

# PART D

EIS synthesis and conclusion

**INLAND  
RAIL** 



## CHAPTER D5

# Approach to mitigation and management



**Narromine to Narrabri**  
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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## D5. Approach to mitigation and management

This chapter, together with chapter D6, provides a synthesis of the EIS for the Narromine to Narrabri project (the proposal). This chapter compiles the key potential impacts that have not been avoided, and the measures proposed to avoid, minimise, manage or offset the impacts identified in Parts B and C. It also provides a compilation of the performance outcomes of the proposal, proposal uncertainties and the proposed approach to design refinements during future stages.

### D5.1 Compilation of impacts

Parts B and C of the EIS provide an assessment of the potential impacts of the proposal during construction and operation. The key potential impacts that require mitigation and management are summarised in Table D5.1 and Table D5.2. Further information on these impacts is provided in Parts B and C.

The identified impacts would be mitigated by implementing the environmental management procedures and plans described in section D5.2 and the mitigation measures compiled in section D5.3.

**TABLE D5.1 SUMMARY OF KEY POTENTIAL CONSTRUCTION IMPACTS**

Issue	Key potential construction impacts
Biodiversity	<p>Permanent removal of about 1,732 hectares (ha) of native vegetation, including about 30 ha of threatened ecological communities listed under the BC Act and about 52 ha of threatened ecological communities listed under the EPBC Act.</p> <p>Impacts on known or potential habitat for 9 threatened flora species and 51 threatened fauna species listed under the BC Act.</p> <p>Impacts on habitat for 6 threatened flora species and 11 threatened fauna species listed under the EPBC Act.</p> <p>Impacts on aquatic ecological systems as a result of works at watercourses.</p>
Water resources (surface and groundwater)	<p>Changes to surface water flows and geomorphological conditions due to the construction of bridges and culverts in flowing watercourses.</p> <p>Changes to overland flows due to the presence of construction infrastructure.</p> <p>It is estimated that the proposal would require about 4.6 giga litres of water for construction. Extraction of groundwater from deep aquifers via bores is proposed as the main source of construction water. Other options would continue to be explored during detailed design.</p> <p>The proposed extraction of groundwater from bores could affect the groundwater table or cause drawdown within the surrounding aquifer and within a small number of existing licenced bores.</p>
Flooding	<p>Potential for inundation of construction infrastructure, such as compounds and temporary workforce accommodation during flood events, posing a risk to workers and the public, and resulting in mobilisation of construction materials in flood waters.</p> <p>Potential for construction activities to impede flood waters and impact surrounding residences and land uses.</p>
Soils and contamination	<p>Disturbance of soils, including dispersive soils, acid sulfate soils or saline soils, resulting in erosion of exposed soil and stockpiled materials, with associated water quality impacts and/or the production and mobilisation of sulfuric acid.</p> <p>Contamination associated with any leaks and spills (from the proposal) and/or disturbance of any historical areas of contamination.</p>
Water quality	<p>Erosion and the generation of sediment, particularly during watercourse crossings and the construction of bridges and culverts in flowing watercourses.</p> <p>Impacts on downstream water quality if management measures are not implemented, monitored and maintained.</p>

Issue	Key potential construction impacts
Aboriginal heritage	<p>Direct impacts on 25 Aboriginal heritage items/sites located within the proposal site during construction.</p> <p>Potential to impact eight sites located within 10 metres (m) of the proposal site, as a result of the movement of vehicles and/or machinery, if appropriate management measures are not implemented.</p> <p>Impact on areas predicted to have moderate to high Aboriginal archaeological potential and/or cultural sensitivity. This includes areas that could not be surveyed due to access restrictions.</p> <p>Impacts on any unexpected finds.</p>
Non-Aboriginal heritage	<p>Impacts on a locally listed heritage site (Woodvale Park Private Cemetery) and a locally listed archaeological site (Curban Inn site).</p> <p>Potential for major impacts on four potential heritage items (the Drinane Public School, corrugated iron hut with chimney, the graves of the Dingwell children, and the two-storey barn/shed at Bohena).</p> <p>Impacts on any unexpected finds.</p>
Noise and vibration	<p>Potential for construction noise to exceed the relevant criteria at numerous receivers along the proposal site.</p> <p>Potential for construction noise to exceed the relevant criteria at receivers near key construction infrastructure (multi-function compounds, temporary workforce accommodation and borrow pits).</p> <p>Potential for blasting overpressure to exceed the relevant criteria at receivers near borrow pits C and D.</p> <p>Exceedances of noise criteria predicted at residential receivers when work is undertaken outside the NSW EPA's recommended standard hours, including potential for sleep disturbance impacts.</p>
Air quality	<p>Generation of dust during ground disturbance and excavation, and as a result of the movement of vehicles equipment and machinery.</p> <p>Potential for emissions to exceed the relevant air quality criteria at receivers near key construction infrastructure (multi-function compounds, temporary workforce accommodation and borrow pits).</p>
Traffic and transport	<p>Temporary impacts on traffic and access, and an increase in heavy and light vehicle movements on the local road network.</p>
Land use and property	<p>In addition to the proposal's permanent land requirements (see Table D5.2), about 1,612 ha would be required during construction only. The temporary land requirements are estimated to include about:</p> <ul style="list-style-type: none"> <li>▶ 1,158 ha of privately-owned land</li> <li>▶ 454 ha of publicly-owned land, mainly owned by the NSW Government (includes about 9 ha of land leased to private landholders).</li> </ul> <p>Construction would require temporary leasing of land from about 413 properties; a number of which would also be affected by the proposal's permanent land requirements.</p> <p>The proposal's land requirements would have the potential to partially affect a property where part of a site is required, requiring adjustments to/relocation of facilities to other parts of the site, or fully affect a property if the entire site on which a property is located is required.</p> <p>The majority of land affected by the proposal is currently used for agriculture (about 2,554 ha or 78 per cent of the proposal site) and production native forests (about 612 ha or 18 per cent of the proposal site).</p> <p>There would be a change in use of land temporarily occupied for construction—from existing land uses to construction work site, with the potential for temporary land use impacts, mainly to agricultural/farming and forestry practices.</p>

Issue	Key potential construction impacts
Visual amenity	<p>Visual impacts in the vicinity of work areas and from identified viewpoints as a result of visible construction elements, such as works, machinery and equipment, stockpiles, borrow pits, compounds and partially constructed structures.</p> <p>Visual impacts associated with temporary workforce accommodation at Gilgandra and Baradine.</p> <p>The views at six viewpoints are predicted to have a moderate potential for impact as a result of vegetation clearing, construction of major features close to the viewpoint and changes in landform due to borrow pits.</p>
Socio-economic assessment	<p>Social impacts (including dislocation, stress and uncertainty), for property owners/occupants and local communities, as a result of the proposal's land requirements and potential property impacts.</p> <p>Beneficial impacts during construction, including employment (an estimated workforce of up to 2,000 people at peak periods), training opportunities, and flow on local and regional employment and economic benefits.</p> <p>Impacts on local amenity in some areas, mainly as a result of potential dust, noise and visual impacts.</p> <p>Impacts associated with the inflow of the workforce into the local area and temporary workforce accommodation, particularly within Gilgandra and Baradine.</p> <p>Direct impacts on community infrastructure, including the Narrabri Dirt Bike Club and recreation areas in State forests.</p>
Waste	The proposal would generate about 690,000 cubic metres (m <sup>3</sup> ) of spoil, with opportunities to reuse spoil as part of the proposal, including for the rehabilitation of borrow pits.

**TABLE D5.2 SUMMARY OF KEY POTENTIAL OPERATION IMPACTS**

Issue	Key potential operation impacts
Biodiversity	<p>Potential for train strike impacts on fauna species.</p> <p>Impacts on fauna connectivity as a result of the presence of the new rail corridor, particularly for terrestrial fauna in the Pilliga forests.</p>
Water resources (surface and groundwater)	<p>The proposed groundwater bores (if retained) could provide flow pathways between groundwater systems that are ordinarily poorly connected or not connected at all.</p> <p>Concentration of overland flows under bridges and through longitudinal drainage and culverts could increase flow velocities and result in scour at outlets and worsening of existing erosional processes within watercourses.</p>
Flooding	<p>The new rail infrastructure would affect surface water flows across the floodplain, changing the flooding regime. Potential increases in flood levels upstream are typically less than about 0.2 m, while localised increases in flood levels downstream are typically less than about 0.1 m.</p> <p>Up to 143 buildings in Narrabri and 30 buildings in Narromine (representing about 3 per cent of buildings in the study area for the flooding assessment) would have the potential to be impacted by more than 0.01 m during a 1% AEP event.</p>
Water quality	<p>Surface runoff, which may contain sediment, traces of fuel, dissolved metals and other contaminants deposited in the rail corridor from operation activities, could impact water quality.</p> <p>Impacts on water quality as a result of any accidental spills.</p>
Noise and vibration	Noise levels at a number of receivers have the potential to exceed the redeveloped rail line criteria for operational rail noise by the year 2040. Predicted noise levels were found to exceed the assessment criteria by less than 5 dB(A) at the majority of these receivers. The highest forecast noise level was 18 dB(A) above the noise assessment criteria.
Air quality	Decreasing the number of heavy vehicles using major transport routes, such as the Newell Highway, would have a positive impact on air quality for receivers along these routes.
Traffic and transport	Impacts on travel time as a result of changes to some roads, including the introduction of level crossings and the closure and/or realignment of public roads.



Issue	Key potential operation impacts
Land use and property	<p>Direct impacts on land use during operation would result from the permanent land requirements and the presence of operational rail and road infrastructure within the proposal's operational footprint.</p> <p>About 1,723 ha of land would be permanently required for the proposal. The permanent land requirements would include land within about 274 properties, and are estimated to include about:</p> <ul style="list-style-type: none"> <li>▶ 1,222 ha of privately-owned land</li> <li>▶ 501 ha of publicly-owned land, mainly owned by the NSW Government (this includes about 20 ha of land leased to private landholders).</li> </ul> <p>The proposal would permanently affect about 433 ha in the Pilliga East, Euligal, Cumbil, Baradine and Merriwindi State forests, representing about 0.2 per cent of State forest land in the study area.</p> <p>As a result of the long linear nature of the proposal, the key potential impact on farming operations relates to property severance. Some severed portions of properties may become unviable due to size of remaining area, configuration or access.</p> <p>Potential to result in a shift in the distribution of holding sizes as a result of land requirements.</p>
Visual amenity	<p>Introduction of new structures in the landscape, including new rail infrastructure and bridges, has the potential to result in landscape changes and affect views at some viewpoints.</p> <p>The significance of permanent landscape character impacts would range from negligible to moderate.</p> <p>Moderate impacts were predicted at two viewpoints (viewpoints 14 and 22), due to the extent of vegetation removal and the introduction of a new rail bridge, respectively. Fourteen viewpoints (viewpoints 1, 2, 4 to 9, 11, 13, 17 to 19 and 21) were found to have a moderate–low visual impact. Impact to views from the two recreational areas assessed were found to be negligible.</p>
Socio-economic assessment	<p>Impacts on local amenity in some areas, mainly as a result of potential noise and visual impacts.</p> <p>Inland Rail, including the proposal, would offer the benefits listed.</p>

## D5.2 Approach to environmental management

Inland Rail operates within the broader ARTC environmental management system. ARTC manages its environmental responsibilities and environmental performance by implementing an environmental management system that is consistent with the principles contained within the ISO 14000 series and standards.

The Inland Rail Environment and Sustainability Policy guides the planning, design and implementation of the Inland Rail Program. It outlines the organisation's commitment to effectively manage any risks that may lead to an impact on the environment during construction and operation of Inland Rail, including the proposal.

The approach to environmental mitigation and management for the proposal involves:

- ▶ Proposal design—as described in chapter A7, the proposal incorporates measures to avoid and minimise impacts
- ▶ Mitigation measures—mitigation measures provided in the chapters in Parts B and C are identified as an outcome of the environmental impact assessment, and are consolidated in section D5.3
- ▶ ARTC's environmental management system—would be used to manage the construction and operation of Inland Rail, including the proposal. The management system would provide the framework for implementing the construction and operation environmental management plans described below, and any conditions of other approvals, licences, or permits.
- ▶ ARTC's Construction Environmental Management Framework—developed to provide for a high standard of environmental performance during construction of all Inland Rail projects
- ▶ Inland Rail NSW Construction Noise and Vibration Management Framework—describes how ARTC proposes to manage construction noise and vibration for Inland Rail in NSW as a whole, including management measures, processes, and the approach to additional surveys and investigations, where required. A copy of the framework is provided in Appendix L.

- ▶ Proposal-specific CEMP and an operational environmental management framework (EMF)—prepared to guide the approach to environmental management during construction and operation, as described in sections D5.2.1 and D5.2.2. The CEMP and EMF would:
  - ▶ Outline the environmental management practices and procedures to be followed
  - ▶ Document processes for demonstrating compliance with the commitments made in this EIS, the submissions/preferred infrastructure report (to be prepared), and relevant approval conditions
  - ▶ Be prepared in consultation with relevant agencies and in accordance with the *Environmental Management Plan Guideline for Infrastructure Projects* (DPIE, 2020a).
- ▶ Environmental performance outcomes—establishes the intended outcomes to be achieved by the proposal. The environmental performance outcomes are provided in D5.5.

### **D5.2.1 Construction environmental management plan**

The management of environmental impacts during construction would be documented in the CEMP, to be prepared by the construction contractor(s). The CEMP would provide a centralised mechanism through which all potential construction-related environmental impacts will be managed. It would also provide the overall framework for the system and procedures to ensure that environmental impacts are minimised, and that legislative and approval requirements are fulfilled.

The CEMP would define how specific environmental issues are to be managed during construction in accordance with the mitigation measures provided in the EIS and the conditions of approval. It would be prepared in consultation with relevant agencies and in accordance with the *Environmental Management Plan Guideline for Infrastructure Projects* (DPIE, 2020a) and the Inland Rail Construction Environmental Management Framework. The CEMP would include:

- ▶ ARTC's environmental policy, objectives, and performance targets for construction
- ▶ Reference to all relevant statutory and other obligations, including consents, licenses, approvals and voluntary agreements required
- ▶ Management policies, procedures, and review processes to assess the implementation of environmental management practices and the environmental performance of the proposal against the objective and targets
- ▶ Requirements and guidelines for management in accordance with:
  - ▶ The conditions of approval for the proposal
  - ▶ The mitigation measures specified in this EIS
  - ▶ Relevant construction management guidelines
  - ▶ Requirements in relation to incorporating environmental protection measures and instructions in all relevant standard operating procedures and emergency response procedures
  - ▶ Roles and responsibilities of all personnel and contractors to be employed onsite
  - ▶ Incident and contingency management procedures
  - ▶ Processes for demonstrating compliance with the commitments made in this EIS, the submissions/preferred infrastructure report (to be prepared), and relevant approval conditions
  - ▶ Procedures for complaints handling and ongoing communication with the community
  - ▶ A monitoring and auditing program, as defined by this EIS, and the conditions of the approval.

The CEMP would comprise a main CEMP document, issue-specific sub-plans, activity-specific procedures and strategies, and site-based control maps. The CEMP, issue-specific sub plans and strategies/plans proposed to manage the impacts identified in the EIS (in accordance with the mitigation measures) are shown in Figure D5.1.

An outline of the CEMP, including the required sub-plans and a guide to the general construction management measures required in each, is provided in Appendix I.

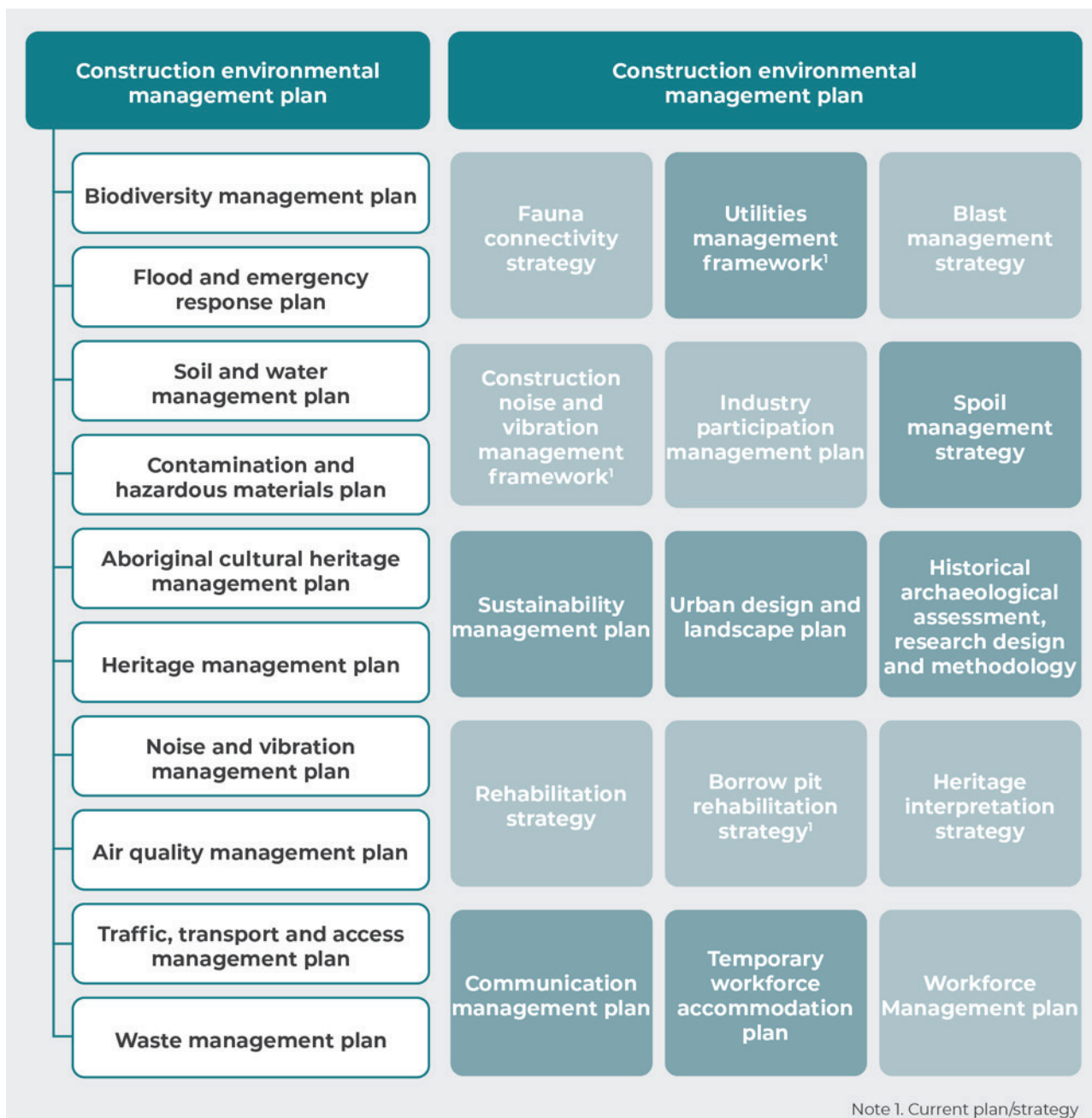


FIGURE D5.1 CEMP SUB-PLANS AND KEY RELATED STRATEGIES AND PLANS

### D5.2.2 Environmental management framework

The EMF would:

- ▶ Describe desired outcomes and processes for the prevention and management of environmental impacts resulting from the operation of the standard-gauge ARTC network
- ▶ Set out the responsibilities and accountabilities within ARTC and others in this regard
- ▶ Identify key management systems that support the delivery of environmental compliance across the ARTC network.

The EMF would include:

- ▶ A description of activities to be undertaken during operation
- ▶ An environmental risk analysis to identify the key environmental performance issues associated with the operation phase



- ▶ Statutory and other obligations that the proponent is required to fulfil during operation, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies
- ▶ A description of the links with ARTC's Environmental Management System, and the environment protection licence relevant to the proposal
- ▶ Overall environmental policies, guidelines and principles to be applied to operation
- ▶ Roles and responsibilities for relevant employees involved in operation, including relevant environmental training and induction requirements
- ▶ Incident and contingency management procedures
- ▶ Details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions would be taken to address identified potential adverse environmental impacts.

### D5.3 Compilation of mitigation measures

Table D5.3 to Table D5.5 provide a compilation of the measures proposed to mitigate and manage the potential impacts of the proposal, as detailed in Parts B and C.

The measures listed may be revised in response to submissions raised during public exhibition of the EIS and/or any design changes made following exhibition. The final list of mitigation measures would be provided in the submissions/preferred infrastructure report. If the proposal is approved, the conditions of approval, which would include reference to the finalised mitigation measures, would guide subsequent phases of the proposal. The works would be undertaken in accordance with the conditions of approval and the final list of mitigation measures.

**TABLE D5.3 COMPILATION OF MITIGATION MEASURES FOR DETAILED DESIGN/PRE-CONSTRUCTION**

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
<b>Biodiversity</b>		
BD1	<i>Avoiding impacts on biodiversity</i>	Detailed design and construction planning would avoid or minimise the need to remove and/or disturb native vegetation and fauna habitat as far as reasonably practicable.
BD2	<i>Avoiding impacts on biodiversity</i>	Vegetation clearing would be limited to the minimum necessary to construct the proposal and allow for its effective operation. Where appropriate, facilities within the multi-function compounds and temporary workforce accommodation would be located to further minimise or avoid impacts on native vegetation, where practicable.
BD3	<i>Impacts on threatened species</i>	Additional threatened flora surveys would be undertaken (where suitable climatic conditions occur) prior to clearing for the species likely to be impacted by the proposal, including: <ul style="list-style-type: none"> <li>▶ <i>Lepidium monoplocoides</i></li> <li>▶ <i>Tylophora linearis</i></li> <li>▶ <i>Commersonia procumbens</i></li> <li>▶ <i>Bertya oppositifolia</i>.</li> </ul> The need for translocation options would be discussed with the Department of Planning, Industry and Environment (Biodiversity and Conservation Division), should these be required.
BD4	<i>Offsetting impacts on native vegetation and threatened species</i>	Biodiversity offsets would be finalised in accordance with the requirements of the <i>Biodiversity Assessment Method</i> (OEH, 2017). This includes retirement of like for like offsets for impacts on matters of national environmental significance.
BD5	<i>Impacts on fish passage</i>	Watercourse crossing structures would meet Inland Rail design standards and be designed in accordance with <i>Why do fish need to cross the road? Fish passage requirements for waterway crossings</i> (Fairfull, S. and Witheridge, G., 2003).

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
BD6	<i>Fauna connectivity</i>	<p>A fauna connectivity strategy would be prepared to guide detailed design. It would include investigation and design of:</p> <ul style="list-style-type: none"> <li>▶ Locations for fauna crossing structures in the Pilliga East State Forest, including bridges and culverts for threatened fauna (such as the koala and Pilliga mouse in areas of preferred habitat), glider poles at regular intervals, and wooden barrier poles at bridges</li> <li>▶ The provision of localised fencing to direct fauna to crossing structures</li> <li>▶ Fauna furniture to be included in the design of bridges and culverts, where appropriate, to encourage crossings by koalas and other native fauna.</li> <li>▶ The connectivity strategy would include monitoring and reporting requirements in relation to the operational performance of the final measures.</li> </ul>
<b>Water resources</b>		
WR1	<i>Construction and potable water supply</i>	<p>Construction water supply options would continue to be explored during detailed design and could include reuse of excess water from the Narrabri Gas Project or other suitable facilities in the area, or lease and/or purchase of existing water access licences from surrounding landholders.</p> <p>Potable water supply options would continue to be explored during detailed design.</p>
WR2	<i>Impacts on existing bores</i>	Where existing licensed bores are located within the proposal site, they would be decommissioned in accordance with the <i>Minimum Construction Requirements for Water Bores in Australia</i> (National Uniform Drillers Licensing Committee, 2012).
WR3	<i>Impacts on existing bores</i>	A bore census would be undertaken for existing licensed bores within 1 km of the proposal's bore fields, where landholders permit. The census would collect baseline groundwater level data and information on a given bore's typical usage and characteristics (including bore construction, pump depth, yield, water level during pumping and water level outside of pumping periods).
WR4	<i>Impacts from extraction of groundwater</i>	<p>Test bores would be installed during detailed design, and further investigation would be undertaken by a qualified hydrogeologist, to confirm the depth and location of the proposed bore field bores.</p> <p>The bore fields would consider the bore field design considerations detailed in section 11.1 of Technical Report 4—Groundwater assessment.</p>
WR5	<i>Impacts from extraction of groundwater</i>	<p>Water volumes required to be extracted from groundwater for construction water and potable water would be confirmed and the appropriate approvals would be obtained prior to extraction.</p> <p>Monitoring would be undertaken during extraction to ensure volumes stipulated by licence requirements are not exceeded.</p>
WR-C11	<i>Groundwater drawdown impacts</i>	Further investigation would be undertaken to determine the potential for the bores associated with the Narromine North and Baradine temporary workforce accommodation facilities to cause drawdown impacts. This would include ensuring any impacts to existing bores are below the <i>NSW Aquifer Interference Policy</i> (DPI, 2012a) minimal impact considerations.
WR-C12	<i>Suitability of groundwater</i>	The quality of groundwater from the proposed bores at the Narromine North and Baradine facilities would be assessed for the suitability of its intended use. Where required, treatment systems would be designed, and a monitoring program established, to ensure water quality does not exceed the relevant drinking water criteria from the <i>National Water Quality Management Strategy Australian Drinking Water Guidelines 6 2011</i> (National Health and Medical Research Council, 2018).

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
<b>Flooding</b>		
FH1	<i>Flooding impacts</i>	<p>The design would continue to be refined where practicable to not worsen existing flooding characteristics at sensitive buildings, up to and including the 1% AEP event. Detailed flood modelling would consider potential changes to:</p> <ul style="list-style-type: none"> <li>▶ Building and property inundation (including floor level surveys and consideration of existing inundation levels)</li> <li>▶ Existing rail line, at rail connections</li> <li>▶ Road flood levels and extent of flooding along roads</li> <li>▶ Overland flow paths and storage effects of construction and operational infrastructure.</li> </ul> <p>Flood modelling would have regard to the guidelines listed in section B3.1.1 of the EIS.</p> <p>Flood modelling, and any mitigation identified as an outcome of modelling, would consider floodplain risk management plans, and would be undertaken in consultation with the relevant local council and local emergency management committees, the Department of Planning, Industry and Environment, the NSW State Emergency Service and potentially impacted landholders.</p>
FH2	<i>Downstream watercourse stability</i>	<p>Further modelling would be undertaken during detailed design to confirm the locations downstream of culverts that require erosion protection, and to confirm the extent and type of protection required.</p>
<b>Soils and contamination</b>		
SC1	<i>Structural integrity</i>	<p>Foundation and batter design would include engineering measures to minimise operational risks from shrink swell, dispersive and/or low strength soils.</p>
SC2	<i>Structural integrity</i>	<p>Soil salinity would be considered in the design of subsurface structures.</p>
SC3	<i>Acid sulfate soils</i>	<p>Prior to ground disturbance in high probability acid sulfate areas, testing would be carried out to determine the presence of acid sulfate soils. If acid sulfate soils are encountered, they would be managed in accordance with the <i>Acid Sulfate Soils Assessment Guidelines</i> (ASSMAC, 1998), and the <i>Waste Classification Guidelines—Part 4: Acid Sulfate Soils</i> (NSW EPA, 2014a).</p>
SC4	<i>Contamination</i>	<p>Hazardous materials surveys would be undertaken during detailed design for all proposed demolition activities.</p>
SC5	<i>Contamination</i>	<p>An appropriately licensed asbestos removal contractor would be engaged to remove all asbestos identified at the illegal waste dump at which sample CS-21 was collected (easting 737305, northing 6617403) prior to works commencing. Asbestos would be removed in accordance with the requirements of applicable work health and safety legislation and codes of practice.</p>
SC6	<i>Contamination</i>	<p>Site investigations would be undertaken by a suitably qualified and experienced Consultant, as defined in Schedule B9 of the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i> (NEPC, 2013) to assess exposure risks to site workers and other receptors as a result of disturbances to the following areas, considered to be at a higher risk of being contaminated:</p> <ul style="list-style-type: none"> <li>▶ Narromine West connection</li> <li>▶ Parkes to Narromine connection</li> <li>▶ Dubbo to Coonamble Line connection</li> <li>▶ Narrabri to Walgett Line connection</li> <li>▶ Narrabri to North Star connection</li> <li>▶ Where the proposal site borders the Santos Narrabri Operations Centre (directly west of the Narrabri West multi-function compound).</li> </ul> <p>The results of the site investigations would be assessed against the criteria contained within the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i> (NEPC, 2013) to determine the need for any remediation.</p>
SC-C11	<i>Soils and water quality</i>	<p>The final approach to reusing wastewater from the Narromine North and Baradine temporary workforce accommodation facilities would be confirmed during detailed design.</p>

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
SC-C12	<i>Soils and water quality</i>	<p>Any irrigation areas would be designed and operated in accordance with the risk framework and management principles contained in the <i>National Guidelines on Water Recycling</i> (Environment Protection and Heritage Council et al., 2006) and the <i>Environmental guidelines: Use of effluent by irrigation</i> (DEC, 2004). This would include the following design requirements:</p> <ul style="list-style-type: none"> <li>▶ Irrigation area/s would be delineated based on the expected rate of irrigation and the drainage characteristics of the receiving soil</li> <li>▶ The quality of treated water would be determined to prevent accumulation of contaminants, with reference to the relevant guidelines</li> <li>▶ Irrigation area/s would be designed to include capacity to store treated water for the duration of typical wet weather events</li> <li>▶ The rate of irrigation would be optimised to avoid waterlogging or ponding of reclaimed water</li> <li>▶ Soil and groundwater conditions would be monitored to identify and correct trends in soil salinity or other potential effects of irrigation.</li> </ul>
<b>Water quality</b>		
WQ1	<i>Water quality</i>	The design features listed in section B5.1.4 would continue to be refined and implemented to minimise the potential impacts on water quality.
<b>Aboriginal heritage</b>		
AH1	<i>Avoiding and minimising impacts on Aboriginal heritage</i>	<p>Detailed design and construction planning would avoid direct impacts on identified items/sites of Aboriginal heritage significance, as far as reasonably practicable. The location of construction compounds and associated access routes would be reviewed to ensure, as far as practicable, they are not located in areas of medium or high archaeological potential.</p>
AH2	<i>Management of salvaged items</i>	<p>A detailed salvage methodology would be prepared by a suitably qualified archaeologist in consultation with relevant registered Aboriginal parties. The methodology would be included in the Aboriginal cultural heritage management plan (mitigation measure AH8) to ensure any artefacts salvaged are managed in accordance with the requirements of the <i>National Parks and Wildlife Act 1974</i> (NSW). The methodology would include the process for consultation with the Department of Planning, Industry and Environment and registered Aboriginal parties in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW</i> (DECCW, 2010c) the <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> (DECCW, 2010b), and the <i>Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW</i> (OEH, 2011). It would also include requirements in relation to the management of, and care and control plans for, salvaged objects.</p> <p>Registered Aboriginal parties would be engaged to assist in the salvage, which would be managed by an appropriately qualified archaeologist engaged to support the process.</p> <p>Detailed analysis and reporting of cultural material collected would be provided to the Department of Planning, Industry and Environment.</p>

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
AH3	<i>Management of salvaged items</i>	<p>A targeted archaeological survey would be undertaken for areas identified as culturally sensitive, requiring further investigation, including:</p> <ul style="list-style-type: none"> <li>▶ Wallaby Creek</li> <li>▶ Ewenmar Creek</li> <li>▶ Marthaguy Creek</li> <li>▶ Castlereagh River</li> <li>▶ Gulargambone Creek</li> <li>▶ Tenandra Creek</li> <li>▶ Baradine Creek</li> <li>▶ Namoi River.</li> </ul> <p>The targeted survey would be undertaken with registered Aboriginal parties in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> (DECCW, 2010c).</p> <p>Additional mitigation and management measures would be developed, in consultation with the registered Aboriginal parties, for areas or items of Aboriginal cultural heritage significance identified during the targeted survey. The additional measures would be included in the Aboriginal cultural heritage management plan (mitigation measure AH8).</p> <p>If additional sites or items are identified that cannot be avoided, salvage of artefacts would be undertaken prior to construction in accordance with the salvage methodology (mitigation measure AH2).</p>
AH4	<i>Management of salvaged items</i>	<p>A pre-construction survey would be undertaken to confirm the locations of the previously listed AHIMS sites that could not be located during the site survey. Surveys would be undertaken with registered Aboriginal parties in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> (DECCW, 2010c).</p> <p>If the sites are located, impacts would be avoided as far as practicable and protection measures put in place in accordance with the Aboriginal cultural heritage management plan (mitigation measure AH8).</p> <p>Any sites with the potential to be impacted would be managed in accordance with the salvage methodology (mitigation measure AH2).</p>
AH5	<i>Impacts on PADs</i>	<p>Detailed archaeological investigations would be undertaken at the following six PADs that may be directly impacted by the proposal:</p> <ul style="list-style-type: none"> <li>▶ Ewenmar Creek 27-6-0036</li> <li>▶ Castlereagh River 28-4-0280 (and associated artefact scatter)</li> <li>▶ Gulargambone Creek 28-1-0060 and 28-1-0090 (and associated artefact scatter)</li> <li>▶ Calga and Looking Glass creeks 28-1-0059 (and associated artefact scatter)</li> <li>▶ Baradine Creek 19-5-0230.</li> </ul> <p>Sub-surface archaeological test excavations would be undertaken to confirm the nature (and extent, if verified) of any archaeological deposits. The test excavations would be carried out in accordance with the approved methodology prepared for the proposal.</p> <p>If test excavation confirms that the PAD has heritage significance and has the potential to be impacted by the proposal, the site would be managed in consultation with DPIE and registered Aboriginal parties. If salvage is required it would be managed in accordance with the agreed salvage methodology (mitigation measure AH2).</p>



Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
AH6	<i>Direct impacts on modified trees</i>	<p>Impacts on the following modified trees would be avoided, as far as practicable:</p> <ul style="list-style-type: none"> <li>▶ Backwater Cowal 35-3-0175</li> <li>▶ Ewenmar Creek 27-6-0035</li> <li>▶ Boothaguy Creek 27-6-0037 and 27-6-0041</li> <li>▶ Baronne Creek 28-1-0062, 28-1-0063 and 28-1-0064</li> <li>▶ Mungery Creek 28-1-0083, 28-1-0084, 28-1-0086 and 28-1-0087.</li> </ul> <p>If impacts are unavoidable, the tree would be photographed and catalogued prior to removal, in consultation with the registered Aboriginal parties, by an appropriately qualified archaeologist.</p> <p>The salvaged artefacts would be managed in accordance with the salvage methodology.</p>
AH7	<i>Impacts on artefact scatters</i>	<p>Surface collection (salvage) of the following artefact scatters would occur prior to construction in accordance with the approved salvage methodology:</p> <ul style="list-style-type: none"> <li>▶ Macquarie River 35-3-0276</li> <li>▶ Castlereagh River 28-4-0280</li> <li>▶ Gulargambone Creek 28-1-0090 and 28-1-0060</li> <li>▶ Calga and Looking Glass Creek 28-1-0059 and 28-1-0095</li> <li>▶ Noonbar Creek 28-1-0096</li> <li>▶ Baradine Creek 19-5-0226</li> <li>▶ Bohena Creek 19-6-0180.</li> </ul>
<b>Non-Aboriginal heritage</b>		
NAH1	<i>Avoiding and minimising impacts on non-Aboriginal heritage</i>	<p>Detailed design and construction planning would avoid direct impacts on identified items/sites of non-Aboriginal heritage significance, as far as reasonably practicable. This would include small sections of the following listed items that overlap with the proposal site:</p> <ul style="list-style-type: none"> <li>▶ Curban Inn site</li> <li>▶ Convict Road, Baradine.</li> </ul> <p>The location of construction compounds and associated access routes would be reviewed to ensure, as far as practicable, they are not located in areas of medium or high archaeological potential.</p>
NAH2	<i>Avoiding and minimising impacts on non-Aboriginal heritage</i>	<p>The location of the graves at the Woodvale Park Private Cemetery listed item would be confirmed by an appropriately qualified archaeologist. Once confirmed, the location would be marked on plans, fenced onsite, and avoided during construction.</p>
NAH3	<i>Avoiding and minimising impacts on non-Aboriginal heritage</i>	<p>In the event that the following items are unable to be avoided, an archaeological assessment, research design and methodology would be prepared. Test excavation would be undertaken by an appropriately qualified Excavation Director, in accordance with the NSW Heritage Council's Excavation Director criteria:</p> <ul style="list-style-type: none"> <li>▶ Curban Inn site</li> <li>▶ Convict Road, Baradine.</li> </ul>
NAH4	<i>Heritage interpretation</i>	<p>A Heritage Interpretation Strategy for non-Aboriginal heritage would be prepared. This would provide a framework for interpreting the heritage items (listed and potential) impacted by the proposal, set out the key interpretative themes, and identify communication strategies.</p> <p>The strategy would include interpretation requirements for specific parts of the proposal, particularly where heritage items are proposed to be removed or archaeological sites are proposed to be excavated. These may include approaches, such as interpretive signage at heritage items that have been removed or excavated, historical/artefact displays at local museums or visitor centres, and online media about heritage items and history in the vicinity of the proposal.</p> <p>The strategy would be prepared with regard to <i>Interpreting Heritage Places and Items: Guidelines</i> and the NSW Heritage Council's <i>Heritage Interpretation Policy</i> (NSW Heritage Office, 2005).</p>

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
NAH5	<i>Archival recording</i>	<p>Archival photographic recording of buildings to be removed would be carried out prior to removal in accordance with <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (Heritage Council of NSW, 2006) and <i>How to prepare archival records of heritage items</i> (NSW Heritage Office, 1998a) at the following sites:</p> <ul style="list-style-type: none"> <li>▶ Drinane Public School (former)</li> <li>▶ Corrugated iron hut with chimney</li> <li>▶ Two-storey barn/shed.</li> </ul>
NAH6	<i>Graves of the Dingwell children</i>	<p>Graves and human skeletal remains at the graves of the Dingwell children would be managed in accordance with the requirements of relevant legislation and guidelines, including the Public Health Regulation 2012 (NSW), <i>Heritage Act 1977</i> (NSW), <i>Work Health and Safety Act 2011</i> (NSW), NSW Health Procedures <i>Exhumation of human remains</i> (NSW Department of Health, 2013), and <i>Skeletal Remains—Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977</i> (NSW Heritage Office, 1998b).</p> <p>A plan of management for exhuming and re-interring the graves would be developed in accordance with these requirements and included in the heritage management plan (mitigation measure NAH8).</p> <p>Approval for exhuming the graves would be sought in accordance with the requirements of Division 4 of Part 8 of the Public Health Regulation 2012. The exhumation and re-interment process would be undertaken in accordance with the terms of the approval and the exhumation plan of management.</p> <p>The exhumation plan of management would also include:</p> <ul style="list-style-type: none"> <li>▶ An archaeological assessment, research design and methodology to undertake archaeological investigation during removal of the graves. The methodology would be developed and implemented by an appropriately qualified Excavation Director, in accordance with the NSW Heritage Council's Excavation Director criteria.</li> <li>▶ Strategies for appropriate reburial, memorialisation and interpretation signage developed in consultation with appropriate stakeholders, including Heritage NSW (Department of Premier and Cabinet), Narrabri and District Historical Society, Coonabarabran History Group, Narrabri Shire Council, NSW National Parks and Wildlife Service, and direct descendants of the Dingwell family.</li> </ul>
NAH7	<i>Visual impacts at heritage items</i>	<p>Opportunities to include plantings to screen the visual outlook from potential heritage homesteads would be considered during development of the urban design and landscape plan.</p>
<b>Noise and vibration</b>		
CNV1	<i>Managing the potential for construction noise and vibration impacts</i>	<p>Location and activity-specific construction noise and vibration impact statements would be prepared based on a more detailed understanding of the construction methods, including the size and type of construction equipment, duration and timing of works, and detailed reviews of local receivers, as required.</p> <p>The statements would confirm predicted impacts at relevant receivers to assist with the selection of feasible and reasonable management measures.</p>
CNV2	<i>Minimising the potential for construction vibration (structural) impacts</i>	<p>Where vibration levels are predicted to exceed the screening criteria, a more detailed assessment of the structure and vibration monitoring would be carried out in accordance with the Inland Rail NSW <i>Construction Noise and Vibration Management Framework</i>, to ensure vibration levels remain below appropriate limits for that structure.</p>
CNV-C11	<i>Blasting management (borrow pits)</i>	<p>A blast management strategy would be prepared in accordance with relevant guidelines, and in consultation with the NSW EPA, and would include:</p> <ul style="list-style-type: none"> <li>▶ Sequencing and review of trial blasting to inform blasting</li> <li>▶ Regularity of blasting</li> <li>▶ Intensity of blasting</li> <li>▶ Periods of relief</li> <li>▶ Blasting program.</li> </ul>

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
ONV1	Noise and vibration impacts during operation	An operational noise and vibration review would be undertaken to review the potential for operational impacts and guide the approach to identifying feasible and reasonable mitigation measures to be incorporated in the detailed design.
ONV2	Noise and vibration impacts during operation	Feasible and reasonable mitigation measures would be identified where exceedances of operational noise and vibration criteria are confirmed. Measures would be identified in accordance with the outcome of the operational noise and vibration review and the Inland Rail Noise and Vibration Strategy. Where at-property noise treatments are identified as the preferred mitigation option, these would be developed in consultation with individual property owners.
ONV3	Structural vibration impacts	If the operational noise and vibration review indicates that vibration levels are predicted to exceed the screening criteria at sensitive receivers, a more detailed assessment of the structure would be carried out. For any heritage items with the potential to be affected, the detailed assessment would determine any specific sensitivities in consultation with a heritage specialist to ensure risks are adequately managed. If a heritage structure is found to be structurally unsound following inspection, a more conservative cosmetic damage objective (for example 2.5 mm/s peak component particle velocity for long-term vibration) would be considered.
<b>Traffic and transport</b>		
TT1	Impacts on existing infrastructure and access	Detailed design and construction planning would avoid or minimise the potential for impacts on the surrounding road and transport network, and property accesses, as far as reasonably practicable.
TT2	Impacts on existing roads	Input would be sought from relevant stakeholders (including local councils and Transport for NSW) prior to finalising the detailed design of those aspects of the proposal that affect the operation of road and other transport infrastructure under the management of these stakeholders.
TT3	Road user safety at changes to the road network	Road safety audits would be undertaken where changes to the road network are required, in accordance with relevant Austroads guidelines, to ensure the safety of all road users is considered in the design process.
TT4	Road user safety at level crossings	Public level crossings would be designed in accordance with relevant guidelines and standards, including AS 1742.7:2016 <i>Manual of uniform traffic control devices</i> (Standards Australia, 2009a), <i>Part 7: Railway crossings</i> and <i>Guide to Road Design Part 4: Intersections and Crossings</i> (Standards Australia, 2016) and ARTC standards, including provision of warning signage, line marking and other relevant controls. Public level crossings with active controls would include boom gates and flashing lights. Where level crossings would provide access for travelling stock routes, consultation would be undertaken with Crown Lands and Local Land Services to determine appropriate controls.
<b>Land use and property</b>		
LP1	Land use and property impacts, including severance and other impacts on operations	The design and construction planning would continue to be refined to minimise potential impacts on land uses and properties as far as reasonably practicable. Consultation with landholders would be ongoing to identify opportunities to minimise impacts on their operations, where practicable.
LP2	Acquisition and property impacts	All property acquisitions would be undertaken in consultation with landowners and in accordance with the requirements of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> (NSW). In line with the Act, ARTC's preference is for acquisition by agreement, where practicable.

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
LP3	<i>Acquisition and property impacts</i>	<p>During the property acquisition process, ARTC would seek to secure agreement with affected landholders, to guide property-level design requirements and the management of construction on, or immediately adjacent to, private properties. The agreements may include:</p> <ul style="list-style-type: none"> <li>▶ Measures to minimise property impacts, including on agricultural operations</li> <li>▶ Specific requirements to ensure that operations, including the movement of livestock and farm machinery are able to be maintained as efficiently as possible</li> <li>▶ Measures to manage severance impacts, where practicable, including appropriate access solutions and amalgamation opportunities</li> <li>▶ Required adjustments to affected structures.</li> </ul> <p>Where land is acquired, compensation would be assessed in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> (NSW) and <i>Determination of compensation following the acquisition of a business</i> (NSW Government, n.d.).</p> <p>Depending on the individual circumstances of each land/business owner, and the proposed impacts on the land and to operations, compensation may take the form of money or land/works—as agreed by the parties.</p>
LP4	<i>Acquisition and property impacts</i>	<p>Property owners and occupants would be consulted in accordance with the communication management plan (mitigation measure SE1), to ensure that owners/occupants are informed about:</p> <ul style="list-style-type: none"> <li>▶ The timing and scope of activities in their area</li> <li>▶ Any potential property impacts/changes, particularly in relation to potential impacts on access, services, or farm operational arrangements</li> <li>▶ Activities that have the potential to impact on livestock.</li> </ul> <p>Feasible and reasonable property-specific measures would be identified in consultation with landholders, and implemented during construction, where construction is located on, or immediately adjacent to, private properties and has the potential to affect farm operational arrangements.</p>
LP5	<i>Maintaining permanent access, addressing changed access arrangements</i>	<p>Where any legal access to a property is permanently affected and a property has no other legal means of access, alternative access to and from a public road would be provided to an equivalent standard, where feasible and reasonable.</p> <p>Where an alternative access is not feasible or reasonable, and a property or part of a property is left with no access to a public road, consideration would be given to acquisition of the property, or part of the property, in accordance with the provisions of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> (NSW). In accordance with the Land Acquisition Act, ARTC's preference is for acquisition by agreement, where practicable.</p>
LP6	<i>Maintaining permanent access, addressing changed access arrangements</i>	<p>Where the proposal affects property access arrangements, input would be sought from relevant landholders prior to finalising the detailed design.</p> <p>Where changes to access arrangements are required for individual properties, ARTC would advise relevant property owners/occupants and consult with them in advance regarding alternative access arrangements.</p>
LP7	<i>Impacts on Crown land</i>	<p>The acquisition of Crown land would be undertaken in consultation with the Department of Planning, Industry and Environment, and in accordance with the requirements of the <i>Crown Lands Management Act 2016</i> (NSW) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> (NSW).</p>
LP8	<i>Impacts on livestock</i>	<p>The need for additional stock management infrastructure on either side of level crossings, such as forcing yards and holding pens, would be identified in consultation with the relevant landholders.</p>
LP9	<i>Impacts on livestock</i>	<p>Livestock fencing would be provided in agricultural areas (as required) to minimise the risk of livestock-train collisions. The preferred fencing arrangements would be confirmed in consultation with landholders.</p>
LP10	<i>Maintenance of fencing</i>	<p>Maintenance agreements would be established for fencing along the rail corridor located within private properties. The agreements would include protocols for reporting damage and arranging repairs of shared boundary fencing.</p>

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
LP11	<i>Minimising impacts on travelling stock reserves</i>	Local Land Services would continue to be consulted during detailed design to confirm how impacts on travelling stock reserves would be avoided during construction and operation. Alternative access arrangements would be made, as required, subject to maintaining rail safety.
LP12	<i>Minimising impacts on travelling stock reserves</i>	Opportunities to refine the design to avoid construction footprint impacts on travelling stock reserve R9489 'Narrabri West' would be investigated.
LP13	<i>Impacts on services and utilities</i>	The location of all utilities, services and other infrastructure, and requirements for access to, diversion, protection and/or support, would be confirmed prior to construction. This would include (as required), undertaking utilities investigations, including intrusive investigations, and consultation and agreement with service providers, in accordance with the utilities management framework provided in Appendix J.
LP14	<i>Impacts on, and construction within, State forests</i>	<p>The Forestry Corporation of NSW would continue to be consulted in relation to:</p> <ul style="list-style-type: none"> <li>▶ Minimising the potential impacts on forestry management practices, including the need for exclusion zones in specific areas where required</li> <li>▶ Opportunities for beneficial reuse of forest products that would be removed during construction.</li> </ul>
LP15	<i>Impacts on, and construction within, State forests</i>	Appropriate management measures and communication requirements for users of State forests in the vicinity of the proposal site would be defined in consultation with the Forestry Corporation of NSW and forest users.
<b>Visual amenity</b>		
LV1	<i>Minimising the potential for visual and landscape impacts</i>	Detailed design and construction planning would seek to minimise the construction and operation footprints and avoid impacts on mature native vegetation, as far as reasonably practicable.
LV2	<i>Minimising the potential for visual and landscape impacts</i>	<p>An urban design and landscape plan would be prepared to provide a consistent approach to design and landscaping. The urban design and landscape plan would include:</p> <ul style="list-style-type: none"> <li>▶ Vegetation screening in strategic locations to visually mitigate impacts from new structures and rail operations, including around bridges and locations where the proposal would be visible from sensitive receivers, where the presence of screening does not impact safe rail operations</li> <li>▶ Appropriate species that respond to the existing landscape character setting and environmental conditions</li> <li>▶ Design guidelines to minimise the visual impacts of bridges, with consideration of the existing landscape and visual context and with regard to <i>Bridge aesthetics: design guidelines to improve the appearance of bridges in NSW</i> (Roads and Maritime Services, 2019).</li> </ul> <p>Detailed design would be undertaken in accordance with the urban design objectives developed for the design, and the urban design and landscape plan.</p>
LV3	<i>Batter slopes in contrast with the existing landform</i>	<p>Batter slopes would be integrated into the surrounding landscape, as far as practicable.</p> <p>Appropriate slope stabilisation would be integrated into batter design to ensure successful rehabilitation and stabilisation.</p>
LV4	<i>Minimising light spill</i>	<p>Temporary and any permanent lighting would be designed and sited in accordance with:</p> <ul style="list-style-type: none"> <li>▶ <i>AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting</i> (Standards Australia, 1997)</li> <li>▶ <i>Dark Sky Planning Guideline: Protecting the observing conditions at Siding Spring</i> (Department of Planning and Environment, 2016).</li> </ul>



Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
LV-CI1	<i>Landscape character and visual impacts associated with (borrow pits)</i>	The borrow pits would be rehabilitated in accordance with the borrow pit rehabilitation strategy provided in Appendix K of the EIS.
<b>Socio-economic impacts</b>		
SE1	<i>Social impacts, communication and engagement</i>	<p>ARTC would continue to manage and deliver program-wide community and stakeholder engagement for Inland Rail in accordance with the Inland Rail Communications and Engagement Strategy.</p> <p>A communication management plan would be developed, in accordance with the Inland Rail Communications and Engagement Strategy, to ensure that:</p> <ul style="list-style-type: none"> <li>▶ Landowners/landholders and community members with the potential to be affected by construction activities are notified in a timely manner about the timing of activities and potential for impacts</li> <li>▶ Enquiries and complaints are managed and a timely response is provided for concerns raised</li> <li>▶ Accurate and accessible information is made available</li> <li>▶ Feedback from the community is encouraged</li> <li>▶ Opportunities for input are provided, where appropriate.</li> </ul> <p>The communication management plan would define the requirements for the complaints management system to be implemented during construction.</p>
SE2	<i>Social impacts, communication and engagement</i>	The communication management plan would include measures to ensure ongoing consultation with local emergency services providers, to inform providers about the locations of level crossings and changes to access routes and road conditions.
SE3	<i>Economic benefits and impacts on regional industries and businesses</i>	ARTC would continue to support local employment in accordance with the <i>Australian Jobs Act 2013</i> (Cth) and <i>Australian Industry Participation National Framework</i> , and through the Inland Rail Academy, to leverage training programs, upskill local residents and young people, and connect businesses with Inland Rail opportunities and key regional industries.
SE4	<i>Economic benefits and impacts on regional industries and businesses</i>	<p>A proposal-specific industry participation plan would be developed and implemented to manage the potential employment and regional economic benefits of the proposal. The plan would address the requirements of the <i>Australian Jobs Act 2013</i> (Cth), the <i>Australian Industry Participation National Framework</i>, and the <i>Inland Rail Indigenous Participation Plan</i> (ARTC, 2019a).</p> <p>The industry participation plan would identify appropriate measures to achieve the objectives of the <i>Australian Jobs Act 2013</i> (Cth) and the <i>Inland Rail Indigenous Participation Plan</i> (ARTC, 2019a), including an achievable list of goods and services that could be subcontracted, as well as targets for local and Indigenous business participation.</p>
SE5	<i>Impacts on the Narrabri Dirt Bike Club</i>	<p>ARTC would continue to consult with the Narrabri Dirt Bike Club, Narrabri Council and the Department of Planning, Industry and Environment (Crown Lands) in relation to:</p> <ul style="list-style-type: none"> <li>▶ The temporary and permanent land requirements at the club site</li> <li>▶ The potential impacts on the club's facilities</li> <li>▶ Measures to address the identified impacts.</li> </ul>
SE-CI1	<i>Impacts on the Baradine Showground</i>	ARTC would continue to consult with the Baradine Showground Trust to manage access and temporary land requirements at the showground.

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
SE-C12	<i>Temporary workforce accommodation</i>	<p>A temporary workforce accommodation plan would be prepared to guide the design and provision of temporary accommodation. The plan would be developed in accordance with ARTC's Inland Rail Program Accommodation Principles, relevant council development codes and guidelines, and the following overarching principles:</p> <ul style="list-style-type: none"> <li>▶ Temporary workforce accommodation is designed to be integrated into the existing communities</li> <li>▶ Temporary workforce accommodation adequately provides for occupants and has a high level of onsite amenity.</li> </ul> <p>The plan would define:</p> <ul style="list-style-type: none"> <li>▶ The arrangement and layout of facilities to minimise amenity impacts on surrounding sensitive receivers (including visual amenity, lighting and privacy)</li> <li>▶ Proposed built-form heights to ensure heights are appropriate within their surrounding context</li> <li>▶ Opportunities for retention of screening vegetation (where present) and provision of additional landscaping, as required</li> <li>▶ How services (such as water, waste, stormwater, wastewater) would be provided and managed to ensure consistency with relevant codes and guidelines and minimise potential impacts on local infrastructure networks and the environment</li> <li>▶ Provision of adequate parking onsite</li> <li>▶ How sites would be decommissioned and rehabilitated consistent with the rehabilitation strategy for the proposal.</li> </ul> <p>The plan would be developed in consultation with relevant key stakeholders, including the relevant local council.</p>
<b>Waste management</b>		
WM1	<i>Excess waste generation</i>	Detailed design would include measures to minimise spoil generation. This would include a focus on optimising the design to minimise spoil volumes and the reuse of material onsite.
WM2	<i>Management of spoil</i>	<p>A spoil management strategy would be developed to define the preferred approach to managing spoil, including the use of spoil to rehabilitate borrow pits. The strategy would include:</p> <ul style="list-style-type: none"> <li>▶ Confirming spoil quantities</li> <li>▶ Undertaking appropriate investigations and surveys, including geotechnical investigations</li> <li>▶ Consideration of the approvals and land application of waste exemptions required, associated lead time and any associated sampling and reporting obligations</li> <li>▶ Consultation with landholders on which borrow pits are located</li> <li>▶ Defining the preferred option for reusing and/or disposing of any spoil not able to be reused at borrow pits.</li> </ul> <p>The outcomes of the strategy would inform the construction waste management plan.</p>
<b>Sustainability</b>		
SU1	<i>Achieving the target sustainability rating</i>	<p>A sustainability management plan would be developed to guide the proposal to achieve an 'excellent' design rating according to ISCA's Infrastructure Sustainability rating scheme.</p> <p>The sustainability management plan would incorporate sustainability objectives and targets consistent with Inland Rail program sustainability objectives and targets, roles and responsibilities, strategies for achieving the 'excellent' design rating, and review and reporting requirements.</p>
SU2	<i>Procurement</i>	Procurement would be undertaken in accordance with the <i>Inland Rail Sustainable Procurement Policy</i> (ARTC, 2020b).
SU3	<i>Reporting</i>	Monthly sustainability reporting (and corrective action where required) would be undertaken during detailed design in accordance with the sustainability management plan.

Ref	Issue/impact	Mitigation measures—detailed design/pre-construction
<b>Climate change</b>		
CC1	<i>Climate change risk management</i>	<p>The climate change risk assessment would continue to be refined as the design of the proposal progresses.</p> <p>The adaptation measures identified for the proposal would be reviewed, and final measures would be incorporated into the design where practicable.</p>

**TABLE D5.4 COMPILATION OF MITIGATION MEASURES FOR CONSTRUCTION**

Ref	Issue/impact	Mitigation measures—construction
<b>Biodiversity</b>		
BD7	<i>Managing the potential for biodiversity impacts during construction</i>	<p>A biodiversity management plan would be prepared prior to construction and implemented as part of the CEMP. The plan would include measures to manage biodiversity and minimise the potential for impacts during construction. The plan would be prepared in accordance with relevant legislation, guidelines and standards. The plan would include, but not be limited to:</p> <ul style="list-style-type: none"> <li>▶ Locations and requirements for pre-clearing surveys</li> <li>▶ Establishing protocols for the staged clearing of vegetation and safe tree felling and log removal to reduce the risk of fauna mortality</li> <li>▶ Measures to avoid and minimise clearing of hollow-bearing trees, where practicable</li> <li>▶ Measures relating to the provision and management of nest boxes, including reuse of hollows and monitoring protocols</li> <li>▶ An unexpected finds protocol</li> <li>▶ Measures to manage biosecurity risks in accordance with the <i>Biosecurity Act 2015</i></li> <li>▶ Measures to reduce the risk of aquatic fauna mortality/injury.</li> </ul>
BD8	<i>Managing the potential for biodiversity impacts during construction</i>	<p>Pre-clearing surveys would be undertaken prior to construction, by a suitably qualified ecologist, in accordance with the biodiversity management plan. Specific surveys would include:</p> <ul style="list-style-type: none"> <li>▶ Surveys for roosting microbats and birds in structures, including telegraph poles and buildings, that are proposed to be removed</li> <li>▶ Searches for nest trees</li> <li>▶ Identification of hollow-bearing trees and logs requiring fauna management during removal</li> <li>▶ Surveys for koalas, which may include trained detection dogs or other appropriate survey techniques</li> <li>▶ Aquatic fauna salvage in watercourses or residual pools within 50 m of the construction footprint and in areas that would be enclosed by silt curtains (e.g. piling locations).</li> </ul>
BD9	<i>Managing the potential for biodiversity impacts during construction</i>	<p>Compounds and stockpile sites would be located an appropriate distance from riparian habitat to avoid indirect impacts on aquatic habitat. This includes, where practicable, a minimum of 100 m for Type 1, Class 1 watercourses, 50 m for Type 2, Class 2 and 3 watercourses, and 10 to 50 m for Type 3, Class 2 to 4 watercourses. Direct impacts on in-stream vegetation and native vegetation on the banks of watercourses would be avoided, as far as practicable.</p>
BD10	<i>Managing the potential for biodiversity impacts during construction</i>	<p>Exclusion areas would be established and maintained around native vegetation to be retained, particularly areas of biodiversity value adjoining the proposal site that are located in close proximity to work areas.</p>
BD11	<i>Rehabilitation of vegetation subject to temporary disturbance</i>	<p>A rehabilitation strategy would be prepared to guide rehabilitation planning, implementation, monitoring and maintenance of disturbed areas outside the operational footprint (such as compounds and temporary workforce accommodation).</p> <p>The strategy would include clear objectives for rehabilitation of native vegetation in temporary disturbances areas.</p>

Ref	Issue/impact	Mitigation measures—construction
<b>Water resources</b>		
WR6	<i>Sedimentation and erosion management</i>	A soil and water management plan would be prepared and implemented as part of the CEMP. The plan would include measures, processes and responsibilities to minimise the potential for soil and water impacts during construction.
WR7	<i>Monitoring groundwater drawdown and quality</i>	<p>A groundwater monitoring program would be developed and implemented as part of the soil and water management plan to monitor potential groundwater impacts. The program would define the following in accordance with chapter 10 of Technical Report 4—Groundwater assessment:</p> <ul style="list-style-type: none"> <li>▶ Monitoring parameters</li> <li>▶ Monitoring locations</li> <li>▶ Frequency and duration of monitoring.</li> </ul> <p>The monitoring program would include baseline monitoring to determine the water quality of groundwater from the proposed bore field bores.</p> <p>Monitoring of groundwater levels would continue, following the completion of groundwater pumping and extraction, until water levels recover to baseline conditions.</p>
WR8	<i>Bore field groundwater quality</i>	The quality of groundwater obtained from the proposed bore field bores would be assessed for the suitability of its intended use. Where required, treatment systems would be designed to ensure water quality does not exceed the relevant water quality criteria from the <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i> (ANZG, 2018).
WR9	<i>Impacts on existing bores</i>	Where groundwater monitoring identifies the potential for groundwater drawdown in existing bores to exceed the <i>NSW Aquifer Interference Policy</i> (DPI, 2012a) minimal impact considerations, make-good provisions would be triggered for those bores, in consultation with the relevant landholders.
WR10	<i>Proposal bore construction</i>	All bores required for the proposal would be constructed by appropriately licensed drillers, in accordance with the <i>Minimum Construction Requirements for Water Bores in Australia</i> (National Uniform Drillers Licensing Committee, 2012) and the relevant requirements of each Water Sharing Plan.
WR11	<i>Works within watercourses</i>	Works within or near watercourses would be undertaken with consideration of the <i>Guidelines for watercourse crossings on waterfront land</i> (DPI, 2012b).
WR12	<i>Unforeseen water table penetration by bulk earthworks</i>	If bulk excavations unexpectedly intersect the water table, potential impacts would be assessed by a hydrogeologist and adaptive mitigation measures implemented, as required.
WR13	<i>Proposal bore fields</i>	<p>Where there is benefit to the local community, the potential for retaining bores post-construction would be considered in consultation with relevant stakeholders (e.g. local councils).</p> <p>Any approvals, operating costs and maintenance associated with retaining and using these bores would be the responsibility of the party that takes ownership.</p>
WR-CI3	<i>Unforeseen water table penetration by borrow pits</i>	If excavations at borrow pits B, C and/or borrow pit D intersect the water table, the potential impacts would be assessed by a hydrogeologist and additional management measures implemented as required.
WR-CI4	<i>Groundwater inflow rate (borrow pits)</i>	If the groundwater inflow rate at borrow pit A is higher than 1 mega litre per year, the inflow rate and implications would be assessed by a hydrogeologist and additional management measures implemented, as required.
<b>Flooding</b>		
FH3	<i>Flooding impacts</i>	Construction planning and the layout of construction work sites and compounds would be undertaken with consideration of overland flow paths and flood risk, avoiding flood liable land and flood events, where practicable.
FH4	<i>Flooding impacts</i>	A flood and emergency response plan would be prepared and implemented as part of the CEMP. The plan would include measures, process and responsibilities to minimise the potential impacts of construction activities on flood behaviour, as far as practicable. It would also include measures to manage flood risks during construction and address flood recovery during construction.

Ref	Issue/impact	Mitigation measures—construction
FH5	<i>Downstream watercourse stability</i>	A geomorphology monitoring program would be implemented in accordance with the soil and water management plan (mitigation measure WR6). The monitoring would observe any changes in the geomorphological stability of watercourses that may be attributable to the proposal and inform appropriate management responses.  The monitoring program would be developed in consultation with the Department of Planning, Industry and Environment and with reference to the <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i> (ANZG, 2018).
FH-C11	<i>Flooding impacts (temporary accommodation facilities)</i>	The Narromine South and Narrabri West temporary workforce accommodation facilities would incorporate appropriate flood protection measures, such as elevating buildings on stilts and storing hazardous materials above the flood levels that inundate these sites.
<b>Soils and contamination</b>		
SC7	<i>General soil and erosion management</i>	The soil and water management plan (mitigation measure WR6) would include erosion and sediment controls appropriate for dispersive soils.
SC8	<i>Contamination</i>	A contamination and hazardous materials plan would be prepared and implemented as part of the CEMP. It would include measures, processes and responsibilities to minimise the potential for contamination impacts on the local community, workers and environment, and procedures for incident management and managing unexpected contamination finds (an unexpected finds protocol).
SC9	<i>Rehabilitation</i>	Disturbed areas would be rehabilitated following construction in accordance with the rehabilitation strategy (mitigation measure BD11).
<b>Water quality</b>		
WQ2	<i>Discharge to surface water</i>	Discharge to surface water would be undertaken in accordance with the environment protection licence for construction of the proposal and would consider the hydrological attributes of the receiving waterbody.
WQ3	<i>Surface water monitoring</i>	A surface water monitoring framework would be developed and implemented as part of the soil and water management plan in the CEMP. It would identify: <ul style="list-style-type: none"> <li>▶ Monitoring locations at discharge points and selected watercourses where works are being undertaken</li> <li>▶ Monitoring parameters</li> <li>▶ Frequency and duration of monitoring.</li> </ul> The monitoring framework would include the relevant water quality objectives, parameters and criteria from Technical Report 5. It would be developed in consultation with the Department of Planning, Industry and Environment, and the NSW EPA.
WQ4	<i>Dewatering of farm dams that require relocation and/or decommissioning</i>	A dam dewatering protocol would be developed as part of the soil and water management plan. It would consider: <ul style="list-style-type: none"> <li>▶ Options for reuse of water in the dam</li> <li>▶ Licensing and approval requirements, where relevant</li> <li>▶ The quality and quantity of the water to be released, where relevant</li> <li>▶ Strategies to minimise impacts on native, threatened or protected species</li> <li>▶ Strategies to minimise spread of nuisance flora and fauna species.</li> </ul>



Ref	Issue/impact	Mitigation measures—construction
<b>Aboriginal heritage</b>		
AH8	<i>Protecting Aboriginal heritage and minimising impacts during construction</i>	<p>An Aboriginal cultural heritage management plan would be prepared prior to construction and implemented as part of the CEMP. The plan would include measures to minimise the potential for impacts and manage Aboriginal heritage, including:</p> <ul style="list-style-type: none"> <li>▶ A salvage methodology (mitigation measure AH2)</li> <li>▶ An unexpected finds procedure (mitigation measure AH11)</li> <li>▶ Plans and installation procedures for fencing and protective coverings</li> <li>▶ Induction package for construction workers and supervisors (mitigation measure AH9)</li> <li>▶ Measures to protect sites close to the proposal site from inadvertent impacts</li> <li>▶ Outcomes of further investigations (mitigation measures AH3 and AH4).</li> </ul> <p>The plan would be prepared in consultation with registered Aboriginal parties and the Department of Planning, Industry and Environment.</p>
AH9	<i>Protecting Aboriginal heritage and minimising impacts during construction</i>	A requirement for cultural and historic heritage awareness training would be included in the Aboriginal cultural heritage management plan. Cultural heritage awareness training would be provided by an Aboriginal representative at the commencement of substantial works for the proposal.
AH10	<i>Unexpected finds</i>	An unexpected finds procedure would be developed and included in the Aboriginal cultural heritage management plan to provide a consistent method for managing any unexpected Aboriginal heritage items discovered during construction, including potential heritage items or objects and human skeletal remains.
AH11	<i>Impacts on Aboriginal cultural values at Etoo Creek 19-5-0239</i>	<p>Prior to construction commencing, and once rehabilitation is complete, a smoking ceremony would be undertaken at the location of Etoo Creek 19-5-0239.</p> <p>Prior to construction commencing, the age of the culturally modified (scarred) tree would be verified by an arborist.</p>
<b>Non-Aboriginal heritage</b>		
NAH8	<i>Avoiding impacts during construction</i>	<p>A heritage management plan would be prepared and implemented as part of the CEMP. It would include measures to manage non-Aboriginal heritage and minimise the potential for impacts during construction.</p> <p>The plan would be prepared in consultation with the relevant heritage agencies (local councils) and take into account the outcomes of further investigations and surveys during detailed design.</p> <p>The heritage management plan would define a requirement for non-Aboriginal historical heritage awareness training for site workers prior to commencement of construction works. The awareness training would promote an understanding of heritage items that may be impacted during the works, and the requirements of the unexpected finds procedure.</p>
NAH9	<i>Unexpected finds including human skeletal remains</i>	<p>An unexpected finds procedure would be developed and included in the heritage management plan to provide a consistent method for managing any unexpected heritage or archaeological items and unexpected human skeletal remains.</p> <p>The procedure would define the requirements for managing any human skeletal remains discovered during construction in accordance with relevant legislation and guidelines, including the Public Health Regulation 2012 (NSW), <i>Heritage Act 1977</i>, <i>National Parks and Wildlife Act 1974</i> (NSW), <i>Work Health and Safety Act 2011</i> (NSW), <i>Coroners Act 2009</i> (NSW), NSW Health Procedures <i>Exhumation of human remains</i> (NSW Department of Health, 2013), and <i>Skeletal Remains—Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977</i> (NSW Heritage Office, 1998b).</p> <p>Any human skeletal remains discovered during construction would be managed in accordance with the <i>Policy Directive—Exhumation of Human Remains</i> (NSW Department of Health, 2013) and <i>Skeletal Remains—Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977</i> (NSW Heritage Office, 1998b).</p>

Ref	Issue/impact	Mitigation measures—construction
NAH10	<i>Avoiding impacts on heritage items</i>	<p>The following heritage items would be fenced and marked on site plans within the CEMP as areas to be avoided during construction:</p> <ul style="list-style-type: none"> <li>▶ Graves within the Woodvale Park Private Cemetery</li> <li>▶ Curban Inn site</li> <li>▶ 'Kickabil' homestead and woolshed</li> <li>▶ 'Allandale' homestead</li> <li>▶ 'Digilah' homestead</li> <li>▶ Convict road, Baradine</li> <li>▶ Rocky Creek Mill site</li> <li>▶ Graves within 'The Aloes' homestead.</li> </ul>
<b>Noise and vibration</b>		
CNV3	<i>Managing the potential for noise and vibration impacts during construction</i>	A construction noise and vibration management plan would be prepared and implemented as part of the CEMP in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework. The plan would include measures, processes and responsibilities to manage noise and vibration, and minimise the potential for impacts during construction.
CNV4	<i>Managing the potential for noise and vibration impacts during construction</i>	<p>The Inland Rail NSW Construction Noise and Vibration Management Framework would be implemented, and the proposal would be constructed, with the aim of achieving the construction noise management levels and vibration criteria identified by the noise and vibration assessment.</p> <p>All feasible and reasonable noise and vibration measures would be implemented.</p> <p>Any activities that could exceed the construction noise management levels and vibration criteria would be identified and managed in accordance with the framework, the noise and vibration management plan and the construction noise and vibration impact statements.</p> <p>Notification of impacts would be undertaken in accordance with the communication management plan for the proposal.</p>
CNV5	<i>Impacts of out-of-hours work</i>	<p>An out-of-hours work protocol would be developed to define the process for considering, approving and managing out-of-hours work, including implementation of feasible and reasonable measures and communication requirements. Measures would be aimed at pro-active communication and engagement with potentially affected receivers, provision of respite periods and/or alternative accommodation for defined exceedance levels.</p> <p>All work outside the primary proposal construction hours would be undertaken in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework and in accordance with the out-of-hours work protocol.</p> <p>The protocol would provide guidance for the preparation of out-of-hours work plans for each construction work location and for key works. Out-of-hours work plans would be prepared in consultation with key stakeholders (including the NSW EPA) and the community, and incorporated into the construction noise and vibration management plan.</p>
CNV6	<i>Minimising the potential for construction vibration (structural) impacts</i>	If vibration-generating activities are conducted within 18 m of a residence, attended vibration measurements would be undertaken at the commencement of vibration-generating activities to confirm that structural vibration limits are within the acceptable range. For piling, this distance is increased to 100 m. Where vibration levels are found to be unacceptable, alternative work methods would be implemented so that the vibration impacts are reduced to acceptable levels.
CNV7	<i>Minimising the potential for construction vibration (structural) impacts</i>	Building condition surveys would be completed before and after construction works where buildings or structures are within the minimum vibration working distances for cosmetic damage.

Ref	Issue/impact	Mitigation measures—construction
CNV8	<i>Impacts on heritage items as a result of construction vibration</i>	<p>Prior to the commencement of vibration-intensive works within the minimum working distances for cosmetic damage for heritage items, the potential for damage to the item would be assessed. Where there is potential for damage, alternative methods that generate less vibration would be investigated and substituted, where practicable.</p> <p>Where residual cosmetic damage risks remain, condition surveys would be carried out and vibration monitoring with real-time notification of exceedance would occur during the activity.</p> <p>Site activities would be modified, where practicable, to avoid exceeding the cosmetic damage criteria. Any identified vibration-related damage to the items would be rectified.</p>
CNV-C12	<i>Minimising potential for impacts of blasting at borrow pits</i>	<p>Blasting would be undertaken during the recommended standard hours for blasting. Management measures defined by the blasting management strategy would be implemented.</p>
<b>Air quality</b>		
AQ1	<i>General air quality impacts</i>	<p>An air quality management plan would be prepared and implemented as part of the CEMP. The plan would include measures, processes and responsibilities to minimise the potential for air quality impacts on the local community and environment during construction.</p>
AQ2	<i>Construction activities and earthworks that may cause dust impacts</i>	<p>Where sensitive receivers are located within the separation distances determined for each key activity, or visible dust is generated from vehicles using unsealed access roads, road watering and/or other stabilising approaches would be implemented.</p>
AQ-C11	<i>Blasting management (borrow pits)</i>	<p>Blasting would be avoided when winds in excess of 5 metres per second (m/s) could carry dust towards a sensitive receiver.</p>
<b>Traffic and transport</b>		
TT5	<i>General impacts of construction activities on traffic, transport, access, pedestrians and cyclists.</i>	<p>A traffic, transport and access management plan would be prepared and implemented as part of the CEMP. The plan would include measures, processes and responsibilities to minimise the potential for impacts on the community and the operation of the surrounding road and transport environment during construction.</p> <p>The plan would be developed in consultation with local councils, Transport for NSW and public transport/bus operators.</p>
TT6	<i>General impacts of construction activities on traffic, transport, access, pedestrians and cyclists.</i>	<p>Consultation with relevant stakeholders would be undertaken regularly to facilitate the efficient delivery of the proposal and to minimise impacts on road users and landholders. Stakeholders would include the relevant local council/s, bus operators, Transport for NSW, emergency services, the Forestry Corporation of NSW (in relation to access within State forests), Crown Land, Local Land Services and other affected property owners/occupants.</p> <p>The community would be notified in advance of any proposed road and pedestrian network changes through signage, the local media, and other appropriate forms of communication.</p> <p>Any additional measures identified as an outcome of consultation would be implemented during construction.</p>
TT7	<i>Emergency vehicle access</i>	<p>Emergency vehicle access routes that may be impacted by the proposal would be identified, and appropriate control measures would be implemented, in consultation with the relevant emergency services providers.</p>
TT8	<i>Heavy vehicles damaging local roads</i>	<p>A dilapidation survey would be undertaken of the made public roads within the proposed haulage routes, prior to and following completion of construction, and provided to the relevant road authority.</p> <p>Pavement condition monitoring would be carried out during works, as required.</p>

Ref	Issue/impact	Mitigation measures—construction
TT-CI1	<i>Construction traffic impacts (temporary workforce accommodation)</i>	The traffic, transport and access management plan would include measures to manage potential traffic impacts at and near temporary workforce accommodation facilities. The plan would include approved access routes and any restrictions on the use of residential streets.
<b>Land use and property</b>		
LP16	<i>Biosecurity</i>	The biodiversity management plan included in the CEMP (mitigation measure BD7) would include measures to minimise the potential for biosecurity risks during construction in accordance with the <i>Biosecurity Act 2015</i> .
LP17	<i>Access to properties</i>	<p>Access to individual residences, services and businesses, and for livestock across the rail corridor, would be maintained during construction. The traffic, transport and access plan included in the CEMP (mitigation measure TT5) would include measures to ensure that access to properties would be maintained at all times during construction.</p> <p>Where alternative access arrangements need to be made, these would be developed in consultation with affected property owners/occupants, and Local Land Services for travelling stock reserves.</p>
LP18	<i>Access within State forests</i>	The traffic, transport and access plan included in the CEMP (mitigation measure TT5) would include measures to ensure that access within State forests is retained to enable forestry operations to continue during construction.
LP19	<i>Rehabilitation</i>	<p>The rehabilitation strategy (mitigation measure BD11) would include measures to restore disturbed sites that do not form part of the operational footprint (such as compounds, temporary workforce accommodation) as close as practicable to the pre-construction condition or as agreed with the landholder.</p> <p>Rehabilitation of disturbed areas would be undertaken progressively, consistent with the rehabilitation strategy and property-level design requirements (where relevant).</p>
LP20	<i>Water supplies for farm operations</i>	Farm water pipelines, dams and drainage channels would be replaced or reinstated to ensure continuity of stock and domestic water supplies prior to removal of existing impacted infrastructure.
LP21	<i>Bushfire risk in forest areas</i>	The flood and emergency response plan (mitigation measure FH4) would include measures to minimise the potential for bushfire risks.
<b>Visual amenity</b>		
LV5	<i>Visual impacts of construction compounds</i>	<p>Construction compounds would be located, as far as practicable, within cleared areas and away from sensitive receivers.</p> <p>Compounds would be designed and orientated to minimise visual impacts. This would include locating areas of low visual amenity away from sensitive receivers, and erecting boundary screening around compounds, where appropriate.</p>
LV6	<i>Protection of trees</i>	Trees to be retained would be protected prior to the commencement of construction in accordance with <i>AS4970-2009 Protection of trees on development sites</i> (Standards Australia, 2009).
LV7	<i>Landscape character and visual impacts</i>	Rehabilitation of disturbed areas would be undertaken progressively in accordance with the rehabilitation strategy (mitigation measure BD11) and individual property agreements (mitigation measure LP3) (where relevant).
LV8	<i>Minimising light spill</i>	Lighting of work areas, compounds, and work sites would be oriented to minimise glare and light spill impact on adjacent receivers.
LV-CI2	<i>Visual impact from construction activities (temporary accommodation facilities)</i>	The temporary workforce accommodation plan (mitigation measure SE-C12) would include requirements for the design and visual screening of facilities to minimise the potential for visual impacts, particularly where facilities are visible from sensitive receivers.

Ref	Issue/impact	Mitigation measures—construction
<b>Socio-economic impacts</b>		
SE6	<i>Social impacts, communication and engagement</i>	<p>Key stakeholders (including local councils, emergency service providers, public transport providers, the general community, and surrounding landowners/occupants) would continue to be consulted in accordance with the communication management plan.</p> <p>Local residents, landholders, landowners, businesses, affected social and recreation facilities and other relevant stakeholders would be notified before work starts, in accordance with the communication management plan, and be regularly informed of construction activities.</p>
SE7	<i>Social impacts, communication and engagement</i>	<p>Complaints during construction would be managed in accordance with the complaints management system defined by the communication management plan. The complaints management system would be maintained throughout the construction period and for a minimum of 12 months after construction finishes.</p>
SE8	<i>Workforce management</i>	<p>A workforce management plan would be developed and implemented during construction to manage:</p> <ul style="list-style-type: none"> <li>▶ Potential impacts of the non-resident construction workforce</li> <li>▶ Local business and employment opportunities</li> <li>▶ Health and wellbeing services needs of the temporary construction workforce, including medical, allied health and wellbeing services.</li> </ul>
SE9	<i>Local employment and training opportunities</i>	<p>The workforce management plan would include measures to manage local employment and procurement requirements, including but not limited to:</p> <ul style="list-style-type: none"> <li>▶ Recruitment, skills and training measures, including identification of skills and qualifications required, and training targets</li> <li>▶ How the contractor would work with regional stakeholders to upskill local residents.</li> </ul>
SE10	<i>Impacts of non-resident workforce on local communities</i>	<p>The workforce management plan would include measures to manage potential impacts of the non-resident construction workforce on local and regional communities, including:</p> <ul style="list-style-type: none"> <li>▶ A code of conduct for workers, including a zero-tolerance policy relating to anti-social behaviour</li> <li>▶ Strategies to promote wellbeing of the workforce</li> <li>▶ A monitoring mechanism for use of local tourist accommodation and rental housing by workers</li> <li>▶ Consultation with local health and emergency services to establish processes for managing potential increased demands due to non-resident workforce.</li> </ul>
SE11	<i>Temporary land requirements at the Narrabri Dirt Bike Club</i>	<p>The area of land within the Narrabri Dirt Bike Club site that is required during construction only would be restored and returned to (as a minimum) the pre-existing condition.</p>
<b>Waste management</b>		
WM3	<i>Construction waste management</i>	<p>A construction waste management plan would be prepared and implemented as part of the CEMP. The plan would adopt the waste hierarchy principles contained in the <i>Waste Avoidance and Resource Recovery Act 2001</i> (NSW), and detail processes, responsibilities and measures to manage waste and minimise the potential for impacts during construction.</p>
WM4	<i>Construction waste and spoil management</i>	<p>All waste generated would be classified in accordance with the <i>Waste Classification Guidelines</i> (NSW EPA, 2014a) and disposed of in accordance with the relevant requirements of the Protection of the Environment Operations (Waste) Regulation 2014.</p>



Ref	Issue/impact	Mitigation measures—construction
<b>Sustainability</b>		
SU4	<i>Achieving the target sustainability rating</i>	A sustainability management plan would be developed to define the measures required to be implemented achieve an 'excellent' as built rating according to the ISCA's Infrastructure Sustainability scheme.  The sustainability management plan would incorporate Inland Rail program-aligned sustainability objectives and targets, roles and responsibilities, strategies for achieving the 'excellent' as built rating, and review and reporting requirements.
SU5	<i>Reporting</i>	Monthly sustainability reporting (and corrective action where required) would be undertaken during construction in accordance with the sustainability management plan.
<b>Climate change</b>		
CC2	<i>Climate change risk management</i>	The adaptation measures identified for the proposal would be reviewed, and final measures would be implemented during construction, as far as practicable.

**TABLE D5.5 COMPILATION OF MITIGATION MEASURES FOR OPERATION**

Ref	Issue/impact	Mitigation measures—operation
<b>Biodiversity</b>		
BD12	<i>Weed management</i>	Weed inspections would be undertaken and weed management would occur in accordance with ARTC's standard operating procedures to meet its obligations under the <i>Biosecurity Act 2015</i> .
BD13	<i>Fauna connectivity</i>	The operational performance of fauna connectivity measures would be monitored in accordance with the fauna connectivity strategy. This would include recording of wildlife collisions with trains, and monitoring of use of crossing structures by target species (including the Pilliga mouse and Eastern pygmy-possum) and feral predators.  The need for additional measures or modifications to existing measures would be identified to respond to any issues identified.
BD14	<i>Aquatic ecology</i>	Culverts that provide for the flow of watercourses would be inspected and maintained in accordance with ARTC's standard operating procedures to address any issues that may contribute to the blockage of fish passage.
<b>Soils and contamination</b>		
SC10	<i>Soil erosion and sedimentation</i>	During any maintenance work where soils are exposed, sediment and erosion control devices would be installed in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> , Volume 1 (Landcom, 2004).
SC11	<i>Contamination</i>	ARTC's existing spill response procedures would be reviewed to determine applicability and suitability during operation. The adopted procedure would include measures to minimise the potential for impacts on the local community and the environment as a result of any leaks and spills.
<b>Water quality</b>		
WQ5	<i>General water quality management</i>	The proposal would be managed in accordance with the water quality management requirements specified in the environment protection licence.
<b>Noise and vibration</b>		
ONV4	<i>Operational noise and vibration</i>	The proposal would be operated with the aim of achieving the operational noise and vibration criteria identified by the operational noise and vibration review, the requirements of the conditions of approval, and the environment protection licence for Inland Rail.

Ref	Issue/impact	Mitigation measures—operation
ONV5	<i>Operational noise and vibration</i>	<p>Operational noise and vibration compliance monitoring would be undertaken, once Inland Rail has commenced operation, at representative locations to compare actual noise performance against that predicted by the operational noise and vibration review.</p> <p>Compliance monitoring requirements would be defined by the operational noise and vibration review.</p> <p>The results of monitoring would be included in an operational noise and vibration compliance report, prepared in accordance with the conditions of approval. The need for any additional feasible and reasonable mitigation measures would be identified as an outcome of the monitoring.</p>
<b>Air quality</b>		
AQ3	<i>Locomotive emissions</i>	Locomotive emissions would be managed in accordance with the air quality management requirements specified in the rollingstock operator's environment protection licence.
AQ4	<i>Impacts during track maintenance</i>	Maintenance service vehicles and equipment would be maintained and operated in accordance with the manufacturer's specifications.
<b>Traffic and transport</b>		
TT9	<i>Road user safety at level crossings</i>	<p>The operation of all level crossings on classified roads, constructed as part of the proposal, would be reviewed after Inland Rail commences operation to confirm that the:</p> <ul style="list-style-type: none"> <li>▶ Level of protection is appropriate</li> <li>▶ Proposed infrastructure is appropriate for the traffic conditions.</li> </ul>
TT10	<i>Road user safety at level crossings</i>	In accordance with National and State Rail Safety Law requirements, public road crossings would be subject to an Interface Agreement with the relevant road manager to ensure that safety risks are identified and minimised as far as practicable during operations.
<b>Land use and property</b>		
LP22	<i>Safety</i>	Guidance would be provided to agricultural landholders at the commencement of operation regarding the frequency of train movements, to assist with safe scheduling of routine agricultural activities.
<b>Visual amenity</b>		
LV9	<i>Landscape character and visual impacts</i>	Vegetation provided in accordance with the rehabilitation strategy (mitigation measure BD11) and urban design and landscape plan (mitigation measure LV2) would be subject to ongoing monitoring and maintenance in accordance with ARTC's standard operating procedures.
<b>Socio-economic impacts</b>		
SE12	<i>Increased safety risks due to new level crossings</i>	A rail safety awareness program would be developed and implemented prior to the operation of Inland Rail to educate the community regarding safety around trains. This would include landholders with properties that are intersected by the proposal.
<b>Waste management</b>		
WM5	<i>Operational waste management</i>	Operational waste, including general litter clean up, would be managed in accordance with ARTC's existing operational maintenance requirements and the waste hierarchy principles in the <i>Waste Avoidance and Resource Recovery Act 2001</i> (NSW).
<b>Sustainability</b>		
SU6	<i>Sustainability</i>	Prior to operation commencing, a sustainability handover plan would be prepared and relevant initiatives would be maintained and implemented through operational management and maintenance procedures.
<b>Climate change</b>		
CC3	<i>Climate change risk management</i>	Operational management and maintenance procedures would address potential climate change risks and adaptation measures.

## D5.4 Proposal uncertainties and approach to design refinements

### D5.4.1 Proposal uncertainties

The EIS is based on the reference design for the proposal. Given the current level of design development, there remain some uncertainties relating to technical requirements, how the proposal would be constructed, and how it would operate as part of Inland Rail overall. These details would be resolved as the design of the proposal, and Inland Rail as a whole, progresses.

A summary of the uncertainties around the design, construction and/or operational methodologies of the proposal, and how these will be resolved, is provided in Table D5.6.

**TABLE D5.6 PROPOSAL UNCERTAINTIES**

Category	Uncertainty	How uncertainties would be resolved
Design	Property acquisition—exact areas that need to be acquired	Refining the amount and location the proposal's land requirements would involve a detailed survey of the proposal site and surrounding properties, and confirmation of the final detailed design for the proposal.
	Flooding—exact nature of potential impacts and design responses	Further flood modelling would be undertaken, incorporating the detailed design and construction planning information. This would provide further guidance on potential flood risks and confirm the required mitigation requirements.
	Utilities—impacts on utilities to be defined in detail	Site utilities investigations would be completed during detailed design to validate the assessments undertaken to date and confirm relocation/protection requirements. The location, nature and extent of utility changes would be confirmed during detailed design in consultation with utility providers. Further consultation would be undertaken with utility providers to refine and confirm changes and manage the proposed staging of work.
	Culverts—erosion protection	Further modelling would be undertaken during detailed design to confirm the locations downstream of culverts that require erosion protection, and the extent and type of protection required.
	Noise barriers	The approach to noise attenuation would be subject to further reasonable and feasible considerations during detailed design including construction limitations. Further noise modelling would be required to confirm the requirements for noise attenuation.
	Biodiversity	Pre-clearing surveys would be undertaken prior to construction.
	Non-Aboriginal heritage	Potential heritage items that were not able to be accessed during the assessment would be surveyed prior to construction.
	Aboriginal heritage	Further surveys would be undertaken in targeted areas.
Construction	Haul routes—exact routes and haulage methods	A detailed haulage program would be developed based on the detailed design.
	Compound sites—location, layout and facilities	The final selection of identified compound locations and final layout of compound sites would be confirmed based on the detailed design and final construction methodology.

Category	Uncertainty	How uncertainties would be resolved
Construction [continued]	Management of spoil	<p>A spoil management strategy would be developed to define the preferred approach to managing spoil, including the use of spoil to rehabilitate borrow pits.</p> <p>The strategy would include:</p> <ul style="list-style-type: none"> <li>▶ Confirming spoil quantities</li> <li>▶ Undertaking appropriate investigations and surveys, including geotechnical investigations</li> <li>▶ Consultation with landowners on which borrow pits are located</li> <li>▶ Defining the preferred option for reusing and/or disposing of any spoil not able to be reused at borrow pits.</li> </ul>
	Temporary land requirements—exact areas that need to be leased	<p>The boundaries of the additional areas to be temporarily leased during construction only would be confirmed based on the final design and detailed surveys.</p>
	Construction water supply	<p>Other options to supply construction water, in addition to extraction from deep aquifers, would continue to be explored, including reuse of excess water from the Narrabri Gas Project (if approved), leasing or purchase of existing licences from nearby landholders, and excess water from other facilities in the area.</p> <p>Opportunities to reduce the use of water for earthworks and dust suppression would be further explored, including use of additives and use of different materials for haul roads. Subject to consideration of potential offsite impacts and safety of haul road operations, a reduced dust suppression regime may be possible along parts of the proposal site.</p> <p>The preferred option for the supply of potable water and the treatment and disposal of wastewater at the temporary workforce accommodation would be determined as part of detailed construction planning.</p>

#### D5.4.2 Approach to design refinements

The reference design defines a proposal that provides a sound basis for developing the detailed design to the standard required to support project delivery. Sufficient flexibility has been provided to allow for the design to be refined during the detailed design stage, where relevant, to improve the performance, minimise impacts on the community and the environment, and in response to feedback from the community and stakeholders. As a result, the final design may vary from the reference design described in this EIS.

Any proposed variations would be reviewed for consistency with the assessments described in this document, including relevant mitigation measures, performance outcomes and any future conditions of approval. If any proposed variations are not consistent with the approvals, appropriate modifications to the project approval would be sought in accordance with the requirements of the EP&A Act.

The design of the proposal, as described in the EIS, would be subject to ongoing refinements during the detailed design phase. Refinements may be made for various reasons, including (for example) to:

- ▶ Avoid ground conditions or services that present significant construction difficulties in terms of logistics, time and/or cost
- ▶ Reduce the construction timeframe
- ▶ Avoid areas of environmental sensitivity identified following approval
- ▶ Reduce impacts on local residents
- ▶ Accommodate other refinements arising out of the further work noted in Table D5.6 or discussions with the construction contractor, once appointed
- ▶ Improve the operation of the proposal without increasing the potential environmental impacts.

Such refinements may include, for example, minor changes to:

- ▶ The location of construction compounds and construction site access routes
- ▶ Access roads
- ▶ The location of key infrastructure, such as refinement or reorientation of site boundaries
- ▶ Technology or features of key proposal components.

Refinements would not include significant changes to the proposal.

For design refinements, a consistency review would be undertaken to consider whether the refinement:

- ▶ Would result in any of the conditions of approval not being met
- ▶ Be consistent with the objectives and operation of the proposal as described in the EIS
- ▶ Result in a significant change to the approved project
- ▶ Would trigger the requirement for additional Aboriginal heritage surveys and mitigation measures, as described in Technical Report 6
- ▶ Would result in any potential environmental or social impacts of a greater scale or different nature than that considered by the EIS.

A refinement that does not meet these criteria would be considered a design modification. Approval would be sought from the Minister for Planning and Public for modifications, as required, in accordance with Division 5.2 of the EP&A Act.

## D5.5 Compilation of performance outcomes

The SEARs identify a number of desired performance outcomes for the proposal. These desired performance outcomes outline the broader objectives to be achieved in the design, construction, and operation of the proposal. Based on the outcomes of the environmental impact assessment, summarised in Part B and Part C of the EIS, and the implementation of the mitigation measures compiled in section D5.3, proposal-specific performance outcomes are proposed. These are listed in Table D5.7. The first and second columns in the table provide the key issue and desired performance outcome from the SEARs. The third column provides the proposal-specific environmental performance outcomes that are proposed to achieve the desired outcome in the SEARs, and/or a statement as to how the outcome has been achieved to date.

Future design development and any design changes would be considered against these environmental performance outcomes.

**TABLE D5.7 COMPILATION OF PERFORMANCE OUTCOMES**

Issue	Desired performance outcome from the sears	Proposal-specific performance outcome
1. Environmental impact assessment process	The process for assessment of the proposal is transparent, balanced, well focused and legal.	The assessment has been prepared in consultation with relevant stakeholders (where appropriate) through a transparent process and has been prepared in accordance with Part 3 of Schedule 2 of the EP&A Regulation and the EPBC Act, and relevant guidelines, standards and policies.
2. Environmental impact statement	The project is described in sufficient detail to enable clear understanding that the project has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise or offset impacts so that the project, on balance, has the least adverse environmental, social and economic impact, including its cumulative impacts.	The proposal is described in detail in chapters A7 and A8. Chapter A6 describes the iterative process of proposal refinements to avoid, minimise or offset proposal impacts at the concept stage.
3. Assessment of key issues	Key issue impacts are assessed objectively and thoroughly to provide confidence that the project will be constructed and operated within acceptable levels of impact.	Impacts are assessed objectively and thoroughly. The implementation of environmental management and mitigation measures (see sections D5.2 and D5.3) would ensure that the proposal is constructed and operated within acceptable levels of impact.

Issue	Desired performance outcome from the sears	Proposal-specific performance outcome
4. Consultation	The project is developed with meaningful and effective engagement during project design and delivery.	Consultation to date is described in chapter A4. The proposal is developed with meaningful and effective engagement.  A communication strategy is implemented to guide effective engagement during proposal delivery.
5. Socio-economic, land use and property	The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities.  The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure.	The proposal minimises impacts on the local community, community infrastructure and businesses.  Impacts on existing land use and properties are minimised.  As part of Inland Rail as a whole, the proposal provides for the development of an efficient and sustainable route for the transport of freight between Brisbane and Melbourne.  The proposal is appropriately integrated with adjoining land uses and access to private properties is maintained.  The proposal is appropriately integrated with local and regional land use planning strategies.  Constructing and operating the proposal has a positive impact on the regional, NSW and Australian economy.
6. Biodiversity	The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity.  Offsets and/or supplementary measures are assured, which are equivalent to any remaining impacts of project construction and operation.	The proposal is designed to minimise impacts on biodiversity, as far as possible, with the footprint refined to reduce clearing, where practicable.  Potential impacts on biodiversity are managed in accordance with relevant legislation, including the EP&A Act, BC Act, FM Act, EPBC Act, and the Biosecurity Act.
7. Protected and sensitive lands	The project is designed, constructed and operated to avoid or minimise impacts on protected and sensitive lands.  The project is designed, constructed and operated to avoid or minimise future exposure to coastal hazards and processes.	The proposal avoids impacts on protected and sensitive lands, as defined by the SEARs.
8. Transport and traffic	Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts.  The safety of transport system customers is maintained.  Impacts on network capacity and the level of service are effectively managed.  Works are compatible with existing infrastructure and future transport corridors.	The proposal provides for more efficient and productive freight rail operations.  Impacts on traffic and transport are minimised.  Motorist, pedestrian and cyclist safety will be maintained or improved.  The proposal contributes to one of the desired outcomes of Inland Rail—to have reduced truck volumes on the road network, improving road safety.  Safe access to properties is maintained.  The proposal is integrated with existing and future local and regional transport infrastructure and planning strategies.



Issue	Desired performance outcome from the sears	Proposal-specific performance outcome
9. Water—flooding	<p>The project minimises adverse impacts on property, public safety and the environment resulting from alteration of the water flow characteristics of watercourses and overland flowpaths.</p> <p>Where feasible, the project includes remedial measures to mitigate any adverse water flow impacts, geomorphological impacts or flood safety risks caused by the existing rail infrastructure within the project area.</p> <p>Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, geomorphological impacts or dam failure.</p>	<p>Construction is undertaken in a manner that minimises the potential for adverse flooding impacts, through staging of works and the implementation of mitigation measures.</p> <p>Structures are designed and located such that flows are not significantly impeded.</p> <p>The proposal reduces, or does not significantly increase, the area subject to flooding.</p>
10. Water—resources	<p>Long-term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised.</p> <p>The environmental values of nearby, connected and affected water sources, groundwater and dependent ecological systems including estuarine and marine water (if applicable) are maintained (where values are achieved) or improved and maintained (where values are not achieved).</p> <p>Sustainable use of water resources.</p>	<p>The proposal avoids long-term impacts on surface water.</p> <p>Opportunities to reuse water resources are considered during the design process.</p> <p>The use of water during construction is minimised as much as practicable.</p>
11. Water—quality	<p>The project is designed, constructed and operated to protect the NSW Water Quality Objectives, where they are currently being achieved, and contribute towards achievement of the Water Quality Objectives over time, where they are currently not being achieved, including downstream of the project to the extent of the project impact including estuarine and marine waters (if applicable).</p>	<p>The proposal is designed and constructed such that changes to water flows in watercourses are minimised as far as practicable.</p> <p>Erosion and sediment controls during construction are implemented in accordance with the Blue Book.</p> <p>The proposal protects or contributes to achieving the water quality objectives, during construction and operation by establishing discharge criteria that protect the environmental values of the receiving waters.</p>
12. Soils	<p>The environmental values of land, including soils, subsoils and landforms, are protected.</p> <p>Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination.</p>	<p>Site-specific soil, subsoil and landform characteristics are taken into consideration during detailed design and construction.</p> <p>Any contamination is managed in accordance with relevant regulatory requirements.</p> <p>Any soil waste is assessed, classified, managed and disposed of in accordance with the <i>Waste Classification Guidelines</i> (NSW EPA, 2014a).</p>
13. Air quality	<p>The modification is designed, constructed and operated in a manner that minimises air quality impacts (including nuisance dust and odour) to minimise risks to human health and the environment to the greatest extent practicable.</p>	<p>Dust and exhaust emissions of plant and equipment are controlled from construction activities.</p> <p>The proposal is constructed and operated in accordance with the requirements of the POEO Act and relevant environment protection licences.</p> <p>Dust generated during construction will not exceed the relevant criteria in the National Environment Protection (Ambient Air Quality) Measure and the <i>Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales</i> (NSW EPA, 2016).</p>

Issue	Desired performance outcome from the sears	Proposal-specific performance outcome
14. Heritage	<p>The design, construction and operation of the project facilitates, to the greatest extent possible, the long-term protection, conservation and management of the heritage significance of items of environmental heritage and Aboriginal objects and places.</p> <p>The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and Aboriginal objects and places.</p>	<p>The design is sympathetic to the historic significance of the study area and listed heritage items, and where practicable, avoids and minimises impacts on heritage.</p> <p>Aboriginal heritage objects with the potential to be impacted by the proposal are salvaged in accordance with the salvage methodology.</p> <p>Visual impacts on heritage items are mitigated through individually tailored landscape treatments.</p> <p>Impacts on heritage are managed in accordance with relevant legislation, including the EP&amp;A Act, the <i>Heritage Act 1977</i> (NSW), the <i>National Parks and Wildlife Act 1974</i> (NSW) and relevant guidelines.</p>
15. Noise and vibration—amenity	<p>Construction noise and vibration (including airborne noise, ground-borne noise and blasting) is effectively managed to minimise adverse impacts on acoustic amenity.</p> <p>Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the project are effectively managed to protect the amenity and wellbeing of the community.</p>	<p>The proposal minimises impacts on the local community by, as far as practicable:</p> <ul style="list-style-type: none"> <li>▶ Controlling noise and vibration on the source to receiver transmission path</li> <li>▶ Controlling noise and vibration at the receiver</li> <li>▶ Implementing feasible and reasonable measures to minimise the noise and vibration impacts of construction activities on local sensitive receivers.</li> </ul>
16. Noise and vibration—structural	<p>Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on the structural integrity of buildings and items including Aboriginal places and environmental heritage.</p> <p>Increases in noise emissions and vibration affecting environmental heritage as defined in the <i>Heritage Act 1977</i> (NSW) during operation of the project are effectively managed.</p>	<p>The proposal minimises impacts on structures by:</p> <ul style="list-style-type: none"> <li>▶ Controlling vibration at the source</li> <li>▶ Controlling vibration on the source to receiver transmission path</li> <li>▶ Implementing feasible and reasonable measures to minimise vibration impacts of construction activities on structures.</li> </ul>
17. Rehabilitation	<p>The modification provides for the proposed borrow sites to be rehabilitated at the conclusion of the modification.</p> <p>Rehabilitation should occur in accordance with the relevant strategic framework and best practice. The modification must propose rehabilitation actions with measurable criteria and clearly identified timeframes for their completion.</p>	<p>The borrow pits will be rehabilitated in accordance with the proposed remediation strategy.</p> <p>Rehabilitation will take into account landowner requirements and will ensure that the sites meet appropriate environmental performance criteria.</p>
18. Visual amenity	<p>The project 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.</p>	<p>The proposal is designed to have regard to the surrounding landscape and visual environment.</p> <p>Vegetation providing screening to the rail corridor is retained, where practicable.</p> <p>The proposal incorporates features to minimise the potential visual impacts where visual receptors are concentrated.</p> <p>The proposal is visually integrated with its surroundings.</p>

Issue	Desired performance outcome from the sears	Proposal-specific performance outcome
19. Waste	All wastes generated during the construction and operation of the project are effectively stored, handled, treated, reused, recycled and/or disposed of lawfully and in a manner that protects environmental values.	<p>The preferred waste management hierarchy of avoidance, minimisation, reuse, recycling and disposal is implemented.</p> <p>Measures to minimise waste, manage waste and conserve resources throughout the construction of the proposal are implemented.</p> <p>Spoil is reused as part of the proposal, as much as possible.</p> <p>Waste is disposed of at appropriately licensed facilities.</p>
20. Climate change risk	The project is designed, constructed and operated to be resilient to the future impacts of climate change.	<p>Resilience to future extreme rainfall and temperature.</p> <p>The proposal contributes to one of the desired outcomes of Inland Rail—to have more than 750,000 fewer tonnes of carbon, one-third less fuel consumption, and reduced truck volumes in over 20 regional towns.</p>
21. Sustainability	<p>The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources.</p> <p>Conservation of natural resources is maximised.</p>	<p>The design process targets an 'excellent' rating in accordance with the ISCA rating tool.</p> <p>Sustainability considerations are integrated throughout the design, construction, and operation phases of the proposal.</p>