Referral of proposed action

Project title:

Inland Rail – Helidon to Calvert

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) and associated geographic information system (GIS) vector (shapefile) dataset showing the location and approximate boundaries of the area in which the Project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the Project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(i).

1.1 **Short description**

Use 2 or 3 sentences to uniquely identify the proposed action and its location.

The Australian Government has committed to delivering the Inland Rail Programme which is designed to deliver freight rail services over a distance of 1700km between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland, shown in Attachment 1.

The Inland Rail Programme consists of 13 separate projects that will be assessed, procured and constructed separately. Each of the projects is able to operate independently of other projects within the Inland Rail Programme.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is the proponent for the Helidon to Calvert Project. The Helidon to Calvert Project is a proposed single track, dual gauge fright line, comprising standard gauge and narrow gauge, approximately 47km in length, utilising sections of the existing rail network and new greenfield corridors. The Helidon to Calvert Project includes construction of track and track formation, new culverts and bridges, a tunnel and ventilation infrastructure, construction of new crossing loops, rationalisation of level crossings with some grade separations of the local road network.

1.2 **Latitude and longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

A Preferred Alignment and wider Study Area have been defined for the Helidon to Calvert Project as discussed in Section 1.4. Coordinates for both polygons are included in Attachment 2.

Also attach the associated GIS-compliant file that delineates the proposed referral area. If the area is less than 5 hectares, please provide the location as a point layer. If greater than 5 hectares, please provide a polygon layer. If the proposed action is linear (e.g. a road or pipeline) please provide a polyline layer (refer to GIS data supply guidelines at Attachment A).

Do not use AMG coordinates.

1.3 **Locality and property description**

Provide a brief physical description of the property on which the proposed action will take place and the Project location (e.g. proximity to major towns, or for off-shore Projects, shortest distance to mainland).

The Helidon to Calvert Project is shown in Attachment 3. It commences at Helidon, deviating from the existing West Moreton Rail Line at a tie-in point along Airforce Road, immediately west of Helidon. The corridor continues south east crossing the Warrego Highway, continuing east between the highway and the existing rail corridor until it runs immediately parallel with the existing rail corridor through Placid Hills.

The new track continues parallel to the north of the existing rail line, through Gatton and the existing Gatton rail station, through Forest Hill and then deviates from the existing rail corridor in a south east direction just north of Laidley Township across Laidley Plainlands Road. The corridor then continues and crosses the existing rail corridor at grade near the former Yarongmulu Station (west of the existing tunnel portal under Little Liverpool Range) then continuing east before reaching a new approximately 1.1km tunnel section through Little Liverpool Range.

After exiting the eastern tunnel portal at the Little Liverpool Range, the Project crosses over the existing rail line twice, bypassing the existing Grandchester Station to the south, running parallel to the existing rail corridor just to the south of the existing rail corridor, and then connecting back in to the existing rail line west of Calvert.

1.4	**Size of the development footprint or work area (hectares)**	The Concept Engineering and Environmental Assessment Phase of the Helidon to Calvert Project have identified a Preferred Alignment and a broader Study Area for consideration in the IAS and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) Referral, as shown in Attachment 3. This will allow for route and tunnel optimisation and other value engineering opportunities to be investigated during subsequent design development, community engagement, environmental assessment and approvals processes. The final Alignment and Project Corridor will be defined during the Environmental Impact Statement (EIS) and design development phases and will include both brownfield (within existing rail corridor) and greenfield development. The resulting Corridor width will be wide enough to accommodate two dual gauge freight tracks and two narrow gauge passenger tracks. The coordinates of the Preferred Alignment and Study Area are included in Attachment 2.
1.5	**Street address of the site**	The Helidon to Calvert Project extends from Helidon in the west to Calvert in the east, and is not associated with a single address point.

1.6 **Lot description**

Describe the lot numbers and title description, if known.

The Helidon to Calvert Project traverses multiple lots, the majority of which were identified as part of the future public passenger transport corridor protected under the Queensland *Transport Planning and Coordination Act 1994* (TPC Act) by the Queensland Government in 2005 following the Queensland Rail Gowrie to Grandchester study. The properties intersected by the Preferred Helidon to Calvert preferred alignment are listed in Attachment 2.

1.7 **Local Government Area and Council contact (if known)**

If the Project is subject to local government planning approval, provide the name of the relevant council contact officer.

The Helidon to Calvert Project is within the Lockyer Valley Regional Council and Ipswich City Council local government areas.

1.8 **Time frame**

Specify the time frame in which the action will be taken including the estimated start date of construction/operation.

The indicative timeframes for the Helidon to Calvert Project are as follows:

- 2017-2019: design, planning and approvals
- 2019-end of 2020: pre-construction and land acquisition
- 2020 - 2024: Construction
- 2024 Project Opening.

1.9	**Alternatives to proposed action** Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?		No
		✓	Yes ARTC have prepared a business case which considers alternatives to projects that are part of the Melbourne to Brisbane Inland Rail Programme.
1.10	**Alternative time frames etc** Does the proposed action include alternative time frames, locations or activities?		No
		✓	Yes ARTC have conducted numerous studies investigating alternate routes between Helidon to Calvert. The wider Study Area identified also allows for further consideration of route definition and value engineering as the Project develops.
1.11	**State assessment** Is the action subject to a state or territory environmental impact assessment?		No
		✓	Yes An initial advice statement (IAS) has been submitted to the Queensland Coordinator-General seeking a coordinated Project declaration. If granted, the Project will be assessed under the Queensland *State Development (Public Works Organisation) Act 1971*.If the project is a controlled action, it is anticipated that assessment will follow under the bilateral agreement.
1.12	**Component of larger action** Is the proposed action a component of a larger action?	✓	No
1.13	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?		No
		✓	Yes The Helidon to Calvert Project is one of 13 separate projects in the Melbourne to Brisbane Inland Rail Programme. Each of the 13 projects is delivered as a separate, but related action, as each project will: • will be subject to separate State assessments; • will be delivered within different timeframes; • will be separately procured, with it being likely that there will be a separate contract for each project; • is designed so that it can be constructed and operated independently of each other project; • will be delivered on State-owned land, with tenure different

			between each jurisdiction; • will be subject to separate referrals under the EPBC Act, if required. Separate projects that are within the Inland Rail Programme that are adjacent to the Helidon to Calvert project are the Separate projects Gowrie to Helidon Project and the Calvert to Kagaru Project. The Helidon to Calvert Project connects to the existing rail line, with tie-in points designed to enable the Project to proceed and be operated independently of the Gowrie to Helidon and Calvert to Kagaru Rail Projects, if required. These Projects are shown in Attachment 1.
1.14	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this Project?	 ✓	No Yes The Melbourne to Brisbane Inland Rail Programme has been allocated funding from the Australian Government in mid-2016 to progress planning approvals and commence land acquisition.
1.15	**Great Barrier Reef Marine Park** Is the proposed action inside the Great Barrier Reef Marine Park?	✓ 	No

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.7.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

The Helidon to Calvert Project is proposed as an approximately 47 km long single-track dual-gauge railway, with crossing loops to accommodate double stack freight trains up to 1800 m long, between Helidon and Calvert in Queensland.

At a point in time defined by demand, business needs, operational modelling and design, a future action may include additional infrastructure within the corridor including freight track duplication and extension of crossing loops to accommodate 3600m freight trains.

The Helidon to Calvert Project corridor will include space provision for the co-location of the separate Gowrie to Grandchester future public passenger transport corridor, to be developed and operated by the Queensland Department of Transport and Main Roads (TMR).

Key components of the Helidon to Calvert Project that constitute the project the subject of this referral include:

- A rail corridor approximately 65m wide, containing a single track dual gauge railway line with crossing loops for up to 1800 m long train
- The approximately 1.1 km Little Liverpool tunnel, approximately 120,000 cubic metres of earthworks (cut and fill), bridges and viaducts to accommodate topography and project crossings of waterways and other infrastructure
- Tie-ins to the existing West Moreton Railway Line at the project boundary and other potential intermediate locations to be confirmed by operational modelling
- Associated rail infrastructure including maintenance facilities, Advanced Train Management Systems (ATMS) and signalling infrastructure
- Ancillary works including road and public utility crossings and realignments
- Third party infrastructure requirements to be confirmed during future project stages
- Construction workspace and access roads.
- Provision within the corridor for the possible future co-location of the Gowrie to Grandchester future public passenger transport corridor including two passenger tracks to be developed and operated by the Queensland Department of Transport and Main Roads (TMR). Requirements for passenger transport infrastructure (e.g. stations) are excluded from this Project, and would be progressed by TMR.

Elements not included as part of the proposed action the subject of this referral include the following:

- complementary infrastructure, such as metropolitan and regional freight terminals
- upgraded freight fleet / rolling stock
- complementary land use and freight precinct developments

The Concept Engineering and Environmental Assessment Phase of the Helidon to Calvert Project have identified a Preferred Alignment and a Study Area for consideration in this EPBC Referral and the IAS submitted to the Queensland Coordinator-General as shown in Attachment 3. The coordinates of the Preferred Alignment and Study Area are included in Attachment 2. The Study Area will allow for route optimisation and other value engineering opportunities to be investigated during subsequent design development, community engagement, environmental assessment and approvals processes.

2.2 Alternatives to taking the proposed action

This should be a detailed description outlining any feasible alternatives to taking the proposed action (including not taking the action) that were considered but are not proposed (note, this is distinct from any proposed alternatives relating to location, time frames, or activities – see section 2.3).

Melbourne to Brisbane Inland Rail Programme

The Melbourne to Brisbane Inland Rail Programme has been under development for many years. This has included economic analysis, route studies and preliminary engineering analysis. The original North- South Rail corridor study was undertaken in 2006, followed by the Inland Rail Alignment Study released in 2010. A concept business case was prepared in 2014, followed by the preparation of the Programme Business Case in 2015.

Various alternate scenarios to the overall Melbourne to Brisbane Inland Rail Programme have been considered, including:

- Do nothing: freight remains on the existing road network, regional development opportunities are not realised, and potential opportunities to reduce significant greenhouse gas emissions unlikely to be realised
- Increasing the size and number of trucks to facilitate forecast freight growth, which would increase road safety risk and also require investment in the road network for maintenance and capacity
- Reforms to delay or remove the need for infrastructure investment (demand management, productivity enhancement or deregulation)
- Progressive upgrades of the National Highway
- Upgrades of the existing coastal railway
- Alternate freight transport solutions including air freight (cost prohibitive) and coastal shipping (constrained by port access).

The Business Case concludes that the preferred way to achieve the programme objectives is to proceed with implementation. The Business Case Summary, 'The Case for Inland Rail' is included at Attachment 4.

Helidon to Calvert Project

Alternate alignments have been investigated within the Study Area. This includes a bypass of Gatton, a northern bypass of Laidley and track lowering refinements at selected locations. This includes the following:

- The 2003 Gowrie to Grandchester Study. This study was undertaken by Queensland Rail and the Department of Transport and Main Roads (formerly Queensland Transport) to define and protect a future railway corridor suitable for 200 km/h passenger services and freight between Gowrie and Grandchester. The 2003 alignment identified in this study was subsequently declared as a "future public passenger transport corridor" under the *Transport Planning and Coordination Act 1994* and reflected in local government planning schemes.
- The 2006 North South Rail Corridor Study. This study assessed the high level viability of four north south freight corridors between Melbourne and Brisbane. The study was not designed to identify a preferred option but identified the most affordable and economic corridor within which to focus future investigation.
- 2010 Inland Rail Alignment Study (IRAS). This study set the blueprint for the development of an inland railway to meet the future freight demands of eastern Australia. This route included consideration of the Gowrie to Grandchester section of Inland Rail (including the Toowoomba Range and Little Liverpool Range crossings) which ARTC had previously identified as likely to be the critical path component for the completion of Inland Rail. An alternate alignment between Gowrie and Grandchester was selected at the conclusion of this study.
- In 2014 the decision was made to move from the 2010 IRAS alignment to an alignment between Gowrie and Calvert that comprised the previously protected corridor known as the 2003 Gowrie to Grandchester route. This was based on input and further options analysis undertaken by the Queensland Department of Transport and Main Roads, leveraging the existing corridor location and inclusion in planning schemes.
- 2015 Melbourne to Brisbane Inland Rail Business Case confirms the 2014 alignment decision and the 2016 ARTC Concept Assessment process proceeds in consultation with the Queensland Government on this basis.

The Preferred Alignment, shown in Attachment 3, is the result of further options analysis undertaken by ARTC's consultants in 2016 in consultation with the Queensland Government. The concept assessment included a review of previous options analyses, further preliminary engineering design and environmental assessment and

was informed by initial engagement with key stakeholders including the Lockyer Valley Council, Ipswich City Council, peak industry bodies and Aboriginal Parties.

2.3 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative time frames, locations or activities (in section 1.10) you must complete this section. Describe any alternatives related to the physical location of the action, time frames within which the action is to be taken and alternative methods or activities for undertaking the action. For each alternative location, time frame or activity identified, you must also complete (where relevant) the details in sections 1.2-1.9, 2.4-2.7, 3.3 and 4. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, time frames or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

The Preferred Alignment is shown in Attachment 3. The wider Study Area has been identified to enable community engagement, route optimisation and value engineering opportunities during subsequent Project phases and to accommodate utilities, road realignments and ancillary activities and potential construction areas.

The nominated construction and operational timeframes set out in section 1.8 are dependent upon funding by the Australian Government, approvals timeframes and detailed design.

2.4 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (e.g. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

The Melbourne to Brisbane Inland Rail Programme

ARTC has prepared a business case, examining the complex issue of freight movement and forecast freight demand along the east coast of mainland Australia. ARTC estimates that by 2030, more than 32 million tonnes of freight will be moved on highways between Melbourne and Brisbane.

Australia is heavily reliant on efficient supply chains to provide competitive domestic freight links and gateways for international trade. Freight transport services between major population centres, particularly our capital cities, deliver millions of tonnes of freight each year and provide for the distribution of goods throughout the country. Efficient and effective domestic supply chains that are internationally competitive against import chains, support economic growth and help keep down the cost of the products we buy. It is estimated the transport and logistics sectors of the Australian economy contribute 14.5 per cent of Gross Domestic Product (GDP), with Australia's supply chain worth an estimated $150 billion every year. Efficient transport of Australian exports to world markets maximises the economic returns to the Australian economy. Productive ports, freight networks and other critical infrastructure is the key to efficient supply chains and to Australia's competitiveness. Better infrastructure has a critical role in lifting our nation's wealth and prosperity and the effective operation of national freight is integral to the wellbeing of all Australians. Inefficient infrastructure networks are one of the key reasons why Australia's productivity has declined and a key driver of the cost of living pressures affecting Australians. Australia's east coast comprises 70 per cent of the country's population, 78 per cent of Australia's national employment and generates 75 per cent of the nation's GDP. With the population estimated to grow by 60 per cent over the next 40 years increasing pressure will be placed on freight infrastructure and services.

ARTC surmises the following:

- Relying on road for freight transport will result in increasing safety, environmental and community impacts
- The existing rail line between Melbourne and Brisbane is constrained by passing through Sydney and can't accommodate double stacking
- Our regional suppliers have limited transport options.

The Case for Inland Rail concludes:

The Business Case shows that Inland Rail:

- *Is compatible and interoperable with high productivity train operations in the east-west corridor, to Adelaide and Perth*
- *Uses and enhances existing rail infrastructure where possible, making the most of recent investments Bypasses the congested Sydney rail network*
- *Improves connections with regional and local rail and road networks*
- *Maximises value for money, while meeting market needs*
- *Delivers the service that rail customers want, at a price they are willing to pay*
- *Provides significant social and environmental benefits*

- *Will cover its ongoing operating and maintenance costs, once operational*
- *Is good for the country's economy – increasing Australia's GDP by an estimated $16 billion by 2050 Meets Australia's strategic, long-term needs.*

The Australian Government approved funding for the Melbourne to Brisbane Inland Rail Programme in the 2016 Federal Budget to progress the design and engineering development, commence primary planning and environmental approvals and property acquisition.

Queensland Planning Context

ARTC is seeking that the project be declared a 'coordinated project for which an EIS is required' under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971*.

In deciding whether to declare a project to be a coordinated project, the Coordinator-General considers:

- Detailed information about the project given by the proponent in an IAS
- Relevant planning schemes or policy frameworks of a local government, the State or the Commonwealth
- Relevant State policies and Government priorities
- A pre-feasibility assessment of the project, including how it satisfies an identified need or demand
- The capacity of the proponent to undertake and complete the EIS for the project
- Any other matter the Coordinator-General considers relevant.

The Helidon to Calvert Project will also be referred under the *EPBC Act 1999* (this document) and if deemed a controlled action, it is anticipated that assessment of the Helidon to Calvert Project will follow the Bilateral Assessment Agreement between the Australian and Queensland Governments.

The key reasons why ARTC are seeking the coordinated project declaration are:

- To provide the public with the opportunity to comment and provide input into the Terms of Reference for the EIS, and following its development, on the draft EIS,
- To have an independent and transparent social, economic and environmental assessment of the project undertaken by the Queensland Coordinator General; and
- For the opportunity of efficient assessment of EPBC Act matters in accordance with the Queensland and Commonwealth government EPBC Act assessment bilateral agreement.

Relevant Planning Schemes and Policy Frameworks

The Preferred Alignment traverses land within two local government areas (LGAs) including:

1. Lockyer Valley Regional Council
2. Ipswich City Council

As such, the following planning schemes may apply to the Project:

- Gatton Shire Planning Scheme 2007
- Laidley Shire Planning Scheme 2003
- Ipswich Planning Scheme 2006.

The Laidley Shire Planning Scheme identifies a proposed rail corridor consistent with the Preferred Alignment on their Development Constraints Overlay Map I1 and protects it from incompatible development. The existing Gatton Shire Planning Scheme 2007 and Ipswich Planning Scheme 2006 also have provisions for development around existing and proposed transport corridors. The Gatton Shire Planning Scheme 2007 and Laidley Shire Planning Scheme 2003 will be replaced once a single planning scheme for the Lockyer Valley is prepared and adopted.

The Preferred Alignment also forms part of the rail corridor identified under the Gowrie to Grandchester Rail Corridor Study in 2003. This rail corridor was subsequently identified as a 'future public passenger transport corridor' in September 2005 in the Public Passenger Transport Guideline made under the *Transport Planning and Coordination Act 1994*.

The Helidon to Calvert Project will be generally within the existing Gowrie to Grandchester future public passenger transport corridor.

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.11) you must complete this section. Describe any environmental assessment of the relevant impacts of the Project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.
Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

The Queensland *State Development and Public Works Organisation Act 1971* allows for the Queensland Coordinator-General to declare a project to be a 'coordinated Projects' requiring either an Environmental Impact Statement (EIS) or an Impact Assessment Report (IAR). When seeking the declaration of a coordinated project, proponents must apply to the Coordinator General in writing through the preparation and submission of an IAS, a statement of the financial and technical capability to complete an EIS, and a separate statement assessing the technical and commercial feasibility of the project. An application has been submitted to the Coordinator-General for the Helidon to Calvert Project, seeking declaration as a coordinated project.

If the Project is declared a coordinated Project and is also determined to be a controlled action under the EPBC Act it is anticipated that assessment may be progressed under the Bilateral Assessment Agreement between the Australian and Queensland Governments.

After the Coordinator-Generals evaluation report,, further approvals are likely to be required under separate approvals processes. It is anticipated that this might include approvals for waterway barrier works and vegetation clearing under the *Planning Act 2016* (which is expected to repeal and replace the *Sustainable Planning Act 2009* in mid-2017), and other permits such as Protected Plant clearing permits and Species Management Programs under the *Nature Conservation Act 1992* and water permits under the *Water Act 2000*.

Offsets may be required as part of the Coordinator-General's impose conditions, or through later State approvals. Other management plans and approvals may be required to progress implementation of the Project.

2.6 Public consultation (including with Indigenous stakeholders)

Your referral must include a description of any public consultation that has been, or is being, undertaken. Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral. Where appropriate include copies of documents recording the outcomes of any consultations.

Extensive community consultation was undertaken by the Queensland Government for the studies to inform the protection of the Gowrie to Grandchester future public passenger transport corridor in 2003. ARTC have commenced consultation with key government and industry stakeholders and aboriginal parties and the outcomes of these initial consultations have informed the concept assessment phase. ARTC will implement an extensive public consultation program for the Helidon to Calvert Project.

Local Government Consultation

Specific issues raised during preliminary consultation undertaken by ARTC in 2015 and 2016 are outlined in **Error! Reference source not found.**

Table 1: Summary of issues raised by Local Government

STAKEHOLDER	ISSUES and OPPORTUNITIES	2015	2016	STATUS
Lockyer Valley Regional Council (LVRC)	**Local road connectivity** Keen for discussions around technical solutions to maintain connections	✔	✔	While some level of severance is expected, grade separated and at grade crossing locations have been identified and discussions will be held with relevant stakeholders
	Flooding Long-standing concerns about contribution of rail infrastructure to flooding impacts	✔	✔	LVRC flooding data and modelling obtained through data sharing agreement. Flooding a key consideration of

				alignment refinement. Detailed modelling to be undertaken in future planning.
	Cumulative environmental impacts Concerns about the environmental impact that will be caused by both TSRC and IR	✔	✔	To be addressed in more detail during future environmental assessments.
	Operational Impacts of operations with alignment through townships such as Gatton	✔	✔	Alignment selection based on robust MCA and concept assessment process, taking into account various concerns and potential mitigation of risk and operational impacts.
Ipswich City Council	**Environmental impacts** Grandchester is a hub for conservation and Council was planning on tourism around this. Offsets and fauna movement were key area for consideration.		✔	To be addressed in more detail during future environmental assessments.
	Visual impacts Height of proposed embankment near Grandchester a key concern		✔	Visual impacts have been considered during the concept design and alignment refinement process.
	Flooding Impacts on low lying properties and existing flood plains	✔	✔	Flooding a key consideration of alignment refinement. Detailed modelling to be undertaken in future planning.
	Infrastructure interface Concerns about interface with existing rail and Council plans for future development to accommodate population growth	✔	✔	To be addressed in more detail during future design.

Landowner Consultation

Private landowners were engaged to obtain agreement to access their properties for the purpose of conducting ecological studies. Key themes from landowner feedback included:

- The majority of landowners were aware of the existence of the protected rail corridor within their properties, however a small number of private landowners were unaware of the protected rail corridor.
- Land acquisition arrangements and timing.
- Future operation of existing rail line.
- Landowners asked about plans for a tunnel through the Toowoomba range.
- Negative experiences with adjacent infrastructure projects, such as the Toowoomba Second Range Crossing, including field studies.
- Ongoing consultation with the dedicated community engagement lead was a consistent request.

Specific issues raised during preliminary consultation are outlined in **Error! Reference source not found.**2.

Table 2: Summary of issues raised by Landowners

STAKEHOLDER	ISSUES and OPPORTUNITIES	2015	2016	STATUS
Landowners	**Awareness of the Gowrie to Grandchester 2003 future public passenger transport corridor** The majority of landowners were aware of the existence of the protected rail corridor within their properties, however a small number of private landowners were unaware of the protected rail corridor.		✔	Release of detailed corridor information deferred until completion of concept assessment report and selection of alignment.
	Land acquisition arrangements and timing Concerns about lack of information being provided about the corridor location and project timing		✔	Commitments were provided to provide further information when it became available.
	Future operation of existing rail line Several landowners queried the planned operation of the existing rail line.		✔	All were advised this information could not be provided at this time, given the early stage of planning for the Inland Rail alignment.
	Adjacent infrastructure Many property owners located in the region had recent experiences with adjacent infrastructure projects, such as the Toowoomba Second Range Crossing, including with field studies undertaken as part of design for those projects and during construction activities. A number of negative comments were expressed relating to property impacts caused by access and construction activities.		✔	Comments were noted.
	Operational impacts Townships and communities such as Gatton and associated operational impacts such as noise, visual amenity, disruption to lifestyle, level crossing operations		✔	To be addressed in more detail during future environmental assessments

Community Information Sessions

Advertised community information and feedback sessions were held 20 to 23 June 2016. Direct mail invitations were distributed to landowners in a 500 metre radius to the corridor. The following are general issues raised:

- Lack of awareness about the location of the 2003 Gowrie to Grandchester protected corridor
- Concern from landowners located adjacent to the protected corridor about operational impacts
- Investment in their properties, such as building new infrastructure were now in doubt
- Interest in Inland Rail, when it will be constructed and in operation
- Volume of freight traffic likely to be using the new line and potential impacts
- Flooding issues, particularly from residents in Forest Hill and Laidley
- Opportunities for corridor modifications considering farmland operations, valley, flood plain, and access.
- Access for farmers, movement of stock and machinery across the rail corridor
- Land acquisition and compensation processes
- Opportunities for intermodal and freight interfaces within local communities

Stakeholder Workshops

In early 2016, stakeholder workshops were held in Toowoomba and Gatton to identify key issues:

- to be addressed during the environmental assessment process;
- opportunities to create additional value for the project and project stakeholders; and
- an initial indication of the potential social license and risks.

Attendance at the Gatton workshop included Gehrke Grains and Transport, Lockyer Better Business, Lockyer Valley Growers, Lockyer Valley Regional Council, Lockyer Valley Water Users Forum, Nolans Transport, Regional Development Authority - Ipswich and West Moreton, SEQ Catchments Limited, UQ – Gatton and Withcott Seedlings.

Key issues raised included:

- The alignment options under consideration, including Gatton Bypass (height for bypass, impacts on cropping land), Helidon deviation;
- There were significant concerns raised in relation to the potential flooding impacts associated with the height of embankments through Forest Hill;
- Future operation of existing rail line - e.g. through Laidley;
- Level crossings- impacts on local roads and delays for traffic – community severance. Laidley-Plainlands;
- The likelihood of stations or terminals for freight being constructed in the Lockyer Valley as few benefits.

Specific issues raised by Peak Bodies during the workshops are outlined in Table 3.

Table 3: Summary of issues raised by Peak Bodies

STAKEHOLDER	ISSUES and OPPORTUNITIES	2015	2016	STATUS
Peak bodies	**Flooding impacts** Flood mitigation is a big issue, residents question whether there should be a levee around Forest Hill. Previous impacts in Laidley, Grantham and Helidon		✔	Flooding a key consideration of alignment refinement. Detailed modelling to be undertaken in future planning. Opportunity to use catchment groups flood modelling data.
	Environmental impacts Helidon Hills is an important environmental area for SEQ (rock wallabies)		✔	To be addressed in more detail during future environmental assessments.

	Supply chain benefits Interested in having loading facilities in the Lockyer and how this could work with climate-controlled containers and need to identify the value-add for the area.		✔	Relevant stakeholders, such as trucking companies and growers consulted
	Connectivity to industrial and infrastructure developments Impact of loss of connectivity across Gatton and to the Warrego Highway		✔	More information to be provided on staging and timing when available.
	Operational impacts Townships and communities such as Gatton and associated operational impacts such as noise, visual amenity, disruption to lifestyle, level crossing operations		✔	To be addressed in more detail during future environmental assessments

Further opportunities for formal and informal public consultation will be undertaken to support the delivery of approvals, and to capture relevant information for consideration in project design and assessments.

Aboriginal Party Consultation

The Study Area crosses the Jagera people's Native Title Claim areas. ARTC commenced initial consultations with representatives from the Jagera People in May 2016, further engagement will occur during subsequent project stages. ARTC will be responsible for the development of a Cultural Heritage Management Plan and Agreement with the Jagera people, in accordance with the *Aboriginal Cultural Heritage Act 2003*.

2.7 A staged development or component of a larger Project

If you have identified that the proposed action is a component of a larger action (in section 1.12) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (e.g. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

3.1 (a) World Heritage Properties

Description
No World Heritage Places are located within 5km of the Project.

Nature and extent of likely impact

The World Heritage Place identified closest to the Project was the Gondwana Rainforests of Australia located approximately 25km south of the Project. It is unlikely the Project would have any direct or indirect impacts on that area, owing to the separation distance and intervening land uses.

3.1 (b) National Heritage Places

Description
No National Heritage Places were identified within 5km of the Project.

Nature and extent of likely impact

The National Heritage Place identified closest to the Project was the Gondwana Rainforests of Australia located approximately 25km south of the Project. It is unlikely the Project would have any direct or indirect impacts on that area, owing to the separation distance and intervening land uses.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description
There were no Wetlands of International Importance (Ramsar) wetlands identified on the PMST.
The Project is located in the headwaters of the Brisbane River catchment which discharges to the ocean in Moreton Bay. The Moreton Bay Ramsar site is approximately 70km east of the Project.

Nature and extent of likely impact

Address any impacts on the ecological character of any Ramsar wetlands.
Due to the significant distances between the Project and any of the Ramsar sites, and the variety of land uses and urban development between the Project site and the Ramsar site, direct and indirect impacts are not expected.

3.1 (d) Listed threatened species and ecological communities

Description

A report from the EPBC Protected Matters Search Tool (PMST) was generated on 12/01/2017 for a 5km linear buffer along the centreline of the Preferred Alignment. Attachment 5 provides the PMST report results.

Initial environmental field investigations were undertaken at locations along the preferred alignment between Helidon and Calvert in early April and early June 2016. Field investigations locations were identified on the basis of desktop review of Queensland Government GIS data and previous studies. Field investigations focused on matters of national environmental significance (MNES) species and communities, remnant regional

ecosystems, waterways and habitats, predominantly in greenfield sections of corridor that were accessible during the field survey period. Land accessibility was limited in some cases by steep topography, thick vegetative understory and/or by land owner consent.

At the majority of sites, habitat assessment was conducted, and opportunistic flora and fauna records collected. Rapid aquatic habitat assessments were conducted at accessible creek and river crossings. Quaternary level flora assessments were conducted at five locations to confirm their regional ecosystem status under the Queensland *Vegetation Management Act 1999*.

The findings of the flora and fauna survey were used to inform a likelihood of occurrence assessment documented in Table 1 and Table 2, identifying the potential for MNES (threatened flora and fauna, threatened ecological communities) to be present in the Study area. Results of the targeted flora and fauna investigations are included in Attachment 6.

Koala presence/absence was determined at six representative locations between Helidon and Calvert, via the use of the Koala Spot Assessment Technique (KSAT). The KSAT methodology adopted from Phillips and Callaghan (2011) categorises the activity levels into low, medium (normal) or high use, based on the mean activity level.

Extrapolation of the initial KSAT locations across the landscape (regional ecosystems) was undertaken to enable a broad understanding of Koala habitat and potential movement corridors and inform further investigations required.

Threatened Ecological Communities

The PMST report identified four Threatened Ecological Communities (TECs) potentially occurring within 5km of the Study Area, being:

- Brigalow (*Acacia harpophylla* dominant and co dominant): Endangered
- Lowland Rainforest of Subtropical Australia: Critically Endangered
- Swamp Tea-tree (*Melaleuca irbyana*) Forest of South east Queensland (critically endangered).
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland: Critically Endangered.

These TECs were not considered likely to occur, based on a review of DNRM regional ecosystem mapping. These were also not identified during initial targeted field investigations along the preferred alignment.

Threatened Fauna

The PMST report identified 28 EPBC Act listed threatened fauna species, including 13 bird species, 9 mammal species, 4 reptile species, and 2 fish species.

Table *1 Fauna Species Likelihood Assessment*

Name	**EPBC**	**Type of presence**	**Habitat and Distribution**	**Likelihood of Occurrence**
Regent Honeyeater (*Anthochaera phrygia)*	CE	Foraging, feeding or related behaviour may occur within area	Associates with nectar-producing trees, particularly those that flower in winter	Seasonal, pending nectar availability
Australasian Bittern *(Botaurus poiciloptilus)*	E	Species or species habitat known to occur within area	Heavily vegetated permanent freshwater wetlands	Low, no suitable wetlands within the Preferred Alignment
Curlew Sandpiper (*Calidris ferruginea*)	CE	Species or species habitat known to occur within area	Intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.	None, no suitable habitat occurs within the study area
Coxen's Fig-Parrot *(Cyclopsitta diophthalma coxeni)*	E	Species or species habitat may occur within area	Rainforest, particularly stands with figs; sometimes isolated trees	Low, lack of figs observed
Eastern Bristlebird *(Dasyornis brachypterus)*	E	Species or species habitat may occur within area	Low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest (Baker 1997b, 2000c; Bramwell, unpublished data; Chapman 1999; Holmes 1989, 1998; Miles 2004; Smith 1977, 1987).	None, confined to high elevation forests with a groundcover of tussock grasses in the north of its range. Prefers early succession, post-fire vegetation
Red Goshawk *(Erythrotriorchis radiates)*	V	Species or species habitat known to occur within area	Very large home-range of 50-220 km2; prefers a mosaic of habitat types, on the coastal plain often found near watercourses in forests of; feeds mainly on birds, intolerant of dense regrowth forests which restrict manoeuvrability when hunting; builds a large stick nest	Moderate, largely confined to forests with a high density of medium to large birds but very large home-range suggests occasional use of Project area possible
Squatter Pigeon (southern subspecies) *(Geophaps scripta scripta)*	V	Species or species habitat known to occur within area	Open-forests to sparse, open-woodlands and scrub that are mostly dominated in the overstorey by *Eucalyptus, Corymbia*, *Acacia* or *Callitris* species with patchy, tussock-grassy understories, within 3 km of water	Low, lantana has invaded most of the suitable habitat (which would preclude it) but some limited areas of forest with a grassy understorey remain
Painted Honeyeater *(Grantiella picta)*	V	Species or species habitat likely to occur within area	Drier Eucalypt forests and woodlands where mistletoes are abundant; diet mostly mistletoe fruit, but also nectar and insects	Moderate, paucity of mistletoes observed, but habitat otherwise suitable
Swift Parrot *(Lathamus discolor)*	CE, Marine	Species or species habitat likely to occur within area	Over-winters on mainland, extending to SE Qld; associates with winter flowering trees (e.g. spotted gums, red gums,	Seasonal, but even then rare

Name	EPBC	Type of presence	Habitat and Distribution	Likelihood of Occurrence
			ironbarks)	
Eastern curlew (*Numenius madagascariensis*)	CE	Species or species habitat may occur within area	Sheltered coasts, mangrove swamps, bays, harbours and lagoons that contain mudflats and sandflats, often with beds of seagrass.	None, no suitable habitat occurs within the study area
Black-throated Finch (southern) *(Poephila cincta cincta)*	E	Species or species habitat may occur within area	Grassy, open woodlands and Eucalyptus forests, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water	Low. Only poor quality habitat available and species has not been recorded in SE Qld since the mid- 1990s
Australian Painted Snipe *(Rostratula australis)*	E	Species or species habitat likely to occur within area	Well-vegetated shallow margins of freshwater wetlands, lakes and swamps, forages for invertebrates on muddy edges; nests in dense reeds near water	Low, but may be suitable habitat outside the area currently investigated
Black-breasted Button-quail *(Turnix melanogaster)*	V	Species or species habitat known to occur within area	Drier rainforests and viny scrubs, often in association with Hoop Pine and a deep, moist leaf litter layer; will use patches of *Lantana camara* when proximate to preferred native habitat types	Moderate. Significant patches of lantana present, but generally associated with Eucalypt forest. No potential feeding signs observed
Mary River Cod *(Maccullochella mariensis)*	E	Translocated population known to occur within area	Generally found in the Mary River Catchment, translocated to numerous water impoundments across south east Queensland	Low. The Mary River cod occurs mainly in pools within relatively undisturbed tributaries (Simpson & Jackson 2000). They prefer large, deep shaded pools with abundant, slowly flowing water (Simpson & Jackson 2000; EES 2003).
Australian lungfish *Neoceratodus forsteri)*	V	Species or species habitat known to occur within area	Found in the Burnett, Mary and Brisbane Rivers. Also reported to have been translocated to some waterways.	Low, project waterways considered unlikely to support suitable habitat
Large-eared Pied Bat *(Chalinolobus dwyeri)*	V	Species or species habitat likely to occur within area	Dry open forest and woodland with extensive cliffs and caves; roosts in caves, crevices, old mines	High, particularly near Little Liverpool Range
Northern Quoll *(Dasyurus hallucatus)*	E	Species or species habitat may occur within area	Open forests and rocky country; shelters in tree hollows; known range only extends south of to central Qld	None, outside known range
Spot-tailed Quoll	E	Species or species	Forests, woodlands, coastal	High, particularly

Name	EPBC	Type of presence	Habitat and Distribution	Likelihood of Occurrence
(Dasyurus maculatus maculatus)		habitat may occur within area	heath; uses hollow-bearing trees, fallen logs and rock crevices as den sites; territories very large ~7.5 km2 for females and 35 km2 for males	around the Little Liverpool Range
Greater Glider *(Petauroides Volans)*	V	Species or species habitat known to occur within area	Wide range of habitat including tall open woodland, Eucalypt forests and low woodlands. Wildlife Queensland	Moderate, confined to areas with large tree hollows
Brush-tailed Rock-wallaby *(Petrogale penicillata)*	V	Species or species habitat known to occur within area	This species prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks (Murray et al. 2008; Short 1982). It also utilises tree limbs. Most colonies are on north-facing slopes and cliff lines. DoEE, 2016	None, no suitable rocky areas
Koala *(Phascolarctos cinereus)*	V	Species or species habitat known to occur within area	Forests containing primary browse trees, e.g. Forest Red Gum (*Eucalyptus tereticornis*), Tallowwood (*E. microcorys*) and Scribbly Gum (*E. racemosa*)	High, recorded
Long-nosed Potoroo *(Potorous tridactylus tridactylus)*	V	Species or species habitat likely to occur within area	Coastal heaths, dry and wet eucalypt forests, rainforest margins; requires a dense understorey with occasional open areas; soil typically a sandy loams; digs for the underground fruit bodies of fungi	Low, potential habitat very limited
New Holland Mouse (*Pseudomys novaehollandiae)*	V	Species or species habitat likely to occur within area	open heathland, open woodland with a heathland understorey and vegetated sand dunes	Low, lack of areas with a heathy understorey
Grey-headed Flying-fox *(Pteropus poliocephalus)*	V	Roosting known to occur within area	Forests with fruiting or flowering trees; roosts in forest near water (including mangroves)	Seasonal, pending nectar availability
Five-clawed Worm-skink, Long-legged Worm-skink *(Anomalopus mackayi)*	V	Species or species habitat may occur within area	Remnant and non-remnant woodlands and grasslands.	None, only known from west of the Dividing Range
Collared Delma *(Delma torquata)*	V	Species or species habitat known to occur within area	Rocky sloped or ridge-top areas, in Eucalypt and Acacia dominated woodland with leaf litter 3 to 10cm deep and a sparse understorey of tussock grass and shrubs or semi-evergreen vine thicket; shelters under loose rocks, flattish bedrock outcroppings, logs or mats of leaf litter, or in cracks	High, recorded

Name	EPBC	Type of presence	Habitat and Distribution	Likelihood of Occurrence
			and crevices among tussock grasses; it is often found in areas with many small rocks (<30cm) and fewer large rocks, and in areas with reasonably sparse vegetation. f) DoE (2016).	
Dunmall's Snake *(Furina dunmalli)*	V	Species or species habitat may occur within area	Dunmall's Snake has been found in a broad range of habitats, including: Forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow, other Wattles, native Cypress or Bull-oak.	Low, no suitable habitat on black alluvial cracking clays
Three-toed Snake-tooth Skink *(Saiphos reticulatus)*	V	Species or species habitat may occur within area.	Occurs on the east coast from north NSW to Coloola in SEQ. Occupies rainforest and moist Eucalypt forest. Found in leaf litter, rotting logs and soil under fallen timber (DERM, 2009 cited in Borsboom 2009).	Low, lack of deep leaf litter and rotting logs
CE= Critically Endangered E= Endangered V= Vulnerable				

Threatened Flora

The PMST search identified 12 EPBC Act listed threatened flora species as being potentially present within 5km of the Preferred Alignment.

Table 2 provides a preliminary species likelihood assessment conducted based on known habitat preferences and observations during initial field investigations.

Table 2: Threatened Flora Species Likelihood Assessment

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
a grass *(Paspalidium grandispiculatum)*	V	Species or species habitat likely to occur within area	Habitat is poorly understood. Soils are generally shallow with a sandy texture, dark in colour, well drained and derived from sandstone rocks. Generally within remnant vegetation, suggesting an intolerance to disturbance	Low. Suitable substrate available, but most habitat areas highly disturbed.
Austral Cornflower, Native Thistle (*Rhaponticum australe)*	V	Species or species habitat likely to occur within area	Usually occurs on basalt in woodland and grassland associated with *E. crebra, E. orgadophila, E. populnea, E. tereticornis* and *E. melanophloia.* Usually in intact habitat.	None. Lack of basalt substrate
Austral Toadflax, Toadflax *(Thesium australe)*	V	Species or species habitat likely to occur within area	Root parasite on grasses, particularly *Themeda*	Moderate. May occur within grassy forest and pasture within the Preferred Alignment
Bluegrass (Dichanthium setosum)	V	Species or species habitat likely to occur	Found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture.	Moderate. Possible occurrences in pastureland.

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
Grevillea quadricauda	V	Species or species habitat likely to occur within area	Grows in gravelly loam or sandy soils, in the understorey of dry eucalypt forest, usually along or near creeks.	Moderate. Possible occurrences along creeklines
Hairy-joint Grass *(Arthraxon hispidus)*	V	Species or species habitat may occur within area	In soaks, seepages and edges of wetlands in forests and pasture. Dies down in winter. Threats include Lantana invasion	Moderate. May occur within wet areas of pasture. Unlikely to occur in most forested areas due to Lantana
Leionema obtusifolium	V	Species or species habitat likely to occur within area	Eucalypt forest, often with White Mahogany (*Eucalyptus acmenoides*) and Brown Bloodwood (*Corymbia trachyphloia*), on sandstone or granite	Low. Suitable vegetation associations do not appear to be present
Lloyd's Olive *(Notelaea lloydii)*	V	Species or species habitat likely to occur within area	Open eucalypt forest, often near the margins of vine thickets, vine forests and softwood scrub at altitudes between 80 and 480m. It is usually found on stony, shallow and rocky soils derived from sandstone or acid volcanic rocks, often on steep slopes, or near drainage lines	Low. Potential habitat on sandstone present, but generally highly disturbed. However, vine thickets and softwood scrubs not present.
Macadamia nut (*Macadamia integrifolia*)	V	Species or species habitat likely to occur within area	The Macadamia Nut grows in remnant rainforest, preferring partially open areas such as rainforest edges. It prefers to grow in mild frost-free areas with a reasonably high rainfall.	Moderate. May occur in limited rainforest areas within the Study area.
Miniature Moss-orchid, Hoop Pine Orchid *(Bulbophyllum globuliforme)*	V	Species or species habitat likely to occur	Host-specific species on Hoop Pine. The Hoop Pine occurs in upland subtropical rainforest communities.	Low. Lack of Hoop Pine within the Preferred Alignment
Mt Berryman Phebalium *(Phebalium distans)*	CE	Species or species habitat likely to occur within area	Semi-evergreen vine thicket on red volcanic soils. Also microphyll to notophyll vine forest with or without *Araucaria cunninghamii* and low microphyll vine forest and semi-evergreen vine thicket.	None. Lack of suitable soils and vegetation communities.
Quassia (Samadera bidwillii)	V	Species or species habitat likely to occur within area	Commonly occurs in lowland rainforest or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland. Quassia is commonly found in areas adjacent to both temporary and permanent watercourses in locations up to 510 m altitude.	Moderate. May occur in limited rainforest areas and adjacent to watercourses within the Study area.
Sophora fraseri	V	Species or species habitat	In moist habitats, often in hilly terrain at altitudes from 60–660m	None. Lack of rainforest (absence

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
		likely to occur within area	on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest communities.	of edges and gaps)
Tall Velvet Sea-berry *(Haloragis exalata subsp. Velutina)*	V	Species or species habitat may occur within area	Rainforest and rainforest margins and adjacent grassland and open grassy woodland above 500 metres altitude	None. No areas above 500m elevation
Wandering Pepper-cress (*Lepidium peregrinum)*	E	Species or species habitat may occur within area	Habitat poorly described. Known from riparian open forest dominated by *Eucalyptus camaldulensis* and *Casuarina cunninghamiana* with a variably dense shrubby understorey of *Hymenanthera dentata, Bursaria spinosa, Acacia fimbriata, A. floribunda, Callistemon viminalis* and *Leptospermum brachyandrum*	Moderate. May occur in limited riparian areas within the Preferred Alignment

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

Threatened Ecological Communities

The four TECs identified in the PMST were not considered likely to occur, based on a review of DNRM regional ecosystem mapping. These were also not identified during initial field investigations of the Preferred Corridor. Consequently the Project is not expected to impact any threatened ecological communities.

Threatened Fauna

The listed threatened species either identified during this survey or considered to have higher potential to occur due to habitat suitability in the area include:

- Koala *(Phascolarctos cinereus)* – known
- Collared Delma (*Delma torquata*) – suitable habitat observed
- Spotted Quoll *(Dasyurus maculatus maculatus)* – high, particularly around the Little Liverpool Range
- Greater Glider (*Petauroides Volans*) – moderate, suitable habitat confined to trees with large hollows
- Grey-headed Flying Fox *(Pteropus poliocephalus)* – seasonal, pending nectar and fruit availability
- Large-eared Pied Bat *(Chalinolobus dwyeri)* – high, suitable habitat present
- Regent Honeyeater (*Anthochaera phrygia)* – seasonal, pending nectar availability)
- Painted Honeyeater *(Grantiella picta)* – moderate, paucity of mistletoes observed, but habitat otherwise suitable
- Red Goshawk *(Erythrotriorchis radiates)* – moderate, very large home-range suggests occasional use of Project area possible
- Swift Parrot *(Lathamus discolor)* – seasonal, but even then rare
- Black-breasted Button-quail *(Turnix melanogaster)* – moderate, significance patches of lantana presence, but generally associated with Eucalypt forest. No potential feeding signs observed in initial surveys.

Koala

Evidence of the Koala (*Phascolarctos cinereus*), a vulnerable species listed under the EPBC Act, has been documented in the vicinity of the proposed works. Koala Spot Assessment Technique (KSAT) surveys were undertaken across seven sites within the current investigation area. These surveys detected scats, ranging in activity level from 7% to 20%. In accordance with Phillips and Callaghan (2011), this indicates a low level of activity across the area, in an East Coast (med-high) activity category. While low activity levels may indicate

the presence of transitory individuals at some sites, it is also likely that areas of lower population density were sampled (e.g. on steeper slopes) (Phillips and Callaghan 2011).

Loss of habitat, habitat fragmentation and mortality during construction and operation are the key impacts that are likely to occur as a result of the Project. The Project will require removal of mapped Koala habitat between Helidon and Calvert. Offset obligations will need to be determined to address the impact of habitat loss.

A rail corridor constitutes a linear barrier to Koala movement, particularly if exclusion fencing is installed (see below). Habitat fragmentation may isolate populations, which if confined to sufficiently small patches, may have a high chance of local extinction. Movement barriers may also restrict gene flow across the landscape. It is possible to mitigate the impact of movement barriers by the installation of underpasses (culverts and bridges), particularly in areas where higher movement rates may be expected (e.g. along creeklines). Project design elements such as viaduct and bridge structures and the retention of existing ridgeline vegetation through tunnelling under the Little Liverpool Range, will facilitate fauna linkages to otherwise potentially fragmented habitat at these locations.

While there are few data available to determine the extent of Koala mortality due to train strike, it is known to occur (e.g. Dique *et al*. 2003). The vulnerability of Koalas to train strike will depend on the frequency of rail movement, particularly at night when Koalas are most active, the speed of trains and the extent of exclusion fencing installed. Exclusion fencing has been demonstrated to be a highly effective means of reducing Koala mortality along roads.

Mitigation measures will be implemented during construction to minimise disturbance, injury or fatality of Koalas. It should be noted that disturbance may make individual Koalas susceptible to disease (e.g. Chlamydia), resulting in infertility or death. Construction stage measures will include the presence of a spotter/catcher and temporary no-go zones around any Koalas found within the clearing footprint.

The Koala Habitat Assessment Tool, contained within Section 6 of the *EPBC Act referral guidelines for the vulnerable Koala* (DoE, 2014) has been applied to the Project to determine if the habitat is critical to the survival of the Koala. The Project area receives approximately 800mm of rainfall annually and has therefore been assessed using the 'Coastal' context of Koala distribution (South East Queensland), as explained in Section 3 of the Guidelines. Table 3 documents the findings of the Koala Habitat Assessment.

Table 3 Koala Habitat Assessment Tool

Attribute	**Score**	**Example habitat appraisal**	
Koala occurrence	+2	Desktop	• EPBC PMST report identified the koala as 'known to occur'. • The Atlas of Living Australia has one koala record approximately 1.3 km north of the impact area from 2013. • EHP Wildlife Online point buffer search records identify 765 sightings within 20km of the Project.
		On-ground	Scat surveys (KSATs) were carried out along the corridor over five days in March, April and June 2016 (SMEC/Arup, 2016). This covered seven sites along the corridor, all of which contained Koala scats. Low levels of Koala activity were detected, with activity levels ranging from 7% to 20%. No Koalas were directly observed, although no specific observational surveys were conducted.
Vegetation structure and composition	+2	Desktop	Regional ecosystem mapping (DNRM, 2016) identifies four regional ecosystems that occur in the vicinity of the corridor. All of these contain koala food trees as follows: - RE 12.3.3 *Eucalyptus tereticornis* woodland on Quaternary alluvium - RE 12.3.7 *Eucalyptus tereticornis*, *Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland - RE 12.9-10.2 *Corymbia citriodora* subsp. *variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks - RE 12.9-10.7 *Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora* spp., *E. melanophloia* woodland on sedimentary rocks Essential habitat for Koala is also mapped in the vicinity of the Little Liverpool Range crossing.
		On-ground	On-ground surveys revealed that *E. tereticornis* and *C. citriodora* were among the most dominant species present in the overstorey. Other dominant species included *E. crebra, E. propinqua, C. intermedia, A.*

Attribute	Score	Example habitat appraisal	
			leiocarpa, Lophostemon suaveolens, and *C. tessellaris.* Mapped REs were confirmed along the corridor. Vegetation at the most eastern extent has a higher level of disturbance than the western extent. Some of these species are regarded as primary or secondary food species (e.g. *E. tereticornis*, *E. crebra*, *E. propinqua*).
Habitat connectivity	+2	Large areas of the land surrounding the Project have been cleared for agriculture, the existing railway, the Warrego Highway, and other roads. The Queensland Government Statewide ecological corridor mapping shows that the Lockyer Creek corridor intersecting the Project east of Gatton is recognised as both state and regionally significant ecological corridors. The eastern extent of the Project intersects the Little Liverpool Range which has been identified as a regional ecological corridor of statewide significance as it connects Main Range National Park in the south to D'Aguilar National Park in the north. Project design elements such as viaduct and bridge structures and the retention of existing ridgeline vegetation through tunneling under the Little Liverpool Range, will facilitate fauna linkages to otherwise potentially fragmented habitat at these locations. At its western extent, the Project traverses the southern edge of a contiguous landscape, with the Helidon Hills, Lockyer State Forrest and Lockyer National Park to the north and north east. This is also recognized as a regional ecological corridor. At the local scale, waterways and remnant vegetation across the Study Area provide for habitat connectivity.	
Key existing threats	+1	Desktop	• Koala Tracker mapping (http://www.koalatracker.com.au/view-mapped-koala-sightings) indicates the death of a number of Koalas on the Warrego Highway.
		On-ground	• Operation of existing linear infrastructure (e.g. Warrego Highway and Western Rail line) • Potential during construction of infrastructure (land development, Toowoomba Second Range Crossing) • Predation (wild dogs, snakes) • Disease (e.g Chlamydia)
Recovery value	+1	Habitat intersected by the Project in the vicinity of Helidon is at the southern extent of a very large area of remnant vegetation associated with the Lockyer National Park. The southern end is surrounded by barriers (existing rail, roads, development and agriculture). It is expected that other, less disturbed vegetation in the north of the Reserve would provide more important habitat for Koala. At its eastern end, the Project Area is embedded in a large area of continuous habitat at the Little Liverpool Range. However, tunneling would occur in this area, substantially reducing potential fragmentation impacts. The Project is not considered to significantly impact achievement of the interim recovery objectives for the coastal context.	
Total	**8**	**Habitat is critical to the survival of the Koala — an assessment of significance against the Significant Impact Criteria is required.**	

An assessment of the Project against the Significant Impact Criteria is provided in Table 4. Reference has been made to Section 7 and 8 of the *EPBC Act referral guidelines for the vulnerable koala* in determining the likely impacts of the Project on the recovery of the species.

Table 4 – Significant impact assessment for Koala

Lead to a long-term decrease in the size of an important population of a species ***(No)***
Habitat removal will be the primary residual impact of the Project. Based on preliminary calculations, approximately 43ha of mapped regional ecosystems may be removed, which has been adopted as a preliminary indicator for koala habitat at this early stage of the Project. Some isolated habitat patches will be created between the proposed rail corridor and the existing Warrego Highway. Habitat fragmentation is likely to occur as a result of the Project, however connectivity will be maintained by the inherent design features and proposed fauna sensitive design of the project (e.g. tunnels, bridges, culverts). As the surrounding vegetation

contains large areas of remnant vegetation comprising Koala habitat and crossing structures will be used to significantly reduce habitat fragmentation, the works are not expected to cause a long-term decrease in the size of an important Koala population. The proposed design minimises habitat fragmentation by utilising existing rail corridors where possible, and traversing vegetation in the vicinity of existing disturbance. Furthermore the works are not expected to cause a long-term decrease in the size of an important population as significant areas of habitat will remain adjacent to the proposed rail corridor, particularly within Lockyer Forest Reserve in which large areas of intact remnant vegetation remain.

Reduce the area of occupancy of an important population ***(Yes)***

Suitable habitat for the Koala will be reduced as a result of linear clearing in greenfield sections of the Preferred Alignment, to enable construction of the rail line, therefore locally reducing the area of occupancy available. This is expected to be due to previous disturbance in the area. In comparison to the extensive area of mapped regional ecosystems surrounding the Project, the removal of Koala habitat may not be a significant reduction to the area of occupancy.

Fragment an existing important population into two or more populations ***(Yes)***

The rail corridor is proposed to be constructed across a key north-south movement corridor, namely the Little Liverpool Range. This Range is mapped as being a regional ecological corridor of state-wide significance as it connects Main Range National Park in the south to D'Aguilar National Park in the north. Lockyer Creek is also mapped as a regional ecological corridor and is intersected by the Project just north of Gatton. Provision of fauna movement corridors below the creek crossing will need to be provided.

The population and preferred movement corridors of Koalas in the region are not well known, however it is considered possible that the rail corridor through Little Liverpool Range may fragment habitat and therefore Koala populations. Whilst tunnelling through the range will minimise surface impacts including vegetation clearing and habitat fragmentation in this area, further investigations will be required to determine the presence and extent of habitat to be removed as a result of the Project.

Adversely affect habitat critical to the survival of a species ***(Yes)***

The Project area has been identified as containing habitat critical to the survival of the koala, in accordance with the Koala Habitat Assessment Tool provided in the *EPBC Act referral guidelines for the vulnerable koala*. The Project will directly impact some areas of critical Koala habitat, with removal of approximately 43ha of mapped regional ecosystems, and as noted in table 3, a habitat score of 8 Surveys undertaken within the impact area and within surrounding habitat show low Koala activity levels along the proposed rail corridor (Phillips and Callaghan, 2011).

Disrupt the breeding cycle of an important population ***(No)***

The koala breeding season is generally between September and March, with females giving birth to a single young between October and May. Construction activities will be undertaken in a manner that minimises direct impacts to Koalas. For example, if a Koala is identified during pre-clearance surveys, an exclusion zone will be established to allow that animal to move from the area of its own accord, minimising disturbance and stress to the species. Clearing will be sequential and a fauna spotter catcher will be present for all clearing works.

During the breeding season, males actively seek female koalas and Koala movement is more extensive. The Project could lead to an increase risk of vehicle (train) strike. The impact of train strike on Koalas is poorly understood, but it is known to occur (e.g. Dique et al. 2003). The frequency and speed of rail movement will affect that severity of this impact. Exclusion fencing of the rail corridor is proposed for strategic locations and is known to effectively reduce vehicle strike on roads.

Based on the mitigation measures described above, it is not expected that this Project will disrupt the breeding cycle of the local population.

Modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline ***(No)***

The Project requires the removal of 43ha of mapped regional ecosystems. Although clearing will cause fragmentation of habitat in Lockyer State Forest and Little Liverpool Range, and reduce the area of available habitat, the Project is not likely to decrease the availability or quality of habitat available to the extent that the species will decline.

Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species habitat ***(No)***

Ecological surveys of the corridor identified weeds at the majority of sites investigated. *Lantana camara, Opuntia* spp. and exotic grasses were noted to be dominant species at some sites. There is potential for such weeds to be spread through the construction phase, resulting in degradation of Koala habitat. Weed management will be undertaken through the construction and maintenance phases to minimise the impact of

pest flora on Koala habitat.

Invasive fauna, including predatory feral animals such as the fox *(Vulpes vulpes)* and dog (*Canis familiaris*) are likely to occur throughout the area. These species, among other pest fauna, were identified in the DEHP wildlife online search. These types of predatory species are drawn to areas of disturbance to prey upon mammals and reptiles that are moving away from the disturbance area, therefore, predation by feral animals is a risk to this species during and immediately after clearing activities. Predatory species are also attracted to the prey opportunities presented by cleared linear corridors. Mitigation and management measures will be implemented during the construction phase to minimise the potential for this to impact Koalas. This may include monitoring of relocating individuals, provision of refuge opportunities for relocating fauna (koala poles and furniture during clearing and construction phase works) and/or pest management initiatives.

Given the existing invasive species occurrences across the Project area, it is considered unlikely that the rail corridor will result in any new invasive species that are harmful to the Koala becoming established in habitat areas.

Introduce disease that may cause the species to decline (No)

The koala is known to be susceptible to a number of diseases, including Chlamydia and Koala retrovirus.

The spread and introduction of diseases and pathogens in koala populations is a potential risk associated with construction of infrastructure. Construction activities have the potential to result in increased stress in koalas through vegetation clearing, habitat fragmentation, increased noise levels, traffic and alteration to existing conditions. Increased levels of stress may cause the expression of disease symptoms in koalas. Stress can be minimised through appropriate construction stage management (e.g. spotter/catchers, temporary no-go zones around observed koalas).

Interfere substantially with the recovery of the species (No)

Whilst the project will impact on koala habitat, significant areas of habitat will remain. The provision of tunnels, viaducts and bridge structures will allow for the movement of koalas between these areas. Consequently the potential for the project to interfere with the recovery of the species will be minimised through design and mitigation measures. Consequently the potential for the project to interfere with the recovery of the species will be minimised through design and mitigation measures.

Collared Delma (*Delma torquata*)

Suitable habitat for the Collared Delma was observed in the Study Area. Loss of habitat and habitat fragmentation are potential impacts that may occur as a result of the Project. Further investigations will be required to determine the presence of Collared Delma in the Study Area, and extent of habitat to be removed as a result of the Project.

Spot-tailed (spotted) Quoll *(Dasyurus maculatus maculatus)*

Suitable habitat for the Spotted Quoll was observed in the Little Liverpool Range area. Works in this area will consist of construction of tunnel portals on the east and west sides of the range. Whilst tunnelling through the range will minimise surface impacts including vegetation clearing and habitat fragmentation in this area, further investigations will be required to determine the presence and extent of habitat for spot-tailed quoll to be removed as a result of the Project.

Greater Glider (*Petauroides Volans*)

Suitable habitat for the Greater Glider may be present in the Study Area, though this will be constrained to areas of tall open woodland and eucalypt forests, supporting large tree hollows. No observations of suitable habitat were made during initial field investigations, however further investigations will be required to accurately determine the presence of suitable hollow bearing trees, and presence of this species in the Study Area. Potential impacts include the loss of hollow-bearing trees and habitat fragmentation as a result of vegetation clearing.

Grey-headed Flying-fox *(Pteropus poliocephalus)*

Suitable foraging habitat was observed in the Study Area, with flowering eucalypts and other food trees present. No camps or breeding habitat were identified during initial field investigations. Potential impacts include a localised loss of nectar sources within the Project area.

Large-eared Pied Bat *(Chalinolobus dwyeri)*

Suitable habitat for this species is described as includes dry open forest and woodland with extensive cliffs and caves; roosts in caves, crevices and old mines. The existing rail tunnels through the Little Liverpool Range may offer suitable habitat. Clearing associated with the Project may result in a small loss of foraging habitat. There is a low probability of the loss of roosting and breeding sites. Due to the mobility of this species, habitat fragmentation is not likely to occur. The construction of a new tunnel through the Little Liverpool Range may result in the disused tunnel becoming a habitat for this species and other bat species.

Regent Honeyeater (*Anthochaera phrygia)*

The Regent Honeyeater has been identified as a potential seasonal user of the Study Area's resources, and would be dependent upon the availability of nectar and flowering species. Potential impacts include the loss of potential feed trees and ephemeral habitat.

Painted Honeyeater *(Grantiella picta)*

Suitable habitat for this species was present, though mistletoe was observed to be absent. Potential impacts include the loss of habitat.

Red Goshawk *(Erythrotriorchis radiates)*

Whilst the home-range of the Red Goshawk is very large, the potential for this species to occasionally utilise the Study Area has been identified. Impacts to this species as a result of vegetation clearing are anticipated to be negligible.

Swift Parrot *(Lathamus discolor)*

The Swift Parrot has been identified a potentially seasonal visitor to the Project area, though this is considered to be a rare occurrence. Consequently habitat clearing in the Project area is not anticipated to significantly impact this species.

Black-breasted Button-quail *(Turnix melanogaster)*

Suitable habitat for the Black-breasted Button-quail was identified, but no evidence of platelets was observed during initial field investigations. Loss of habitat and habitat fragmentation are potential impacts that are may occur as a result of the Project. Further investigations will be required to determine the presence of Button-quail in the Study Area, and extent of habitat to be removed as a result of the Project.

Threatened Flora

The flora species either identified during field survey or considered to have higher potential to occur in the area include:

- Hairy-joint Grass *(Arthraxon hispidus)*
- Four-tailed grevillea (*Grevillea quadricauda*)
- Wandering Pepper-cress *(Lepidium peregrinum)*
- Austral Toadflax *(Thesium australe)*

Further investigations will be required to determine the presence and/ or extent of presence of these flora species in the Study Area, and to determine the extent of impact as a result of vegetation clearing for the Project.

3.1 (e) Listed migratory species

Description

The PMST identified 17 listed migratory species considered to have the potential to occur within 5km of the Preferred Alignment.

Table 5 provides a preliminary species likelihood assessment conducted based on known habitat preferences and observations during initial field investigations.

Table 5 – Likelihood assessment for Migratory Species

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
Fork-tailed Swift *(Apus pacificus)*	Migratory, Marine	Species or species habitat likely to occur within area	The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to	High. Aerial species that would forage over the

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
			at least 300 m above ground and probably much higher. All breeding occurs in the northern hemisphere.	project area occasionally.
Oriental Cuckoo *(Cuculus optatus)*	Migratory, Marine	Species or species habitat may occur within area	Inhabits forest including coniferous, deciduous and mixed forest.	Rare in Australia
White-throated Needletail *(Hirundapus caudacutus)*	Migratory, Marine	Species or species habitat known to occur within area	Aerial space over a variety of habitat types, but prefers to forage over treed habitats as these would provide a greater abundance of insect prey; often forage on the edge of low pressure systems and may follow these systems; breeds in northern Asia	High. Aerial species that would forage over the project area occasionally.
Black-faced Monarch *(Monarcha melanopsis)*	Migratory, Marine	Species or species habitat known to occur within area	Occurs in rainforest to cool/dry rainforest and regrowth rainforest and sometimes in open eucalyptus forest. DoE 2016 (b)	Low, lack of suitable habitat
Spectacled Monarch *(Symposiachrus trivirgatus)*	Migratory, Marine	Species or species habitat may occur within area	Thick understorey rainforests, wet gullies and waterside vegetation and mangroves.	Low, lack of suitable habitat
Yellow Wagtail *(Motacilla flava)*	Migratory, Marine	Species or species habitat may occur within area	Does not breed in Australia. Inhabits near water.	Low. Rare in Project locality.
Satin Flycatcher *(Myiagra cyanoleuca)*	Migratory, Marine	Species or species habitat known to occur within area	Heavily vegetated gullies in eucalypt-dominated forests and taller woodlands.	Low, lack of suitable habitat
Rufous Fantail *(Rhipidura rufifrons)*	Migratory, Marine	Species or species habitat known to occur within area	In south-east Australia, mainly inhabits wet sclerophyll forests, often in gullies	Low, lack of suitable habitat
Great Egret *(Ardea alba)*	Migratory, Marine	Breeding known to occur within area	Wide range of wetland habitats including inland and coastal, freshwater and saline, permanent and ephemeral, open to vegetated environs.	Low. Lack of suitable wetland habitat.
Cattle Egret *(Ardea ibis)*	Migratory, Marine	Breeding likely to occur within area	Broad habitat including temperate and tropical grasslands, wooded lands and terrestrial wetlands. Particularly associates with large herbivores (e.g. cattle)	High. Large areas of pasture within Study Area.
Sharp-tailed Sandpiper *(Calidris acuminata)*	Migratory, Marine	Species or species habitat known to occur within area	Prefers muddy edges of shallow fresh or brackish wetlands with grass and sedges.	None. Lack of suitable habitat.

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
Red-necked Stint *(Calidris ruficollis)*	Migratory, Marine	Species or species habitat known to occur within area	Does not breed in Australia. Mostly found in coastal areas but also found in coastal or inland, permanent or ephemeral shallow wetlands	Low, mainly found in coastal areas.
Curlew Sandpiper (*Calidris ferruginea*)	CE	Species or species habitat known to occur within area	Intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.	None, no suitable habitat occurs within the study area
Latham's Snipe *(Gallinago hardwickii)*	Migratory, Marine	Species or species habitat known to occur within area	Permanent and ephemeral wetlands, open freshwater wetlands with low, dense vegetation	Possible in limited habitat
Eastern curlew (*Numenius madagascariensis*)	CE	Species or species habitat may occur within area	Sheltered coasts, mangrove swamps, bays, harbours and lagoons that contain mudflats and sandflats, often with beds of seagrass.	None, no suitable habitat occurs within the study area
Osprey *(Pandion haliaetus)*	Migratory, Marine	Species or species habitat known to occur within area	Estuaries, large rivers and lakes; feeds over open water; builds a stick nest in a large tree	Low to None. Lack of suitable foraging habitat.
Common Greenshank *(Tringa nebularia)*	Migratory, Marine	Species or species habitat likely to occur within area	Inland wetlands and sheltered coastal habitats, including harbours, river estuaries, deltas and lagoons also permanent and ephemeral terrestrial wetlands including swamps, lakes, dams, rivers, creeks, billabongs and waterholes.	Moderate. Possible in limited habitat; particularly around dams.
Marsh Sandpiper *(Tringa stagnatilis)*	Migratory, Marine	Species or species habitat known to occur within area	Permanent and ephemeral wetlands of varying salinity	Moderate

Marine Species

The PMST identifies 23 marine species, of which 17 are also listed as migratory species in Table 5.

Table 6 provides a preliminary species likelihood assessment based on known habitat preferences and observations during initial field investigations for the marine species identified in the PMST.

Table 6- Marine Species Likelihood Assessment

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
Magpie Goose *(Anseranas semipalmata)*	Marine	Species or species habitat may occur within area	Typically found in shallow wetlands with fringing rushes or sedges	Low, lack of suitable habitat.
Fork-tailed Swift	Marine,	Species or	The Fork-tailed Swift is	High. Aerial species

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
(Apus pacificus)	Migratory	species habitat likely to occur within area	almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher	that would forage over the project area occasionally.
Great Egret *(Ardea alba)*	Marine, Migratory	Breeding known to occur within area	Wide range of wetland habitats including inland and coastal, freshwater and saline, permanent and ephemeral, open to vegetated environs.	Low. Lack of suitable wetland habitat.
Cattle Egret *(Ardea ibis)*	Marine, Migratory	Breeding likely to occur within area	Broad habitat including temperate and tropical grasslands, wooded lands and terrestrial wetlands	High. Large areas of pasture within alignment.
Sharp-tailed Sandpiper *(Calidris acuminate)*	Marine, Migratory	Species or species habitat known to occur within area	Prefers muddy edges of shallow fresh or brackish wetlands with grass and sedges.	None. Lack of suitable habitat.
Calidris ferruginea Curlew Sandpiper	CE	Species or species habitat known to occur within area	Intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.	None, no suitable habitat occurs within the study area
Red-necked Stint *(Calidris ruficollis)*	Marine, Migratory	Species or species habitat known to occur within area	Does not breed in Australia. Mostly found in coastal areas but also found in coastal or inland, permanent or ephemeral shallow wetlands	Low, Mainly found in coastal areas.
Oriental Cuckoo, Himalayan Cuckoo *(Cuculus saturatus)*	Marine, Migratory	Species or species habitat may occur within area	Inhabits forest including coniferous, deciduous and mixed forest.	Rare in Australia
Latham's snipe *(Gallinago hardwickii)*	Marine, Migratory	Species or species habitat known to occur within area	Permanent and ephemeral wetlands, open freshwater wetlands with low, dense vegetation	Possible in limited habitat; particularly associated with seepages (e.g. around dams).
White-bellied Sea-Eagle *(Haliaeetus leucogaster)*	Marine	Species or species habitat known to occur within area	Coastlines, estuaries, large rivers and lakes; occasionally over adjacent habitats; builds a large stick nest in a tall tree, rarely on artificial structures	Occasional. Navigates along river systems and occasionally forages over adjacent habitats.
Black-winged Stilt *(Himantopus himantopus)*	Marine	Species or species habitat known to occur within area	Coastal habitats	Low. Lack of suitable wetland habitat.
White-throated Needletail *(Hirundapus caudacutus)*	Marine, Migratory	Species or species habitat known to occur within area	Aerial space over a variety of habitat types, but prefers to forage over treed habitats as these would provide a greater abundance of insect prey; often forage on the edge of	High. Aerial species that would forage over the project area occasionally.

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
			low pressure systems and may follow these systems; breeds in Asia	
Swift Parrot (Lathamus discolor)	Marine, Critically Endangered	Species or species habitat likely to occur within area	Over-winters on mainland, extending to SE Qld; associates with winter flowering trees (e.g. spotted gums, red gums, ironbarks)	Seasonal. Presence linked to significant winter flowering events
Numenius madagascariensis Eastern Curlew	CE	Species or species habitat may occur within area	Sheltered coasts, mangrove swamps, bays, harbours and lagoons that contain mudflats and sandflats, often with beds of seagrass.	None, no suitable habitat occurs within the study area
Black-faced Monarch *(Monarcha melanopsis)*	Marine, Migratory	Species or species habitat known to occur within area	Occurs in rainforest to cool/dry rainforest and regrowth rainforest and sometimes in open eucalyptus forest. DoE 2016 (b)	Low, lack of suitable habitat
Spectacled Monarch *(Monarcha trivirgatus)*	Marine, Migratory	Species or species habitat may occur within area	Thick understorey rainforests, wet gullies and waterside vegetation as well as mangroves.	Low, lack of suitable habitat
Yellow Wagtail *(Motacilla flava)*	Marine, Migratory	Species or species habitat may occur within area	Does not breed in Australia. Inhabits near water.	Low. Rare in Project locality.
Satin Flycatcher *(Myiagra cyanoleuca)*	Marine, Migratory	Species or species habitat known to occur within area	Heavily vegetated gullies in eucalypt-dominated forests and taller woodlands.	Low, lack of suitable habitat
Osprey *(Pandion haliaetus)*	Marine, Migratory	Species or species habitat known to occur within area	Estuaries, large rivers and lakes; feeds over open water; builds a stick nest in a large tree	Low. Lack of suitable foraging habitat.
Red-necked Avocet *(Recurvirostra novaehollandiae)*	Marine	Species or species habitat known to occur within area	Coastal habitats	Low. Lack of suitable wetland habitat.
Rufous Fantail *(Rhipidura rufifrons)*	Marine, Migratory	Species or species habitat known to occur within area	In south-east Australia, mainly inhabits wet sclerophyll forests, often in gullies	Low, lack of suitable habitat
Painted Snipe *(Rostratula benghalensis) (sensu lato)*	Marine	Species or species habitat likely to occur within area	Well-vegetated shallow margins of freshwater wetlands, lakes and swamps, forages for invertebrates on muddy edges; nests in dense reeds near water	Moderate, possible in limited habitat; particularly associated with seepages (e.g. around dams).
Common Greenshank	Marine, Migratory	Species or species	Inland wetlands and sheltered coastal habitats,	Moderate. Possible in limited habitat;

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
(Tringa nebularia)		habitat likely to occur within area	including harbours, river estuaries, deltas and lagoons also permanent and ephemeral terrestrial wetlands including swamps, lakes, dams, rivers, creeks, billabongs and waterholes.	particularly around dams.
Marsh Sandpiper *(Tringa stagnatilis)*	Marine, Migratory	Species or species habitat known to occur within area	Permanent and ephemeral wetlands of varying salinity	Moderate. Possible in limited habitat; particularly around dams.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

Potential habitat for the following migratory (and marine) species was identified in the vicinity of the Project area:

- Fork-tailed Swift *(Apus pacificus)* – Migratory, Marine
- Rainbow Bee-eater *(Merops ornatus)* –Marine
- White-throated Needletail *(Hirundapus caudacutus)* – Migratory, Marine
- Cattle Egret *(Ardea ibis)* – Migratory, Marine
- Marsh Sandpiper *(Tringa stagnatilis)* – Migratory, Marine
- Painted Snipe *(Rostratula benghalensis) (sensu lato)* – Marine
- Swift Parrot *(Lathamus discolor)* – Critically Endangered, Marine, also addressed under section 3.1(d).

Further investigations will be required to determine habitat values and timing of use by migratory species within the Project area. Potential impacts include habitat clearing, modification of waterways and wetlands, and may require consideration of farm dams potentially impacted by the Project.

Table 1 provides a preliminary species likelihood assessment based on known habitat preferences and observations during initial field investigations.

Threatened Flora

The PMST search identified 12 EPBC Act listed threatened flora species as being potentially present within 5km of the Preferred Alignment.

Table 2 provides a preliminary species likelihood assessment conducted based on known habitat preferences and observations during initial field investigations.

Table 2: Threatened Flora Species Likelihood Assessment

Name	**EPBC**	**Type of Presence**	**Habitat and Distribution**	**Likelihood of Occurrence**
Hairy-joint Grass *(Arthraxon hispidus)*	V	Species or species habitat may occur within area	In soaks, seepages and edges of wetlands in forests and pasture. Dies down in winter. Threats include Lantana invasion	Moderate. May occur within wet areas of pasture. Unlikely to occur in most forested areas due to Lantana
Miniature Moss-orchid, Hoop Pine Orchid *(Bulbophyllum globuliforme)*	V	Species or species habitat likely to occur	Host-specific species on Hoop Pine. The Hoop Pine occurs in upland subtropical rainforest communities.	Low. Lack of Hoop Pine within the Preferred Alignment
Grevillea quadricauda	V	Species or species habitat likely to occur within area	Grows in gravelly loam or sandy soils, in the understorey of dry eucalypt forest, usually along or near creeks.	Moderate. Possible occurrences along creeklines
Tall Velvet Sea-berry *(Haloragis exalata subsp. Velutina)*	V	Species or species habitat may occur within area	Rainforest and rainforest margins and adjacent grassland and open grassy woodland above 500 metres altitude	None. No areas above 500m elevation
Leionema obtusifolium	V	Species or species habitat likely to occur within area	Eucalypt forest, often with White Mahogany (*Eucalyptus acmenoides*) and Brown Bloodwood (*Corymbia trachyphloia*), on sandstone or granite	Low. Suitable vegetation associations do not appear to be present
Wandering Pepper-cress (*Lepidium peregrinum)*	E	Species or species habitat may occur within area	Habitat poorly described. Known from riparian open forest dominated by *Eucalyptus camaldulensis* and *Casuarina cunninghamiana* with a variably dense shrubby understorey of *Hymenanthera dentata, Bursaria spinosa, Acacia fimbriata, A. floribunda, Callistemon viminalis* and *Leptospermum brachyandrum*	Moderate. May occur in limited riparian areas within the Preferred Alignment
Lloyd's Olive *(Notelaea lloydii)*	V	Species or species habitat likely to occur within area	Open eucalypt forest, often near the margins of vine thickets, vine forests and softwood scrub at altitudes between 80 and 480m. It is usually found on stony, shallow and rocky soils derived from sandstone or acid volcanic rocks, often on steep slopes, or near drainage lines	Low. Potential habitat on sandstone present, but generally highly disturbed. However, vine thickets and softwood scrubs not present.
a grass	V	Species or	Habitat is poorly understood. Soils	Low. Suitable

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
(Paspalidium grandispiculatum)		species habitat likely to occur within area	are generally shallow with a sandy texture, dark in colour, well drained and derived from sandstone rocks. Generally within remnant vegetation, suggesting an intolerance to disturbance	substrate available, but most habitat areas highly disturbed.
Mt Berryman Phebalium *(Phebalium distans)*	CE	Species or species habitat likely to occur within area	Semi-evergreen vine thicket on red volcanic soils. Also microphyll to notophyll vine forest with or without *Araucaria cunninghamii* and low microphyll vine forest and semi-evergreen vine thicket.	None. Lack of suitable soils and vegetation communities.
Austral Cornflower, Native Thistle (*Rhaponticum australe)*	V	Species or species habitat likely to occur within area	Usually occurs on basalt in woodland and grassland associated with *E. crebra, E. orgadophila, E. populnea, E. tereticornis* and *E. melanophloia.* Usually in intact habitat.	None. Lack of basalt substrate
Sophora fraseri	V	Species or species habitat likely to occur within area	In moist habitats, often in hilly terrain at altitudes from 60–660m on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest communities.	None. Lack of rainforest (absence of edges and gaps)
Austral Toadflax, Toadflax *(Thesium australe)*	V	Species or species habitat likely to occur within area	Root parasite on grasses, particularly *Themeda*	Moderate. May occur within grassy forest and pasture within the Preferred Alignment

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

Threatened Ecological Communities

The four TECs identified in the PMST were not considered likely to occur, based on a review of DNRM regional ecosystem mapping. These were also not identified during initial field investigations of the Preferred Alignment. Consequently the Project is not expected to impact any threatened ecological communities.

Threatened Fauna

The listed threatened species either identified during this survey or considered to have higher potential to occur due to habitat suitability in the area include:

- Koala *(Phascolarctos cinereus)* – known
- Collared Delma (*Delma torquata*) – suitable habitat observed
- Spotted Quoll *(Dasyurus maculatus maculatus)* – high, particularly around the Little Liverpool Range
- Greater Glider (*Petauroides Volans*) – moderate, suitable habitat confined to trees with large hollows
- Grey-headed Flying Fox *(Pteropus poliocephalus)* – seasonal, pending nectar and fruit availability
- Large-eared Pied Bat *(Chalinolobus dwyeri)* – high, suitable habitat present
- Regent Honeyeater (*Anthochaera phrygia)* – seasonal, pending nectar availability)
- Painted Honeyeater *(Grantiella picta)* – moderate, paucity of mistletoes observed, but habitat otherwise suitable
- Red Goshawk *(Erythrotriorchis radiates)* – moderate, very large home-range suggests occasional use of Project area possible

- Swift Parrot *(Lathamus discolor)* – seasonal, but even then rare
- Black-breasted Button-quail *(Turnix melanogaster)* – moderate, significance patches of lantana presence, but generally associated with Eucalypt forest. No potential feeding signs observed in initial surveys.

Koala

Evidence of the Koala (*Phascolarctos cinereus*), a vulnerable species listed under the EPBC Act, has been documented in the vicinity of the preferred alignment. Koala Spot Assessment Technique (KSAT) surveys were undertaken across seven sites within the study area. These surveys detected scats, ranging in activity level from 7% to 20%. In accordance with Phillips and Callaghan (2011), this indicates a low level of activity across the study area, in an East Coast (med-high) activity category. While low activity levels may indicate the presence of transitory individuals at some sites, it is also likely that areas of lower population density were sampled (e.g. on steeper slopes) (Phillips and Callaghan 2011).

The key project impacts for koalas that will be examined during the environmental assessment are loss of habitat (which may increase susceptibility to disease), and habitat fragmentation and mortality. The Project will require removal of mapped Koala habitat between Helidon and Calvert. Environmental offsets obligations will likely be required to compensate for impacts on habitat.

A rail corridor constitutes a linear barrier to Koala movement, particularly if exclusion fencing is installed (see below). Habitat fragmentation may isolate populations and restrict gene flow across the landscape. It is possible to mitigate the impact of movement barriers by the installation of underpasses (culverts and bridges), particularly in areas where higher movement rates may be expected (e.g. along creeklines). Project design elements such as viaduct and bridge structures and the retention of existing ridgeline vegetation through tunnelling under the Little Liverpool Range, will facilitate fauna linkages to otherwise potentially fragmented habitat at these locations.

While there are few data sets available to determine the extent of Koala mortality due to train strike, it is known to occur (e.g. Dique *et al*. 2003). The vulnerability of Koalas to train strike will depend on the frequency of rail movement, particularly at night when Koalas are most active, the speed of trains and the extent of exclusion fencing installed. Exclusion fencing has been demonstrated to be a highly effective means of reducing Koala mortality along roads.

Mitigation measures will be implemented during construction and operation to minimise disturbance, injury or fatality of Koalas. Construction stage measures will include the presence of a spotter/catcher and temporary no-go zones around any Koalas found within the clearing footprint.

The Koala Habitat Assessment Tool, contained within Section 6 of the *EPBC Act referral guidelines for the vulnerable Koala* (DoE, 2014) has been applied to the Project to determine if the habitat is critical to the survival of the Koala. The Project area receives approximately 800mm of rainfall annually and has therefore been assessed using the 'Coastal' context of Koala distribution (South East Queensland), as explained in Section 3 of the Guidelines. Table 3 documents the findings of the Koala Habitat Assessment.

Table 3 Koala Habitat Assessment Tool

Attribute	**Score**	**Example habitat appraisal**	
Koala occurrence	+2	Desktop	• EPBC PMST report identified the koala as 'known to occur'. • The Atlas of Living Australia has one koala record approximately 1.3 km north of the impact area from 2013. • EHP Wildlife Online point buffer search records identify 765 sightings within 20km of the preferred alignment.
		On-ground	Scat surveys (KSATs) were carried out along the preferred alignment over five days in March, April and June 2016 (SMEC/Arup, 2016). This covered seven sites along the corridor, all of which contained Koala scats. Low levels of Koala activity were detected, with activity levels ranging from 7% to 20%. No Koalas were directly observed, although no specific observational surveys were conducted.
Vegetation structure and composition	+2	Desktop	Regional ecosystem mapping (DNRM, 2016) identifies four regional ecosystems that occur in the vicinity of the preferred alignment. All of these contain koala food trees as follows: - RE 12.3.3 *Eucalyptus tereticornis* woodland on Quaternary alluvium - RE 12.3.7 *Eucalyptus tereticornis*, *Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland - RE 12.9-10.2 *Corymbia citriodora* subsp. *variegata* +/- *Eucalyptus*

Attribute	Score	Example habitat appraisal	
			crebra open forest on sedimentary rocks - RE 12.9-10.7 *Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora* spp., *E. melanophloia* woodland on sedimentary rocks Essential habitat for Koala is also mapped in the vicinity of the Little Liverpool Range crossing.
		On-ground	On-ground surveys revealed that *E. tereticornis* and *C. citriodora* were among the most dominant species present in the overstorey. Other dominant species included *E. crebra, E. propinqua, C. intermedia, A. leiocarpa, Lophostemon suaveolens,* and *C. tessellaris.* Mapped REs were confirmed along the corridor. Vegetation at the most eastern extent has a higher level of disturbance than the western extent. Some of these species are regarded as primary or secondary food species (e.g. *E. tereticornis*, *E. crebra*, *E. propinqua*).
Habitat connectivity	+2	Large areas of the land surrounding the preferred alignment have been cleared for agriculture, the existing railway, the Warrego Highway, and other roads. The Queensland Government Statewide ecological corridor mapping shows that the Lockyer Creek corridor intersecting the Project east of Gatton is recognised as both state and regionally significant ecological corridors. The eastern extent of the preferred alignment intersects the Little Liverpool Range which has been identified as a regional ecological corridor of statewide significance as it connects Main Range National Park in the south to D'Aguilar National Park in the north. Project design elements such as viaduct and bridge structures and the retention of existing ridgeline vegetation through tunneling under the Little Liverpool Range, will mitigate potential impacts to habitat at these locations. At its western extent, the preferred alignment traverses the southern edge of a contiguous landscape, with the Helidon Hills, Lockyer State Forrest and Lockyer National Park to the north and north east. This is also recognized as a regional ecological corridor by the State government. At the local scale, waterways and remnant vegetation across the Study Area provide for habitat connectivity.	
Key existing threats	+1	Desktop	• Koala Tracker mapping (http://www.koalatracker.com.au/view-mapped-koala-sightings) indicates the death of a number of Koalas on the Warrego Highway.
		On-ground	• Operation of existing linear infrastructure (e.g. Warrego Highway and Western Rail line) • Potential during construction of infrastructure (land development, Toowoomba Second Range Crossing) • Predation (wild dogs, snakes) • Disease (e.g Chlamydia)
Recovery value	+1	Habitat intersected by the preferred alignment in the vicinity of Helidon is at the southern extent of a very large area of remnant vegetation associated with the Lockyer National Park. The southern end is surrounded by barriers (existing rail, roads, development and agriculture). It is expected that other, less disturbed vegetation in the north of the Reserve would provide more important habitat for Koala. At its eastern end, the preferred alignment is embedded in a large area of continuous habitat at the Little Liverpool Range. However, tunneling would occur in this area, substantially reducing potential fragmentation impacts. The Project is not considered to significantly impact achievement of the interim recovery objectives for the coastal context.	
Total	**8**	**Habitat is critical to the survival of the Koala — an assessment of significance against the Significant Impact Criteria is required.**	

An assessment of the Project against the Significant Impact Criteria is provided in Table 4. Reference has been made to Section 7 and 8 of the *EPBC Act referral guidelines for the vulnerable koala* in determining the likely impacts of the Project on the recovery of the species and the Significant Impact Guidelines Version 1.1.

Table 4 – Significant impact assessment for Koala

Lead to a long-term decrease in the size of an important population of a species ***(No)***
Habitat removal will be the main impact of the Project. Based on preliminary calculations, approximately 43ha of mapped regional ecosystems may be removed, which has been adopted as a preliminary indicator for koala habitat at this early stage of the Project. Some isolated habitat patches will be created between the proposed rail corridor and the existing Warrego Highway. Habitat fragmentation is likely to occur as a result of the Project however connectivity will be maintained by the inherent design features and proposed fauna sensitive design of the project (e.g. tunnels, bridges, culverts). As the surrounding vegetation contains large areas of remnant vegetation comprising Koala habitat and crossing structures will be used to significantly reduce habitat fragmentation, the Project is not expected to cause a long-term decrease in the size of an important Koala population. The proposed design minimises habitat fragmentation by utilising existing rail corridors where possible, and traversing vegetation in the vicinity of existing disturbance. Furthermore the Project is not expected to cause a long-term decrease in the size of an important population as significant areas of habitat will remain adjacent to the proposed rail corridor.
Reduce the area of occupancy of an important population ***(Yes)***
Suitable habitat for the Koala will be reduced as a result of linear clearing in greenfield sections of the Preferred Alignment, therefore reducing the area of occupancy available for the existing population. This is expected to be due to previous disturbance in the area. In comparison to the extensive area of mapped regional ecosystems surrounding the Project, the removal of Koala habitat may not be a significant reduction to the area of occupancy.
Fragment an existing important population into two or more populations ***(Yes)***
The Project is proposed to be constructed across a key north-south movement corridor, namely the Little Liverpool Range. This Range is mapped as being a regional ecological corridor of state-wide significance as it connects Main Range National Park in the south to D'Aguilar National Park in the north. Lockyer Creek is also mapped as a regional ecological corridor and is intersected by the Project just north of Gatton. Provision of fauna movement corridors below the creek crossing will need to be provided. The population and preferred movement corridors of Koalas in the region are not well known, however the provisions of tunnels, viaducts and bridge strictures will allow for movement of Koalas in these ares. These design aspects together with other mitigations to be further developed during future project phases when potential impacts are further defined will reduce potential impacts on habitat connectivity and therefore Koala populations.
Adversely affect habitat critical to the survival of a species ***(Yes)***
The study area has been identified as containing habitat critical to the survival of the koala, in accordance with the Koala Habitat Assessment Tool provided in the *EPBC Act referral guidelines for the vulnerable koala*. The Project will directly impact some areas of critical Koala habitat, with removal of approximately 43ha of mapped regional ecosystems, and as noted in table 3, a habitat score of 8 Surveys undertaken within the impact area and within surrounding habitat show low Koala activity levels along the proposed rail corridor (Phillips and Callaghan, 2011).
Disrupt the breeding cycle of an important population ***(No)***
The koala breeding season is generally between September and March, with females giving birth to a single young between October and May. Construction activities will be undertaken in a manner that minimises direct impacts to Koalas. For example, if a Koala is identified during pre-clearance surveys, an exclusion zone will be established to allow that animal to move from the area of its own accord, minimising disturbance and stress to the species. Clearing will be sequential and a fauna spotter catcher will be present for all clearing works. During the breeding season, males actively seek female koalas and Koala movement is more extensive. The Project could lead to an increase risk of vehicle (train) strike. The impact of train strike on Koalas is poorly understood, but it is known to occur (e.g. Dique et al. 2003). The frequency and speed of rail movement will affect that severity of this impact. Exclusion fencing of the rail corridor is proposed for strategic locations and is known to effectively reduce vehicle strike on roads. Based on the mitigation measures described above, it is not expected that this Project will disrupt the breeding cycle of the local population.
Modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline ***(No)***
The Project requires the removal of 43ha of mapped regional ecosystems that are consistent with the habitat for koala. Although clearing will cause fragmentation of habitat in Lockyer State Forest and Little Liverpool

Range, and reduce the area of available habitat, the Project is not likely to decrease the availability or quality of habitat available to the extent that the species will decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species habitat ***(No)*** Ecological surveys of the corridor identified weeds at the majority of sites investigated. *Lantana camara, Opuntia* spp. and exotic grasses were noted to be dominant species at some sites. There is potential for such weeds to be spread through the construction phase, resulting in degradation of Koala habitat. Weed management will be undertaken through the construction and operational phases to minimise the impact of pest flora on Koala habitat. Invasive fauna, including predatory feral animals such as the fox *(Vulpes vulpes)* and dog (*Canis familiaris*) are likely to occur throughout the area. These species, among other pest fauna, were identified in the DEHP wildlife online search. These types of predatory species are drawn to areas of disturbance to prey upon mammals and reptiles that are moving away from the disturbance area, therefore, predation by feral animals is a risk to species during and immediately after clearing activities. Predatory species are also attracted to the prey opportunities presented by cleared linear corridors. Mitigation and management measures will be implemented during the construction phase to minimise the potential for this to impact Koalas. This may include monitoring of relocating individuals, provision of refuge opportunities for relocating fauna (koala poles and furniture during clearing and construction phase works) and/or pest management initiatives. Given the existing invasive species occurrences across the Project area, it is considered unlikely that the rail corridor will result in any new invasive species that are harmful to the Koala becoming established in habitat areas.
Introduce disease that may cause the species to decline ***(No)*** The koala is known to be susceptible to a number of diseases, including Chlamydia and Koala retrovirus. The spread and introduction of diseases and pathogens in koala populations is a potential risk associated with construction of infrastructure. Construction activities have the potential to result in increased stress in koalas through vegetation clearing, habitat fragmentation, increased noise levels, traffic and alteration to existing conditions. Increased levels of stress may cause the expression of disease symptoms in koalas. Stress can be minimised through appropriate construction stage management (e.g. spotter/catchers, temporary no-go zones around observed koalas).
Interfere substantially with the recovery of the species ***(No)*** Whilst the project will impact on koala habitat, significant areas of habitat will remain. The provision of tunnels, viaducts and bridge structures will allow for the movement of koalas between these areas. Consequently the potential for the project to interfere with the recovery of the species will be minimised through design and mitigation measures.

Collared Delma (*Delma torquata*)

Suitable habitat for the Collared Delma was observed in the Study Area. Loss of habitat and habitat fragmentation are potential impacts that may occur as a result of the Project. Further investigations will be required to determine the presence of Collared Delma in the Study Area, and extent of habitat to be impacted as a result of the Project.

Spot-tailed (spotted) Quoll *(Dasyurus maculatus maculatus)*

Suitable habitat for the Spotted Quoll was observed in the Little Liverpool Range area. Works in this area will consist of construction of tunnel portals on the east and west sides of the range. Whilst tunnelling through the range will minimise surface impacts including vegetation clearing and habitat fragmentation in this area, further investigations will be required to determine the presence and extent of habitat for spotted quoll to be removed as a result of the Project.

Greater Glider (*Petauroides Volans*)

Suitable habitat for the Greater Glider may be present in the Study Area, though this will be constrained to areas of tall open woodland and eucalypt forests, supporting large tree hollows. No observations of suitable habitat were made during initial field investigations, however further investigations will be required to accurately determine the presence of suitable hollow bearing trees, and presence of this species in the Study Area. Potential impacts include the loss of hollow-bearing trees and habitat fragmentation as a result of vegetation clearing.

Grey-headed Flying-fox *(Pteropus poliocephalus)*

Suitable foraging habitat was observed in the Study Area, with flowering eucalypts and other food trees present. No camps or breeding habitat were identified during initial field investigations. Potential impacts include a localised loss of nectar sources within the Project area.

Large-eared Pied Bat *(Chalinolobus dwyeri)*

Suitable habitat for this species includes dry open forest and woodland with extensive cliffs and caves; roosts in caves, crevices and old mines. The existing rail tunnels through the Little Liverpool Range may offer suitable habitat. Clearing associated with the Project may result in a small loss of foraging habitat. There is a low probability of the loss of roosting and breeding sites. Due to the mobility of this species, habitat fragmentation is not likely to occur. The construction of a new tunnel through the Little Liverpool Range may result in the disused tunnel becoming a habitat for this species and other bat species.

Regent Honeyeater (*Anthochaera phrygia)*

The Regent Honeyeater has been identified as a potential seasonal user of the Study Area's resources, and would be dependent upon the availability of nectar and flowering species. Potential impacts include the loss of potential feed trees and ephemeral habitat.

Painted Honeyeater *(Grantiella picta)*

Suitable habitat for this species was present, though mistletoe was observed to be absent. Potential impacts include the loss of habitat.

Red Goshawk *(Erythrotriorchis radiates)*

Whilst the home-range of the Red Goshawk is very large, the potential for this species to occasionally utilise the Study Area has been identified. Impacts to this species as a result of vegetation clearing are anticipated to be negligible.

Swift Parrot *(Lathamus discolor)*

The Swift Parrot has been identified a potentially seasonal visitor to the Project area, though this is considered to be a rare occurrence. Consequently habitat clearing in the Project area is not anticipated to significantly impact this species.

Black-breasted Button-quail *(Turnix melanogaster)*

Suitable habitat for the Black-breasted Button-quail was identified, but no evidence of platelets was observed during initial field investigations. Loss of habitat and habitat fragmentation are potential impacts that ay occur as a result of the Project. Further investigations will be required to determine the presence of Button-quail in the Study Area, and extent of habitat to be removed as a result of the Project.

Threatened Flora

The flora species either identified during field survey or considered to have higher potential to occur in the area include:

- Hairy-joint Grass *(Arthraxon hispidus)*
- Four-tailed grevillea (*Grevillea quadricauda*)
- Wandering Pepper-cress *(Lepidium peregrinum)*
- Austral Toadflax *(Thesium australe)*

Further investigations will be required to determine the presence and/ or extent of presence of these flora species in the Study Area, and to determine the extent of impact as a result of vegetation clearing for the Project.

3.1 (e) Listed migratory species

Description

The PMST identified 17 listed migratory species considered to have the potential to occur within 5km of the Preferred Alignment.

Table 5 provides a preliminary species likelihood assessment conducted based on known habitat preferences and observations during initial field investigations.

Table 5 – Likelihood assessment for Migratory Species

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
Black-faced Monarch *(Monarcha melanopsis)*	Migratory, Marine	Species or species habitat known to occur within area	Occurs in rainforest to cool/dry rainforest and regrowth rainforest and sometimes in open eucalyptus forest. DoE 2016 (b)	Low, lack of suitable habitat
Cattle Egret *(Ardea ibis)*	Migratory, Marine	Breeding likely to occur within area	Broad habitat including temperate and tropical grasslands, wooded lands and terrestrial wetlands. Particularly associates with large herbivores (e.g. cattle)	High. Large areas of pasture within Study Area.
Common Greenshank *(Tringa nebularia)*	Migratory, Marine	Species or species habitat likely to occur within area	Inland wetlands and sheltered coastal habitats, including harbours, river estuaries, deltas and lagoons also permanent and ephemeral terrestrial wetlands including swamps, lakes, dams, rivers, creeks, billabongs and waterholes.	Moderate. Possible in limited habitat; particularly around dams.
Curlew Sandpiper (*Calidris ferruginea*)	Marine, Migratory	Species or species habitat known to occur within area	Intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.	None, no suitable habitat occurs within the study area
Eastern Curlew *(Numenius madagascariensis)*	Marine, Migratory	Species or species habitat may occur within area	Sheltered coasts, mangrove swamps, bays, harbours and lagoons that contain mudflats and sandflats, often with beds of seagrass.	None, no suitable habitat occurs within the study area
Fork-tailed Swift *(Apus pacificus)*	Migratory, Marine	Species or species habitat likely to occur within area	The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. All breeding occurs in the northern hemisphere.	High. Aerial species that would forage over the project area occasionally.
Great Egret *(Ardea alba)*	Migratory, Marine	Breeding known to occur within area	Wide range of wetland habitats including inland and coastal, freshwater and saline, permanent and ephemeral, open to vegetated environs.	Low. Lack of suitable wetland habitat.
Latham's Snipe *(Gallinago hardwickii)*	Migratory, Marine	Species or species habitat known to occur within area	Permanent and ephemeral wetlands, open freshwater wetlands with low, dense vegetation	Possible in limited habitat
Marsh Sandpiper *(Tringa stagnatilis)*	Migratory, Marine	Species or species habitat known to occur within area	Permanent and ephemeral wetlands of varying salinity	Moderate

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
Oriental Cuckoo *(Cuculus optatus)*	Migratory, Marine	Species or species habitat may occur within area	Inhabits forest including coniferous, deciduous and mixed forest.	Rare in Australia
Osprey *(Pandion haliaetus)*	Migratory, Marine	Species or species habitat known to occur within area	Estuaries, large rivers and lakes; feeds over open water; builds a stick nest in a large tree	Low to None. Lack of suitable foraging habitat.
Red-necked Stint *(Calidris ruficollis)*	Migratory, Marine	Species or species habitat known to occur within area	Does not breed in Australia. Mostly found in coastal areas but also found in coastal or inland, permanent or ephemeral shallow wetlands	Low, mainly found in coastal areas.
Rufous Fantail *(Rhipidura rufifrons)*	Migratory, Marine	Species or species habitat known to occur within area	In south-east Australia, mainly inhabits wet sclerophyll forests, often in gullies	Low, lack of suitable habitat
Satin Flycatcher *(Myiagra cyanoleuca)*	Migratory, Marine	Species or species habitat known to occur within area	Heavily vegetated gullies in eucalypt-dominated forests and taller woodlands.	Low, lack of suitable habitat
Sharp-tailed Sandpiper *(Calidris acuminata)*	Migratory, Marine	Species or species habitat known to occur within area	Prefers muddy edges of shallow fresh or brackish wetlands with grass and sedges.	None. Lack of suitable habitat.
Spectacled Monarch *(Symposiachrus trivirgatus)*	Migratory, Marine	Species or species habitat may occur within area	Thick understorey rainforests, wet gullies and waterside vegetation and mangroves.	Low, lack of suitable habitat
White-throated Needletail *(Hirundapus caudacutus)*	Migratory, Marine	Species or species habitat known to occur within area	Aerial space over a variety of habitat types, but prefers to forage over treed habitats as these would provide a greater abundance of insect prey; often forage on the edge of low pressure systems and may follow these systems; breeds in northern Asia	High. Aerial species that would forage over the project area occasionally.
Yellow Wagtail *(Motacilla flava)*	Migratory, Marine	Species or species habitat may occur within area	Does not breed in Australia. Inhabits near water.	Low. Rare in Project locality.

Marine Species

The PMST identifies 23 marine species, of which 17 are also listed as migratory species in Table 5.

Table 6 provides a preliminary species likelihood assessment based on known habitat preferences and observations during initial field investigations along the preferred alignment for the marine species identified in the PMST.

Table 6- Marine Species Likelihood Assessment

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
Black-faced Monarch *(Monarcha*	Marine, Migratory	Species or species habitat known	Occurs in rainforest to cool/dry rainforest and regrowth rainforest and	Low, lack of suitable habitat

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
melanopsis)		to occur within area	sometimes in open eucalyptus forest. DoE 2016 (b)	
Black-winged Stilt *(Himantopus himantopus)*	Marine	Species or species habitat known to occur within area	Coastal habitats	Low. Lack of suitable wetland habitat.
Cattle Egret *(Ardea ibis)*	Marine, Migratory	Breeding likely to occur within area	Broad habitat including temperate and tropical grasslands, wooded lands and terrestrial wetlands	High. Large areas of pasture within alignment.
Curlew Sandpiper (*Calidris ferruginea*)	Marine, Migratory	Species or species habitat known to occur within area	Intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.	None, no suitable habitat occurs within the study area
Common Greenshank *(Tringa nebularia)*	Marine, Migratory	Species or species habitat likely to occur within area	Inland wetlands and sheltered coastal habitats, including harbours, river estuaries, deltas and lagoons also permanent and ephemeral terrestrial wetlands including swamps, lakes, dams, rivers, creeks, billabongs and waterholes.	Moderate. Possible in limited habitat; particularly around dams.
Eastern Curlew *(Numenius madagascariensis)*	Marine, Migratory	Species or species habitat may occur within area	Sheltered coasts, mangrove swamps, bays, harbours and lagoons that contain mudflats and sandflats, often with beds of seagrass.	None, no suitable habitat occurs within the study area
Fork-tailed Swift *(Apus pacificus)*	Marine, Migratory	Species or species habitat likely to occur within area	The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher	High. Aerial species that would forage over the project area occasionally.
Great Egret *(Ardea alba)*	Marine, Migratory	Breeding known to occur within area	Wide range of wetland habitats including inland and coastal, freshwater and saline, permanent and ephemeral, open to vegetated environs.	Low. Lack of suitable wetland habitat.
Latham's snipe *(Gallinago hardwickii)*	Marine, Migratory	Species or species habitat known to occur within area	Permanent and ephemeral wetlands, open freshwater wetlands with low, dense vegetation	Possible in limited habitat; particularly associated with seepages (e.g. around dams).
Magpie Goose *(Anseranas semipalmata)*	Marine	Species or species habitat may occur within area	Typically found in shallow wetlands with fringing rushes or sedges	Low, lack of suitable habitat.
Marsh Sandpiper *(Tringa stagnatilis)*	Marine, Migratory	Species or species habitat known to occur	Permanent and ephemeral wetlands of varying salinity	Moderate. Possible in limited habitat; particularly around dams.

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
		within area		
Oriental Cuckoo, Himalayan Cuckoo *(Cuculus saturatus)*	Marine, Migratory	Species or species habitat may occur within area	Inhabits forest including coniferous, deciduous and mixed forest.	Rare in Australia
Osprey *(Pandion haliaetus)*	Marine, Migratory	Species or species habitat known to occur within area	Estuaries, large rivers and lakes; feeds over open water; builds a stick nest in a large tree	Low. Lack of suitable foraging habitat.
Painted Snipe *(Rostratula benghalensis) (sensu lato)*	Marine	Species or species habitat likely to occur within area	Well-vegetated shallow margins of freshwater wetlands, lakes and swamps, forages for invertebrates on muddy edges; nests in dense reeds near water	Moderate, possible in limited habitat; particularly associated with seepages (e.g. around dams).
Rainbow Bee-eater *(Merops ornatus)*	Marine	Species or species habitat may occur within area	Open forests and woodlands, shrublands and in cleared or semi cleared habitats normally located near permanent water.	High, recorded
Red-necked Avocet *(Recurvirostra novaehollandiae)*	Marine	Species or species habitat known to occur within area	Coastal habitats	Low. Lack of suitable wetland habitat.
Red-necked Stint *(Calidris ruficollis)*	Marine, Migratory	Species or species habitat known to occur within area	Does not breed in Australia. Mostly found in coastal areas but also found in coastal or inland, permanent or ephemeral shallow wetlands	Low, Mainly found in coastal areas.
Rufous Fantail *(Rhipidura rufifrons)*	Marine, Migratory	Species or species habitat known to occur within area	In south-east Australia, mainly inhabits wet sclerophyll forests, often in gullies	Low, lack of suitable habitat
Satin Flycatcher *(Myiagra cyanoleuca)*	Marine, Migratory	Species or species habitat known to occur within area	Heavily vegetated gullies in eucalypt-dominated forests and taller woodlands.	Low, lack of suitable habitat
Sharp-tailed Sandpiper *(Calidris acuminate)*	Marine, Migratory	Species or species habitat known to occur within area	Prefers muddy edges of shallow fresh or brackish wetlands with grass and sedges.	None. Lack of suitable habitat.
Spectacled Monarch *(Monarcha trivirgatus)*	Marine, Migratory	Species or species habitat may occur within area	Thick understorey rainforests, wet gullies and waterside vegetation as well as mangroves.	Low, lack of suitable habitat
Swift Parrot (Lathamus discolor)	Marine, Critically Endangered	Species or species habitat likely to occur within area	Over-winters on mainland, extending to SE Qld; associates with winter flowering trees (e.g. spotted gums, red gums, ironbarks)	Seasonal. Presence linked to significant winter flowering events

Name	EPBC	Type of Presence	Habitat and Distribution	Likelihood of Occurrence
White-bellied Sea-Eagle *(Haliaeetus leucogaster)*	Marine	Species or species habitat known to occur within area	Coastlines, estuaries, large rivers and lakes; occasionally over adjacent habitats; builds a large stick nest in a tall tree, rarely on artificial structures	Occasional. Navigates along river systems and occasionally forages over adjacent habitats.
White-throated Needletail *(Hirundapus caudacutus)*	Marine, Migratory	Species or species habitat known to occur within area	Aerial space over a variety of habitat types, but prefers to forage over treed habitats as these would provide a greater abundance of insect prey; often forage on the edge of low pressure systems and may follow these systems; breeds in Asia	High. Aerial species that would forage over the project area occasionally.
Yellow Wagtail *(Motacilla flava)*	Marine, Migratory	Species or species habitat may occur within area	Does not breed in Australia. Inhabits near water.	Low. Rare in Project locality.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

Potential habitat for the following migratory (and marine) species was identified in the vicinity of the Project area:

- Fork-tailed Swift *(Apus pacificus)* – Migratory, Marine
- White-throated Needletail *(Hirundapus caudacutus)* – Migratory, Marine
- Cattle Egret *(Ardea ibis)* – Migratory, Marine
- Marsh Sandpiper *(Tringa stagnatilis)* – Migratory, Marine
- Painted Snipe *(Rostratula benghalensis) (sensu lato)* – Marine
- Rainbow Bee-eater (*Merops ornatus*) - Marine
- Swift Parrot *(Lathamus discolor)* – Critically Endangered, Marine, also addressed under section 3.1(d).

Further investigations will be required to determine habitat values and timing of use by migratory species within the Project area. Potential impacts include habitat clearing, modification of waterways and wetlands, and may require consideration of farm dams potentially impacted by the Project.

3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

No Commonwealth Marine Areas were identified within the PMST search area. The Commonwealth Marine Area identified closest to the Project, the Exclusive Economic Zone and Territorial Sea, was approximately 125km east of the Project.

Nature and extent of likely impact

Due to the significant distances between the Study Area and the nearest Commonwealth Marine Area, direct impacts are not expected and there is limited potential for indirect impacts from the project.

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description

If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

The PMST report identifies one area of Commonwealth land in the PMST search area. This is the Department of Defence Gatton Agricultural College Training Depot, located outside of the Study Area for the Project as shown on Attachment 3. The Commonwealth land is located on Lot 185 CC2914 which is surrounded by the Reserve for the University of Queensland Gatton Campus on Lot 184 CC3374.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

As the Project is expected to remain generally within the existing Gowrie to Grandchester rail corridor/ protected corridor in the vicinity of the University of Queensland Gatton Campus, impacts to the Commonwealth land are not envisaged.

3.1 (h) The Great Barrier Reef Marine Park

Description

Not applicable

Nature and extent of likely impact

Not applicable

3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description

Not applicable

Nature and extent of likely impact

Not applicable

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your Project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area;
- will be taken on Commonwealth land; or
- will be taken in the Great Barrier Reef marine Park.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	**Is the proposed action a nuclear action?**	✓	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	✓	No The ARTC is not a Commonwealth agency for the purposes of the EPBC Act following the amendment of the Environment Protection and Biodiversity Conservation Regulation 2000 on 14 November 2009 to exclude ARTC from the definition of a "Commonwealth agency" under the EPBC Act.
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	✓	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))		

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	✓	No
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))		

3.2 (e)	**Is the proposed action to be taken in the Great Barrier Reef Marine Park?**	✓	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))		

3.3 Other important features of the environment

Provide a description of the Project area and the affected area, including information about the following features (where relevant to the Project area and/or affected area, and to the extent not otherwise addressed above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

3.3 (a) Flora and fauna

The Queensland Government State-wide ecological corridor mapping shows that the Lockyer Creek corridor is recognised as both state and regionally significant ecological corridors. A corridor of regional significance also traverses the Study Area at the Little Liverpool Range, east of Grandchester. These ecological corridors are shown in Attachment 5. At the local scale, waterways and remnant vegetation across the Study Area provide for habitat connectivity.

A review of Queensland Government Essential Habitat Mapping available identified five areas of essential habitat along the preferred alignment which are listed in Table 7. These are also identified in Attachment 5.

Table 7: Mapped Essential Habitat Areas

Area	Description
Lockyer National Park, north of Helidon	Large expanse of essential habitat mapped, attributed as core habitat for koala
Lockyer Creek	Essential habitat attributed as core habitat for koala
Land north east of Placid Hills	Smaller areas of essential habitat attributed as core habitat for koala
Gatton National Park, south east of Gatton	National Park and adjacent lots mapped as essential habitat attributed as core habitat for koala. A smaller patch is located south of Forest Hill
Little Liverpool Range	Essential habitat mapped on the eastern slopes, attributed as core habitat for koala. A separate area is located to the north of Grandchester

The species listed in Table 8 were identified in searches of the study area on the Queensland Government Wildlife online database. These are in addition to the species identified under section 3.1(d).

Table 8: Species protected under the Queensland Nature Conservation Act 1992

Scientific Name	Common Name	Q	A	Habitat and Distribution	Likelihood of Occurrence
Calyptorhynchus lathami lathami	glossy black-cockatoo (eastern)	V	-	Forests and woodlands with she-oaks (*Allocasuarina* spp.); nests in large tree hollow	Moderate, but no feeding evidence was detected during preliminary surveys
Falco hypoleucos	Grey Falcon	V	-	Range covers eastern Australia in arid and semi-arid areas.	Low, lack of suitable habitat
Ornithorhynchus anatinus	Platypus	SL	-	Dependant on rivers, streams and bodies of freshwater, ideal habitat consists of earth banks and coarser bottom substrates.	High, previously recorded
Tachyglossus aculeatus	Short-beaked Echidna	SL		Common in dry open country on eastern Australia, open heathlands and in forests.	High, previously recorded
Acanthophis antarcticus	Common Death Adder	V	-	Habitats associated with deep leaf litter	Low, possible suitable habitat
Hemiaspis damelii	Grey Snake	E	-	Favours woodlands with cracking clay soils in areas with small gullies and water bodies.	Low to None, no suitable habitat
Ninox strenua	Powerful Owl	V		Open forests and woodlands along watercourses	Recorded in O2 Ecology report for the Toowoomba Second Range Crossing
Q- Queensland legislation A- Australian legislation					

The Preferred Alignment and wider Study Area will intercept areas of regulated vegetation and mapped essential habitat particularly in the vicinity of the Little Liverpool Range. The Preferred Alignment also

intercepts mapped koala bushland and rehabilitation habitat within the South East Queensland Koala Protection Area (Ipswich City Council area). A number of Eucalypt dominated "of concern" regional ecosystems will be intercepted by the Preferred Alignment, which is discussed further under item 3.3(e).

The Preferred Alignment and wider Study Area will intercept areas of fauna habitat and has the potential to impact on connectivity for some species. This includes crossings of the Lockyer Creek regional and state significant ecological corridor and the Little Liverpool Range regional ecological corridor. Fauna passage provisions will be key considerations in future design phases.

Potential exists for animal strike to occur during the operational stage of the Project. Appropriate mitigation (fauna fencing etc.) should limit this potential residual impact.

The western extent of the Study Area north of Postmans Ridge/Helidon is partially located within the DEHP Protected Plants High Risk Flora Survey Trigger map area, as is an area at Lawes, Grandchester and Calvert, indicating records of NC Act listed flora in the vicinity.

3.3 (b) Hydrology, including water flows

The Preferred Alignment spans two catchments, with the boundary following a range between Grandchester and Laidley. The western section is located within the Lockyer Creek Catchment and the eastern section of the corridor is located within the Bremer River Catchment. Both catchments drain toward the Brisbane River and are part of the Drainage Division for the North East Coast.

The Preferred Alignment within the Lockyer Creek Catchment crosses several sub-catchments including Laidley Creek and Lockyer Creek. Laidley Creek joins Lockyer Creek which flows in a north easterly direction toward the Brisbane River, eventually discharging into Moreton Bay.

The Preferred Alignment within the Bremer River Catchment is within the sub-catchment of Western Creek. Western Creek flows east into Bremer River which in turn joins the Brisbane River, eventually discharging into Moreton Bay.

The Preferred Alignment crosses Sandy Creek (tributary of Lockyer Creek), Lockyer Creek, Sandy Creek (tributary of Laidley Creek), Laidley Creek and Western Creek (tributary of the Bremer River). These creeks are shown in Attachment 5.

3.3 (c) Soil and Vegetation characteristics

Soils

Overlying the Marburg Formation are solodic soils generally comprising the following pedological sequence:

- Thin organic topsoil: dark shallow porous loamy soils and friable and cracking dark clays
- Sandy-silty layer: red friable earths
- Medium to high plasticity clay: deeper dark cracking clays.

These solodic soils, characterised by their sodic/saline nature, are dispersive and highly reactive, transitioning from a hard material when dry to non-trafficable when wet due to their plasticity. The cracking clays also experience significant shrinkage and swelling with variations in moisture content.

The Quaternary Alluvium is typically overlain by black earth comprised of black and dark grey clays of high plasticity. The reactive nature of this material allows the mixing of organic content from the surface during the shrink/swell process. The reactive nature of this material results in shrinking and swelling characteristics.

Alluvium material in the Study Area is associated with watercourses and floodplains and is closely aligned with the mapping of important agricultural areas, defined as "land that has all of the requirements for agriculture to be successful and sustainable, is part of a critical mass of land with similar characteristics and, is strategically significant to the region or the state" (Department of Agricultural and Fisheries). There are extensive areas of mapped important agricultural areas within the Study Area associated with Lockyer Creek, Sandy Creek and Laidley Creek. This accounts for the majority of the corridor between Gatton and Laidley.

Contaminated Land and UXO

Sections of the Preferred Alignment are located within the existing railway, on agricultural and rural lands, and in the vicinity of Defence facilities. There is a potential for contaminated land and unexploded ordnance to be present. Further investigations will be undertaken in future stages to quantify this risk.

3.3 (d) Outstanding natural features

Whilst the following natural features are not directly impacted by the Preferred Alignment or wider Study Area, they are in the vicinity and may require further consideration. This includes the Lockyer National Park, Locker State Forest and Lilydale State Forest, located north of Helidon, and the Gatton National Park, located south

east of Gatton. Further afield at the eastern extent of the Project is Main Range National Park approximately 30km to the south and D'Aguilar National Park approximately 50km to the northeast.

3.3 (e) Remnant native vegetation

Four Regional Ecosystem (REs) types were identified in the vicinity of the Preferred Alignment as shown in Table 10.

Table 10: Mapped Regional Ecosystems

Regional Ecosystem	Vegetation Management Act Class	Biodiversity Status	Description
12.3.3	Endangered	Endangered	*Eucalyptus tereticornis* woodland on Quaternary alluvium
12.3.7	Least Concern	Not of Concern	*Eucalyptus tereticornis*, *Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland
12.9-10.2	Least Concern	Not of Concern	*Corymbia citriodora* subsp. *variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks
12.9-10.2/12.9-10.7	Least Concern/Of Concern	Not of Concern/Of Concern	*Corymbia citriodora* subsp. *variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks and *Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora spp.*, *E. melanophloia* woodland on sedimentary rocks
12.9-10.7	Of Concern	Of Concern	*Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora spp.*, *E. melanophloia* woodland on sedimentary rocks

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

The Preferred Alignment progresses up from the flats of Helidon (150m AHD) into the foothills associated with Lockyer National Park (160-180m AHD) before crossing Sandy Creek at 135m AHD. It then remains relatively flat up to Forest Hill at 100m AHD before moving through the undulating hills of the Little Liverpool Range (up to 250m AHD) then from Grandchester the landscape remains relatively flat as it approaches Calvert at approximately 100m-60m AHD. Elevation ranges from 60m AHD at Calvert to 250 m AHD in the adjacent hills.

3.3 (g) Current state of the environment

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

The Preferred Alignment traverses predominantly brownfield areas, following the existing rail corridor for the majority of its length. Some greenfield sections deviate from the existing corridor, where impacts to natural areas, agricultural areas and emerging residential areas will occur. Whilst traversing a predominantly agricultural and modified environment, there are areas of significant habitat and fauna corridors throughout the Study Area, associated with the major creeks and the Little Liverpool Range. Some areas of weed infestation were observed during initial field investigations, including lantana (*Lantana camara*).

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

No Commonwealth Heritage Places were identified in the Study Area. There are several listed places of historical heritage significance within the Study Area or in close proximity to the Preferred Alignment. The results of database and register searches are listed in Table 11.

Table 11: Heritage Values

Source	Result	Notes
Australian Heritage Database (NHL, CHL, RNE)	1 place	William and Victoria Streets Group (File No. 4/01/088/0005) Indicative Place (RNE).
Queensland Heritage Register	5 places	• Grandchester Railway Station Complex • Boer War Memorial, Gatton • Lockyer Valley Hotel, Gatton. • Forest Hill Hotel, Forest Hill • Weeping Mother Memorial, Gatton.
Local Planning schemes (Toowoomba, Lockyer Valley, Ipswich)	15 places	These places are located within the Ipswich and former Gatton Shire areas, some are also listed in the Queensland Heritage Register.

Queensland Rail Heritage Register	2 places	These are places listed in Buchanan (2002) which formed the basis for the Queensland Rail Heritage Register. e.g Gatton Railway Station

Desktop analysis has also identified the potential for previously unidentified and unlisted historical heritage places and values to be located within the Study Area. Further investigations will be required to determine impacts and mitigation requirements.

3.3 (i) Indigenous heritage values

A search of the DATSIP databases and register for known cultural heritage objects, or places within, or in proximity to, the Study Area was undertaken. Results are provided in Table 12.

Table 12: Aboriginal heritage sites identified on the DATSIP cultural heritage database within 5km of Study Area

Source	Result	Notes
DATSIP	1 Site	This site is an artefact scatter.
DATSIP	1 site	This site is an artefact scatter.
DATSIP	93 sites	Sites include artefact scatters, a cultural site, historical places, isolated finds, a landscape feature, resource areas and scarred trees.

The most common types of cultural objects recorded in search results are stone artefacts. These objects can be found as individual items or as contiguous scatters. Previous archaeological research indicates an abundance of stone artefact scatters with their presence and frequency largely determined by proximity to water. This further strengthens the potential for there to be additional cultural heritage material identified within the Project Study Area.

The existence of known Aboriginal cultural heritage sites and intangible sites within, and in proximity to, the Study Area, as well as high risk landscape features such as creeks, indicate that there is a high risk of encountering, cultural heritage values, as yet unidentified, within the Study Area.

The review of historical aerial photos and results of initial consultation meetings with the Aboriginal parties for the Study Area also indicate the likely presence of additional Aboriginal cultural heritage object, items and values.

3.3 (j) Other important or unique values of the environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc.).

Matters of State Environmental Significance mapped by the Queensland Government that are located within the Study Area include:

- Regulated vegetation intersection a watercourse (throughout the Study Area)
- Large expanse of regulated vegetation, wildlife habitat and protected area designation associated with Lockyer National Park, north of Helidon. A similar area is located to the south of Gatton, in Gatton National Park.
- Large corridor of Wildlife Habitat and Regulated vegetation, which continues to a protected area in the Mt Mort area, south of the Study Area
- Areas of mapped wildlife habitat associated with the creeks and tributaries intersected by existing east-west infrastructure corridors.

3.3 (k) Tenure of the action area (e.g. freehold, leasehold)

The predominant tenure across the Study Area is freehold, with reserves and state owned land in discrete pockets.

3.3 (l) Existing land/marine uses of area

A review of existing land uses was undertaken, with reference to available aerial imagery and Queensland Government land use mapping. These localities are shown in Attachment 1.

Helidon is dominated by rural and rural residential uses. The Helidon area is historically associated with natural springs and sandstone, which was quarried for building materials across Queensland.

Grantham and Ringwood are dominated by grazing and agricultural uses with some residential areas. The northern reaches of both slope up into the ranges associated with the Lockyer National Park and Lockyer Regional Park. The township of Grantham is located south of the existing rail line and is characterised by large lot rural residential. Following the floods in 2011, a new housing initiative adjoining the township called the

"Strengthening Grantham Project" was designed to relocate residents to a master planned community out of the flood zone.

Placid Hills is predominantly large lot residential on the elevated areas with some grazing and irrigated seasonal horticulture to the south and southeast on the floodplain of Lockyer Creek. Placid Hills borders Gatton, with the Lockyer Creek forming the boundary between the two.

Adare is predominantly agricultural country located north of the existing rail line. Areas of residential purposes follow a man-made water channel connecting in the north with Lake Clarendon.

Gatton is the largest town in the Lockyer Valley and is the main hub of the region. Designated as Urban Footprint in the South East Queensland Regional Plan, Gatton is home to the Lockyer Valley Regional Council, Lockyer Valley Cultural Centre, and Gatton industrial area. It is located in proximity to the Warrego Highway and the existing rail line contributing to its development as an agricultural and transportation hub. The Gatton Racecourse is located in a bend of Lockyer Creek, close to the existing railway. Lake Apex and a fauna sanctuary are located south west of the town environs. Gatton National Park is located south east of the town area.

The University of Queensland Gatton campus is located at Lawes. South of the existing rail line, the area is dominated by grazing country.

The Forest Hill township is designated as Urban Footprint in the South East Queensland Regional Plan, and is the locale of a little town built up around two rail sidings adjoining the existing rail line near the confluence of Sandy Creek and Laidley Creek. To the north east, an area of large lot residential has established, adjoining the developed areas at and around Plainland. The rest of the area in Forest Hill is dominated by irrigated seasonal horticulture and grazing country.

Laidley and Laidley North are located near the eastern edge of the Lockyer Valley. The community of Laidley forms the second largest town within the Lockyer Valley, behind its close neighbour, Gatton. It is also designated as Urban Footprint in the SEQ Regional Plan. Laidley is a significant heritage town whilst also being one of the main agricultural towns within the region. Along with its strong agricultural base, the area is home to the Laidley Cultural Centre and RSL Sub-branch, providing recreational facilities.

Grandchester roughly follows the catchment of Western Creek with the town of Grandchester located along the existing rail line and Western Creek. The region is predominantly grazing country with pockets of residential zoning surrounding the town, associated with the historic rail station.

Calvert is located on the existing rail line and is a small community on Western Creek surrounded by grazing country.

3.3 (m) Any proposed land/marine uses of area

The proposed land use is rail and associated infrastructure, including road realignments, grade separations and ancillary infrastructure.

4 Environmental outcomes

Provide descriptions of the proposed environmental outcomes that will be achieved for matters of national environmental significance as a result of the proposed action. Include details of the baseline data upon which the outcomes are based, and the confidence about the likely achievement of the proposed outcomes. Where outcomes cannot be identified or committed to, provide explanatory details including any commitments to identify outcomes through an assessment process.

If a proposed action is determined to be a controlled action, the Department may request further details to enable application of the draft *Outcomes-based Conditions Policy 2015* and *Outcomes-based Conditions Guidance 2015* (http://www.environment.gov.au/epbc/consultation/policy-guidance-outcomes-based-conditions), including about environmental outcomes to be achieved, details of baseline data, milestones, performance criteria, and monitoring and adaptive management to ensure the achievement of outcomes. If this information is available at the time of referral it should be included.

General commitments to achieving environmental outcomes, particularly relating to beneficial impacts of the proposed action, CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, and conditions of approval, if your proposal proceeds to these stages).

To date, endeavours to avoid and reduce impacts to matters of national environmental significance and other environmental values have been a key factor in option assessment and route selection processes for the

Project and across the Melbourne to Brisbane Inland Rail Programme. As the Project progresses, impact avoidance and reduction will remain key drivers in design development.

The Project will undergo environmental assessment in line with Commonwealth and Queensland legislative requirements, preferably under the bilateral agreement between the Australian Government and the State of Queensland. This process will provide further detail regarding environmental outcomes, and the data upon which these assessments and proposed outcomes are based. This includes the completion of further studies and design development. Key aspects to be addressed include:

- Further definition of habitat and vegetation impacts, through iterative design and environmental assessment
- Confirmation of the location of MNES and Matters of State Environmental Significance (MSES) habitat and species presence, and significance of populations, through targeted ecological investigations, in accordance with relevant State and Commonwealth survey guidance
- Confirmation of other environmental values in the Project area
- Design development to avoid, reduce or manage impacts to identified environmental values
- Determination of environmental offset requirements for MNES and MSES impacts. A Programme-wide approach to biodiversity offset management is currently being considered.

The Project's environmental outcomes should also be considered in the context of the overall intent and outcomes of the ultimate Melbourne to Brisbane Inland Rail Programme. The establishment of a freight rail route that provides a comparable level of service to road freight is expected to negate or delay the need for progressive upgrades of the National Highway and associated environmental impacts.

5 Measures to avoid or reduce impacts

Note: If you have identified alternatives in relation to location, time frames or activities for the proposed action at Section 2.3 you will need to complete this section in relation to each of the alternatives identified.

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:
- what the measure is,
- how the measure is expected to be effective, and
- the time frame or workplan for the measure.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

Provide information about the level of commitment by the person proposing to take the action to achieve the proposed environmental outcomes and implement the proposed mitigation measures. For example, if the measures are preliminary suggestions only that have not been fully researched, or are dependent on a third party's agreement (e.g. council or landowner), you should state that, that is the case.

Note, the Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided on the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:
- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

If a proposed action is determined to be a controlled action, the Department may request further details to enable application of the *Outcomes-based Conditions Policy 2016* (http://www.environment.gov.au/epbc/publications/outcomes-based-conditions-policy-guidance), including information about the environmental outcomes to be achieved by proposed avoidance, mitigation, management or offset measures, details of baseline data, milestones, performance criteria, and monitoring and adaptive management to ensure the achievement of outcomes. If this information is available at the time of referral it should be included in the description of the proposed measures.

More general commitments (e.g. preparation of management plans or monitoring), commitments to achieving environmental outcomes and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, if your proposal proceeds to these stages).

At the time of referral, preliminary information is available regarding measures to avoid or reduce impacts. Further baseline data, design information and confirmation of suitable management approaches will be developed in the next stage of the Project.

Design

All of the Projects that are part of the Inland Rail Programme will be designed and assessed in a consistent way, guided by an overarching Environmental Strategy. Environmental assessment during the design phase will address design, construction and operational phase impacts and management measures. Detailed requirements for environmental assessment and design will also be specified in Project tender documentation. This information is still under development, and will also incorporate any assessment requirements provided by the Queensland and Australian governments, if relevant and available at the time of tender release.

Opportunities to minimise earthwork extents, avoid significant impacts to creeks and watercourses through sensitive design, avoid or reduce impacts to areas of sensitive habitat (including habitat loss, habitat fragmentation and mortality) will be key considerations throughout design. Opportunities to minimise amenity impacts (noise, air quality, visual) will also be key drivers of subsequent design processes.

Construction

An Environmental Management Plan will be developed to ensure management and mitigation measures and conditions of approval are clearly documented, and are implemented during the construction phase of the Project. This will include definition of no-go zones, requirements for post-works rehabilitation, and scheduling of works where necessary to minimise impacts during breeding periods or times of heightened environmental sensitivity.

Operation

ARTC have established an environmental process that applies to operations on their network. This includes an environmental policy, an environmental management system and a pollution incident response management plan.

In all their activities, ARTC commits to:

- Taking prompt action in response to non-compliance and other environmental complaints
- Having effective relationships with all environmental agencies and regulators
- Ensuring agreements between contractors and rail operators comply with our Environmental Management System
- Ensuring employees are inducted so they can perform their duties.

Project-specific environmental management or monitoring requirements identified through future stages of design and impact assessment will be incorporated into the relevant operational management documentation. These management and monitoring measures will be determined based on current guidelines and scientific knowledge, with input from relevant government agencies. At this stage of the process the exact nature of this documentation is yet to be determined, however the existing ARTC Environmental Protection Licences for operations in New South Wales and South Australia provide an example of how this is addressed in these jurisdictions. A Project specific example is the ARTC operational environmental management plan for the Southern Sydney Freight Line, which was developed in accordance with the conditions of approval from the New South Wales Department of Planning.

6 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

6.1 Do you THINK your proposed action is a controlled action?

	No, complete section 5.2
✓	Yes, complete section 5.3

6.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

6.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

	Matters likely to be impacted
	World Heritage values (sections 12 and 15A)
	National Heritage places (sections 15B and 15C)
	Wetlands of international importance (sections 16 and 17B)
✓	Listed threatened species and communities (sections 18 and 18A)
	Listed migratory species (sections 20 and 20A)
	Protection of the environment from nuclear actions (sections 21 and 22A)
	Commonwealth marine environment (sections 23 and 24A)
	Great Barrier Reef Marine Park (sections 24B and 24C)
	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

The Project will result in impacts to habitat for listed threatened species, in particular the Koala and potential habitat for other listed threatened species such as the Collared Delma. Management and mitigation measures will be further developed as the Project progresses, to address the impact of habitat loss and enable habitat connectivity. The extent of habitat loss and impact on listed threatened species will require further detailed assessment to determine whether the Project is likely to have a significant residual impact on these matters of national environmental significance.

7 Environmental record of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

		Yes	No
7.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** ARTC are a national rail operator. ARTC operate in New South Wales and South Australia under Environmental Protection Licences, and as such are accountable to the respective Environmental Protection Agencies for their operations. Through implementation of ARTC's Environmental Policy, Environmental Management System, and Project specific environmental management plans and licences for construction and operation, ARTC has maintained a satisfactory record of responsible environmental management.	✓	
7.2	**Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details**		✓
7.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** ARTC's Environmental Policy is attached. ARTC also operates an environmental management system, and has a state based (NSW) code of practice for assessing the impact of Projects.	✓	
7.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?**	✓	

Provide name of proposal and EPBC reference number (if known)		
2016/7729 – Australian Rail Track Corporation Ltd/Transport - Land/Narrabri to North Star/New South Wales/Narrabri to North Star Section of Inland Rail, NSW (22 June 2016)		
2016/7731 – Australian Rail Track Corporation Ltd/Transport - Land/Parkes to Narromine/New South Wales/Parkes to Narromine Section Inland Rail, NSW (22 June 2016)		
2009/4897 – Upgrade of approx. 32km of Main Northern Railway, including construction of 3rd track, Main Northern Railway between Maitland Junction and Minimbah (NSW) (18 May 2009)		
2009/4783 – Melbourne to Sydney Rail Upgrade Project – Passing Lane 2, Near Hume Highway, between Donnybrook Road and Beveridge Road (VIC) (06 March 2009		
2008/4500 – Northern East Rail Revitalisation, Glenrowan Station (VIC) (08 October 2008) 2007/3795 – Passing Land 2 between Donnybrook Road and Beveridge Road level crossings, Melbourne to Sydney Rail Corridor (VIC) (22 October 2007)		
2005/2393 – South Sydney Freight Rail Line, Sefton Park to Macarthur (NSW) (18 November 2005)		
2005/1948 – Sandgate Rail Grade Separation, Newcastle (NSW) (13 January 2005)		

8 Information sources and attachments

(For the information provided above)

8.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

- 2006 North South Rail Corridor Study
- 2010 Inland Rail Alignment Study (IRAS)
- 2015 Melbourne to Brisbane Inland Rail Business Case
- Australian Heritage Database (NHL, CHL, RNE)
- Borsboom, A. (2009). *Coeranoscincus reticulatus* - Species Information Sheet. Provided to the Department of the Environment, Water, Heritage and the Arts. Department of Environment and Resource Management.
- Buchanan Architects 2002 Brisbane to Toowoomba: A Heritage Management Survey for Queensland Rail. Unpublished report for Queensland Rail.
- DATSIP databases: Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP)
- Department of Agriculture and Fisheries (DAF), 2016, GIS layer: Queensland Waterways for Waterway Barrier Works
- Department of the Environment and Energy (DoEE) 2016 Species Profile and Threats Database.
- Dique, D., Preece, H. and de Villiers, D. (2003c) Koalas in Pine Rivers Shire: Distribution, Abundance and Management., Unpublished Report to the Queensland Parks and Wildlife Service, Brisbane
- DoE, 2014. EPBC Act Referral Guidelines for the Vulnerable Koala
- EPBC Protected Matters Search Tool (PMST) was generated on 14/06/2016 for a 5km linear buffer along the proposed alignment
- Kerr, J. 1994 Queensland Rail Heritage Report, Final Report, July 1993. Unpublished report to Queensland Rail.
- Koala Tracker mapping (http://www.koalatracker.com.au/view-mapped-koala-sightings)
- Murray, J.V., S. Low Choy, C.A. McAlpine, H.P. Possingham, A.W. Goldizen (2008). The importance of ecological scale for wildlife conservation in naturally fragmented environments: A case study of the brush-tailed rock-wallaby (Petrogale penicillata). Biological Conservation. 141 (1):7-22.
- O2 Ecology (2014) Toowoomba Second Range Crossing Consolidated Fauna Survey and Management Report
- Phillips, Stephen and Callaghan, John. "The Spot Assessment Technique: A Tool for Determining Localised Levels of Habitat Use by Koalas Phascolarctos Cinereus." Australian Zoologist 35, no. 3 (November 2011): 774–80.
- Queensland Government (2009) South East Queensland Regional Plan 2009-2031
- Queensland Government (2016) South East Queensland's Rail Horizon
- Queensland Government Essential Habitat Mapping
- Queensland Government Statewide ecological corridor mapping
- Queensland Government Wildlife online
- Queensland Heritage Register
- Queensland Land Use Mapping Program, February 2016. Queensland Land Use Mapping
- Queensland Rail/ Queensland Transport 2003 Gowrie to Grandchester Rail Corridor Study (Part 2) Helidon to Grandchester
- DNRM, 2016. Regional ecosystem mapping
- Short, J, 1982. Habitat requirements of the brush-tailed rock-wallaby, Petrogale penicillata, in New South Wales. Australian Wildlife Research. 9: 239-246.
- Arup/Smec, 2016. Melbourne to Brisbane Inland Rail, Helidon to Calvert Phase 1 Engineering and Environment- Preliminary Environmental Assessment Report
- Toowoomba Regional Council Transport Strategy Proposals to 2031 (Brian Lister Planning and TransPosition 2010
- William and Victoria Streets Group (File No. 4/01/088/0005) Indicative Place (RNE).

8.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

8.3 Attachments

Indicate the documents you have attached. All attachments must be less than three megabytes (3mb) so they can be published on the Department's website. Attachments larger than three megabytes (3mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the Project locality (section 1)	✓	
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the Project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)		
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

9 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Project title:

9.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act[2], this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[3].

1. Name and Title:	Simon Thomas, Project Director
2. Organisation (if applicable):	Australian Rail Track Corporation
3. EPBC Referral Number (if known):	
4: ACN / ABN (if applicable):	081 455 754 / 75081455754
5. Postal address	11 Sir Donald Bradman Drive, Keswick Terminal, South Australia
6. Telephone:	(08) 8217 4366
7. Email:	enquiries@artc.com.au
8. Name of proposed proponent (if not the same person at item 1 above and if applicable):	

[1] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Gateway (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

[2] *If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A,* EPBC Act*). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.*

9. ACN/ABN of proposed proponent (if not the same person named at item 1 above):

COMPLETE THIS SECTION ONLY IF YOU QUALIFY FOR EXEMPTION FROM THE FEE(S) THAT WOULD OTHERWISE BE PAYABLE

I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

□ an individual; OR

□ a small business entity (within the meaning given by section 328-110 (other than subsection 328-119(4)) of the *Income Tax Assessment Act 1997*); OR

□ not applicable.

If you are small business entity you must provide the Date/Income Year that you became a small business entity:

Note: You must advise the Department within 10 business days if you cease to be a small business entity. Failure to notify the Secretary of this is an offence punishable on conviction by a fine (regulation 5.23B(3) *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth)).

COMPLETE THIS SECTION ONLY IF YOU WOULD LIKE TO APPLY FOR A WAIVER

I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations. Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made:

□ not applicable.

Declaration

I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.
I understand that giving false or misleading information is a serious offence.
I agree to be the proponent for this action.
I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature

Date 10/2/17

9.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	John Herron
Title	Environment Manager
Organisation	Australian Rail Track Corporation
ACN / ABN (if applicable)	
Postal address	Level 12/40 Creek Street, Brisbane 4000

Telephone	0733648919
Email	jherron@artc.com.au
Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence.
Signature	 Date 10 Feb. 2017

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ❑ Completed all required sections of the referral form?
- ❑ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ❑ Provided a map showing the location and approximate boundaries of the Project area?
- ❑ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ❑ Provided a digital file (preferably ArcGIS shapefile, refer to guidelines at Attachment A) delineating the boundaries of the referral area?
- ❑ Provided complete contact details and signed the form?
- ❑ Provided copies of any documents referenced in the referral form?
- ❑ Ensured that all attachments are less than three megabytes (3mb)?
- ❑ Sent the referral to the Department (electronic and hard copy preferred)?

Attachment A

Geographic Information System (GIS) data supply guidelines

If the area is less than 5 hectares, provide the location as a point layer. If the area greater than 5 hectares, please provide as a polygon layer. If the proposed action is linear (eg. a road or pipeline) please provide a polyline layer.

GIS data needs to be provided to the Department in the following manner:

- Point, Line or Polygon data types: ESRI file geodatabase feature class (preferred) or as an ESRI shapefile (.shp) zipped and attached with appropriate title
- Raster data types: Raw satellite imagery should be supplied in the vendor specific format.
- Projection as GDA94 coordinate system.

Processed products should be provided as follows:

- For data, uncompressed or lossless compressed formats is required - GeoTIFF or Imagine IMG is the first preference, then JPEG2000 lossless and other simple binary+header formats (ERS, ENVI or BIL).
- For natural/false/pseudo colour RGB imagery:
    - If the imagery is already mosaiced and is ready for display then lossy compression is suitable (JPEG2000 lossy/ECW/MrSID). Prefer 10% compression, up to 20% is acceptable.
    - If the imagery requires any sort of processing prior to display (i.e. mosaicing/colour balancing/etc) then an uncompressed or lossless compressed format is required.

Metadata or 'information about data' will be produced for all spatial data and will be compliant with ANZLIC Metadata Profile. (http://www.anzlic.org.au/policies_guidelines#guidelines).

The Department's preferred method is using ANZMet Lite, however the Department's Service Provider may use any compliant system to generate metadata.

All data will be provide under a Creative Commons license (http://creativecommons.org/licenses/by/3.0/au/)