts of a project and assessing the magnitude, duration and likelihood of identified benefits and impacts.
- **Identification of mitigation and monitoring measures**, including measures to enhance the project's benefits and avoid, manage or mitigate its potential impacts.

Additional outcomes which may flow from effectively considering the socio-economic benefits and impacts of road and maritime projects include:

- Promoting community 'buy-in' and confidence in a project through inclusion in a project's planning and decision making.

- Identification of possible changes to the project footprint, construction methods, operation or maintenance which could reduce negative impacts or maximise project benefits.
- Balancing a project's benefits for local and regional communities with transport and efficiency outcomes for the State.
- Providing decision makers, stakeholders and the community with information on the socio-economic benefits and impacts and strategies to be implemented to avoid or manage negative impacts and maximise positive impacts.
- Helping to manage or avoid potential community conflicts about a project.

2. Assessing socio-economic impacts

This section provides guidance on identifying and assessing socio-economic impacts as part of environmental impact assessment. Interfacing with communications is also covered.

2.1. Task 1 - Project scoping checklist

The Project scoping checklist (**Appendix B**) will guide RMS project managers and environment staff in deciding the level of socio-economic impact assessment required. The socio-economic impacts section of the checklist is completed by the RMS project manager in consultation with environment and communications staff.

Discuss the socio-economic findings of the checklist with the Lead environmental advisor to:

- Identify the scale and magnitude of potential impacts to determine the level of socio-economic impact assessment required.
- Establishing the extent of the study or focus of the socio-economic impact assessment.
- Inform the community consultation program.

The checklist should be used to consider both communities that are directly impacted and likely to experience changes due to their proximity to the project, as well as those indirectly impacted.

2.2. Task 2 – Investigate avoid options

Review the project scoping checklist for potential impacts on the socio-economic environment. Investigate opportunities for avoiding the impact in project design. Avoid options can also include avoiding impacts through project scheduling. Issues likely to cause broad community concern are likely to need an increased level of community consultation.

2.3. Task 3 - Determine level of socio-economic impact assessment

The level of socio-economic impact assessment required will depend on the nature and scale of potential impacts and whether these can be appropriately managed. The size or capital investment value of the project does not necessarily dictate the appropriate level of socio-economic impact assessment.

In consultation with the Lead environmental advisor, use **Table 1** and the findings of the Project scoping checklist to identify the appropriate level of socio-economic assessment. Example scenarios for each level of assessment are provided in **Appendix C**.

Note that the basic level of assessment should be undertaken by someone with experience in impact assessment, preferably with some experience in community engagement and socio-economic impact assessment. The moderate and comprehensive assessments should be undertaken by people with experience in socio-economic impact assessment.

Table 1 Levels of socio-economic impact assessment

Level of assessment	Scale of impacts	Magnitude of impacts	Information expectations	Socio-economic baseline content
Basic	▪ Few impacts OR ▪ Very localised impacts	▪ Impacts of a minor nature only ▪ Short duration impacts OR ▪ Impacts that can be managed by standard mitigation measures (eg generic measures, standard safeguards from the *Environmental Assessment Procedure for Routine and Minor Works*)	▪ Mainly desktop ▪ Quantitative information from secondary sources ▪ For Minor Works, information as per Minor Works REF template	▪ ABS Census data to describe relevant demographic characteristics (ie identify groups that may be particularly vulnerable to changes from the project) ▪ Basic local community structure and patterns (eg pedestrian movements) ▪ Outcomes of previous or basic consultation (ie with local Council officers)
Moderate	▪ Several impacts OR ▪ Two or more medium or high impacts OR ▪ Impacts on groups of people	▪ Impacts of a moderate nature OR ▪ Impacts of moderate duration ▪ Impacts that require specific mitigation measures	▪ Desktop research ▪ Quantitative information from secondary sources ▪ Limited primary research ▪ Targeted consultation with some key community and government stakeholders to identify specific impacts and mitigation measures	▪ ABS Census data, describing key population characteristics ▪ Local community structure and patterns ▪ Relevant business and economic data ▪ Outcomes of targeted consultation
Comprehensive	▪ Many impacts OR ▪ Impacts affecting a broad section of the community OR ▪ Impacts likely to cause broad community concern	▪ Impacts of a major nature OR ▪ Impacts of long duration ▪ Impacts that require specific mitigation measures ▪ Impacts that may have residual affect after mitigation	▪ Desktop research ▪ Quantitative information from secondary sources ▪ Extensive primary research required ▪ Community and stakeholder consultation to define community values, impacts and mitigation measures	▪ ABS Census data, fully describing population and demographic characteristics ▪ Community structure and patterns ▪ Community values ▪ Economic environment ▪ Outcomes of consultation with community and government

2.4. Task 4 – Update project communications plan

RMS carries out consultation and communication at various stages of a project life – the community involvement and communications process often starts in early project development and continues into the Project's operation. Community involvement for RMS projects is carried out in accordance with the *RMS Community Engagement Policy Statement 2012* and the *RMS Community Engagement and Communication Manual 2012*, which are complemented by procedures set out in the RMS EIA guidelines, ProjectPack and MinorProject.

Consultation with Aboriginal communities may also be undertaken for a project. Consultation with Aboriginal communities must be done in accordance with the *RMS Procedure for Aboriginal Cultural Heritage Consultation and Investigation* to comply with statutory requirements.

The relationship between community involvement and socio-economic impact assessment is explored in more detail in **Appendix D**, including a best practice case study.

In consultation with the Lead environmental advisor and communications officer, update or develop a communications plan that reflects the issues identified and the level of assessment decision made during **Task 2**. The plan should identify those communications activities intended to be undertaken by the socio-economic impact assessment contractor.

Table 2 provides an indicative list of stakeholders to be consulted for the socio-economic impact assessment. This is in addition to the wider consultation with property owners, the general public, transport users and key stakeholders generally undertaken for RMS projects. The stakeholder groups to be consulted are similar for moderate and comprehensive levels of assessment. However the number of stakeholders is likely to increase as the level of assessment increases and consultation is likely to expand to include the views of both directly and indirectly impacted groups and individuals.

Stakeholder consultation should not be undertaken until agreed to by RMS communications staff and should be coordinated with other stakeholder engagement activities for the project.

Table 2 Indicative stakeholders to be consulted for a socio-economic impact assessment

Stakeholder	Basic level of assessment	Moderate level of assessment	Comprehensive level of assessment
Local council officers	✓	✓	✓
Local council elected representatives			✓
State government officers (ie education, health, police and emergency services)		✓	✓

State government elected representatives		✓	✓
Community facility providers (ie schools, child care, aged care, support services)		✓	✓
Affected property or business owners	✓	✓	✓
Community/ resident groups		✓	✓
Environmental groups (including local heritage groups)			✓
Business or industry associations		✓	✓

2.5. Task 5 – Engage a contractor (if required)

To engage a contractor to undertake a socio-economic impact assessment:

1. Adjust the model brief (**Appendix E**) to fit the project request for tender. Note if a stand alone brief is required, contact Environmental Planning and Assessment.
2. Include a plan indicating the timing and nature of communications and stakeholder consultation activities during the preparation of the socio-economic impact assessment.
3. Attach Part 2 of this practice note to the brief.
4. Provide the brief to the Lead environmental advisor for review.
5. Once comments from the Lead environmental advisor have been addressed, proceed with tender process as per RMS policy and guidelines.

The appointed contractor should be provided with any consultation and/or issues reports produced for this or other related projects.

2.6. Task 6 – Review the draft socio-economic impact assessment

It is vital that the Project manager understands and supports the mitigation and management measures proposed in the socio-economic impact assessment. The project manager is accountable for the outcomes of the assessment. Guidance on developing mitigation and management measures is provided to the contractor in Part 2 of this practice note.

Review the draft socio-economic impact assessment and provide comments to the contractor. The Lead environmental advisor will also provide feedback on the report. Give particular attention to the mitigation and management measures proposed, which should:

- Directly respond to an impact identified in the report.
- Be reasonable, feasible and have RMS support.
- Have a timeframe and responsibility assigned.

PART TWO:

Assessment and reporting

3. Scope of a socio-economic impact assessment

This section provides guidance on the level of socio-economic impact assessment required to appropriately evaluate potential benefits and impacts of a project.

3.1. Preliminary scoping checklist

At the commencement of the project, the project manager completed a preliminary scoping checklist. The checklist aims to flag potential issues within the community for the project and determine the level of socio-economic impact assessment required. The preliminary scoping checklist also informs the community consultation program that is developed for the project.

RMS undertakes socio-economic impact assessment at three levels depending upon the complexity of the project and the sensitivity of the existing environment: basic; moderate; and comprehensive. The decision on level of assessment is made by the RMS project team based upon the scoping checklist and the guidance provided in Table 1.

The brief will outline the level of socio-economic impact expected, including the community consultation plan and the contractor's role in consultation. The preliminary scoping checklist is attached to the brief.

The contractor must review the preliminary scoping checklist. Based on knowledge of socio-economic issues, the community in which the project occurs and previous similar projects, the contractor must assess the checklist for gaps. Gaps identified in the tendering phase should be highlighted in the response to brief. Otherwise, discuss gaps directly with the project manager.

Table 1 Levels of socio-economic impact assessment

Level of assessment	Scale of impacts	Magnitude of impacts	Information expectations	Socio-economic baseline content
Basic	▪ Few impacts OR ▪ Very localised impacts	▪ Impacts of a minor nature only ▪ Short duration impacts OR ▪ Impacts that can be managed by standard mitigation measures (eg generic measures, standard safeguards from the *Environmental Assessment Procedure for Routine and Minor Works*)	▪ Mainly desktop ▪ Quantitative information from secondary sources ▪ For Minor Works, information as per Minor Works REF template	▪ ABS Census data to describe relevant demographic characteristics (ie identify groups that may be particularly vulnerable to changes from the project) ▪ Basic local community structure and patterns (eg pedestrian movements) ▪ Outcomes of previous or basic consultation (ie with local Council officers)
Moderate	▪ Several impacts OR ▪ Two or more medium or high impacts OR ▪ Impacts on groups of people	▪ Impacts of a moderate nature OR ▪ Impacts of moderate duration ▪ Impacts that require specific mitigation measures	▪ Desktop research ▪ Quantitative information from secondary sources ▪ Limited primary research ▪ Targeted consultation with some key community and government stakeholders to identify specific impacts and mitigation measures	▪ ABS Census data, describing key population characteristics ▪ Local community structure and patterns ▪ Relevant business and economic data ▪ Outcomes of targeted consultation
Comprehensive	▪ Many impacts OR ▪ Impacts affecting a broad section of the community OR ▪ Impacts likely to cause broad community concern	▪ Impacts of a major nature OR ▪ Impacts of long duration ▪ Impacts that require specific mitigation measures ▪ Impacts that may have residual affect after mitigation	▪ Desktop research ▪ Quantitative information from secondary sources ▪ Extensive primary research required ▪ Community and stakeholder consultation to define community values, impacts and mitigation measures	▪ ABS Census data, fully describing population and demographic characteristics ▪ Community structure and patterns ▪ Community values ▪ Economic environment ▪ Outcomes of consultation with community and government

4. Describing the existing socio-economic environment

This chapter outlines expectations for the description of the existing socio-economic environment. The description of the existing socio-economic environment should provide the project team and the community with an understanding of the social and economic context of the project.

4.1.1. Identifying the study area

The extent of the study area for the socio-economic impact assessment depends on the extent or scale of potential impacts, including both direct and indirect impacts, and the context of the area surrounding the project (ie whether it is in an urban, rural or regional setting).

For larger projects, such as a new road corridor, major highway upgrade or new commuter wharf, the study area would generally incorporate a larger area, such as a number of suburbs (in an urban context) or the wider local government area (in a rural or regional context). Towns and/or major population centres should also be included, particularly for projects in regional or rural areas.

For smaller projects, such as a new pedestrian fence or new access ramp for an existing wharf facility, the study area would be more focussed and may include residents, businesses, facilities or communities directly impacted by the project or closest to the proposed works.

The bounds of the study should be confirmed with the RMS project team.

The ABS collects and publishes Census data and other information that will inform the socio-economic profile. ABS statistical geographic areas (Australian Statistical Geography Standard areas) may assist with defining a study area[1] but may not correspond directly to the area of interest.

The main geographic areas that will be relevant to a socio-economic assessment include:

- Statistical Areas Level 1.
- Statistical Areas Level 2.

[1] The Australian Statistical Geography Standard (ASGS) is being used for the release of data from the 2011 Census of Population and Housing (2011 Census). This replaces the Australian Standard Geographical Classification (ASGC) used in previous Censuses. Familiar statistical boundaries such as Census Collection Districts, Statistical Local Areas, and Statistical Divisions are replaced by new units. This will cause some issues with time series comparisons, especially at the CCD and SLA level. To assist with the transition to the Australian Statistical Geography Standard, 2011 Census data are available for both the Australian Statistical Geography Standard and Statistical Local Areas from the 2011 Australian Standard Geographical Classification (ABS, undated).

- Urban Centres/ Localities.
- Local Government Areas.

While statistical local areas are no longer supported by the ABS, information from the 2011 Census is also presented for statistical local areas to assist with the transition to the new geographic areas.

Data collected by other Commonwealth or State government agencies, such as population projections and employment and business data, is generally collected for either statistical local areas or local government areas.

Other geographic areas are listed in **Appendix F**. A description of each of these geographic areas is available on the ABS website (www.abs.gov.au).

Where a project impacts upon an Aboriginal community, other geographical groupings may be more relevant for the purposes of statistics, for example: Indigenous Locations, Areas and Regions.

4.1.2. Socio-economic data sources

Sources of primary and secondary information will include but not be limited to:

- Data on population and demography, income and employment and business and industry available from the ABS, and Commonwealth, State and local government agencies.
- Existing socio-economic policies and strategies relevant to the study area, including local government policies and strategies (eg community strategic plans, local environmental plans, social plans and economic development strategies).
- Outcomes of consultation, including consultation undertaken as part of the socio-economic impact assessment, for the project generally and previous consultation undertaken for the project or for other projects in the study area.
- Observations of the study area, visual surveys or surveys of pedestrians, public transport users, businesses and industry, social and economic infrastructure, or local and regional communities.
- Analysis of social infrastructure, based on a review of web based information, including Council websites and consultation with managers of community services and facilities.

4.1.3. Surveys

For moderate and comprehensive assessments, there are a range of surveys that can assist with establishing the socio-economic baseline:

- Shopper surveys, to identify patterns in commercial activity.
- Origin and destination surveys, to gauge travel patterns in and around the area, identify traffic generators and get a sense of commercial activity.

- Pedestrian surveys, to identify lines of desire, commercial activity and how people are using public spaces.
- Survey of business owners, to understand the target market of businesses, their products and clientele, business operations (ie key accesses) and employment levels.
- Car parking surveys, to understand use and availability of car parking.
- Surveys of community facilities, such as public spaces, to understand the level of use and catchment for community facilities.
- Values surveys, to understand community values, what people like about their community, what makes a community or a location unique, priority issues for the community, spiritual connections and sense of place.

4.2. Describing the socio-economic profile of the community

The description of the existing socio-economic environment should tell a story of the community within the study area. The community should not be defined by raw statistics. Rather statistics should be used to support findings on the people who make up the community and their capacity to adapt to change. The range of socio-economic characteristics used to describe the existing environment will vary according to the level of assessment required.

The socio-economic baseline should consider existing conditions as well as known or likely future conditions. For example, population projections and known or expected future developments should be acknowledged as part of the existing environment discussion.

To better understand the existing socio-economic environment of the study area, statistical information can be compared at different geographical scales to identify key local differences.

4.2.1. Basic assessment

A basic level of assessment will apply to projects of few, short duration or localised impacts or where impacts can be appropriately managed by notifications and consultation.

For a basic level of assessment, the socio-economic profile should identify who (individuals, businesses, groups) is likely to be affected by the proposal and how the area, service, facility or aspect of concern is currently used. The basic assessment should also focus on identifying groups within the community that may be vulnerable to changes brought about by the project, due to such things as their level of economic resources, age, need for assistance or cultural background.

Table 2 provides guidance on the parameters of the socio-economic profile for a basic assessment.

Table 2 Socio-economic profile – basic assessment

Socio-economic aspects to consider
• Vulnerable groups and their access to an area, service, facility or other aspect of concern.
• Numbers of people potentially directly affected.
• Who uses the area, service, facility or other aspect of concern.
• How and for what purpose do users use the area, service, facility or other aspect of concern.
• When, how long or how often do the users use the area, service, facility or other aspect of concern.
• How the area, service, facility or other aspect of concern is accessed.

The socio-economic profile for a basic assessment will be informed by desktop research, findings from previous consultation and observations. Tables 3 and 4 provide a list of indicators that may assist with drawing a socio-economic profile for a basic assessment, with a focus on readily available quantitative data. The socio-economic characteristics described in the existing environment should be informed by the range of potential issues identified in the preliminary scoping checklist.

Table 3 Basic level of assessment – quantitative indicators

Socio-economic characteristics	Sub-category	Indicator	Source
Social characteristics			
Population and demography	Population	Total population (ERP)	ABS (3235.0) Population by Age and Sex, Regions of Australia (by statistical local area)
	Age	Proportion of people aged 14 years or under	ABS Census of Population and Housing
		Proportion of people aged 65 years or older	
	Cultural Diversity	Aboriginal and Torres Strait Islander population	
		Language other than English spoken at home	
Need for assistance	People with disability	People with need for assistance	
Travel to work	Travel to work	Travel to work by car (as driver or passenger)	
		Travel to work by public transport, including breakdown of travel by ferry, bus, rail and tram (where relevant)	
		Travel to work by cycle or walking	

Socio-economic characteristics	Sub-category	Indicator	Source
Economic characteristics			
Income and employment	Income	Median household income ($)	ABS Census of Population and Housing
	Employment	Unemployment rate	ABS Census of Population and Housing Department of Employment and Workplace Relations (Small Area Labour Markets – by statistical local area)
		Industry of employment	Department of Employment and Workplace Relations (Small Area Labour Markets – by statistical local area) Department of Infrastructure and Transport (Bureau of Industry, Transport and Regional Economics) – Industry structure database

Qualitative indicators that will assist with developing the socio-economic profile of the community are listed in Table 4.

Table 4– Basic level of assessment – qualitative indicators

Socio-economic characteristics	Sub-category	Indicator
Economic characteristics		
Business and industry	Local business	Immediately adjacent businesses or services
Social infrastructure		
Social infrastructure	Social infrastructure directly impacted, or immediately adjacent, to the project.	Education facilities (ie child care centres, schools, major tertiary education facilities)
		Health, emergency and aged care services
		Sport, recreation and cultural facilities
		Community support services
		Transport facilities, including key roads, pedestrian and cycle networks, public transport facilities, and school bus routes

4.2.2. Moderate assessments

A moderate level of assessment applies to projects with several impacts, medium duration impacts or impacts on groups of people. Moderate level assessments will usually require project specific mitigation measures to ensure impacts are acceptable to the community.

For a moderate level of assessment, the socio-economic profile is expanded from the basic level to consider groups of people within the community, the services, businesses and facilities that they access and how they move around the community.

Table 5 Socio-economic profile – moderate assessment

Socio-economic aspects to consider
• Vulnerable groups and their access to an area, service, facility or other aspect of concern.
• Groups, individuals and businesses potentially directly affected.
• Groups, individuals and businesses potentially indirectly affected.
• Services, businesses, facilities or other aspect of concern and their spatial location.
• Access to and use of services, businesses, facilities or other aspect of concern.
• Patterns of moving around the community.
• Patterns of use of public spaces.

A moderate socio-economic profile is still primarily generated from quantitative data, easily accessible community information and field observation. However to understand an area and how it is used by the community better, some consultation and surveys may be appropriate. Tables 6 and 7 provide a list of indicators that may assist with drawing a socio-economic profile for a moderate socio-economic assessment. The socio-economic characteristics described in the existing environment should be informed by the range of potential issues identified in the preliminary scoping checklist.

Table 6 Moderate assessment – quantitative indicators

Socio-economic characteristics	Sub-category	Indicator	Source
Social characteristics			
Population and demography	Population	Total population (ERP)	ABS (3235.0) Population by Age and Sex, Regions of Australia (by statistical local area)
	Age	Proportion of people aged 14 years or under	ABS Census of Population and Housing
		Proportion of people aged 65 years or older	
	Cultural Diversity	Aboriginal and Torres Strait Islander population	
		Overseas born	

Socio-economic characteristics	Sub-category	Indicator	Source
		Language other than English spoken at home	
Families and housing	Dwellings	Total dwellings	
		Dwelling type	
	Households and families	Total households	
		Average household size	
	Housing cost and tenure	Housing tenure	
Socio-economic indicators for areas (SEIFA)	Advantage/ Disadvantage Index	Advantage/ disadvantage index by decile	
Need for assistance	People with disability	People with need for assistance	
Travel behaviour	Vehicle ownership	Households with no vehicles	
		Households with one vehicle	
		Households with two or more vehicles	
	Travel to work	Travel to work by car (as driver or passenger)	
		Travel to work by public transport, including breakdown of travel by ferry, bus, rail and tram (where relevant)	
		Travel to work by walking or cycling	
Economic characteristics			
Labour force, income and employment	Income	Median household income ($)	ABS Census of Population and Housing
	Employment	Unemployment rate	ABS Census of Population and Housing Department of Employment and Workplace Relations (Small Area Labour Markets – by statistical local area)
		Industry of employment	Department of Employment and Workplace Relations (Small Area Labour Markets – by statistical local area) Department of Infrastructure and Transport (Bureau of

Socio-economic characteristics	Sub-category	Indicator	Source
			Industry, Transport and Regional Economics) – Industry structure database
Business and industry	Agriculture	Productivity of agricultural land	Significant agricultural lands mapping
	Tourism	Visitor statistics by tourism region, level of self-drive tourism	Tourism NSW (visitor nights, expenditure, tourism businesses by tourism region and LGA)

Table 7 provides a list of qualitative indicators to assist with understanding the community. Information of this type will be informed mainly by desktop research and field observations.

Table 7 Moderate assessment – qualitative indicators

Socio-economic characteristics	Sub-category	Indicator
Social characteristics		
Travel behaviour	Key transport networks	Key pedestrian, cycle, public transport and local road networks, maritime transport and facilities, scenic drives/ tourist routes
	Activity centres	Key activity centres such as commercial areas, schools, employment and user catchments
	Desire lines	Shopper/ pedestrian surveys
	Cultural landscape	Areas, buildings, places, open spaces, landscapes and views of importance
Economic characteristics		
Business and industry	Local business	Type, nature and number of local businesses
	Industry	Key local and regional industries, value of industry
	Access	Current access and parking facilities available to businesses
Social infrastructure		
Social infrastructure	Services	Location of relevant services such as education, health and emergency services.
	Community facilities	Location of relevant sporting facilities, open space areas, museums, churches, community halls, etc.
	Shopping	Provision and location of shopping centres, regular markets, etc.
	Transport and access	Transport facilities, including key roads, pedestrian and cycle networks, public transport facilities, school bus routes, airports, and tourist routes

4.2.3. Comprehensive assessments

A comprehensive assessment centres on the question of "what is it like to live here?" A comprehensive assessment considers the full range of quantitative aspects of a socio-economic profile. In addition, a comprehensive assessment will attempt to capture those intangible aspects of a community that define its character.

Table 8 provides guidance on the parameters of the socio-economic profile of a comprehensive assessment.

Table 8 Socio-economic profile – comprehensive assessment

Socio-economic aspects to consider
• Vulnerable groups and their access to an area, service, facility or other need.
• Patterns of settlement.
• Spatial distribution of socio-economic advantage.
• Services and facilities and their spatial location.
• Patterns of moving around the community.
• Patterns of use of public spaces.
• Local and regional economy.
• Local and regional industry.
• Distance to major centres (for bypass projects).
• External drivers of socio-economic change.
• Community character and values.
• Cultural landscape and sense of place.

The socio-economic profile for a basic assessment will be heavily reliant on current community consultation, surveys and mapping to complement quantitative data. Tables 9 and 10 provide a list of indicators that may assist with drawing a socio-economic profile for a comprehensive assessment.

Table 9 Comprehensive level of assessment – quantitative indicators

Socio-economic characteristics	Sub-category	Indicator	Source
Social characteristics			
Population and demography	Population	Total population (ERP)	ABS (3235.0) Population by Age and Sex, Regions of Australia (by statistical local area)
		Population Growth (ERP) - 5 years and 12 months	ABS Census of Population and Housing
		Population Projections	NSW Department of Planning and Infrastructure

Socio-economic characteristics	Sub-category	Indicator	Source
			(by statistical local are and statistical division)
	Age	Age profile	ABS Census of Population and Housing
	Cultural Diversity	Aboriginal and Torres Strait Islander population	
		Overseas born	
		Language other than English spoken at home	
	Population mobility (ie population transience)	Other address 12 months previous	
		Other address 5 years previous	
Families and housing	Dwellings	Total dwellings	
		Dwelling type	
	Households and families	Total households	
		Household type	
		Family type	
		Average household size	
	Housing cost and tenure	Median property prices	
		Median rental costs	
		Housing tenure	
Socio-economic indicators for areas (SEIFA)	Advantage/ Disadvantage Index	Advantage/ disadvantage index by decile	
	Economic Resources Index	Economic resources index by decile	
Need for assistance	People with disability	People with need for assistance	
Travel behaviour	Vehicle ownership	Households with no vehicles	
		Households with one vehicle	
		Households with two or more vehicles	
	Travel to work	Travel to work by car (as driver or passenger)	
		Travel to work by public transport, including breakdown of travel by ferry, bus, rail and tram (where relevant)	
		Travel to work by walking or cycling	

Socio-economic characteristics	Sub-category	Indicator	Source
Economic characteristics			
Labour force, income and employment	Income	Median household income ($)	ABS Census of Population and Housing
		Low income households <$500/ week	ABS Census of Population and Housing
	Employment	Workforce participation	ABS Census of Population and Housing Department of Employment and Workplace Relations (Small Area Labour Markets – by statistical local area)
		Unemployment rate	ABS Census of Population and Housing Department of Employment and Workplace Relations (Small Area Labour Markets – by statistical local area)
		Industry of employment	Department of Employment and Workplace Relations (Small Area Labour Markets – by statistical local area) Department of Infrastructure and Transport (Bureau of Industry, Transport and Regional Economics) – Industry structure database
Business and industry	Agriculture	Productivity of agricultural land	Significant agricultural lands mapping
		ABS Agriculture statistics	Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)
	Tourism	Visitor statistics by tourism region, level of self-drive tourism	Tourism NSW (visitor nights, expenditure, tourism businesses by tourism region and LGA)

Table 10 provides a list of qualitative indicators to assist with understanding the community. Information of this type will be informed by field observations, targeted surveys, broad community consultation outcomes and consultation with local Council officers and elected local government officials.

Table 10 Comprehensive level of assessment – qualitative indicators

Socio-economic characteristics	Sub-category	Indicator
Social characteristics		
Travel behaviour	Key transport networks	Key pedestrian, cycle, public transport and local road networks, maritime transport and facilities, scenic drives/ tourist routes
	Activity centres	Key activity centres such as commercial areas, schools, employment and user catchments
Community values	Participation in community life	Rate of voluntary work for organisation or group
		Community groups and events
	Desire lines	Shopper/ pedestrian surveys
	Cultural landscape	Areas, buildings, places, open spaces, landscapes and views of importance
External drivers of change	Shifts in demography	Changes to the make-up of the community, e.g. young people leaving, sea/tree-changers, local/State/Federal strategies for population/immigration planning
	Service equity	Closure or opening of medical and financial services
	Employment equity	Closure or opening of business/industry in the region
Economic characteristics		
Business and industry	Local business	Type, nature and number of local businesses
	Industry	Key local and regional industries, value of industry
	Dependency on passing trade	Nature of local business (ie highway or transport based businesses), business surveys, shopper surveys, stoppers survey, origin destination surveys
	Access	Current access and parking facilities available to businesses
	Regional economy	Role of business, including agribusiness, in the regional economy
		Distance from major centres
Social infrastructure		
Social infrastructure	Education	Provision and location of child care, primary schools, secondary schools, tertiary education facilities
	Health, emergency and aged care	Provision and location of hospitals, community health centres, ambulance stations, police stations, fire stations, aged care facilities
	Sport, recreation and cultural facilities	Provision and location of sporting facilities, open space areas, museums, churches, community halls, etc.
	Community support services	Provision and location of employment and training services, disability support, child, family and youth support services, accommodation support services
	Community networks	Provision and location of sporting clubs, resident associations, historical societies, scouts, etc.

Socio-economic characteristics	Sub-category	Indicator
	Shopping	Provision and location of shopping centres, regular markets, etc.
	Transport and access	Transport facilities, including key roads, pedestrian and cycle networks, public transport facilities, school bus routes, airports, and tourist routes

4.2.4. Community values

Understanding community values is important for comprehensive assessments. Identifying community values may also be appropriate for moderate level assessments. Community values relate to such things as:

- Amenity and character, including character of the built form or natural environment, existing noise levels and air quality, heritage and cultural features important to local communities.
- Community health and safety, including road safety and perceptions of community safety.
- Community cohesion and sense of community, including levels of community participation, places of importance to community members, presence of community networks, existing barriers to movement and access to employment and community services.
- Environmental values, including natural features important to local communities, waterways, perceived air quality.
- What defines a place for its inhabitants and users, the intangible connections to place.
- Community fears, aspirations and view of the future.

The community itself owns community values, with places and features of importance specific to individual communities. As such, it is preferable to source this information directly. Community consultation, including broad consultation undertaken for the project and targeted consultation undertaken for the socio-economic impact assessment, is the best source of information on community values.

In the absence of this level of detail in community consultation, identifying community values may be informed by such things as:

- Understanding of the level of social networks, community organisations or events, as an indicator of community cohesion.
- Literature reviews and data analysis.
- Existing government and council socio-economic policies and strategies.
- Local environment plans or other environmental planning instruments.
- Observation of conditions in the study area.

5. Assessing socio-economic impacts

This chapter outlines what information should be used in assessing the impacts of road and maritime projects.

The impact assessment identifies and analyses the likely changes to the existing socio-economic conditions, or baseline, of the study area as a result of the project's footprint, construction and operation. The assessment of socio-economic impacts also includes determining the significance of likely impacts, based on considerations such as the scale and duration, intensity and scope of the impacts.

5.1. Information requirements

The assessment of socio-economic impacts should be informed by a range of information, such as:

- Project information on the project footprint, number and type of directly affected properties and construction methodology, including location of work areas, number of jobs, haulage routes, and associated construction infrastructure.
- Experience of impacts from other transport projects.
- Information on other large developments occurring in the area.
- Information collected on the existing environment.
- Outcomes of community and stakeholder consultation.

The socio-economic impact assessment will also be informed by the outcomes of other studies undertaken for the project such as:

- Land use and property.
- Noise and vibration.
- Air quality.
- Visual assessment.
- Traffic and transport.
- Aboriginal and non-Aboriginal cultural heritage assessments.
- Economic appraisal.
- Flooding.

The socio-economic impact assessment may also be informed by broader studies, such as the RMS commissioned review of bypasses (**Appendix F**).

The socio-economic impact assessment should provide an understanding of the social context of the impacts identified in these studies, such as how people are likely to experience these impacts or how they may impact on the local and regional economy. For

example, changes to noise, air quality and traffic may result in changes to amenity for local communities or businesses, while changes in traffic volumes may impact on community values around safety.

5.2. Approach

The assessment of the socio-economic impacts should provide the RMS project team and the community with an understanding of the likely direct and indirect impacts of the project on the local and regional communities, businesses and economies.

The socio-economic assessment should assess the whole of life impacts of the project. This includes:

- Construction, such as:
  - Work areas, including within the project footprint and associated work sites.
  - Haulage routes for materials, equipment and supplies.
  - Associated infrastructure, such as temporary detention basins and stock pile areas.
  - Changes to access.
  - Use of local resources.
- Operation, particularly:
  - The operational footprint, including associated infrastructure such as permanent detention basins, noise walls, and pedestrian networks.
  - The operation of the project itself as well as surrounding transport networks (road, ferry, rail, bus, pedestrian/cycle etc).

The range of socio-economic impacts considered would be guided by the initial scoping phase and the depth of assessment for each issue will vary according to the level of assessment required (ie basic, moderate or comprehensive).

Consideration should also be given to the community's "perceived" impacts of the project, as community perceptions about possible impacts may influence tolerance of change.

5.3. Evaluating impacts

The assessment must attempt to weigh negative impacts upon communities and individuals with the positive impacts of a project for transport users as a whole. In order to achieve this, the impacts of the project should be assessed in the context of existing social change processes. This would include both cumulative impacts resulting from the combined effects of existing and future developments and impacts resulting from external drivers of change (e.g. industry closure, loss of financial and medical services).

Interactions with other projects' impacts, or with external drivers of change, may decrease or intensify the socio-economic benefits and impacts of a project. The assessment should consider other projects and sources of social change that are likely or probable in proceeding, rather than those that are merely possible.

Some examples of cumulative socio-economic impacts of road and maritime transport projects include:

- Extended periods of construction, due to the sequential construction of multiple projects, increasing the duration of impacts on local amenity or disruptions to traffic and pedestrian networks and public transport facilities.
- Incremental loss or severance of open space or important environmental areas due to multiple projects, impacting on community values.
- Construction traffic from multiple projects placing additional pressure on road networks, leading to periods of congestion and frustration for motorists.
- Traffic from the interaction of multiple developments placing additional pressure on road networks, leading to increased congestion.
- Construction traffic from multiple projects resulting in increased traffic noise and impacts on local amenity.
- Construction of projects on adjoining properties, including both transport and non-transport projects, increasing disruption to pedestrian access, including for people with mobility difficulties.
- Consultation and construction "fatigue" for local communities due to the concurrent or sequential planning and construction of multiple projects.

5.4. Indicative socio-economic impacts

Table 12 provides an overview of those matters to be considered in assessing the socio-economic benefits and impacts of road and maritime transport projects, including impacts of a project's footprint, construction and operation.

Table 12 Matters to be considered in assessing socio-economic impacts

Issue	Sub-category	Matters to be considered	Information requirements

Property impacts (note that some of the information gathered here will overlap with that required for the Landuse and property assessment).	Impacts on property	▪ Number of properties directly affected by the project, including totally or in part
		▪ Properties affected by changes in access or severance impacts
		▪ Ownership of properties directly affected by the project (ie private, local government, state government)
		▪ Types of properties directly affected by the project. For example:
		  ▪ Residential
		  ▪ Commercial (business or industry)
		  ▪ Agriculture
		  ▪ Natural resources (ie quarries, mining, State Forests, etc)
		  ▪ Community facilities
		  ▪ Open space
		  ▪ Conservation (ie national parks and reserves)
			▪ Details of directly affected properties
			▪ Outcomes of land use and planning investigations
			▪ GIS information on land use

	Impacts of property acquisition (ie stress, anxiety, loss of social networks and community cohesion)	▪ Need for residents to relocate as a result of property acquisition for the project
		▪ Likely characteristics of residents who are required to relocate. If information on specific property owners are not available (ie through consultation) do the demographics of the local community demonstrate that there are likely to be people who may be more vulnerable to impacts of moving, such as:
		  ▪ Higher proportions of elderly people or people in need of assistance
		  ▪ Higher proportions of people who are unemployed, on low incomes or who
			▪ Outcomes of property owner consultation
			▪ Outcomes of community and stakeholder consultation
			▪ Population and demographic information collected for the existing environment (ie age, population mobility, economic resources, need for assistance, etc)
			▪ Mapping of socio-economic advantage index

Issue	Sub-category	Matters to be considered	Information requirements
		demonstrate higher levels of disadvantage and lower levels of economic resources ▪ Higher proportions of longer-term residents or owner occupiers ▪ Communities that demonstrate high levels of community cohesion ▪ Ability for residents to relocate locally (ie availability of alternative housing) ▪ Need for businesses to relocate due to the project: ▪ Ability to establish locally ▪ Number of employees that are likely to be impacted	
	Impact on property amenity	▪ Impacts of accessibility/ amenity changes may affect property enjoyment.	▪ Project information for directly affected properties ▪ Changes in local access, including improvements for motorists and public transport users ▪ Potential changes in local amenity, including amenity improvements – street scaping/ beautification works undertaken for the project
Changes to population and demography		▪ Possible influx of workers to the study area during construction, including the number and likely demographics of workers ▪ Proportion of local workers and workers from outside of the study area ▪ Number of residents required to relocate for the project, particularly outside of the area ▪ Demographic profile of residents required to relocate for the project ▪ Potential for urban renewal opportunities which may change the existing demographics particularly in regards to levels of socio-economic advantage/ disadvantage ▪ Number of people who may relocate to/ away from the study area from improved connectivity/ accessibility with other activity centres.	▪ Project information on directly affected properties, including number of residential properties affected ▪ Project information on construction workforce requirements ▪ Information on study area population.
Economy	Employment and income	▪ Number of direct jobs created by the project during construction ▪ Number of indirect jobs created by the project	▪ Project information on construction workforce requirements ▪ Project information on directly affected properties,

Issue	Sub-category	Matters to be considered	Information requirements
		during construction ■ Potential impact on employment in local business and major industries within the study area (eg directly or indirectly, through such things as increased demand for goods and services or impacts on local businesses) ■ Impact on household income through changes in wages and salary.	including number of commercial properties (local businesses) affected ■ Business surveys ■ Outcomes of property owner consultation ■ Outcomes of economic modelling for the project.
	Value add	■ Impact (if any) on value add (economic output) by measuring the impact of the project on the change in size of the economy through gross state/ domestic product.	■ Economic modelling (impact tools including input-output analysis or computable general equilibrium modelling) ■ Surveys ■ Outcomes of land use and planning studies ■ Capital and operating expenditure estimates ■ Direct employment estimates where possible.
Business and industry	Impact on local business	■ Direct impacts on local business due to property acquisition for the project ■ Direct decrease in revenue potential (loss of income) including retraining or relocation and set-up costs ■ Indirect impacts on local businesses due to changes in access, for both customers and service vehicles (ie delivery vehicles) ■ Indirect impacts on local businesses due to such things as changes to visibility, or amenity (ie increased noise or dust) ■ Benefits for local or regional businesses during construction (ie supply of goods and services to construction, increased spending by workers, etc).	■ Project information on directly affected properties, including number of commercial properties (local businesses) affected ■ Business surveys ■ Outcomes of community and stakeholder consultation ■ Outcomes of consultation with property owners.

	Impact of bypassing businesses	■ Extent that the project results in the bypass of commercial centres, towns or villages
		■ Impacts on commercial centres, towns or villages would be influenced by:
		  ■ The size of the town
		  ■ The existing economic base, particularly degree of dependence on highway generated trade
		  ■ Distance from a larger centre
			■ Information on population of towns and villages bypassed
			■ Business surveys
			■ Outcomes of community and stakeholder consultation.

Issue	Sub-category	Matters to be considered	Information requirements
		▪ Opportunities to enhance local businesses with the removal of through traffic from a centre (ie through improvements in local amenity and access to businesses).	
	Regional industries	▪ Direct or indirect impacts on regional industries (ie tourism, agriculture and agri-business, commercial fishing, mining and resources, forestry and manufacturing), including through: ▪ Property impacts ▪ Changes or disruption to access ▪ Potential sterilisation of resources ▪ Property severance (eg of larger agricultural properties) ▪ Increased demand for short-term tourist accommodation ▪ Improved service conditions (ie lower transportation costs) and flow on effects to alternative industries	▪ Project information on directly affected properties, including number of commercial properties (local businesses) affected ▪ Information on the project design ▪ Outcomes of community and stakeholder consultation ▪ Outcomes of consultation with industry groups.
Social infrastructure	Direct impacts on community services, facilities, networks	▪ Impact on any community services or facilities identified in the existing environment investigations due to property acquisition ▪ Direct impact on social housing due to property acquisition ▪ Impact on service levels if community services and facilities are required to relocate due to the project (ie will depend on existing access to alternate services and facilities locally and ability of the facility or service to relocate locally). ▪ Direct or indirect impacts on the operation of emergency services.	▪ Project information on directly affected properties (ie community services and facilities, social housing) ▪ Information on existing community services and facilities available locally ▪ Outcomes of community and stakeholder consultation ▪ Outcomes of consultation with facility managers.
	Indirect impacts (ie access and amenity)	▪ Changes in access to local or regional level community services and facilities ▪ Potential for community services or facilities located near to the project to be affected by: ▪ Increased noise from construction and operation ▪ Changes in air quality, including dust and vehicle emissions ▪ Changes to property access	▪ Project information on design and construction methodology ▪ Outcomes of other project studies (ie noise, vibration, traffic and transport, visual assessment) ▪ Outcomes of community and stakeholder consultation ▪ Outcomes of consultation with facility managers.

Issue	Sub-category	Matters to be considered	Information requirements
		▪ Changes to traffic volumes (increase or decrease) ▪ Changes to the visual amenity.	
Community values	Local character and identity, community cohesion, community safety, environmental values, sense of place, heritage	▪ Potential direct impacts on areas or features of importance to local or regional communities identified by the existing environment investigations (eg heritage places, areas of natural or recreational value, public places) ▪ Potential impacts on community values identified by the existing environment investigations due to: ▪ Changes to local access and local connectivity ▪ Changes in the level of community severance (either reducing or increasing) (ie will it create or remove barriers to movement in the community) ▪ Disruption in access to public places, including waterways, public foreshore areas, shopping centres, and open spaces. Changes in community safety or perceptions of community safety ▪ Changes in noise, air quality or visual environment impacting on local amenity ▪ Relocation of residents or reducing the amount of social interaction potentially impacting on community cohesion ▪ Changes which may affect community identity (ie green space, change in the nature of land use, heritage, places of importance to local communities) ▪ Opposing views about the project amongst community members, impacting on community cohesion	▪ Information on areas or features of community importance identified in existing environment ▪ Information on existing community safety ▪ Outcomes of community and stakeholder consultation ▪ Outcomes of other project studies (ie noise, vibration, traffic and transport, visual assessment, heritage) ▪ Community surveys
Local amenity	Local amenity	▪ Potential changes in local amenity due to: ▪ Changes to local access ▪ Changes in noise, air quality or visual environment impacting on local amenity ▪ Impacts on features that contribute to local amenity, such as green space, heritage places, natural features (ie waterways, public foreshore	▪ Project information on design and construction methodology ▪ Outcomes of community and stakeholder consultation ▪ Outcomes of other project studies (ie noise, vibration, traffic and transport, visual assessment, heritage).

Issue	Sub-category	Matters to be considered	Information requirements
		areas, national parks, etc), areas of vegetation, including native or urban vegetation.	

Access and connectivity	Walking and cycling networks, public transport facilities, roads, parking, changes to adjacent road conditions (ie clearways, heavy vehicle routes)	▪ Temporary or permanent changes to:
		  ▪ Traffic volumes on local or regional road networks (ie increase/ decrease in traffic volumes, changes to local routes, etc)
		  ▪ Pedestrian and cycle networks, public transport facilities or car parking (ie by closing or relocating the facility)
		  ▪ Access for people with disabilities
		  ▪ School bus routes
		  ▪ Property access
		  ▪ Local parking, including on-street parking
		  ▪ Access to waterways, including for commercial and recreational users.
		▪ Impacts on any specific population groups identified in the existing environment investigations that may experience mobility difficulties, such as elderly people, people with disability, children or households that may have limited transport options
		▪ Construction related traffic, including workers, worker parking, heavy vehicles
		▪ Delays and disruptions to road and transport users (motorists, pedestrians, cyclists and public transport) during construction.
			▪ Project information on design and construction methodology, including timing and duration of possible closure of public facilities (ie public transport facilities, boat ramps, etc)
			▪ Project information on traffic management, including worker parking, changes to local networks, haulage routes and alternate public transport services and facilities
			▪ Outcomes of other project studies (ie noise, vibration, traffic and transport, visual assessment)
			▪ Population and demographic information collected for the existing environment (ie age, population mobility, economic resources, need for assistance)
			▪ Information on existing pedestrian and cycle networks and public transport facilities identified in the existing environment.

5.5. Evaluating significance

For many people affected by social impacts, many impacts of a project are likely to be considered substantial, but the degree to which they are tolerated differs with factors such as people's skills or resources to cope with change, and the effectiveness of project communication with affected stakeholders.

Evaluating significance helps to identify those impacts which are considered to have a negligible or low impact, and which can be readily managed through communication and agreement with stakeholders, versus those which require mitigation strategies to avoid effects on social conditions.

In evaluating significance, consideration should be given to whether:

- Changes will be negative or positive.
- Quality of life, community identity, safety, health or economic viability will be affected.
- Impacts will be acceptable or tolerated by most people, rather than cause concern or discomfort.
- The area affected is limited to people for whom individual arrangements can be made, or extends to an area which requires more detailed strategies to be implemented.
- Impacts will affect social equity, such as access to housing, employment, services or customers.
- Negative impacts will be temporary or permanent.
- The impacts will compromise wider planning goals or community values.

The significance of an impact will depend on the magnitude of the impact, such as the intensity or duration of the effect and the scope or extent of the effect.

The intensity of an impact would depend on such things as the strength of the impact, proportion of the socio-economic value lost/ enhanced and rate of loss/ benefit. The duration of an impact would consider such things as period of impact and whether the impact is continuous or intermittent. Consideration should also be given to the immediate effects of the impact as well as the effects that may result over time as well as the phase of the project that the impact occurs and to whether impacts are permanent or temporary.

It is possible that something that may be identified as being a "low" level of significance based on its intensity or duration, and scope or extent, may be a significant issue for the community. As such, consideration should also be given to the level of community acceptability or community concern about the impact when determining the level of significance. For example, the loss of agricultural land for a project may be minor within the context of the amount of agricultural land within the region, however this may be a significant

issue for local communities and the level of community acceptability or concern around this issue should be considered in the overall evaluation.

Socio-economic impact assessments must provide comment on the significance of the impacts identified and the capacity and willingness of the community to adapt to the proposed changes to the socio-economic environment.

6. Developing management and mitigation measures

This section provides information to assist in identifying and developing management and mitigation measures to avoid, minimise, manage or mitigate the project's impacts and enhance or maximise the project's benefits identified through the socio-economic impact assessment.

6.1. Objectives

Management and mitigation measures should generally seek to:

- Avoid, where possible, the negative impacts of the project on quality of life or socio-economic conditions within the study area through changes to the project (footprint, construction or operation) so that the impact is eliminated.
- Minimise the impacts of the project on quality of life or socio-economic conditions within the study area, by modifying the project to reduce the severity of the impact.
- Mitigate the impacts of the project on quality of life or socio-economic conditions within the study area, by implementing measures that alleviate or offset an impact.
- Enhance the quality of life or socio-economic conditions within the study area, implementing measures that ensure the project fits more harmoniously into the community.

Strategies should also be implemented to ensure local communities, including residents, business owners and managers of community facilities are informed about the project's construction and operation and consulted about proposed measures to manage impacts.

6.2. Identifying management and mitigation measures

Management and mitigation measures are important in managing the impacts and benefits of the project's footprint, construction and operation. They should be tailored to the needs of specific projects and should clearly link to the issues identified through the impact assessment.

Management and mitigation measures may relate to the pre-construction, construction and operation phases of a project.

Management and mitigation measures should be developed in consultation with the RMS project manager to ensure they can be implemented. In identifying management and mitigation measures, consideration should be given to:

- Measures and strategies that have been successfully used in other projects to manage similar project impacts and benefits.

- Potential for eliminating the cause of the impact, where possible, rather than managing the outcome. For example, can impacts of traffic noise on local communities be managed through the project design rather than through the use of noise attenuation measures such as noise barriers or double glazing?
- Ensuring that any significant adverse impacts of the project are addressed as a priority.
- Identifying management and mitigation measures through consultation with affected residents, businesses, communities and stakeholders, to ensure that the proposed strategies address the impacts identified.
- Opportunities to enhance the project's long-term socio-economic benefits.

Consideration should also be given to those measures or strategies to be delivered by the project as well as other management or mitigation measures that may be undertaken by other agencies (ie local or state government) with support from RMS.

The implementation of community and stakeholder engagement strategies during a project's construction and operation phases are also important in managing or mitigating a project's impacts on local and regional communities. For example, undertaking early consultation and communication with affected communities about construction activities, including timing and duration of activities and potential impacts and management measures, will allow people to appropriately plan their activities to take account of potential disruptions (ie time of travel, travel route, etc).

6.3. Example management and mitigation measures

Examples of management and mitigation measures used on RMS projects to manage specific socio-economic impacts include the following:

"As far as possible and practicable, source construction materials and other products and services from local suppliers" – Hume Highway Upgrade, Holbrook Bypass.

"The travelling stock route through and around Holbrook would be maintained during operation of the project. This would be further developed during detailed design in consultation with the Hume Livestock Health and Pest Authority and other relevant stakeholders" – Hume Highway Upgrade, Holbook Bypass.

"Develop a signage strategy to provide appropriate signage on the Hume Highway on approach to Holbrook and near to interchanges to identify Holbrook as a stopping destination" – Hume Highway Upgrade, Holbrook Bypass.

"RMS and contractors would work closely with businesses and residents affected by parking restrictions during construction to develop alternative measures to ensure access and trade can continue during construction" – Great Western Highway Upgrade, Kelso.

"Use of temporary road signage would be considered in consultation with business owners where businesses may be impacted due to lack of views from the road during construction" – Great Western Highway Upgrade, Kelso.

"Future Mid-block pedestrian crossings would be monitored within one year of operation between Littlebourne Street and Pat O'Leary Drive. This would be conducted by RMS to Great Western Highway upgrade, to determine whether these have increased, decreased or remained the same compared to existing conditions. Should it be determined that pedestrian safety is compromised due to mid-block crossings then a pedestrian refuge would be considered at this location" – Great Western Highway Upgrade, Kelso.

"Regrade existing access ways. Where not practicable, provide suitable alternative access, the location of which will be determined in consultation with the landowner" – Hume Highway Duplication, Sturt Highway to Tarcutta.

"Negotiations for property acquisition will include consultation on property adjustments where required to maintain farm management practices" – Hume Highway Duplication, Woomargama to Mullengandra.

7. Reporting

This section provides an overview of key considerations for reporting on socio-economic impacts.

The socio-economic impact assessment should provide a balanced assessment of the project's potential benefits and impacts, considering:

- Differing views of community members and key stakeholders.
- Experience from other transport projects.
- Findings from the existing environment investigations.
- Outcomes of other studies such as traffic and transport, land use and planning, noise, air quality and visual assessment.

The impact assessment should also give appropriate weighting to the discussion of issues, based on the level of impact or likely level of community concern.

The current RMS Editorial Style Guide should be used as a writing reference to encourage clarity in the report and provide consistency in style.

7.1. Report structure

The structure of the socio-economic assessment report should demonstrate a logical process of assessment and clear links between the findings of the baseline investigations, assessment of project impacts and the development of mitigation and management strategies. For example, where an impact is identified, the existing condition impacted should be described in the existing environment section of the report. Further, all management and mitigation strategies identified should mitigate those impacts described in the impact assessment section of the report.

The report structure should clearly distinguish between those impacts resulting from the different project phases (ie planning and development, construction and operation and maintenance).

While the structure would depend on the individual writer or project reporting requirements (ie uniformity with other technical studies), the report should provide:

- Project introduction, including:
  - Report purpose.
  - Assessment methodology.
  - Data sources used to inform the study.
  - Geographical description of the study area.

  - Project overview.
- Overview of the social policy framework, relevant to the project and the study area.
- Description of the existing socio-economic environment (refer to Section 4), including:
  - Overview of the local and regional socio-economic context.
  - Discussion of relevant socio-economic characteristics.
  - Summary of key findings relevant to the socio-economic impact assessment.
- Impact assessment (refer Section 5), including:
  - Discussion of the socio-economic impacts relevant to the project's operation.
  - Discussion of the socio-economic impacts of the project's construction.
  - Summary of key findings of the impact assessment.
- Management and mitigation strategies (refer Section 0), including:
  - Overview of project commitments.
  - Monitoring framework.
- Conclusion.

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Appendix A Legislative and policy context

This appendix provides an overview of the legislation and policy relevant to socio-economic impact assessment.

A.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the primary legislation governing land use and development in New South Wales. The EP&A Act provides the framework for the assessment of RMS activities.

RMS projects that may require a socio-economic impact assessment are generally assessed and approved or determined under the following parts of the EP&A Act:

1) Part 5.1 applies to State significant infrastructure and requires approval from the Minister for Planning and Infrastructure. Environmental impact statements are prepared in accordance with the requirements of the Director-General of the Department of Planning and Infrastructure.
2) Part 5 applies to the majority of RMS activities. Usually a review of environmental factors (REF) is prepared to assess the environmental impacts of the proposal prior to a determination being made on whether or not to proceed with the works.
3) Part 4 applies to projects that require development consent from a Council or the Minister for Planning and Infrastructure. A statement of environmental effects or environmental impact statement (for designated development) is prepared to assess environmental impacts.

In the EP&A Act, ***environment*** is defined as including all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings. The objects of the Act support the promotion of the social and economic welfare of the community and providing increased opportunity for public involvement and participation in environmental planning and assessment.

A.2 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage matters of national environmental significance. This includes nationally and internationally important flora, fauna, ecological communities and heritage places. The EPBC Act also provides a framework for assessing development relating to Commonwealth land or being undertaken by Commonwealth agencies.

If a project is determined to be a 'controlled action' under the EPBC Act, there will be a need for an environmental assessment to be prepared and this may require a socio-economic impact assessment.

When deciding if a proposed action should be approved, and what conditions are to be imposed, the Commonwealth Minister for Environment will consider the impacts of the proposed action on matters protected by the EPBC Act as well as other economic and social matters.

A range of other Commonwealth government legislation, policies and strategies may also be relevant to the socio-economic environment, particularly in relation to:

- Social inclusion.
- Education and employment.
- Families and housing, community services and Aboriginal affairs.
- Population and communities.

A.3 Ecologically sustainable development

In NSW, the commitment to the concept of environmental sustainability is expressed in current legislation. It is an object of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act) to encourage ESD (Section 5(vii)). The EP&A Act refers to the NSW Protection of the Environment Administration Act 1991 (PEA Act) for definition of ESD.

Principles and programs aimed at achieving ESD are defined in Section 6(2) of the PEA Act as follows:

Ecologically sustainable development requires the effective integration of economic and environmental considerations in the decision making process. Ecologically sustainable development can be achieved through the implementation of the following programs and principles:

- *The 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 that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*
- *Conservation of biological diversity and ecology integrity – that conservation of biological diversity and ecological integrity should be a fundamental consideration.*
- *Improved valuation, pricing and incentive mechanisms – that environmental factors should be included in the valuation of assets and services.*

It is also an object of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to "promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources" (Section

3(b)). The four principles outlined in the PEA Act also appear in the EPBC Act. The EPBC Act identifies a fifth principle, the integration principle:

Integration principle – decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.

Case law has developed around ESD in the NSW and Federal court systems. Recent court decisions relating to ESD and learnings for RMS are summarised in the *Environmental Planning and Assessment Practice Note – Addressing Ecologically Sustainable Development* (EIA-N02).

A key consideration in relation to socio-economic impact assessment is how project responds to intergenerational equity concerns such as economic viability, access and maintaining vibrant communities. This includes consideration of such things as:

- Impacts on passing trade or access to local businesses, or agricultural or productive land.
- Transport needs of future urban development and improved access for residents and users.
- Potential impacts on the cohesiveness or viability of communities; availability of residential, commercial, industrial and community lands; improved road safety; and traffic noise impacts.

A.4 RMS guidelines and policies

2012-2016 Corporate Strategy

The RMS Corporate Strategy outlines what RMS will strive to deliver over the next four years. It sets out a clear commitment of what customers, the community and partners can expect from RMS and provides guidance on where the organisation is heading.

The strategy identifies six community results that are relevant when considering socio-economic impacts. They include:

- Customer – the customer is at the heart of everything we do.
- Travel – the door-to-door movement of people and goods is efficient and reliable.
- Asset – transport infrastructure meets acceptable standards.
- Access – the accessibility of transport is aligned to the needs of the community and the economy
- Safety – the safety and security of the transport system is maximised.
- Environment – the impact of transport on the environment is minimised.

Other RMS policy

Several other RMS policies and guidelines have been developed to establish frameworks for consulting with the community and for considering and managing impacts on the built and social environment. Relevant RMS policies and guidelines include, but are not limited to:

- *Community engagement policy statement 2012*.
- *Community engagement and communication manual 2012.*
- *Beyond the pavement: RTA urban design policy, procedures and design principles*, July 2009.
- *Contributing to liveable communities: roads as links and places – guidelines for investigating the liveability effects of road and traffic management projects in town centres*, August 2012.
- *Environmental Planning and Assessment Practice Note – Addressing Ecologically Sustainable Development* (EIA-N02).
- *Land acquisition information guide, February 2012.*

Appendix B Project scoping checklist

Issue	Consideration	Scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact manageable using standard mitigation measures? If yes, how?	Comment
Property impacts	Are property acquisitions likely?						
	Is there a potential for displacement of residents or businesses due to property acquisition?						
	Will there be impacts on vulnerable groups (ie elderly, people in need of assistance, communities that demonstrate higher levels of disadvantage)?						
	Will the project impact upon any property improvements?						
	Does the project result in fragmentation of rural properties?						
Changes to population and demography	Will residents need to relocate as a result of property acquisition?						
	Will the project's construction result in a large influx of workers to the study area?						
Economy	Will the project impact on local employment?						
	Will the local population benefit from improvements in income as a result of the project?						
Business and	Does the project impact (either directly						

Issue	Consideration	Scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact manageable using standard mitigation measures? If yes, how?	Comment
industry	or indirectly) on businesses/ commercial enterprises, including agricultural businesses?						
	Are impacts on businesses likely to have flow on effects for employees?						
	Is the project likely to have direct or indirect effects on the regional economy?						
	Will the project result in changes in access to or bypass of businesses?						
	Does the project impact on the composition of regional industries (ie tourism, agriculture, mining and resources, manufacturing)?						
Social infrastructure	Will the project impact (directly or indirectly) any community services or facilities such as hospitals, schools, recreational facilities, aged care, etc?						
Community values, including community health and safety, and community cohesion/ severance	Does the project impact on any places of Aboriginal or non-Aboriginal heritage?						
	Does the project impact on any places likely to be of importance to the local community (ie environmental areas, local parks, local monuments, etc)?						
	Do sections of the community have a strong attachment to place (e.g. large number of generations of a family have						

Issue	Consideration	Scale of impact: Individuals only	Scale of impact: Groups of residents/ special interest groups/ businesses	Scale of impact: Sections of the community/ economy	Scale of impact: Towns/ suburbs/ town centres	Is the impact manageable using standard mitigation measures? If yes, how?	Comment
	lived in the same area)?						
	Is there a potential for impacts (real or perceived) on community health or safety due to emissions to air or water, noise or chemical hazards?						
	During construction, is there a potential for impacts (real or perceived) on community health or safety due to emissions to air or water, noise or chemical hazards?						
	Is there the potential for severance of communities or towns?						
	Will the project change the way people use and access community facilities?						
	Will the project change the unique character of the place or community in which it is located?						
Local amenity	Will the project change the amenity for residents, businesses, or community facilities? (ie through changes in air quality, visual and landscape impacts, noise and vibration)						
	During construction, will the project change the amenity of residents, businesses or community facilities? (ie through changes in air quality, visual and landscape impacts, noise and vibration)						

Issue	Consideration	Scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact manageable using standard mitigation measures? If yes, how?	Comment
Access and connectivity	Will the project change:						
	▪ travel patterns (eg introduce turning restrictions, traffic signals, road closures, new connections, etc)						
	▪ cyclist facilities or access						
	▪ pedestrian access (ie access to public transport, and to/ within commercial precincts, town centres, recreational locations, shops)						
	▪ public transport services or facilities						
	▪ parking						
	▪ property access						
	▪ access for people with special needs (ie people with mobility difficulties, elderly, children, etc)						
	During construction, will the project:						
	▪ generate large volumes of traffic						
	▪ change pedestrian, cyclist or property access						
	▪ alter public transport services or facilities						
	▪ alter travel patterns						
	▪ impact on traffic flow						

Appendix C Level of assessment scenarios

This appendix provides scenarios to demonstrate how the Project scoping checklist can be used to determine the level of socio-economic impact assessment required for a proposal.

C.1 Basic assessment

Description of the proposal

The proposal involves the upgrade of a wharf used by a volunteer marine rescue service. The existing wharf prevents stretcher access for emergency services and limits the size of the vessel used in rescue operations. A 4m section of the existing timber wharf would be removed. New piles would be installed to accommodate a wider aluminium gangway and floating pontoon. The assembled pontoon would travel to, and be stored at, the site on a barge. The wharf and rescue base would be closed to all but emergency activities. A crane required for installation of the gangway would operate from the driveway and public carpark area at the front of the rescue base. The works would take approximately three weeks.

Level of socio-economic impact assessment

See below attachment for potential impacts identified in the project scoping checklist.

The proposal would require a basic level socio-economic impact assessment because:

- There are few impacts. Construction related impacts to amenity would be localised and the temporary closure of the wharf would inconvenience a limited number of people.
- Impacts to amenity can be managed by community consultation and information.

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation or information? If yes, how?	Comment
Community values, including community health and safety, and community cohesion/ severance	During construction, is there a potential for impacts (real or perceived) on community health or safety due to emissions to air or water, noise or chemical hazards?		✓			Yes. Mitigation for noise, water quality etc., inform residents of works program and environmental protection measures.	
Local amenity	During construction, will the project change the amenity of residents, businesses or community facilities? (ie through changes in air quality, visual and landscape impacts, noise and vibration)		✓			Yes. Mitigation for noise, air quality, visual impacts etc., inform residents of works program and environmental protection measures.	Existing wooden shelter would be retained but new structure would be added. Investigate community acceptability.

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation or information? If yes, how?	Comment
Access and connectivity	During construction, will the project:						
	▪ alter travel patterns		✓			Yes. Signage and awareness for car park users.	Relates to use of public car park when crane is in operation.

C.2 Moderate assessment

Description of proposal

The proposal occurs over 5km of an arterial road with traffic congestion that causes delays during peak hour in both travel directions. The road is located in an area earmarked for future growth. It is proposed to widen the two lane road with unrestricted intersections to a four lane road with a closed median and traffic signals at intersections.

The proposal passes through rural-residential settlement. A nursery, pet shop and small commercial centre also occur within this area. The proposal would result in strip acquisition and the loss of approximately 15 parking spaces.

Level of socio-economic impact assessment

See below project scoping checklist for potential impacts identified. The proposal would require a moderate level socio-economic impact assessment because:

- The introduction of a median changes access to commercial and residential properties with potential to impact on businesses, their employees and clientele.
- The alignment encroaches on parking at the commercial centre.
- The introduction of a median will close right-turn access for a number of side streets, changing travel patterns for residents and bus routes.
- The changes to access, parking and travel patterns cannot be solved by standard mitigation measures and requires development of mitigation measures specific to the project.

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation and information? If yes, how?	Comment
Property impacts	Are property impacts likely?	✓				No	Strip acquisition required for private and commercial properties.
Business and industry	Does the project impact (either directly or indirectly) on businesses/ commercial enterprises, including agricultural businesses?		✓			No	Access and parking will change for 10 businesses located within the commercial centre and operating from rural properties.
	Are impacts on businesses likely to have flow on effects for employees?	✓				No	Potentially, see above.
	Will the project result in changes in access to or bypass of businesses?		✓			No	Yes, vehicle access will change with the loss of parking, and closure or right turns potentially affecting loading activities and customers.

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation and information? If yes, how?	Comment
Access and connectivity	Will the project change:						
	▪ travel patterns (eg introduce turning restrictions, traffic signals, road closures, new connections etc)			✓		No	The closure of right turn access will alter travel patterns for residents and bus commuters.
	▪ cyclist facilities or access					N/A	A shared pedestrian-cycle path runs along the proposal.
	▪ pedestrian access					N/A	A shared pedestrian-cycle path runs along the proposal.
	▪ public transport services or facilities			✓		No	Bus routes and stops will have to be relocated to accommodate the changed access to side streets.
	▪ parking		✓			No	15 parking spaces will be lost from the commercial centre.
	▪ property access	✓				No	Access for properties with direct frontage will change with median closure.
	During construction, will the project:						
	▪ change pedestrian, cyclist or property access		✓				
	▪ property access		✓				
	▪ alter travel patterns		✓				
	▪ impact on traffic flow		✓				

C.3 Comprehensive assessment

Description of proposal

The proposal involves an upgrade to 12 kilometres of a State Highway to a four-lane road. The proposal passes primarily through rural and semi-rural landscapes, two townships would be bypassed. Five grade separated interchanges and four new bridges would be built. A major cutting (approx. 26 metres deep) would be built to accommodate six lanes across the ascent/descent of a ridge.

There would be modifications to nine local roads, including two road closures. Access to 47 properties would be modified, with direct property accesses to be limited to left-in, left-out access. There would be partial acquisition of 23 properties, including three agricultural properties which would be severed by the proposal. The new path of the freeway would run between the main centre of one rural town and residential development to the north-east.

A public open space area used for sporting and other community events would be subsumed by the alignment.

Project scoping checklist

See below project scoping checklist for potential impacts identified. The proposal would require a comprehensive level socio-economic impact assessment because:

- There are many potential impacts around property, access, business, amenity and community values which are likely to impact on many people and cause broad community concern.
- Several impacts are of a permanent and major nature, requiring project specific mitigation strategies to reduce impacts, including relocation of a public open space. Residual impacts may remain after mitigation strategies are applied.

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation and information? If yes, how?	Comment
Property impacts	Are property acquisitions likely?		✓			No	Partial acquisitions only, including three properties severed.
	Will there be impacts on vulnerable groups (ie elderly, people in need of assistance, communities that demonstrate higher levels of disadvantage)?		✓			No	Potential for severance of north-eastern sector of township. Investigate social advantage and demography aspects.
	Will the project impact upon any property improvements?	✓				No	Potential for loss, particularly in cases of severance. Itemise improvements within acquisition areas.
	Does the project result in fragmentation of rural properties?	✓				No	Three properties severed.
Changes to population and demography	Will the project's construction result in a large influx of workers to the study area?					N/A	Large influx not anticipated but may be some increase.
Economy	Will the project impact on local employment?	✓				N/A	Potential for temporary increase in opportunities with construction related spending.
	Will the local population benefit from improvements in income as a result of the project?	✓				N/A	Potential for temporary increases in income with construction related spending.
Business and industry	Does the project impact (either directly or indirectly) on businesses/ commercial enterprises, including agricultural businesses?				✓	No	Bypass of Foxground and Berry, severance of agricultural properties. Assess reliance on passing

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation and information? If yes, how?	Comment
							trade.
	Are impacts on businesses likely to have flow on effects for employees?			✓		No	Potentially, related to town bypass. See above.
	Will the project result in changes in access to or bypass of businesses?				✓	No	See above.
Social infrastructure	Will the project impact (directly or indirectly) any community services or facilities such as hospitals, schools, recreational facilities, aged care, etc?		✓			No	Impacts upon David Park.
Community values, including community health and safety, and community cohesion/ severance	Does the project impact on any places likely to be of importance to the local community (ie environmental areas, local parks, local monuments, etc)?		✓			No	Impacts upon David Park.
	Do sections of the community have a strong attachment to place (e.g. large number of generations of a family have lived in the same area)?				✓	No	Berry strong community, sense of place, tourism and arts centre.
	During construction, is there a potential for impacts (real or perceived) on community health or safety due to emissions to air or water, noise or chemical hazards?		✓			No	Residents living adjacent to new route.
	Is there the potential for severance of communities or towns?				✓	No	Residential expansion to north east of the town would be severed by the road.
	Will the project change the way people use and access community facilities?				✓	No	

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation and information? If yes, how?	Comment
	Will the project change the unique character of the place or community in which it is located?				✓	No	Potentially.
Local amenity	Will the project change the amenity for residents, businesses, or community facilities? (ie through changes in air quality, visual and landscape impacts, noise and vibration)				✓	No	Change for some groups of residents from current rural aspect.
	During construction, will the project change the amenity of residents, businesses or community facilities? (ie through changes in air quality, visual and landscape impacts, noise and vibration)				✓	Yes	

Issue	Consideration	Increasing scale of impact: Individuals only	Groups of residents/ special interest groups/ businesses	Sections of the community/ economy	Towns/ suburbs/ town centres	Is the impact able to be managed with consultation and information? If yes, how?	Comment
Access and connectivity	Will the project change:						
	▪ travel patterns (eg introduce turning restrictions, traffic signals, road closures, new connections, etc)			✓			Two road closures, modifications to several local roads.
	▪ pedestrian access (ie access to public transport, and to/ within commercial precincts, town centres, recreational locations, shops)			✓			Particular reference to residents of north-east sector
	▪ public transport services or facilities			✓			
	▪ property access		✓				
	During construction, will the project:						
	▪ generate large volumes of traffic		✓				
	▪ change pedestrian, cyclist or property access			✓			
	▪ alter public transport services or facilities			✓			
	▪ alter travel patterns			✓			
	▪ impact on traffic flow			✓			

Appendix D Community involvement

D.1 Role of consultation in socio-economic impact assessment

Community and stakeholder consultation is an important part of socio-economic impact assessment, helping to identify:

- Community issues or concerns relating to a project, informing the project scoping and assessment stages.
- Community values, including places or features of importance to local or regional communities, including the strength of feeling about particular places or features.
- Community facilities, services or networks of importance to local communities and how these operate or function.
- Potential benefits or impacts of a project's design, construction or operation on local or regional communities.
- Measures or strategies to avoid, manage or mitigate a project's negative impacts or maximise or enhance a project's positive impacts.

The amount and type of consultation and communication undertaken varies for each project, depending on the specific issues and community interest or project complexity and potential level of impact.

RMS community involvement and socio-economic impact assessment processes are often complementary. Community consultation undertaken prior to environmental impact assessment can assist with the scoping phase for socio-economic impact assessment. Conversely, scoping of likely socio-economic issues early in project development can inform the community involvement plan for the project. When community consultation and socio-economic impact assessment processes align, better project outcomes are likely to be achieved, as demonstrated in the case study in below.

D.2 Level of community and stakeholder consultation

The scoping phase for the socio-economic impact assessment also helps to determine the level of community and stakeholder consultation to be undertaken specifically for the socio-economic impact assessment. This would depend on such things as the scope of likely project impacts, existing understanding of community issues and level of assessment being undertaken.

For some projects, consultation undertaken specifically for the socio-economic impact assessment may be limited to key stakeholders such as affected property or business owners or local government officers with a focus on community development, economic development, tourism or strategic planning. For these projects, information on community issues or community values would be informed by such things as the outcomes of wider

project consultation, consultation previously undertaken for the project or undertaken for similar projects elsewhere, or other projects in the study area.

For other projects, a comprehensive consultation process should be undertaken for the socio-economic impact assessment, which could involve targeted consultation with a broad range of community and business organisations, government stakeholders or local property and business owners. For some projects, this may also include a community or business survey to identify baseline information on such things as community values, including relative weighting of values, existing travel patterns or travel behaviours and local business activity.

D.3 Best practice case study – Hampden Bridge – involving the community in decision making

Hampden Bridge is a steel suspension bridge with a timber deck built in 1898. The iconic bridge is located on Moss Vale Road and is a major focal point of the town of Kangaroo Valley. The bridge has historic, technical, aesthetic, social and functional significance. To maintain these values into the future, major rehabilitation work was required, including:

- Replacing the entire timber deck of the bridge.
- Reinforcing the abutments on both sides of the bridge.
- Refurbishing the four bridge bearings.

Closures of the bridge to all traffic were inevitable. Major impacts on the way the community accessed and used local facilities and services were also expected. These socio-economic impacts were identified early and influenced the decision to develop the program of works in consultation with the community.

The community involvement program commenced with a phone survey of 80 businesses and stakeholders. Further community input was sought through targeted briefings to key stakeholders including community groups, business owners and emergency service providers, followed by community forums. A working party was then established to ensure ongoing community input into the development of the maintenance works. Community engagement was further supported by various community updates and information releases.

The community involvement program developed for Hampden Bridge effectively allowed the community to define their own socio-economic impacts and take part in formulating solutions. Positive outcomes for the community included the development of a program of work specifically tailored to reduce a range of potential impacts and a shuttle bus service for closure periods. The significant improvement of RMS's public profile in this area is a testament to the success of this approach.

Appendix E Model brief

Below are samples of sections for inclusion in the scope of works section of the contractor brief for both early investigations and environmental impact assessment stage.

E.1 Overview of Socio-Economic Effects (use for preliminary environmental investigations)

(a) Objective:

To identify the social-economic effects expected of the Boundary St Upgrade Roseville.

(b) Key Issues/Activities:

(i) review social-economics effects from the preferred Concept Design.

(ii) describe the existing socio-economic environment in accordance with a [low, moderate, comprehensive] level of assessment as described in the Environmental Impact Assessment Practice Note – Socio-economic impact assessment (EIA-N05).

(iii) carry out consultation with individuals, groups, community representatives and officials as identified in the community consultation plan and identify major issues of concern.

(iv) consider comments received from various affected government instrumentalities, including local Councils, and the requirements of Department of Planning and Infrastructure.

(v) identify likely impacts specific from the preferred Concept Design.

(vi) identify opportunities to avoid impacts from the preferred Concept Design.

(vii) examination of all Corridor/Route Options in relation to the expected impacts.

(viii) prepare a general statement on the types of impacts that can be expected and the practicality of their measurement, which may include health, psychological stress, intrusion, community severance, impacts on industry, commerce, tourism or recreation.

(ix) present findings on community perspectives drawn from consultation activities.

(x) identify any additional work that would be required at environmental impact assessment stage to further evaluate socio-economic impacts.

(c) Outputs:

Socio-economic effects report on the preferred Concept Design.

E.2 Socio-economic impact assessment (use for reviews of environmental factors or environmental impact statements)

(a) Objective:

Identify the socio-economic impacts of the project and describe the strategies and measures to mitigate these impacts.

(b) Key Issues/Activities:

(i) review overview of socio-economics effects from the preferred Concept Design.

(ii) describe the existing socio-economic environment in accordance with a [low, moderate, comprehensive] level of assessment as described in the Environmental Impact Assessment Practice Note – Socio-economic impact assessment (EIA-N05).

(i) describe the local and regional community structure and patterns

(ii) describe the local and regional industry and commercial activities

(iii) carry out consultation with individuals, groups, community representatives, community officials and government agencies as identified in the community consultation plan and identify major issues of concern.

(iv) identify and assess potential significance of the impacts of the Project on individuals and the community in accordance with a [low, moderate, comprehensive] level of assessment as described in the *Environmental Impact Assessment Practice Note – Socio-economic impact assessment* (EIA-N05).

(v) assess the impact of the project in the context of other concurrent and foreseeable projects, including external drivers of social change such as changes to land use and industry.

(vi) perform an economic evaluation, including:

- Road User Cost Benefit analysis
- other quantified economic impacts (including business impacts and, where possible, quantified environmental costs/benefits)
- non quantified environmental costs/benefits
- relate the two (2) previous dot points to any specific economic evaluation and, as appropriate, to multi criteria analysis and community involvement program in identifying the community's view of the economic valuation of environmental impacts

(vii) cross reference results of Road User BCR evaluations and results of community consultation; and

(viii) identification of mitigation measures and their feasibility for managing the impacts of the project.

(c) Outputs:

Socio-Economic Impact Assessment report on the preferred Concept Design as part of the [Concept Design Report/Review of Environmental Factors/Environmental Impact Statement].

Appendix F ABS defined geographic areas

The ABS collects and publishes data from the Census of Population and Housing and other information for various geographic areas, based on two broad categories:

- ABS structures – those regions which are defined and maintained by the ABS.
- Non-ABS structures – those regions defined and maintained by other organisations, but for which the ABS supplies data.

The following provides a list of the geographic locations under each category.

ABS Structures

- Mesh Blocks.
- Statistical Area Level 1 (SA1).
- Statistical Area Level 2 (SA2).
- Statistical Area Level 3 (SA3).
- Statistical Area Level 4 (SA4).
- Greater Capital City Statistical Areas.
- State/Territory.
- Australia.
- Indigenous Locations.
- Indigenous Areas.
- Indigenous Regions.

Non-ABS Structures

- Postal Areas (POA).
- State Suburbs (SSC).
- Statistical Local Areas (SLA).
- Local Government Areas (LGA).
- Commonwealth Electoral Divisions (CED).
- State Electoral Divisions (SED).
- Australian Drainage Divisions (ADD).
- Natural Resource Management Regions (NRMR).

Appendix G Highway bypasses review

Socio-economic impact of highway bypasses

A review of highway bypass literature was undertaken on behalf of the RMS by the University of NSW (2011) to understand those factors that influence the longer-term socio-economic impacts of highway bypasses.

The review examined three key areas of highway bypass impacts – economic impacts, social impacts and community response and mitigation measures. The literature review found that:

- In the longer-term, highway bypasses generally do not have adverse economic impacts on bypassed towns. Economic impacts that do occur tend to be minimal and of a relatively short-term duration, and in many cases the bypasses have resulted in longer-term economic development benefits for the bypassed towns.
- There are three main indicators of post-bypass economic change, being:
  - **Population size** – smaller towns are generally more likely to experience economic impacts from a highway bypass than medium and larger towns. However, they continue to survive.
  - **Economic base**, particularly the degree of dependence on highway generated trade – those towns with a higher level of dependence on highway generated trade may experience greater difficulty in managing post-bypass recovery than towns with a low level of dependence on highway generated trade.
  - **Distance from a larger economic centre** – in some studies being close to a larger centre was seen as detrimental to post-bypass recovery as motorists could use the bypass to quickly access the larger centre for highway related services. In other studies it was remoteness from a larger centre that was a hindrance to economic growth in the post bypass environment.
- Longer-term traffic levels in medium or larger bypassed towns may approach those of pre-bypass levels, due to increased economic activity from local and regional clientele and from stopping traffic.
- Factors such as the state of the national and regional economy, rural population decline, restructuring of industry and services and the number and scale of chain retail stores may have more of an impact on the economy of a town than the introduction of a highway bypass.
- In the US context, a highway bypass was found to bring about positive land use and land value changes for the bypassed community and for businesses on the main street, with new land use activity generated along the bypass route.
- The social impacts on a bypassed community are generally positive; there is a perception on the part of residents and businesses in bypassed communities that the bypass is very important to the quality of life in their communities and to the environmental amenity of their communities.
- Active leadership and pro-active planning on the part of the local community and Government and road authorities are important aspects of managing change in a post-bypass environment.

The literature review indicated that in the longer term, there is generally “life after the bypass” and that other impacts may influence the economic prosperity of a community more so than a highway bypass. For smaller communities, the literature review highlighted the importance of pre- and post-bypass pro-active planning to mitigate any potential adverse losses and manage post-bypass change. Irrespective of the population size of a bypassed community or its distance from a larger centre, a highway bypass triggers change in the highway related sector of a town economy so that the retail landscape may be quite different in the longer-term. It is important for businesses and the community to capitalise on these changes (University of NSW, 2011).

Appendix H Common terms

Community
A community refers to a group of people who share an attachment with one another and ascribe to a common membership and shared rights and responsibilities. A community can be linked geographically, culturally, ethnically, racially, or through some other identifier (Mackenzie Valley Environmental Impact Review Board, 2007).

Community cohesion
Community or social cohesion can be understood as "the bonds and relationships people have with their family, friends and the wider community. Day to day interactions between people in a community build trust and reciprocity and contribute to cohesion" (ABS, 2010).

Community severance
Community severance refers to reduced access to local amenities and disruption of local social networks caused by a physical barrier running through a community (ie a road or other transport route). Community severance may also be caused by significant increases in traffic flow on a road that was not originally regarded as a barrier (Health Scotland, 2007).

Community values
Community values are those elements held as being important to quality of life and wellbeing. They include tangible (physical) elements such as parks, buildings, and landscape, and intangible (social) elements such as sense of belonging and community diversity. Social infrastructure such as churches, schools, public places and community centres is also highly valued in local communities, as are demographic characteristics and local features.

Economic impact assessment
Economic impact assessment examines how a proposed development might impact how people make a living, their material well-being and the economic structures of local or regional communities (Mackenzie Valley Environmental Impact Review Board, 2007).

Micro-economic appraisal techniques such as Cost-Benefit Analysis is generally undertaken during the planning phases of a project to inform a public sector investment decision. Cost benefit analysis compares the costs of the project against its benefits to various beneficiaries including users and non-users. If overall benefits are demonstrated to exceed the expected costs, the project is considered economically viable. RMS and the NSW Government have well established methodologies for economic appraisals, based on nationally recognised guidelines.

Macro-economic appraisal tools such as computable general equilibrium and input-output modelling can be utilised when an investment decision has been made to determine the effect of a project on economic activity in a region. The assessment of economic impacts involves both quantitative and qualitative analysis to determine changes to such things as business and industry, employment and income, and economic output.

Environment

Environment is defined as including all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social grouping (*Environmental Planning and Assessment Act 1979)*.

Social impact assessment

Social impact assessment includes the "*processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment*" (International Association of Impact Assessment, 2003).

Social infrastructure

Social infrastructure refers to the *"community facilities, services and networks which help individuals, families, groups and communities meet their social needs, maximise their potential for development, and enhance community wellbeing. They include:*

- *Universal facilities and services such as education, training, health, open space, recreation and sport, safety and emergency services, religious, arts and cultural facilities, and community meeting places.*
- *Lifecycle-targeted facilities and services, such as those for children, young people and older people.*
- *Targeted facilities and services for groups with special needs, such as families, people with a disability and Indigenous and culturally diverse people"* (SEQ Regional Plan, Implementation Guideline Number 5 – Social Infrastructure Planning, June 2007).

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Approval and authorisation		Name
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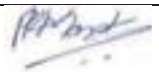
1	E.Davidson L. Harding C. Lau	P Mandke		Simon Page		21/06/2017

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