INLAND RAIL

Submissions Report

Appendix G

North Star to NSW/Queensland Border

Environmental Impact Statement

ARTC

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

IR_1535

APPENDIX

G

Revised Environmental Mitigation Measures

NORTH STAR TO NSW/QUEENSLAND BORDER ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Appendix G: Revised Environmental Mitigation Measures

The following table contains the revised list of Outline Environmental Management Plan mitigation measures from EIS Chapter 27. Where the cell has been left blank, there has been no changes to this mitigation measure.

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Biodiversity	Detailed design	Flora and fauna/ biodiversity	BD.1	Undertake detailed design and/or construction planning to minimise the construction footprint and avoid impacts to vegetation as far as practicable. Clearing of vegetation will be limited as far as practicable and disturbance is to only occur within the approved footprint.	
			BD.2	A Biodiversity Management Sub-plan will be developed as part of the CEMP. This plan should include appropriate criteria, directives and procedures in relation to: ▸ Methods and sequencing of threatened plant surveys, in accordance with the requirements of *Guide to Surveying Threatened Plants* (OEH, 2016) ▸ Methods and sequencing of pre-clearance fauna surveys, including terrestrial, aquatic and breeding habitats (including burrows and hollow bearing trees/logs, existing culverts and structures) ▸ Staging works to avoid animal breeding periods where possible.	
			BD.3	Develop a Soil Management Sub-plan that includes procedures and protocols relevant to potential impacts to the receiving environment: ▸ Soil/land conservation objectives for the proposal ▸ Management of problem soils (refer Chapter 15: Land Resources and Contamination), such as: ▸▸ Cracking clays (vertosols) that are expected to be encountered directly south of the Macintyre River ▸▸ Saline soils, particularly in potential expression areas, such as soil salt stores, artificial restrictions and roads. ▸ Specification of the type and location of erosion and sediment controls. The erosion and sediment control measures, developed in accordance with the *Managing Urban Stormwater* series (Bluebook) (DECC, 2004; DECC, 2008) to be implemented during construction of the proposal include: ▸▸ Minimise disturbance of areas identified as susceptible to erosion ▸▸ Use existing tracks, where possible. Design new access tracks (permanent and temporary) with the aim of minimising disturbance of substrates and vegetation ▸▸ Water quality and erosion-control measures that consider site-specific soil types Prescribed erosion and sediment controls relevant to the site risk.	
		Riparian vegetation and aquatic habitats	BD.4	The design will continue to be developed to minimise the extent of impacts to waterways, riparian vegetation and in-stream flora and habitats, in accordance with relevant policies and guidelines, including: ▸ *Policy and Guidelines for Fish Habitat Conservation and Management Update 2013* (Fairfull and Department of Primary Industries (DPI), 2013) ▸ *Guidelines for controlled activities on waterfront land* (DPI, 2012).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Biodiversity [continued]	Detailed design [continued]	Water quality	BD.5	A Surface Water Management Sub-plan will be developed as a component of the CEMP. The sub-plan will provide a surface water monitoring framework for the proposal that establishes: ▸ Frequency, testing requirements and location of surface water sampling during construction of the proposal, with consideration for: ▸▸ Construction activities with potential to impact water quality ▸▸ Seasonality ▸▸ Sensitivity of receiving watercourse. ▸ A risk-management framework for evaluation of the risks to surface water quality and ecosystems in the receiving environment, including definition of instances (including accidental discharge of contaminants and sediments) that trigger contingency and ameliorative measures ▸ Responses to impact threshold exceedances.	
		Fauna passage	BD.6	Fauna movement opportunities identified during the reference design process will be developed and refined during detailed design. Development of these opportunities will involve: ▸ Assessment of the compatibility of each approach with the general design principles at each location ▸ Assessment of adjacent habitat and connectivity (including existing adjacent land use) ▸ Consideration of safety requirements for the rail corridor and adjoining properties ▸ Elevated fauna crossing structures may be required to provide clearance over double-stacked trains (e.g. glider poles). To be determined in detailed design, taking into account safety requirements (e.g. for higher bridges or viaducts, rope bridges may be more practical) ▸ For higher bridges or viaducts, rope-bridge underpasses may be more practical ▸ Fauna crossing structures that may be suitable include glider poles, rope-bridge underpasses and fauna furniture within culverts ▸ Fauna exclusion fencing will be used to channel fauna towards crossing structures ▸ Fish passage measures will be assessed in consultation with NSW DPI Fisheries for implementation.	Added last point as a result of Goondiwindi Regional Council submission ID #136

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Biodiversity [continued]	Detailed design [continued]	Fauna fencing	BD.7	Fauna fencing opportunities will be further developed during detailed design. Development of these opportunities will involve: ▸ Assessment of the compatibility of each approach with the general fencing principles at each location and existing land use ▸ Consideration of safety requirements for the rail corridor and adjoining properties, e.g. rail corridor fencing has not been proposed across the Macintyre River floodplain to prevent the possibility of debris accumulation in fencing during flood events Consideration of maintenance constraints that a fauna connectivity or fencing opportunity may introduce.	
		Fauna fencing [continued]	BD.8	Priority will be given to fauna fencing in areas identified as State, regional or local fauna movement corridors, to channel fauna toward safe movement options (i.e. culverts) in order to limit vehicle strikes and associated incidents.	
		Aquatic fauna	BD.9	The design will continue to be developed to minimise the extent of impacts to waterways, riparian vegetation and in-stream flora and habitats, in accordance with the current applicable policies/legislation.	
			BD.10	The detailed design will be developed to minimise the potential for watercourse diversion, as defined under the Fisheries Management Act 1994 (Qld)	
			BD.11	Detailed design and construction will be undertaken to ensure fish passage is maintained. Any watercourse crossing structures will be designed in accordance with, Why do fish need to cross the road? Fish passage requirements for waterway crossings (DPI, 2003).	
		Flora	BD.12	Construction areas including compounds, stockpiles, fuel storage areas, laydown areas and staff parking will be located and established outside the tree protection zone, as defined in AS4970-2009 Protection of trees on development sites (Standards Australia, 2009).	
		Weeds and pests	BD.13	A Biosecurity Management Sub-plan will be developed as a component of the CEMP in accordance with the *Biosecurity Act 2015* (Cth).	
			BD.14	Property-specific biosecurity requirements will be agreed with the relevant landowner/operator prior to pre-construction/construction activities occurring on that property. Agreed protocols will be documented in individual property management agreements, to be signed by ARTC and the landowner/operator.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Biodiversity [continued]	Detailed design [continued]	Rehabilitation [continued]	BD.15	A Rehabilitation and Landscaping Management Sub-plan will be developed for the proposal, as a component of the CEMP. This sub-plan will be based on the Inland Rail Landscape and Rehabilitation Strategy, the Inland Rail Landscape and Rehabilitation Framework and property-specific reinstatement commitments. As a minimum, it will establish the following: ▸ Location-specific objectives for rehabilitation of borrow pit sites, reinstatement and/or stabilisation. Objectives will differ for within the rail corridor and outside of the rail corridor. Outside of the rail corridor, property-specific and township-specific (e.g. North Star) rehabilitation and landscaping requirements may apply. ▸ Timeframes for rehabilitation and/or reinstatement/stabilisation works to be achieved ▸ Details of the actions and responsibilities to progressively rehabilitate, regenerate and/or revegetate areas, consistent with the agreed objectives ▸ Include rehabilitation requirements such as: ▸ Milling and removal of bitumen pavement ▸ Removal of any decommissioned culverts ▸ Tyning and ripping of base and sub-base material ▸ Application of soil ameliorants	
			BD.15 [continued]	▸ Topsoiling and/or compost blanket ▸ Stabilisation and rehabilitation (e.g. planting and or seeding). ▸ Consideration for maintenance or performance issues of rehabilitation, e.g. vegetation that does not grow and obscure signals or impact the longevity of rail infrastructure ▸ Procedures, timeframes, measurable performance objectives and responsibilities for monitoring the success of rehabilitation and/or reinstatement/stabilisation areas Where temporary construction facilities/borrow pits are required, land will be returned to a stable condition that complies with the conditions of applicable landowner agreements and regulatory approvals.	
		Offsets	BD.16	Restriction of the proposal footprint as far as practical, to that required to safely and efficiently construct and operate the proposal. In doing so, avoid areas of matters of national environmental significance (MNES), *Biodiversity Conservation Act 2016* (NSW) (BC Act) listed receptors and their associated habitat, where possible, thereby minimising significant adverse residual impacts to these matters.	
			BD.17	A biodiversity offset strategy will be developed in consultation with the Department of Agriculture, Water and the Environment (DAWE) (Australian Government) and the Department of Planning, Industry and Environment (NSW).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Biodiversity [continued]	Pre-construction/ construction	Flora and fauna/ biodiversity	BD.18	Scheduling of construction activities to minimise time of works in or adjacent to drainage lines, waterways or watercourses, particularly during periods of flow.	
			BD.19	Clearly mark designated 'no-go' areas and clearing extents/site boundary/limit of works prior to any vegetation clearing.	
			BD.20	Where possible, minimise loss of canopy vegetation and works that will lead to the proliferation of weed species.	
			BD.21	A qualified ecologist with relevant NSW licences will undertake pre-clearance surveys of remnant and regrowth vegetation.	
			BD.22	The ecologist will supervise the subsequent clearing of where damage to any trees 3 metres (m) or greater in height may occur; where arboreal fauna has been identified in, or adjacent to, the clearing front; known and potential habitat trees, log piles, burrows, stags and nests may occur; and areas identified as containing threatened fauna species, habitat and mapped Plant Community Type (PCT)/threatened ecological communities (TECs).	
			BD.23	Scheduling of clearing activities will be done to avoid breeding seasons as far as reasonably practical. Where this is not practical, and where breeding sites are identified within the corridor during pre-clearance surveys, a suitably qualified person will provide mitigation measures for exclusion zones/relocation requirements relevant to the specific species identified.	
			BD.24	Clearing extents will be limited to the area of the permanent and temporary works, avoiding impacts to native vegetation and habitats as far as practicable.	
		Riparian vegetation and aquatic habitats	BD.25	Plant maintenance activities and refuelling must be carried out a minimum of 50 m from riparian vegetation and waterways, where practical, with appropriate interception measures in place to avoid impacts to waterways, aquatic habitats, and groundwater. Where this cannot be achieved, a risk-management approach will be applied with additional management controls applied appropriate to the level of environmental risk.	
			BD.26	The Surface Water Management Sub-plan, as a component of the CEMP, will be implemented (refer above).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Biodiversity [continued]	Pre-construction/ construction [continued]	Riparian vegetation and aquatic habitats [continued]	BD.27	Works within or adjacent to watercourses will be conducted in accordance with the intent of: ▸ *Policy and Guidelines for Fish Habitat Conservation and Management Update 2013* (DPI, 2013) ▸ Guidelines for controlled activities on waterfront land (DPI, 2012) ▸ The salvage and relocation of fish within isolated aquatic environments will be managed in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 ▸ Why do fish need to cross the road? Fish passage requirements for waterway crossings (DPI, 2003).	
			BD.28	In the event of a spill incident during construction, any impacted aquatic environments will be assessed for the presence of fauna. If necessary, salvage and recovery efforts will be undertaken.	
		Flora	BD.29	Minimise clearance of remnant vegetation to that necessary for construction. Ensure all necessary permits and approvals are in place prior to the commencement of construction.	
			BD.30	Clearly mark designated revegetation/rehabilitation zones and other no-go areas (including large significant trees) before to any vegetation clearing. High-visibility tape, barricade webbing or similar should be used. All contractors are to be briefed on clearing requirements and restrictions (including fines) to prevent over-clearing of these areas.	
			BD.31	Where possible, minimise loss of canopy vegetation and works that will lead to the proliferation of weed species.	
			BD.32	Topsoil stockpiles will be a maximum of 2.5 m in height to avoid heat sterilisation of the seed bank.	
			BD.33	Topsoil stockpiles will be managed to maintain the viability of soil seed banks for threatened flora species such as Slender Darling-pea, Silky Swainson-pea and Winged peppercress.	
		Fauna fencing	BD.34	Any required fauna fencing will be installed in accordance with the fencing strategy, which will be finalised and documented in the detailed design.	
		Weeds and pests	BD.35	The Biosecurity Management Sub-plan, as a component of the CEMP, will be implemented (refer above).	
			BD.36	The effectiveness of weed hygiene measures will be monitored as a component of the environmental monitoring procedure for the proposal.	
			BD.37	Vegetation material will be managed with a general biosecurity duty to prevent, eliminate or minimise any cross contamination due to the spreading of known weeds.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Biodiversity [continued]	Pre-construction/ construction [continued]	Weeds and pests [continued]	BD.38	ARTC's Enviroline will be advertised for the proposal to enable members of the public to notify ARTC of issues, including concerns regarding weeds and pests.	
		Erosion and sediment control	BD.39	Implement the Soil Management Sub-plan, including erosion and sediment controls, as a component of the CEMP.	
		Rehabilitation and landscaping	BD.40	The Rehabilitation and Landscaping Management Sub-plan, as a component of the CEMP, will be implemented (refer above).	
			BD.41	Rehabilitation of disturbed areas will be undertaken progressively and in accordance with the Rehabilitation Management Sub-plan.	
	Operation	Riparian vegetation and aquatic habitats	BD.42	Maintenance activities within or adjacent to watercourses will be conducted in accordance with relevant NSW policies and guidelines.	
		Weeds and pests	BD.43	Weed management protocols for the operational rail corridor and other ARTC facilities will be in accordance with the requirements of the *Biosecurity Act 2015* (Cth) and incorporated into the OEMP. These protocols will include: ▸ Site hygiene and waste-management procedures to deter pest animals ▸ Weed surveillance and treatment during operation and maintenance activities ▸ Requirements in relation to pesticide and herbicide use, including any limitations on use. Restrictions may apply in proximity to watercourses, known areas of MNES or BC Act listed receptors, habitat or land uses sensitive to spray-drift from the application of pesticides and herbicides ▸ Erosion- and sediment-control risks associated with broad-scale weed removal or treatment.	
			BD.44	ARTC's Enviroline will be advertised for the proposal to enable members of the public to notify ARTC of issues, including concerns regarding weeds and pests.	
		Fauna fencing	BD.45	Fauna fencing and adjacent vegetation clearance zones (3 m) will be inspected and maintained during operation to retain the fauna fencing integrity.	
			BD.46	Vegetation maintenance on the habitat side of the fauna exclusion fencing associated with fauna passages would be required to ensure that species cannot use vegetation to climb onto the exclusion fencing.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Heritage	Pre-construction/ construction	Heritage (General)	HT.1	Clearing extents/site boundary/limit of works are consistent with proposal extents defined in a condition of approval.	
			HT.2	Clearing extents are limited to that required to undertake the works.	
			HT.3	The clearing extents/site boundary/limit of works is clearly defined, with flagging or marking tape, signage or other suitable means, to delineate no-go areas. This delineation and marking process will be incorporated and align with the flagging/marking tape process and specifications for the proposal, to ensure that it aligns with the greater Inland Rail program processes and does not conflict or contradict any of their demarcation.	
			HT.4	Disturbance is minimised, to avoid impacts to identified heritage as far as practicable.	
			HT.5	A Heritage Management Sub-plan will be developed as part of the CEMP, which complies with the proposal conditions of approval, relevant regulatory requirements and State or Commonwealth guidelines. This plan should include appropriate criteria, directives and processes on: ▸ Site registry with approved management requirements ▸ Requirements and protocols for heritage clearances including engagement of Registered Aboriginal Parties (RAPs) for areas of Aboriginal heritage sensitivity ▸ Unexpected finds procedure, including the following steps: 1. All activity to cease within a 10 m buffer of the suspected find, and the area to be cordoned off using temporary fencing 2. Site supervisor is to be immediately notified, who will then engage a qualified heritage advisor to assess the find 3. If the find is determined to be Aboriginal cultural heritage, the Department of Premier and Cabinet and the RAPs are to be notified immediately of the find. The heritage advisor is to consult with the RAPs on the management of the object and prepare a site card for submission to the Aboriginal Heritage Information Management System (AHIMS) register. Including details on analysis of lithic material with respect to both surface finds and excavated materials (where applicable): ▸ Consultation engagement protocols and dispute resolution process for Aboriginal heritage ▸ Relocation methodology of salvaged material (where applicable) ▸ Requirements for inspections and corrective actions during construction and other activities in vicinity of heritage items ▸ Heritage management actions to be undertaken by suitably qualified persons	New mitigation detail in regards to lithic material as a result of Heritage NSW—Aboriginal Culture Heritage submission ID #108

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Heritage [continued]	Pre-construction/ construction [continued]	Heritage (General) [continued]	HT.5 [continued]	▸ Requirements for training, inspections, corrective actions, notification and classification of incidents, record keeping, monitoring and performance objectives for handover on completion of construction ▸ Any other requirements necessary to comply with conditions of approval, subsequent approvals or regulatory requirements.	
		Isolated artefacts and low-density artefact scatters (<100 artefacts)	HT.6	Aboriginal artefacts are to be surface collected as per the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW Department of Environment Climate Change & Water, 2010).	
			HT.7	Historical artefacts determined to be of high significance are to be surface collected as per the *Historical Archaeology Code of Practice* (Heritage Office, 2006a).	
			HT.8	Individual artefacts are mapped using tablet devices and/or handheld differential GPS.	
			HT.9	An Aboriginal Site Impact Recording Form will be completed for Aboriginal stone artefacts, where required.	
			HT.10	All historical heritage items are to be analysed by a historical heritage professional.	
		Artefact scatters (>100 artefacts)	HT.11	Aboriginal artefacts are to be surface-collected as per the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW Department of Environment Climate Change & Water, 2010).	
			HT.12	Historical artefacts determined to be of high significance are to be surface-collected as per the *Historical Archaeology Code of Practice* (NSW Heritage Office, 2006a).	
			HT.13	Individual artefacts are mapped using tablet devices and/or handheld differential GPS.	
			HT.14	A program of test excavation is to be undertaken as per the requirements of the relevant code and approved Heritage Management Plan.	
			HT.15	An Aboriginal Site Impact Recording Form will be completed for Aboriginal stone artefacts, where required.	
			HT.16	All historical heritage items are to be analysed by a historical heritage professional.	
		Aboriginal culturally modified trees	HT.17	All culturally modified trees are to be avoided as far as practicable.	
			HT.18	Where avoidance is not achievable and salvage is appropriate, a program of consultation must be undertaken with the relevant Aboriginal Parties to identify a suitable salvage methodology and agreement on keeping place.	
		Historic heritage	HT.19	A program of archival recording is to be undertaken prior to construction. This program will seek to map the full extent of each site, through surface finds, and documented with photographs as per the NSW guidelines (Heritage Office, 2006b).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Surface water	Construction	Increased water turbidity and sedimentation	SW.1	A Stormwater and Erosion and Sediment Control Management Sub-plan will be developed as part of the CEMP, which complies with the project conditions of approval, relevant regulatory requirements and industry guidelines (e.g. *Managing Urban Stormwater—Soils and Construction—NSW* (DECC, 2004)). This is expected to include: ▸ Water quality and soil/land conservation objectives for the proposal ▸ Temporary erosion- and sediment-control measures (including progressive erosion and sediment control plans that allow for staging of erosion and sediment controls as construction progresses) ▸ Rainfall monitoring requirements across the project area ▸ Workplace health and safety requirements relating to management of contamination and unexploded ordnance risk (UXO) ▸ Management of problem soils (e.g. acid sulfate soils and erosive, dispersive, reactive, acidic, sodic or alkaline soils) ▸ Stockpiling and management/segregation of topsoil where it contains native plants, seedbank or weed material ▸ Vehicle, machinery and imported fill hygiene protocols and documentation ▸ Measures to prevent/minimise mud and dirt being tracked onto public roadways by trucks and any equipment leaving the site ▸ Requirements for training, inspections, corrective actions, notification and classification of environmental incidents, record keeping, monitoring and performance objectives for handover on completion of construction ▸ Any other requirements necessary to comply with conditions of approval, subsequent approvals or regulatory requirements.	
			SW.2	The construction of bridges, waterway crossings and waterway realignment/diversions is scheduled and/or staged to minimise impacts to bed, banks and environmental flows, in accordance with relevant regulatory requirements.	
			SW.3	Design and construction of waterway realignments considers staging requirements/temporary works, in accordance with relevant regulatory requirements.	
			SW.4	The siting of temporary construction facilities compounds, stockpiles, fuel storage, laydown areas, temporary access roads and staff parking will be in accordance with the project conditions of approval and sited to minimise the extent of disturbance.	
			SW.5	Temporary waterway crossings are rehabilitated in accordance with conditions of approval and the Reinstatement and Rehabilitation Plan.	
			SW.6	Riparian vegetation and aquatic habitats are identified and avoided, where possible.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Surface water [continued]	Construction [continued]	Increased water turbidity and sedimentation [continued]	SW.7	The project must be designed, constructed and operated so as to maintain the NSW Water Quality Objectives where they are being achieved within the locality of this proposal, unless an Environmental Protection Licence in force in respect to the proposal contains different requirements in relation to the NSW Water Quality Objectives, in which case those requirements must be complied with. These outcomes will be identified in the CEMP.	
		Changes to water chemistry	SW.8	The boundary requirements defined for the proposal allow sufficient room for provision of the required temporary and permanent erosion and sediment control/pollution control measures, where identified, as a mitigation measure for an identified environmental impact or risk.	
			SW.9	The siting and scale of stockpiles, construction compounds, fuel storage and laydown areas and other construction areas will be informed by a flood risk assessment, relevant conditions of approval and relevant regulatory requirements.	
			SW.10	Opportunities to re-use/recycle construction water are identified and implemented, where feasible, during construction.	
			SW.11	Requirements for construction water (volumes, quality, demand curves, approvals requirements and lead times) will be defined during design, e.g. water used for dust suppression will not result in adverse environmental or health impacts.	
			SW.12	A surface water monitoring framework will be developed as part of the Soil and Water Management Sub-plan in the CEMP. It will identify monitoring locations at discharge points and selected locations in watercourses where works are being undertaken.	
			SW.13	Water quality should be monitored during construction in accordance with the Surface Water Monitoring Framework.	
	Operations	Increased water turbidity and sedimentation	SW.14	Demolition of bridges and waterway crossing structures does not introduce pollutants or waste materials into waterways.	
		Changes to water chemistry	SW.15	Maintenance activities and refuelling must be carried out at an appropriate distance from riparian vegetation and waterways, with appropriate measures in place to avoid impacts to waterways, aquatic habitats, and groundwater in accordance with relevant regulatory requirements. Specifically, relevant legislation and regulations that specify requirements about permissible works in/near watercourses, and release of contaminants to waters, should be referred to. Additionally, relevant Australian Standards should be considered and adhered to where applicable and relevant.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Ground water	Detailed design	Water resources	GW.1	Further assessment of design concepts will be undertaken at watercourse crossings to minimise embankment loading or compaction of alluvial sediments and mounding of groundwater levels (i.e. use of pilings).	
			GW.2	Assessment of sizing for longitudinal drainage for permanent drainage features.	
			GW.3	Define requirements for construction water (volumes, quality, demand curves, approvals requirements and lead times), storage locations along the construction footprint, e.g. water used for dust suppression will not result in adverse environmental or health impacts.	
			GW.4	Moderate and high potential aquatic and terrestrial groundwater dependent ecosystems (GDEs) have been identified within the groundwater study area and can potentially be impacted by the proposal. Field truthing of these particular environments will be undertaken to confirm the location and status of potential GDEs within the predicted impact areas.	
		Water quality	GW.5	Further assessment of potential borrow pit areas to confirm quality of material to ensure no contamination.	
	Pre-construction	Water resources	GW.6	Confirm (i.e. physical survey/'ground truth') the location of registered bores that may be lost due to construction or operation of the proposal and engage with licensed users to determine mitigation strategy (e.g. replacement of water supply, if required).	
			GW.7	Undertake bore survey/census to identify any potential unregistered bores (landowners) that may be impacted by the proposal.	
			GW.8	Confirm sources for construction water requirements (surface water, groundwater, municipal supply, etc.) via consultation with relevant stakeholders (including landowners/occupants) prior to construction. Appropriate approvals and agreements will be sought for the extraction of water. Where private water sources are used for construction, monitoring will be undertaken during extraction to ensure volumes and conditions stipulated by licence requirements and/or private landowner agreements are met.	
		Water quality	GW.9	Identification and/or reuse of contaminated, hazardous or potentially contaminated material onsite (i.e. soil, ballast) will be subject to a risk assessment and managed in accordance with any relevant applicable legislation and regulations.	
	Construction	Water resources	GW.10	Permanent drainage structures (precast concrete pipe products) will be installed in areas where there are significant sections of embankment fill that incorporate significant cross-drainage structures over floodplain areas.	
			GW.11	Opportunities to re-use/recycle construction water are identified and implemented, where feasible, during construction.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Ground water [continued]	Construction [continued]	Water quality	GW.12	Vehicle and plant maintenance activities will be undertaken in suitable areas, with hardstand, to minimise risk of contaminants from incidental spills or leaks from entering aquifers via infiltration or surface runoff.	
		Water quality [continued]	GW.13	Refuelling will only occur at selected sites, located to minimise impacts to surface water bodies and other sensitive receptors. These refuelling locations will be equipped with onsite chemical and hydrocarbon-absorbent socks/booms and spill kits.	
			GW.14	Laydown areas and storage areas will be located to minimise potential impacts on creeks, rivers and/or sensitive receptors such as existing groundwater bores or known GDEs.	
			GW.15	Drilling and excavation activities during construction will make use of drilling fluids and chemicals that are environmentally neutral and biodegradable, where practical. Mobile plant, drill rigs and equipment will be maintained in accordance with manufacturer requirements and inspected frequently to minimise breakdowns and decrease the risk of contamination.	
			GW.16	Any bores that are decommissioned will be undertaken in accordance with the *Minimum Construction Requirements for Water Bores in Australia—Edition 3* (National Water Commission, 2012).	
	Operation	Water quality	GW.17	Operator will notify their employees of the storage, handling, or transport of hazardous substances or dangerous goods, to raise awareness and reduce potential of associated incidents.	
			GW.18	Operator will ensure appropriate controls are in place to prevent environmental incidents, including leaks/spills from refuelling activities and locomotive operations, and to protect the environment in the event of an incident.	
			GW.19	In the event of a spill, all necessary actions will be taken to contain the spill.	
			GW.20	The supervisor or person in charge of the work activity must be notified immediately. The matter will be recorded on the reportable environmental incident checklist and, in the case of a major spill or incident, the Emergency Management Procedure (RLS-PR-044) will be followed.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Land resources	Detailed design	Erosion and sediment control	LR.1	Proposal clearing extents are limited to that required to construct and operate the works, and clearing is scheduled to minimise the exposure time of unprotected earth.	
			LR.2	An Erosion and Sediment Control Plan will be created. The Erosion and Sediment Control Plan will include temporary and permanent measures implemented across phases of the proposal that are appropriate to the site conditions, contain an erosion risk assessment, relevant environmental receptors, climatic zone and seasonal factors. It will also establish and specify the monitoring and performance objectives for handover on completion of construction. Furthermore, the plan will detail the following procedures and protocols relevant to potential impacts of land resources and contamination: ▸ Soil/land conservation objectives for the proposal ▸ Temporary/permanent erosion and sediment control measures ▸ Workplace health and safety requirements relating to management of contamination and unexploded ordnance (UXO) risk ▸ Management of problem soils (e.g. acid sulfate soils (ASS), and erosive, dispersive, reactive, acidic, sodic, or alkaline soils) ▸ Stockpiling and management/segregation of topsoil where it contains native plants, seedbank or weed material ▸ Vehicle, machinery and imported fill hygiene protocols and documentation.	
		Materials handling and storage	LR.3	A hazardous substances and dangerous goods risk management strategy will be developed to manage the potential for risks.	
		Rehabilitation	LR.4	Prepare a Rehabilitation and Reinstatement Plan to guide the approach to rehabilitation following the completion of construction. The plan should include and clearly specify: ▸ Location of areas subject to rehabilitation and/or reinstatement/stabilisation ▸ Details of the actions and responsibilities to progressively rehabilitate, regenerate, and/or revegetate areas, consistent with the agreed objectives.	
		Land and soil	LR.5	Minimise risks through appropriate geotechnical design where reactive or problem soils are present or suspected.	
			LR.6	Cut-and-fill balance and minimisation of transport requirements for import/disposal of spoil are considered as part of the design process.	
			LR.7	Soil conditions across the study area are appropriately characterised at a suitable scale in accordance with the EMP prior to construction, to inform design and environmental management measures. This includes identification of potential/actual ASS, reactive soils, erosive soils, dispersive soils, saline soils, acidic soils, alkaline soils and contaminated soils.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Land resources [continued]	Detailed design [continued]	Land and soil [continued]	LR.8	A contaminated land investigation of the NS2B rail corridor will be undertaken by a suitably qualified person in accordance with requirements of National Environment Protection Measures (NEPM) (2013) and the methodology captured in the CEMP.	
	Pre-construction/ Construction	Materials handling and storage, hazardous waste	LR.9	A CEMP will be developed as part of the project. The CEMP will detail the following procedures and protocols relevant to potential impacts of land resources and contamination: ▸ A response plan to deal with accidental spills and leaks. The supervisor or person in charge of the work activity must be notified immediately. The matter will be recorded on the reportable environmental incident checklist or the emergency management procedure ▸ All bunding, hydrocarbon and chemical storage areas are routinely checked, and their integrity and functionality maintained in a good condition, so they continue to function in an effective manner ▸ Operator must ensure appropriate controls are in place to prevent environmental Incidents, including leaks/spills from refuelling activities and locomotive operations, and to protect the environment in the event that incidents occur ▸ Spill kits will be available at all work fronts and laydown areas in the event of a spill or leak ▸ Chemical and dangerous goods storage areas will be stored and located in accordance with relevant Australian Standards ▸ Identification of contaminated, hazardous or potentially contaminated material onsite (i.e. soil, ballast) will be subject to a risk assessment ▸ Appropriate register and records of chemicals, hydrocarbons and hazardous substances and materials onsite will be kept up to date as required by the CEMP. Where appropriate, this should include a relevant risk assessment prior to the substance coming to, and being used, onsite, plus a Safety Data Sheet Register ▸ Operators must not transport hazardous substances or dangerous goods if they know, or ought reasonably to know, that a special provision applies to the transport of the goods, and the transport of the goods does not comply with the special provision. Operators must notify their employee of the storage, handling or transport of hazardous substances or dangerous goods. ▸ Refuelling to occur 50 m from a defined watercourse, overland flow path or other sensitive environment receivers where practical.	
		Contamination	LR.10	Personnel involved in ground-disturbing works must be familiar with the unexpected finds protocol/procedure and be trained in the identification of potential contaminated soil/material and relevant controls.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Land resources [continued]	Pre-construction/ Construction [continued]	Contamination [continued]	LR.11	The reuse or retention of contaminated or potentially contaminated material onsite (i.e. soil, ballast) will be subject to a risk assessment and/or occur as per the relevant components of the CEMP.	
		Erosion and sediment control, rehabilitation	LR.12	Appropriate erosion and sediment control measures are to be implemented for each phase or elements of the construction works, in accordance with the Construction Erosion and Sediment Control Plan.	
			LR.13	Reinstatement, stabilisation and rehabilitation of temporarily disturbed areas (such as laydown, site offices and temporary access tracks) will be undertaken progressively, consistent with a Reinstatement and Rehabilitation Plan.	
		Hazardous waste	LR.14	A contaminated and hazardous material survey will be undertaken prior to demolition of structures. If asbestos or other hazardous materials are identified, removal will be undertaken in accordance with relevant State guidelines and the CEMP.	
		Unexploded ordnances	LR.15	Identification of UXO will be subject to a risk assessment. Where a risk of encountering known or possible UXO is identified, assessment and identification of management options will be carried out by a suitably qualified person.	
	Operation	Land and soil contamination	LR.16	Ongoing management and maintenance of the corridor to be in accordance with existing environmental management system and corridor management procedures.	
Noise and vibration	Detailed design	Construction noise and vibration impacts on sensitive receptors	NV.1	A Noise and Vibration Management Sub-plan will be developed as a component of the CEMP. This sub-plan will include: ▸ Construction noise and vibration criteria for the proposal ▸ Location of sensitive receivers in proximity to the construction area ▸ Specific management measures for activities that could exceed the construction noise and vibration criteria.	
			NV.2	Notification process within the community engagement plan (including who to contact in the event of a complaint) to advise of significant works with potential for noise nuisance or vibration at sensitive receivers and surrounding residences/premises.	
			NV.3	Noise management measures, including controlling noise and vibration at the source, controlling noise and vibration on the source to receiver transmission path, and controlling noise and vibration at the receiver, as reasonably practical.	
			NV.4	Requirements for training, inspections, corrective actions, monitoring, notification and classification of environmental incidents/complaints, record keeping.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Noise and vibration [continued]	Detailed design [continued]	Construction noise and vibration impacts on sensitive receptors [continued]	NV.5	Confirm the proximity of sensitive receivers to finalised locations for construction activities, laydown areas and other construction-phase facilities. Continued consultation with potentially affected landowners and stakeholders to communicate the anticipated scheduling of construction works and the activities that may occur in proximity to each receiver.	
	Pre-construction	Pre-condition surveys	NV.6	Building condition/dilapidation surveys should be undertaken at receivers identified as being particularly sensitive to vibration, including heritage buildings. Building surveys should also be undertaken at vibration-sensitive receivers that are expected to exceed the structural damage vibration limits given by DIN 4150.3 and, as-required, revise the assessment of potential internal rail noise levels. This will inform the selection of appropriate acoustic mitigation measures for the structures and upgrades to any existing boundary fencing. Validation of these results will also take place during the operational phase.	Altered measure as a result of NSW Macintyre Floodplain Landowners Group submission ID #472. Added the text '... and, as-required, revise the assessment of potential internal rail noise levels. This will inform the selection of appropriate acoustic mitigation measures for the structures and upgrades to any existing boundary fencing. Validation of these results will also take place during the operational phase.'
	Construction	Consultation	NV.7	A complaint hotline will be established to enable members of the public to notify ARTC of issues, including the generation of excessive noise and/or vibration. A complaints register will also be maintained and regularly reviewed to determine if alternative work methods could be adopted in response to repetitive, same receiver complaints.	Altered measure as a result of DPIE Request for Information. This sentence was added, 'A complaints register will also be maintained and regularly reviewed to determine if alternative work methods could be adopted in response to repetitive, same receiver complaints.'
		Monitoring	NV.8	Noise and vibration monitoring will be undertaken to verify compliance with construction-phase criteria at locations and at times nominated in the Noise and Vibration Management Sub-plan.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Noise and vibration [continued]	Construction [continued]	Monitoring [continued]	NV.9	Noise and/or vibration monitoring may be undertaken in response to legitimate noise or vibration complaints to assess compliance of construction activities against adopted criteria.	
		Construction work hours	NV.10	Works in the vicinity of sensitive receivers and/or outside of the proposed construction hours should be completed in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009).	
			NV.11	Extended working hours outside of the nominated work hours for the proposal should be considered permissible where there are no nearby sensitive receivers or impacts to receivers can be appropriately managed.	
			NV.12	Time differences between NSW and Queensland from October to April must be considered when conducting works near the NSW/Queensland border. Works should be considered to be occurring outside standard hours if the time at nearby sensitive receivers is outside standard hours.	
		Equipment selection	NV.13	Equipment selections will be reviewed with a preference for adopting quieter and non-vibratory plant items near sensitive receivers, where feasible and reasonable.	
			NV.14	Appropriately sized equipment will be selected for the task, such as vibratory compactors and rock excavation equipment.	
		Blasting	NV.15	Vibration impacts from blasting will be assessed by the contractor once the locations and depths of blasting and the charges to be used are confirmed. This assessment will confirm which receivers at which blasting impacts are expected to exceed the nominated blasting vibration criteria.	
			NV.16	Where blasting impacts are expected to exceed the vibration limits, the following measures are recommended, where practicable: ▸ Reducing the charge size by use of delays and reduced charge masses ▸ Ensuring adequate blast confinement to minimise the amount of overpressure ▸ Avoiding secondary blasting where possible. The use of rock breakers or drop hammers may be an acceptable alternative. ▸ Avoiding blasting during heavy cloud cover or during strong winds blowing towards sensitive receivers ▸ Establishing a blasting timetable through community consultation, e.g. blasts times negotiated with surrounding sensitive receivers ▸ Residents, occupants and other stakeholders in a 2-km radius of a blast location will be notified a minimum of three calendar days in advance of a blast occurring.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Noise and vibration [continued]	Construction [continued]	Blasting [continued]	NV.17	ARTC will demonstrate community engagement on potential blasting impacts. If this community engagement does not result in an agreement for the relaxed objectives, then smaller charges or delayed charges would be used to comply with the *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (Australian and New Zealand Environment Council, 1990).	New mitigation measure as a result of EPA submission ID #82
		Use and siting of plant	NV.18	Where possible, the duration of simultaneous operation of noise or vibration-intensive plant will be minimised. Plant and equipment used intermittently or no longer in use will be throttled or shut down.	
			NV.19	Noise-emitting plant and equipment will be orientated away from sensitive receivers where practical and feasible.	
			NV.20	Construction plant, vehicles and machinery will be maintained and operated in accordance with manufacturer's instructions to minimise noise and vibration emissions.	
		Construction traffic	NV.21	Where reasonable, unsealed areas should be graded regularly, and potholes sealed access roads and hardstand areas filled in to reduce noise from construction vehicles.	
			NV.22	Where reasonable, construction traffic should be kept to a minimum.	
			NV.23	The speed of construction traffic should be minimised near noise-sensitive receivers.	
		Sleep disturbance noise impacts	NV.24	Notification process to advise of significant works at surrounding residential premises.	New mitigation measure added as a result of DPIE Request for Information
			NV.25	Noise monitoring to verify predicted LA1 noise levels.	New mitigation measure added as a result of DPIE Request for Information
			NV.26	Use of local barriers around noisy equipment, where feasible.	New mitigation measure added as a result of DPIE Request for Information
			NV.27	Where sleep disturbance criteria are exceeded, works generating noise with special audible characteristics should be scheduled during less sensitive time periods, where feasible and reasonable. This includes the use of chainsaws, crushing plant, jack and rock hammering, piling and vibratory rolling.	New mitigation measure added as a result of DPIE Request for Information
			NV.28	Equipment selections to be made with a preference for adopting quieter and non-vibratory plant items near sensitive receivers, where feasible and reasonable. Appropriately sized equipment to be selected for the task, such as vibratory compactors and rock excavation equipment.	New mitigation measure added as a result of DPIE Request for Information

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Air quality	Detailed design	Dust generation (windborne erosion) from construction or operation	AQ.1	Incorporate treatments in earthworks and landscape design of railway batters and other exposed surfaces.	
			AQ.2	Define and design temporary access tracks to minimise dust generation, e.g. appropriate surface treatments for the predicted construction traffic movements, installation of rumble grids, concrete pads or other physical measures to reduce trackout.	
			AQ.3	Define proposed stockpiles locations with consideration of proximity to sensitive receptors.	
		Emissions from refuelling activities during construction	AQ.4	Review and refine the location of proposed fuel tank storage locations, particularly where the separation distance to a sensitive receptor is less than 50 m.	
	Construction	CEMP	AQ.5	An Air Quality Management Plan will be prepared as a sub-plan in the Construction Environment Management Plan.	New mitigation measure as a result of EPA submission ID #105 and DPIE Request for Information
		Dust generation from earthworks, clearing and grubbing, construction activities and exposed areas within the construction disturbance footprint	AQ.6	Limit clearing to that required to construct and operate the proposal.	
			AQ.7	Where practical, stage clearing and grubbing, and construction activities to limit the size of exposed areas.	
			AQ.8	Implement controls to prevent or minimise dust generation during activities involving excavation or disturbance of soils or vegetation, or handling ballast (e.g. use water sprays or water carts for dust suppression as required).	
			AQ.9	Stabilise disturbed areas and exposed surfaces as soon as practical.	
			AQ.10	Long-term stockpiles should be avoided wherever possible; however, where necessary, long-term stockpiles should be established in locations with suitable separation from sensitive receptors and not in the path of prevailing winds (which would transport dust towards sensitive receptors). Stabilise and protect long-term stockpiles from erosive processes while not in use.	
			AQ.11	Provide timely, meaningful responses to air quality or dust complaints. This may include investigations, corrective actions, monitoring or notification to relevant authorities.	
			AQ.12	Establish and communicate the protocol for notifying relevant stakeholders when potentially dust-generating activities are planned to be carried out, with contact details for queries or complaints.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Air quality [continued]	Construction [continued]	[continued]	AQ.13	Visually monitor dust generation (visible plumes) throughout construction and undertake visual inspection at the boundary of the disturbance footprint in areas in proximity to sensitive receptors, to inform when corrective actions are required.	
		Dust generation and deposition as a result of adverse weather conditions	AQ.14	Avoid ground-disturbing activities during windy conditions. When this is not practical, implement additional management measures, such as enhanced watering of access roads and works areas to minimise the potential increase in dust generation.	
			AQ.15	Implement additional dust suppression controls prior to the onset of adverse weather, including covering of stockpiles and additional watering of access roads.	
			AQ.16	Blasting will not be undertaken if the prevailing wind conditions are likely to transport dust emissions towards the nearest sensitive receptors.	New mitigation measure added as a result of DPIE Request for Information.
		Emissions from refuelling activities	AQ.17	Refuelling activities to be located and operated in accordance with a risk assessment, to minimise odour and air quality issues at a sensitive place.	
		Emissions from combustion engines (construction vehicles and generators)	AQ.18	Maintain and operate construction plant, vehicles and machinery in accordance with manufacturer's recommendations.	
			AQ.19	Turn off idling plant, equipment and vehicles when not in use.	
		Use of non-potable water for dust suppression	AQ.20	Water used in dust suppression must be of suitable quality and not result in environmental or human health risks, or impact rehabilitation outcomes. Water additives used to improve dust suppression effectiveness (e.g. the addition of soil binders to water for dust suppression on roads or handstand areas) are to be risk assessed prior to adoption.	
		Dust generated by traffic on access tracks	AQ.21	Where sensitive receptors are located within 350 m of construction works, or visible dust is generated from vehicles using unsealed access roads, road watering or other appropriate controls are to be implemented.	
			AQ.22	Adjust access road watering or treatments, as required, to prevent visible dust generation or impacts to sensitive receptors.	
		Dust emissions from vehicles transporting materials to and from site	AQ.23	Cover vehicles transporting potentially dust- and/or spillage-generating material to and from the construction site immediately after loading (prior to traversing public roads).	
			AQ.24	Visually inspect vehicles entering/exiting the site and implement additional controls if corrective actions are required.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Sustainability	Detailed design	Infrastructure Sustainability (IS) Rating Tool	SS.1	A Sustainability Strategy will be developed to guide the design, construction and operation of the proposal. The plan will address, as a minimum, safety, employment, materials and waste, procurement, ecological connectivity, greenhouse gas emissions, and climate change risk, and establish the basis for these to be considered across the delivery phases of the proposal, using the IS rating tool process.	
		Sustainability	SS.2	The Sustainability Strategy will incorporate the updated sustainability initiatives and the review and reporting requirements necessary to demonstrate how sustainability has been incorporated into the proposal during design, construction and operation.	
	Construction	Procurement	SS.3	Procurement will be undertaken in accordance with the *Sustainable Procurement Guide* (Department of Environment and Energy, 2018) and the *NSW Government Resource Efficiency Policy* (OEH, 2014) or other applicable State-based policy and guidance.	
		Reporting	SS.4	Sustainability reporting (and corrective action where required) will be undertaken during construction in accordance with the Sustainability Strategy.	
	Operation	Procurement	SS.5	Procurement will be undertaken in accordance with the *Sustainable Procurement Guide* (Department of Environment and Energy, 2018) and the *NSW Government Resource Efficiency Policy* (OEH, 2014) or other applicable State-based policy and guidance.	
		Sustainability	SS.6	Prior to operation commencing, the Sustainability Strategy will be reviewed and updated, and relevant initiatives will be implemented during operation.	
Climate change	Detailed design	Adaptation measures	CC.1	Ensure that design and procurement of trackside equipment (e.g. signals, communication relay points) accounts for an increase in ambient temperatures and extreme heat days.	
			CC.2	Consider the use of elastic fasteners and/or heavier sleepers to account for potential track buckle.	
			CC.3	Consider the use of lighter-coloured ballast or painted rails to reduce trackside temperature.	
			CC.4	Locate electrical equipment and supporting infrastructure outside of bushfire-prone areas, where reasonable and feasible, to reduce risk of damage from bushfire.	
			CC.5	Include allowance for climate change in the design criteria for flooding based on a 10 per cent increase in rainfall events, particularly around track-side storage detention basins/stormwater infrastructure, in accordance with the NSW Office of Water guidance, *Practical Consideration of Climate Change* (Office of Water, 2007).	
			CC.6	Undertake sensitivity testing in line with climate change scenario planning for RCP 8.5 by reviewing implications of 20 per cent and 30 per cent increases in rainfall (in accordance with the *Australian Rainfall and Runoff Guidelines 2019* (OEH, 2019).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Climate change [continued]	Detailed design [continued]	Adaptation measures [continued]	CC.7	Implement flood-mitigation measures along the rail corridor, including the locating of critical electrical systems (signalling, communications huts, etc.) above potential flood zones and increasing the design height of bunds.	
			CC.8	Design site grading to direct flooding into onsite detention and other stormwater channels/drainage infrastructure.	
			CC.9	Design culverts and drainage to be concrete lined to reduce potential for damage.	
			CC.10	Incorporate additional drainage network features and flood protection measures (e.g. larger drainage network, additional pits, larger pipe diameters, larger sumps, etc.) to mitigate a potential increase in flood risks.	
			CC.11	Investigate the inclusion and development of an early flood warning system (e.g. flood gauges, trackside monitors) to alert ARTC to impending flooding.	
			CC.12	Backup power supply and/or built-in system redundancy (in case of substation failure) provided as standard to ensure continuous operation of electrical systems, including signalling and communications equipment along the corridor.	
			CC.13	Incorporate solar photovoltaic (PV) and battery storage as a built-in redundancy to ensure ongoing operation of signalling and communications equipment in the event of power failure.	
	Pre-construction and construction	Adaptation measures	CC.14	Provide shade for trackside equipment (double ventilated signal boxes and/or double skinned enclosures) and/or specify material and colour selection to reduce heat load.	
			CC.15	Establish vegetation clearance zones across the corridor to minimise vegetation (debris and bushfire risk).	
		General	CC.16	Implement high temperature stop-work threshold if not already considered within existing ARTC operational framework.	
			CC.17	Develop or update emergency response procedures to respond to extreme weather events.	
			CC.18	Engage with local emergency services to discuss and coordinate emergency response procedures.	
	Operation	Adaptation measures	CC.19	Reduce train speeds during days where trackside temperature exceeds 35°C.	
		General	CC.20	Maintenance program to be developed/operational policy updated to avoid outdoor works during hotter times (where practicable).	
			CC.21	Develop or update emergency response procedures to respond to extreme weather events.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Climate change [continued]	Operation [continued]	General [continued]	CC.22	Engage with local emergency services to discuss and coordinate emergency response procedures.	
Traffic and transport	Design/pre-construction	Road safety	TT.1	Road safety audits will be undertaken pre-construction at level crossings in accordance with the Austroads Guidelines (Austroads, 2019) to confirm: ▸ The level of protection is appropriate ▸ The infrastructure is appropriate for the traffic conditions ▸ The crossing is designed to provide suitable stacking and sight distance.	
			TT.2	Ongoing consultation with local government/Roads and Maritime Services (RMS) and asset owners will be undertaken to ensure safety concerns and issues are assessed.	
			TT.3	Relevant emergency services should be notified of changes to the road network and of construction activities, prior to construction commencing.	
		Road network	TT.4	Traffic management plan prepared in consultation with the Construction Contractor, Transport for NSW (TfNSW), local governments and an accredited road safety auditor. This plan will identify the impacts that construction traffic is likely to have on the transport infrastructure and detail ameliorative measures required to mitigate all identified impacts of the proposal.	
		Road–rail Interface	TT.5	Consult with stakeholders (level crossings) for public roads and private landowners before detailed design phase.	
		Intersection	TT.6	Traffic management plans, traffic control plans and temporary road works, including diversion and signage, should be prepared prior to construction, in accordance with the latest edition of the *Traffic control at work sites: Technical Manual 2018* (Roads and Maritime Services, 2018) and Australian Standard 1742.3, *Manual of uniform traffic control devices—Traffic control* (Standards Australia, 2019) for works on roads. Traffic management plans should consider construction activity delivery timeframes that avoid peak-hour travel conditions.	
		Access	TT.7	Ongoing consultation with RMS/local governments and asset owners will be undertaken to ensure proposed access arrangements are suitable.	
	Construction	Road safety	TT.8	Road safety measures to be implemented, taking into consideration: speed restrictions; construction worker driver fatigue; in-vehicle communications; signage; demarcations; maintenance; safety checks; interaction with public transport; transport of hazardous and dangerous goods; and emergency response and disaster management.	
			TT.9	Relevant emergency services should be notified in advance prior to the movement of all hazardous/dangerous or oversize construction material and equipment.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Traffic and transport [continued]	Construction [continued]	Road safety [continued]	TT.10	Consideration should be given to limiting construction traffic on school bus routes during pick-up and set-down times on school days; alternatively, appropriate school bus infrastructure could be installed.	
			TT.11	Traffic-calming devices to be installed along road segments with surrounding land uses containing vulnerable road users (e.g. schools) where deemed necessary in consultation with local road authorities and relevant stakeholders.	
		Road network	TT.12	Construction traffic management plan to be implemented and reviewed periodically for effectiveness by stakeholders.	
			TT.13	Ongoing consultation with relevant local governments, police, emergency services and affected property owners/occupiers to inform of proposal status and likely traffic disruptions and temporary road closures.	
			TT.14	Relevant emergency services should be notified in advance, prior to the movement of all hazardous/dangerous or oversize construction material and equipment.	
			TT.15	Secondary alternative construction route activities should be determined as part of the traffic management plans, in the event that the primary route is blocked off by an emergency/accident.	
		Road/rail interface	TT.16	Road safety audits will be undertaken at the level crossings post construction in accordance with the Austroads guidelines (Austroads, 2019). Level crossings will be reviewed to confirm: ▸ The level of protection continues to be appropriate ▸ The infrastructure is appropriate for the traffic conditions.	
		Intersection	TT.17	Traffic management plans, traffic control plans and temporary road works to be implemented and reviewed to ensure effectiveness.	
			TT.18	Construction Traffic Management Plan to be implemented and reviewed periodically by stakeholders to ensure intersection operations are effective.	
		Biosecurity	TT.19	A CEMP will be prepared prior to construction commencing. As part of the CEMP, a project biosecurity plan will be developed to identify operating requirements of machinery during construction.	
		Access	TT.20	The Rail Maintenance Access Road strategy to be reviewed and updated to ensure it remains effective.	
	Operation	Road network	TT.21	Develop a protocol between ARTC and emergency service providers, defining appropriate and co-ordinated responses and communication in the event of emergencies during operations (e.g. access to real time information about crossing times and access to alternate crossing points).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Traffic and transport [continued]	Operation [continued]	Road/rail interface	TT.22	Road safety audits will be undertaken at the level crossings post opening, in accordance with the relevant legislation and guidelines. Level crossings will be reviewed to confirm: ▸ The level of protection continues to be appropriate ▸ The infrastructure is appropriate for future traffic conditions.	
Landscape character and amenity	Detailed design	Landscape and visual impacts due to vegetation removal	LA.1	Prepare a Rehabilitation and Reinstatement Plan to guide the approach to rehabilitation following the completion of construction. The plan should include and clearly specify: ▸ Location of areas subject to rehabilitation and/or reinstatement/stabilisation details of the actions and responsibilities to progressively rehabilitate, regenerate and/or revegetate areas, consistent with the agreed objectives.	
			LA.2	Clearing of visually significant vegetation is further limited during the detailed design phase to that required to enable the works. Locations include: ▸ Between North Star Road and Scotts Road (approx. Ch 8.2 km to Ch. 9.2 km) ▸ Between North Star Road and the alignment (generally) ▸ Adjacent Wilby Street in North Star ▸ Associated with watercourses as described below.	
		Landscape and visual impacts on watercourses	LA.3	Develop the detailed design to further minimise impacts to waterways, riparian vegetation and in-stream flora and habitats. Particular locations include: Back Creek, Forest Creek, Whalan Creek, and the Macintyre River and their tributaries.	
			LA.4	Adopt a crossing structure hierarchy: bridges preferred to culverts; however, local conditions and constructability impacts must be considered when determining the preferred environmental solution—aim to avoid, then minimise, the extent of waterway diversions or realignments.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Landscape character and amenity [continued]	Detailed design [continued]	Visual impact of rail infrastructure	LA.5	Infrastructure (such as structures, embankments/cuttings and bridges) should be designed following an integrated design process, with regard to landscape character and views, as identified in the landscape and visual impact assessment, seeking to: ▸ Legacy: create a consistent legacy of treatments along the Inland Rail Program alignment to enhance the overall recognition and legacy of the proposal ▸ Bridges: through detailed design, ensure that bridges contribute to an overall coherent sense of design, respect their surroundings and consider connectivity, Crime Prevention through Environmental Design, and graffiti issues. In particular, consider urban design input to: ▸ Macintyre river/Whalan Creek bridge crossing and viaduct (around Ch. 30.6 km): Potential urban design input to the Macintyre Bridge during detailed design phase could enhance its visual amenity and potential to create a legacy of elegant waterway crossings ▸ Bruxner Way overbridge (around Ch. 25.6 km): Additional urban design input to the Macintyre Bridge during the detailed design phase could enhance its visual amenity and potential to create a legacy of elegant bridge structures. ▸ Embankments: minimise the extent to which landform (embankments) restricts views or affects views from nearby residences, to the greatest extent possible, including through sensitive stabilisation, revegetation or, where appropriate, screen planting ▸ Cuttings: minimise the extent of cut batters, noting that this has already been addressed to the greatest extent possible.	
			LA.6	Develop a Landscape and Rehabilitation Plan and associated detailed landscape design with landscaping treatments in accordance with the conditions of approval. The plan should reference the key landscape characteristics and elements identified in this landscape and visual impact assessment, and place particular emphasis on sensitive design appropriate to the setting as described below.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Landscape character and amenity [continued]	Detailed design [continued]	Rural and natural landscapes	LA.7	The landscape design must respect and enhance the rural landscapes. Considerations include: ▸ Design of the landscape earthworks and planting to screen and integrate the railway and associated structures and features, wherever practicable, and appropriate to the character and maintenance of desired views. This includes further opportunity for design of targeted planting of buffer/shelterbelts adjacent to major earthworks within the rail corridor to the extent consistent with safety. For example, planting strips could be introduced adjacent to significant embankments and structures (such as those associated with bridge crossings) to reduce visual impact and assist in integrating the landform and structures into the existing landscape setting (which, it is noted, already includes similar shelterbelts beside roads and riparian vegetation along watercourses). ▸ The landscape design must seek to enhance the features and qualities that give the landscape its particular characteristic, ensuring the design responds to the natural patterns of the rural or natural landscape.	
			LA.8	Where appropriate, consult with local stakeholders and landowners during design (and construction) in order to understand the landscape context and the particular qualities of landscapes.	
		Ecologically sensitive areas	LA.9	Design to provide opportunities for ecological gain to benefit biodiversity where practical within the operational rail corridor. This includes: ▸ Development of diverse planting and seed mixes to maximise and connect habitat types for ecological gain ▸ Enhancement of landscape corridors and ecological links across the landscape by, where possible, joining or re-joining fragmented areas of habitat ▸ Landscape design and planting to incorporate ecological requirements to benefit the characteristic and visual amenity of local landscapes, including through revegetation with locally Indigenous species.	
		Heritage Landscapes	LA.10	Heritage landscapes, through detailed design: ▸ Seek to further limit direct impacts or impacts to the setting of identified items of Aboriginal, historic or natural heritage significance, to the greatest extent possible.	
			LA.11	Consider the development of interpretation strategy and wayfinding to assist in the interpretation of visual elements of heritage significance, such as old rail lines, bridges, buildings or other items of visual value.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Landscape character and amenity [continued]	Detailed design [continued]	Light impacts	LA.12	Opportunity for vegetation screening or 'at receptor' mitigation, as negotiated with the landowner, such as light blocking curtains, to minimise impacts on affected properties, including the rural property 'Ohmi' (around Ch. 7.1 km). Selection of at-property mitigation measures and treatments will be undertaken in consultation with affected landowners.	
	Construction	Landscape and visual impacts due to damage to vegetation	LA.13	Minimise disturbance to avoid impacts to native vegetation and habitats as far as practicable.	
			LA.14	Consider selective retention of existing mature trees in laydown areas, where practical; in particular, in North Star (adjacent to Wilby Street and within the construction facility footprint) where views towards the proposed construction facility will be clearly evident, to provide some screening of construction activities and provide a framework for restoration planting following completion of works (in consultation with the affected landowners).	
			LA.15	Construction areas, including compounds, stockpiles, fuel storage, laydown areas and staff parking, to be located outside the tree protection zone, as defined in AS4970-2009: *Protection of trees on development sites* (Standards Australia, 2009).	
		Visual impacts of construction activities	LA.16	Minimise construction compounds close to sensitive receptors to the greatest extent possible.	
			LA.17	Minimise height of all stockpiles, to the greatest extent possible, to reduce their visual impact.	
			LA.18	Temporary treatments (such as hoardings and screens) to site compounds should be considered, to assist in reducing visual impacts. These include: ▸ Site compounds—opportunities to use features on temporary fencing/hoarding. This may include art-based treatments to assist with screening the works from the public and using information boards (or similar) to educate the public about the construction works.	
		Landscape and visual impacts due to borrow pits	LA.19	Borrow pits to be rehabilitated at the conclusion of the construction of the proposal. Rehabilitation should occur to minimise long-term landscape and visual impacts, respond to the intended land use, in accordance with the relevant strategic framework and best practice, and in consultation with the affected landowners.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Land use and property	Detailed design	Property	LU.1	The overall disturbance of construction areas is to be limited where possible.	
			LU.2	Where land is not purchased on the open market, land will be acquired for the proposal in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW). Acquisitions of Crown land will also be undertaken in accordance with the *Crown Land Management Act 2016* (NSW).	
			LU.3	If it is determined that land parcels fragmented by the proposal have a historical or current dwelling entitlement that is no longer applicable under the Gwydir Shire Local Environmental Plan (LEP) or Moree Plains LEP as a result of fragmentation, ARTC will consult with affected landowners where appropriate.	
			LU.4	Detailed management measures to reduce land-use impacts on individual properties and land users will be developed in consultation with the individual landowners concerned, during the detailed design and property acquisition negotiations.	
			LU.5	Individual property management agreements will be developed in consultation with landowners/occupants, with respect to the management of construction on, or immediately adjacent to, private properties. These will detail any required adjustments to fencing, access, farm infrastructure, and relocation of any impacted structures, as required: ▸ Any impacts on operational farm requirements will be managed and reinstated as soon as possible ▸ ARTC will work with individual landowners to develop suitable solutions based on individual farm-management practices. Solutions may include the provision of crossing points or underpasses for access to fragmented or isolated properties or, where disruption to water supply occurs, crossing points will be provided or the relocation of dams or irrigated systems will be undertaken.	
			LU.6	During the detailed design process, consideration will be given to the movement of stock across the rail line. In the event that private stock routes are identified through consultation with landowners, appropriate mitigation measures will be agreed upon with affected landowners. Mitigation measures may include the provision of alternative access arrangements developed in consultation with affected landowners.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Land use and property [continued]	Detailed design [continued]	Property [continued]	LU.7	Stock fencing must be in accordance with the Inland Rail fencing standards and be constructed prior to the removal of existing fencing or any works being carried out on the subject land, unless otherwise agreed with the landowner. Where fencing is required, the relevant landowner will select the type of fencing, in a like-for-like fashion from ARTC's standard fence and gate types, to suit the farm operations. Internal fencing matters will be considered, as appropriate, during in the land acquisition process.	Revised as a result of public submissions. Measure now includes 'Where fencing is required, the relevant landowner will select the type of fencing in a like-for-like fashion from ARTC's standard fence and gate types, to suit the farm operations. Internal fencing matters will be considered, as appropriate, during in the land acquisition process.'
		Access	LU.8	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 will be provided to an equivalent standard, where feasible and practicable. Where an alternative access is not feasible or practicable and a property is left with no access to a public road, negotiations will be undertaken with the relevant property owner for acquisition of the property in accordance with the provisions of the applicable land acquisition legislation and regulatory requirements.	
			LU.9	Detailed design aims to minimise the potential for impacts to the surrounding road and transport network, and property access.	
			LU.10	For public crossings, ARTC will continue to undertake necessary consultation with Gwydir Shire and Moree Plains Shire councils and the local community in relation to the preferred road–rail interface treatments for each location.	
			LU.11	Appropriate road–rail interface will continue to be assessed on a case-by-case basis for design purposes, with consideration given to current and future usage of the existing asset, its location relative to other crossings of the rail corridor, and the road and rail geometry at the crossing location.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Land use and property [continued]	Detailed design [continued]	Access [continued]	LU.12	The proposal will seek to maintain connectivity of travelling stock reserves (TSRs) and Crown Lands through appropriate mitigation and management measures that include consultation with the relevant managing authority and proposing certain treatments, where practicable. ARTC will continue to liaise with Crown Lands and Local Land Services during detailed design and will seek consultation and agreement where the use of Crown Lands or TSRs is required by the contractor when accessing borrow pits.	Revised as a result of Crown Lands submission ID #50. Reference to 'Crown Lands' now included and second sentence revised to 'ARTC will continue to liaise with Crown lands and Local Land Services during detailed design and will seek consultation and agreement where the use of Crown Lands or TSRs is required by the contractor when accessing borrow pits.'
		Utilities	LU.13	Utility providers will continue to be consulted during detailed design to identify possible interactions and develop procedures to minimise the potential for service interruptions and impacts on existing land uses.	
			LU.14	The location of utilities and other infrastructure will be identified prior to construction, to determine requirements for access to, diversion, protection and/or support.	
	Construction	Stakeholder engagement	LU.15	Property owners and occupants will be consulted in accordance with the communication plan for the proposal, to ensure that owners/occupants are informed about the timing and scope of activities in their area and any potential property impacts/changes, particularly in relation to potential impacts to access, utilities, or farm operational arrangements.	
			LU.16	The rehabilitation strategy will include measures to reinstate and restore disturbed sites as close as possible to the pre-construction condition or better, or in consultation with the landowner.	
Socio-economic	Pre-construction and construction	Severance and amenity impacts	SE.1	Existing rail corridor used for 25 km to avoid direct impacts on private properties.	
			SE.2	Macintyre River Viaduct designed to address risks to community safety through changes to flooding patterns or people accessing the rail corridor.	
			SE.3	Working with property owners to ensure that a satisfactory level of access between adjoining properties is maintained and to identify actions that will minimise or offset changes to connectivity or changes to water flows that affect their properties.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Socio-economic [continued]	Pre-construction and construction [continued]	Severance and amenity impacts [continued]	SE.4	Consulting with landowners to identify specific measures that will reduce impacts on farm connectivity or amenity.	
		Proposal alignment	SE.5	ARTC's consideration of proposal alignment options is detailed in Chapter 3: Alternatives and Proposal Options. Chapter 8: Consultation describes the consultation process that occurred in relation to the proposal's alignment.	
		Potential flooding impacts	SE.6	ARTC will continue working with stakeholders, including directly impacted landowners, concerned landowners, local councils, State departments and local flood specialists, to inform and refine assessments and design, construction and operational phases of the proposal.	
		Local business opportunities	SE.7	Development of a Local Content Policy and strategy to ensure proposal supply opportunities are available to local businesses (within 125 km of the proposal).	
			SE.8	Identification of businesses within 125 km with potential capacity to supply the proposal, with the additional commitments of: ▸ Business Capability Workshops will be held to support local businesses to prepare for opportunities in the Inland Rail supply chain ▸ ARTC will facilitate additional support for businesses in the pre-construction phase, including business briefings.	Altered mitigation measure as a result of Gwydir Shire Council submission ID #172. Further mitigation commitments were clarified in bullet points
		Employment opportunities	SE.9	Engagement with the Toomelah and Boggabilla communities, representative organisations and service providers to support development of new local businesses and implement training and development partnerships which will equip local jobseekers for jobs in proposal construction.	Altered mitigation measure as a result of Gwydir Shire Council submission ID #173. New text was added '... to support development of local businesses and implement training and development partnerships which will equip local jobseekers for jobs in proposal construction.'
			SE.10	Providing a clear and efficient process for people to seek information about employment opportunities and register their interest in Inland Rail.	
			SE.11	The proposal will seek to employ locally where possible.	New mitigation measure as a result of Moree Plains Shire Council submission ID #226

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Socio-economic [continued]	Pre-construction and construction [continued]	Toomelah community safety and wellbeing	SE.12	Providing a grade-separated crossing of Tucka Tucka Road.	
			SE.13	Working with the Toomelah community and government stakeholders to identify education and training pathways, and employment opportunities for Toomelah residents during and post-construction.	
			SE.14	Supporting Toomelah residents to develop businesses that will service the proposal and/or support long-term employment outcomes.	
			SE.15	Access to an Indigenous Participation Advisor to support participation and initiatives which will support community cohesion.	New mitigation measure as a result of DPIE Request for Information
			SE.16	Support for the delivery of a 'Young Dreaming' project, which is working with children and young people in Toomelah to empower them with stories, support and discussions of identity.	New mitigation measure as a result of DPIE Request for Information
			SE.17	Provision of access to a Smart Communications board to enable video an online communication in Toomelah.	New mitigation measure as a result of DPIE Request for Information
			SE.18	Develop tailored and targeted rail and road safety programs for delivery to local schools, local young people and nearby communities.	New mitigation from Social Impact management Plan as clarified in Toomelah Aboriginal Land Council submission ID #236
			SE.19	Work closely with the Toomelah and Boggabilla communities to build awareness about the construction process and rail operations and discuss how the rail safety program can be tailored for Toomelah and Boggabilla.	New mitigation from Social Impact management Plan as clarified in Toomelah Aboriginal Land Council submission ID #236
			SE.20	Consult with the TrackSafe Association to identify best practice management strategies.	New mitigation from Social Impact management Plan as clarified in Toomelah Aboriginal Land Council submission ID #236
			SE.21	Monitor the outcomes of the Victoria METRO's 'Dumb Ways to Die' campaign and adapt successful strategies for culturally appropriate use in the Moree Plains, Goondiwindi and Gwydir local government areas.	New mitigation from Social Impact management Plan as clarified in Toomelah Aboriginal Land Council submission ID #236

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Socio-economic [continued]	Pre-construction and construction [continued]	Toomelah community safety and wellbeing [continued]	SE.22	The proposal will provide cultural heritage and cultural values training to personnel in support of positive behaviours and will deliver or facilitate activities to help build personnel's understanding of Indigenous values, e.g. acknowledgement of Country and participation in NAIDOC celebrations. The Contractor will be required to provide an Indigenous mentor as part of the construction workforce to engage with Indigenous personnel and support them to feel comfortable in the workplace, including comfort to make a complaint about racist behaviour. ARTC's Indigenous Participation Advisor will engage regularly with the Toomelah LALC to gauge community experiences of interactions with personnel and maintain regular communication with the Toomelah Boggabilla LALC to monitor any concerns.	New mitigation measure as a result of DPIE Request for Information
			SE.23	Delivery of the program-wide mental health service partnership.	New mitigation from Social Impact management Plan as clarified in Toomelah Aboriginal Land Council submission ID #236
		North Star community impacts and benefits	SE.24	Ongoing consultation with North Star residents regarding the proposed accommodation site and construction hours.	
			SE.25	Inclusion of an access road within the proposal design to reduce traffic impacts pastNorth Star Public School and in the village.	
		Community wellbeing	SE.26	Consultation with landowners whose properties would be transected or bordered by the proposal to identify mitigation measures addressing impacts on farm management, access and residential amenity. A Communication Management Plan will be developed for the construction phase of the proposal and ARTC will provide adequate notice to the community.	Altered mitigation measure as a result of several public submissions. New sentence was added, 'A Communication Management Plan will be developed for the construction phase of the proposal and ARTC will provide adequate notice to the community.'
			SE.27	Engagement with North Star stakeholders and Gwydir Shire Council regarding plans for an accommodation construction facility in North Star.	
			SE.28	Establishing and maintaining a Community Reference Group throughout construction to include, as a minimum, landowners and residents from nearby communities, with future need for the Community Reference Group to be agreed with Community Consultative Committee members and DPIE following the conclusion of construction.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Socio-economic [continued]	Pre-construction and construction [continued]	Community wellbeing [continued]	SE.29	Inland Rail manages the risk of COVID-19 in accordance with the advice and guidelines provided by SafeWork Australia (the leading health and safety body in Australia) and complies with WHS Regulator (Comcare) requirements. All contractors engaged by ARTC and Inland Rail are expected to comply with these same regulatory obligations and must provide Inland Rail with assurances that it is actively managing its health and safety risks.	New mitigation measure as a result of Moree Plains Shire Council submission ID #226

			SE.30	The construction contractor engaged to construct the preferred infrastructure will be required to implement a complaints management system during construction. This system will be incorporated in the construction environmental management plan (CEMP), which the contractor will be required to prepare and have approved by ARTC prior to construction commencing. The complaints management procedure will include, at a minimum:
				▸ Contact details for a 24-hour response line and email address, for ongoing stakeholder contact throughout construction
				▸ Provision of accurate public information signs while construction work is in progress
				▸ Staging of works, developed in consultation with relevant stakeholder groups, to minimise disruption and impacts on community activities and functions
				▸ Management of complaints in accordance with ARTC's emergency management procedure, specifically:
				  ▸ Details of all complaints received will be recorded
				  ▸ Verbal and written responses will be provided within defined time limits.
					New mitigation measure as a result of complaints management consideration in Section 4.5.3 of the Response to Submissions Report

		Accommodation construction facility	SE.31	ARTC will require the contractor to provide an ACMP, which will reflect ARTC's accommodation management principles and the results of the contractor's consultation with the Goondiwindi and Moree Plains Councils, and with police, regarding accommodation management and servicing. The ACMP will provide details of how the contractor will: ▸ Deliver and manage a self-sufficient accommodation facility that avoids impacts on Councils' water, sewage and waste management systems ▸ Address the results of consultation with MPSC, GRC, NSW Police, Queensland Police regarding management and servicing of the accommodation facility ▸ Monitor the number of non-local personnel who may require accommodation ▸ Minimise the use of rental housing in potentially impacted communities through the provision of a suitable, affordable accommodation ▸ Enable local businesses to benefit from the accommodation facility's supply arrangements ▸ Consult with MPSC, GSC and GRC throughout the accommodation's operational period to provide updates on workforce numbers and accommodation management strategies, and receive feedback from Councils on the effectiveness of these strategies ▸ Monitor any personnel demands on the availability and cost of rental housing, affordable accommodation provision and short-term/tourism accommodation in the SIA study area.	New mitigation measure as a result of Moree Plains Shire Council submission ID #226

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Socio-economic [continued]	Pre-construction and construction [continued]	Accommodation construction facility [continued]	SE.31 [continued]	ARTC will monitor the implementation and effectiveness of the ACMP and may require the contractor to refine their accommodation solutions if adverse impacts on housing and accommodation availability are identified.	
			SE.32	ARTC has committed to employing paramedic and security staff to service the workers' accommodation facility to offset some of the demand for health and ambulance services.	New mitigation measure as a result of Moree Plains Shire Council submission ID #226
Hazard and risk	Detailed design	Bushfire	HR.1	Design to maintain appropriate access during construction and operation, ensuring local roads allow emergency access, first-response firefighting, access to water supply for firefighting purposes, and safe evacuation routes.	
			HR.2	A landscaping design to include a wide strip of land on either side of the tracks to be clear from vegetation, to provide a suitable fire break.	
		Flooding and flash flooding	HR.3	Work with stakeholders, including directly impacted landowners, relevant community stakeholders, local governments, State departments and local flood specialists, to inform and refine assessments and design.	
			HR.4	Continue to refine project design in response to hydraulic modelling. This includes consideration of peak water levels, flow distribution, velocities, and duration of inundation. This will inform bridge lengths, culvert sizing and numbers, scour and erosion protection measures for both rail, road and other permanent project infrastructure.	
			HR.5	Review flood risk assessment to inform the siting and scale of temporary construction areas (including stockpiles, construction compounds, access roads, laydown areas, etc).	
			HR.6	Locate plant and equipment maintenance activities and refuelling facilities in accordance with a risk assessment at an appropriate distance from riparian vegetation and waterways, with appropriate measures in place to avoid impacts to waterways and aquatic habitats as per water quality management plans.	
		Landslide, sudden, subsidence, movement of soil or rocks	HR.7	Incorporate batter slopes and scour protection into design.	
		Climatic conditions	HR.8	Continue to refine the cut/fill balance for earthworks to minimise material transport requirements.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Detailed design [continued]	Climatic conditions [continued]	HR.9	The proposal will implement safety measures for the potential damage of tracks and asset as a result of extreme hot weather events, such as considering the use of elastic fasteners or heavier sleepers to reduce the risk of track buckling, selection of materials and colour to reduce heat load on trackside equipment.	
			HR.10	The reference design has been developed to achieve a design life of 100 years. In doing so, designs for formation, track and structures have been developed in accordance with the ARTC *Codes of Practice*. The management of temperature fluctuation would be assured by sourcing components that have the assurance from manufacturers that the components maintain integrity at the required or envisaged temperatures.	
			HR.11	Factor for the potential increase in flood risk arising from any increase in extreme rainfall as a result of climatic conditions. Adaption strategies, such as installing an early flood warning system to alert ARTC to impending flood risks; locating critical electrical systems (signalling, communications huts, etc.) above potential flood zones; and considering the use of solar and battery devices to ensure uninterrupted operation of signalling and network communication in the event of power failure will be incorporated into the detailed design.	
			HR.12	Design for future climate, including consideration of existing ARTC protocols for operating in extreme temperatures.	
			HR.13	Sustainability initiatives, particularly in relation to energy consumption and savings throughout the project lifecycle, must be incorporated in detailed design.	
		Private access and travelling stock reserve	HR.14	ARTC would consult with Gwydir Shire Council, Moree Plains Shire Council and Crown Lands—DPIE to identify potential solutions for the treatment of rail and TSR interfaces.	
			HR.15	Impacts to TSR and fully or partially acquisition of affected owners' land will be managed through the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW).	
			HR.16	Where the proposal impacts on land designated as a TSR, the proposal will seek to maintain the connectivity of TSRs by either: ▸ Creating an Interface Agreement with Crown Lands—DPIE ▸ Implementing rail-over-road bridges where practicable ▸ Acquiring land and implement TSR route deviations ▸ Co-using level crossings (incorporating features of fencing, barrier or stock crossing, such as cattle grid).	
		Rail incidents	HR.17	Advanced Train Management System (ATMS) will be the adopted signalling technology once operational. ATMS improves network capacity, operational flexibility, train service availability, transit times, rail safety, and reliability.	
			HR.18	Track detailed design will be investigated and implemented where relevant.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Detailed design [continued]	Road–rail interfaces	HR.19	Any physical controls, such as boom gates and warning lights, that have been determined necessary from ALCAM will be detailed in the proposal design.	
		Interfaces at level crossings	HR.20	All level crossings will be designed to comply with the Australian Standard for Railway Crossings (AS1742.7 2016 *Manual of Uniform Traffic Control Devices, Part 7 Railway Crossings* (Standards Australia, 2016)). This includes a requirement that the primary control at crossings must be visible to an approaching driver at the safe stopping distance; detailed design of site-location appropriate fencing is required near roads or where trespass is likely to occur; and all active level crossings are provided with a backup battery bank to keep the level crossing operational during power outages. The batteries give a backup of 36–48 hours and if the batteries start to go flat, alarms are sent to Network Control and trains are warned that the level crossing may be faulty and to follow the Network rules. In this case, the train will stop and ensure road traffic has stopped before proceeding across the level crossing.	Revised this mitigation as a result of public submissions to include further information.
		Emergency access	HR.21	Emergency access will be addressed by the development of an access strategy. Consideration of the use of the maintenance access road by emergency vehicles will be made when evaluating the position of corridor access points. To facilitate emergency egress, multiple access points into and out of the rail corridor will be provided.	
			HR.22	Safe corridor access and vehicle turnaround points will be provided for maintenance work to ensure sufficient setback while working adjacent to live railway. Maintenance and emergency access roads will be designed such that it will allow separation, to prevent interaction between trains and vehicles without impeding escape or rescue activities.	
	Pre-construction	Underground and overhead services	HR.23	The proposal will identify known services that require relocation prior to construction.	
			HR.24	Overhead transmission lines and buried telecommunication cables will be identified before construction to ensure that construction and operation do not interfere or damage the utilities, as per the requirements of *Gas and Electricity (Consumer Safety) Regulation 2018* and *Safe Work Australia Model Code of Practice—Managing Electrical Risk in the Workplace* (Safe Work Australia, 2018b) The proposal has considered alignment to minimise the potential interference with these overhead utilities.	
			HR.25	The proposal will lodge a Dial Before You Dig enquiry prior to excavation or drilling work, which provides information about underground services on the worksite. Procedural control for the proposal will ensure that excavation work will comply with the *Safe Work Australia Model Code of Practice—Excavation Work* (Safe Work Australia, 2015).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Pre-construction [continued]	Contaminated land	HR.26	A Contaminated Site Management Sub-plan will be prepared to document management controls for works on land known or suspected of being contaminated and outline the process to identify, document and manage contaminated sites. This will include notification to the regulator as required, undertaking an impacted site review, reporting site contamination to authorities as required, recording the site contamination on ARTC Contaminated Site Register, and developing and implementing an action plan.	
		Asbestos	HR.27	Older infrastructure and previously disturbed land within the disturbance footprint may contain asbestos. The proposal will adhere to *Safe Work Australia Model Code of Practice—How to Manage and Control Asbestos in the Workplace 2016* (Safe Work Australia, 2020) and *Safe Work Australia Model Code of Practice – How to Safely Remove Asbestos 2018* (Safe Work Australia, 2018a).	
			HR.28	Survey of infrastructure that will be removed or disturbed by the proposal will be conducted to potentially identify asbestos-containing materials.	
			HR.29	Construction activities likely to disturb asbestos will review the presence and requirement for specific controls.	
			HR.30	The proposal will engage with competent contractors who are appropriately licensed for asbestos disturbance work.	
		Bridges	HR.31	Further ground surveys will be carried out as determined by a geotechnical engineer during construction early works to mitigate against bridge collapse.	
		Road–rail interfaces	HR.32	Crossing consolidation, relocation, diversion or realignment—existing road–rail interfaces may be closed, consolidated into fewer crossing points, relocated or diverted. Roads will only be closed where the impact of diversions or consolidations is considered acceptable, or the existing location is not considered safe and cannot reasonably be made safe. Approval for closures, where required, will be progressed in accordance with the requirements of the relevant legislation and road closure permits.	
	Construction and commissioning	Bushfire	HR.33	High fire-risk activities, such as hot works including flash-butt welding, will be carried out in accordance with ARTC's *Fire Prevention Management Procedure* (ARTC, 2007) and *Total Fire Bans Procedure* (ARTC, 2019). These procedures establish processes to manage hot work/high fire-risk activities, including observation of relevant Queensland Fire and Emergency Service directives, check extent of worksite vegetation prior to hot work, and ensure appropriate firefighting equipment and trained personnel are available.	
		Flooding and flash flooding	HR.34	Construction staging to include construction of drainage structures before embankment sections, to mitigate flooding potential during construction.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Construction and commissioning [continued]	Landslide, sudden subsidence, movement of soil or rocks	HR.35	Implement a Soil Management Plan to manage the topsoil onsite such that it can be reused in rehabilitation and landscaping activities. Soil stockpiles are to be managed in accordance with erosion and sediment control plans.	
			HR.36	Regular earthworks inspections will be implemented to identify defects and conditions that may affect or indicate problems with the stability of earthworks.	
			HR.37	The period that soil is exposed will be minimised through progressive ground cover revegetation to minimise erosion.	
			HR.38	Temporary construction facilities will be sited to avoid flood areas, overland flow paths and clearance of established vegetation, where possible.	
		Climatic conditions	HR.39	Considering opportunities for the reduction of GHG generation during construction as per the Sustainability Management Plan developed during the detailed design/pre-construction phases.	
			HR.40	Laydown areas will be included along the length of the proposal and at strategic locations, such as near structures. These will act as a centralised point for material storage, with some storing hazardous materials such as fuel. The locations of laydown areas have been chosen to avoid areas that are within the 1% AEP floodplains, where possible; however, by virtue of the requirement of laydown areas for constructing bridges, some laydown areas must be within flood plains and near water sources.	
			HR.41	ARTC will work towards minimising future risk in emergencies and engage with local governments and the Local Disaster Management Groups.	
			HR.42	Construction water will be obtained from sustainable sources, with the necessary water entitlement, water allocation, water licence or water permit. Overall, an allowance of 190 L water per cubic metres of earthworks has been made for estimated construction water demand. Current water demand can be met through the use of existing water sources; however, further options may need to be investigated depending on engagement with water resource owners and water availability.	
		Wildlife	HR.43	Construction works will be undertaken in accordance with a Flora and Fauna Sub-plan.	
		Biosecurity	HR.44	Develop and implement a Biosecurity Management Plan as part of the CEMP in accordance with the *Biosecurity Act 2015* (NSW).	
		Fatigue and heat stress management	HR.45	Ensure construction management plans, systems, workplace conditions and facilities align with requirements of the *Work Health Safety Act 2011* (NSW).	
			HR.46	Follow Safe Work Australia, *Guide for managing the risks of working in heat* (Safe Work Australia, 2017).	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Construction and commissioning [continued]	Dust, respirable silica and other airborne contaminants	HR.47	Direct construction exposure to respirable silica and other airborne contaminants will be controlled through the use of appropriate personal protective equipment.	
			HR.48	Where sensitive receptors, agricultural land uses or protected vegetation are located within 350 m of construction works, or visible dust is generated from vehicles using unsealed access roads, road watering or other appropriate controls are to be implemented.	
			HR.49	Cover vehicles transporting potentially dust and/or spillage-generating material to and from the construction site immediately after loading (prior to traversing public roads).	
			HR.50	Visually inspect vehicles entering/exiting the site and implement additional controls such as wheel wash.	
			HR.51	Limit clearing to that required to construct and operate the works, in accordance with the areas defined during detailed design.	
			HR.52	Where practical, stage clearing and grubbing and construction activities to minimise exposure to erosive processes.	
			HR.53	Implement controls to prevent and/or minimise dust generation during activities involving excavation or disturbance of soils or vegetation, or handling ballast (i.e. use water sprays or water carts for dust suppression as required).	
			HR.54	Avoid ground-disturbing activities during windy conditions or when prevailing winds are likely to result in dust impacts to sensitive receptors.	
			HR.55	Implement additional dust-suppression controls prior to the onset of adverse weather. This may include covering of stockpiles and additional watering of access roads.	
		Noise and vibration	HR.56	The proposal will develop and implement a Noise and Vibration Management Sub-Plan as part of the CEMP.	
			HR.57	Noise and vibration sources from construction involving heavy machinery will incorporate appropriate noise mitigation equipment and devices, including mufflers and acoustic barriers. The proposal will reduce and manage noise as much as possible through a range of noise-management measures. Noise disruption from night works are kept to a minimum and work will be completed as quickly and efficiently as possible.	
		Road incidents	HR.58	A Traffic Management Sub-plan will be implemented to identify the impacts that construction traffic is likely to have on the transport infrastructure, and detail ameliorative measures required to mitigate all identified impacts of the development.	
			HR.59	Specific hazard-control measures will be applied, including clearly defined access for vehicles and pedestrians along the rail corridor and the provision of fencing and gating for all corridor access points to prevent unauthorised entry.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Construction and commissioning [continued]	Road incidents [continued]	HR.60	Access roads and laydown areas established for construction that will have no permanent use will be decommissioned following construction, unless otherwise agreed with relevant landowners. ARTC will manage critical pedestrian, road and rail safety risks during operation, in accordance with the ARTC's Fatal and Severe Risk Program.	
			HR.61	Preferred options for public road–rail interface treatments currently applied over the length of the proposal include grade separation and level crossings.	
		Private access and travelling stock reserve	HR.62	ARTC will continue to consult with the affected landowner and alternative access arrangements will be provided to ensure safe access to residential property.	
		Underground and overhead services	HR.63	Procedural control for the proposal will ensure that excavation work will comply with *Safe Work Australia Model Code of Practice—Excavation Work* (Safe Work Australia, 2015).	
			HR.64	The ARTC *Engineering Standard for Requirements—Electric Aerials Crossing ARTC Infrastructure* (ARTC, 2005) requires that all structures supporting a span of electric aerials over ARTC railway track or sidings be located so that, in the event of failure, no part will fall within 1.8 m outside rail of any railway track.	
		Contaminated land (including unexploded ordnances)	HR.65	Construction personnel involved in ground-disturbing works will be trained in the identification of potential contaminated soil/material and the relevant controls that will be put in place in the event of its discovery.	
			HR.66	Waste generation from construction activities can potentially contaminate the surrounding land and will be managed in accordance with the Waste Management Sub-plan and ARTC *Environmental Policy* (ARTC, 2014). A Hazardous Materials Management Sub-plan will be developed and implemented as part of the Waste Management Sub-plan.	
			HR.67	Identification of UXO will be subject to a risk assessment. Where there is a risk of encountering known or possible UXO, a suitably qualified person will assess and identify management options.	
			HR.68	Implementation of the Contaminated Site Management Sub-plan if contaminated land is suspected.	
		Emergency access	HR.69	The maintenance of emergency access will be managed through the development and implementation of a Proposal Access Strategy. Access for emergency vehicles during construction of the proposal will be discussed with service providers during development of the strategy. In instances where construction-phase emergency access is affected, use of the rail maintenance access road (RMAR) by emergency vehicles may be appropriate. Multiple access points into and out of the rail corridor will be provided.	
			HR.70	A proposal Traffic Management Plan under the CEMP will be implemented to minimise impacts to surrounding land users.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Construction and commissioning [continued]	Chemicals spillage and loss of containment	HR.71	Construction facilities where hazardous materials may be used or stored have been located outside of floodplains and away from areas of social and environmental receptors in accordance with the NSW SEPP 33. Additionally, the locations of construction facilities where vehicle maintenance and refuelling activities are expected will be selected to achieve appropriate separation to riparian vegetation and waterways.	
			HR.72	During the construction phase of the proposal, dangerous goods will be required at construction sites and facilities. Licensed transporters operating in compliance with *Australian Code for the Transport of Dangerous Goods by Road & Rail* (National Transport Commission, 2020) will be used for dangerous goods deliveries.	
			HR.73	Construction chemicals stored and handled will be managed in accordance with the *Work Health Safety Act 2011* (NSW) and Regulation, the relevant Australian Standards and the requirements of chemical safety data sheets. Safety data sheet information will be obtained from the supplier of these chemicals and stored in an easily accessible location.	
		Explosives	HR.74	Where explosives are used for significant cuttings during construction, the works will be undertaken by licensed shotfirers in accordance with the *Explosives Act 2003* (NSW) and *AS 2187—Explosive—Storage, Transport and Use* (Standards Australia, 1998).	
			HR.75	Develop and implement a Blast Management Plan as part of the Noise and Vibration Management Sub-plan within the CEMP.	
			HR.76	At all times, the handling and use of explosives will follow procedures to: ▸ Prevent misfire ▸ Minimise the risk associated with material projected by a blast ▸ Minimise adverse effects of ground vibration and shock waves caused by a blast ▸ Ensure explosives are not used after either the manufacturer's recommended shelf life or the approved, extended shelf-life ▸ Ensure public safety, vehicular access and security ▸ Identify other activities within proximity of explosive use ▸ Identify the environment of explosive use, including flood, bushfire, landslide zones.	
			HR.77	Workplace Health and Safety (WH&S) Management Plans to include appropriate measures to manage risk associated with blasting such as consultation with service providers, comply with separation requirements and access controls, exclusion zones, trails, and buffers. Additionally, WH&S Management Plans will seek to minimise interruption to mine explosive transport routes, by communicating with mine management in regard to the schedule and activities of the proposal.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Operation	Bushfire	HR.78	Existing ARTC management plans and strategies, including *Engineering (Track and Civil) Code of Practice—Section 17 Right of Way* (ARTC, 2013) and fire prevention management and total fire ban engineering procedures will be applied throughout the proposal lifecycle to minimise damage to property and maximise the safety of people.	
			HR.79	The *ARTC Engineering (Track and Civil) Code of Practice—Section 17 Right of Way: Vegetation Management* (ARTC, 2013) will be implemented to minimise fire risk within the rail corridor, which includes specifications for vegetation management/ fire hazard reduction within the corridor.	
			HR.80	Local fire authorities and local emergency services will be consulted to ensure appropriate operational actions are taken, such as providing feedback on the firefighting vehicles accessibility, fire prevention plans and cooperation on burning-off activities.	
		Flooding and flash flooding	HR.81	Established site safety protocol (procedures, warnings, depth, indicators, etc.).	
			HR.82	Inspections and assessments will be carried out regularly to identify drainage defects that impact the operation of the proposal.	
		Landslide, sudden subsidence, movement of soil or rocks	HR.83	Regular earthworks inspections will be implemented to determine defects and conditions that may affect or indicate problems with the stability of earthworks.	
		Climatic conditions	HR.84	Operations on the corridor will comply with the *ARTC Route Access Standard General Information Route Standards: Speed Restrictions During Hot Weather* (ARTC, 2018b).	
			HR.85	ARTC Standard *ETM-06-08 Managing Track Stability* will be employed to ensure integrity of the track during increased extreme heat events. The *Track Stability Handbook* (ARTC, 2017) will be used as guide for track buckling mitigation plans through managing track stability. These will ensure regular rail inspection, maintenance, and de-stressing of the rail to maintain track stability during both seasonal and annual temperature fluctuations. The track structure design has allowed for temperature-based adjustment in operation.	
		Wildlife	HR.86	Stock fencing, fauna fencing and wildlife permeability structures will be inspected and maintained as per *ARTC Engineering (Track and Civil) Code of Practice—Section 17 Right of Way: Inspection and Assessment* (ARTC, 2013).	
		Biosecurity	HR.87	Pest and weed management will be carried out within the rail corridor in accordance with the *ARTC Engineering (Track and Civil) Code of Practice – Section 17 Right of Way: Vegetation Management.*	
			HR.88	Adhere to quarantine rules and regulations.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Operation [continued]	Noise and vibration	HR.89	During the operational phase, environmental management will be managed in accordance with ARTC's EMS, which will incorporate the requirements of the Outline EMP, as appropriate, in line with the Noise and Vibration Management Sub-Plan.	
			HR.90	Adhere to the noise and vibration management requirements as per ARTC standards.	
			HR.91	Noise and vibration sources from maintenance work involving heavy machinery will incorporate appropriate noise-mitigation equipment in compliance with relevant state policy and guidelines.	
		Asbestos	HR.92	Adhere to ARTC's *Work Health and Safety Work Instruction for Asbestos* (Safe Work Australia, 2018a), along with Safe Work *Australia Model Code of Practice—How to Manage and Control Asbestos in the Workplace* (Safe Work Australia, 2020) and *Safe Work Australia Model Code of Practice—How to Safely Remove Asbestos 2018* (Safe Work Australia, 2018).	
		Dust, respirable silica and other airborne contaminants	HR.93	Trains to minimise idling time near sensitive receivers (where possible).	
			HR.94	Operators must ensure that significant dust-generating activities on the proposal are managed in a proper and efficient manner to minimise dust emissions and comply with any relevant conditions of approval.	
			HR.95	Conduct proactive community consultation where undertaking operational works with potential for adverse air-quality impacts.	
		Road–rail interface	HR.96	ARTC will conduct routine inspections of crossing infrastructure, in accordance with ARTC *Engineering (Track and Civil) Code of Practice—Section 17 Right of Way: Inspection and Assessmen*t (ARTC, 2013) and will regularly review crossing performance and incident information to identify and remedy potential hazards.	
		Pedestrian interface at level crossings	HR.97	ARTC is committed to continued delivery of railway safety messages to the community, in line with the Social Impact Management Plan (SIMP), through the awareness activities, community engagement activities and campaigns to increase public awareness.	
		Bridges	HR.98	Safety elements for double-stack freight trains such as loading requirements, centre of gravity and inspections for rolling stock are required to meet the organisational rolling stock and loading requirements, to ensure stability and prevent excessive movements of loads and containers during train movements or severe weather events.	
		Emergency access	HR.99	Local fire authorities and local emergency services will be consulted to ensure appropriate operational actions are taken.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Hazard and risk [continued]	Operation [continued]	Overhead and underground services	HR.100	Operation upholds the following ARTC and Australian Standards: ▸ *ARTC Underground/Overhead Services Work Method Statement (ARTC, 2016)* ▸ *AS 4799—Installation of underground utility services and pipelines within railway boundaries* (Standards Australia, 2020).	
			HR.101	The proposal will also comply with the clearance distance as specified in the ARTC *Engineering Standard for Requirements—Electric Aerials Crossing ARTC Infrastructure* (ARTC, 2005) to ensure sufficient clearance and prevent contact with live electricity.	
		Contaminated land	HR.102	Hazardous (regulated) waste, such as hydrocarbons and hydrocarbon-contaminated products (e.g. oily waste or oil filters), which could potentially be generated during operation (either from maintenance operations or from freight spillages) will be collected and disposed of by a licensed waste transporter.	
			HR.103	Implementation of the Contaminated Site Management Sub-plan if contaminated land is suspected.	
		Freight dangerous goods	HR.104	Emergency information holders must be readily available containing the *Initial Emergency Response Guide* (Standards Australia/Standards New Zealand, 2010), dangerous goods transport and consignment documents.	
			HR.105	The freight transportation of dangerous goods on the proposal will be in accordance with the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission, 2020). Freight carts will be required to display appropriate Hazchem signage, including placards, and carry appropriate spill-containment equipment to be used by emergency services personnel in the event of an emergency.	
			HR.106	ARTC will develop a Spill Response Plan as part of a Hazardous Materials Management Sub-plan to outline the appropriate actions to be taken to minimise the effects of a spill.	
			HR.107	Train operators will comply with the ARTC *Inspecting Trains Policy* (ARTC, 2015), such that inspections of dangerous-goods loading (e.g. restraining of packages, segregation of dangerous goods), brake conditions and train integrity are compliant with the ARTC *Train Operating Conditions Manual* (ARTC, various), before and during travel on the ARTC network. Details of the train's consist (a sequence of train carriages or cars) and content will also be provided to the ARTC network control.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Waste and resource management	Detailed design	Generation of waste	WR.1	Cut-and-fill balance and minimisation of transport requirements for import/disposal of earthworks material considered further during detailed design by implementing the waste hierarchy in the *Waste Avoidance and Resource Recovery Act 2007* (WA).	
			WR.2	Establish waste-reduction targets for design and construction.	
			WR.3	A waste-reduction review will be undertaken to identify opportunities to meaningfully achieve the waste-reduction targets through detailed design, construction and operation of the proposal.	
			WR.4	Consideration of alternative approaches to materials used, construction and operational techniques, and maintenance of a process to achieve a less resource-intensive and more efficient process, in accordance with relevant design standards. For example, material specifications should consider aspects such as use of prefabricated materials, percentage of recycled content and percentage of material rejection to reduce waste generation from the proposal.	
			WR.5	Investigate and develop a wastewater solution for the management of effluent from the construction accommodation facility, including an assessment of irrigation to fields and opportunity for beneficial reuse as non-potable water for agricultural purposes.	
	Pre-construction	Generation of waste	WR.6	The CEMP must comply with the conditions of approval and relevant regulatory requirements, detailing waste-management information, including: ▸ General protocols and performance objectives for keeping the worksite clean and tidy ▸ Processes for documenting waste volumes, types and how these will be compared to waste targets ▸ Contingency measures for managing unexpected volumes of waste or other exceptional circumstances ▸ Requirements for secure temporary storage, collection frequency and disposal/recycling requirements ▸ Procedures and reporting/documentation requirements for ensuring waste transporters and receivers are appropriately licensed according to the type of waste ▸ Requirements for training, inspections, audits, corrective actions, notification and classification of environmental incidents, record keeping, monitoring and performance objectives for handover on completion of construction.	
		Hazardous waste	WR.7	A contaminated and hazardous material survey will be undertaken prior to demolition of structures. In the event that asbestos or other hazardous materials are identified in these structures, a Contaminated and Hazardous Materials Management Plan will be developed and implemented as part of the CEMP.	

Chapter	Delivery phase	Aspect	Mitigation Number	Proposed mitigation measures	Changes as a result of submission responses
Waste and resource management [continued]	Construction	Generation of waste	WR.8	Identify opportunities to achieve waste-reduction targets appropriate to the scope of the construction works.	
			WR.9	Avoid disposal of excavated material to landfill by implementing the waste-management hierarchy and measures in the CEMP relating to waste management.	
			WR.10	All cut material of appropriate suitability (as per organisational specifications) should be stockpiled separately and reused onsite where possible.	
			WR.11	Purchase construction materials in bulk, where practical, to minimise packaging waste.	
			WR.12	Plant and equipment used in the proposal is appropriately maintained.	
			WR.13	Maintenance activities, refuelling and concrete washout will be carried out at an appropriate distance (relative to task risk) from riparian vegetation and waterways, with appropriate measures in place to reduce the potential for impacts to waterways, aquatic habitats and groundwater.	
			WR.14	Effluent disposal from the construction site facilities to be managed in accordance with EPA environmental criteria and effluent quality requirements.	
			WR.15	Contractors to adhere to the practices of the waste hierarchy in the *Waste Avoidance and Resource Recovery Act 2007* (WA), which sets out options for managing waste, from avoiding, to reusing, recovering, treating and disposing of waste.	
			WR.16	Appropriate waste bins, facilitating segregation of waste, should be located at key site compounds to facilitate segregation and prevent cross contamination.	
		Hazardous waste	WR.17	Contaminated waste must be classified and disposed in accordance with the CEMP.	
			WR.18	Hazardous waste to be correctly stored, managed and disposed of by a licenced contractor or facility and in accordance with the relevant occupational health and safety legislative and regulatory obligations, including wastes generated as a result of demolition.	
	Operation	Generation of waste	WR.19	Plant and equipment used in the proposal is appropriately maintained.	
			WR.20	Operators to adhere to the practices of the waste hierarchy in the *Waste Avoidance and Resource Recovery Act 2007* (WA), which sets out options for managing waste from avoiding, to reusing, recovering, treating and disposing of waste.	
		Hazardous waste	WR.21	Contaminated waste must be classified and disposed in accordance with relevant legislative requirements.	