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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

RE	QUIREMENTS 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.

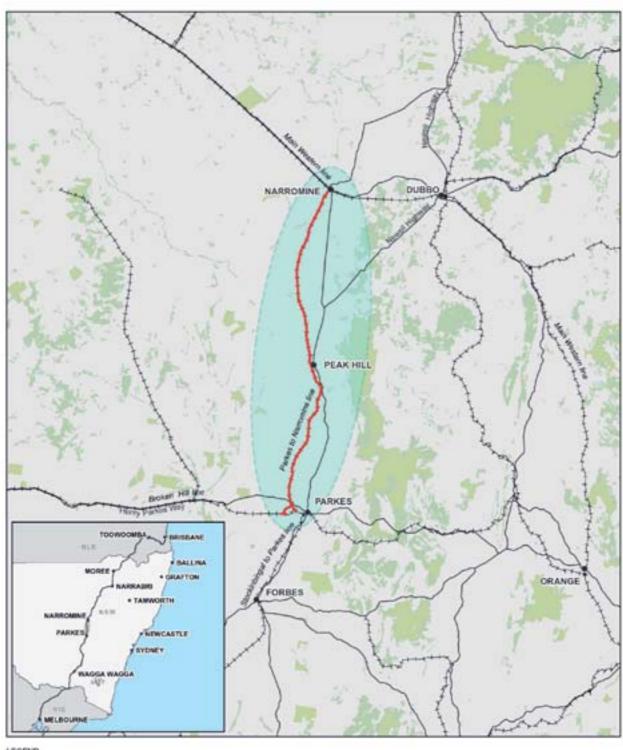
The relevant SEARs encompass some aspects and potential impacts that are not directly related to landscape and visual issues. Although interactions have occurred across applicable technical specialists such as biodiversity, historical heritage, land use planning, noise and vibration (surface), social, 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.

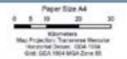


#### LEGEND

Proposal site

Proposal location

Main roads



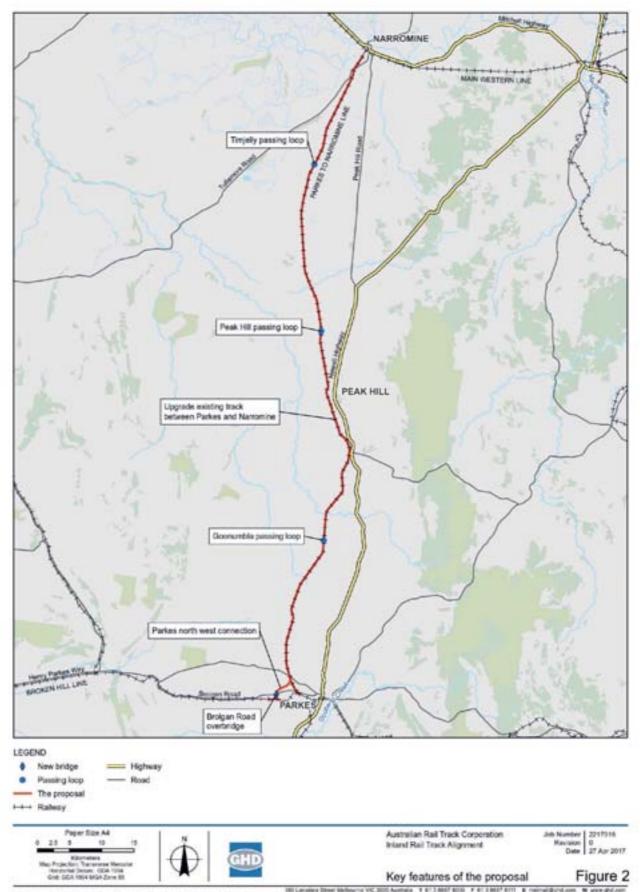




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Location of the proposal

Figure 1



# 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*. 3<sup>rd</sup> Edition (2013)<sup>1</sup>.

# 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**).

6 ASSESSMENT APPROACH AND METHODOLOGY

<sup>&</sup>lt;sup>1</sup> The Landscape Institute and Institute for Environmental Management and Assessment LIIEMA, (2013). Guidelines for Landscape and Visual Impact Assessment. Routledge 3<sup>rd</sup> 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:

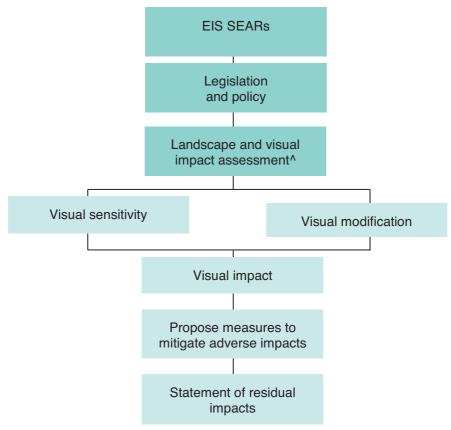
- Users of all outdoor recreational areas whose attention or interest may be focused on, or dependant on the landscape for their experience
- Communities where the proposal results in changes in the landscape setting or to the value of views enjoyed by the community
- People using tourist roads
- Occupiers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



<sup>^</sup> 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 Sensitivity

Visual Modification

	Н	М	L	VL
Н	Н	Н	M	L
M	Н	M	L	VL
L	М	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)<sup>2</sup>.

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<sup>&</sup>lt;sup>2</sup> 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

	FOREGROUND	MIDDLEGROUND	BACKGROUND
VISUAL USE AREA	Local Setting	Sub-Regional Setting	Regional Setting
	0 – 0.35 kilometres	0.35 - 0.7 kilometres	0.7 - <=1 kilometres
Residential / Homestead	Н	Н	Н
Parks and recreational areas	Н	Н	Н
Townships and villages	Н	Н	M
Newell Highway	М	М	М
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

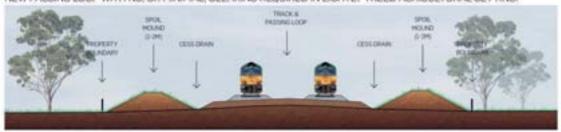
The methodology adopted for this landscape and visual impact assessment assumes that any change to the landscape or views from sensitive receptor locations arising from the proposal would be negative. This is in recognition that people's perception of the visual impact of the proposal would differ both 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.

#### 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
	D - 0.35KM	0.35 - 0.7KM	0.7~ <> 1KM
PARALLEL	MH	м	L
PERPENDICULAR	L-M	L	VL.

## **CONDITION 2**

## RE-INSTATEMENT OF EXISTING TRACK THROUGH OPEN AGRICULTURAL LAND.

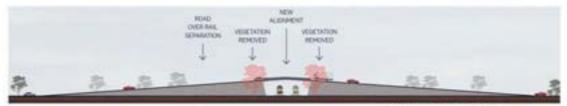


VISUAL MODIFICATION	FOREGROUND	MIDDLEGROUND	BACKGROUND
	0 · 0.35kM	0.35-0.7KM	0.7- <= 1KM
PARALLEL	L	Sec.	VL.
PERPENDICULAR	L	VL.	VL.

#### VISUAL MODIFICATION CONDITIONS FOR PARKES NORTH-WEST CONNECTION

## CONDITION 1

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

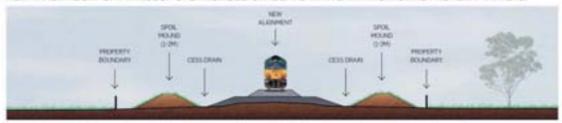


\*ALIGNMENT RELATES TO ROADWAY

VISUAL MODIFICATION	FOREGROUND	MODLEGHOUND	BACKGROUND
N	0 - 0.35kM	0.35-0.7KM	0.7- <= 1KM
PARALLEL	н	: H	м
PERPENDICULAR	H	н	м

#### **CONDITION 2**

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



VISUAL MODIFICATION	FOREGROUND 0 - 0.35KM	MIDDLEGROUND 0.35 - 0.7KM	BACKGROUND 0.7 · <= 1KM
PERPENDICULAR	м	м	L

#### CONDITION 3

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

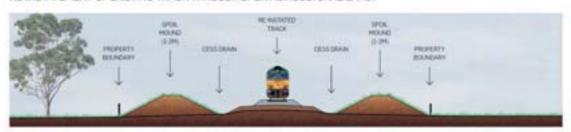


VISUAL MODIFICATION	FOREGROUND 0 - 0.35KM	MIDDLEGROUND 0.35 - 0.7KM	8ACKGROUND 0.7 - <= 1KM
PERPENDICULAR	M	: M	

## VISUAL MODIFICATION CONDITIONS FOR PARKES NORTH-WEST CONNECTION

# **CONDITION 4**

RE-INSTATEMENT OF EXISTING TRACK THROUGH OPEN AGIRCULTURAL LAND.



VISUAL MODIFICATION	FOREBROUND 0 - 0.35KM	MIDDLESROUND 0.35-0.79M	BACKGROUND 0.7 - c= 1KM
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.

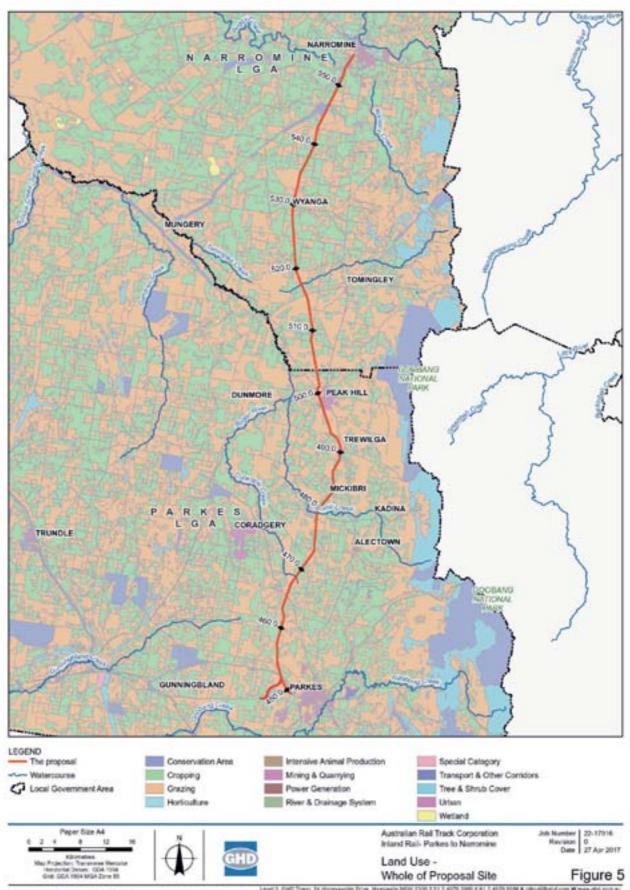
A number of threatened ecological communities and flora species were recorded from desktop searches in proximity to the proposal site. At least five threatened ecological communities and three threatened flora species were identified as likely to occur within the proposal site: Refer to Umwelt, 2017,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

#### **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.

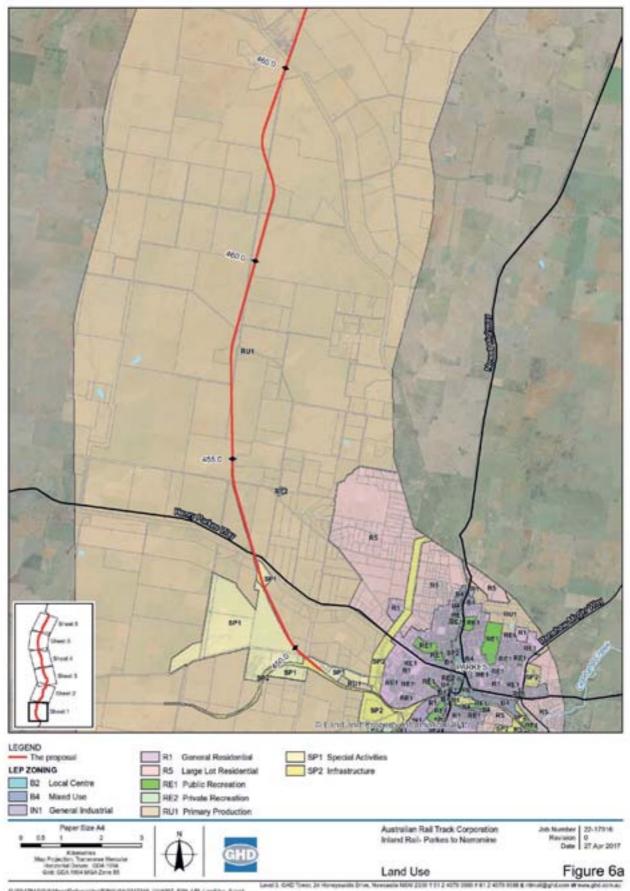
#### Non-Aboriginal heritage

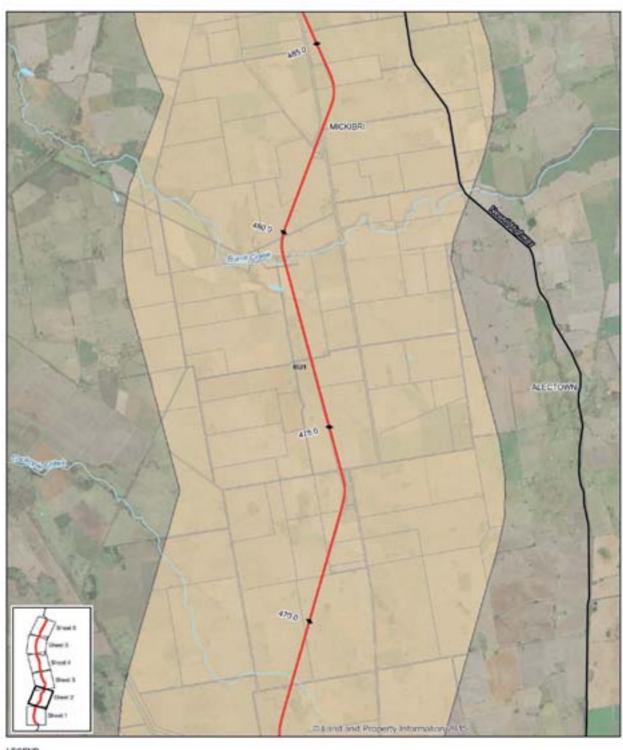
The desktop assessment identified no heritage listed items within or in the vicinity of the proposal site. The nearest listed items are situated in the townships of Parkes, Peak Hill and Narromine.



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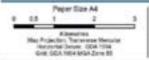




LEGEND
The proposal

LEP ZONING

RU1 Primary Production



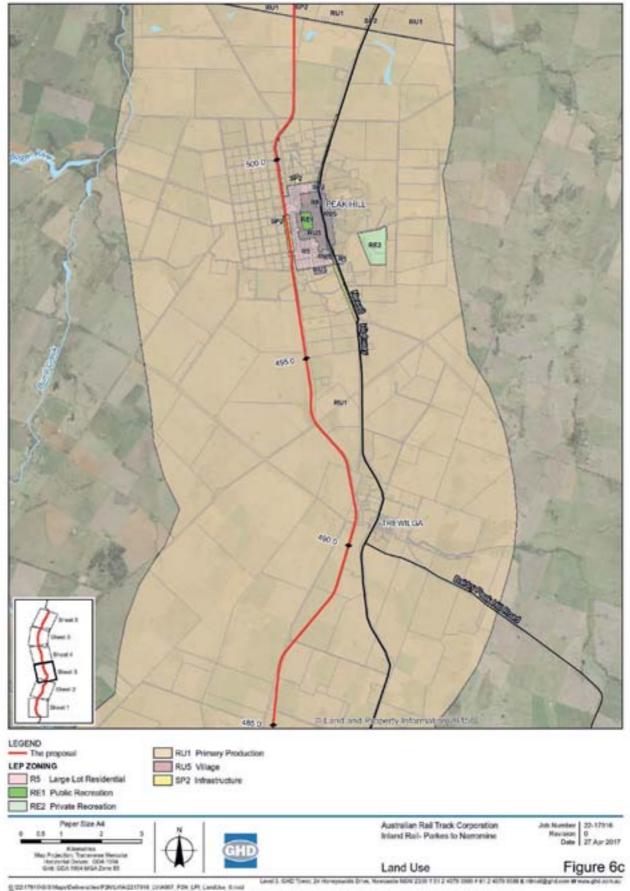


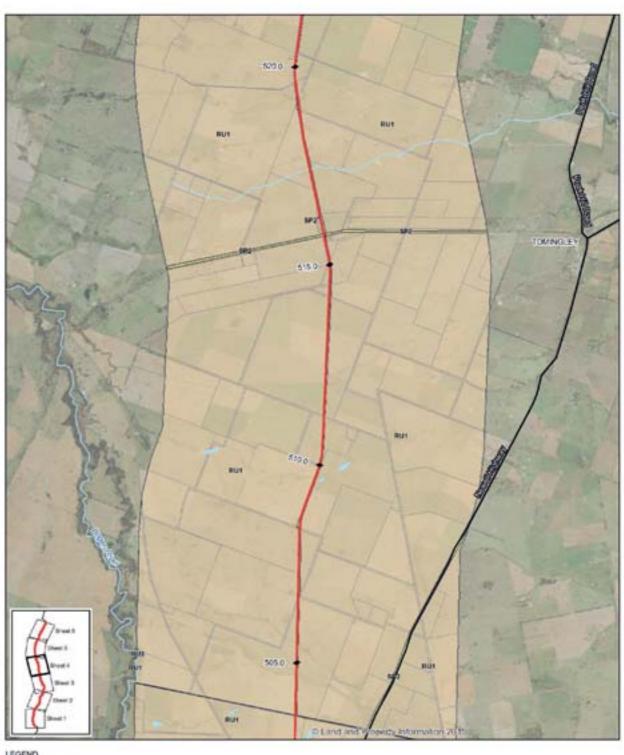
Australian Rail Track Corporation Inland Rail- Parkes to Namonine Job Number 22-17016 Herison 0 Date 27 Apr 2017

Land Use

Figure 6b

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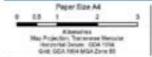


LEGEND The proposal

LEP ZONING

RU1 Primary Production

SP2 Inhastructure



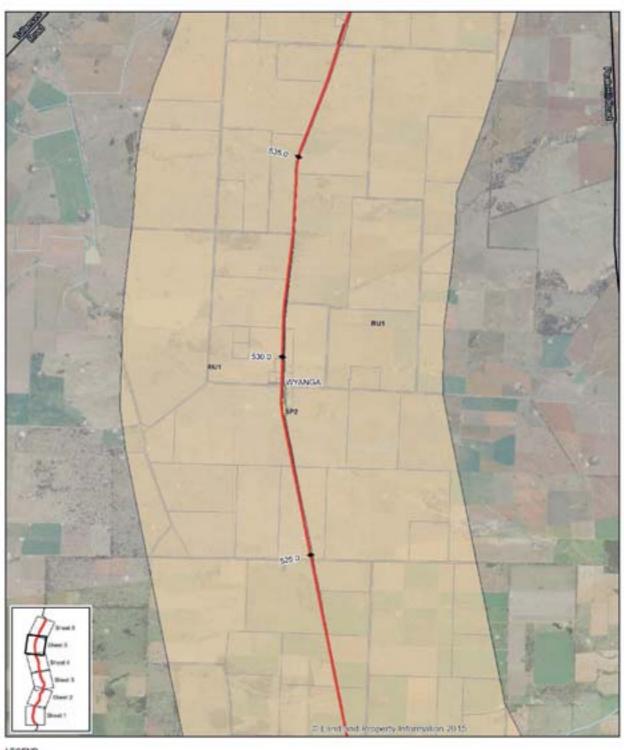


Australian Rail Track Corporation Inland Rail- Porkes to Narromine Job Number 22-17016 Herison 0 Date 27 Apr 2017

Land Use

Figure 6d

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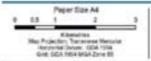


LEGEND
The proposal

LEP ZONING

RU1 Primary Production

SP2 Inhastructure



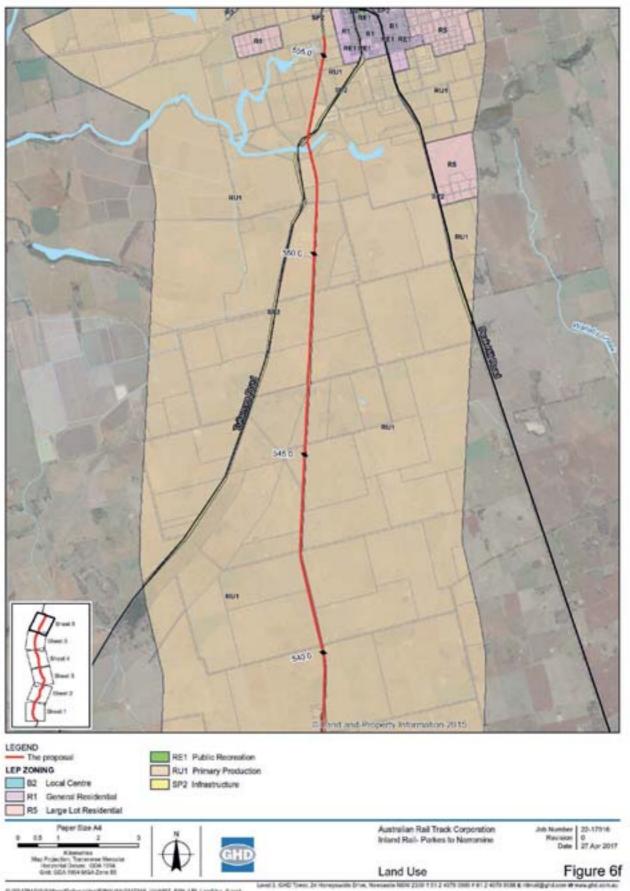


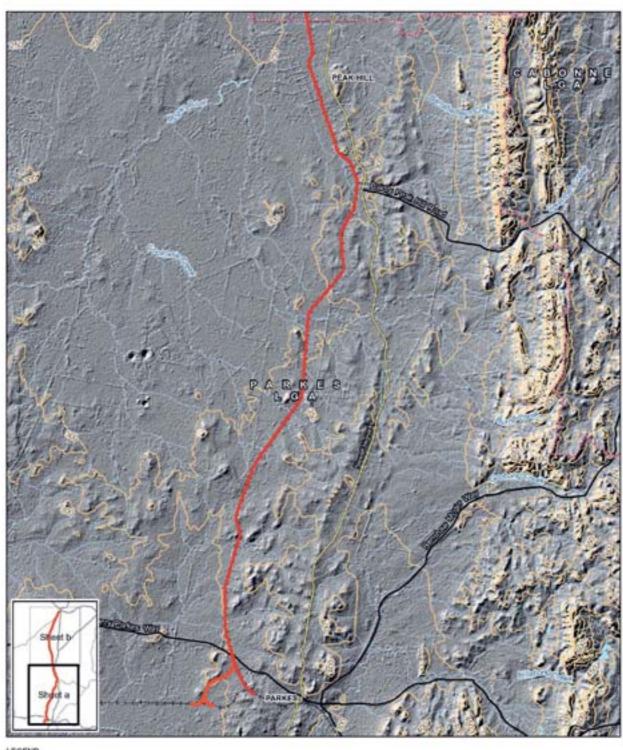
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Land Use

Figure 6e

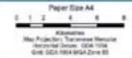
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Watercourse





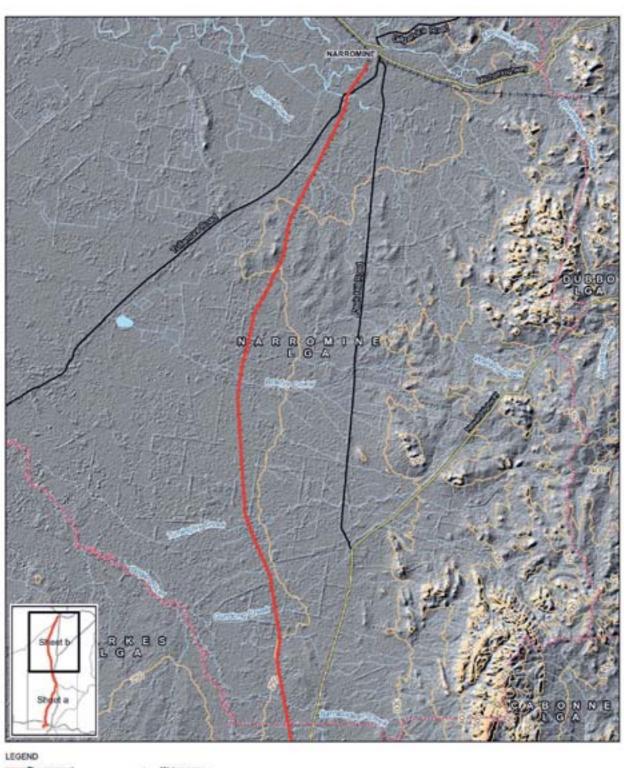
GHD

Australian Rail Track Corporation Inland Rail - Parkes to Narromine Job Number 22-17016 Herison 0 Date 27 Apr 2017

Topography

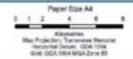
Figure 7a

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The proposal
Local Government Area

Watercourse







Australian Rail Track Corporation Inland Rail - Parkes to Narromine Job Number 22-17016 Herison 0 Date 27 Apr 2017

Topography

Figure 7b

Topography 1 Iguro 7 I

#### 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).

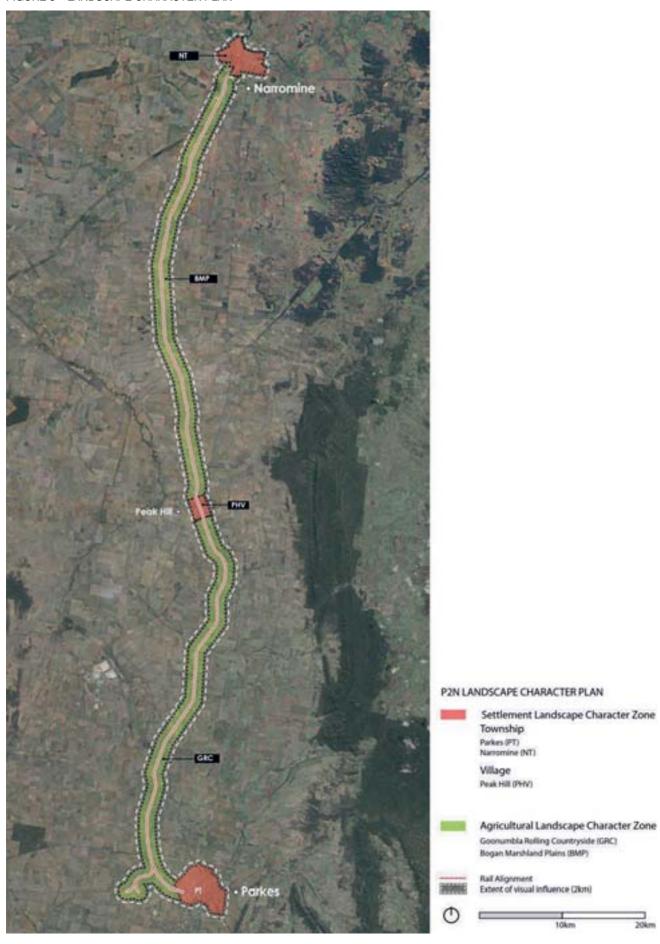
The proposal straddles the western edge of Peak Hill through land reserved for rail infrastructure. The village centre, located to the east, is surrounded by grid-like pattern low density residential development, on relatively large land parcels (as shown in *Picture 6*).

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 zo	one					
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.

38 VISUAL ASSESSMENT

## 6.2 Visual impact assessment

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

hainage (km)	Development	Distance to most	Most Sensitive	Level of visual	Visual	Visual impact	Comments	
	Condition #	sensitive viewpoint	Viewpoint	modification	sensitivity		COLUMN TO THE PARTY OF THE PART	
449-458	2	0.10km	Residential / Homestead	- L	H	11.	Culvert and track replacement only raises approx. between 250-400mm	
458 - 462.5	.2.	Okm	Local Road	T.	T.	i.	Culvert and track replacement only raises approx. between 250-400mm	
462.5 - 465	2	0.64km, 0.93km	Residential / Homestead	VL.	38	L.	Culvert and track replacement only raises approx. between 250-400mm	
465 - 467.5	2	Okm:	Local Road	- 31	M	L.	Culvert and track replacement only raise approx. between 250-400mm	
467.5 - 469.5	2	0.30km	Residential / Homestead	L	н	ш	Culvert and track replacement only naise approx. between 250-400mm	
469.5 - 471.5	2	Okm	Agricultural Area	L	VL	VI.	Culvert and track replacement only raise	
471.5 - 472.5	2	0.80km	Residential /	VL.	H	L	approx. between 250-400mm Culvert and track replacement only raise	
		1/2/2/2/2	Homestead	2000	- 10		approx. between 250-400mm Culvert and track replacement only raise	
472.5 - 474	2	Okm	Rural Road Residential /	L	T	L	approx. between 250-400mm	
474 - 476.5	1	0.95km	Homestead	VL.	н	L	Crossing loop at Alectown West	
476.5 - 477.5	2	Okm	Agricultural Area	VL.	VL.	VL.	Culvert and track replacement only raises approx, between 250-400mm	
477.5 - 484.5	2	0.56km, 0.73km, 0.66km, 0.35km	Residential / Homestead	T.	H	ti.	Culvert and track replacement only raise approx. between 250-400mm	
494.5 - 497	2	0.03km	Rural Road	31	ī.	L.	Culvert and track replacement only raise approx. between 250-400mm	
497 - 489	2	0.90km	Residential / Homestead	VL.	ЭН	L.	Culvert and track replacement only raise approx. between 250-400mm	
488 - 489	2:	0.50km	Rural Road	1.	- L	L	Culvert and track replacement only raise	
489 - 503	2	0.12km - 0.90km	Residential / Homestead	L	н	ш	approx. between 250-400mm. Culvert and track replacement only raised approx. between 250-400mm.	
503-508.5	2	Okm	Agricultural Area	T.	.VL	VL.	Culvert and track replacement only raise approx. between 250-400mm	
500.5 - 511.5	1	Okm	Agricultural Area	L-M	Vt.	VL.	Crossing toop at Peak Hill.	
511.5 - 514.5	2	0km	Local Road	L.	I.	L	Culvert and track replacement only raise approx. between 250-400mm	
514.5 - 517	2	0.15km, 0.57km	Residential / Homestead	L	н	м	Culvert and track replacement only raise approx. between 250-400mm	
517 - 519.5	2	.63km	Rural Road	L	L	L	Culvert and track replacement only raise approx, between 250-400mm	
519.5 - 525.5	2	0.15km, 0.22km, 0.25km	Residential /	1.	14	u	Culvert and track replacement only raise	
525.5 - 529.5	2	03km	Flural Road	1	1	L	approx, between 250-400mm Culvert and track replacement only raise	
529.5 - 530.5	2	0.25km	Rural Road	- G	н	u.	approx. between 250-400mm Culvert and track replacement only raise	
530.5 - 535.5	2	Okm	Rural Road	-1	ı.	L	approx. between 250-400mm Culvert and track replacement only name	
535.5 - 538	1	3.500	Residental /	-	-		approx. between 250-400mm	
		0.30km	Homestead	LM	н	.H.	Crossing loop at Timjetly  Culvert and track replacement only raise	
538 - 538 5	2	.03km	Rural Road	, L	r	T.	approx. between 250-400mm	
538.5 - 549.5	2	0.43km, 0.90km, 0.44km, 0.90km, 0.30km, 0.95km, 0.77km, 0.23km	Residential / Homestead	VL.	н	L	Culvert and track replacement only raise approx. between 250-400mm	
549.5 - 552.5	2	0.35km	Local Road	L	M	L	Culvert and track replacement only raise approx. between 250-400mm	
552.5 - 555	2	Oken	Residential / Homestead	L	н	ш	Culvert and track replacement only raise approx, between 250-400mm	

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	Н	М	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	М	Н	Н	
450.1-449.8	3	0.22km	Residential / Homestead	М	Н	Н	Removal of native canopy trees, crosses over Millers Lookout Road (rural road)
449.8-448.7	2	0.22km	Residential / Homestead	М	Н	Н	
448.7-448.5	1	0.45km	Residential / Homestead	Н	Н	Н	Brolgan Road grade separation
448.5-447.4	2	0.40m	Residential / Homestead	М	Н	Н	south-west arm
448.5-448	2	0.50km	Residential / Homestead	М	Н	Н	south-east arm
448-447.8	3	0.68km	Residential / Homestead	Н	Н	Н	Coopers Road closure
447.8-447.4	2	0.80km	Residential / Homestead	М	Н	Н	
	#1	Grade separation in lightly treed agricultural setting.					
	#2	Grade separation in lightly treed agricultural setting.  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.					



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



Cadastre



- 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

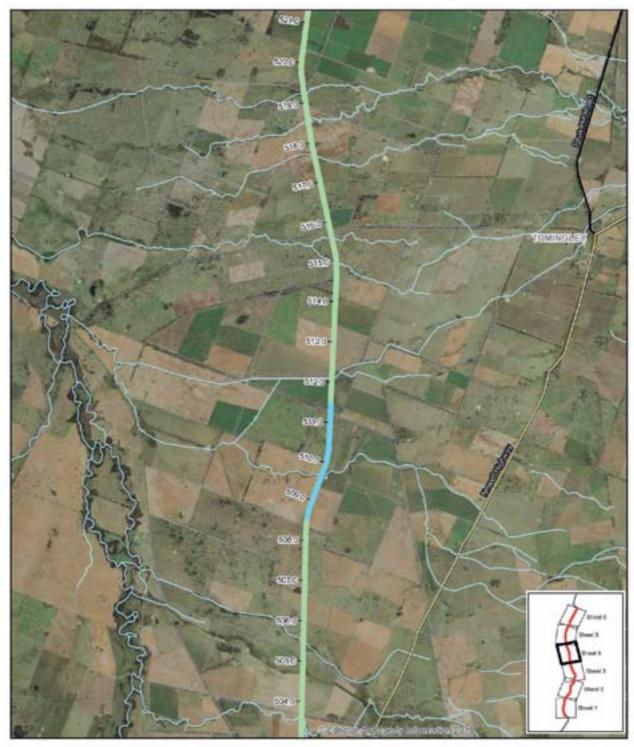




2- Re-instatement of existing track through open agricultural land

Cadestre

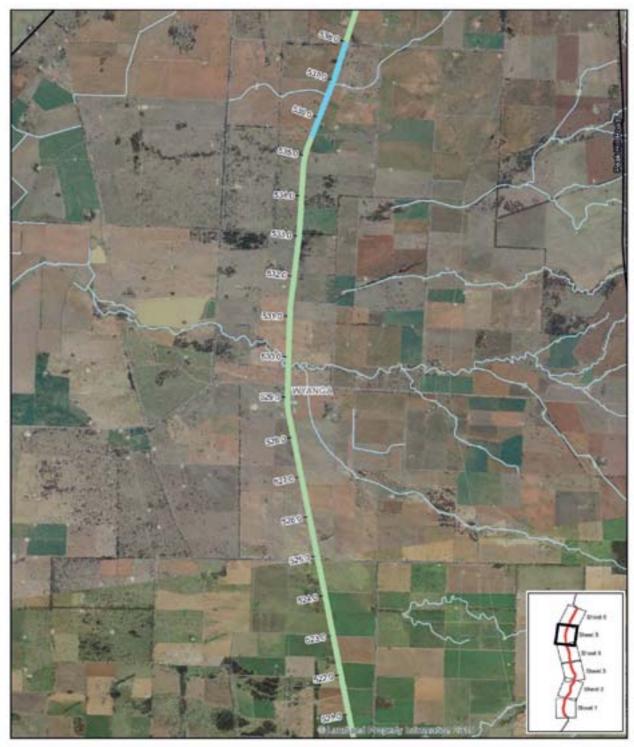




- 1- New crossing loop with no, or minimal, clearing required in lightly treed agricultural land
- 2- Re-instatement of existing track through open agricultural land

Cadastre





- 1- New crossing loop with no, or minimal, clearing required in lightly beed agricultural land
- 2- Re-instatement of existing track through open agricultural land

Cadastre

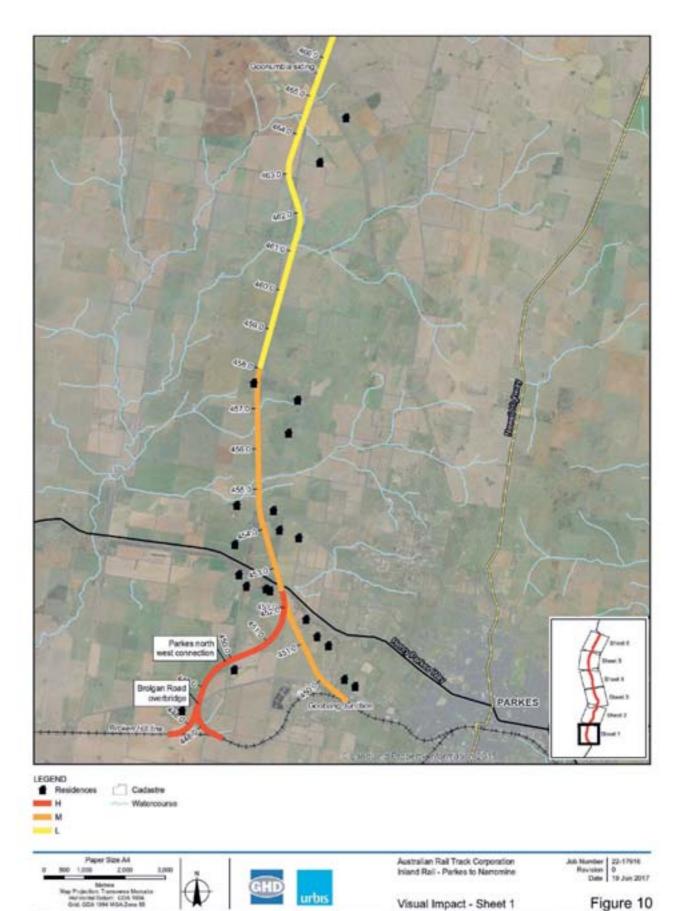


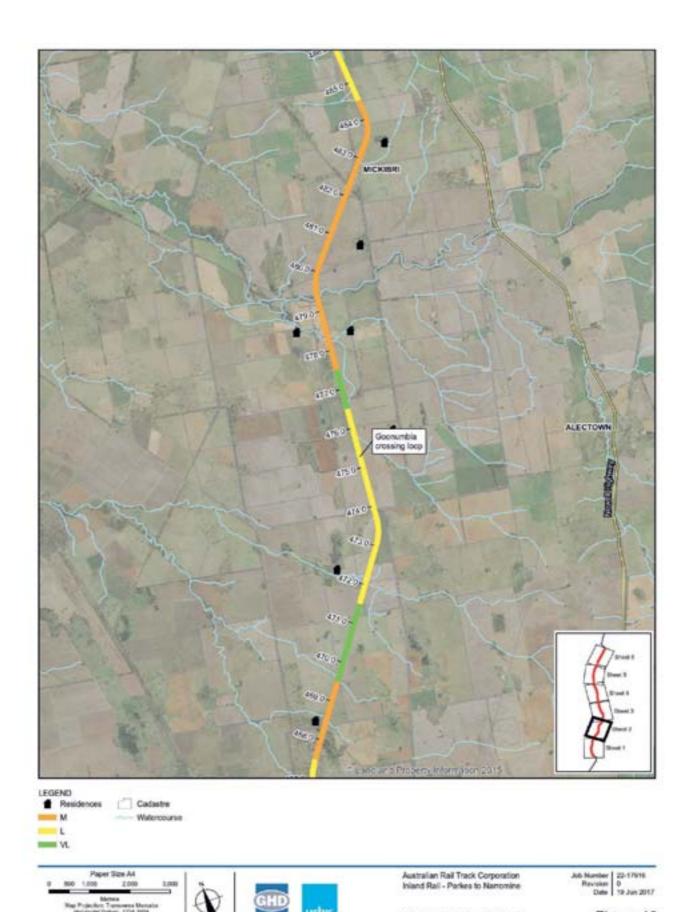


2- Re-instatement of existing track through open agricultural land

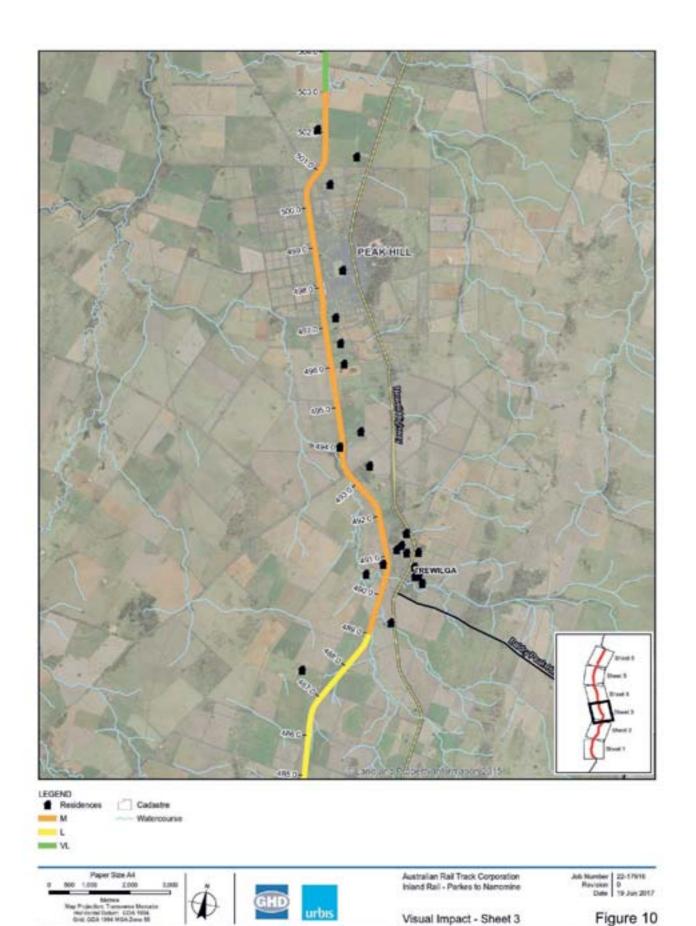
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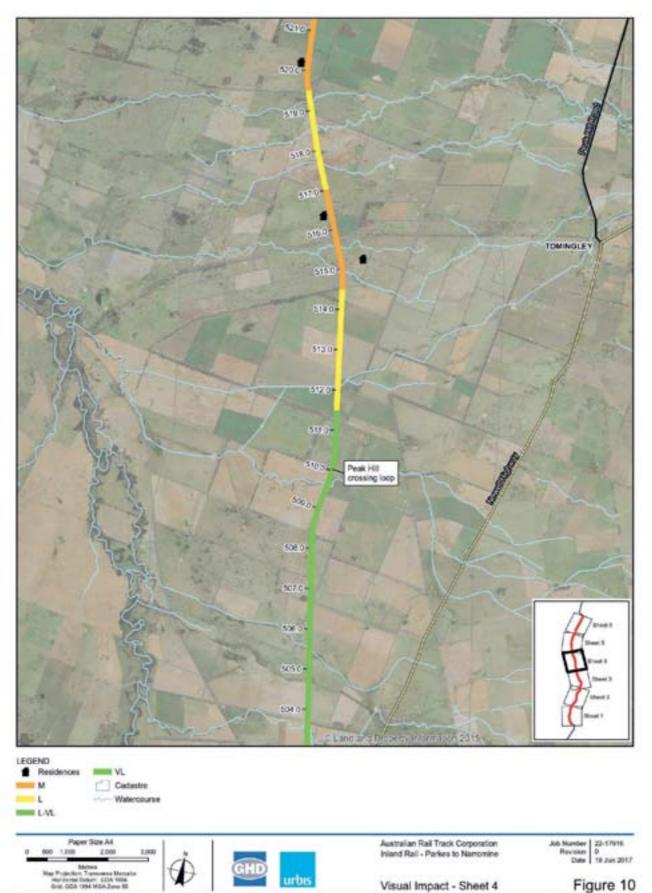


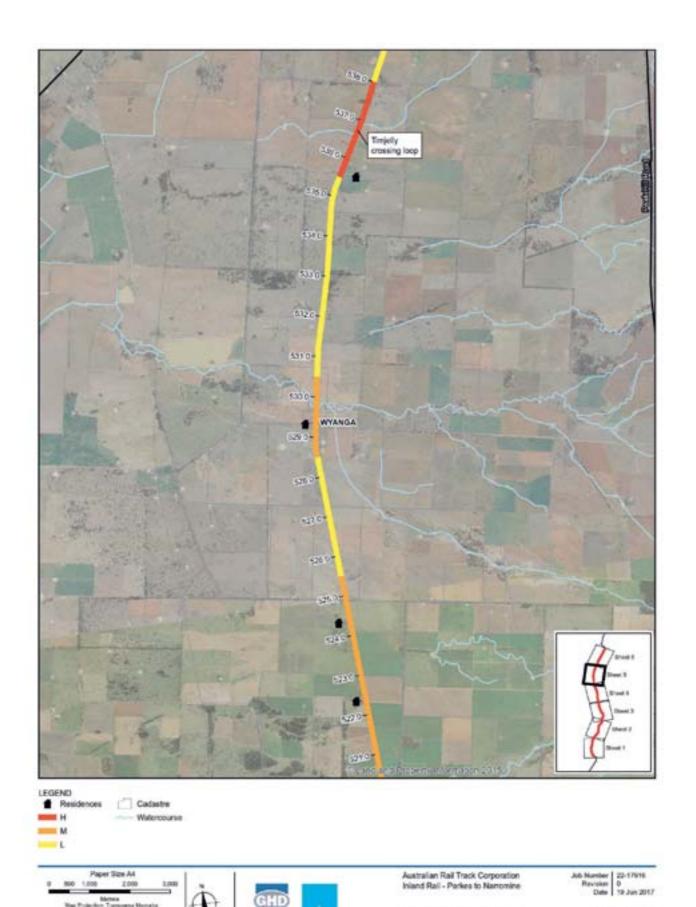


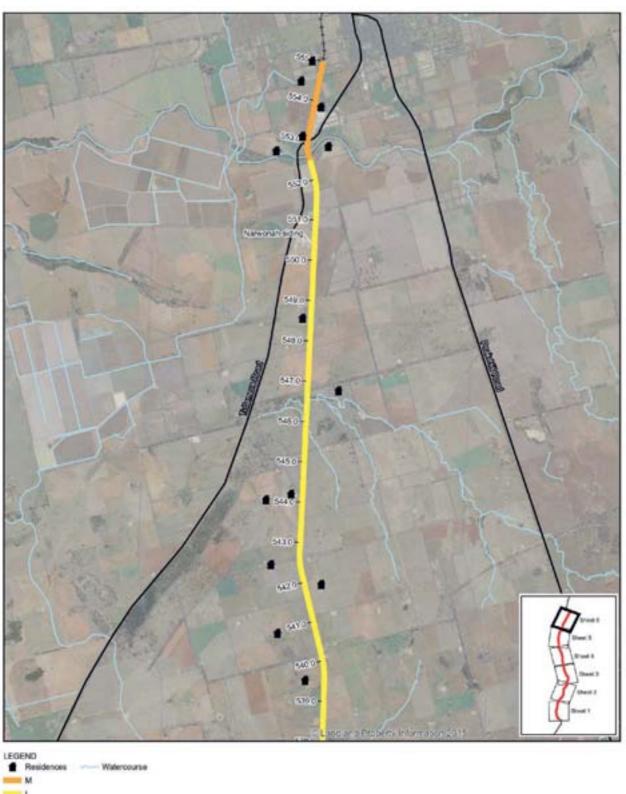


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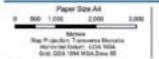
















Australian Rail Track Corporation Inland Rail - Parkes to Nanomine

Jub Number | 22-17616 Revision | 0 Date | 19 Jun 2017

Visual Impact - Sheet 6

Figure 10

Selevance: LPI, DCSR, Inspec, 2015. Little, Heal Impact, Residence, 2016. Creeks by gradientst, Insete, Igantia

### 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.	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

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#### 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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