

**PART
D**



**Synthesis and
conclusion**

**INLAND RAIL—NARROMINE TO NARRABRI
ENVIRONMENTAL IMPACT STATEMENT**

PART D
EIS synthesis and conclusion



CHAPTER D1
Cumulative impacts



Narromine to Narrabri
Environmental Impact Statement



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

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D1. Cumulative impacts

This chapter provides an assessment of the potential cumulative impacts of the Narromine to Narrabri project (the proposal), taking into account other projects in the study area.

D1.1 Overview

For an EIS, cumulative impacts can be defined as the successive, incremental, and combined effect of multiple impacts, which may in themselves be minor but could become significant when considered together.

The SEARs for the proposal requires (item 2.1(o)), ‘an assessment of the cumulative impacts of the project taking into account other projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed.’

D1.2 Methodology

The assessment of potential cumulative impacts has been undertaken in accordance with the SEARs and considers the potential for impacts, taking into account other projects in the study area.

The following tasks were undertaken to assess the potential for cumulative impacts:

- ▶ Identifying potentially relevant projects in the study area (either proposed or approved) based on information available in the public domain
- ▶ Screening identified projects for their potential to interact with the proposal
- ▶ Identifying and assessing (quantitatively or qualitatively) the significance of potential cumulative impacts.

The study area for the cumulative impact assessment varies for each environmental issue depending on the area of influence identified. The three types of area of influence identified, and how they apply to relevant environmental issues, is shown in Table D1.1.

TABLE D1.1 TYPES OF AREA OF INFLUENCE AND APPLICABLE ENVIRONMENTAL ISSUES

Type of area of influence	Definition	Applicable environmental issues
Derived by assessment	Determined for a given environmental value by the corresponding impact assessment	<ul style="list-style-type: none">▶ Air quality▶ Groundwater▶ Flooding▶ Noise and vibration▶ Visual amenity▶ Traffic and transport▶ Indigenous heritage▶ Socio-economic
Administrative	Determined by recognised administrative boundaries	<ul style="list-style-type: none">▶ Aboriginal heritage▶ Non-Aboriginal heritage▶ Land use and property
Designated area	Determined by the recognised physical or operational extent of the feature/facility being assessed	<ul style="list-style-type: none">▶ Water quality and hydrology▶ Biodiversity▶ Waste management

Potentially relevant projects in the study area were identified based on a search of the following data sources in May 2020:

- ▶ The Department of Planning, Industry and Environment’s Major Projects register
- ▶ Proponent websites
- ▶ Local council websites/DA tracking databases.

The projects identified were screened in relation to their potential for cumulative impacts with the proposal, based on their nature, size, and proximity to the proposal site.

The assessment also draws on the cumulative impact assessments undertaken by the specialist impact assessments that support the EIS (technical reports 1 to 14), and publicly available environmental impact assessments for other projects obtained via the Major Projects register.

Screening of potential cumulative impacts was undertaken by comparing the extent and duration of impacts and their potential to occur in the same place at the same time as that for the proposal. The significance of cumulative impacts was then assessed to the extent possible, with consideration of the extent, magnitude, and duration of the impact and the sensitivity of the environment.

D1.3 Other projects in the study area

Projects in the study area considered to have the potential for cumulative impacts with the proposal are listed in Table D1.2 and are shown in Figure D1.1.

TABLE D1.2 PROJECTS WITH THE POTENTIAL FOR CUMULATIVE IMPACTS WITH THE PROPOSAL

Project	Proponent	Site location and interaction with the proposal site	Type	Status and timing	LGA
APA—Western Slopes Pipeline	APA Western Slopes Pipeline Pty Limited—a wholly owned subsidiary of the APA Group (together referred to as APA)	Multiple, extending from the Narrabri Gas Project (see below). The pipeline site crosses the proposal site about 20 kilometres (km) south of Narrabri.	Gas supply	Currently at the 'Prepare EIS' stage. Construction would take about 8–10 months and is expected to commence in mid-2022.	Bogan, Cobar, Coonamble, Lachlan, Narrabri, Walgett, Warren
Inland Rail—Narrabri to North Star	ARTC	Includes the Mungindi Line to the north of Narrabri The northern end of the proposal site connects with the southern end of the Inland Rail Narrabri to North Star project.	Rail infrastructure facilities	Phase 1 is currently at the 'Assessment' stage. Construction planned to commence in October 2020 and is scheduled for completion in September 2025.	Narrabri
Inland Rail—Parkes to Narromine	ARTC	The Parkes to Narromine Line to the south of Narromine The southern end of the proposal site connects with the northern end of the Inland Rail Parkes to Narromine project.	Rail infrastructure facilities	Construction underway, scheduled for completion in late 2020.	Narromine
Narrabri Gas Project (Santos)	Santos NSW (Eastern) Pty Ltd	Lot 1 of DP 771141 and surrounding State forests. The proposal site is located on the northern boundary of the lot.	Petroleum extraction	Currently at the 'Recommendation' stage, with a response to submissions and a supplementary response to submissions prepared. Drilling was planned to commence in mid-2020, subject to approval.	Narrabri
Silverleaf Solar Farm	Silverleaf Solar Farm Pty Limited (ENGIE)	330 Logans Lane (lots 21 to 23 of DP 1174848) and 2461 Newell Highway (lot 2 DP 586990) The proposal site is located on the eastern boundary of the solar farm site and associated transmission line upgrades would cross the proposal site.	Electricity generation—solar	Currently at 'Response to Submissions' stage. Construction is expected to take 12 months and was planned to commence in mid-2020.	Narrabri

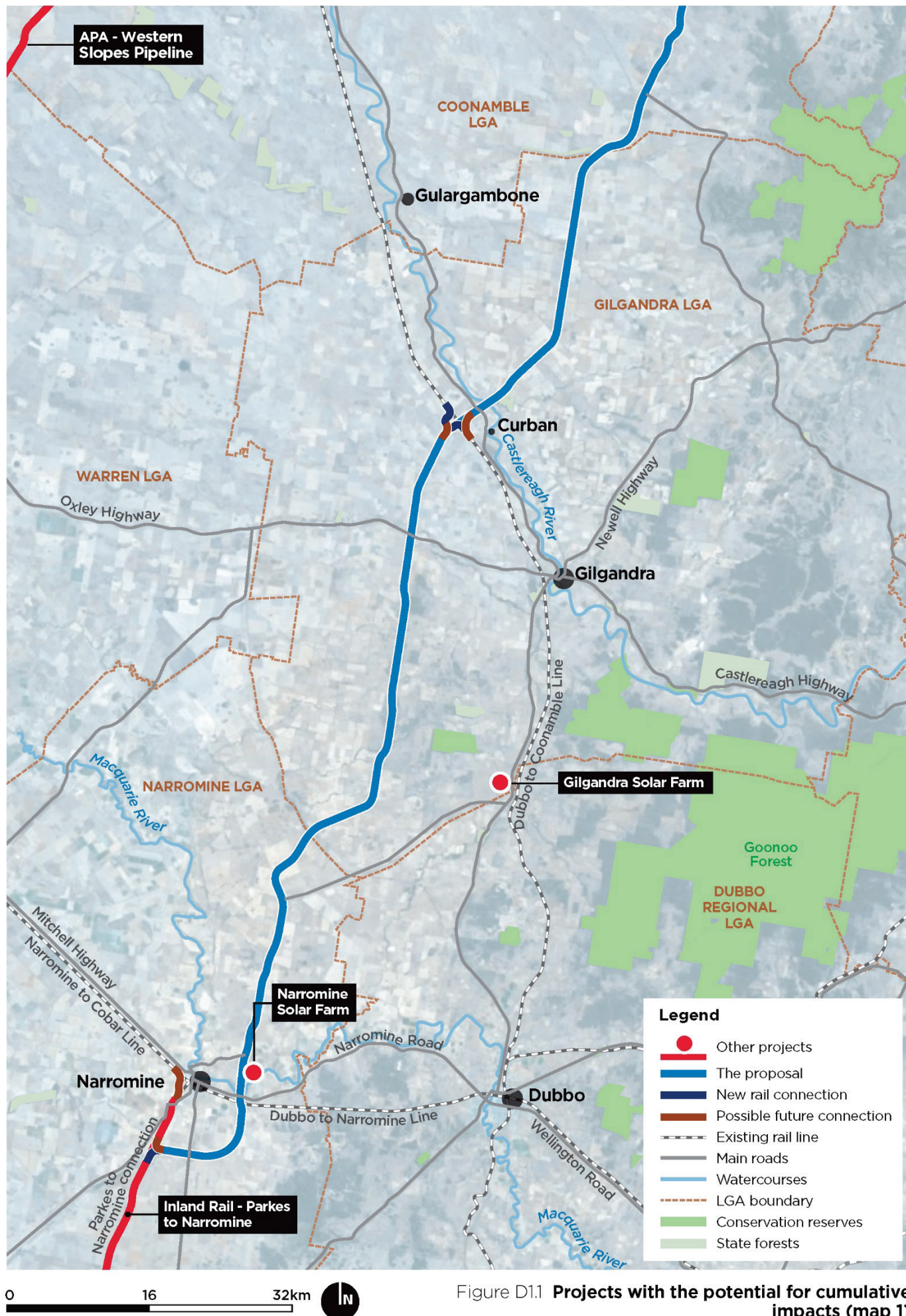


Figure D1.1 **Projects with the potential for cumulative impacts (map 1)**

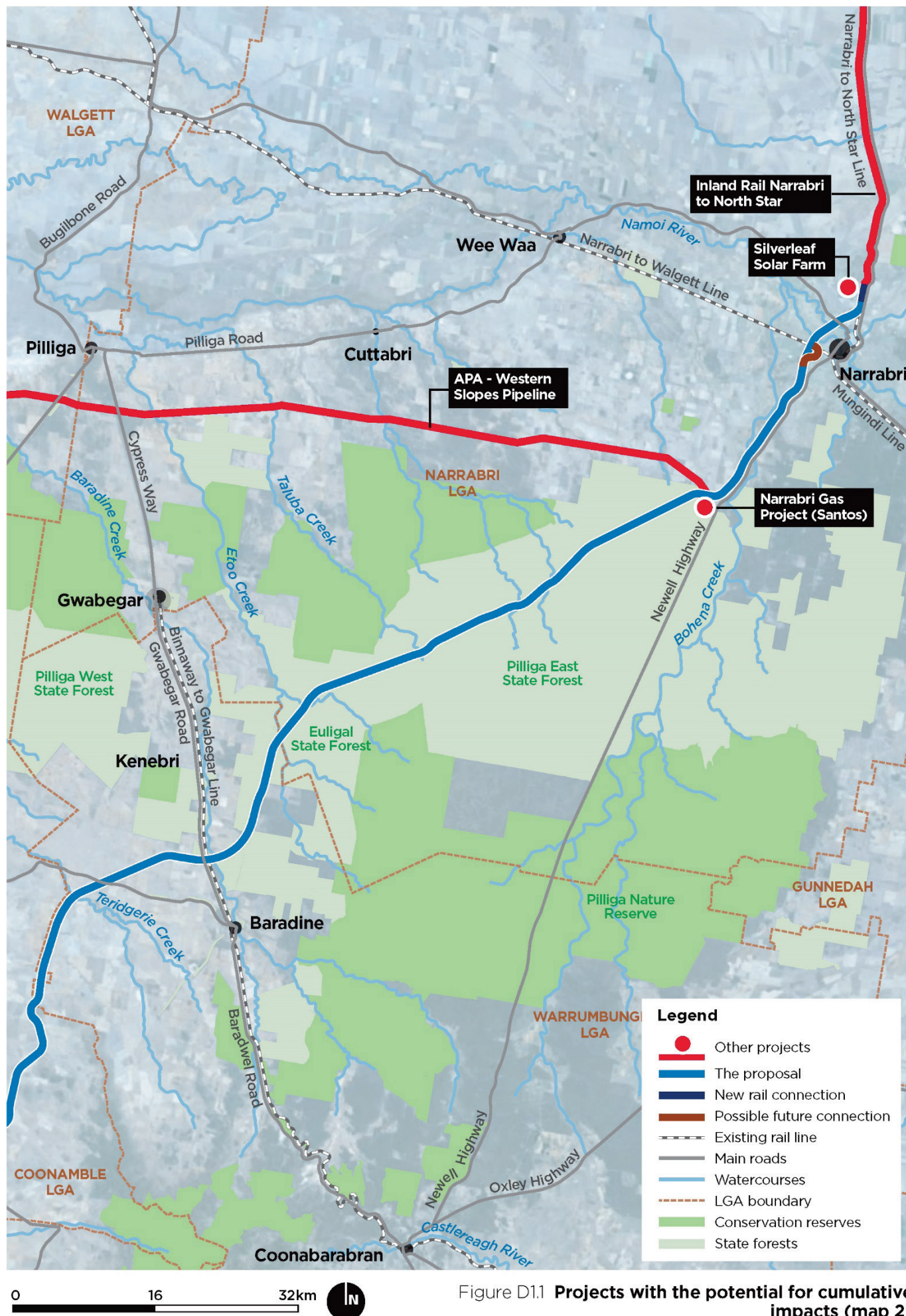


Figure D1.1 Projects with the potential for cumulative impacts (map 2)

The temporal relationships between the construction period for these projects and the proposal (based on information available at July 2020) are shown in Figure D1.2. Cumulative impacts are most common during the construction phase, hence the focus on this time period. The potential for cumulative impacts to occur during operation has also been considered; however, the operational timelines have not been plotted, as these projects all have significant operational lifespans of greater than 25 years.

Further information on these projects is provided on the following pages.

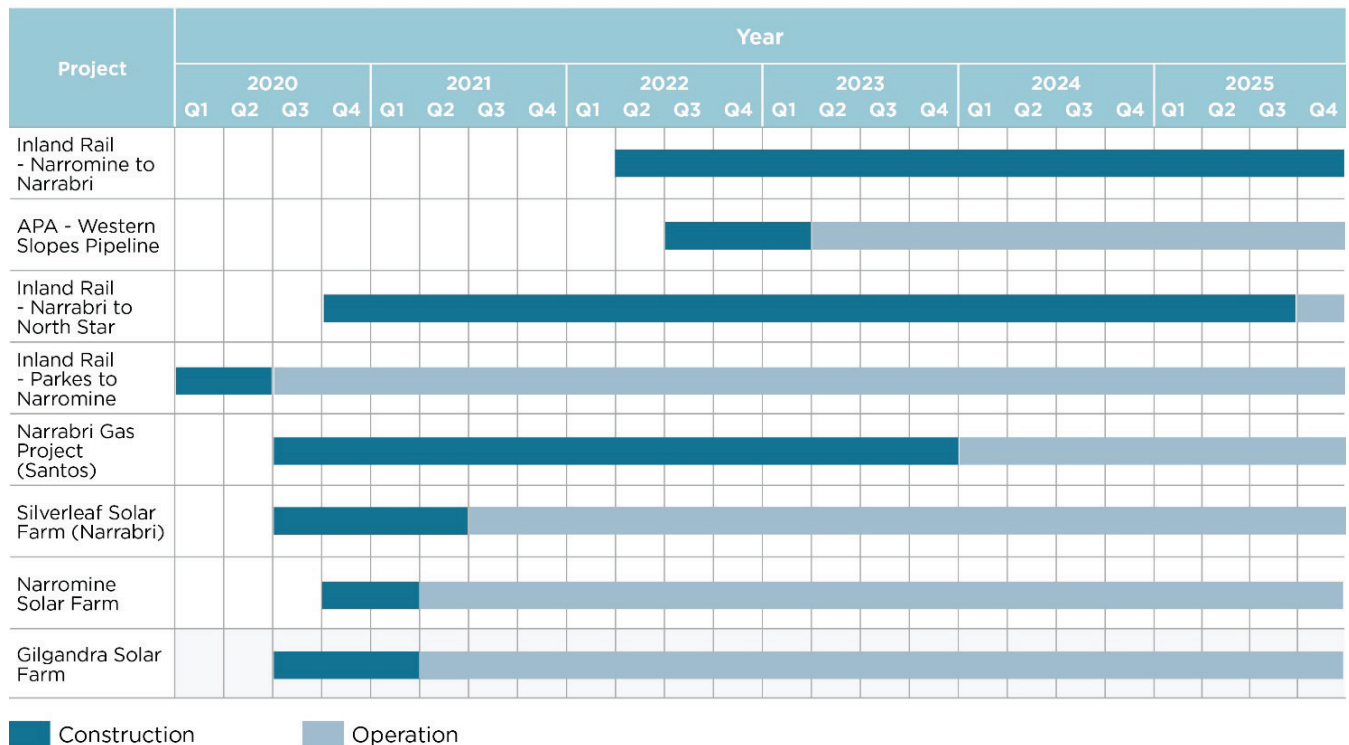


FIGURE D1.2 TIMING OF PROJECTS CONSIDERED BY CUMULATIVE IMPACT ASSESSMENT

APA—Western Slopes Pipeline

The Western Slopes Pipeline is a proposed high-pressure gas pipeline about 450 km long. The pipeline will connect the proposed Narrabri Gas Project near Narrabri to the Moomba to Sydney Pipeline near Bundure. The pipeline crosses the proposal site about 20 km south of Narrabri.

The project would involve construction of the gas pipeline and temporary facilities such as construction workers accommodation and laydown areas. During operation, the pipeline would transport gas from the Narrabri Gas Project to the Moomba to Sydney Pipeline for distribution across the broader network.

The project is planned to employ about 250 to 350 workers during construction (which would take between 8–10 months) and about 4–5 workers during operation. The project would also generate a number of heavy and light vehicle movements during construction and, to a far lesser extent, during operation.

Inland Rail—Narrabri to North Star

The Inland Rail Narrabri to North Star project involves upgrading about 183 km of rail line between Narrabri and North Star. The proposal would connect to the Narrabri to North Star project, as described in section A7.3.6. The project has been divided into two phases. Phase 1 consists of two sections of upgraded track and associated facilities, including 93 km of track between Narrabri and Moree and 80 km of track between Camurra North and North Star. Phase 2 consists of about 15 km of track between Moree and Camurra North. Phase 2 will be subject to a separate approval process to phase 1.

During construction, existing train operations may be suspended during periods of full track possession to allow for more efficient construction work. The project is expected to employ about 180 workers who would move along the corridor to nearby accommodation as the construction front moves.

Inland Rail—Parkes to Narromine

The Inland Rail Parkes to Narromine project involves upgrading about 106 km of rail line between Parkes and Narromine and building a new rail connection to the Broken Hill Line near Parkes. The proposal would connect to the Parkes to Narromine project as described in section A7.3.6. The project is currently under construction and is due for completion prior to the commencement of construction of the proposal.

Narrabri Gas Project (Santos)

The Narrabri Gas Project is a coal seam gas project centred about 20 km south-west of Narrabri. The project would involve development of up to 850 wells, a gas processing facility, a water treatment facility, a compression facility and supporting workforce accommodation facilities, infrastructure corridors, access roads and gas and water gathering lines. The proposal is located on the northern boundary of the gas processing and water treatment facilities and would pass through the gas field within Pilliga East State Forest.

The project was assessed to occur over a 25-year project life with a peak construction period in the first three to four years. The workforce is estimated to reach about 1,300 workers during the peak construction period, reducing to about 350 for the remainder of the project life.

The project would generate in the order of 310 vehicle movements per day during peak construction and significantly fewer for the remainder of the project life. The workforce may be accommodated at a combination of proposed workforce accommodation facilities, existing accommodation facilities in Narrabri, and existing dwellings in Narrabri and the surrounding region.

Silverleaf Solar Farm

The Silverleaf Solar Farm is proposed on a site located about 4 km north of Narrabri. The project involves installing solar panels over about 300 hectares (ha), generating about 120 megawatts of electricity.

The project is planned to employ 280 workers during peak construction and around 10 to 14 workers during operation. Construction and operation of the project would also generate relatively small numbers of heavy and light vehicle movements.

Narromine Solar Farm

The Narromine Solar Farm (Wahroonga Solar Farm) is proposed on a site located about 5.5 km from Narromine. The project involves installing solar panels over about 15.6 ha, generating about 5 megawatts of electricity.

During construction there is expected to be 50 workers onsite. Once operational, the project will be unmanned. Maintenance is expected to be carried out quarterly by a crew of two to three people.

Gilgandra Solar Farm

Neoen Australia (Neoen) proposes to construct and operate a 50-megawatt solar farm about 23 km south of Gilgandra.

During construction, there is expected to be 110 workers on site, reducing to a small number during operation for maintenance.

D1.4 Cumulative impacts with other projects

D1.4.1 Biodiversity

The results of the biodiversity impact assessments are provided in Technical Report 1—Biodiversity development assessment report and Technical Report 2—Aquatic ecology assessment. There is sufficient biodiversity information for the following regional major projects to allow consideration of cumulative biodiversity impacts:

- ▶ Inland Rail—Narrabri to North Star
- ▶ Inland Rail—Parkes to Narromine
- ▶ Narrabri Gas Project
- ▶ Gilgandra Solar Farm
- ▶ Narromine Solar Farm.

The impacts of the Western Slopes Pipeline and the Silverleaf Solar Farm have not yet been quantified and have not been considered, beyond noting that they will have potential impacts that will be relevant.

The cumulative impacts of the proposal and the above projects would include the loss and fragmentation of vegetation and habitats, including the removal of up to 3,500 ha of native vegetation.

There would be cumulative impacts on the following five threatened ecological communities:

- ▶ Box Gum Woodland (BC Act)—33.3 ha (8.3 ha for the proposal/25 ha from other projects)
- ▶ Brigalow (BC Act)—24.6 ha (0.6 ha for the proposal/24 ha from other projects)
- ▶ Fuzzy Box Woodland (BC Act)—11.6 ha (3.6 ha for the proposal/8 ha from other projects)
- ▶ Myall Woodland (BC Act)—13.05 ha (3.05 ha for the proposal/10 ha from other projects)
- ▶ Inland Grey Box Woodland (BC Act)—53.79 (14.71 ha for the proposal/39 ha from other projects).

In addition, the cumulative loss and fragmentation of native vegetation and associated habitats identified above would adversely affect native flora and fauna species, including a large number of threatened species. Operation of the proposal would also increase the risk of fauna mortality through wildlife–train collisions and has the potential for a cumulative impact in this regard, given existing linear infrastructure with similar operational impacts.

Cumulative impacts on native vegetation, threatened ecological communities and threatened species and their habitats will be mitigated by providing biodiversity offsets for each respective project. ARTC is preparing an offset strategy for the combined impacts of the entire Inland Rail program.

The proposal, and other projects identified above, involve minimal disturbance to aquatic habitats. The potential cumulative impacts on aquatic ecological communities and sensitive receiving environments would be minimal.

D1.4.2 Water resources (hydrology and groundwater)

The results of the hydrology and groundwater assessments are provided in Technical Report 3—Flooding and hydrology assessment and Technical Report 4—Groundwater assessment.

The proposal is expected to have minimal impacts on water resources with implementation of the proposed design features and mitigation measures. The proposal's footprint is negligible in the context of the wider catchments. Similarly, the proposed projects are anticipated to have minimal impacts on hydrology. As such, impacts are highly localised and the potential for cumulative impacts is negligible.

In relation to groundwater, projects identified as potentially contributing to cumulative impacts with the proposal include the Inland Rail Parkes to Narromine and Narrabri to North Star projects, and the Narrabri Gas Project. Potential cumulative impacts to groundwater include:

- ▶ Impacts to groundwater quality resulting from accidental spills or leaks of hazardous materials (such as fuels, lubricants and hydraulic oils) during construction
- ▶ Drawdown of groundwater levels due to groundwater extraction from bores to supply construction water or operate the Narrabri Gas Project bore field.

The risk of cumulative groundwater quality or drawdown impacts is considered low for all projects. The project with the greatest risk of cumulative impacts is the Narrabri Gas Project. The groundwater assessment concluded that the risk was low.

D1.4.3 Flooding

Potential flooding impacts are described in Technical Report 3—Flooding and hydrology assessment. Projects that are relevant to the consideration of cumulative flooding and geomorphology impacts, both temporally and spatially, are those in the same surface water catchments.

With regards to the Western Slopes Pipeline, cumulative construction impacts on flooding and geomorphology are expected to be short term. Potential impacts may include localised changes to flooding regimes due to obstacles to overland flow; and localised geomorphology impacts due to disturbance of watercourse bed and banks.

At the project interfaces with the Inland Rail Parkes to Narromine and Narrabri to North Star projects there is limited interaction or overlap of flood behaviour and catchments. The interfaces occur within the catchment of minor tributaries. As such, there is considered to be minimal potential for cumulative flooding impacts during construction and operation.

The Narrabri Gas Project, Silverleaf Solar Farm, Narromine Solar Farm and Gilgandra Solar Farm are all anticipated to have negligible potential for flooding impacts. Construction of the Narromine Solar Farm will not overlap with the proposal. The Gilgandra Solar Farm is geographically distanced, removing the potential for cumulative impacts. As such, there are no anticipated cumulative flooding impacts associated with these projects.

D1.4.4 Soils and contamination

The potential for erosion and sedimentation impacts as a result of the proposal is mainly associated with construction. These potential impacts would be readily managed with the implementation of standard erosion and sedimentation control measures. As such, it is not expected that the proposal would have a material impact on erosion and sedimentation at the scale that cumulative impacts could occur.

Potential impacts associated with contamination for the proposal are considered low during construction, with further testing required to confirm the potential for any localised contamination. During operation, there is the potential for minor leaks and spills potentially resulting in highly localised contamination. There are no cumulative impacts considered likely when taking into account other identified projects. In addition, the overall risk of encountering land contamination is low, and the proposal would be unlikely to generate impacts at a scale that would interact with other projects.

D1.4.5 Water quality

Potential water quality impacts are described in Technical Report 5 – Surface water quality assessment. The proposal is expected to have a minor contribution to cumulative surface water quality impacts with the implementation of mitigation measures during construction and operation.

Identified projects within close proximity of the proposal site considered as part of the cumulative impact assessment are those that would have an immediate interface during construction and/or operation of the proposal. Other projects occurring in the broader study area would likely have a negligible increase in surface flows or runoff. Combined with the distance to downstream waterways and implementation of the proposed mitigation and management measures, the cumulative impact is expected to be negligible.

Overall, the proposal, when considered with other ongoing and planned developments in the area, would have minor cumulative impacts on surface water quality associated with construction, and minor cumulative impacts associated with operation. Where any minor impacts occur, they are likely to be either highly localised, temporary and/or readily assimilated into the existing waterways.

D1.4.6 Aboriginal heritage

Potential impacts are described in Technical Report 6—Aboriginal cultural heritage assessment. The assessment identifies that the proposal would have the potential to impact listed and new Aboriginal heritage sites, including scarred trees.

Potential Aboriginal cultural heritage impacts may result from the Inland Rail Parkes to Narromine project if two registered sites cannot be avoided. There are no identified Aboriginal cultural heritage impacts identified for the other projects that cannot be avoided or mitigated. Overall, the cumulative Aboriginal cultural heritage impacts are considered to be negligible.

D1.4.7 Non-Aboriginal heritage

Potential impacts are described in Technical Report 7—Non-Aboriginal heritage assessment and statement of heritage impact.

The majority of the heritage items impacted by the Inland Rail Narrabri to North Star and Parkes to Narromine projects are within the rail corridor and comprised former stations, sites of former stations, a rail underbridge and other railway infrastructure items. The only comparable item within the study area for the proposal is the former Kickabil railway station and station master's cottage, which would not be impacted by the proposal. As such, cumulative impacts in relation to the other Inland Rail projects is considered negligible.

In relation to the Narrabri Gas Project, 53 non-Aboriginal heritage items were identified within the project's study area, mostly timber extraction sites. These sites were mostly assessed as not having individual heritage significance. Exceptions were made for eight sites that had additional features and were recommended for exclusion from works. No timber extraction sites would be impacted by the proposal and hence no cumulative impacts are expected.

Based on available information, there are no anticipated non-Aboriginal heritage impacts associated with the Western Slopes Pipeline, Silverleaf Solar Farm, Narromine Solar Farm or Gilgandra Solar Farm. It is therefore assessed that there would be negligible potential for cumulative impacts on non-Aboriginal heritage.

D1.4.8 Noise and vibration—construction

Potential impacts are described in Technical Report 8—Noise and vibration assessment—construction and other operations. Cumulative construction noise impacts may occur where nearby project construction timing coincides with construction of the proposal or where consecutive impacts occur, potentially extending the duration of construction noise impact on any noise sensitive receiver. Noise impacts were considered for noise sensitive receivers within a 2-km radius of the proposal and identified projects. There is negligible potential for cumulative impacts beyond this distance.

There would be potential cumulative impacts associated with the Inland Rail Parkes to Narromine and Narrabri to North Star projects. There are a number of residential noise sensitive receivers within 2 km of the Narrabri to North Star project, Parkes to Narromine project and the proposal. Potential cumulative noise impacts associated with these projects have been assessed as part of track connection works noise modelling. Appropriate mitigation measures are provided in chapter B8.

A number of noise sensitive receivers may be impacted by either concurrent or consecutive cumulative noise impacts within 2 km of the following projects:

- ▶ Western Slopes Pipeline—eight noise sensitive receivers
- ▶ Silverleaf Solar Farm—87 noise sensitive receivers
- ▶ Narrabri Gas Project—six noise sensitive receivers
- ▶ Narromine Solar Farm—32 noise sensitive receivers.

The construction strategy for the proposal consists of a progressive approach along the proposal site. As a result, concurrent construction impacts with a nearby project (most of which have a relatively short duration) would only last for a short period until the works have progressed out of range; however, where cumulative impacts relate to the proposal's construction infrastructure, these concurrent impacts may occur for a longer duration, as the construction infrastructure (temporary workforce accommodation, compounds, borrow pits) typically operates in a specific location in support of other activities.

Gilgandra Solar Farm is located 16.5 km from the proposal and, hence, cumulative noise and vibration impacts are not anticipated at this distance.

D1.4.9 Noise and vibration—operation

Operational noise and vibration assessment results are provided in Technical Report 9—Noise and vibration assessment—operational rail and Technical Report 8—Noise and vibration assessment—construction and other operations. Noise impacts were considered for noise sensitive receivers within a 2 km radius of the proposal and identified projects. Beyond this distance there is negligible potential for cumulative impacts.

The proposal directly links with the Inland Rail Parkes to Narromine and Narrabri to North Star projects. The primary source of rail noise would be trains as they travel on the proposal alignment. Rail noise from the arrival and departure of the trains from the adjacent project sections will occur further from the proposal infrastructure. As such, adjacent rail operations are not expected to result in a cumulative increase in daily railway noise levels at the sensitive receivers within the proposal study area.

There would be no operational cumulative impacts associated with Western Slopes Pipeline, Silverleaf Solar Farm, Gilgandra Solar Farm or the Narromine Solar Farm. Once operational, these projects will only generate low-level intermittent noise associated with maintenance.

Although the Narrabri Gas Project will generate noise during operation, when considered with the proposal, potential impacts are considered negligible. There are six noise-sensitive receivers located within 2 km of the area where the proposal is in close proximity to the Narrabri Gas Project. Given that rail noise is intermittent, the cumulative noise impact for sensitive receivers is considered negligible.

Other operational noise impacts associated with the proposal consist of noise relating to the operation of maintenance sidings, track maintenance and maintenance of roads and access tracks. Sensitive noise receivers were identified within 2 km of the proposed maintenance sidings.

Due to the significant distance (greater than 2 km) of maintenance sidings from other industrial noise sources and future projects, cumulative operational noise impacts are not anticipated. In addition, no other cumulative impacts are expected from track maintenance and maintenance of roads and access tracks.

D1.4.10 Air quality

The results of the air quality assessment, which included an assessment of the potential for cumulative air quality impacts, are described in chapter B10 and chapters in Part C (as appropriate). The construction and operation impact assessment identified a maximum separation distance of 550 m required to protect receivers from potential air quality impacts. Consequently, the potential for cumulative impacts has been considered for projects within 550 m of any construction or operational activity. On this basis, the Gilgandra Solar Farm was not considered further as it is located about 16.5 km from the proposal site. The other identified projects are all located within 550 m of the proposal site.

Air quality impacts from the proposal are predominately associated with construction dust and batching plant emissions. Construction of the proposal is likely to overlap with construction of the adjoining Inland Rail Narrabri to North Star project, the Western Slopes Pipeline and the Narrabri Gas Project. The assessment found that the predicted particulate levels from construction of the proposal would be unlikely to extend more than 550 m from work areas and would have insignificant cumulative impacts with other projects. Predicted particulate increments from construction would be localised to within a few hundred metres of construction works and would be unlikely to impact on regional air quality. Due to the transient nature of the proposal's construction (excluding proposal borrow pits and compounds) any overlapping construction activities would be for a short period only. Cumulative impacts are, therefore, very unlikely considering the separation distances between the construction areas for the proposal and other projects, and the short duration of the proposal construction in proximity to any of the identified projects.

The operational impact assessment identified combustion emissions as the primary pollutants of concern during operation of the proposal. Impacts associated with the Inland Rail Parkes to Narromine and Narrabri to North Star projects, are considered equivalent. As a result, the risk of cumulative impacts due to operational interaction between sections are considered to be negligible.

The air quality operational impact assessment identified idling locomotives at crossing loops as the only operational emission source with significant potential for air quality impacts. Consequently, potential cumulative impacts during operation of the proposal are only likely at receivers located adjacent to rail crossing loops. Excluding other Inland Rail projects, the remaining projects with potential combustion/gaseous emissions are the APA—Western Slopes Pipeline and the Narrabri Gas Project.

Both projects are located more than 10 km from the nearest proposal crossing loop and, as such, the risk of cumulative impacts during operation of the proposal is considered to be low.

D1.4.11 Traffic and transport

Potential impacts are described in Technical Report 10—Traffic, and transport assessment.

The proposal would connect with two other Inland Rail projects (Parkes to Narromine and Narrabri to North Star) and both involve upgrading existing rail lines. The Parkes to Narromine project is planned to be completed in 2020, before the planned construction start of the proposal, and would not have any cumulative impacts from construction.

The Narrabri to North Star project is planned to be constructed from 2020 to 2024 and would overlap with construction of the proposal. Haulage routes may experience increased traffic as traffic movements from the Narrabri to North Star project cross over with suppliers in the vicinity of the proposal. Construction traffic generated north of Narrabri is not expected to impact the proposal.

The proposed Gilgandra Solar Farm, Narromine Solar Farm and the Narrabri Gas Project would potentially be constructed during the same timeframe as the proposal. It is expected that the shared haulage routes are likely to be arterial roads, and these roads have capacity to accommodate increased vehicle movements. If any local roads are to be shared for construction access, this would be managed by including appropriate management measures in the CEMP for the proposal.

D1.4.12 Land use and property

Potential impacts are described in Technical Report 11—Agriculture and land use assessment. The proposal would result in about 1,721 ha of land being permanently required, affecting 142 privately owned properties and 132 publicly owned properties. The main land uses affected by the proposal's operational land requirements are cropping, grazing and production of native forests.

The adjoining Inland Rail projects require minimal land acquisition as they are largely based in existing rail corridors. The Western Slopes Pipeline and Narrabri Gas Project are predominately buried assets and therefore result in a minimal footprint during operation. The solar farms result in a change in land use for a number of properties; however, there is the potential for these properties to return to agricultural use upon decommissioning. Due to the minimal need to acquire land for these projects, the cumulative impact is considered negligible.

During construction, there will be minor temporary loss of agricultural land associated with the Western Slopes Pipeline, the two Inland Rail projects and the Narrabri Gas Project. The majority of agricultural land affected by these projects would be returned to agricultural activities following construction, resulting in negligible operational agricultural impacts. The Narrabri Gas Project would also result in some additional loss of State forest land.

Overall, the proposal is expected to have a minor cumulative impact on State forest land during construction and operation when considered in conjunction with the identified projects. In the context of the study area and availability of agricultural land, this cumulative impact is considered to be minimal.

D1.4.13 Visual amenity

Potential impacts are described in Technical Report 12—Landscape and visual assessment. To determine the potential for cumulative impacts, four criteria were considered for each identified project:

- ▶ Similarity to the proposal in scale and form
- ▶ Likelihood of project being implemented within a similar timeframe
- ▶ Likelihood of combined visibility
- ▶ Likelihood of sequential visibility.

The major source of cumulative impacts would be the connection points to the other sections of Inland Rail, namely Narrabri to North Star, which is assigned a high rating, and Parkes to Narromine, which received a moderate rating; however, these projects are different stages of the same program and once the different stages have been completed they are not likely to be viewed as separate developments. Over time, the cumulative impact of the separate stages of Inland Rail are expected to diminish for this reason.

There is expected to be moderate cumulative impacts with the Narrabri Gas Project; however, these would potentially reduce depending on final well placement, and mitigation and landscape plans for this project and the proposal.

The potential for cumulative impact associated with the Western Slopes Pipeline and the solar farms is considered to be low to negligible. The Western Slopes Pipeline will have almost no operational visual impact. The solar farms are vastly different in scale and form to the proposal and not likely to draw a connection between the developments. In addition, there is limited or no opportunity for the solar farms to be viewed together with the proposal.

D1.4.14 Socio-economic assessment

Potential impacts are described in Technical Report 13—Social assessment and Technical Report 14—Economic assessment.

Multiple projects undergoing construction concurrently and/or sequentially may lead to the following socio-economic benefits:

- ▶ Increased opportunity for local businesses in the region to supply goods and services to multiple projects and increase local employment; particularly labourers, tradespeople, machinery operators, engineers, surveyors and site supervisors
- ▶ Lowered mobilisation costs and transfer of labour experience and skills to projects; particularly those constructed in the period leading up to, and the period following, the proposal's construction phase
- ▶ Increased demand for accommodation benefiting providers; particularly in Narrabri and Narromine where multiple projects are co-located
- ▶ Benefits for local and Indigenous businesses in the region
- ▶ Supply chain benefits where different projects require comparable material, such as fuels, equipment, steel, borrow and quarried material
- ▶ Local sourcing of materials increasing local and regional economic activity.

There are also potential socio-economic impacts associated with concurrent and/or sequential construction, including:

- ▶ Depending on the type of land requirements for each project, the potential impacts described in chapter B12 have the potential to be greater for affected landholders, as a result of engaging with several projects, either at the same time or within a short timeframe
- ▶ A minor cumulative demand for tourist and rental accommodation, which could lead to a shortage of tourist accommodation, depending on the timing of construction for the projects

- ▶ Potential shortage of skilled workers for other industries due to the employment demand created by Inland Rail
- ▶ Potential for some community members to experience delays at times in the areas where projects overlap, which could increase travel times and be an inconvenience
- ▶ Should demand for material surpass supply, resulting in a shortage of available material, input costs to other projects may increase (due to increased prices of materials), driving up construction costs and potentially negatively impacting the economic return of projects
- ▶ Multiple project workforces requiring access to health infrastructure may exceed the capacity of the local health network and may reduce the availability of health infrastructure and services for local residents, which may lead some local residents travelling further to access health services.

Residents in the study area, particularly in Narrabri and Narromine where more projects are located close to each other, may experience cumulative amenity impacts and construction fatigue if the proposal undergoes construction concurrently or within a short period of time. Construction fatigue can lead to feelings of annoyance, inconvenience, and people feeling they are at a greater disadvantage than before the projects occurred. Residents may experience a diminished sense of pride and enjoyment of their area. These impacts may affect people's way of life (including their capacity to participate in community activities), affect personal and social relationships and reduce social interactions. The mitigation measures described in section 14.5 would be implemented to minimise the potential for amenity impacts associated with the proposal.

D1.4.15 Waste management

The results of the waste management assessment for the proposal are described in chapter D2. Construction waste management activities for the proposal would not have a significant impact on the environment or human health, provided recommended mitigation measures are implemented and construction wastes are managed in accordance with these measures. Similarly, impacts of other identified projects in regard to construction waste are also considered negligible.

There is the potential for cumulative impacts in relation to capacity at waste management facilities within the study area (described in section D2.2.4). The majority of the landfill and transfer stations are operated by local councils for use by residents; however, the larger landfills and transfer stations are able to accept commercial waste. Arrangements would be made with landfill operators, prior to the delivery of waste and recycling to any facility, to ensure that the waste types and quantities could be accepted.

Many of the facilities in remote locations do not have large capacities and they may also have restrictions on throughput. Should the closer local (but generally smaller) facilities be unable to accept the waste quantities from all projects, then there may be a requirement to truck the waste further distances to larger regional facilities.

The other projects identified would also potentially be sending construction waste to the above facilities. The Narrabri Gas Project, in particular, could generate significant quantities of waste. Consultation will need to be undertaken with each local council to ensure there is sufficient capacity for waste disposal from the proposal. The generation of construction waste would be limited by avoidance and reuse programs, as far as practicable, and implementation of the waste mitigation measures provided in chapter D2.

There are no anticipated cumulative waste impacts associated with operation of the proposal and the identified projects.

D1.4.16 Sustainability and climate change

Cumulative sustainability and climate change assessments are not relevant to the proposal. The sustainability assessment required by the SEARs is for an assessment of the sustainability of the proposal using the Infrastructure Sustainability rating tool and current guidelines and targets. This cannot be applied to a cumulative assessment. In relation to climate change, the SEARs requires an assessment of the impacts of climate change on the proposal, not an assessment of the influence the proposal would have on climate change.

D1.5 Summary of results

Despite the extent of the area included in this cumulative impact assessment, a relatively small number of projects were identified for consideration. The assessment considered all existing projects as part of the baseline assessment.

The potential for cumulative impacts between the proposal and other proposed projects is considered to be negligible to low. Potential minor cumulative impacts have been identified for:

- ▶ Biodiversity—cumulative loss and fragmentation of native vegetation and associated habitats during construction and potential increase in risk of fauna mortality through wildlife–train collisions. Impacts will be mitigated by the provision of biodiversity offsets for each respective project. ARTC is preparing an offset strategy for the combined impacts of the entire Inland Rail program.
- ▶ Noise and vibration—potential for some impacted receivers to be affected by multiple projects where construction occurs at the same time or consecutively
- ▶ Traffic and transport—potential for cumulative increases in construction vehicle movements where construction occurs at the same time, in particular near Narromine and Narrabri
- ▶ Socio-economic—potential for cumulative amenity impacts and construction fatigue. Potential cumulative benefits would also arise through opportunities for business and workers associated with multiple projects.
- ▶ Waste management—there may be insufficient capacity at smaller local facilities and construction waste may need to be transported to larger regional facilities.

Potential cumulative impacts for the proposal would be managed in accordance with the CEMP and the mitigation measures compiled in section D5.3.