

CHAPTER 28

Conclusion and justification of the proposal

NARRABRI TO NORTH STAR—PHASE 2 ENVIRONMENTAL IMPACT STATEMENT

ARTC

INLAND
RAIL

An Australian Government Initiative

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28 Conclusion and justification of the proposal

This chapter is the conclusion to the EIS. It summarises the Narrabri to North Star (N2NS) Phase 2 Moree to Camurra North section of Inland Rail ('the proposal') for which approval is sought; the uncertainties that still exist and how these would be resolved; and provides the justification for the proposal, having regard to the biophysical, economic and social considerations as discussed in each chapter.

The Secretary's Environmental Assessment Requirements (SEARs) relevant to the EIS synthesis (conclusion), and where they are addressed, are listed in Table 28-1. Additional information relevant to *clause r* of the SEARs can be found in Chapter 27: Approach to environmental management. Full copies of the SEARs are provided in Appendix A.

TABLE 28-1: SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS FOR THE SYNTHESIS

Key Issue	requirement	Where addressed
2. Environmental impact statement	2 The EIS must include the following:	
	r a chapter that synthesises the environmental impact assessment and provides:	Chapter 28
	i a succinct but full description of the project for which approval is sought;	Section 28.1
	ii the reasons justifying carrying out the project as proposed, having regard to the biophysical, economic and social considerations, including ecologically sustainable development and cumulative impacts;	Section 28.3 and 28.3.4.5

28.1 Summary of the proposal

This EIS considers the potential impacts from construction and operation of the Narrabri to North Star Phase 2 section of Inland Rail. It has been prepared to support ARTC's application for approval of the proposal in accordance with the requirements of Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act), and as a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The EIS addresses the environmental assessment requirements of the Secretary of the (then) Department of Planning, Industry and Environment, dated 14 October 2020.

28.1.1 Proposal key features

The proposal involves an upgrade of approximately 13.7 kilometres (km) of existing rail corridor between Moree and Camurra North, in addition to the construction of about 1.6 km of realigned rail corridor within a greenfield area.

Key features of the proposal are:

- ▶ enhancement of about 13.7 km of existing track through minor adjustments to the vertical and horizontal alignment, and the construction of about 1.6 km of new rail corridor, including rail embankments
- ▶ demolition and reconstruction of eight underbridges at Mehi River, Gwydir River, Skinners Creek, Duffys Creek and at four other un-named water courses
- ▶ installation of approximately 1,100 new flood relief box culverts along the formation
- ▶ three new signalised level crossings at Gwydirfield Road, the Rocks Road and Back Pally Road, replacing the existing level crossings
- ▶ realignment and changes to 6 private level crossings (including closure of one private level crossing)
- ▶ new turnout between the Gwydir River and Back Pally Road, immediately north of the new Gwydir underbridge, to provide a connection to the Inland Rail/North Star line to the east and the Weemelah line to the west
- ▶ decommissioning and removal of the Camurra hairpin and the associated formation, through the construction of the greenfield Camurra Bypass, providing connections to the existing rail lines to the east and the Weemelah line to the west
- ▶ reconstruction of a new rail spur for the Weemelah line.

Associated works would include installation of signalling systems, signage, fencing, drainage, the relocation of services and utilities where necessary and the formation of rail maintenance access roads (RMARs) within the rail corridor adjacent to the line. The construction and operation of the proposal would also require the following ancillary facilities:

- ▶ construction access and haul roads linking to the surrounding public road network
- ▶ construction storage and laydown areas
- ▶ associated earthworks for the construction of pads for piling rigs and cranes at underbridge locations.

Additional ancillary facilities could also include mobile batch plant, accommodation for construction workers and construction water supply and storage.

The proposal would require temporary occupation and permanent acquisition of land along the alignment. A total of 27 lots would be impacted by permanent land acquisition, including approximately 4 hectares (ha) of private land within 12 lots and 9 ha of Crown Land within 15 lots.

28.1.2 Operation

Once operational, the proposal would form part of the rail network managed and maintained by ARTC, with trains operated by a variety of operators. Inland Rail, in its entirety, would be operational once all 13 sections are complete, which is estimated to be in 2027. Prior to this, N2NS Phase 2 would form part of the existing network serving grain operations on currently active rail lines to North Star and Weemelah. Therefore, use of the proposal section could occur prior to operation of Inland Rail. This activity would recommence following the completion of construction of the proposal and N2NS Phase 1.

Maximum train speeds would range from 80 to 115 kilometres per hour (km/h), except through Moree, where the maximum train speed would be 60 km/h due to track geometry and safety.

Based on current demand forecasting, N2NS Phase 2 is expected to have an annual average of about 11 trains per day travelling between Camurra and Moree in 2027. This would increase to about 20 trains per day in 2040.

The new rail line would be a faster, more efficient route that bypasses the Sydney rail network and would enable the use of double-stacked trains along its entire length. The Inland Rail trains would be a mix of grain, bulk freight and other general transport trains. Total annual freight tonnages would be about 11.8 million tonnes in 2027, increasing to about 19 million tonnes in 2040 (from the existing two million tonnes of grain per year).

28.1.3 Construction

Construction of the proposal would commence once all necessary approvals are obtained, and the detailed design is complete. It is anticipated that construction would take about 24 months, starting in 2024.

The majority of works involve upgrading the rail track within the existing rail corridor. There would also be approximately 1.6 km of new track realignment, that would bypass the existing Camurra hairpin curve. The Camurra hairpin curve would be removed, with the track formation reused in the new track realignment and the redundant rail corridor rehabilitated as part of the proposal.

Construction would typically involve the following indicative sequences:

- ▶ Sequence 1: Site establishment and enabling works
- ▶ Sequence 2: Demolition of existing structures, including bridges and culverts
- ▶ Sequence 3: Construction of new bridges
- ▶ Sequence 4: Installation of culverts
- ▶ Sequence 5: Track works
- ▶ Sequence 6: Camurra hairpin
- ▶ Sequence 7: Rehabilitation.

Further details of the construction sequencing are described in Chapter 8 of the EIS.

28.2 Compliance with statutory requirements

28.2.1 Summary of the approval process

The proposal is permissible without consent through the effect of the Transport and Infrastructure State Environmental Planning Policy (SEPP). The proposal is State Significant Infrastructure (SSI) and it requires approval from the Minister for Planning under Division 5.2 of the EP&A Act. An environment protection licence

(EPL) is required under the *Protection of the Environmental Operations Act 1997* for the construction of the proposal. In relation to the operation component of the new section of track, either a modification to the existing EPL or a new licence would be required due to condition A1.2 of the existing EPL.

Notice of the application for planning approval must be given to the landowners in accordance with clause 181(6) of the EP&A Regulation.

Ministerial approval would be sought to close level crossings, bridges or other structures in accordance with section 99B of the *Transport Administration Act 1998* *Transport Administration Act*.(NSW). Prior to closing the crossing, TfNSW and the local council must be notified.

A licence would be sought under the relevant water regulatory regime if required, and a permit would be sought under the *Roads Act 1993 No 33* (NSW) for closure or works within roads.

The proposal was referred to the Australian Government's Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) for consideration as to whether the proposal was deemed to be a controlled action under the EPBC Act due to the presence of Matters of National Environmental Significance (MNES). The proposal was declared a controlled action. Consequently, the proposal will require approval under the EPBC Act from the Australian Government Minister for the Environment.

28.2.2 Summary of the assessment process

In accordance with Division 5.2 of the EP&A Act, the planning and approvals process includes the following key steps:

1. submission of SSI application with the supporting document to the Secretary of the Department of Planning and Environment under section 5.15 of the EP&A Act, to seek the Secretary's Environmental Assessment Requirements (SEARs)
2. preparation and submission of an EIS under section 5.16(2) of the EP&A Act, addressing the requirements of the EP&A Act and EP&A Regulation and the matters outlined in the SEARs
3. public exhibition of the EIS for a minimum of 28 days
4. preparation of either a Response to Submissions Report (Submissions Report) (if no material changes to the proposal are proposed post-exhibition) or a Submissions and Preferred Infrastructure Report (SPIR) (if material changes to the proposal are proposed post-exhibition), and submission of the report to the Department of Planning and Environment
5. assessment of the application, the EIS and the Submissions Report/SPIR by the Department of Planning and Environment (DPE) and preparation of the Secretary's Environmental Assessment Report (section 5.18 of the EP&A Act)
6. determination of the application by the minister.

The SEARs for the proposal were issued on 14 October 2020 (application number SSI-10054). This EIS has been prepared in accordance with the SEARs.

28.2.3 Monitoring and compliance

Once the SSI has been determined and approval conditions have been set, the responsible construction contractor would develop a construction environmental management plan (CEMP), which would include various compliance requirements and checklists. These checklists would include the Minister's conditions of approval, as well as any management commitment determined within the EIS. This documentation would facilitate ongoing monitoring and communication with the regulators. The proponent would also develop an operational environmental management plan (OEMP) to guide the approach to environmental management during operation.

The CEMP and OEMP would:

- ▶ reference all relevant statutory and other obligations, including consents, licenses, approvals, and voluntary agreements required
- ▶ outline the environmental management practices and procedures, execution responsibilities and monitoring and reporting requirements to be followed
- ▶ document processes for demonstrating compliance with the commitments made in this EIS, the submissions report (to be prepared), and relevant approval conditions

- ▶ document processes for reporting non-compliances and incidents
- ▶ be prepared in consultation with relevant agencies and in accordance with the Guideline for the Preparation of Environmental Management Plans (Department of Environment, 2014).

28.3 Justification of the proposal

28.3.1 Summary of proposal justification

Australia's freight task is set to experience significant growth over the coming decades. The existing freight infrastructure cannot support this projected growth, with increasing pressure on already congested roads and rail lines through Sydney and on major highways and increasing use of heavy trucks such as B-doubles and potentially B-triples.

Inland Rail will address the growing freight task by helping to move freight off the congested road network and moving interstate freight off the already congested suburban rail network. It provides a reliable road-competitive solution to the freight task and enables the commercial and social benefits of rail to meet Australia's long-term freight challenge.

Inland Rail will connect key production areas in Queensland, NSW and Victoria with export ports in Brisbane and Melbourne, and provide linkages between Melbourne, Brisbane and Sydney, and eventually Adelaide and Perth (via Inland Rail connections to the east-west rail lines). It will reduce freight transit times, reduce congestion on rail and road networks and enable the movement of larger freight volumes via rail, by making the movement of longer and double-stacked trains possible.

Inland Rail will provide the backbone infrastructure necessary to significantly upgrade the performance of the east coast rail freight network to better serve future freight demands, while also diverting demand from the constrained road freight and rail passenger network.

In summary, as described in Chapter 5: Need for the Inland Rail Program and the strategic context of the proposal, Inland Rail is needed to respond to the growth in demand for freight transport and address existing freight capacity and infrastructure issues. The analysis of demands undertaken by ARTC indicated that there would be sufficient demand for Inland Rail.

The strategic context of the proposal is influenced by the outcomes of several strategic plans for transport, development and freight that have been prepared at the national, state, and regional levels. Key national and state strategies, policies and plans have also informed and influenced the vision, objectives and development of the proposal.

The proposal is a critical component of Inland Rail and has been designed to minimise environmental and social impacts, while still contributing to the overall efficiency of Inland Rail.

The N2NS Phase 2 proposal is needed to improve flood immunity and realign the track through the Moree Plains and to safely and efficiently cross two major river systems as part of the floodplain—the Mehi and the Gwydir rivers. Without the Phase 2 component of the proposal, the provision of faster and more efficient connections that are less prone to delays from flooding, would not be possible for the entire route of the Inland Rail.

28.3.2 Summary of proposal benefits

The proposal provides for the following major benefits:

- ▶ it reduces the risk of disruption/closure of the rail line due to flooding, particularly through the Gwydir floodplain
- ▶ it avoids the need for trains to slow down, by constructing a new section of track to eliminate the need to use the Camurra hairpin curve
- ▶ upgrades two bridges, which will allow heavier loads and enable trains to travel at increased speeds.

28.3.3 Consequences of not proceeding

- ▶ The proposal is an integral component of the Inland Rail route between Melbourne and Brisbane, and Inland Rail could not proceed if the proposal does not proceed, which would mean the benefits of Inland Rail would not be realised.

28.3.4 Environmental considerations

Environmental investigations were undertaken during preparation of the EIS to assess the potential impacts of the proposal. The EIS has documented the potential environmental impacts of the proposal, considering both potential positive and negative impacts, and identifies mitigation and management measures to protect the environment where required.

28.3.4.1 Biophysical

The impacts of the proposal on the biophysical environment include a number of impacts on biodiversity, hydrology, surface water, groundwater, air quality and soils.

Direct impacts to biodiversity would occur through clearing areas of native vegetation for permanent and temporary construction facilities, resulting in the direct loss of native flora and fauna habitat, and the potential injury and mortality of fauna during clearing. The clearing of vegetation would also reduce habitat connectivity, preventing fauna from moving across the landscape to breed. The removal of habitat features such as hollow bearing trees would further contribute to the direct loss of fauna habitat. Three threatened ecological communities were confirmed as present within the proposal site, including endangered and critically endangered habitats. These include Weeping Myall Woodland, Natural Grasslands and Poplar Box Woodland. Three EPBC-listed species were recorded during the field surveys, including the Murray cod, Koala and Grey-headed flying-fox. Seven additional fauna species were considered to have potential to occur due to the presence of suitable habitat within the subject land. These species include the Belson's Panic, Painted honeyeater, Five-clawed Worm-skink, Superb Parrot, Corben's Long-eared Bat, Winged Peppercreep and Satin Flycatcher.

Potential indirect impacts to flora and fauna are also likely, including inadvertent impacts on adjacent habitat or vegetation; reduced viability of adjacent habitat due to edge effects, noise, dust or light spill; transport of weeds and pathogens from the site into adjacent vegetation; increased risk of starvation, exposure, and loss of shade or shelter for fauna; cumulative loss of breeding habitat and increased competition for remaining resources; pollution and rubbish dumping; and an increase in pest animal populations such as cane toads.

Minor changes to hydrological flows and flooding patterns would occur due to an increased rail level and the installation of additional cross-drainage structures (culverts). Flood modelling suggests the proposal would result in localised increases in afflux and velocity of flood water downstream of the rail corridor in 2% and 5% AEP flood events, with flood levels generally reduced upstream. Localised increases in flood levels upstream of the corridor are predicted in a 1% AEP event. Flood level increases in the urban area of Moree south are likely but are unlikely to exceed 20 mm. Cropping land is likely to be the most affected by changes in afflux due to the construction of the proposal.

Surface water quality impacts during construction would predominantly be caused by increased run-off volumes entering receiving waterways. The use of water for construction activities such as dust suppression, and the clearing of vegetation and stockpiling resulting in additional exposed soils, would likely result in increased run-off volumes across exposed areas and subsequently increase pollutant, sediment load, or organic matter entering receiving waterways. Geomorphological impacts to watercourses may also occur as a result of the construction of new bridges and culverts.

Groundwater impacts during construction relate mostly to groundwater quality and availability. Dewatering and changes to flow (due to piling impeding groundwater flow) may result in reduced groundwater availability for existing groundwater users, groundwater dependant ecosystems, or baseflow to creeks or river systems. Changes to groundwater quality may occur due to contamination from the storage, spillage and leaks of hazardous substances during construction or maintenance activities.

Air quality impacts are likely to be transient and short term as the construction progresses along the alignment. However, key impacts to local air quality during construction may occur as a result of dust generation from bulk earthwork, dust from exposed soil and stockpiles, emissions associated with the operation of construction plant and machinery, emissions associated with increased construction vehicle movements, and dust and particulate matter from the demolition and removal of existing track, culverts and bridges.

Soil and land related risks associated with the construction and operation of the proposal relate to the disturbance and erosion of soils during earthwork activities, including vegetation clearing. This has the potential to cause sedimentation or contamination of waterways down-gradient from the proposal. The contamination of land and nearby waterways is also possible where contaminated material leaks or spills.

28.3.4.2 Social and economic

The main potential impacts of the proposal on the socio-economic environment (including land use, heritage, and socio economics) include:

- ▶ changes to private property access arrangements as a result of changes to level crossings (all improved)
- ▶ visual impacts as a result of the introduction of a new railway and permanent structures in the landscape, including two new bridges
- ▶ amenity related impacts during construction and operation (e.g. increase in construction noise, dust, traffic)
- ▶ permanent acquisition of some land for the realignment of the Camurra hairpin and temporary occupation requirements by leases of some properties within the proposal's construction footprint (including land for access tracks and construction compounds)
- ▶ impacts to surrounding agricultural land uses and property severance due to construction of the new track and fauna fencing (in some locations)
- ▶ impacts to agricultural land uses and residential properties due to minor increases in flood levels
- ▶ employment and associated economic benefits during construction due to an increase in consumers by way of construction employees in the town of Moree
- ▶ contribution to the benefits of Inland Rail as a whole, being a direct freight line between Melbourne and Brisbane
- ▶ local and regional benefits via enhanced freight connections, allowing for the expansion and development of industry and specialised freight precincts around Inland Rail terminals which may contribute to long term economic sustainability.

28.3.4.3 Cumulative impacts

As identified in Chapter 26: Cumulative impacts, the potential for cumulative impacts between the proposal and other existing or proposed projects is generally low. The assessment did, however, conclude that the impacts from the proposal, combined with other existing and proposed projects in the study area, would likely result in cumulative impacts associated with flooding. The risk of potential cumulative impacts for this factor was found to be high, due to the combined effects of two other major projects within the study area. These two projects include the N2NS Phase 1 vertical alignment north of Moree Station and the upgrade of the Newell Highway north of the Moree town. Additional mitigation measures have been proposed for the consideration of the Department of Planning and Environment to manage and reduce the cumulative impacts on flooding and hydrology associated with these projects and the proposal.

28.3.4.4 Scale and nature of impacts

Analysis of the biophysical, social, economic and cumulative impacts associated with the construction and operation of the proposal has shown that the majority of impacts are able to be effectively managed. Detailed design, combined with the strategic implementation of key management principles and environmental management plans during construction and operation of the proposal, will ensure that the scale (extent of impact) and nature (magnitude/severity of impact) of impacts are minimised.

The key areas where the scale and nature of impacts is likely to remain more significant include:

- ▶ Land use and property—the scale of this impact is relatively minor, as the permanent acquisition of private property is limited to a total area of approximately 4 hectares (ha) of private property. However, the nature of the impact of land acquisition on property owners is likely to be significant. The permanent acquisition may result in changes to land use, which may restrict or sterilise land for agricultural operations. Impacts to utilities, travelling stock routes, and access to private and public properties during construction would also likely occur, but are not considered significant in magnitude.
- ▶ Biodiversity—the scale of biodiversity impacts is relatively low due to the majority of the proposal site being situated within the existing rail corridor and the surrounding land having been previously cleared for agricultural purposes. Accordingly, the majority of clearing is limited to the riparian zones around the Mehi and Gwydir rivers, and the construction of the Camurra bypass. The significance of impacts to biodiversity is also relatively minor, due to the nature of the existing environment (previously cleared). Impacts would be mitigated through offsets, improving biodiversity values in offset areas.
- ▶ Traffic and transport—the scale of this impact is minor, as the residual impacts associated with traffic and transport, after the implementation of mitigation measures, will be limited to increased traffic delays at the public level crossings with passing trains. Accordingly, the impact is highly localised. However, the nature of the impact is significant, in that vehicles may be delayed at the level crossing for up to 158 seconds, notably affecting travel time. This impact is not able to be mitigated, as the delay is due to the passing of trains.

- ▶ Hydrology—the scale of this impact is broad. The flood model has shown that the construction of the proposal would impact flooding and hydrological patterns across the entire Gwydir River floodplain, both upstream and downstream of the proposal. However, the nature of the impacts are relatively minor through implementing a range of design mitigations. Impact limits on agricultural land and at buildings and sensitive receivers are generally met, with minor afflux exceedances. However, an overall net reduction in the number of buildings flooded would result once the design mitigations are included.
- ▶ Heritage:
 - ▶ Non-indigenous—the scale of this impact is minor as the impact is localised to the Gwydir and Mehi river bridges only. However, the nature of the impact is significant as the proposal will require the complete demolition of the two heritage listed bridges.
 - ▶ Indigenous—the scale of this impact is also minor, as the impact is localised to seven specific archaeological sites (containing scattered artefacts and artefact deposits) within the proposal site. The nature of the impact is significant because, while the artefacts would be recovered, the site itself loses cultural heritage value.
- ▶ Noise and vibration—the scale of this impact is minor, as the area of significant impact is limited to the southern section of the alignment in Moree—in particular, the residential receivers along Moreton and Oak streets. Exceedances of noise management levels during construction are predicted in all modelled scenarios in this area, making the nature of the impact significant. Noise impacts are not likely to significantly impact receivers along the remainder of the alignment due to the sparsely populated nature of the agricultural areas surrounding the proposal site.

Cumulative impacts have been assessed as a low or medium level of impact significance for all aspects except hydrology. This is largely due to the potential of the proposed Newell Highway upgrade to cause flood impacts to land owners in the southern portion of the proposal, and additional surface flows originating from N2NS Phase 2 overtopping a portion of the new rail in N2NS Phase 1. Specific consultation is being undertaken between TfNSW and ARTC to avoid or minimise these cumulative impacts.

28.3.4.5 Ecologically sustainable development

The EP&A Act adopts the definition of ecologically sustainable development contained in clause 6 of the *Protection of the Environment Administration Act 1991* (NSW). An assessment of the proposal against the principles of ecologically sustainable development, as per clause 192 of the *Environmental Planning and Assessment Regulation 2021* is provided below. The principles of ecologically sustainable development, as outlined in clause 193 of the *Environmental Planning and Assessment Regulation 2021* include:

- a) the **precautionary principle**, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by—
 - i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
 - ii) an assessment of the risk-weighted consequences of various options
- b) **inter-generational equity**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,
- c) **conservation of biological diversity and ecological integrity**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration
- d) **improved valuation, pricing and incentive mechanisms**, namely, that environmental factors should be included in the valuation of assets and services, such as—
 - i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement
 - ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste
 - iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Precautionary principle

A range of environmental investigations have been undertaken during the development of the proposal and the environmental assessment process to ensure that potential impacts are understood with a high degree of certainty. The assessment of the potential impacts of the proposal is considered to be consistent with the precautionary principle. The assessments undertaken are consistent with accepted scientific and assessment methodologies and have taken into account relevant statutory and agency requirements. The assessments have applied a conservative approach with regard to construction and operational arrangements, and the modelling used.

The proposal alignment and design has evolved to avoid impacts where possible and practicable, and to reflect the findings of the studies and assessments undertaken. The route for the proposal has been selected to minimise the potential environmental impacts, particularly through maximising the use of the existing rail corridor.

Another key consideration during the design of the proposal was the mitigation of impacts associated with flooding. Mitigation and management measures have been proposed to minimise potential impacts, and these management measures would be implemented during construction and operation.

Lack of full scientific certainty has not been used as a reason to postpone or avoid identification and adoption of design or management measures to avoid or minimise environmental degradation. No threat of serious or irreversible damage to the environment arising from the proposal has been identified.

Principle of inter-generational equity

The construction of a long linear infrastructure project, such as the proposal, has the potential for some degree of environmental and social disturbance. These disturbances include, but are not limited to, the clearing of vegetation; disturbance to private properties during construction; potential disturbance of heritage sites; and localised impacts such as noise, dust, vibration and traffic. The potential for environmental and social disturbance as a result of construction, however, has to be balanced against the long-term benefits of the Inland Rail overall.

If the proposal were not to proceed, the principle of intergenerational equity may be compromised as future generations would experience the increased environmental and safety impacts associated with transport of large volumes of freight via road—in this case the Newell Highway. The strategic planning studies summarised in Chapter 5: Need for the Inland Rail Program and the strategic context of the proposal identified a strong need and justification for Inland Rail. The proposal would, therefore, as part of Inland Rail, benefit future generations by providing a safer, more efficient and environmentally sustainable means of freight transport.

Conservation of biological diversity and ecological integrity

Ecological studies have been undertaken to identify potential adverse impacts on biodiversity. Where potential impacts cannot be avoided, mitigation measures would be implemented to reduce the impact as much as possible. The route has been refined to minimise ecological impacts through using the existing rail corridor as much as possible. The proposal would, however, result in the clearing of vegetation to establish a new section of rail corridor in place of the existing Camurra hairpin curve.

A biodiversity assessment was undertaken in accordance with the Biodiversity Assessment Method (OEH, 2020) to identify potential adverse impacts on biodiversity. Mitigation measures are proposed to minimise and manage the significance of the impact on native vegetation and flora and fauna. Biodiversity offsets would be implemented to address the impacts that cannot be avoided.

Improved valuation and pricing of environmental resources

The assessment has identified the environmental and other consequences of the proposal, and identified mitigation measures, where appropriate, to manage likely impacts. If approved, the construction and operation of the proposal would be undertaken in accordance with relevant legislation, the conditions of approval, and the construction and operation environmental management plans. These requirements would result in an economic cost to the proponent. The implementation of mitigation measures would increase both the capital and operating costs of the proposal. This signifies that environmental resources have been given appropriate valuation.

The value of environmental resources is also inherently considered in the development of a design that avoids and minimises impacts. The concept design for the proposal has been developed with an objective of minimising potential impacts on the surrounding environment. The extra costs associated with designing alternate alignments, flood mitigation measures, proposal elements and features, management measures and impact offset and mitigation strategies, have been included in the total estimated proposal cost, in order to avoid and minimise environmental and social impacts. Examples include the provision of numerous culverts to minimise potential impacts on flood plains and agricultural land, and the proposed biodiversity offset package.

28.3.5 Design measures to avoid and minimise impacts

As described in Chapter 7: Proposal features and operation; Chapter 8: Construction of the proposal; and Chapter 27: Approach to environmental management, the proposal would incorporate construction management measures and design features to ensure that potential impacts are managed and mitigated as far as practicable. The majority of the potential construction-related impacts would be effectively managed by the implementation of best-practice construction management. The construction environment management plan (CEMP) outline provided in Appendix F details the various environmental management approaches and subplans to be implemented during construction of the proposal.

The approach to design development has included a focus on avoiding and/or minimising the potential for impacts during all key phases of the proposal. A design was completed based on detailed imagery, updated cadastral (land ownership) data, site investigations, ecological, geotechnical investigations, and hydrological assessments. The design approach aims to remove or minimise various types of impacts influenced by the proposed section of rail upgrade between Moree and Camurra North.

The design seeks to avoid and minimise impacts in the following areas:

- ▶ land impacts:
 - ▶ minimising land acquisition along the alignment through using the existing rail corridor as far as practicable
 - ▶ minimising land acquisition in areas where adjustments to the rail corridor were necessary to prevent short stacking
 - ▶ the current design also accommodates both the existing Newell Highway alignment and the future planned realignment of the Newell Highway whilst avoiding short stacking and accommodating vertical tie-ins at the proposed level crossings.
- ▶ biodiversity impacts:
 - ▶ proposal footprint designed to minimise clearing of vegetation, through using existing rail corridor so far as practicable
 - ▶ proposal designed to minimise impacts to waterways, riparian vegetation and in-stream flora and habitats, through prioritising bridges over culverts and avoiding any waterway diversions or realignments
 - ▶ fauna fencing included in design.
- ▶ traffic and transport interface challenges:
 - ▶ improved safety at level crossings through the inclusion of active controls at all public level crossings and enhancing passive controls at private level crossings
 - ▶ design avoids short-stacking and subsequent safety risks at level crossings and intersections through minor adjustments to the rail alignment
 - ▶ design minimises impacts to private level crossings, thereby minimising accessibility issues for landowners.
- ▶ hydrology and flooding impacts:
 - ▶ design achieves Flood Planning Level (FPL) for top of formation (TOF) minimum of 5% annual exceedance probability; and top of rail (TOR): minimum of 1% AEP. Design achieves above FPLs through raising the level of the rail by approximately 500 mm above existing levels, with a reconstructed rail formation and provision of approximately 1,100 cross-drainage structures (flood relief culverts) to allow passage of overland flow on floodplain between Mehi and Gwydir rivers
 - ▶ increasing the flood immunity of the TOF and TOR above the FPLs noted above was not considered viable due to the difficulties further track raising would present at level crossings and connections to Phase 1
 - ▶ new cross drainage structures (culverts) have been carefully sized and located to ensure they do not pass flow too efficiently through the rail corridor and adversely impact flooding on the downstream (western) side of the rail corridor. One of the key objectives of the cross-drainage design is to preserve existing flooding patterns as closely as possible as development and farming practices have adapted to the existing flood behaviour.
- ▶ heritage:
 - ▶ where feasible and reasonable, design elements of the Mehi River Bridge and the Camurra–Gwydir River underbridge would be incorporated into the new bridge designs. This would include:
 - a more sympathetic design that incorporates or references the original design of the steel Pratt truss bridges would be considered to reflect the heritage values of the Mehi River Bridge and Camurra–Gwydir River underbridge
 - the new bridges would be designed in consultation with suitably qualified heritage consultants and heritage architects.
- ▶ noise impacts:
 - ▶ design has identified the preferred bridge piling method for the Mehi River Bridge to be vibratory and bored piling, compared to driven piling to minimise noise close to the town of Moree
 - ▶ design has considered use of operational noise mitigation measures including noise barrier and/or at property treatments. These would be explored further during detailed design.
- ▶ social impacts:
 - ▶ access to private properties would be maintained throughout construction and operation
 - ▶ active signals at level crossings may cause an increase in travel time for commuters. However, upgrades to the track would allow for increased train speeds, thereby reducing waiting time in some instances.

28.4 Consultation and issues raised

In response to community gathering restrictions due to the COVID-19 pandemic, ARTC undertook a flexible approach to consultation. Regionally based staff personally attended consultation events and landowner meetings, supported by other team members attending and presenting online. This enabled a greater presence of experts than may have ordinarily been possible.

The meetings with landowners involved a hydrologist, regionally based engagement officers, the Senior Environmental Adviser and an engineering specialist where relevant or requested. Community information sessions during this period involved two virtual sessions and three face-to-face sessions.

The online approach to consultation enabled more flexibility for stakeholders to participate, especially considering the regional project area. By hosting a community information session online, ARTC assisted stakeholders to participate in their homes and have access to all members of the project team to ask questions or raise concerns.

Three separate sessions were undertaken with stakeholders during the EIS and centred on three different themes:

1. Hydrology model and proposal overview: August to September 2020
2. Understanding impacts, feedback on design: November to December 2020
3. Noise and what it means: February 2021.

28.4.1 Results of consultation relevant to the EIS

A number of interests and issues were raised by stakeholders and community members in meetings, briefings, information sessions, and via email and phone during the preparation of the EIS. Hydrology was the key concern raised across consultation events, reflecting the complexity of the proposal area and justifying the removal of this section from the N2NS alignment.

A summary of the key issues raised by stakeholders and community members during the consultation rounds included:

- ▶ property impacts:
 - ▶ process and timing of property acquisition and temporary land leases
 - ▶ concerns about property devaluation
 - ▶ impact of proposal on future property plans (subdivisions, selling property)
 - ▶ fencing of rail corridor needs to reflect land use (crop, livestock)
 - ▶ impact on irrigation channels and operations during construction
- ▶ traffic and access to properties:
 - ▶ safety at level crossings
 - ▶ wait times at level crossings
 - ▶ ensuring emergency access clearance is maintained
 - ▶ design allowance for farming machinery and trucks at level crossings
 - ▶ improved road safety by freight moving on rail once operational
 - ▶ detour routes and lengths during construction
 - ▶ impacts on heavy vehicle movements during construction, particularly during harvesting and planting times
 - ▶ impacts of construction and operation on travelling stock routes
 - ▶ interaction with the Newell Highway
 - ▶ safety concerns regarding road width and sight lines at Gwydirfield Road (underbridge)
 - ▶ maintaining access to irrigation channels within the rail corridor
 - ▶ maintain access to the rail corridor for weed management
 - ▶ maintaining access across the rail line for Aboriginal communities
- ▶ hydrology and flooding concerns including flow duration, depths and velocities:
 - ▶ concern around interfaces with highway upgrades and floodplain management programs
 - ▶ culvert location and heights
 - ▶ changes to flow duration, depth and velocity

- ▶ impacts of flooding related to levee bank heights in the area
- ▶ maintaining water flow through the rail line
- ▶ noise and vibration:
 - ▶ impact of noise and vibration during operation
 - ▶ concern about vibration impacts to property during piling as part of bridge construction
 - ▶ noise mitigation measures available to nearby landowners
 - ▶ nature of noise carrying along the Mehi River and across from the rail line
 - ▶ concern about operational noise modelling results and lack of mitigation measures required according to the Rail Infrastructure Noise Guideline (RING) (EPA, 2017)
 - ▶ concern about graffiti/crime associated with the noise wall mitigation option
 - ▶ concern about sleep disturbance for shift workers during construction
- ▶ social and economic impacts:
 - ▶ opportunities for local jobs and bringing people to the area
 - ▶ increased connectivity for farmers and new industries
 - ▶ better pricing of grains to more competitive and broader markets
 - ▶ opportunities for community partnerships, grants and sponsorship
- ▶ visual impacts and amenity during operation
- ▶ negative health impacts from air quality.

As part of the EIS development, ARTC responded to the feedback obtained during the consultation process such as:

- ▶ modifying the construction impact zone/construction footprint to minimise impacts to properties
- ▶ using local, commercial sources rather than setting up specific borrow sites for the proposal
- ▶ installing additional culverts on the floodplain to assist mitigations of flooding onto private properties
- ▶ further consideration will be undertaken during detailed design of widening of bridge piers to allow for widening of Gwydirfield Road under the Mehi River Bridge
- ▶ access under bridges and for the travelling stock route to be maintained to ensure farmers are able to move livestock from one side of the rail line to the other
- ▶ initiation of focused consultation in the southern sector of the project to determine practical and feasible noise abatement solutions to impacted residents.

28.4.2 Ongoing consultation

Ongoing consultation will be undertaken during the development of the detailed design and issues raised will be carried into the detailed design phase to be further developed.

This EIS will be placed on public exhibition by the Department of Planning and Environment (DPE) for a minimum of 28 calendar days. During this period, stakeholders and the community will be able to review the EIS and are invited to make submissions.

The EIS will be made available for viewing on the DPE and Inland Rail websites. Anyone who wishes to make a submission will be able to review the EIS and send submissions to DPE for consideration.

28.5 Concluding statement

The proposal involves upgrading the existing rail line between Moree and the Camurra North, with a 1.6 km section of new track to replace the Camurra hairpin.

The proposal is justified in terms of its strategic need and its anticipated benefits, taking into account the matters of ecologically sustainable development. The proposal is considered to best meet the objectives compared to all other alternatives considered.

This EIS has been prepared in accordance with the provisions of Part 5.2 of the EP&A Act and addresses the Secretary's Environmental Assessment Requirements (SEARs). It also includes consideration of the issues raised by the community and stakeholders during the development of the proposal.

It is inevitable that a proposal of this scale and location in a rural environment would have some adverse impacts, particularly during construction. These adverse impacts should be considered within the context of the overall objectives of the proposal and the significant benefits it would provide over the medium to longer term, and particularly for future generations.

Key environmental issues have been examined throughout the design development process. Consultation has been carried out with affected stakeholders to identify key potential impacts at an early stage and, where possible, avoided or appropriate mitigation measures developed. This has resulted in a number of design changes that have minimised many of the potential significant impacts.

Provided the measures and commitments specified in the EIS are applied and effectively implemented during the design, construction and operational phases, the justification for the proposal to proceed outweighs the identified environmental impacts.