CHAPTER 07

Sustainability

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

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

Contents

Tables

7. Sustainability

7.1 Summary

Sustainability is an important consideration for the Helidon to Calvert (H2C) Project (the Project). As part of the wider Inland Rail Program (Inland Rail), the Project provides opportunities to:

- Maximise resource efficiency
- Enhance local economic activity
- Mitigate potential environmental and social impacts.

These key areas of focus align with the ARTC's *Inland Rail Environment and Sustainability Policy* (ARTC, 2018a), which outlines the sustainability objectives, targets and commitments for the Project. This policy can be found in Appendix F: Corporate Policies.

During the development of the design, sustainability initiatives were identified and incorporated into the Project. These opportunities and initiatives will contribute towards achieving an Infrastructure Sustainability (IS) rating for the Project against version 1.2 of the IS Rating Scheme, which is administered by the Infrastructure Sustainability Council of Australia (ISCA, 2018). The Project's contribution will also form part of the Inland Rail's target of achieving an 'Excellent' rating under the IS Rating Scheme.

7.2 Scope of chapter

This chapter provides a summary of the sustainability considerations for the Project including:

- Describing the legislation, policies, standards and guidelines relevant to sustainability in the context of the Project (refer Section 7.3)
- Defining ARTC's approach to sustainability within the context of Inland Rail, and how this has been considered during the design of the Project (refer Section 7.4)
- Detailing the proposed Sustainability Management Plan requirements (refer Section 7.5 and Chapter 23: Draft Outline Environmental Management Plan) and identified sustainability initiatives that will guide the detailed design (refer Section 7.6), construction and operation of the Project (refer Section 7.7).

The early design stages capture the key design inputs required for the Environmental Impact Statement (EIS) and will provide the basis from which primary approval documentation will be developed. It will also advise the development of detailed designs as the Project progresses (refer Section 7.6).

7.3 Legislation, policies, standards and guidelines

The pursuit of sustainable development has gained momentum since the release of *Our Common Future*, commonly referred to as the Brundtland Report (World Commission on Environment and Development, 1987). In the Australian context, the definition of sustainable development is based on the information contained in the Brundtland Report, as well as the *National Strategy for Ecologically Sustainable Development* (Council of Australian Governments, 1992). The *National Strategy for Ecologically Sustainable Development's* definition of ecologically sustainable development is:

> *'...using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'.*

The legislation, policies and guidelines outlined in Table 7.1 have been used to guide the implementation of sustainability initiatives during the Project design, in consideration of the whole Project life cycle. Table 7.1 should be read in conjunction with the regulatory context presented is technical discipline studies such as ecology, hydrology, visual impact assessment and cultural heritage, which also focus on preservation of the natural, social and built environment. Refer Chapter 3: Project approvals for further detail.

TABLE 7.1: REGULATORY CONTEXT

Legislation, policy or guideline	Relevance to the Project
Commonwealth legislation	
Environment Protection and Biodiversity Conservation Act 1999	▸ Promotes ecological sustainable development through the conservation and ecologically sustainable use of natural resources
National Greenhouse and Energy Reporting Act 2007	▸ Outlines the approach to providing data and reporting in relation to greenhouse gas emissions and energy consumption and production
State legislation	
Environmental Protection Act 1994 (Qld)	▸ Aims to protect the environment while allowing for ecologically sustainable development
State Development and Public Works Organisation Act 1971	▸ Establishes the framework for environmental assessment of declared coordinated projects in Queensland
Planning frameworks, strategies and statutory guidelines	
United Nations Framework Convention on Climate Change including the Paris Agreement on Climate Change	▸ Australia is a party to the Paris Agreement 2015. In August 2015, the Australian Government committed to reduce emissions by 26–28 per cent below 2005 levels by 2030
Sustainable Procurement Guide (Commonwealth of Australia, 2018)	▸ Outlines the concepts of sustainable procurement, the general principles underpinning it, and the priorities and direction for sustainable procurement for Australian Government agencies and organisations
Guide for sustainable procurement of services (Eco-Buy Limited, 2013)	▸ Sets the priorities and direction for sustainable procurement for Australian Government agencies and organisations
Infrastructure Sustainability Planning Guidelines (ISCA, 2016)	▸ Details how the IS rating scheme may be applied to the planning phase of infrastructure projects, which occurs prior to the detailed design phase
Infrastructure Sustainability Rating Scheme Version 1.2, April 2018 update (ISCA, 2018)	▸ Inland Rail has adopted the IS Rating Scheme for guiding sustainability for all projects
Queensland Climate Change Response, including the Climate Transition Strategy and Climate Adaptation Strategy (DEH 2017a and DEH 2017b) (Department of Environment and Heritage Protection (DEHP), 2017a; DEHP 2017b)	▸ Provides guidance on the context for consideration of climate change mitigation and adaptation approaches in Queensland
Australian Standards	
AS 5334–2013 *Climate change adaptation for settlements and infrastructure—A risk-based approach* (Standards Australia, 2013a)	▸ Provides guidance on managing climate change risks that settlements and infrastructure face and includes implementation plans for suitable and effective adaptation (treatment)
Inland Rail related guidelines	
Inland Rail Sustainable Procurement Policy (ARTC, 2018b)	▸ Sets the priorities and direction for sustainable procurement in the context of Inland Rail
Inland Rail Environment and Sustainability Policy (ARTC, 2018a)	▸ Sets the priorities and direction for implementing sustainability initiatives during the planning, design and operational phases of Inland Rail

7.4 Approach to sustainability on Inland Rail

The opportunities that freight rail provides to reduce the environmental and social impacts associated with economic advancement, and by connecting the producers of agricultural and industrial goods to their markets, is at the heart of the Inland Rail.

Inland Rail will provide a long-haul freight solution that is time and cost competitive compared to road freight (refer Chapter 2: Project rationale). It is anticipated that Inland Rail will replace some of the long-haul road freight task, resulting in reduced road congestion. Fewer vehicular emissions are also expected with Inland Rail compared to transportation of the same volume of freight via the road route.

In recognition of the role Inland Rail has in demonstrating sustainability leadership, ARTC has developed the *Inland Rail Environment and Sustainability Policy* (ARTC, 2018a). A copy of the policy is provided in Appendix F: Corporate Policies.

The sustainability commitments embedded in the *Inland Rail Environment and Sustainability Policy* (ARTC, 2018a), and targets for Inland Rail have guided the Project's approach to sustainability. These commitments are summarised in Table 7.2.

TABLE 7.2: INLAND RAIL SUSTAINABILITY COMMITMENTS (AND APPLICATION)

Sustainability commitments	Application to Project
No Harm: ▸ Our goal is that no-one is harmed at work or on our network.	▸ Health and Wellbeing—Creating a safe environment, developing programs and initiatives to improve safety outcomes to local communities and ensuring ongoing engagement. All activities in accordance with the Social Impact Management Plan, and the Health and Wellbeing Action Plan ▸ Crime Prevention through Environmental Design (CPTED)—incorporating measures in design, construction and operation that reduce the likelihood of damage and injury to people and property and the impact these have on local communities. Investigating the opportunity for designing temporary construction diversions and lighting to meet CPTED guidance.
Engage early and meaningfully with stakeholders, including communities, industry, government and Indigenous organisations: ▸ Build effective working relationships and a shared understanding of the Program and solutions.	▸ Community and Stakeholder Engagement—encouraging, planning, implementing and monitoring engagement in accordance with the Social Impact Management Plan and Community and stakeholder engagement Action Plan ▸ Heritage—recognising the role that engagement with the Indigenous and non-Indigenous community has in the identification of heritage items and values.
Promote long-term economic benefits within regional communities: ▸ Create opportunities for development of skilled local and Indigenous workers ▸ Support local and Indigenous businesses to ensure they are prepared for and are provided with opportunities to participate ▸ Enable Inland Rail to be a catalyst for complementary private sector investment.	▸ Procurement—encouraging sustainability throughout the value chain for goods and services used to build and operate Inland Rail ▸ Community and Stakeholder Engagement—encouraging, planning, implementing and monitoring stakeholder and community engagement ▸ Heritage—recognising the role, and opportunities, that engagement with the Indigenous and non-Indigenous community has in investigating and interpreting heritage matters (including options to mitigate, manage and enhance/promote historical cultural and landscape heritage values) ▸ Community Health and Wellbeing—identification of opportunities to support local economic benefits to local, regional and Indigenous communities ▸ Implement the Social Impact Management Plan and supporting Action Plans, specifically relating to workforce management, housing and accommodation, and local business and industry procurement.

Sustainability commitments	Application to Project
Protect the environment by minimising the environmental footprint: ▸ Apply the principles of avoid, minimise, offset to manage impacts to receiving environments and ecological values ▸ Reduce greenhouse gas emissions and minimise waste ▸ Minimise water use ▸ Continually investigate opportunities to improve environmental values and prevent pollution ▸ Obtain and comply with all relevant environmental approvals.	▸ Environment—seek opportunities to reduce the environmental footprint of the Project ▸ Waste—seek opportunities to minimise waste generation and to reuse or recycle materials ▸ Energy and carbon—seek opportunities to reduce the carbon footprint of the Project ▸ Water—seek opportunities to reduce the total amount of water used on the Project and to identify sources of water which reduce the potential demand on potable water supplies ▸ Resources and embodied energy—seek opportunities to reduce the environmental impacts of materials used during construction and operation of the Project, encouraging dematerialisation of the design and improving service life of the materials.
Future-proof Inland Rail so it is efficient and effective in the long term: ▸ Design for climate change resilience ▸ Incorporate the future demand requirements and corridor uses in current design.	▸ Climate change—considering climate change impacts and opportunities to reduce the risks to Inland Rail associated with a future climate ▸ Future-proofing—considering the future demand requirements to reduce potential impacts to the natural and social environment (future upgrades and potential increased demand).
Base decisions on a balanced consideration of technical, economic, environmental and social issues: ▸ Adopt a consistent approach across Inland Rail.	▸ Decision making—consistently considering the environmental, social, local economic and technical impacts during decision making and ensure such considerations ae built into the decision-making process.
Regularly review and audit processes and performance: ▸ Challenge the way we have always done things ▸ Ensure we are doing what we said we would do.	▸ Leadership—demonstrating sustainability leadership across the delivery of Inland Rail and at the Project levels ▸ Management and governance—recognising the importance of monitoring, and review of progress to identify opportunities for continuous improvement ▸ Benefits identification—early identification of the benefits the Project will bring, so that the promised benefits can be assessed and reviewed during operation.
Drive a culture of continuous improvement: ▸ Seek to improve, collaborate and value add throughout delivery ▸ Continually improve our Environmental Management System to enhance environmental performance.	▸ Management and governance—encouraging improvement in the delivery of the Project and on the promises made to stakeholders and the community ▸ Innovation—reviewing the outcomes from the way things are done to find new and better ways of achieving the desired outcomes.

7.5 Sustainability Management Plan

A Sustainability Management Plan will be developed by the contractor responsible for the delivery of the design and construction of the Project. The Plan will be consistent with, although independent of, the Draft Outline Environmental Management Plan (refer Chapter 23: Draft Outline Environmental Management Plan) to guide the Project.

The Sustainability Management Plan will:

- Demonstrate leadership and commitment to sustainability
- Include reasonable targets for safety, local employment, materials, waste, procurement, ecological connectivity, greenhouse gas emissions and climate resilience in line with the Inland Rail objectives and targets
- Establish the roles, responsibilities and resourcing requirements for embedding sustainability throughout the design, procurement and construction of the Project
- Document the process for the identification, assessment and implementation of sustainability initiatives and opportunities, particularly those associated with the efficient use of energy, water and transport
- Document the process to be used to manage the assessment, monitoring and review of sustainability against achieving the requirements to contribute to an 'Excellent' rating under the *IS Rating Scheme*
- Outline the documentation and reporting requirements necessary to demonstrate how sustainability has been incorporated into the Project during design, construction and operation.

The plan will be reviewed and audited by ARTC as part of its management of the proposed *IS Rating Scheme* target , in line with Version 1.2 of the rating scheme.

Prior to the commencement of operations, the design and construction phase Sustainability Management Plan will be reviewed and updated to focus on operations and maintenance aspects.

7.6 Sustainability in design

During design, frameworks were developed to guide to identify sustainability initiatives and guide the development of the design. These frameworks have been captured in Table 7.3.

TABLE 7.3: DESIGN FRAMEWORK FOR SUSTAINABILITY INITIATIVES

Theme	Topic	Sustainability in design measures

Governance	Making informed decisions	▸ Development of a Sustainability Management Plan that: guides the design processes for the Project; provides sustainability outcomes; and supports the ARTC's Inland Rail *Environment and Sustainability Policy* (ARTC, 2018a)
		▸ Use of a safety in the design process that provides a comprehensive framework to avoid or minimise risk and enhance safety
		▸ Development of a Sustainability Management Plan that: guides the design processes for the Project; provides sustainability outcomes; and supports the ARTC's Inland Rail *Environment and Sustainability Policy* (ARTC, 2018a)
		▸ Investigation of realignment, and implementation in three locations where better outcomes were identified:
		  ▸ Realignment of the Warrego Highway Crossing resulting in the ability for a box girder arrangement rather than a steel-tied arch bridge to be designed and constructed (see Section 2.7.4.1)
		  ▸ Investigation of the realignment at Gatton to reduce potential impacts, which was identified by the multicriteria assessment process as being less favourable than the original alignment (see Section 2.7.4.2)
		▸ Realignment through Forest Hill where the track was relocated along the existing rail line in response to stakeholder feedback seeking reduction to potential impacts on existing agricultural activities (see Section 2.7.4.3)
		▸ Constructability assessment that identifies key processes from start to finish during the construction phase to inform how the Project may be built
		▸ Implementation of a value management process that highlights potential opportunities for defining, maximising and achieving efficiencies
		▸ Engagement with community and stakeholders, such as the Lockyer Valley Regional Council, Ipswich City Council and the establishment of the Lockyer Valley Community Consultative Committee
		▸ Implementation of Consultation Manager to record (and track) stakeholder feedback for all phases of the Project

Theme	Topic	Sustainability in design measures

Governance (continued)	Future-proofing	▸ The alignment has considered future asset requirements, including ultimate corridor considerations, to minimise the potential for premature decommissioning.
		▸ The following were considered:
		  ▸ Additional earthworks and property required to accommodate extended crossing loops for trains up to 3,600 m in length
		  ▸ Structures designed to accommodate 30-tonne axle loads
		  ▸ Track structure and formation designed to suit 30-tonne axle loads
		  ▸ Connections to existing operating rail via turnout connections to Inland Rail
		▸ The design has endeavoured not to preclude opportunities for adjacent land use or business to access the Inland Rail corridor in the future.

	Climate response	▸ Consideration of climate change to inform the design of drainage and hydrology including:
		  ▸ Application of the latest version of the *Australian Rainfall and Runoff* (Engineers Australia, 2014) which considers climate change impacts on rainfall
		  ▸ Assessment of impacts associated with the 1% annual exceedance probability (AEP) to determine the sensitivity of the design to potential changes in rainfall intensity
		  ▸ Where new track is to be constructed in greenfield areas, track crossing and longitudinal drainage with capacity to convey the 1% AEP without over topping formation (including climate change and blockage factors)
		  ▸ Where enhancing or upgrading existing track, no worsening of the existing track flood immunity
		  ▸ Adoption of afflux design limits of 0.01 m for existing habitable and/or publicly used commercial structures, buildings/premises (e.g. dwellings, schools, hospitals, shops) , unless agreed otherwise with affected stakeholders for the 1% AEP
		▸ Consideration and implementation of treatment and adaptation options associated with the direct and indirect impacts of climate change and natural hazards to reduce the potential for service disruption
		▸ Identification of climate change risk and mitigation in accordance with industry standards, including AS 5334–2013 *Climate change adaptation for settlements and infrastructure—A risk-based approach* (Standards Australia, 2013a)
		▸ Design mitigation measures applied to manage runoff and flooding to existing potentially affected sensitive receivers
		▸ Establishment of flood resilience requirements including designs providing the 1% AEP event without overtopping the rail formation
		▸ Consideration of extreme frequency flood events to improve flood immunity including consideration of the 1-in-100 year and 1-in-2,000 year AEP flood events
		▸ Consideration of longer duration flood events on infrastructure components including embankments
		▸ Implementation of changes to horizontal and vertical alignment of the infrastructure to accommodate proposed bridges over floodplains to minimise hydrological impacts to adjoining properties (19 rail-over-waterway bridges are considered).

The Project has embraced the three main aspects of sustainability: consideration of the local economic, environmental and social impacts and opportunities. The sustainability initiatives that have been identified, documented and implemented during design in accordance with these principles are identified in Table 7.4 under the themes of:

- Advancing local, regional and national economies
- Environmental protection
- Respect for people, communities and valued places.

TABLE 7.4: SUSTAINABILITY IN DESIGN INITIATIVES

Theme	Area	Sustainability opportunities
Advancing local, regional and national economies	Supporting local and Indigenous businesses	▸ Adhere to the *Sustainable Procurement Policy* (ARTC, 2018b) and strategy to ensure Project supply opportunities are available to local business (within 125 km of the Project alignment) ▸ ARTC Business Development Manager engaged with local business(es) to identify opportunities to develop and promote participation ▸ Consideration of local material sourcing strategies, including using existing lawful operations and identifying opportunities for using local material sources, quarries and concrete suppliers ▸ Develop a clear and efficient process for people to seek information about employment opportunities and to register their interest in Inland Rail ▸ Working with local communities and government stakeholders to identify education and training pathways, and employment opportunities for residents during and after construction.

Environmental protection	Biodiversity conservation	▸ The preferred alignment minimises impacts to prime agricultural land and biodiversity values
		▸ The corridor has been positioned to align with rail, roads and property boundaries where possible to reduce impacts to habitat, fauna passages and remnant vegetation
		▸ This includes three proposed concept fauna crossings at:
		  ▸ Ch 29.7 km—over track at natural level (cut/fill interface)
		  ▸ Ch 32.6 km—associated with the proposed rail bridge
		  ▸ Ch 65.7 km—associated with the proposed rail bridge.
		▸ Where culverts are to be replaced or constructed, in addition to fish passage considerations, the opportunity for dry fauna passage is not precluded
		▸ Design has identified and implemented measures to maintain connectivity and reduce impacts to species, including the use of fencing and dedicated crossings—as associated with the three main terrestrial biodiversity corridors and to support the fish passage strategy
		▸ Design is developed to minimise impacts to waterways, migratory wetland species and aquatic habitats associated with the Lockyer Creek and Bremer River catchments, including the:
		  ▸ Adoption of a crossing structure hierarchy (e.g. where bridges are preferred to culverts), as applicable and relevant to local conditions and constructability. In total 19 rail-over-waterway bridges are proposed as well as 86 culverts
		  ▸ Aim to avoid, then minimise the extent of waterway diversions or realignments. The Project has limited the number of diversion drains to two at affected flow paths, and one at the western tunnel portal
		  ▸ Avoidance of discharges/impacts to hydrology associated with wetlands, including surface flows
		  ▸ Consideration of water quality design matters in response to impacts identified through the EIS, including the collection (and possible treatment) of tunnel water prior to release.

Environmental protection	Efficient use of resources and minimisation of carbon footprint	▸ Identify opportunities for the re-use of:
		  ▸ Local sources of aggregate and treated dispersive and reactive materials to improve mass haul
		  ▸ Material excavated below the rail embankment for less critical parts of infrastructure
		  ▸ Excavated material as a stabilised structural fill
		▸ Optimise the number, width and depth of cuts to avoid the generation of material that would be considered surplus to Project requirements
		▸ Investigate the viability of the potential re-use of ballast as high-quality general fill or structural fill to minimise the import of rock amour
		▸ Maximise the use of onsite materials through the potential reuse of up to 2.2 million cubic metres of spoil on the Project, minimising disposal and transportation of materials

Theme	Area	Sustainability opportunities

Environmental protection (continued)	Efficient use of resources and minimisation of carbon footprint (continued)	▸ Identification of opportunities for surplus quantities of tunnel spoil to be available for beneficial reuse offsite as part of rehabilitation activities for disused quarries or the development of new sites, such as the Gatton West Industrial Zone
		▸ Implementation of geotechnical works to inform the design and minimise the extent of:
		  ▸ Structural fill required
		  ▸ Cuttings expected to require blasting
		  ▸ Imported non-dispersive soil to embankments
		▸ Refining the horizontal and vertical design alignments to minimise the quantity of offsite fill required as much as reasonably practicable
		▸ Avoiding, where possible, steep terrain and topographical constraints to minimise earthworks and provide for more efficient track geometry and grade
		▸ Co-location with existing transport corridors such as the West Moreton System rail corridor and the protected Gowrie to Grandchester rail corridor and alignment with property boundaries wherever practically possible to minimise land severance and loss of productive agricultural land
		▸ Use of existing brownfield rail environments minimising land take impacts
		▸ During pre-construction, engage with Department of Agriculture and Fisheries to identify opportunities for state forest timber salvage to supply local timber mills prior to commencement of rail construction
		▸ Consideration of the shape and size of batters to encourage cut and fill balancing
		▸ Completing an assessment of the availability, quality and volume of materials that are readily accessible using standard construction equipment onsite or close by
		▸ Adopting the intent to preferentially reuse material, identifying ways to treat or ameliorate materials that would normally be considered unsuitable for use
		▸ Provision for erosion and sediment control and scour protection in the permanent and temporary Project footprint to minimise the potential for soil loss during construction and operation.

Respect for people, communities and valued places	Being a good neighbour	▸ Position the rail corridor to align with roads and private property boundaries where possible to reduce impacts to limit property severance ▸ Consultation with landowners to ensure that a satisfactory level of access between adjoining properties is maintained, and to identify action that will minimise or offset changes to connectivity or changes to water flows that affect their properties ▸ Minimise vegetation clearing and land disturbance to that required for safe construction and operation of the rail network to maintain the rural character of the area.

		▸ Design and implementation of horizontal alignment to avoid direct impacts on nationally and regionally landscape areas including the Lockyer National Park and Gatton National Park
		▸ Evaluation of the use of treatments on embankments to soften their visual impact
		▸ Consideration and adoption of measures to minimise noise impacts on neighbouring properties including those in Gatton, Forest Hill (brownfield) and Laidley (greenfield) through:
		  ▸ Changes to the radius of the curves where noise impacts are greater than linear sections
		  ▸ Use of continuously welded rail
		  ▸ Identification of potential mitigation measures such as concept noise barriers (based reasonableness and practicality)

Theme	Area	Sustainability opportunities
Respect for people, communities and valued places (continued)	Respecting heritage and culture values	▸ Continued engagement with registered Aboriginal parties in accordance with the Cultural Heritage Management Plans for the Project, ensuring ARTC's commitments in fulfilling its duty of care under the *Aboriginal Cultural Heritage Act 2003* (Qld) occurs in a manner that is endorsed by the relevant parties ▸ Location of permanent and temporary infrastructure and activities to minimise impacts to locations of cultural heritage value including protection of Indigenous heritage values and historic sites such as the Helidon Railway Culvert and Lockyer Creek Rail Bridge ▸ Alignment options assessment to reduce the proximity of the Project to non-indigenous cultural heritage.
	Building relationships	▸ Incorporation of community and stakeholder feedback into alignment and design decision making as well as the identification of future opportunities.
	Community safety, health and wellbeing	▸ Optimisation of road and rail interfaces for public roads to minimise safety risks, consider wait times and maintain a high level of local accessibility, including 36 public road (formed) interfaces, 9 public road (unformed) interfaces, 5 pedestrian crossings (including replacement of the existing pedestrian footbridge at Gatton Station) and 7 active road level crossings ▸ Consulting with landowners to identify specific measures that will reduce impacts on farm management, connectivity or amenity, including consideration of the level of existing conditions and amenity with the location and design of the Project intended to reduce potential impacts as part of Chapter 10: Landscape and visual amenity and Chapter 15: Noise and vibration ▸ Watercourse crossing structures (including culverts and bridges) designed to minimise the need for ongoing maintenance, scour and risk of blockage ▸ 4 crossing loops positioned to avoid, where possible, sensitive receptors to potential emissions ▸ Temporary construction facilities (laydowns, flash-butt welding as examples) positioned to avoid, where practical, potentially affected sensitive receptors ▸ Permanent alignment selection for rail and road infrastructure has considered the proximity of sensitive receptors to potential impacts (air quality, noise and vibration) ▸ Future controls through the safety in design process are incorporated into the design to address key safety risks throughout the Project life cycle.

7.7 Future sustainability opportunities

A summary of future sustainability opportunities for the Project is in Table 7.5.

These opportunities were identified during the design phase to date but require further investigation during the detailed design, construction and/or operational phases.

TABLE 7.5: SUSTAINABILITY OPPORTUNITIES THAT MAY BE IMPLEMENTED DURING FUTURE PHASES OF THE PROJECT

Theme	Area	Sustainability opportunities
Governance	Sustainability leadership	▸ Create a culture within ARTC where implementation of sustainability initiatives is inherent in all business activities ▸ Commit to be a responsible and attractive employer ▸ Maintain a high level of safety and security through the development of management systems.
	Monitoring and evaluating performance	▸ Maintain dialogue with supply chain stakeholders and report transparently about environmental and social performance ▸ Require the contractor to report against sustainability targets on a monthly basis.
	Making Informed decisions	▸ Build an internal environmental management system that collects sustainability data in a consistent, reliable and traceable format ▸ Create a robust sustainability reporting framework that supports decision making against the sustainability strategy ▸ Continue to pursue opportunities to re-use worksites and haul roads and/or water bores associated with projects being pursued within the region or neighbouring regions.

	Future proofing	▸ Embed the principles of sustainability and environmental benefits into rail asset management programs including:
		  ▸ Resource consumption (energy, water, fuel, chemicals)
		  ▸ Selection of fuel-efficient plant and equipment and the operation of the equipment to reduce fuel and electricity consumption
		  ▸ Procurement of environmentally friendly and socially friendly materials and suppliers aligned to ARTC's *Sustainable Procurement Policy* (ARTC, 2018b), State and national policies and ISO 20400:2017 *Sustainable Procurement* (International Organization for Standardization, 2017)
		  ▸ Triple-bottom-line reporting into asset risk analysis including potential for environmental damage, negative social impacts and regulatory compliance issues from asset failures
		  ▸ Review of sustainability impacts from asset disposal and end-of-life decommissioning.

	Encouraging innovation	▸ Apply precautionary approaches to environmental challenges and support initiatives, projects and new technologies for further improved environmental performance ▸ Partner with key material suppliers (e.g. suppliers of rails and sleepers) to pursue innovation opportunities ▸ Encouraging innovation by continually improving existing systems and processes.
	Learning from our experiences/ continuous improvement	▸ Establish a Program-wide sustainability network to enable the sharing of lessons learnt between projects and with the broader industry ▸ Identify environmental risks and processes across ARTC and support new ways of acting to reduce these ▸ Provide access to training on environmental requirements and improvements ▸ Provide awareness and visibility initiatives across ARTC.
Advancing local, regional and national economies	Supporting local and Indigenous businesses	▸ Include specific details on opportunities and targets for local and indigenous business participation in the implementation plan for ARTC's *Sustainable Procurement Policy* (ARTC, 2018b) ▸ Pursue opportunities identified in the Social Impact Management Plan.

Theme	Area	Sustainability opportunities

Advancing local, regional and national economies (continued)	Job creation and skills development	▸ Work with Department of Employment, Small Business and Training to assist the local workforce to adjust to construction employment opportunities through:
		  ▸ Workforce upskilling
		  ▸ Engagement of small business
		  ▸ Liaison with education and training providers
		  ▸ Development of procurement and tendering processes for local business and suppliers
		  ▸ Development of a 'work–life balance policy' that includes outreach to women
		▸ Focus on local impacts and communities through better understanding and engagement, with emphasis on local plans and assets
		▸ Consider skills development and training partnerships with Registered Training Organisations and schools that enable apprentices, and vocational education and training students to continue skills development beyond the life of the Project they were originally engaged on
		▸ Have a clear and efficient process for people to seek information about employment opportunities and to register their interest in Inland Rail
		▸ Continue engaging with communities, representative organisations and service providers to develop new local businesses.

	Stimulating sustainable procurement	▸ Engage with suppliers to ensure they recognise and understand their role in supporting ARTC's sustainable objectives ▸ Adopt strategies to avoid unnecessary consumption and manage demand ▸ Select products and services which have lower environmental impacts across their life cycle compared with competing products and services, in the context of whole of life value for money ▸ Foster a viable market for sustainable products and services by supporting businesses and industry groups that demonstrate innovation in sustainability ▸ Support suppliers who are socially responsible and adopt ethical practices.

Respect for people, communities and valued places	Building relationships	▸ Maintain Community Reference Groups to ensure a representative selection of the community who:
		  ▸ Are afforded the opportunity to provide feedback and are involved in the Project
		  ▸ Have an increased understanding about the Project
		  ▸ Contribute to a more effective response from the Project team to community issues and concerns
		  ▸ Identify opportunities for interpretation and viewing associated with old and new rail infrastructure
		  ▸ Identify opportunities to create legacy branding of new rail infrastructure, such as date stamps, that will enhance its potential as a future heritage element
		▸ Implement communication mechanisms that will be maintained by ARTC throughout the approval, pre-construction and construction phases.

	Community safety, health and wellbeing	▸ Move freight competitively by rail will take long haul truck traffic off roads reducing greenhouse gas emissions
		▸ Explore the use of monitoring systems that address rail trespass and road vehicle incursions specifically targeting:
		  ▸ Fire detection and response
		  ▸ Remote monitoring of tracks and unattended or secure locations
		  ▸ Video surveillance and analysis
		  ▸ Train scheduling
		  ▸ Track maintenance and detection of damage or obstructions
		  ▸ Railway crossing management and detection of objects on the line
		  ▸ Speed detection and of over speeding
		  ▸ Detection of objects protruding from moving trains

Theme	Area	Sustainability opportunities
Respect for people, communities and valued places (continued)	Community safety, health and wellbeing (continued)	▸ Investigate possible re-use of temporary areas and infrastructure ▸ Seek opportunities to integrate CPTED considerations as part of the toolkit being developed by Department of Transport and Main Roads to support councils that want to lower speed limits in areas where there is high interface between pedestrians, motorists and cyclists.
	Biodiversity conservation/ ecological integrity	▸ Investigate opportunities to work with local land care groups to implement a program of supplementary planting of habitat corridors ▸ During detailed design, continue to refine and optimise alignment design to minimise the corridor footprint ▸ Evaluate options to re-vegetate soil slopes steeper than 1V:3H and maintain this cover as protection from ongoing erosion ▸ Adopt waterway design principles to promote natural flow through culverts and 'wet areas' ▸ Use endemic species in site restoration that minimise weed spread and require minimal maintenance (where practical) ▸ Seek opportunities to participate in research to investigate opportunities for fire ant contaminated topsoil treatment solutions (for extended durations in stockpiles).

	Using resources efficiently	▸ Explore opportunities for material delivery and haulage via the existing rail networks
		▸ Promote the consideration of fuel/energy efficiency in the selection of plant and equipment used during construction. During detailed design:
		  ▸ Identify opportunities to change batter slopes and save earthworks where not adversely impacting bulk earthworks or material re-use
		  ▸ Review vertical alignment to determine potential earthworks volumes and culvert design savings
		  ▸ Assess culverts with view of optimisation
		  ▸ Identify potential earthworks savings by reverting from reinforced concrete pipes to reinforced concrete box culverts to reduce cover requirements
		▸ Investigate the refinement of earthworks and substructure quantities through:
		  ▸ Potentially re-use dispersive soils over the outer part of embankments using lime and specialist revegetation detailing
		  ▸ Re-use high plasticity clay soils
		  ▸ Use geogrids and stabilisation to reduce the volume of subgrade treatment
		  ▸ Use low embankments providing the opportunity to omit rock protection (subject to hydraulic assessment)
		▸ During construction investigate the use of:
		  ▸ Light detection and ranging aerial surveying for accurate knowledge and control of cut and fill requirements
		  ▸ Alignment designs capable of considering available materials sourced locally
		  ▸ Mobile crushing plants and materials handling
		  ▸ Positioning of pre-casting and manufacturing locations to reduce transport footprint
		▸ Investigate the opportunity to balance the use of materials across Project boundaries, including the exchanging of surplus fill, aggregates, pipe work and common use materials between projects
		▸ Investigate the use of pre-fabricated Project components throughout the construction life cycle
		▸ Pursue opportunities to increase design life of asset components which are less than 100 years in duration, thus reducing frequency of replacement
		▸ Possibly re-use water bores which are no longer required by bore owners
		▸ Possibly re-use recycled water plant and surplus water supply from landowners
		▸ Consider the use of solar power systems, including stand-alone systems, for the provision of power at site offices and for permanent infrastructure associated with signalling

Theme	Area	Sustainability opportunities
Respect for people, communities and valued places	Pollution prevention and minimising carbon footprint	▸ Investigate the implementation of signalling control systems that automatically adjust control and speed profiles so that the train arrives at target destinations on time while minimising energy consumption ▸ Invest in practical methods to address waste minimisation, energy and water saving technologies and practices during construction, operation and maintenance.

7.8 Conclusions

Sustainability is an important consideration for the Project to help maximise resource efficiency, enhance local economic activity, and mitigate potential environmental and social impacts. A number of sustainability in design initiatives have been identified and may be implemented as outlined in Table 7.4, and these initiatives have been used to assess the anticipated sustainability performance of the Project. Future sustainability opportunities that may be implemented during future Project phases are outlined in Table 7.5.

The Project's contribution will also form part of the Inland Rail's target of achieving an 'Excellent' rating under the IS Rating Scheme.