

CHAPTER

21

INLAND
RAIL 

Landscape and Visual Impact Assessment

NORTH STAR TO NSW/QUEENSLAND BORDER ENVIRONMENTAL IMPACT STATEMENT

 ARTC

The Australian Government is delivering
Inland Rail through the Australian
Rail Track Corporation (ARTC), in
partnership with the private sector.

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21. Landscape and visual amenity

21.1 Scope and chapter

This Environmental Impact Statement (EIS) considers potential impacts from construction and operation of the North Star to NSW/Queensland Border project (the proposal). It has been prepared to support ARTC's application for approval of the proposal in accordance with the requirements of Part 5 Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act), and as a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The EIS addresses the environmental assessment requirements of the Secretary of the Department of Planning, Industry and Environment (DPIE), dated 8 August 2018.

Key objectives of the landscape and visual impact assessment are to:

- ▶ Undertake a baseline assessment describing existing environmental values of the study area with respect to landscape character and visual amenity, including scenic viewpoints
- ▶ Describe the existing landscape including with reference to any landscape or visual values identified in planning schemes (landscape receptors) and identify those people who experience and value views of the landscape (visual receptors)
- ▶ Identify key proposal risks on landscape and/or visual values during day (and consider the potential for any night-time impacts)
- ▶ Evaluate the significance of the impacts of the proposal activities on landscape, views and visual receptors during construction, operation and decommissioning/closure during day and night
- ▶ Describe any proposal modifications or management techniques that can mitigate identified landscape and visual impacts
- ▶ Illustrate the visual impacts using visualisation techniques to assist members of the public in understanding potential impacts.

21.2 Secretary's Environmental Assessment Requirements

This chapter has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) as shown in Table 21.1.

TABLE 21.1 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS COMPLIANCE

Desired performance outcome	Item 18: Visual Amenity The proposal minimises adverse impacts on the visual amenity of the built and natural environment (including public open space) and capitalises on opportunities to improve visual amenity.
Current guidelines	<i>AS4282-1997 Control of the obtrusive effects of outdoor lighting</i> <i>Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW</i> (RMS, 2012) <i>NSW Sustainable Design Guidelines Version 4.0</i> (TfNSW, 2017) <i>Technical Guideline for Urban Green Cover in NSW</i> (OEH, 2015)
SEARs requirement	EIS section
Item 18.1 The Proponent must assess the visual impact of the project (including permanent spoil mounds, borrow sites, rail formation, bridges, viaduct, and over or underpasses) and any ancillary infrastructure on: a) views and vistas b) streetscapes, key sites and buildings c) heritage items including Aboriginal places and environmental heritage d) private landowners and the local community.	Section 21.6.3.2 discusses visual impact assessment of the proposal and ancillary infrastructure Section 21.6.3.1 discusses impact assessment on landscape character Section 21.6.3.1 and Section 21.6.3.2 details relevant heritage information and relevant viewpoints
Item 18.2 The Proponent must provide artist impressions and perspective drawings of the project to illustrate how the project has responded to the visual impact through urban design and landscaping.	Section 21.6.3.2 details artistic impressions and perspective drawing of the proposal

21.3 Legislation, policies, standards and guidelines

Table 21.2 identifies and discusses the relevance of any legislative or policy-level objectives and standards (whether qualitative or quantitative) in relation to the protection or management of landscape and visual values in the context of the proposal.

An overarching and broad discussion of legislation, policies, standard and guidelines is in Appendix P: Landscape and Visual Impact Assessment. Relevant Queensland legislation is also referred to due to the potential for cross-border impacts in the northern part of the alignment associated with the Macintyre River Viaduct.

TABLE 21.2 SUMMARY OF LEGISLATION, POLICIES, STANDARDS AND GUIDELINES

Legislation, policy, strategy or guideline	Relevance to the proposal
Commonwealth	
<i>AS4282-1997 Control of the obtrusive effects of outdoor lighting</i> (Standards Australia, 1997)	This standard sets out guidelines for the control of the obtrusive effects of outdoor lighting and gives recommended limits for the relevant lighting parameters to contain these effects within tolerable levels. It refers to the potential effects of lighting systems on receptors including nearby residents and users of adjacent roads. It does not apply to road lighting or lighting systems that are of a cyclic or flashing nature. This standard is also required for consideration as part of the Dis-5 Light Pollution credit in the IS Rating Scheme.
<i>AS4970 Protection of Trees on Development Site</i> (Standards Australia, 2009)	This standard provides guidance on the principles for protecting trees on land subject to development. Where development is to occur, the standard provides guidance on how to decide which trees are appropriate for retention, and on the means of protecting those trees during construction work. The standard does not apply to the establishment of new trees.
<i>Disability (Access to Premises—Buildings) Standards</i> , (RMS 2010).	This is a legislative document that provides a nationally applicable set of provisions that detail what must be done to provide for non-discriminatory access to public buildings for people with disability.
State (NSW)	
<i>Beyond the Pavement: Road and Traffic Authority urban design policy, procedures and design principles</i> (RMS, 2014)	A high-level urban design policy produced by Roads and Maritime Services (RMS), formerly the Road and Traffic Authority. The policy systematically incorporates urban design thinking into infrastructure proposals, with a focus on delivering improved design outcomes and higher levels of community satisfaction. This policy is referenced in the <i>IS Technical Manual</i> (ISCA, 2018) as part of the Urb-1 Urban Design credit in the IS Rating Scheme.
<i>Environmental Impact Assessment Practice Note—Guideline for Landscape Character and Visual Impact Assessment EIA-N04</i> (RMS, 2018)	This practice note applies to proposals for which RMS is seeking determination and approval to proceed. Therefore, it applies principally to road proposals. It recognises the importance of landscape character and visual impact assessment to determine impacts on the character and views within a place to ensure a good urban design outcome.
<i>Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW</i> (RMS, 2012)	The purpose of this document is to help design teams produce bridges of aesthetic value.
<i>NSW Sustainable Design Guidelines Version 4.0</i> (TfNSW, 2017)	These guidelines are a key tool in helping to realise sustainable proposal outcomes. They aim to encourage sustainable development practices by embedding sustainability initiatives into the planning, design, construction, operations and maintenance of transport infrastructure projects.
<i>Crime prevention and the assessment of development applications</i> (2001)	These guidelines are intended to assist councils identify crime risk and minimise opportunities for crime through the appropriate assessment of development proposals.
<i>Urban Green Cover in NSW: Technical Guidelines</i> (OEH, 2015)	These guidelines offer built environment professionals practical information and typical details to encourage best practice applications of green cover, to minimise urban heat impacts across NSW.

Legislation, policy, strategy or guideline	Relevance to the proposal
<i>Healthy Urban Development Checklist</i> (NSW Health, 2009)	The checklist is intended to assist health professionals to provide advice on urban development policies, plans and proposals. It is a tool for reviewing and commenting on development plans and providing input and advice from the earliest possible phases of the urban planning and development process.
<i>New England North West Regional Plan 2036</i> (DPIE, 2017)	<p>The <i>New England North West Regional Plan 2036</i> is a 20-year blueprint for the future. The rail alignment passes through Gwydir local government area (LGA), Moree Plains LGA, and is near Inverell LGA within this region of NSW. The NSW State Government's vision for the region is 'A sustainable future that maximises the advantages of the region's diverse climates, landscapes and resources'.</p> <p>This plan will guide the NSW Government's land-use planning priorities and decisions to 2036. It is not intended to be a step-by-step approach to all land use planning. Rather, it provides an overarching framework to guide subsequent and more detailed land use plans, development proposals and infrastructure funding decisions.</p>
Queensland	
<i>Road Landscape Manual</i> (TMR, 2013)	This manual produced by Department of Transport and Main Roads aims to facilitate the understanding of, and procedures associated with, the assessment, design and management of roads as they affect the Queensland landscape. It sets out principles for the design of roads to assist in their integration in their natural, cultural and urban landscape settings. Appendix 2 of the manual describes the process for visual assessment required in the planning and design of Queensland roads. Although this document applies to Queensland it has been considered and, where relevant, applied to landscape and visual impact assessment to ensure consistency of approach for the impact assessment and mitigation approach across the Inland Rail Program.
<i>Crime Prevention through Environmental Design</i> (2001)	These guidelines seek to promote the incorporation of crime prevention through environmental design principles into the planning, design and management of development in Queensland. They aim to guide and encourage public and private developers to design with crime prevention through environmental design in mind. Although this document applies to Queensland it has been considered and, where relevant, applied to landscape and visual impact assessment to ensure consistency of approach for the impact assessment and mitigation approach across the Inland Rail program.
Local and Regional Government—Queensland	
<i>Darling Downs Regional Plan 2013</i> (DSDIP, 2013)	The plan provides strategic direction and policies to deliver regional outcomes that align with the state's interests in planning and development. It is focused on delivering regional policy aimed at achieving specific regional outcomes. The region includes Goondiwindi Regional Council and Toowoomba Regional Council through which Inland Rail passes. Although this document applies to the Darling Downs region it has been considered and, where relevant, applied to landscape and visual impact assessment to ensure consistency of approach for the impact assessment and mitigation approach across the Inland Rail Program.
<i>Goondiwindi Regional Council Planning Scheme</i> (GRC, 2018)	The scheme divides the area into zones with associated codes. The proposal joins the B2G alignment on the NSW/QLD border at the proposed Macintyre River bridge. The planning scheme recognises and protects areas valued for their landscape and/or scenic qualities, arising from nature conservation or rural characteristics. Although this document applies to the Goondiwindi LGA it has been considered and, where relevant, applied to landscape and visual impact assessment to ensure consistency of approach for the impact assessment and mitigation approach across the Inland Rail Program.

Local Government—New South Wales

<i>North West NSW—Destination Management Plan 2013/14</i> (Destination NSW, 2013)	The Inland Regional Tourism Organisation adopted a series of destination management plans for Inland NSW. The region was divided into 'clusters' of LGAs, with some of the clusters overlapping. The plan describes actions to enhance tourism in the North West NSW region.
<i>Destination Country and Outback NSW Destination Management Plan 2018–2020</i> (Destination NSW, 2018)	Destination Country and Outback NSW is one of six destination networks established by the NSW Government.
<i>Gwydir Local Environmental Plan 2013</i> (GSC, 2013)	This plan aims to make local environmental planning provisions for land in Gwydir in accordance with the relevant standard environmental planning instrument under section 33A of the EP&A Act.
<i>Gwydir Shire Community Strategic Plan 2017–2027</i> (Gwydir Shire Council, 2017b)	The community strategic plan is a high-level plan providing information on the local community's goals and aspirations for the future.
<i>Gwydir Shire Destination Management Plan 2017</i> (Gwydir Shire Council, 2017a)	The purpose of the plan is to provide the direction and framework for taking the Shire's visitor economy forward over the next five years.
<i>Gwydir Shire Tourism Plan 2006–2011</i> (GSC, 2006)	The purpose of the plan is to provide the direction and framework for guiding tourism.
<i>Moree Plains Local Environment Plan 2011</i> (MPSC, 2011)	The aim of the plan is to guide planning decisions for the Moree Plains LGA through zoning and development controls, which provide a framework for the way land can be used. The local environmental plan is the main planning tool to shape the future of communities and ensure local development is done appropriately.
<i>Moree Plains Shire Growth Management Strategy 2009</i> (MPSC, 2009)	This growth management strategy provides a future direction for the settlements and land within the Shire. The document provides a description of the physical, social and economic environment of the shire as well as the planning context. The development pattern of the shire is described and the issues during the future of the Shire have been discussed. The strategy then makes several recommendations for future action.
<i>Moree Plains Shire Community Strategic Plan: Moree Plains 2027—Your Shire</i> (MPSC, 2017)	This plan identifies the community's main priorities and aspirations for the future and plan strategies to achieve them.
<i>Moree Plains Shire Development Control Plan 2013</i> (MPSC, 2013)	This development control plan provides specific, more comprehensive guidelines for certain types of development, or area-specific requirements for localities.
<i>Inverell Local Environmental Plan 2012</i> (ISC, 2012)	The aim of this local environmental plan is to guide planning decisions for Moree Plains LGA through zoning and development controls.

21.4 Methodology

21.4.1 Study area

For the purposes of the assessment, the landscape and visual impact assessment study area has been defined as the area illustrated in Figure 21.1 and Figure 21.2. The study area establishes the area within which the proposal has potential to influence landscape and/or visual values and receptors. This is based on:

- ▶ The horizontal and vertical alignment for the proposal
- ▶ Visibility analysis mapping, which establishes the theoretical viewshed of the proposal based on landform
- ▶ Assumptions regarding the likely extent of visibility of proposals of this nature. It is considered unlikely that any visual receptors located beyond the boundary of the 10 km landscape and visual impact assessment study area will be able to view the proposal
- ▶ Refinement during the field survey stage.

A description of the proposal is available in Chapter 6: The Proposal and Chapter 7: Construction of the Proposal.

21.4.2 Assessment methodology

The landscape and visual impact assessment methodology has been developed with reference to guidelines and techniques used in Australia and internationally, including:

- ▶ *Guidance Note for Landscape and Visual Assessment* (Australian Institute of Landscape Architects (Qld), 2018)
- ▶ *The Environmental Impact Assessment Practice Note—Guideline for Landscape Character and Visual Impact Assessment EIA-N04* (practice note EIA-N04) (RMS, 2018)
- ▶ *Guidelines for Landscape and Visual Impact Assessment, Third Edition*, (The Landscape Institute and the Institute of Environmental Management and Assessment, 2013) and Second Edition (2002)
- ▶ *South East Queensland Regional Plan Implementation Guideline No 8, Identifying and protecting scenic amenity values*, (DLGRMA, 2007)
- ▶ Landscape Institute Advice Note 01/09: *Use of photography and photomontage in landscape and visual assessment* (The Landscape Institute, 2009)
- ▶ Landscape Institute Technical Guidance Note: *Photography and Photomontage in Landscape and Visual Impact Assessment*, Public Consultation Draft (The Landscape Institute, 2018)
- ▶ *Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity* (Scottish Natural Heritage and The Countryside Agency, 2006)
- ▶ *AS 4282 Control of Obtrusive Effects of Outdoor Lighting* (Standards Australia, 1997).

The landscape and visual impact assessment methodology is a significance assessment as described in Chapter 10: Assessment Methodology.

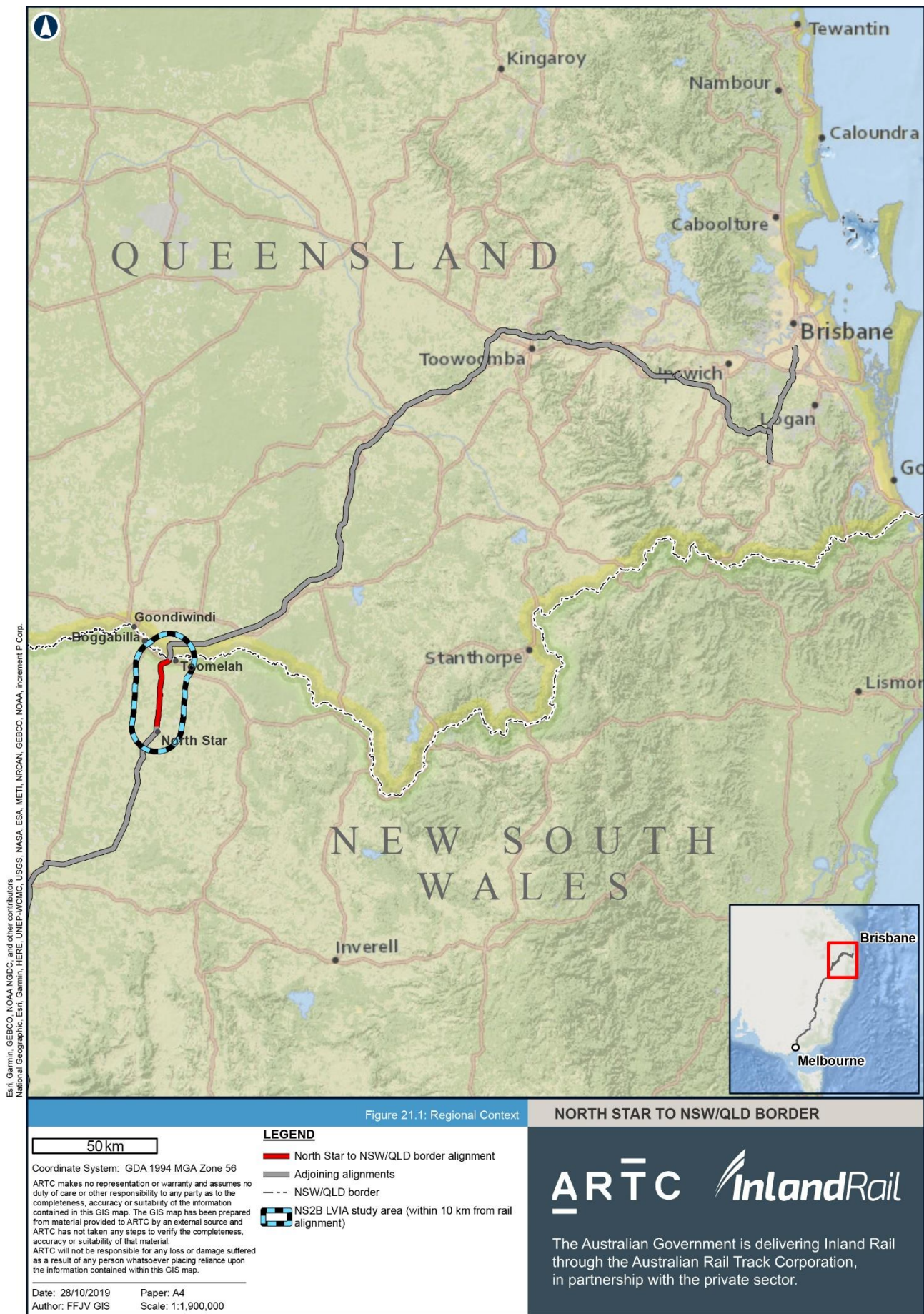


FIGURE 21.1 REGIONAL CONTEXT

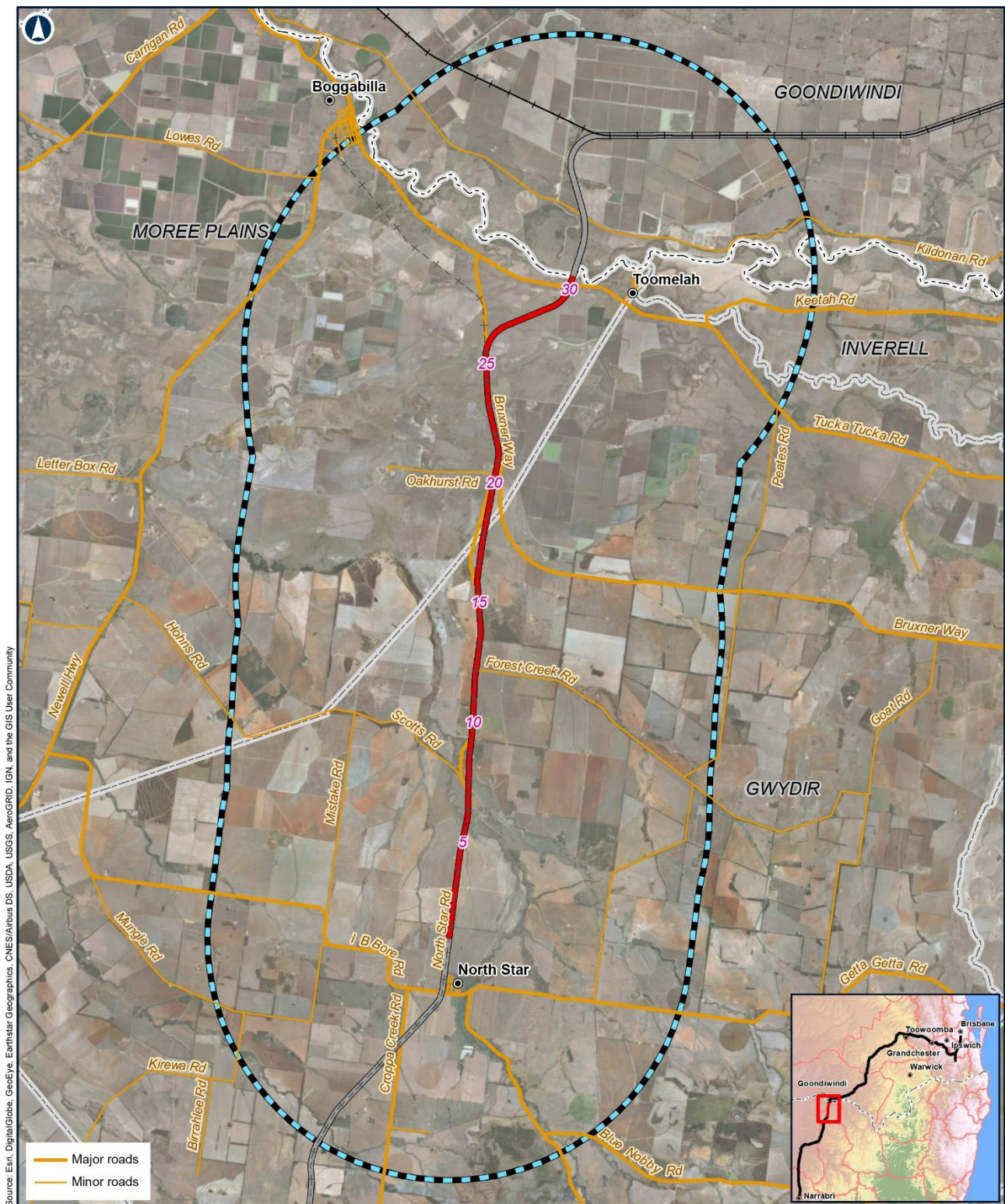


FIGURE 21.2 STUDY AREA

The significance assessment method has been applied to environmental values that will be impacted by the proposal where impacts cannot be quantified. The landscape and visual impact assessment methodology has defined its own thresholds for sensitivity and magnitude. The assessment is based on the principles defined in Chapter 10: Assessment Methodology and follows criteria more widely used for the assessment of landscape and visual impacts.

Table 21.3 provides a summary of the landscape and visual impact assessment methodology, which is discussed further in Appendix P: Landscape and Visual Impact Assessment Technical Report.

TABLE 21.3 LANDSCAPE AND VISUAL IMPACT ASSESSMENT METHODOLOGY

Method	Description
Desktop assessment	A desktop analysis of existing landscape character and visual amenity for the proposal site and the wider landscape and visual impact assessment study area was undertaken to inform this assessment.
Field survey	A field assessment of the landscape and visual impact assessment study area was carried out to ground truth the findings of the desktop assessment and to assess landscape character and visual amenity. This included identifying sensitive viewpoints requiring further assessment.
Stakeholder and community consultation inputs	Relevant feedback from preliminary consultation activities undertaken by others (including as part of the social impact assessment) has informed the landscape and visual amenity assessment, where appropriate.
Identification of potential proposal impacts	This task included describing infrastructure that is likely to be associated with the proposal, such as the presence of embankments, bridges, cuttings, fencing, noise barriers and level crossings. Potential impacts were then considered in the landscape and visual assessments.
Landscape assessment	A landscape assessment was carried out based on an analysis of landscape character. This included those landscape features that contribute to the amenity of the area, but particularly any landscape values identified in legislation or planning documents during the desktop phase or through community and stakeholder consultation. The landscape impact assessment defined the sensitivity of the landscape as well as the magnitude of change to the landscape. The significance of the potential impacts on the landscape character was then rated based on an evaluation of the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur. For full details of landscape assessment methodology refer to Appendix P: Landscape and Visual Impact Assessment Technical Report.
Visual assessment	A visual assessment was undertaken based on an analysis of views and viewsheds, particularly any major views or outlooks identified in legislation or planning documents during the desktop phase or through stakeholder and community consultation. Viewpoints and the visual receptor audiences they represent were defined and then rated for their sensitivity. Following this, the magnitude of change to views and visual amenity were determined. The magnitude of change is dependent on the nature, scale and duration of the change that is expected to occur. The magnitude of change also depends on the loss, change or addition of any feature in the field of view of the receptor, or any change to the backdrop to, or outlook from, a viewpoint. The significance of the overall potential impacts on visual amenity is then determined based on the sensitivity of existing views to change and the magnitude of change that is likely to occur. For full details of landscape assessment methodology refer to Appendix P: Landscape and Visual Impact Assessment Technical Report.
Preparation of visualisations	Visualisations have been prepared to represent the potential visual impact of the proposal from a selection of the representative viewpoints identified. Visualisations are illustrations/photomontages that aim to represent an observer's view of a proposed development.

Method	Description
Lighting assessment	A lighting assessment was carried out based on an analysis of representative views identified through the visual assessment. Lighting impacts are considered during both construction and operation phases of the proposal. Changes in after-dark lighting conditions were determined by elements such as proximity of the viewpoint to a lighting source associated with the proposal, and the accessibility of the viewpoint to viewers at night. The assessment of the magnitude of change to views and visual amenity due to lighting depends on the nature, scale and duration of the change to lighting that is expected to occur. The magnitude of change also considers any change to the backdrop to, or outlook from, the representative viewpoint. The significance of lighting impact in each representative viewpoint was then made by considering the sensitivity of each representative night-time viewpoint and the magnitude of change that is likely to occur. For full details of landscape assessment methodology refer Appendix P: Landscape and Visual Impact Assessment Technical Report.
Impacts mitigation	Following identification of impacts, consideration has been given to how these can be mitigated. This included modification of the design (horizontal or vertical alignment and materiality), vegetation screening and, if necessary, liaison with landowners. ARTC standard mitigation measures were considered in the assessment and further landscape and additional visual mitigation opportunities have been proposed where appropriate.

21.5 Existing environment

21.5.1 Regional landscape context

The proposal is in central northern NSW, near Boggabilla and North Star, and approximately 18 km south-east of Goondiwindi in Queensland. The proposal site's regional context and study area are illustrated in Figure 21.1 and Figure 21.2.

21.5.1.1 Settlement

The proposal is in a predominantly rural area comprising isolated rural settlements, open wooded and pastoral and agricultural landscapes. The study area has both a rich Aboriginal and colonial history and has been heavily modified by agriculture, farming and settlement in the region. The nearest town is Boggabilla, located approximately 8.5 km west of the northern extent the study area. Goondiwindi, the closest regional centre, is in Queensland approximately 18 km to the northwest. There are two small rural settlements near the study area. Approximately 1.5 km to the south of the southern extent of the study area is the village of North Star, which has a population of 260 (North Star State Suburb), (Australian Bureau of Statistics (ABS), 2016). The Aboriginal Toomelah community (Toomelah Locality) (ABS, 2016) with a population of 202 is approximately 2.5 km east of where the alignment crosses the Macintyre River and NSW/QLD border.

21.5.1.2 Geology, landform and hydrology

Landform within the study area and wider landscape is flat, typically from 220 m Australian height datum (AHD) to 260 m AHD. It is characterised by branching streams incised into alluvial plains, with multiple anabranches, effluent channels and lagoons. These auxiliary channels drain water away from the main channel when river water levels are high.

The main watercourses in the study area are the Macintyre and Dumaresq rivers. These are significant river systems that define the NSW/QLD border. The alignment traverses the Macintyre floodplain and many small tributaries of the Dumaresq River, including Whalan Creek, Forest Creek, Back Creek and Mobbindry Creek. All creek tributaries fall within the Border Rivers catchment.

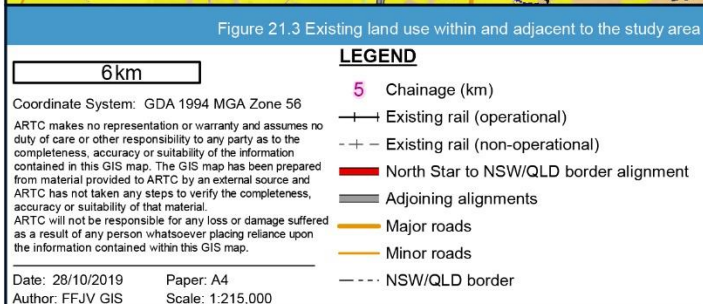
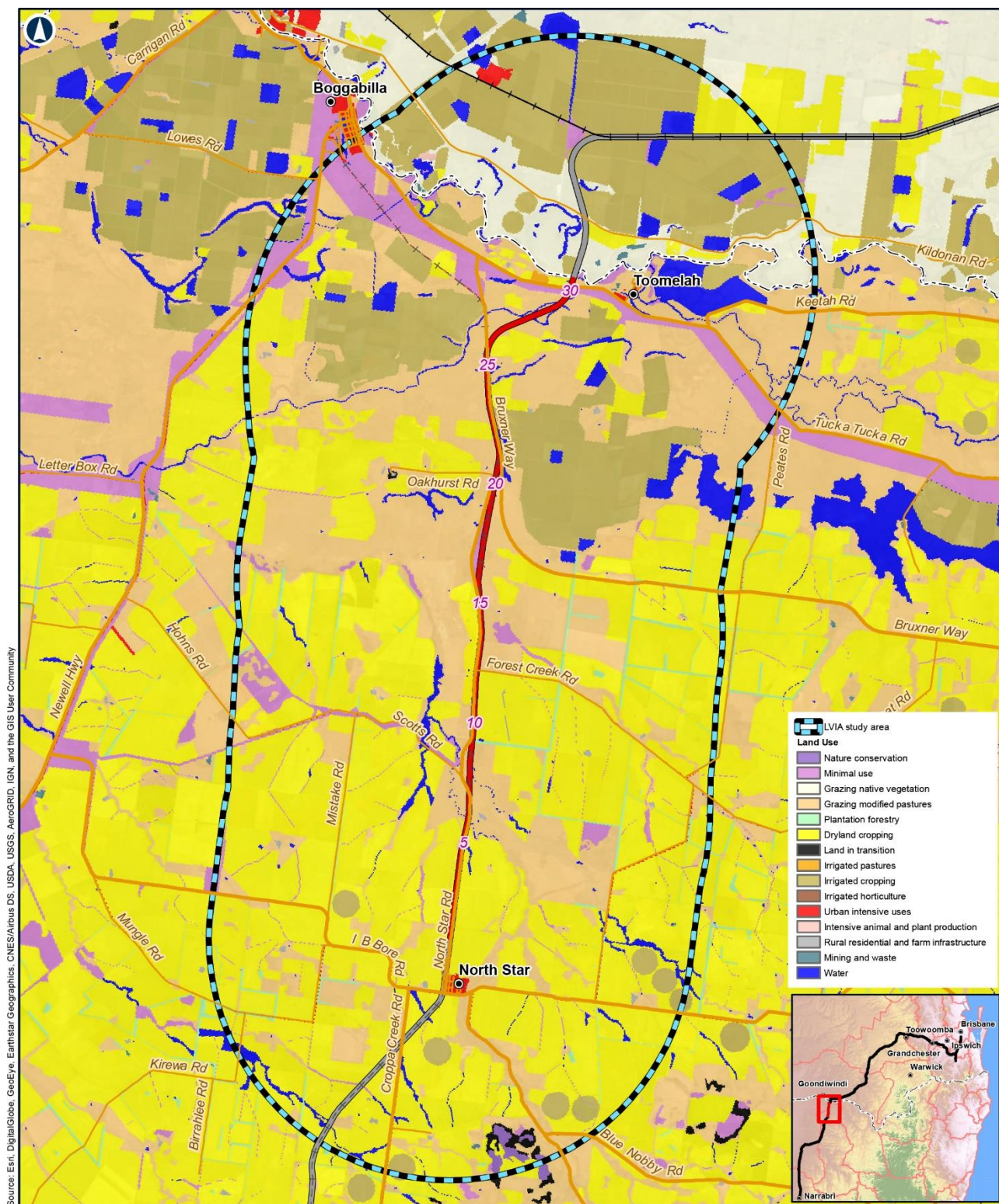
21.5.1.3 Soils, vegetation and land use

Existing land use within and adjacent to the study area is shown on Figure 21.3. As the figure demonstrates, the land use is predominantly rural, characterised by broad-acre cropping (including cotton, wheat, chickpeas, oats and barley) and pastoral or grazing properties for livestock production (predominantly beef cattle and sheep) on vertosols, sodosols and dermosols. Irrigated cropping occurs more frequently near the Macintyre and Dumaresq rivers, supported by extensive irrigation infrastructure including large field dams.

Extensive areas within the study area have been cleared for agricultural production. Native remnant vegetation is largely influenced by floodplains and alluvial fans and comprises small open woodlands, tree belts associated with edge of local and state roads and scattered riparian vegetation associated with creeks. Most waterways intersecting the alignment are lined by narrow remnant corridors of river red gum (*Eucalyptus camaldulensis*) with surrounding myall (*Acacia pendula*), rosewood (*Alectryon oleifolium*) and belah (*Casuarina cristata*) woodlands. River red gums, river oaks (*Casuarina cunninghamiana*) and river paperbarks (*Melaleuca spp.*) characteristically line the deeper main channels and waterways.

21.5.1.4 Designated landscapes

There are no national parks or other nationally protected landscapes within the study area. Dthinna Dthinnawan Nature Reserve and Dthinna Dthinnawan National Park are located around 28 km east of the study area. The nature reserve covers an area of 1,870 ha, while the national park is 27,803 ha. Much of the reserve is dominated by towering black cypress, white cypress, smoothed barked apple and dirty gum trees, and the park contains a wide range of Aboriginal sites. The park has 70 km of horse-riding trails, and there are picnic and barbecue facilities located at the heritage Inverary Homestead, which offers wildlife, walking, mountain biking and 4WD tours of the area. Due to their distance from the proposal, these areas would not be affected so are not considered further in this assessment.



NORTH STAR TO NSW/QLD BORDER

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.

Map by: GN Z:\GIS\GIS_270_NS2B\Tasks\270-EEC-201901140910_Project_Figures\270-EEC-201901140910_Fig21.3_Land_Use_v2.mxd Date: 31/10/2019 11:16

FIGURE 21.3 EXISTING LAND USE WITHIN AND ADJACENT TO THE STUDY AREA

21.5.1.5 Landscape character assessment

The identified Landscape Character Types (LCT) and landscape character areas (LCA) falling within the study area are shown on Figure 21.4 and summarised in Table 21.4.

TABLE 21.4 LANDSCAPE CHARACTER TYPES AND AREAS

Landscape Character Type	Associated Landscape Character Areas
LCT A: Vegetated Watercourses—Rivers	<ul style="list-style-type: none"> ▶ Macintyre River Vegetated Watercourse (LCA A1) ▶ Dumaresq River Vegetated Watercourse (LCA A2).
LCT B: Vegetated Watercourses—Creeks and Channels	<ul style="list-style-type: none"> ▶ Whalan Creek Vegetated Watercourse (LCA B1) ▶ Forest Creek Vegetated Watercourse (LCA B2) ▶ Mobbindry Creek Vegetated Watercourse (LCA B3) ▶ Back Creek Vegetated Watercourse (LCA B4) ▶ Swamp Creek Vegetated Watercourse (LCA B5) ▶ Dry Creek Vegetated Watercourse (LCA B6) ▶ Mungle Creek Vegetated Watercourse (LCA B7) ▶ Mungle Back Creek Vegetated Watercourse (LCA B8).
LCT C: Irrigated Croplands	<ul style="list-style-type: none"> ▶ Kurumbul Irrigated Croplands (LCA C1) ▶ Melon Ridge and Humptybung Irrigated Croplands (LCA C2).
LCT D: Dry Croplands and Pastures	<ul style="list-style-type: none"> ▶ Dumaresq Dry Croplands and Pastures (LCA D1) ▶ Tucka Tucka Dry Croplands and Pastures (LCA D2) ▶ Coppymurrimbilla Dry Croplands and Pastures (LCA D3) ▶ Newell Dry Croplands and Pastures (LCA D4) ▶ Burringbar Dry Croplands and Pastures (LCA D5) ▶ Forest Creek Dry Croplands and Pastures (LCA D6) ▶ Bruxner Dry Croplands and Pastures (LCA D7) ▶ North Star Dry Croplands and Pastures (LCA D8) ▶ Getta Getta Dry Croplands and Pastures (LCA D9).
LCT E: Rural Settlement	<ul style="list-style-type: none"> ▶ Boggabilla Township (LCA E1) ▶ North Star Village Rural Settlement (LCA E2) ▶ Kurumbul Rural Settlement (LCA E3) ▶ Toomelah Indigenous Settlement (LCA E4).
LCT F: Vegetated Grazing	<ul style="list-style-type: none"> ▶ Brigalow Creek Vegetated Grazing (LCA F1) ▶ Kildonan Vegetated Grazing (LCA F2) ▶ Boggabilla Vegetated Grazing (LCA F3).

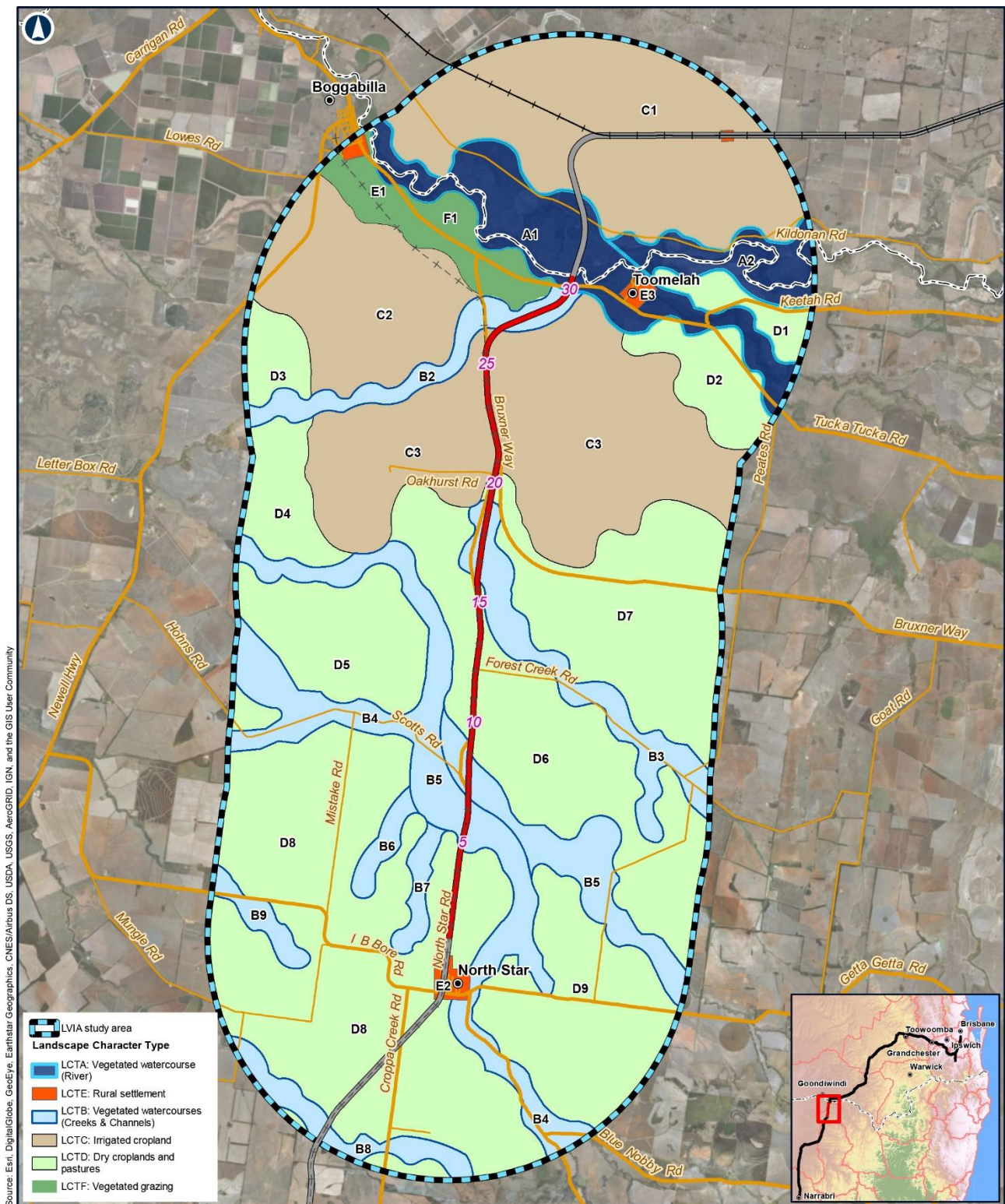


Figure 21.4 Landscape character types and areas within the study area

NORTH STAR TO NSW/QLD BORDER

6km

Coordinate System: GDA 1994 MGA Zone 56

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Date: 13/02/2019 Paper: A4
Author: FFJV GIS Scale: 1:215,000

LEGEND

- 5 Chainage (km)
- Existing rail (operational)
- Existing rail (non-operational)
- North Star to NSW/QLD border alignment
- Adjoining alignments
- NSW/QLD border
- Major roads
- Minor roads

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.

FIGURE 21.4 LANDSCAPE CHARACTER TYPES AND AREAS WITHIN THE STUDY AREA

21.5.2 Visual assessment

21.5.2.1 Viewpoint selection and visual audiences and receptors

Representative viewpoints were selected to provide an assessment of the potential landscape and visual impacts of the proposal, using a range of distances from the alignment within the landscape to inform the visual impact assessment. These included, but were not limited to:

- ▶ Local residents and workers in townships (North Star, Toomelah and Kurumbul)
- ▶ Local residents and workers on rural properties
- ▶ Travellers on main roads
- ▶ Tourists on numerous local roads including users of scenic drives
- ▶ Recreational users.

The selected viewpoints are summarised in Table 21.5 and shown on Figure 21.5. These are discussed further in in Appendix P: Landscape and Visual Impact Assessment.

TABLE 21.5 VIEWPOINT SELECTION

Viewpoint name	Anticipated approximate distance to alignment	Key visual receptors
Viewpoint 1: Corner of Capernum Street and David Street, North Star	Alignment is approximately 1.5 km north of this viewpoint.	Represents typical and accessible views of residents, students and staff of North Star Public School and of visitors, workers and tourists travelling north along North Star Road towards Goondiwindi.
Viewpoint 2: North Star Road, looking north	This viewpoint is within the disturbance footprint of the alignment.	Represents typical and accessible views of residents and of visitors, workers and tourists travelling along North Star Road.
Viewpoint 3: North Star Road, looking east	Alignment is approximately 400 m east of this viewpoint.	Represents typical and accessible views of residents, visitors, workers and tourists travelling along North Star Road.
Viewpoint 4: Bruxner Way. Looking northwest	Alignment is approximately 400 m west of this viewpoint and 900 m north.	Represents typical and accessible views of residents and of visitors, workers and tourists travelling along Bruxner Way.
Viewpoint 5: Bruxner Way, looking east	This viewpoint is within the disturbance footprint of the alignment.	Represents typical and accessible views of residents and of visitors, workers and tourists travelling along Bruxner Way.
Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)	Alignment is approximately 50 m east of this viewpoint.	Represents typical and accessible views of residents and of visitors, workers and tourists travelling along Tucka Tucka Road (including residents of Toomelah).

21.6 Potential impacts

The following sections include a summary of the potential landscape and visual amenity impacts that are associated with the proposal. Further details are included in Appendix P: Landscape and Visual Impact Assessment.

21.6.1 Construction phase

The construction activities that will create a potential impact are detailed in Table 21.6.

TABLE 21.6 POTENTIAL LANDSCAPE AND VISUAL IMPACTS DURING CONSTRUCTION PHASE

Construction activities and infrastructure	Indicative imagery
<p>Demolition of existing infrastructure</p> <p>The demolition and removal of existing redundant rail infrastructure would convey construction traffic to and within the construction areas resulting in short-term impacts on landscape and visual values.</p>	 <p>Source: Lat27</p>
<p>Vegetation clearing and associated earthworks</p> <p>Much of the landscape is already cleared for agricultural purposes. Where required, large-scale machinery will be used to assist in vegetation clearance or trimming activities. This will generate traffic on surrounding roads. Temporary stockpiles of cleared vegetation may also be present. Topsoil, subsoil, rock and other unsuitable materials will be removed where necessary to create stable and level areas for infrastructure to be constructed. This will result in the temporary presence of exposed areas of land.</p>	 <p>Source: ARTC</p>
<p>Road and rail construction</p> <p>The construction of new infrastructure along the proposal alignment would result in construction traffic travelling to and within the construction areas and result in short-term impacts on landscape and visual values.</p>	 <p>Source: FFJV</p>
<p>Bridge construction</p> <p>Bridges, culverts, and viaducts (as detailed in Operation impacts below) will be constructed over creeks, rivers, flood plains and existing road corridors. The construction of new infrastructure would convey construction traffic to and within the construction areas resulting in short-term impacts on landscape and visual values.</p>	 <p>Source: ARTC</p>
<p>Borrow pits</p> <p>Borrow pits are required to provide fill material for the proposal. There are 11 potential sites proposed, some of which lie beyond the study area, but all of which have been assessed in this landscape and visual impact assessment. Of these, 10 are existing borrow pits while one is a new potential borrow pit location (Site 2). Landscape and visual impacts associated with borrow pits include clearance of vegetation, presence of bare soil associated with earthworks and landform modification.</p>	 <p>Source: Lat27</p>

Construction activities and infrastructure

Indicative imagery

Creation of stockpiles (existing material from site)

Stockpiles of materials cleared from site will be present in the laydown areas in the temporary (construction) footprint, where they will be stored prior to use, re-use or disposal. This includes ballast from the existing, non-operational Boggabilla rail corridor; rail tracks and soil from cut and fill sites.



Source: Lat27

Creation of stockpiles (material delivered to site)

Stockpiles of materials delivered to site will be present in the laydown areas and beside the existing, non-operational Boggabilla rail corridor, where they will be stored prior to use. This includes ballast, soil, rock protection and rail materials including tracks and sleepers.



Source: FFJV

Associated construction equipment

Large-scale construction equipment and machinery such as cranes, excavators, trucks, water trucks, scrapers, graders, heavy bulldozers, generators and dump trucks will be required for construction activities.



Source: ARTC

Construction accommodation camp and workers

Presence of construction workers wearing high visibility Personal Protective Equipment. The construction workforce is expected to peak at approximately 350 workers in Quarter 3 of 2022. One construction camp is proposed in North Star (east of Wilby Street and north of North Star Road). This will comprise an amenities building, accommodation units with associated communal areas.



Source: ARTC



Preliminary location of North Star construction camp (area shown in yellow).

Source: FFJV

Construction activities and infrastructure

Indicative imagery

Construction traffic movement

There will be increased traffic movement on existing main roads and side roads. This will include a variety of vehicle types. A traffic impact assessment has been undertaken as part of the EIS and this detailed the impacts to traffic numbers. Refer to the traffic impact assessment undertaken by the FFJV located in the Appendix of the EIS.



Source: Lat27

Temporary construction lighting

Site preparation activities undertaken to provide access to the rail corridor are commonly conducted during daylight hours. However, some activities may be undertaken outside of standard daytime hours. Night lighting would be required at the construction camp, site offices, traffic management/road diversions and fuel storage areas. The primary light source will likely be from temporary security lighting and lighting towers. The number and details of the lighting requirements is yet to be determined and will be available after detailed design and a construction plan has been developed.

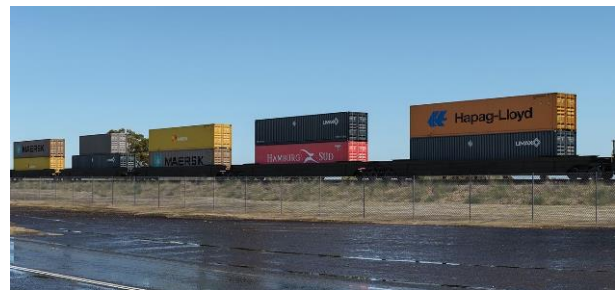


Source: FFJV

Embankments and mounding

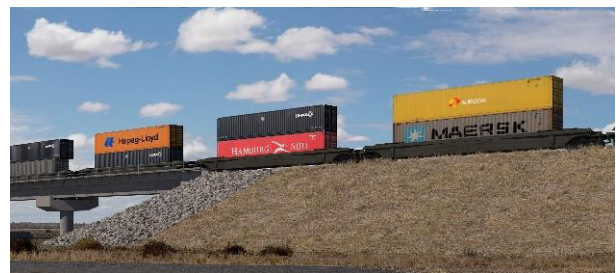
Many embankments and mounding will be created to accommodate the proposed rail corridor. This will be evident in areas where there is a change in levels with the existing ground. In addition, culverts and bridges will be constructed over creeks and existing road corridors.

Low embankment



Source: Lat27 (Visualisation)

High embankment



Source: Lat27 (Visualisation)

Shipping containers and storage sheds

Shipping containers will be delivered to construction sites via crane trucks and then stored in laydown areas. The containers commonly contain construction equipment.



Source: FFJV

Construction activities and infrastructure

Indicative imagery

Site offices and associated car parking areas

The proposal will require several temporary buildings on site. This will include site offices and workshops, as well as car parking areas. This will bring additional traffic, staff and machinery to the landscape and visual impact assessment study area. The new, temporary built forms may be seen as uncharacteristic elements in a predominantly rural landscape.

Five locations are proposed to have site offices:

- ▶ CMP000.1: North Star Road—Construction Camp
- ▶ LDN007.4: North Star Road—Satellite Offices
- ▶ LDN020.0: North Star Road Southern NS2B main site offices
- ▶ LDN029.8: Tucka Tucka Road—Satellite Offices
- ▶ LDN035.6: Eukabilla Road—Northern NS2B main site offices.



Source: FFJV

Construction of drainage infrastructure including concrete piping

Temporary and permanent drainage infrastructure will be present, including areas near existing road corridors.



Source: FFJV

Signage

Many signs will be displayed around construction sites, especially where existing road corridors are near the proposed rail corridor. Signage will include speed signs, stop signs, and safety signs and construction signage such as truck access signage.



Source: FFJV

Relocation of utilities





During construction, utilities that may be impacted by the proposal will be decommissioned, protected or relocated. There are two locations where electricity poles must be relocated outside of the rail corridor.

No image available.

21.6.2 Operation phase

The operation activities that will create a potential impact are detailed in Table 21.7.

TABLE 21.7 POTENTIAL LANDSCAPE AND VISUAL IMPACTS DURING OPERATION

Operation activities and infrastructure	Indicative imagery
<p>Lighting infrastructure</p> <p>No permanent lighting is proposed for the proposal. However, there will be standard flashing lights associated with two proposed active level crossings at:</p> <ul style="list-style-type: none">▶ North Star Road at Ch 7.0 km▶ North Star Road at Ch 19.9 km.	 <p>Source: ARTC</p>
<p>Freight trains</p> <p>Trains may be at times visible in the landscape from existing roads and residential properties. The current assumption is that there will be on average 14 train movements per day by 2025 (increasing to a maximum 21 trains per day in 2040). These will be 1,800 m long (potentially up to 3,600 km long in the future) and single stacked but, eventually, may be double stacked up to around 6.5 m high. It will take a minimum 2.5 minutes for a train to pass. The train will have a headlight.</p>	 <p>Source: ARTC</p>  <p>Source: ARTC</p>
<p>Rail-over-road bridges</p> <p>These bridges are an obvious visible feature for viewers and are typically landmarks for motorists. The proposal has two proposed rail-over-road bridges, typically proposed as single track, Super-T girder type structures. The names of key rail-over-road bridges (two in total) and the approximate length of each are:</p> <ul style="list-style-type: none">▶ Bruxner Way Rail Bridge: 114 m▶ Macintyre River Viaduct: 1,750 m (passes over Tucka Tucka Road and the Macintyre River).	<p>Rail-bridge-over road</p>  <p>Source: Lat27 (Visualisation)</p>

Operation activities and infrastructure

River and creek bridges

Rail-over-water bridges are typically lower, with their height determined by flood levels, except where they also pass over adjacent roads. They are, too, an obvious built landmark for viewers where visible from main roads and residential areas. The names of key rail-over-water bridges (10 in total) and the approximate length of each are:

- ▶ Mobbindry Creek Rail Bridge: 112 m
- ▶ Mobbindry Floodplain Rail Bridge: 182 m
- ▶ Back Creek Rail Bridge: 70 m
- ▶ Forest Creek Rail Bridge: 42 m
- ▶ UT1 Forest Creek Rail Bridge: 136 m
- ▶ Melonenkamm Rail Bridge: 160 m
- ▶ Whalan Floodplain #1 Rail: 136 m
- ▶ Whalan Floodplain #2 Rail: 126 m
- ▶ Whalan Floodplain #3 Rail: 126 m
- ▶ Macintyre River Viaduct: 1,750 m (also passes over Tucka Tucka Road).

Level crossings

Crossings occur where the rail alignment intersects a road. Infrastructure includes rail tracks, crossing protection measures (as required) and signage. Two active level crossings are proposed (with lights and barriers) for:

- ▶ North Star Road at Ch 7.0 km
- ▶ North Star Road at Ch 19.9 km

One passive level crossing is proposed for:

- ▶ Forest Creek Road at Ch 12.2 km

Railway tracks

Where buffers (for example, vegetation and topographic features) do not exist, the railway tracks are likely to become a visible element of infrastructure in the landscape, commonly sighted from adjacent roads and residents' properties. The proposal alignment largely follows an existing alignment with a new connection over the Macintyre River at the Queensland border).

Culverts

Twenty culvert banks are required where the route crosses small creeks, drainage lines and waterway crossing.

Indicative imagery

Rail bridge over waterway



Source: Lat27 (Visualisation)



Source: ARTC



Source: ARTC



Source: ARTC

Operation activities and infrastructure

Indicative imagery

Embankments, abutments and retaining walls
Embankments and mounding will be created to accommodate the proposed rail infrastructure.



Source: FFJV

Fencing

Fencing will be provided along the rail corridor as required. This will typically be rural stock fencing. Security fencing will be provided at the rail yards. Fauna fencing may also be required and is subject to landowner consultation. It is noted that permanent noise barriers are not anticipated for this proposal, although localised temporary noise barriers may be required during construction.



Source: FFJV



Source: FFJV

21.6.3 Landscape, visual and lighting impacts

The following sections include a summary of the impact assessment for landscape and visual amenity associated with the proposal. Further details are included in Appendix P: Landscape and Visual Impact Assessment.

21.6.3.1 Landscape impacts

Six Landscape Character Types (LCTs) have been identified within the study area. Four LCTs are intersected by the proposal:

- ▶ LCT A: Vegetated watercourses—rivers
- ▶ LCT B: Vegetated watercourses—creeks and channels
- ▶ LCT C: Irrigated croplands
- ▶ LCT D: Dry croplands and pastures.

Two other LCTs are present in the wider landscape and visual impact assessment study area but are not directly intersected by the alignment. No meaningful impacts are anticipated; therefore, they are not considered further:

- ▶ LCT E: Rural settlement (noting parts of these are affected by adjacent Inland Rail projects)
- ▶ LCT F: Vegetated grazing.


These LCTs are described in Table 21.8 to Table 21.12. These tables also assess the likely sensitivities for each identified LCT in relation to the proposal and provide a preliminary indication of the likely magnitude of change and consequent likely significance of that effect on landscape amenity.

Construction impacts on landscape character are temporary and relate to things such as removal of vegetation which would persist into the operational phase. Therefore, the assessment presented below is a combined assessment of impacts during both construction and operation. It reflects elements removed or disturbed during construction as well as the introduction of structures that affect the perception and character of the landscape over the longer term.

Landscape Character Type A

TABLE 21.8 SUMMARY DESCRIPTION OF LCT A: VEGETATED WATERCOURSES—RIVERS

Type A: Vegetated watercourses—rivers

Landscape baseline assessment	
Location and boundaries	<p>This landscape type is in the northern extent of the study area, associated with the corridors of the Macintyre and Dumaresq rivers.</p> <p>There are two LCAs of this type in the study area: the Macintyre River Vegetated Watercourse (LCA A1) and the Dumaresq River Vegetated Watercourse (LCA A2). These areas merge at the confluence of the two river systems, near the Aboriginal settlement of Toomelah.</p>
Typical character images:	
	
Key characteristics	<ul style="list-style-type: none"> ▶ Network of river valleys that are low lying in relation to the surrounding landscape and often incised into the landscape with steep banks ▶ Typically, well-vegetated riverbanks with mature river red gums (<i>Eucalyptus camaldulensis</i>), river oaks (<i>Casuarina cunninghamiana</i>) and river paperbarks (<i>Melaleuca spp.</i>), which line the riverbanks ▶ Visually interesting natural character ▶ Are not the subject of any landscape planning designations but likely to be valued for scenic amenity ▶ Adjoining oxbow lakes valued for nature conservation, including some areas that are used for recreation purposes, such as camping.
Precedent modifications and infrastructure elements	<ul style="list-style-type: none"> ▶ Natural landscape with few built infrastructure elements ▶ Occasional irrigation pump stations located along the river system ▶ Bondi Road bridge crossings (note, this bridge lies just beyond study area boundary and is currently disused).
Landscape character sensitivity assessment	<ul style="list-style-type: none"> ▶ High degree of perceived naturalness, with little evidence of human uses and modifications to the waterways ▶ Significant fringing vegetation on the riverbanks and floodplains contain views to and from the waterways, reducing the sensitivity ▶ Parts of the Macintyre River near of Toomelah, as well as Rainbow Reserve and lagoon (over the border in Queensland) are listed as cultural heritage sites and are known to be of value to the local aboriginal community ▶ The overall sensitivity is, at greatest, moderate. This rating recognises the relatively intact and high quality of the landscape and its value for the local Aboriginal community. However, it is noted that there are no formal landscape designations.

Type A: Vegetated watercourses—rivers

Impact assessment

Magnitude of change assessment	<ul style="list-style-type: none"> ▶ The proposed alignment will cross the Macintyre River, approximately 2.6 km west of Toomelah ▶ New bridge and railway infrastructure will result in highly localised removal of vegetation and the intrusion of built infrastructure within what is currently a relatively undeveloped landscape ▶ This location and the river crossing will only be visible from Tucka Tucka Road, primarily impacting residents of Toomelah ▶ The overall magnitude of change is predicted to be low. A very localised area of this LCT will be affected but there will be no fundamental change to the character of this LCT.
Significance of effect	▶ The effect of the proposal on LCT A: Vegetated Watercourses—Rivers is low.

Landscape Character Type B

TABLE 21.9 LANDSCAPE IMPACT ASSESSMENT OF LCT B: VEGETATED WATERCOURSES—CREEKS AND CHANNELS

Type B: Vegetated watercourses—creeks and channels

Landscape baseline assessment

Location and boundaries	<p>This landscape type is located through the study area, associated with the many small tributaries that traverse the alignment.</p> <p>There are eight LCAs of this type: the Whalan Creek Vegetated Watercourse (LCA B1); Forest Creek Vegetated Watercourse (LCA B2); Mobbindry Creek Vegetated Watercourse (LCA B3); Back Creek Vegetated Watercourse (LCA B4); Swamp Creek Vegetated Watercourse (LCA B5); Dry Creek Vegetated Watercourse (LCA B6); Mungle Creek Vegetated Watercourse (LCA B7); and Mungle Back Creek Vegetated Watercourse (LCA B8).</p>
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Indicative images



Key characteristics	<ul style="list-style-type: none"> ▶ Includes creeks and low-lying effluent channels that form part of the lower Border Rivers Valley Floodplain and catchment, conveying large amounts of floodwaters away from the Macintyre River when in flood ▶ Remnant areas of flood-dependent forest/woodlands and wetlands.
Precedent modifications and infrastructure elements	<ul style="list-style-type: none"> ▶ Relatively natural landscape with minimal infrastructure, comprising road and existing rail bridges over the main creek channels within the study area ▶ Generally fringing vegetation has been retained and creates a buffer between adjacent broad acre agricultural areas ▶ Electrical infrastructure including utility poles typically follows the road alignment.

Type B: Vegetated watercourses—creeks and channels

Landscape character sensitivity assessment	<ul style="list-style-type: none"> ▶ Moderate degree of perceived naturalness, with some instances of evidence of human uses and modifications to the waterways ▶ Significant fringing vegetation contain views to and from creek lines, reducing the sensitivity ▶ The overall sensitivity is low. This recognises that there are no formal landscape designations associated with this LCT and the landscape does not appear to be used by the local community for recreation. Additionally, parts of the LCT are already affected by the presence of rail infrastructure (albeit some of which is disused) so it has capacity to accommodate further change.
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Impact assessment

Magnitude of change assessment	<ul style="list-style-type: none"> ▶ The proposed alignment typically follows the existing rail alignment, and will include nine creek crossings, where the alignment crosses Whalan Creek, Whalan Floodplain, Forest Creek, Back Creek and Mobbindry Creek ▶ New bridge and railway infrastructure, as well as associated drainage infrastructure (e.g. culverts) will result in localised removal of vegetation ▶ Typically, these works be replacing existing infrastructure within the existing rail alignment ▶ Where the alignment deviates from the existing rail corridor, views to creek and floodplain infrastructure will be evident from Bruxner Way and Tucka Tucka Road. Due to the transient nature of views from the main road, the primary impact will be on residents of Toomelah travelling along Tucka Tucka Road ▶ The overall magnitude of change is predicted to be low.
Significance of effect	▶ The effect of the proposal on LCT B: Vegetated Watercourses—Creeks and Channels is Negligible.

Landscape Character Type C

TABLE 21.10 LANDSCAPE IMPACT ASSESSMENT OF LCT C: IRRIGATED CROPLANDS

Type C: Irrigated croplands

Landscape baseline assessment

Location and boundaries	<p>This landscape type is located to the immediate north and south of the Macintyre and Dumaresq rivers.</p> <p>There are three LCAs of this type in the study are: the Kurumbul Irrigated Croplands (LCA C1); Melon Ridge (LCA C2); and the Humptybung Irrigated Croplands (LCA C3). These three LCAs are typically located in areas with highly fertile vertosol soils.</p>
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Indicative images




Type C: Irrigated croplands

Key characteristics	<ul style="list-style-type: none"> ▶ Extensively developed agricultural areas with levee banks constructed to protect irrigated agriculture and urban centres from flood inundation ▶ Typically located in areas with highly fertile vertosol soils ▶ Extensive large and relatively flat open fields of irrigated cropland ▶ Landscape substantially cleared of vegetation, except at the periphery, along creek lines (LCT B) on the skyline and local roads ▶ In addition to irrigated production, current land use activities include grazing, dryland farming, irrigated and intensive industries such as feedlots, forestry and recreation.
Precedent modifications and infrastructure elements	<ul style="list-style-type: none"> ▶ To enhance agricultural productivity, works have been built on the floodplain to improve land used for grazing, dryland cropping and irrigated cropping ▶ Typically, works such as levees, earthworks, banks and channels have been built to protect crops, land, stock and properties from flooding, provide on farm access, and to manage and store irrigation, stock and domestic water.
Landscape character sensitivity assessment	<ul style="list-style-type: none"> ▶ The irrigated croplands landscape type is predominantly visually open, with a sparsely settled rural character and no large-scale infrastructure elements. It has long-distant views and strong skylines, interrupted by irrigation infrastructure (e.g. levees and earthworks) ▶ Vegetation is extensively cleared and very sparse ▶ Because of the extensively modified character of the landscape and local value of the landscape in terms of landscape amenity the overall inherent sensitivity is low.
Impact assessment	
Magnitude of change assessment	<ul style="list-style-type: none"> ▶ Impact on private land and valuable irrigated areas has been minimised by utilising the existing non-operational rail alignment for most of the proposal's alignment ▶ The primary impact will be on private land where the alignment deviates from the existing rail corridor ▶ Because of the transient nature of views from the main road, the landowners of affected properties and travellers along Bruxer Way will be most affected ▶ It should be noted that new earthwork infrastructure within this landscape will be consistent with the current landscape character ▶ The overall magnitude of change is predicted to be low.
Significance of effect	<ul style="list-style-type: none"> ▶ The effect of the proposal on LCT C: Irrigated Croplands is negligible.

Landscape Character Type D

TABLE 21.11 LANDSCAPE IMPACT ASSESSMENT OF LCT D: DRY CROPLANDS AND PASTURES

Type D: Dry croplands and pastures

Landscape baseline assessment	
Location and boundaries	This landscape extends across the southern parts of the study area and is largely defined by extensively cleared open rural properties used for agriculture and livestock production. There are nine character areas: the Dumaresq Dry Croplands and Pastures (LCA D1); Tucka Tucka Dry Croplands and Pastures (LCA D2); Coppymurrumbilla Dry Croplands and Pastures (LCA D3); Newell Dry Croplands and Pastures (LCA D4); Burringbar Dry Croplands and Pastures (LCA D5); Forest Creek Dry Croplands and Pastures (LCA D6); Bruxner Dry Croplands and Pastures (LCA D7); North Star Dry Croplands and Pastures (LCA D8); and the Getta Getta Dry Croplands and Pastures (LCA D9).
Indicative images	
	
Key characteristics	<ul style="list-style-type: none"> ▶ Soils comprise sodosols and vertosols ▶ The sodosols have a gravelly, sandy character, often exposed in areas and vulnerable to tunnel and gully erosion ▶ The vertosols, are typically cracking clay soils with high nutrients capable of supporting agriculture ▶ Generally, the landscape is flat, typically between 220 m and 260 m AHD ▶ Land use is predominantly rural, characterised by broad acre dryland cropping and pastoral properties for livestock production, interspersed by incised branching creek lines, many of which are seasonal with multiple anabranches. These include Forest Creek, Back Creek, Swamp Creek, Dry Creek, Mobbindry Creek Mungle Creek and Mungle Back Creek ▶ Vegetation comprises native roadside shelter belts and sporadic riparian vegetation associated with creek lines ▶ Transport corridors are straight in character reflecting the flat topography, with subtle kinks associated with topographic variation that connect the key settlements and rural properties. Main roads are sealed but other roads are typically unsealed gravel ▶ Open and exposed character with long distant views and strong skylines, except where views are contained by roadside or creek-side vegetation ▶ Sparsely settled landscape, with only property homesteads and cottages, and small rural 'villages' such as North Star. Farmsteads are typically located on gently elevated areas ▶ Harmonious but typical rural character, which is valued at a local level by local communities and visitors.
Precedent modifications and infrastructure elements	<ul style="list-style-type: none"> ▶ Highly modified for agricultural practices, including clearing and levelling of land for cultivation of arable farmland and pastures for grazing ▶ Construction of roads, railways and bridges ▶ Electrical infrastructure including utility poles.

Type D: Dry croplands and pastures

Landscape character sensitivity assessment	<ul style="list-style-type: none"> ▶ The Dry croplands and pastures Landscape Character Type is predominantly visually open, with a sparsely settled rural character and little large-scale infrastructure. It has long-distant views and strong skylines. ▶ Roadside shelter belts and sporadic riparian vegetation associated with creek lines and flood channels provide some screening ▶ Because of the simple character and local value of the landscape, which is not protected in any planning scheme, the overall inherent sensitivity is low.
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Impact assessment

Magnitude of change assessment	<ul style="list-style-type: none"> ▶ Impact on private land, including agricultural and pastoral areas has been minimised by utilising the existing non-operational rail alignment for most of the proposal's alignment ▶ Any impacts within this landscape character area will be due to localised vegetation removal and increased embankment heights ▶ Overall, the impact on this LCT is low.
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Significance of effect	▶ The effect of the proposal on LCT D: Dry Croplands and Pastures is negligible.
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Landscape Character Type E

TABLE 21.12 LANDSCAPE IMPACT ASSESSMENT OF LCT E: RURAL SETTLEMENT

Type E: Rural settlement

Landscape baseline assessment

Location and boundaries	<p>Four rural settlements are located within the study area. They include the town of Boggabilla and the small settlements of North Star, Kurumbul and Toomelah. Accordingly, there are four LCAs:</p> <ul style="list-style-type: none"> ▶ Boggabilla Township (LCA E1) ▶ North Star Village Rural Settlement (LCA E2) ▶ Kurumbul Rural Settlement (LCA E3) ▶ Toomelah Settlement (LCA E4).
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Indicative images



Key characteristics	<ul style="list-style-type: none"> ▶ Small rural towns, villages and communities are low-scale built forms with limited services ▶ Typically, single-storey buildings of varying age and condition ▶ Larger settlements (Boggabilla, North Star and Toomelah) have social infrastructure including parks, public schools and sport facilities ▶ Historic railway station and platforms signs are located throughout the corridor ▶ Boggabilla (LCA E1) is a small town located southeast of Goondiwindi
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Type E: Rural settlement

Key characteristics (continued)	<ul style="list-style-type: none"> ▶ North Star (LCA E2) is a small rural village surrounded by agricultural land, servicing the local farming community (closest to the adjoining N2NS project). The existing Boggabilla Branch Line runs alongside the town and terminates north of the village ▶ Kurumbul (LCA E3) is a very small village with no services located in the northern extent of the study area (closest to the adjoining B2G project). The South Western railway line runs through the centre of the community ▶ Toomelah (LCA E4) is an Aboriginal settlement situated near the confluence of the Macintyre and Dumaresq rivers.
Precedent modifications and infrastructure elements	<ul style="list-style-type: none"> ▶ Presence of roads, railways and bridges ▶ Electrical infrastructure including utility poles ▶ Infrastructure associated with agricultural production and the rail line (e.g. silos and storage sheds).
Landscape character sensitivity assessment	<ul style="list-style-type: none"> ▶ The rural settlements landscape type is predominantly visually open, with a sparsely settled rural character and some localised large-scale agricultural infrastructure ▶ Street trees and remnant vegetation provide some screening effect ▶ The sensitivity of these settlements is Moderate. While not valued within planning schemes, these settlements have a distinctive character with some elements of interest (such as buildings and silos) and are also likely to be valued by the people that reside in or visit them.
Impact assessment	
Magnitude of change assessment	<ul style="list-style-type: none"> ▶ The proposal alignment does not pass directly through any of these settlements ▶ Boggabilla is some distance from the alignment so will have no impact ▶ Both North Star and Kurumbul are situated close to existing railway infrastructure and will be affected by adjacent Inland Rail projects—Narrabri to North Star (N2NS) and Border to Gowrie (B2G), respectively. The impact of this proposal is therefore nil, but cumulative impacts need to be considered (refer Chapter 26: Cumulative Impacts). ▶ Toomelah is closest to the alignment but not directly impacted by the proposal ▶ The magnitude of change on the Rural Settlement LCT is no impact.
Significance of effect	<ul style="list-style-type: none"> ▶ The effect of the proposal on LCTE: Rural Settlement is no impact.

Landscape Character Type F

TABLE 21.13 LANDSCAPE IMPACT ASSESSMENT OF LCT F: VEGETATED GRAZING

Type F: Vegetated grazing

Landscape baseline assessment	
Location and boundaries	<p>This landscape type is typically located in the northern most extent of the study area, and is characterised by poorer quality soils, remnant vegetation and cattle and sheep grazing</p> <p>There is one LCA of this type in the site—Boggabilla Vegetated Grazing (LCT F3).</p>
Indicative images	
	

Type F: Vegetated grazing

Key characteristics	<ul style="list-style-type: none">▶ Sparsely settled landscape with large land holdings (stations) and scattered farmsteads▶ Pastureland with broad areas of open wooded remnant vegetation, typically denser along creek and drainage lines▶ Roads are typically straight in character and unsealed gravel. Views in most instances are contained by roadside shelter belts▶ Harmonious but typical rural character.
Precedent modifications and infrastructure elements	<ul style="list-style-type: none">▶ Highly modified for agricultural practices, including clearing and levelling of land for cultivation of pastures for grazing of cattle and sheep▶ Construction of roads▶ Electrical infrastructure including utility poles.
Landscape character sensitivity assessment	<ul style="list-style-type: none">▶ The vegetated grazing landscape type is predominantly visually contained, with a sparsely settled rural character and little large-scale infrastructure. Long-distance views are possible at breaks in roadside shelter breaks▶ Harmonious but typical rural character, which is valued at a local level by local communities and visitors▶ Because of the simple character of the landscape and local value of the landscape the overall inherent sensitivity is low.
Impact assessment	
Magnitude of change assessment	<ul style="list-style-type: none">▶ The alignment does not transect this landscape type, therefore any impacts on this landscape type would be indirect▶ Because of the distance from the alignment it is anticipated that there would be no impact.
Significance of effect	<ul style="list-style-type: none">▶ The effect of the proposal on LCT F: Vegetated Settlement is no impact.

21.6.3.2 Visual impacts assessment

Six viewpoints have been selected within the study area to represent potential visual impacts across that area. The identified viewpoints are shown on Figure 21.5 and the assessment of each is described in Table 21.14 to Table 21.22.

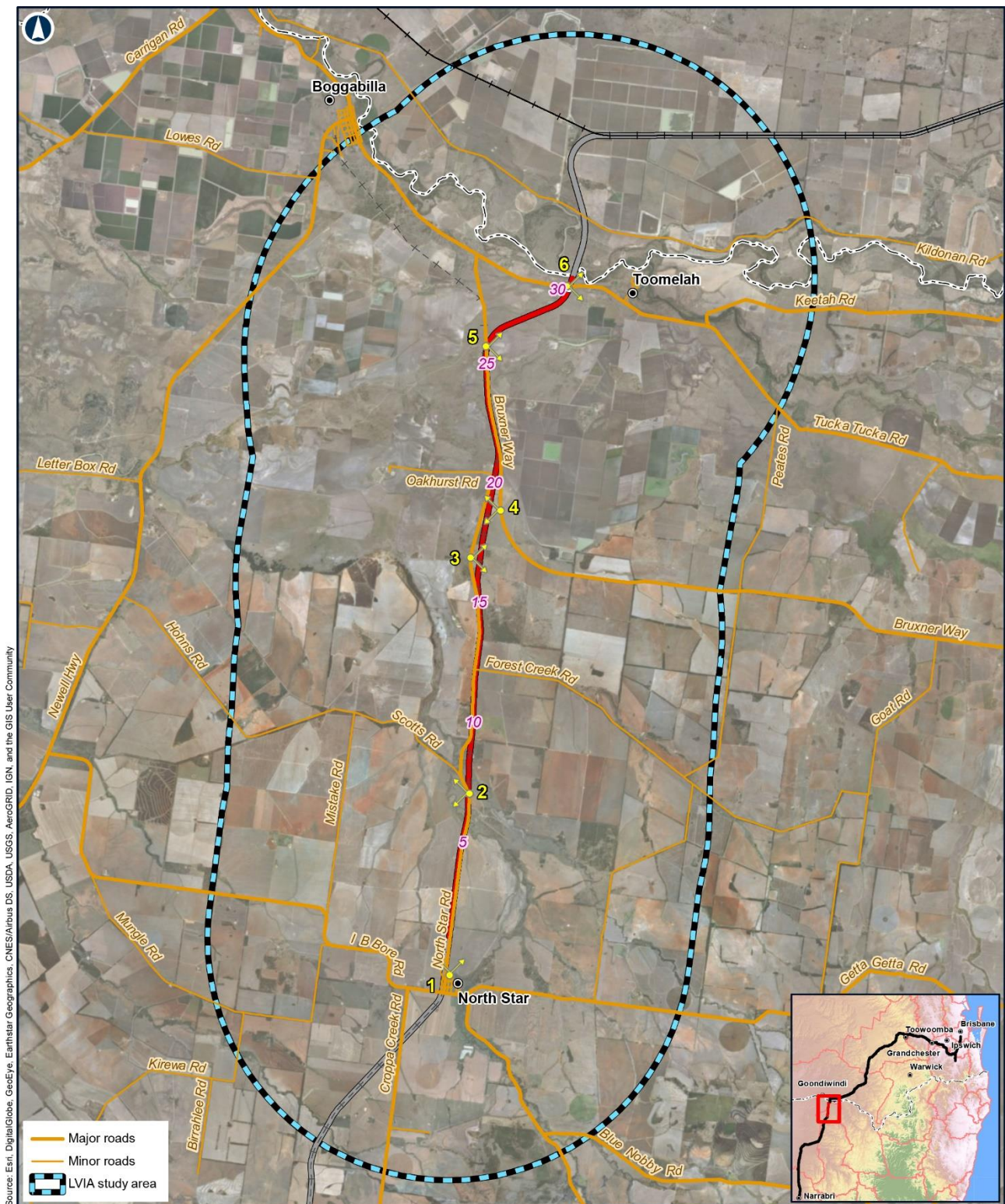


Figure 21.5: Identified viewpoints

NORTH STAR TO NSW/QLD BORDER

ARTC **InlandRail**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation, in partnership with the private sector.

FIGURE 21.5 IDENTIFIED VIEWPOINTS

Viewpoint 1

TABLE 21.14 LIKELY VISUAL EFFECT OF THE PROPOSAL ON VIEWPOINT 1: CORNER OF CAPERNUM STREET AND DAVID STREET, NORTH STAR, LOOKING NORTHWEST

Viewpoint 1: Corner of Capernum Street and David Street, North Star, looking north-west

Visual baseline assessment



Existing view from Viewpoint 1

Location and description	<ul style="list-style-type: none"> ▶ Elevation: 260.0 m ▶ North-westerly view from the corner of Capernum Street and David Street, on the outskirts of North Star ▶ Proposed alignment is situated along the existing rail corridor, approximately 1.5 km north of this viewpoint, although noting the N2NS alignment is 150 m west of this viewpoint ▶ Proposed construction camp is approximately 500 m southeast of this viewpoint ▶ Represents typical accessible views of residents of North Star, students and staff of North Star Public School and of visitors, workers and tourists travelling through North Star towards Goondiwindi ▶ North-westerly views from this point provide open views towards existing rail infrastructure and the proposed alignment, including landscapes typical of the Dry Croplands and Pastures (LCT D).
Key visual sensitivities	<ul style="list-style-type: none"> ▶ Receptors include residents of North Star (who are likely to be interested in the view) and travellers passing through North Star close to North Star Road, an alternative scenic route to the Newell Highway ▶ The presence of existing rail infrastructure (Boggabilla Branch Line), grain silos, power poles and powerlines reduce the overall sensitivity of this view ▶ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, due to the medium sensitivity of viewers (e.g. nearby residents).
Visual evaluation	
Construction	
Magnitude of change assessment	<ul style="list-style-type: none"> ▶ Construction works will be occurring mainly within the existing rail corridor. However, the construction of the alignment and the presence of extensive laydown areas near residential properties of North Star and the nearby proposed construction camp (500 m south-east of this viewpoint) would cause a perceptible change in the landscape character of this viewpoint. ▶ While not within this view, the proposed construction camp and associated laydown areas will be clear for residents of North Star living approximately 300 m west of the proposed construction camp location, and immediately adjacent laydown areas ▶ The proposed construction camp will include the provision of a sewage treatment plant, amenities building, dining room, accommodation units with associated communal areas and other associated service infrastructure ▶ It is noted that vehicular access for the construction camp will be off North Star Road, approximately 575 m from the nearest residential receptor ▶ Close views from this viewpoint and surrounding residential properties within North Star towards proposed laydown areas and the proposed construction camp would result in a perceptible change in the view; however, as these impacts are temporary, this is considered to represent a Moderate magnitude of change.
Significance of effect (construction)	The effect of the proposal on Viewpoint 1 during construction is moderate (noting that cumulative effects will be experienced with the N2NS alignment).

Viewpoint 1: Corner of Capernum Street and David Street, North Star, looking north-west

Operation

Magnitude of change assessment—permanent infrastructure	<ul style="list-style-type: none"> ▶ The nearest section of the proposal alignment is approximately 1.5 km north of this viewpoint. The skyline is already affected by the presence of powerlines, and existing grain silos and infrastructure associated with the existing rail line. The magnitude of change on this receptor is anticipated to be noticeable, therefore low, due to the following factor: <ul style="list-style-type: none"> ▶ Noticeable change due to an increase in embankment height, due to the replacement of existing rail infrastructure at a height varying from 0.09 m to 0.7 m above the existing surface level ▶ Where required, fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is typically proposed that will be in keeping with the existing rural character ▶ It has been assumed that no noise barriers will be required through this section ▶ At this distance, while the alignment will be evident, it will not change the fundamental visual character of the landscape because it will be simply replacing existing infrastructure. It is unlikely that height increases less than 1 m would be perceivable from this distance, and the alignment will largely replicate the existing view. This represents a low magnitude of change
Magnitude of change assessment—train	<ul style="list-style-type: none"> ▶ Movement of double-stacked freight trains up to 1,800 m long (potentially up to 3,600 m long in the future) with a height of 6.50 m at speeds of up to 115 km/hr will have a considerable impact on residents of North Star. This is a moderate magnitude of change—noting there would be approximately 14 train movements per day on the completion of all 13 sections of Inland Rail in 2025.

Significance of effect (operation)	The effect of the proposal on Viewpoint 1 during operation is up to moderate.
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Viewpoint 2

TABLE 21.15 LIKELY VISUAL EFFECT OF THE PROPOSAL ON VIEWPOINT 2: NORTH STAR ROAD, LOOKING NORTH-EAST

Viewpoint 2: North Star Road, looking north-east

Visual baseline assessment



Existing view from Viewpoint 2

Location and description	<ul style="list-style-type: none"> ▶ Elevation: 240.0 m ▶ Northerly view along North Star Road, near existing level crossing and private property 'Ohmi' ▶ Proposed alignment is situated along the existing rail corridor, approximately 35 m west of this viewpoint ▶ Represents typical and accessible views of residents of Ohmi and of visitors, workers, tourists and local rural residents travelling along North Star Road towards Goondiwindi ▶ Northerly views from this point provide close views towards existing rail infrastructure and the proposed alignment, including landscapes typical of the Vegetated Watercourses—Creeks and Channels (Type B) and Dry Croplands and Pastures (Type D) landscape types.
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Viewpoint 2: North Star Road, looking north-east

Key visual sensitivities	<ul style="list-style-type: none">▶ Low sensitivity of transient receptors, predominantly travellers along North Star Road, an alternative scenic route to the Newell Highway and nearby isolated rural residents (Annual Average Daily Traffic around 292 northbound and 317 southbound of which around 25% are heavy vehicles)▶ Residents of Ohmi will be interested in the visual amenity of the landscape▶ The presence of existing rail infrastructure (decommissioned) and powerlines reduces the overall sensitivity of this view▶ This viewpoint it is considered to have a low sensitivity overall to the change proposed, due to the low sensitivity of viewers (e.g. travellers along North Star Road and isolated rural residents).
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Visual evaluation

Photomontage



Photomontage view from Viewpoint 2: North Star Road, looking north-east (75° field of view)

Construction

Magnitude of change assessment (construction)	<ul style="list-style-type: none">▶ Construction works will occur within and alongside the existing, non-operational Boggabilla rail corridor; therefore, the construction of the alignment would cause a noticeable change in the landscape character of this viewpoint▶ Because of the historic clearing, vegetation clearing for the construction of the proposed alignment, service road and laydown area in this area will not significantly impact the visibility of the alignment▶ Construction works will impact the isolated rural properties in the area, notably Ohmi, which is approximately 60 m east of the alignment. This is a dominant change with a High, albeit temporary, magnitude of change.
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Significance of effect (construction)	The effect of the proposal on Viewpoint 2 during construction is moderate.
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Operation

Magnitude of change assessment—permanent infrastructure	<ul style="list-style-type: none">▶ The nearest section of the alignment is approximately 35 m west of this viewpoint. The proposed alignment runs along or close to the existing decommissioned Boggabilla Branch Line. The magnitude of change on this receptor is anticipated to be noticeable, therefore low, because of the following:<ul style="list-style-type: none">▶ Noticeable change due to the replacement of existing rail infrastructure and new level crossing▶ Within the proximity of the North Star Road crossing the rail alignment is typically close to or at existing surveyed surface level▶ Because of the sparse nature of existing remnant vegetation, vegetation clearing will have minimal impact
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Viewpoint 2: North Star Road, looking north-east

(continued from previous page)	<ul style="list-style-type: none"> ▶ Where required, fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is typically proposed that will be in keeping with the existing rural character ▶ At this distance, while the proposed alignment will be more evident than the existing rail line, it will not change the fundamental visual character of the landscape. It is likely that further along the alignment (visible from rural property Ohmi) increases in the embankment height would be noticeable. However, because of the speed at which people are driving along North Star Road and the isolated nature of sensitive receptors, the change would be minimal and low.
Magnitude of change assessment—train	▶ Views of the movement of double-stacked freight trains up to 1,800 m long (potentially up to 3,600 m long in the future) with a height of 6.50 m at speeds of up to 115 km/hr will have a considerable impact on residents of Ohmi. This magnitude of change is moderate.
Significance of effect (operation)	The effect of the proposal on Viewpoint 2 during operation is low.

Viewpoint 3

TABLE 21.16 LIKELY VISUAL EFFECT OF THE PROPOSAL ON VIEWPOINT 3: NORTH STAR ROAD, LOOKING NORTH-EAST

Viewpoint 3: North Star Road, looking north-east

Visual baseline assessment



Existing view from Viewpoint 3

Location and description	<ul style="list-style-type: none"> ▶ Elevation: 220.0 m ▶ North-easterly view North Star Road, approaching the intersection with Bruxner Way ▶ Proposed alignment is along the existing, non-operational Boggabilla rail corridor, approximately 400 m east of this viewpoint ▶ Represents views of residents, visitors, workers and tourists travelling along North Star Road. There are no residential properties at this location ▶ North-easterly views from this point provide open views towards existing infrastructure and the proposed alignment, including landscapes typical of the Vegetated Watercourses—Creeks and Channels (Type B) and Dry Croplands and Pastures (Type D) landscape types.
Key visual sensitivities	<ul style="list-style-type: none"> ▶ Low sensitivity of receptors, predominantly travellers along North Star Road, an alternative scenic route to the Newell Highway (Annual Average Daily Traffic around 292 northbound and 317 southbound of which around 25% are heavy vehicles) ▶ The presence of existing rail infrastructure (decommissioned) reduces the overall sensitivity of this view ▶ This viewpoint is considered to have a low sensitivity overall to the change proposed, because of the type of viewers (e.g. travellers experiencing transient views along North Star Road).

Visual evaluation

Construction

Magnitude of change assessment (construction)	<ul style="list-style-type: none"> ▶ Vegetation clearing for the construction of the alignment and proposed laydown area will have minimal impact due to the sparse vegetation in this location ▶ Construction works will occur within and alongside the existing, non-operational Boggabilla rail corridor, therefore the construction of the alignment would cause a noticeable change in the landscape character of this viewpoint. However, this would be temporary, representing a low magnitude of change.
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Viewpoint 3: North Star Road, looking north-east

Significance of effect (construction) The effect of the proposal on Viewpoint 3 during construction is negligible.

Operation

Magnitude of change assessment—permanent infrastructure	<ul style="list-style-type: none"> ▶ The nearest section of the alignment is approximately 400 m east of this viewpoint. The proposed alignment runs along or close to the existing decommissioned Boggabilla Branch Line. The magnitude of change on this receptor is anticipated to be considerable, therefore Moderate, due to the following factors: <ul style="list-style-type: none"> ▶ Noticeable change due to an increase in embankment height, varying from +0.310 m to +3.408 m above the existing surface level and the provision of new rail infrastructure, including the Forest Creek Rail Bridge ▶ Vegetation clearing for the construction of the proposed alignment will have minimal impact because of the sparse vegetation in this location ▶ Where required, fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is typically proposed that will be in keeping with the existing rural character ▶ At this distance, while the proposed alignment will be more evident than the existing rail line, it will not change the fundamental visual character of the landscape. It is likely that height increases would be considerable, although because of the speed at which people are driving along North Star Road the change would only be experienced for a short duration. This represents a moderate magnitude of change.
Magnitude of change assessment—train	<ul style="list-style-type: none"> ▶ Movement of double-stacked freight trains up to 1.80 km long (potentially up to 3.6 km long in the future) with a height of 6.50 m will only be experienced occasionally because of the low number of travellers on this road. Therefore, the magnitude of impact is low.

Significance of effect (operation) The effect of the proposal on Viewpoint 3 during operation is low.

Viewpoint 4

TABLE 21.17 LIKELY VISUAL EFFECT OF THE PROPOSAL ON VIEWPOINT 4: BRUXNER WAY LOOKING NORTH-WEST

Viewpoint 4: Bruxner Way, looking north-west

Visual baseline assessment



Existing view from Viewpoint 4

Location and description	<ul style="list-style-type: none"> ▶ Elevation: 230.0 m ▶ North-westerly view North Star Road, approaching the intersection with Bruxner Way ▶ Proposed alignment is situated along the existing, non-operational Boggabilla rail corridor, approximately 500 m west of this viewpoint ▶ Intersection with North Star Road, and proposed bridge structure is approximately 1 km north of this viewpoint ▶ Represents typical and accessible views of residents and of visitors, workers and tourists travelling along Bruxner Way towards Goondiwindi ▶ North-westerly views from this point provide open views towards existing infrastructure and the proposed alignment, including landscapes typical of the Vegetated Watercourses—Creeks and Channels (Type B); Irrigated Croplands (Type C) ;and Dry Croplands and Pastures (Type D) Landscape Character Types.
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Viewpoint 4: Bruxner Way, looking north-west

Key visual sensitivities	<ul style="list-style-type: none"> ▶ Receptors predominantly comprise travellers along Bruxner Way (Annual Average Daily Traffic around 279 east-bound and 297 west-bound of which up to 50% are heavy vehicles) ▶ The presence of existing rail infrastructure (decommissioned Boggabilla Branch Line) reduces the overall sensitivity of this view ▶ This viewpoint is considered to have a low sensitivity overall to the change proposed, because of the transient nature of viewers including high numbers of heavy vehicles travelling along Bruxner Way.
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Visual evaluation

Construction

Magnitude of change assessment—(construction)	▶ Vegetation clearing will have minimal impact because of the sparse vegetation in this location. Construction works will occur within and alongside the existing, non-operational Boggabilla rail corridor; therefore, the construction of the alignment would cause a noticeable change in the landscape character of this viewpoint. However, this would be temporary, resulting in a low magnitude of change.
Significance of effect (construction)	The effect of the proposal on Viewpoint 4 during construction is Negligible.

Operation

Magnitude of change assessment—permanent infrastructure	<ul style="list-style-type: none"> ▶ The nearest section of the alignment is approximately 500 m west of this viewpoint. The existing, non-operational Boggabilla rail corridor is somewhat screened by vegetation. The magnitude of change on this receptor is anticipated to be barely perceptible, therefore Negligible, due to the following factors: <ul style="list-style-type: none"> ▶ Negligible change due to the reinstatement of existing infrastructure within or in very close proximity to the existing, non-operational Boggabilla rail corridor, screening foreground vegetation and the proposed alignment height varying from -0.3 m to +1.8 m above the existing surface level, which would be barely perceptible at this distance ▶ Where required, fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is typically proposed that will be in keeping with the existing rural character ▶ The alignment will 'blend' into the existing view to a considerable extent. Therefore, the magnitude of impact is negligible.
Magnitude of change assessment—train	▶ Movement of double stacked freight trains up to 1,800 m long (potentially up to 3,600 m long in the future) with a height of 6.50 m will be evident to travellers on Bruxner Way, but only experienced occasionally due to the low number and transient nature of travellers on this road. Therefore, the magnitude of impact is low.
Significance of effect (operation)	The effect of the proposal on Viewpoint 4 during operation is negligible.

Viewpoint 5

TABLE 21.18 LIKELY VISUAL EFFECT OF THE PROPOSAL ON VIEWPOINT 5: BRUXNER WAY, LOOKING EAST

Viewpoint 5: Bruxner Way, looking east

Visual baseline assessment



Existing view from Viewpoint 5

Viewpoint 5: Bruxner Way, looking east

Location and description	<ul style="list-style-type: none"> ▶ Elevation: 220.0 m ▶ Easterly view from Bruxner Way, towards proposed road realignment and Bruxner Way rail-over-road bridge. ▶ Proposed alignment is situated approximately 50 m east of this viewpoint ▶ Represents typical and accessible views of residents of local rural properties, and of visitors, tourists and workers travelling along Bruxner Way ▶ Easterly views from this point provide open views towards the proposed alignment and the proposed Bruxner Way Rail rail-over-road bridge, including landscapes typical of the Irrigated Croplands (Type C) landscape type.
Key visual sensitivities	<ul style="list-style-type: none"> ▶ Low sensitivity of receptors, including travellers along Bruxner Way and workers on local rural properties (Annual Average Daily Traffic around 279 eastbound and 297 westbound, of which up to 50% are heavy vehicles) ▶ The presence of existing rail infrastructure (power poles and powerlines) reduces the overall sensitivity of this view ▶ This viewpoint is considered to have a Low sensitivity overall to the change proposed because of the low sensitivity of viewers (e.g. travellers along Bruxner Way).

Visual evaluation

Photomontage



Photomontage view from Viewpoint 5: Bruxner Way, looking east (75° field of view)

Construction

Magnitude of change assessment	<ul style="list-style-type: none"> ▶ Significant areas within area are proposed as construction laydown areas ▶ Construction of proposed embankments, rail and bridge infrastructure, and the realignment of Bruxner Way will cause disturbance within the landscape ▶ Demolition of existing Bruxner Way and redundant rail infrastructure will also occur ▶ At this distance, construction works and laydown areas will be highly evident and change the visual character of the landscape, albeit temporarily. This is a high magnitude of change.
Significance of effect	The effect of the proposal on Viewpoint 5 during construction is a moderate impact.

Operation

Magnitude of change assessment—permanent infrastructure	<ul style="list-style-type: none"> ▶ The nearest section of the alignment is approximately 50 m east of this viewpoint. The proposed alignment will head northeast, veering away from the existing highway alignment. The magnitude of change on this receptor is anticipated to be dominant, therefore high, because of the following: <ul style="list-style-type: none"> ▶ Dominant change due to proposed earthworks and the provision of new rail infrastructure, including Bruxner Way Rail Bridge, Whalan Tributary 1 Rail Bridge and the realignment of Bruxner Way to the east ▶ Height of proposed embankments varies, with the maximum proposed height being approximately 7.60 m above natural ground
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Viewpoint 5: Bruxner Way, looking east

(continued from previous page)	<ul style="list-style-type: none"> ▶ Where required, fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is typically proposed that will be in keeping with the existing rural character ▶ At this distance, the alignment and associated infrastructure will be clear, and represent a dominant change to the visual character of the landscape by introducing new, dominant visual elements into the landscape. This is considered to have up to a high magnitude of change.
Magnitude of change assessment—train	▶ Movement of double-stacked freight trains up to 1,800 m long (potentially up to 3,600 m long in the future) with a height of 6.50 m experienced at close distance will have a considerable impact on travellers on Bruxner Way. Therefore, the magnitude of impact is moderate.
Significance of effect (operation)	The effect of the proposal on Viewpoint 5 during operation is up to moderate.

Viewpoint 6

TABLE 21.19 LIKELY VISUAL EFFECT OF THE PROPOSAL ON VIEWPOINT 6: LOOKING IN A NORTH-EASTERLY DIRECTION ALONG TUCKA TUCKA ROAD (TOWARDS ACCESS ROAD TO TOOMELAH)

Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)

Visual baseline assessment



Existing view from Viewpoint 6

Location and description	<ul style="list-style-type: none"> ▶ Elevation: 220.0 m ▶ Easterly view from Tucka Tucka Road, approaching the turn-off to Toomelah ▶ Proposed alignment and Tucka Tucka Road Rail Bridge is situated approximately 50 m east of this viewpoint ▶ The Macintyre River and proposed Macintyre River Viaduct is situated approximately 450 m north of this viewpoint ▶ Representative of potential views of residents of local rural properties, i.e. residents of Toomelah and of visitors and workers travelling along Tucka Tucka Road. This view is considered representative of the worst-case impacts on the Toomelah community, noting that the main residential area of the community is approximately 2.5 km east of this vantage point ▶ Easterly views from this point provide open views towards the proposed alignment, including Tucka Tucka Road Rail Bridge, Macintyre River Viaduct and Whalan Creek Rail Bridge, including landscapes typical of the Vegetated Watercourses—Rivers (Type A) and Vegetated Watercourses—Creeks and Channels (Type B) Landscape Character Types.
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Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)

- Key visual sensitivities
- ▶ Moderate sensitivity of receptors, including residents of Toomelah and a relatively low number of travellers along Tucka Tucka Road (Annual Average Daily Traffic 241 eastbound and 190 westbound, around 10% of which are heavy vehicles)
 - ▶ The presence of existing power poles and powerlines reduces the overall sensitivity of this view
 - ▶ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, because of the low number of viewers (e.g. travellers along Tucka Tucka Road) but reflecting the fact that this viewpoint is being used to represent views from the Toomelah community within a heritage area.

Visual evaluation

Photomontage



Photomontage view from Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah) (75° field of view)

Construction

- Magnitude of change assessment
- ▶ Significant construction areas within this viewpoint are proposed, including a major construction laydown area and satellite offices
 - ▶ Construction includes localised vegetation clearing, building the proposed embankments, and constructing rail and bridge infrastructure, which will cause considerable disturbance within the landscape
 - ▶ Tucka Tucka Road is the access road for residents of Toomelah; therefore, construction works could impact the views of residents
 - ▶ At this distance, construction works, vegetation removal and laydown areas will be highly evident, and fundamentally change the visual character of the landscape
 - ▶ This represents a moderate magnitude of change.

Significance of effect (construction) The effect of the proposal on Viewpoint 6 during construction is moderate.

Operation

- Magnitude of change assessment—permanent infrastructure
- ▶ The nearest section of the alignment is approximately 50 m east of this viewpoint. The proposed alignment will cross the existing Tucka Tucka Road and head north towards the Macintyre River. The magnitude of change on this receptor is anticipated to be dominant, therefore High, because of the following:
 - ▶ Widespread change due to proposed earthworks and the provision of new rail infrastructure, including the Tucka Tucka Road Rail Bridge, Macintyre River Viaduct and the Whalan Creek Rail Bridge
 - ▶ Nearest embankments are approximately 600 m south of this viewpoint on the other side of Whalan Creek. Height of proposed embankments varies, with the maximum proposed height being approximately 5.0 m above natural ground

Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)

(continued from previous page)	<ul style="list-style-type: none"> ▶ Where required, fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is typically proposed that will be in keeping with the existing rural character ▶ At this distance, the alignment and associated infrastructure will be dominant, and fundamentally change the visual character of the landscape by introducing new, dominant visual elements into the landscape, representing a high magnitude of change.
Magnitude of change assessment—train	▶ Movement of double-stacked freight trains up to 1,800 m long (potentially up to 3,600 m long in the future) with a height of 6.50 m experienced at close distance will have a considerable impact on travellers on Tucka Tucka Road and Toomelah. Therefore, the magnitude of impact is moderate.
Significance of effect (operation)	The effect of the proposal on Viewpoint 6 during operation is high.

The selected views described above all fall within NSW. Views from other parts of the study area that fall within Queensland looking towards the proposal have been considered. It was determined that views of the rail bridge over the Macintyre River are relatively inaccessible to the public on the Queensland side of the border. The potential viewpoints identified in Queensland (for example in Rainbow Reserve accessed from Kildonan Road) are affected primarily by the Border to Gowrie project rather than the proposal (and are considered in the Border to Gowrie landscape and visual impact assessment), so are not considered further here.

Visual impact of borrow pits

A desktop assessment was undertaken of the potential impact of proposed borrow pits on landscape and visual values, as identified in Table 21.20. Based on investigations during the reference design phase, 11 borrow-pit sites have been identified with the potential to provide material for the proposal. Of these, 10 are existing, and therefore impacts on landscape and visual values would be limited to localised increases in their extent, including vegetation clearance and earthworks. Only one potential new borrow-pit site is identified, which would, if used, result in the localised clearance of vegetation and earthworks. All proposed borrow-pit sites are located on private property and relevant landowners have been consulted throughout the reference design phase. It is noted that the provision of and extent of borrow pits is subject to detailed design and further consultation with landowners, and therefore no viewpoint has been selected to specifically illustrate the visual impact of the proposed borrow pits.

TABLE 21.20 VISUAL IMPACT OF PROPOSED BORROW PITS

Borrow pit site number/location	Existing/new	Potential visual impact
1. Wearne Road (Site 4)	Existing	Private land located on private access drive with existing screening vegetation. Pit extension largely into agricultural land, therefore considered to have no impact on visual values.
2. 1069 B Bore Road, North Star (Site 5)	Existing	Private land located on private access drive 6 km from Newell Highway. Would result in some vegetation clearance; however, this would be barely perceptible and therefore result in a negligible level of effect on visual values.
3. Wearne Road (Site 7 and 7b)	Existing	Private land located behind existing buffer vegetation around 400 m east of Edward Street/North Star Road. Would result in additional vegetation clearance. Potential for some visual impact; likely to result in a low level of effect on visual values.
4. 7409 North Star Road (Site 8)	Existing	Private land located around 1 km west of Edward Street/North Star Road. Existing site is densely vegetated and already affected by extensive earthworks; however, this is screened by existing buffer vegetation. Would result in additional vegetation clearance and removal of buffer vegetation. Potential for some visual impact; likely to result in a low level of effect on visual values.

Borrow pit site number/location	Existing/new	Potential visual impact
5. Lot 12 Bruxner Way, Boonal (Site 9)	Existing	Private land located around 750 m south of Bruxner Way. Existing site is heavily vegetated and affected by extensive earthworks; however, this is screened by existing buffer vegetation. Would result in additional vegetation clearance. Potential views from parts of Bruxner Way; likely to result in a low level of effect on visual values.
6. 19911 Bruxner Way, Boonal (Site 11)	Existing	Private land located within existing vegetation around 2.8 km southwest of Bruxner Way. Would result in additional localised vegetation clearance around existing earthworks but site is well-screened and remote from public views; therefore, this impact would be barely perceptible and the effect on visual values would be negligible.
7. 31486 Newell Highway, Boggabilla (Site 13)	Existing	Private land located around 50 m west of Newell Highway. Would result in additional localised disturbance around existing earthworks, largely affecting agricultural land. Potential views from parts of Newell Highway but likely to be largely screened by existing vegetation adjoining the Highway. As an existing site, changes would be barely perceptible and result in a negligible level of effect on visual values.
8. 1257 Forest Creek Road (Site 25)	Existing	Private land located via private access drive approximately 650 m from nearest residence and over 0.75 km from Forest Creek Road, with narrow band of existing screening vegetation along road. This would result in additional vegetation clearance; however, pit extension is largely into agricultural land and would be barely perceptible. As such, the effect on visual values would be negligible.
9. 647 Hohns Road (Site 26)	Existing	Private land located behind existing buffer vegetation close to small local road (unsealed). Would result in some vegetation clearance; however, this would be barely perceptible and the effect on visual values would be negligible.
10. Site 1	Existing	Private land located around 1 km west of North Star Road and 750 m south of Minilya Road. Existing site is affected by earthworks, but the site is screened by dense vegetation. Would result in additional vegetation clearance; however, this would be barely perceptible and the effect on visual values would be negligible.
11. Site 2	New	Private land located around 750 m east of North Star–Croppa Creek Road. Site is densely vegetated, elevated land surrounded by low-lying agricultural land. Would result in considerable vegetation clearance; however, this would be barely perceptible and the effect on visual values would be negligible because of distance from nearby public roads and screening by topography.

21.6.3.3 Lighting impacts

This section considers the impact of proposal lighting.

As described in Table 21.6, construction lighting will only be associated with the construction camp in North Star village, site offices and fuel storage areas. It may also be used at bridge laydown areas. In terms of operational lighting, the only proposed permanent lighting is associated with safety lighting at the controlled level crossing on North Star Road near Ohmi homestead. There would also be transient lighting associated with train headlights. On this basis, most of the assessed viewpoints would not receive any lighting impacts. Therefore, only the following viewpoints have been assessed, which are reported in Table 21.21 to Table 21.22:

- ▶ Viewpoint 2 (construction and operation)
- ▶ Viewpoint 6 (construction).

Viewpoint 2

TABLE 21.21 LIKELY VISUAL EFFECT OF THE PROPOSAL LIGHTING ON VIEWPOINT 2

Viewpoint 2: North Star Road, looking northeast

Lighting assessment	
Visual evaluation	
Sensitivity assessment	<ul style="list-style-type: none"> ▶ Low, as described for daytime assessment. There will be few receptors in this location at night—the residents of Ohmi are the key night-time viewers.
Magnitude of change assessment (construction)	<ul style="list-style-type: none"> ▶ During construction it is anticipated that minimal works will be undertaken at night. However, there may be short-term construction works after dark that may require lighting. Additionally, the laydown area proposed within this view would be lit. ▶ The current light levels are assumed to be ‘intrinsically dark’ and it is assumed that, with careful planning, the levels would be ‘predominantly dark’ representing a low magnitude of change.
Significance of effect (construction)	Negligible.
Magnitude of Change Assessment (operation)	<ul style="list-style-type: none"> ▶ The active crossing proposed would be controlled by automatic warning systems, including flashing lights, and would be visible from the rural property ‘Ohmi’ ▶ There would also be short-term impacts due to the headlight on the passing freight train which would last for up to 2.5 minutes ▶ This would, at worst, change a ‘intrinsically dark’ landscape into a ‘predominantly dark’ landscape, representing a noticeable change considered to have a low magnitude of change.
Level of effect (operation)	Negligible.

Viewpoint 6

TABLE 21.22 LIKELY VISUAL EFFECT OF THE PROPOSAL LIGHTING ON VIEWPOINT 6

Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)

Lighting assessment	
Visual evaluation	
Sensitivity assessment	<ul style="list-style-type: none"> ▶ This viewpoint is representative of views experienced by a low number of motorists travelling along Tucka Tucka Road ▶ These travellers are typically residents of Toomelah and are considered to have an interest in their night-time surroundings; however, because of the distance from the settlement this viewpoint is considered to have Low sensitivity at night.
Magnitude of change assessment (construction)	<ul style="list-style-type: none"> ▶ During construction it is anticipated that minimal works will be undertaken at night. However, there may be short-term construction works after dark that may require lighting. Additionally, the proposed bridge laydown area and site office within this view would be lit. ▶ The current light levels are assumed to be ‘intrinsically dark’ and it is assumed that, with careful planning, the levels would be ‘predominantly dark’, representing a noticeable low magnitude of change.
Significance of effect (construction)	Negligible.
Magnitude of change assessment (operation)	<ul style="list-style-type: none"> ▶ There would be no permanent lighting associated with the new Tucka Tucka Road Bridge (over road) and Macintyre River Viaduct. Therefore, there would be no impact at night. ▶ There would be very short-term impacts due to the headlight on the passing freight train which would last for up to 2.5 minutes ▶ Overall, the impact would be negligible.
Level of effect (operation)	Negligible.

21.7 Mitigation measures

This section outlines the initial mitigation measures included in the proposal design, and identifies proposed mitigation measures to manage predicted environmental impacts in the preconstruction and construction and operational phases of the proposal.

21.7.1 Initial mitigation

The mitigation measures presented in Table 21.23 have been incorporated into the proposal design. These design measures have been identified through collaborative development of the design and consideration of environmental constraints and issues, including proximity to sensitive receptors. These design measures are relevant to both construction and operational phases of the proposal. It is also considered that the proposal addresses the relevant provisions of Infrastructure Sustainability Council of Australia (ISCA) Version 1.2 in relation to Hea-2 Crime Prevention, Dis-5 Light Pollution and Urb-1 Urban Design to a level appropriate to the current design stage.

The mitigation measures and controls presented in Table 21.23 have been factored into the reference design for the proposal. These design considerations are standard design solutions to the potential impacts that may arise on a proposal of this nature. Therefore, these initial mitigations have contributed to the initial significance rating for each potential proposal impact.

TABLE 21.23 ARTC STANDARD MITIGATION MEASURES RELEVANT TO LANDSCAPE AND VISUAL AMENITY

Aspect	Design measures
Landscape and visual issues	<ul style="list-style-type: none">▶ The design aims to use the existing, non-operational Boggabilla rail corridor to protect and minimise land severance and impacts to natural and rural landscapes as much as possible. In total, 25 km out of 30 km is located along a former/existing rail alignment▶ The proposal aims to be co-located with existing road infrastructure where possible▶ The disturbance footprint defined in proposal design aims to minimise vegetation clearing extents to that required to construct and operate the works▶ The alignment aims to reduce the extent of impact on watercourses and their landscape setting▶ The extent of cut and fill including the height of structures and embankments has been kept to the minimum consistent with required engineering design and requirements for cross-corridor connectivity for people and vehicles▶ The alignment has been kept away from settlements as much as possible (consistent with the existing rail alignment).

21.7.2 Proposed mitigation measures

Several mitigation measures and design objectives are proposed for implementation in future stages of design and delivery, in order to manage and mitigate proposal impacts. These proposed mitigation measures respond to proposal specific issues and opportunities, address legislative requirements, accepted government plans, policy and practice.

Table 21.24 presents these proposed mitigation measures in accordance with the proposal phase during which they would be implemented, as follows:

- ▶ Detailed design
- ▶ Preconstruction
- ▶ Construction
- ▶ Operation.

These mitigation measures include proposal-wide considerations as well as location or issue-specific measures in response to impacts identified in the landscape and visual impact assessment. Further detail with regards to timing and responsibilities for implementation of design objectives or proposed mitigation measures is discussed in Chapter 27: Environmental Management Plan.

A range of additional legacy opportunities have also been identified that provide opportunities to enhance the outcomes of the Project for affected communities. As these are not strictly mitigation to address identified landscape and visual impacts, they are included in Chapter 18: Sustainability.

TABLE 21.24 ADDITIONAL MITIGATION MEASURES RELEVANT TO LANDSCAPE AND VISUAL AMENITY

Delivery phase	Aspect	Proposed mitigation measures
Detailed design	Landscape and visual values	<p>Landscape and visual impacts due to vegetation removal</p> <ul style="list-style-type: none"> ▶ Clearing of visually significant vegetation is further limited during the detailed design phase to that required to enable the works. Locations include: <ul style="list-style-type: none"> ▶ Between North Star Road and Scotts Road (approx. Ch 8.2 km to Ch. 9.2 km) ▶ Between North Star Road and the alignment (generally) ▶ Adjacent Wilby Street in North Star ▶ Associated with watercourses as described below ▶ Prepare a Rehabilitation and Reinstatement Plan to guide the approach to rehabilitation following the completion of construction. The plan should include and clearly specify: <ul style="list-style-type: none"> ▶ Location of areas subject to rehabilitation and/or reinstatement/stabilisation details of the actions and responsibilities to progressively rehabilitate, regenerate, and/or revegetate areas, consistent with the agreed objectives.
		<p>Landscape and visual impacts on watercourses</p> <ul style="list-style-type: none"> ▶ Develop the detailed design to further minimise impacts to waterways, riparian vegetation and in-stream flora and habitats. Locations include Back Creek, Forest Creek, Whalan Creek and the Macintyre River and their tributaries ▶ Adopt a crossing structure hierarchy: bridges preferred to culverts; however, local conditions and constructability impacts must be considered when determining the preferred environmental solution: aim to avoid, then minimise, the extent of waterway diversions or realignments.
		<p>Visual impact of rail infrastructure</p> <ul style="list-style-type: none"> ▶ Infrastructure (such as structures, embankments/cuttings and bridges) should be designed following an integrated design process regarding landscape character and views as identified in the landscape and visual impact assessment, that is: <ul style="list-style-type: none"> ▶ Legacy: create a consistent legacy of treatments along the Inland Rail program alignment to enhance the overall recognition and legacy of the proposal ▶ Bridges: through detailed design, ensure that bridges contribute to an overall coherent sense of design, respect their surroundings and consider connectivity, Crime Prevention through Environmental Design and graffiti issues. In particular, consider urban design input to: <ul style="list-style-type: none"> - Macintyre River/Whalan Creek bridge crossing and viaduct (around Ch. 30.6 km): Urban design input to the Macintyre River Bridge during detailed design phase could enhance its visual amenity and potential to create a legacy of elegant waterway crossings - Bruxner Way overbridge (around Ch. 25.6 km): Additional urban design input to the Macintyre River Bridge during the detailed design phase could enhance its visual amenity and potential to create a legacy of elegant bridge structures ▶ Embankments: minimise the extent to which landform (embankments) restricts views or affects views from nearby residences, as much as possible, including through sensitive stabilisation, revegetation or, where appropriate, screen planting. ▶ Cuttings: minimise the extent of cut batters, noting that this has already been addressed as much as possible.

Delivery phase	Aspect	Proposed mitigation measures
		<p>Landscape design treatments</p> <ul style="list-style-type: none"> ▶ Develop a Landscape and Rehabilitation Plan and associated detailed landscape design with landscaping treatments in accordance with the conditions of approval. The plan should reference the key landscape characteristics and elements identified in this landscape and visual impact assessment, and place particular emphasis on sensitive design appropriate to the setting as described below. <hr/> <ul style="list-style-type: none"> ▶ Rural and natural landscapes: The landscape design shall respect and enhance the rural landscapes. Considerations include: <ul style="list-style-type: none"> ▶ Design of the landscape earthworks and planting to screen and integrate the railway and associated structures and features (where practicable and appropriate to the character and maintenance of desired views). This includes further opportunity for design of targeted planting of buffer/shelterbelts adjacent to major earthworks within the rail corridor, consistent with safety. For example, planting strips could be introduced adjacent to significant embankments and structures (such as associated with bridge crossings) to reduce visual impact and assist in integrating the landform and structures into the existing landscape (which, it is noted, already includes similar shelterbelts beside roads and riparian vegetation along watercourses) ▶ Design of the landscape to enhance the features and qualities that give the landscape its character, with the design responding to the natural patterns of the rural or natural landscape ▶ Where appropriate consult with local stakeholders and landowners during design (and construction) in order to understand the landscape context and the qualities of landscapes ▶ Ecologically sensitive areas: Design to provide opportunities for ecological gain to benefit biodiversity. This includes: <ul style="list-style-type: none"> ▶ Development of diverse planting and seed mixes to maximise and connect habitat types for ecological gain ▶ Enhancement of landscape corridors and ecological links across the landscape by, where possible, joining or re-joining fragmented areas of habitat ▶ Landscape design and planting to incorporate ecological requirements to benefit the character and visual amenity of local landscapes, including through revegetation with locally indigenous species. <hr/> <p>Heritage landscapes</p> <ul style="list-style-type: none"> ▶ Heritage landscapes through detailed design: <ul style="list-style-type: none"> ▶ Seek to further limit direct impacts or impacts to the setting of identified items of Aboriginal, historic or natural heritage significance as much as possible ▶ Consider the development of interpretation strategy and wayfinding to assist in the interpretation of visual elements of heritage significance such as old rail lines, bridges, buildings or other items of visual value. <hr/> <p>Light impacts</p> <ul style="list-style-type: none"> ▶ Opportunity for vegetation screening or 'at receptor' mitigation such as light-blocking curtains to minimise impacts on affected properties, including the rural property Ohmi (around Ch. 7.1 km). Selection of at-property mitigation measures and treatments will be undertaken in consultation with affected landowners.
Preconstruction	Landscape and visual values	<p>Visual impacts of pre-construction activities</p> <ul style="list-style-type: none"> ▶ Develop a Rehabilitation and Landscaping Management Plan as part of the Environmental Management Plan to minimise disturbance to landscape and visual amenity values during the construction period.

Delivery phase	Aspect	Proposed mitigation measures
Construction	Landscape and visual values	<p>Landscape and visual impacts due to damage to vegetation</p> <ul style="list-style-type: none"> ▶ Minimise disturbance to avoid impacts to native vegetation and habitats as far as practicable ▶ Consider selective retention of existing mature trees within laydown areas, in particular in North Star (adjacent Wilby Street and within the construction camp footprint), where views towards the proposed construction camp will be clearly evident. This will provide some screening of construction activities and provide a framework for restoration planting following completion of works (in consultation with the affected landowners) ▶ Construction areas including compounds, stockpiles, fuel storage, laydown areas, staff parking to be located outside the tree protection zone as defined in <i>AS4970-2009: Protection of trees on development sites</i>.
		<p>Visual impacts of construction activities</p> <ul style="list-style-type: none"> ▶ Minimise construction compounds close to sensitive receptors as much as possible ▶ Minimise height of all stockpiles as much as possible to reduce their visual impact, including minimising height of topsoil stockpiles to 2.5m ▶ Temporary treatments: Temporary treatments (such as hoardings and screens) to site compounds should be considered to assist in reducing visual impacts. These include: <ul style="list-style-type: none"> ▶ Site compounds—opportunities to use features on temporary fencing/hoarding. This may include art-based treatments to assist with screening the works from the public and using information boards (or similar) to educate the public about the construction works.
		<p>Landscape and visual impacts due to borrow pits</p> <ul style="list-style-type: none"> ▶ Borrow pits to be rehabilitated at the conclusion of the construction of the proposal. Rehabilitation should minimise long-term landscape and visual impacts, respond to the intended land use, be in accordance with the relevant strategic framework and best practice, and in consultation with the affected landowners).
	Lighting	<p>Light impacts of construction activities</p> <ul style="list-style-type: none"> ▶ Avoid night works as much as possible close to people's houses. Where unavoidable, construction light impacts should be considered in the development of the detailed design and associated construction plan following discussion with affected landowners.

21.8 Summary of impact assessment

21.8.1 Summary of landscape impacts

Six LCTs with associated character areas were identified through the landscape assessment process. A summary of the overall likely landscape impact anticipated during the construction and operation of the proposal for each LCT is presented in Table 21.25.

TABLE 21.25 SUMMARY LANDSCAPE ASSESSMENT (CONSTRUCTION AND OPERATION)

Viewpoint name	Landscape sensitivity	Magnitude of change	Potential landscape effect
LCT A: Vegetated Watercourses—Rivers	Moderate	Low	Low ^{1 and 2}
LCT B: Vegetated Watercourses—Creeks and Channels	Low	Low	Negligible ^{1 and 2}
LCT C: Irrigated Croplands	Low	Low	Negligible ^{1 and 2}
LCT D: Dry Croplands and Pastures	Low	Low	Negligible ^{1 and 2}
LCT E: Rural Settlement	Moderate	No impact	No impact ^{1 and 2}
LCT F: Vegetated Grazing	Low	No impact	No impact ^{1 and 2}

Table notes:

1 Initial mitigation only

2 Assessment including additional mitigation measures

This table shows that the proposal is not considered likely to result in any impacts on landscape character and amenity during construction or operation of above low significance.

These impacts will be managed through the implementation of the mitigation measures described in Section 21.7.

21.8.2 Summary of visual impacts

Based on digital mapping (visibility analysis mapping) and the field survey, six representative viewpoints were selected for detailed assessment. Cross-border views from Queensland were considered but were not considered to be significant. A summary of the baseline analysis and overall likely visual impact anticipated during the construction of the proposal is summarised for each viewpoint in Table 21.26.

TABLE 21.26 SUMMARY PRELIMINARY VISUAL ASSESSMENT (CONSTRUCTION)

Viewpoint name	Viewpoint sensitivity	Magnitude of change	Potential visual effect
Viewpoint 1: Corner of Capernum Street and David Street, North Star	Moderate	Moderate	Moderate ^{1 and 2}
Viewpoint 2: North Star Road, looking north	Low	High	Moderate ^{1 and 2}
Viewpoint 3: North Star Road, looking northeast	Low	Low	Negligible ^{1 and 2}
Viewpoint 4: Bruxner Way, looking northwest	Low	Low	Negligible ^{1 and 2}
Viewpoint 5: Bruxner Way, looking east	Low	High	Moderate ^{1 and 2}
Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)	Moderate	Moderate	Moderate ^{1 and 2}

Table notes:

1 Initial mitigation only

2 Assessment including additional mitigation measures

This table shows that the proposal is considered likely to result in visual impacts of up to moderate significance during construction.

A summary of the overall likely visual impact on the same representative viewpoints during the operation of the proposal is summarised in Table 21.27.

TABLE 21.27 SUMMARY PRELIMINARY VISUAL ASSESSMENT (OPERATION)

Viewpoint name	Viewpoint sensitivity	Magnitude of change	Potential visual effect
Viewpoint 1: Corner of Capernum Street and David Street, North Star	Moderate	Up to Moderate	Moderate ^{1 and 2}
Viewpoint 2: North Star Road, looking north	Low	Moderate	Low ^{1 and 2}
Viewpoint 3: North Star Road, looking northeast	Low	Moderate	Low ^{1 and 2}
Viewpoint 4: Bruxner Way, looking northwest	Low	Low	Negligible ^{1 and 2}
Viewpoint 5: Bruxner Way, looking east	Low	High	Moderate ^{1 and 2}
Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)	Moderate	High	High ¹
		Moderate	Moderate ²

Table notes:

1 Initial mitigation only

2 Assessment including additional mitigation measures

This table shows that the proposal is considered likely to result in only one visual impact of High significance during operation relating to the presence of the railway bridge crossing the natural landscape of the Macintyre River valley (vicinity of Toomelah Aboriginal settlement and heritage area). Other impacts of up to moderate significance include views from North Star and from Bruxner Way.

Consideration was also given to the potential impacts of the borrow pits that will be used to extract material for use as fill. In total there are 11 potential sites proposed, some of which lie beyond the landscape and visual impact assessment study area. Of these, 10 are existing borrow pits, while one new potential pit on private property has been identified. Most of these pits are existing, located on private land, at a distance from important viewing locations, and largely screened by existing mature vegetation. Therefore, impacts of up to low significance are associated with three of the sites: Wearne Road (Site 7 and 7b), North Star Road (Site 8), and Bruxner Way (Site 9). This is due to the greater number of receptors in these areas, greater sensitivity of the landscape, and/or more open views into the proposed borrow pit. These impacts will be managed through the implementation of the mitigation measures described in Section 21.7.2.

21.8.3 Summary of lighting impacts

As there is limited lighting proposed, most of the viewpoints are not anticipated to be affected by permanent night lighting and would, at most, be affected by short-duration impacts of up to 2.5 minutes due to the headlight of the passing train. A summary of the baseline analysis and overall likely visual impact anticipated during the operation of the proposal is provided for each viewpoint (as described above) and presented in Table 21.28.

TABLE 21.28 SUMMARY LIGHTING ASSESSMENT (CONSTRUCTION AND OPERATION)

Viewpoint name	Viewpoint sensitivity	Magnitude of change	Potential visual effect
Viewpoint 1: Corner of Capernum Street and David Street, North Star	No impact	No impact	No impact ^{1 and 2}
Viewpoint 2: North Star Road, looking north	Low	Low	Negligible (construction and operation) ^{1 and 2}
Viewpoint 3: North Star Road, looking northeast	No impact	No impact	No impact ^{1 and 2}
Viewpoint 4: Bruxner Way, looking northwest	No impact	No impact	No impact ^{1 and 2}
Viewpoint 5: Bruxner Way, looking east	No impact	No impact	No impact ^{1 and 2}
Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)	Low	Low	Negligible (construction) ^{1 and 2}
		Negligible	Negligible (operation) ^{1 and 2}

Table notes:

1 Initial mitigation only

2 Assessment including additional mitigation measures

21.8.4 Impact assessment summary

In conclusion, the proposal is assessed to have the impacts on landscape and visual values as shown in Table 21.29.

TABLE 21.29 IMPACT ASSESSMENT SUMMARY

Impact	Significance
Landscape impacts during construction and operation	For landscape impacts during construction and operation, the greatest impact identified of up to low significance is on LCT A Vegetated Watercourses—Rivers.
Visual impacts during construction	For visual impacts during construction, the greatest impact identified of up to moderate significance for three viewpoints (Viewpoint 2: North Star Road, looking north, Viewpoint 5: Bruxner Way looking east, and Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah).
Visual impacts during operation	For visual impacts during operation, the greatest impact identified of up to high significance relates to one viewpoint (Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah).
Lighting impacts	For lighting impacts the greatest impact identified of up to negligible significance relates to three viewpoints (Viewpoint 2: North Star Road, looking north, Viewpoint 3: North Star Road, looking northeast and Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah).
Cumulative impacts during construction	Low consequence
Cumulative impacts during operation	Low consequence
Cumulative impacts of night lighting	Nil

Table note:

Impact Significance in the summary table above is given for the most significant impact identified for each attribute.

21.8.5 Residual Impact assessment

Potential impacts to landscape and visual amenity associated with the proposal in the construction and operation phases are outlined in Section 21.6. These impacts have been subjected to a significance assessment as per the methodology detailed in Chapter 10: Assessment Methodology and as described further in Section 21.4.

The initial impact assessment is undertaken on the basis that the design measures (or initial mitigations) detailed in Section 21.7.1 have been incorporated into the proposal design.

Proposed mitigation measures, described in Section 21.7, were then applied as appropriate to the phase of the proposal to reduce the level of potential impact.

The residual risk level of the potential impacts was then reassessed after the proposed mitigation measures were applied. The initial significance levels were compared to the residual significance levels in order to assess the effectiveness of the proposed mitigation measures.

In conclusion, the proposal is assessed to have the impacts on landscape and visual values as shown in Table 21.30.

TABLE 21.30 RESIDUAL IMPACT ASSESSMENT SUMMARY

Aspect	Phase	Landscape Character Type/Viewpoint	Sensitivity	Initial significance#1		Residual significance#2	
				Magnitude	Significance	Magnitude	Significance
Landscape impacts	Construction/Operation	LCT A: Vegetated Watercourses—Rivers	Moderate	Low	Low	Low	Low
		LCT B: Vegetated Watercourses—Creeks and Channels	Low	Low	Negligible	Low	Negligible
		LCT C: Irrigated Croplands	Low	Low	Negligible	Low	Negligible
		LCT D: Dry Croplands and Pastures	Low	Low	Negligible	Low	Negligible
		LCT E: Rural Settlement	Moderate	No impact	No impact	No impact	No impact
		LCT F: Vegetated Grazing	Low	No impact	No impact	No impact	No impact
Visual impacts	Construction	Viewpoint 1: Corner of Capernum Street and David Street, North Star	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 2: North Star Road, looking north	Low	High	Moderate	High	Moderate
		Viewpoint 3: North Star Road, looking east	Low	Moderate	Low	Moderate	Low
		Viewpoint 4: Bruxner Way, looking northwest	Low	Low	Negligible	Low	Negligible
		Viewpoint 5: Bruxner Way, looking east	Low	High	Moderate	High	Moderate
		Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)	Moderate	Moderate	Moderate	Moderate	Moderate
Visual impacts	Operation	Viewpoint 1: Corner of Capernum Street and David Street, North Star	Moderate	Up to Moderate	Moderate	Up to Moderate	Moderate
		Viewpoint 2: North Star Road, looking north	Low	Moderate	Low	Moderate	Low
		Viewpoint 3: North Star Road, looking east	Low	Moderate	Low	Moderate	Low
		Viewpoint 4: Bruxner Way, looking northwest	Low	Low	Negligible	Low	Negligible
		Viewpoint 5: Bruxner Way, looking east	Low	High	Moderate	High	Moderate
		Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)	Moderate	High	High	High	Moderate

Aspect	Phase	Landscape Character Type/Viewpoint	Sensitivity	Initial significance#1		Residual significance#2	
				Magnitude	Significance	Magnitude	Significance
Lighting impacts	Construction/operation	Viewpoint 1: Corner of Capernum Street and David Street, North Star	No impact	No impact	No impact	No impact	No impact
		Viewpoint 2: North Star Road, looking north	Low	Low	Negligible (construction and operation)	Low	Negligible (construction and operation)
		Viewpoint 3: North Star Road, looking northeast	No impact No impact	No impact No impact	No impact (construction) No impact (operation)	No impact No impact	No impact (construction) No impact (operation)
		Viewpoint 4: Bruxner Way, looking northwest	No impact	No impact	No impact	No impact	No impact
		Viewpoint 5: Bruxner Way, looking east	No impact	No impact	No impact	No impact	No impact
		Viewpoint 6: Looking in a north-easterly direction along Tucka Tucka Road (towards access road to Toomelah)	Low No impact	Low No impact	Negligible (construction) Negligible(operation)	Low No impact	Negligible (construction) Negligible(operation)

Table notes:

1 Includes implementation of initial mitigations specified in Table 21.23

2 Includes implementation of additional mitigations and controls as identified in Table 21.24

21.9 Conclusions

The landscape between North Star and the QLD/NSW border is a working agricultural landscape, characterised by generally flat, irrigated and non-irrigated croplands interspersed by a network of vegetated watercourses. Historically, a freight rail has existed for much of the proposed alignment and there is a legacy of operational and abandoned rail infrastructure throughout the area.

The proposal would introduce 30 km of rail into the landscape, of which 25 km would be along the existing non-operational Boggabilla line.

It is considered that the proposal addresses the relevant provisions of ISCA Version 1.2 in relation to Hea-2 Crime Prevention, Dis-5 Light Pollution and Urb-1 Urban Design to a level appropriate to the current design stage.

The key landscape and visual impacts of the proposal relate to the removal of vegetation, the raising of embankments and creation of new rail bridges.

Six LCTs have been identified that have impacts of up to low significance (Landscape Type A: Vegetated Water Courses—River) but no significant impacts on landscape character were identified.

In this flat to gently undulating landscape, visual impacts are contained by the presence of vegetation and landform. There are relatively few visual receptors with much of the landscape comprising isolated farmsteads set on large private farms. The main views are obtained from local roads including North Star Road and Bruxner Way.

Six representative viewpoints have been assessed. The only identified significant visual impact of the proposal identified relates to the introduction of the railway bridge and viaduct over the Macintyre River on the Toomelah Aboriginal Community and associated heritage area that is up to high significance. Other visual impacts are lower, relating to isolated homesteads during construction and operation.

No significant lighting impacts were identified.

In conclusion, the requirement for specific mitigation to manage landscape and visual impacts is limited. A range of opportunities to enhance the legacy of the proposal on landscape and visual values have been identified for consideration. These have potential to result in some reductions to the residual impact and would enhance the outcome of the proposal on landscape and visual values.