



CHAPTER 14 - LANDSCAPE AND VISUAL



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14. Landscape and visual

This chapter provides a summary of the landscape and visual assessment. It describes the existing environment, identifies potential construction, operation and decommissioning impacts of the project, and provides measures to mitigate and manage the impacts identified.

The project would involve temporary changes within the project site during construction, which may be viewed from public locations as well as private residences. Permanent changes during operation would be associated with the presence of the maintained easement for the underground pipeline and surface operational infrastructure.

The assessment found that the project would not cause major changes that would significantly impact views and landscape character. During construction, potential visual and landscape impacts would range from moderate-low to negligible. During operation, potential visual and landscape impacts would be moderate-low in two locations and low to negligible at other locations. No significant visual impacts are anticipated during decommissioning given the limited scope, short duration and localised nature of the works.

Suitable mitigation and management measures will be implemented during construction to ensure the risk of impacts remains low.

Further information is provided in Technical Report 10 (Landscape and visual impact assessment).

14.1 Approach

14.1.1 Overview

Potential landscape and visual impacts during construction, operation (including maintenance) and decommissioning of the project were assessed using a qualitative, risk-based approach in general accordance with *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute and Institute of Environmental Management and Assessment, 2013). The assessment was also undertaken with reference to other relevant policies, guidelines and standards, including the *Environmental impact assessment practice notes EIA-N04 - Guideline for landscape character and visual impact assessment, Version 2.3* (Transport for NSW, 2023), *Guidance Note for Landscape and Visual Impact Assessment* (Australian Institute of Landscape Architects, 2018) and Australian/New Zealand Standard *AS/NZS 4282:2023 Control of the obtrusive effects of outdoor lighting*. Terminology, assessment methods and nomenclature established in these guidelines have been used to inform the development of the methodology outlined below, including the development of assessment matrices.

Potential lighting impacts were considered with reference to the *Dark Sky Planning Guideline* (DPE, 2023b).

An overview of the assessment methodology is provided below. Further information is provided in section 2 of Technical Report 10 (Landscape and visual assessment).

14.1.2 Methodology

Study area

The study area for the landscape and visual impact assessment is defined as the area within two kilometres of the construction right of way, proposed construction facilities and new access tracks, which encompasses the surrounding landscape and visual environments the project could affect.

The study area is shown in Figure 14.1.

Key tasks

The landscape and visual impact assessment involved:

- desktop analysis, including analysing aerial photographs and topographic maps, and reviewing relevant strategies, plans and guidelines

- site visit and analysis to understand the existing landscape and visual context
- identifying landscape character zones and representative viewpoints and their sensitivity to change
- understanding the key visual features of construction, operation and decommissioning
- assessing the potential for landscape character and visual impacts during construction, operation and decommissioning, and determining the potential significance of impacts by assessing sensitivity and magnitude
- recommending mitigation and management measures.

Landscape character impact assessment

Landscape refers to all aspects of a tract of land, including landform, vegetation, buildings, villages, and infrastructure.

The potential landscape character impacts of the project were determined based on the sensitivity of the landscape character zones (see section 14.2.1) and the magnitude of the change. Sensitivity refers to how sensitive the existing character of the setting is to the proposed change. A high sensitivity means that a landscape is less able to absorb the impacts of a project and, therefore, there is more potential for impacts on landscape character.

Magnitude of landscape character impacts refers to the physical size and scale of the change to the landscape. The combination of sensitivity and magnitude determines the landscape character impact, which is rated from negligible to high.

Visual impact assessment

An assessment of visual impacts considers the effects of change and development on the views available to people, individuals or groups, and their visual amenity.

A total of 12 representative viewpoints were selected to illustrate the visual influence of the project (see section 14.2.2).

The potential visual impacts were determined based on the sensitivity of the viewpoint and the magnitude of the change. The combination of sensitivity and magnitude determines the potential visual impact, with the level of significance rated from negligible to high.

14.2 Existing environment

14.2.1 Landscape character zones

Three landscape character zones were identified in the study area, as shown on Figure 14.1 and described in Table 14.1. Representative photographs from each landscape character zone are provided in Table 14.1.

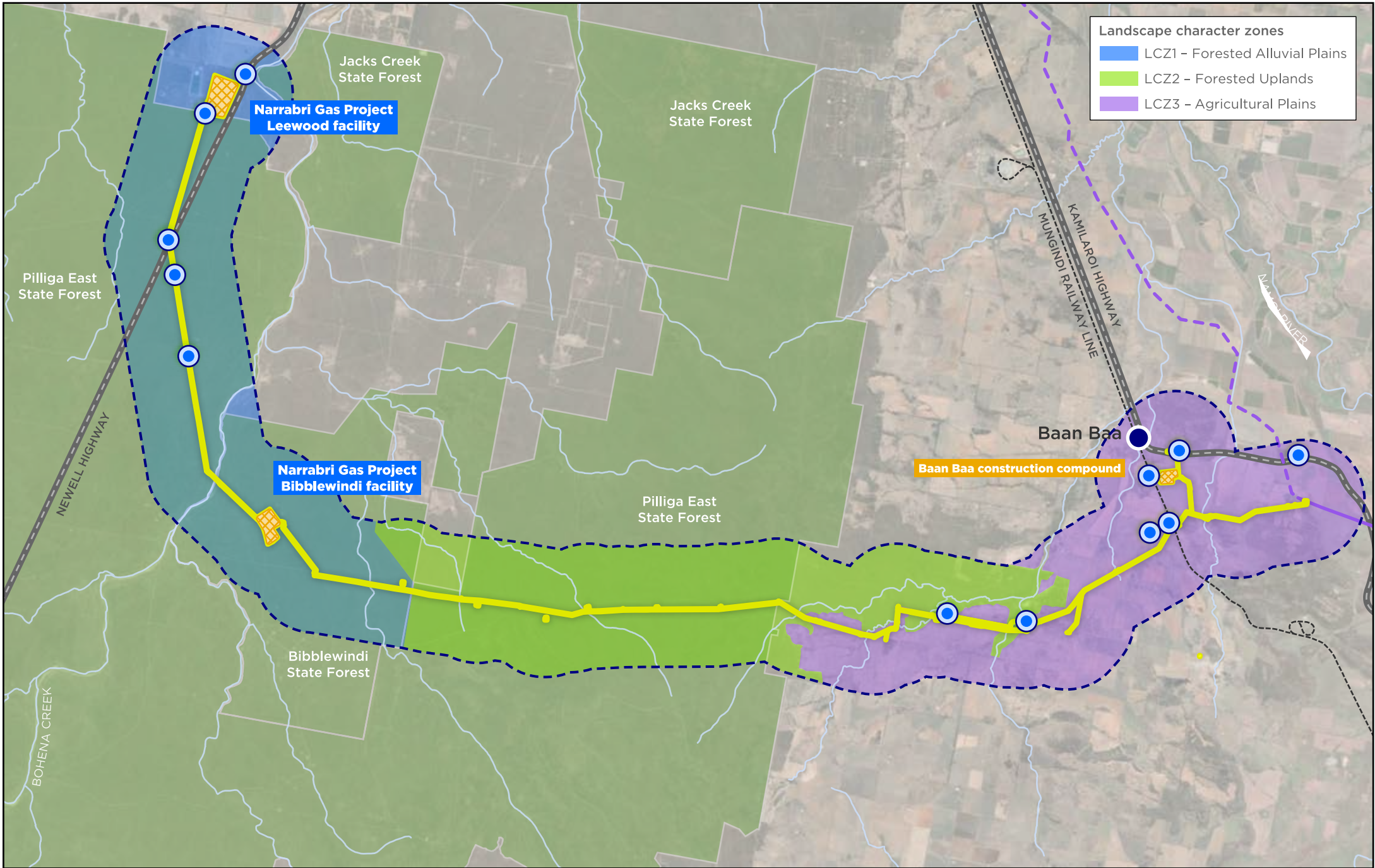
14.2.2 Representative viewpoints

Sensitive visual receivers within the study area include:

- residents of rural properties
- residents, workers and visitors within Baan Baa
- road users
- rural workers.

A total of 12 viewpoints (VP) were selected as representative locations to assess the potential visual impacts of the project. The locations of the viewpoints are representative of the range of views to the project site. The viewpoints are shown on Figure 14.1 and listed in Table 14.2.

Further information on the viewpoints, including a description and representative photos, are provided in section 4 of Technical Report 10 (Landscape and visual assessment).



Landscape character zones

- LCZ1 - Forested Alluvial Plains
- LCZ2 - Forested Uplands
- LCZ3 - Agricultural Plains

Figure 14.1 Landscape character zones and viewpoint locations

Legend

- Study area
- Project site
- Construction facility
- Viewpoint
- Stage 2 Hunter Gas Pipeline - Indicative pipeline route
- Stage 3 Hunter Gas Pipeline - Indicative pipeline route
- Town
- Highway
- Railway line
- Watercourse

0 1 2 3 4
Kilometres

Table 14.1 Landscape character zones and sensitivity ratings




Landscape character zone	Description	Sensitivity	Indicative appearance
<p>1 – Forested colluvium plains</p>	<p>This landscape character zone extends over the western end of the study area and includes sections of the Pilliga East State Forest and Bibblewindi State Forest. The topography is relatively flat with gentle slopes and ridges and a small valley from the Bohena Creek. Vegetation is dense.</p> <p>There is an extensive network of unsealed forestry tracks within the State forests. The Newell Highway and the William Bridges Rest Area are also present.</p> <p>Land in the landscape character zone is predominantly used for forestry purposes.</p> <p>The zone presents scenic values associated with the natural setting of the Pilliga East and Bibblewindi State forests. Although existing vegetation is of scenic value, human intervention is present, including natural gas infrastructure, and periodic forestry activities.</p>	<p>Low</p>	
<p>2 – Forested uplands</p>	<p>This landscape character zone includes the eastern end of the Pilliga East State Forest and the Bibblewindi State Forest. The zone consists of a relatively undisturbed landscape with slopes and ridges, and dense vegetation. The land is used for forestry purposes and there is a network of unsealed forestry tracks.</p> <p>Similar to landscape character zone 1, there is a network of unsealed forestry roads and unsealed roads, including Caloola Road and Beehive Road.</p> <p>Values associated with this landscape character zone include the landscape quality and scenic attributes, which make a strong contribution to the local character. The zone features limited human intervention.</p>	<p>Moderate</p>	
<p>3 – Agricultural plains</p>	<p>This landscape character zone includes the village of Baan Baa and surrounding areas at the eastern end of the study area. The zone is primarily used for farming and rural living, and includes residential and community infrastructure within Baan Baa.</p> <p>The topography is generally flat with some gentle undulation in the west and gentle hillside areas in the east of the LCZ. Native vegetation has generally been cleared for agriculture. The zone is highly modified, with evidence of agricultural use (including facilities and agriculture) across the landscape</p> <p>Transport infrastructure in this zone includes the Kamilaroi Highway, Caloola Road, Curracabah Road and the Mungindi railway line.</p> <p>This landscape character zone displays highly modified agricultural landscapes, which are common across the Narrabri local government area.</p>	<p>Low</p>	

Table 14.2 Key viewpoints and sensitivity ratings

Viewpoint	Location	Sensitivity
VP01	Sir William Bridges rest area (Newell Highway)	Low
VP02	Old Mill Road	Low
VP03	Newell Highway near Bohena 3 gas well	Low
VP04	Reedy Creek Road	Low
VP05	Brandons Road	Low
VP06	Caloola Road	Low
VP07	Caloola Road intersection with Baan Baa Road	Low
VP08	Private residential property	Moderate
VP09	Curracabah Road and Mungindi rail corridor crossing	Low
VP10	Curracabah Road	Low
VP11	Kamilaroi Highway near Baan Baa compound	Low
VP12	Kamilaroi Highway intersection with private driveway	Low

14.3 Construction impacts

The project would result in temporary changes to landscape character and visual amenity during construction. These changes would be experienced by visual receivers, such as residents, motorists, workers and visitors to areas in the vicinity of the project site.

Visible elements during construction would include the construction right of way, machinery and equipment compounds, ancillary facilities, and stockpiles. Other construction activities that may result in changes to landscape character and visual amenity include:

- the removal of vegetation that contributes to the amenity and character of the local area and/or screens views from properties surrounding the project site (see section 14.3.1 and 14.3.2)
- night works resulting in potential lighting impacts on neighbouring properties and residents (see section 14.3.3).

The potential impacts on visual amenity would depend on the nature and intensity of the construction activity. The change in the visual environment would generally be experienced from a relatively short distance, and impacts would be more significant at locations where residential or other sensitive receivers have unscreened views towards the project site. Potential impacts on visual amenity from the presence of machinery and stockpiles would only be experienced for a short duration at any one location, as construction activities progress and move along the construction right of way.

The removal of vegetation would lead to visual impacts until the works are complete and disturbed areas rehabilitated. The rehabilitation of disturbed areas would be undertaken progressively, consistent with the rehabilitation strategy (see section 3.4.5).

Potential landscape character and visual impacts during construction would be minimised by implementing the measures provided in section 14.6.

14.3.1 Landscape impacts

Construction activities, particularly the presence of construction plant and equipment, vegetation clearing, and grading, has the potential to result in landscape impacts. Most impacts would be temporary and short-term, restricted to the construction phase. The removal of vegetation to facilitate construction would result in a longer-term change to the landscape character, until vegetation regrowth occurs. However, due to the existing operations within the landscape character zones, including activities for logging, gas exploration and agriculture, potential impacts would not be uncharacteristic of the landscape.

Overall, the landscape within the study area has a high capacity to visually absorb construction activities and pipeline infrastructure. As a result, the assessment concluded that the project would generally have a low significance of impacts on the landscape, as summarised in Table 14.3. Landscape character zone 2 has the potential to experience a slightly higher landscape impact due to the higher scenic value.

Further information on the ratings and assessment for each landscape character zone is provided in section 4.1 of Technical Report 10 (Landscape and visual impact assessment).

Table 14.3 Summary of landscape character impacts during construction

Landscape character zone	Description	Sensitivity to change	Magnitude of change	Significance of impact
1	Forested colluvium plains	Low	Low	Low
2	Forested uplands	Low	Moderate	Moderate-low
3	Agricultural plains	Low	Negligible	Negligible

14.3.2 Visual impacts

The assessed impact significance ratings at key viewpoints ranged from moderate-low to negligible. A summary of the changes and the significance of potential impacts at viewpoints during construction are provided in Table 14.4.

Two viewpoints (VP04 and VP05) are predicted to have a moderate-low potential for impact from construction, due to pipeline construction activities being close to the viewpoint, and the use of the proposed Baan Baa construction compound.

Further information on the ratings and assessment for each key viewpoint is provided in section 4.2 of Technical Report 10 (Landscape and visual impact assessment). Images showing changes during construction at selected viewpoints are provided in section 4.2 in Technical Report 10.

Table 14.4 Summary of visual impacts during construction

Viewpoint	Description of change	Magnitude of change	Significance of impact
VP01	Vehicles, work crew and construction activities may be temporarily visible around the project site. Construction activities (including at the Leewood facility) would be located about 800 m away and would be predominantly screened by existing roadside vegetation.	Negligible	Negligible
VP02	Activities at the Leewood facility would be visible from this location. Construction activities related to installation of the pipeline would also be visible, as would clearing for the future Narrabri Gas project infrastructure corridor. Temporary workspaces and stockpiles along the construction right of way would also be visible.	Low	Low
VP03	The crossing of the Newell Highway would be undertaken using a trenchless construction method. Some vegetation clearing and temporary stockpiling beyond the road shoulders would be visible to road users. Cumulative clearing with that required for the future Narrabri Gas Project infrastructure corridor would also be visible.	Low	Low

Viewpoint	Description of change	Magnitude of change	Significance of impact
	Additionally, 24-hour lighting would be visible during the highway crossing; however, the duration would be short-term.		
VP04	Construction activities would be visible at this location. Temporary workspaces and stockpiles along the construction right of way would be visible to passing road users. Cumulative clearing with that required for the future Narrabri Gas Project infrastructure corridor would also be visible.	Moderate	Moderate-low
VP05	Construction activities and stockpiles would be visible at this location. Cumulative clearing with that required for the future Narrabri Gas Project infrastructure corridor would also be visible.	Moderate	Moderate-low
VP06	Clearing, grading and trenching would be within the background of the view. These activities would not be uncharacteristic within the existing view and agricultural land use activities.	Negligible	Negligible
VP07	Clearing, grading and trenching would be within the mid to far view across Caloola Road, with temporary stockpiles along the construction RoW. While vegetation removal would increase visibility, retained foreground trees would offer partial screening. These temporary changes align with the area's rural and agricultural character.	Negligible	Negligible
VP08	Visual impacts would be associated with clearing, grading and trenching. Machinery and equipment used would be visible. While some specialised equipment may be uncharacteristic for the area, visual changes would be temporary and minor.	Negligible	Negligible
VP09	A trenchless method of construction would be used to cross Curracabah Road and the Mungindi rail line. Access points would be established either side of the transport corridor. During the trenchless construction crossing, 24-hour lighting may be visible; however, the duration would be short-term. Construction activities may be visible beyond the access points.	Low	Low
VP10	The proposed construction compound at Baan Baa and associated operations may be visible in the background at this location. Due to the vegetation and the rail corridor embankment, only filtered and distant views for road users are likely.	Low	Low
VP11	The proposed construction compound at Baan Baa and associated operations may be visible at this location, as well as construction vehicles accessing/egressing the compound.	Low	Low
VP12	Construction activities would be undertaken within the background of this view (at a distance of about 1.5 km). Construction activities may be visible from the private residence. Most views for road users would be screened by undulating topography. The residents would also experience views of construction for the Hunter Gas Pipeline, which could occur around the same time as the project.	Low	Low

14.3.3 Lighting impacts

As described in section 3.5.2, some construction activities, such as trenchless crossings, may occur outside project working hours. As such, lighting of work areas and construction facilities may be required.

The Dark Sky Planning Guideline (DPE, 2023b) provides guidance on managing the potential impacts of lighting at night within the Dark Sky Region to minimise the impact of lighting on the effectiveness of the Siding Spring Observatory.

Temporary lighting would be designed and sited to minimise glare and light spill into adjoining areas and adjacent receivers in accordance with Australian/New Zealand Standard *AS/NZS 4282:2023 Control of the obtrusive effects of outdoor lighting* (see section 14.6). This would minimise the potential for impacts on surrounding receivers. Night time work would be restricted to small, discrete areas. Given the small scale and temporary nature of lighting required, and the distance to the Siding Spring Observatory (about 90 kilometres at the nearest point), no impacts on the observatory or Dark Sky Region (centred on the Siding Spring Observatory) are expected.

14.4 Operation impacts

14.4.1 Landscape impacts

The project would introduce minimal surface infrastructure, including scraper stations and pipeline markers, in what is currently a forested and rural agricultural landscape.

The pipeline easement would represent a change in the landscape character compared to the existing character. However, the easement would be progressively rehabilitated at the end of construction in accordance with the rehabilitation strategy and is expected to regrow groundcover and shrub cover over time (see section 3.4.5). On land zoned for agriculture, crops or grazing uses would be reinstated, as required by each landholder. Pipeline marker signs and cathodic protection system test points would represent a new permanent element in the landscape. However, these minor intrusions would be imperceptible within the landscape character zones, given the small dimensions of the signs and test points, the highly modified agricultural landscape, and distance to sensitive receivers.

The proposed scraper station at the Leewood facility (in landscape character zone 1) would be consistent with the existing and approved infrastructure, and would not be visible outside Narrabri Gas Project infrastructure. The proposed scraper station at the tie-in with the Hunter Gas Pipeline (in landscape character zone 3) would be visible as a minor feature within the landscape; however, given the relatively small scale, existing agricultural land use and infrastructure, and distance from the road it would not represent a dominant feature.

Overall, the project would represent a change within the existing landscape character. However, it would not be uncharacteristic given the existing and proposed natural gas infrastructure, the presence of ongoing forestry operations, and agricultural activities.

The landscape within the study area generally has a high capacity to visually absorb an underground pipeline and associated infrastructure.

14.4.2 Visual impacts

Views to the project during operation would be limited. The proposed scraper station at the Leewood facility would be located within the larger facility to be built as part of the Narrabri Gas Project and would not be visible. The scraper station at the Hunter Gas Pipeline tie-in would be visible at a distance, as would a cathodic protection unit on private property west of Towri Road. Pipeline marker posts and cathodic protection test points would be visible along the permanent easement. Images showing the approximate location of project features at select viewpoints are provided in Technical Report 10 (Landscape and visual assessment).

While the project would result in visual changes as a result of construction activities, disturbed areas would be rehabilitated in accordance with the rehabilitation strategy at the end of construction. It is expected the project would blend into the existing landscape over time.

14.4.3 Lighting impacts

The surface infrastructure would not require lighting, and the project would not result in lighting impacts during operation.

14.5 Decommissioning impacts

At project closure, the pipeline would be decommissioned as described in section 3.8, including compliance with the Pipelines Act and Regulation, AS 2885 and relevant guidelines and requirements.

Decommissioning activities with the potential to affect the visual environment include:

- removal of surface facilities, which would involve the use of machinery and transport vehicles, contributing to short-term visual disturbance
- excavation of bell holes and cutting/capping of pipeline sections, which may temporarily expose soil and create minor visual contrast until reinstatement is complete.
- residual gas management, which may (depending on the outcomes of the safety management study and abandonment plan) involve controlled release or combustion using portable equipment – controlled combustion (if required) could produce light emissions for a short duration, particularly in low-light conditions or from elevated viewpoints in areas with otherwise low levels of artificial lighting
- presence of work crews, vehicles and equipment, which may be visible from nearby properties or public viewpoints during active decommissioning works.

These activities are expected to be short-term (typically less than one week per location), highly localised, and managed to minimise disturbance. The abandonment plan would define appropriate measures to minimise environmental and community (including visual) impacts, including timing, location, equipment selection and reinstatement protocols, in accordance with relevant criteria, standards and technologies in place at the time.

Measures to manage potential visual impacts during decommissioning will be defined in the decommissioning environmental management plan. Given the limited scope, short duration, and localised nature of the decommissioning activities, and with implementation of the above processes and measures, no significant visual impacts are anticipated.

Further information about the approach to environmental management during decommissioning is provided in section 20.4.

14.6 Mitigation and management

14.6.1 Approach to mitigation and management

The landscape and visual assessment found that impacts associated with the project are minor, as the majority of infrastructure (the pipeline) is located underground. Surface infrastructure, such as scraper stations and cathodic protection systems, would be located in locations with low visibility from visual receivers.

The main potential for impacts would occur during construction. The assessment identified that construction facilities and temporary workspaces would present temporary, short-term impacts; however, due to the existing infrastructure and agricultural land use, would not be uncharacteristic within the existing setting. The project would result in visual impacts at some viewpoints and landscape character changes for some landscape character zones largely related to vegetation clearing and changes in land use, either temporarily or permanently. The majority of impacts during operation were assessed as low or negligible as the pipeline would be buried.

The temporary impacts during construction would be unavoidable, the measures provided in Table 14.5 will reduce or mitigate potential landscape and visual impacts, in addition to measures outlined in chapter 6 (Biodiversity) and chapter 11 (Land use and agriculture).

14.6.2 List of mitigation measures

Measures that will be implemented to address potential landscape and visual impacts are listed in Table 14.5.

Table 14.5 Landscape and visual mitigation measures

Impact/issue	Ref	Mitigation measures	Timing
Lighting spill	V1	Temporary lighting will be designed and sited to minimise glare and light spill into adjoining areas and adjacent receivers in accordance with Australian/New Zealand Standard AS/NZS 4282:2023 <i>Control of the obtrusive effects of outdoor lighting</i> .	Pre-construction, construction
Site restoration and rehabilitation	V2	All temporary infrastructure will be removed at the completion of construction, unless otherwise agreed with relevant stakeholders.	Construction
Visual impacts during decommissioning	V3	The decommissioning environmental management plan will include measures to manage potential visual impacts as far as practicable.	Decommissioning