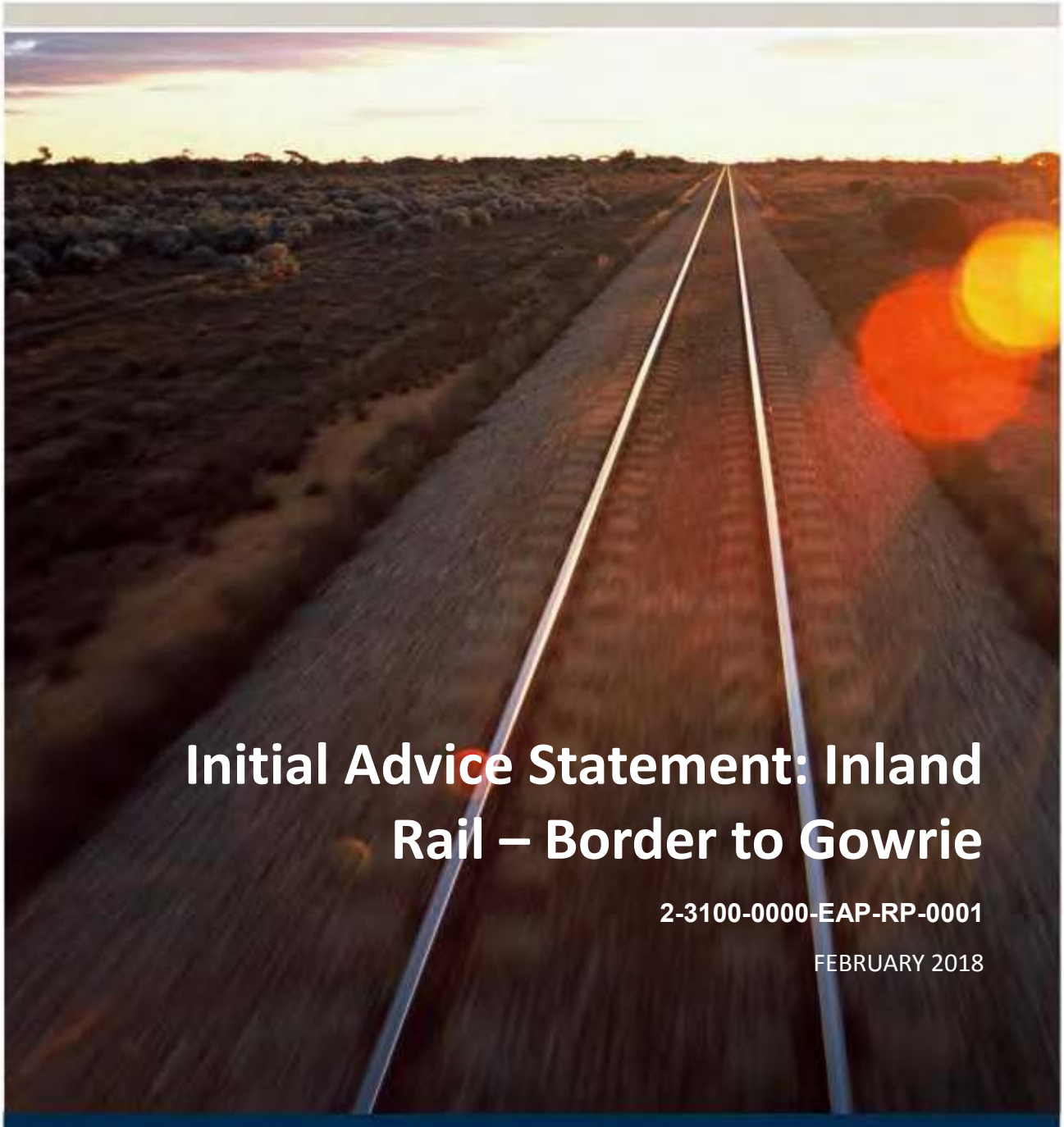
ARTC InlandRail

The Australian Government's priority freight rail project



Initial Advice Statement: Inland Rail – Border to Gowrie

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FEBRUARY 2018

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EXECUTIVE SUMMARY

This Initial Advice Statement (IAS) has been prepared for the Inland Rail Border to Gowrie Project, one of 13 separate projects that are part of the Inland Rail programme. Australian Rail Track Corporation (ARTC) is an Australian Government owned corporation and currently manages and maintains approximately 8,500 kilometres (km) of rail network across Victoria, NSW, South Australia, Western Australia and QLD.

The project would comprise a new dual gauge freight railway extending from the border of New South Wales (NSW) and Queensland (QLD), near Kildonan, to Gowrie, 13 km north west of Toowoomba. The following Table 1 sets out the 13 projects that collectively comprise the Inland Rail programme.

Table 1 Inland Rail Programme projects

PROJECT NAME	STATE	DESCRIPTION	LENGTH (KM)
Tottenham to Albury	VIC	Enhancement works	305
Albury to Illabo	NSW	Enhancement works	185
Illabo to Stockinbingal	NSW	New Railway	37
Stockinbingal to Parkes	NSW	Enhancement works	169
Parks to Narromine	NSW	Upgrade works	111
Narromine to Narrabri	NSW	New Railway	307
Narrabri to North Star	NSW	Upgrade works	186
North Star to NSW/QLD Border	NSW	New Railway	37
NSW/QLD Border to Gowrie	**QLD**	**New Railway and upgrade works**	**224**
Gowrie to Helidon	**QLD**	New Railway	26
Helidon to Calvert	**QLD**	New Railway	47
Calvert to Kagaru	**QLD**	New Railway	53
Kagaru to Acacia Ridge/Bromelton	**QLD**	Enhancement works	49
	Total	**Total**	**1,736**

Each project can be delivered independently with tie-in points on the existing railway. The ARTC 2015 Inland Rail Business Case shows that Inland Rail maximises value for money while meeting market needs and provides benefits to the Australian economy through efficient freight transport.

The Border to Gowrie Project will be constructed as an approximately 224 km long single-track dual gauge railway with crossing loops to accommodate double stack freight trains up to 1,800 m long. Impact assessment will be undertaken for the proposed development described in the Inland Rail Business Case (2015) for rail traffic and associated activities projected at the year 2040. The Border to Gowrie Project will also include land provision to accommodate the

potential future duplication of the rail line and possible future extension of the crossing loops to accommodate trains up to 3,600 m in length.

The Border to Gowrie Project is one of the 'missing links' within the Inland Rail programme. A Conceptual Alignment has been identified for the Border to Gowrie Project within a broader Study Area. This will allow for route 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.

ARTC is seeking a declaration for coordinated project status under the *State Development and Public Works Organisation Act 1971 (Qld)* (SDPWO Act). The Border to Gowrie Project will also be referred under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* (EPBC Act) and if determined to be a controlled action, it is anticipated that assessment of the Border to Gowrie Project will be progressed under the Assessment Bilateral Agreement between the Australian and Queensland Governments.

The key reasons ARTC is seeking the coordinated project declaration under the SDPWO Act are:

- To provide the public with the opportunity to comment and provide input into the terms of reference for the Environmental Impact Statement (EIS), and following its development, on the draft EIS prepared by ARTC,
- 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 (if required).

The EIS will undertake a range of investigations into the potential impacts and mitigation measures required for the delivery of the Border to Gowrie Project. Those investigations will as a minimum assess:

- Land use
- Flora and fauna
- Water quality
- Hazards, health and safety
- Social and economic factors
- Air quality
- Noise and vibration
- Water resources
- Waste management
- Cultural heritage
- Transport.

1. INTRODUCTION

1.1. Background

The Australian Government has committed to building a nationally significant piece of transport infrastructure by constructing an inland railway between Melbourne and Brisbane, via regional Victoria, central-west New South Wales (NSW) and Toowoomba in Queensland (QLD).

The Melbourne to Brisbane Inland Rail programme will enhance Australia's existing rail network and serve the interstate freight market by delivering a road competitive service that will see freight delivered by rail between Melbourne and Brisbane in less than 24 hours with reliability, pricing and availability that is equal to or better than road. Inland Rail provides a step-change in freight productivity, while also catalysing a range of potential benefits from complementary investments in land use and supply chains that leverage the enhanced logistics capabilities of Inland Rail.

The Inland Rail programme has evolved over several decades with many alternatives and options assessed to meet Australia's growing freight transport needs. The current Inland Rail alignment, shown in **Figure 1-1**, builds upon the alignment in the Inland Rail Business Case 2015 and the Inland Rail Implementation Group's report to the Australian Government (August 2015).

The Australian Government has prioritised the Inland Rail programme, and in 2014 engaged Australian Rail Track Corporation (ARTC) under the guidance of the Inland Rail Implementation Group to develop a 10-year delivery programme for Inland Rail.

The Inland Rail route, which is approximately 1,700 km long, will involve:

- Using the existing interstate rail line through Victoria and southern NSW
- Enhancing and upgrading approximately 1200 km of existing track, Victoria, NSW and QLD; and
- Providing approximately 500 km of new track in northern NSW and south-east QLD.

Inland Rail has been divided into 13 projects, five (5) of which are located in QLD, as shown in

Figure 1-2. Each of these projects is able to be delivered, constructed and operated independently with tie-in points on the existing railway.

The Border to Gowrie Project is the subject of this Initial Advice Statement (IAS). The Border to Gowrie Project will provide an efficient route through the undulating topography between the NSW/QLD border and Gowrie.

The Study Area's southern extent has been curtailed at the state border to enable a single state approval process to be followed.

On 21 September 2017, the then Minister for Infrastructure and Transport, the Hon Darren Chester MP, announced that the alignment via Wellcamp and Charlton will proceed to the planning and approvals phase.

The proposed Study Area has been determined based on environmental, engineering and property/community impact considerations. This determination followed a lengthy and extensive alignment review under the direction of the Federal Minister for Transport & Infrastructure and with the establishment of the Yelarbon to Gowrie Project Reference Group.

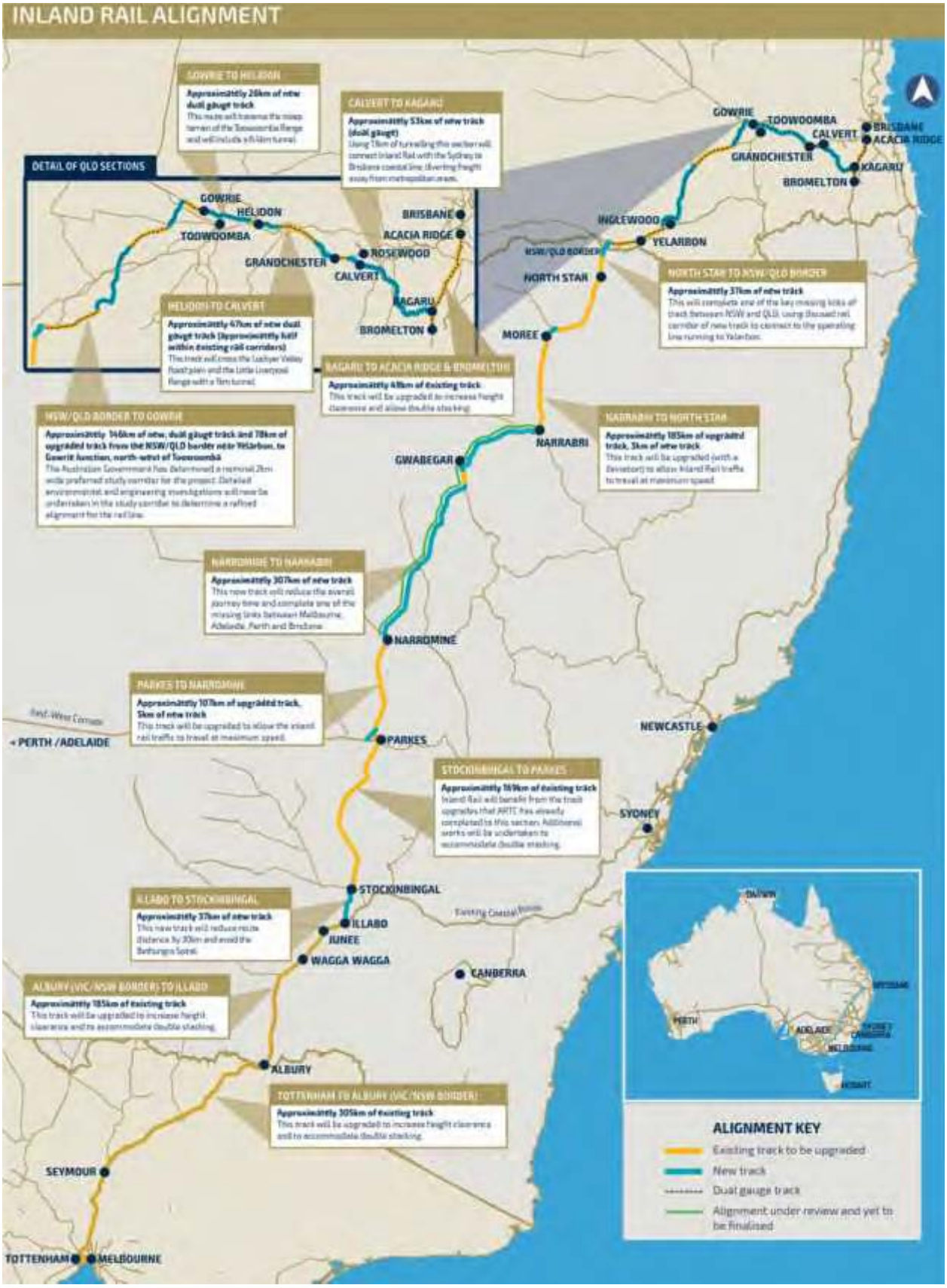


Figure 1-1 The Melbourne to Brisbane Inland Rail programme

Figure 1-2 QLD Projects in the Inland Rail programme

1.2. Purpose and Scope of the Initial Advice Statement

This IAS has been prepared for the Border to Gowrie Project to support an application to the Queensland Coordinator-General for a 'coordinated project' declaration under Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). Given the scale and extent of the proposed Border to Gowrie Project, ARTC believe that an Environmental Impact Statement (EIS) is appropriate for assessing the social, economic and environmental impacts.

ARTC is seeking a declaration that the Border to Gowrie Project is a coordinated project due to the significant infrastructure investment and strategic direct and indirect economic benefits of creating an efficient freight route. ARTC is also seeking to have Commonwealth matters under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) assessed in accordance with the Assessment Bilateral Agreement between the Queensland State Government and the Commonwealth Government, if the Commonwealth Minister determines that the Border to Gowrie Project is a controlled action. The Border to Gowrie Project will have complex approval and permitting requirements under Commonwealth, State and local legislation and the potential for significant environmental impact unless appropriately managed.

The IAS provides information to assist the Coordinator-General to decide whether the Border to Gowrie Project should be declared a coordinated project, to determine the appropriate level of assessment, and inform the preparation of a terms of reference for an EIS should the Border to Gowrie Project be declared under section 26(1)(a) of the SDPWO Act, and require an EIS.

The Border to Gowrie Project will be referred to the Commonwealth Department of the Environment and Energy (DotEE) for a decision as to whether the Border to Gowrie Project is a controlled action requiring assessment and approval under the EPBC Act. If the Border to Gowrie Project is determined to be a controlled action, it can be assessed by the SDPWO Act EIS process accredited under the Assessment Bilateral Agreement between the Australian Government and the State of Queensland.

A Conceptual Alignment and a broader Study Area for the Border to Gowrie Project has been identified for consideration in the IAS and EPBC Referral. These aspects are discussed further in **Section 3.1**.

2. THE PROPONENT

ARTC is an Australian Government owned corporation and current operator of the Australian freight network. ARTC has been tasked by the Australian Government with delivery of the Inland Rail programme. ARTC was established in 1998 after the privatisation of the national rail network and Commonwealth and State Government agreement to form a 'one-stop' shop for all operators wanting access to the standardised interstate rail network.

ARTC currently manages and maintains approximately 8,500 km of rail network across Victoria, NSW, South Australia, Western Australia and QLD. Since 2011, ARTC has delivered a capital works programme of almost $3 billion to modernise the east coast freight rail lines and other projects to enhance the national rail network offering to customers. The Inland Rail is an integral component of the future enhancement of the national rail network.

ARTC is fully capable of completing an EIS, having established an Inland Rail programme team with in-house support from specialist consultant technical advisors. Packages of technical (engineering and environmental) work are also being procured from industry consultants. ARTC plans to engage suitably qualified consultants with demonstrated experience in delivering the required social, economic and environmental impact assessment, and the associated engineering solutions for a project of this nature and scale.

ARTC has not incurred any environmental prosecutions within the last five years. During the execution of almost $3 billion of capital works, ARTC have incurred two penalties relating to minor environmental incidents including:

- New South Wales Environment Protection Authority (EPA) Penalty Notice to ARTC dated 29 May 2012 for discharge of sediment-laden water at Allandale (Maitland to Minimbah Third Track Project). Penalty: $1500.
- New South Wales EPA Penalty Notice to Transport Express JV (operating under ARTC Environment Protection Licence) dated 5 March 2012 for sediment and erosion control issues at Sawtell. Penalty: $1500.

ARTC entered into a Voluntary Enforceable Undertaking, i.e. formal written undertakings in relation to a contravention or alleged contravention of the law, with the Commonwealth DotEE under the EPBC Act in 2011.

Contact details for the Inland Rail programme are as follows:

Inland Rail
Australian Rail Track Corporation
Level 12, 40 Creek Street
PO Box 2462 Queen Street
Brisbane Qld 4000
Telephone: 1800 732 761

3. NATURE OF THE PROPOSAL

3.1. Scope of the Border to Gowrie Project

The proposed Border to Gowrie Project is an approximately 224 km long single-track dual-gauge railway with crossing loops to accommodate double stacked freight trains up to 1,800 m long. The land requirement for the Border to Gowrie Project will comprise a corridor with an average width of 40 m, with some variation to accommodate particular infrastructure and to cater for local topography. The corridor will be of sufficient width to accommodate the infrastructure currently proposed for construction, as well as future expansion, including possible future requirement for 3,600 m trains.

Initial project construction will be a single-track dual-gauge railway, with crossing loops to accommodate double stacked freight trains up to 1,800 m long. Components of the construction will include infrastructure to accommodate possible future augmentation and upgrades of the track, including a possible future requirement for 3,600 m trains.

The operational phase at year 2040 will be of a single track with crossing loops to accommodate double stacked freight trains up to 1,800 m long. Impact assessment will be undertaken for the proposed development described in the Inland Rail Business Case (ARTC, 2015) for rail traffic and associated activities projected at the year 2040.

The Border to Gowrie Project will use a combination of new corridor and track (greenfield) and upgrade of existing rail track (brownfield) of which some is currently operational and some disused (non-operational) rail corridor. The Conceptual Alignment connects to the existing Queensland Rail West Moreton Line to the west of Toowoomba in Gowrie (**Figure 3-1**) and traverses in a south-west direction towards the QLD and NSW border with a bridge crossing across the McIntyre River near Kildonan. The Border to Gowrie Project is located between the adjacent Inland Rail proposed projects of North Star to Border to the south west and Gowrie to Helidon to the north east.

A Conceptual Alignment and a Study Area have been identified as shown in **Figure 3-1**. 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. Further details are included in **Section 3.4**.

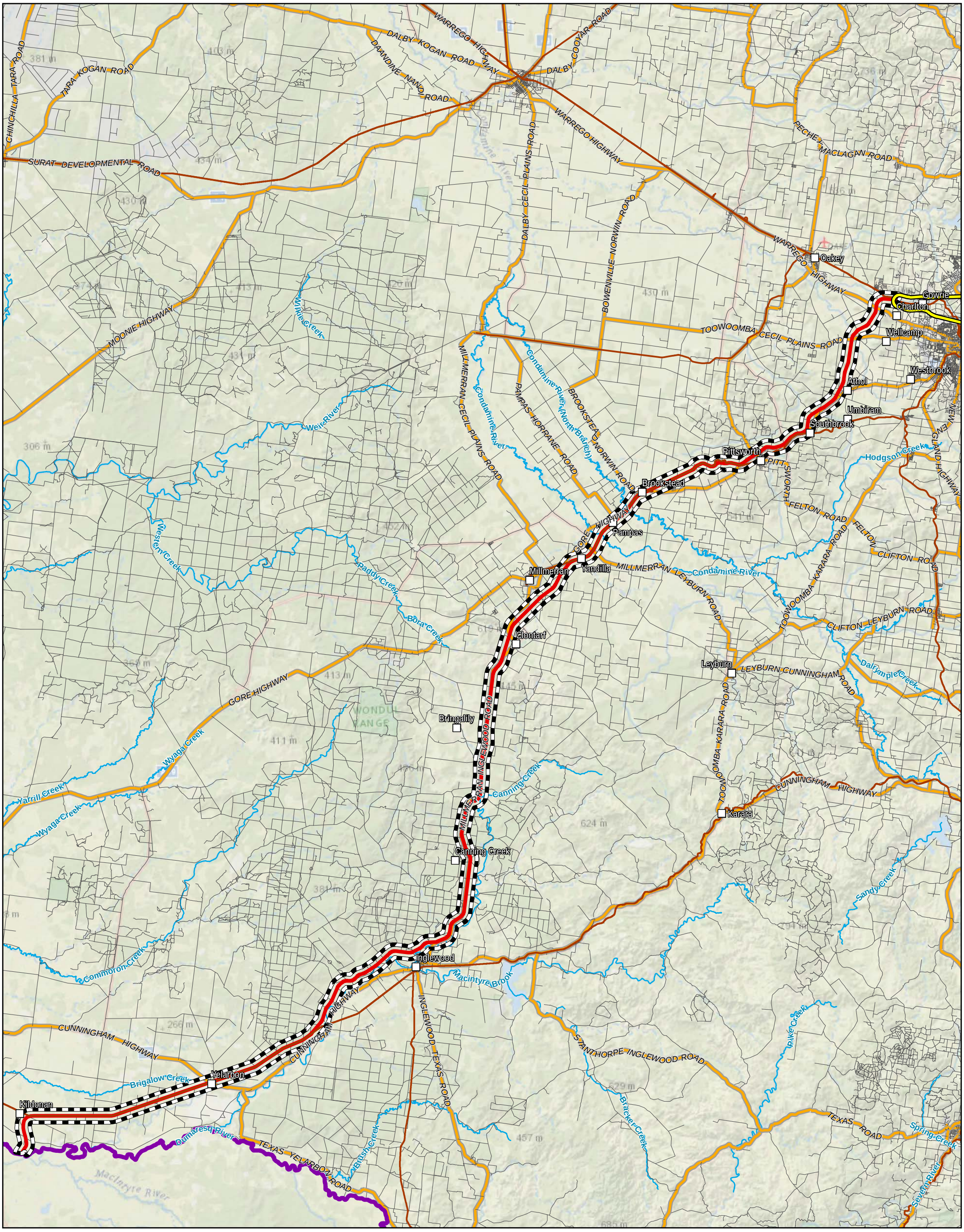
3.2. Land Use

The Study Area is primarily characterised by rural and rural-residential land uses on a variety of property sizes. The diversity in rural land use is reflected through the various rural allotment sizes.

The Conceptual Alignment passes through, or within proximity to, a number of townships such as Yelarbon, Inglewood, Millmerran, Brookstead, Pittsworth, Southbrook, Athol and Gowrie.

- The Conceptual Alignment extends across approximately 46 km of floodplain[1] (Macintyre River, Macintyre Brook, Condamine River (south, main and north branches), Westbrook Creek and Gowrie Creek).

[1] Based on the Queensland Reconstruction Authority (QRA) Indicative Flood Assessment Overlays.



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Legend

- Towns
- Existing Rail Network
- Conceptual Alignment
- Major Roads
- Minor Roads
- Study Area
- Adjacent Inland Rail Project
- State Boundary

OVERVIEW

Data sources:
Road and Rail Network - DNRM 2017
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Border to Gowrie Project

Project Context

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Figure **3.1** (1 of 3)

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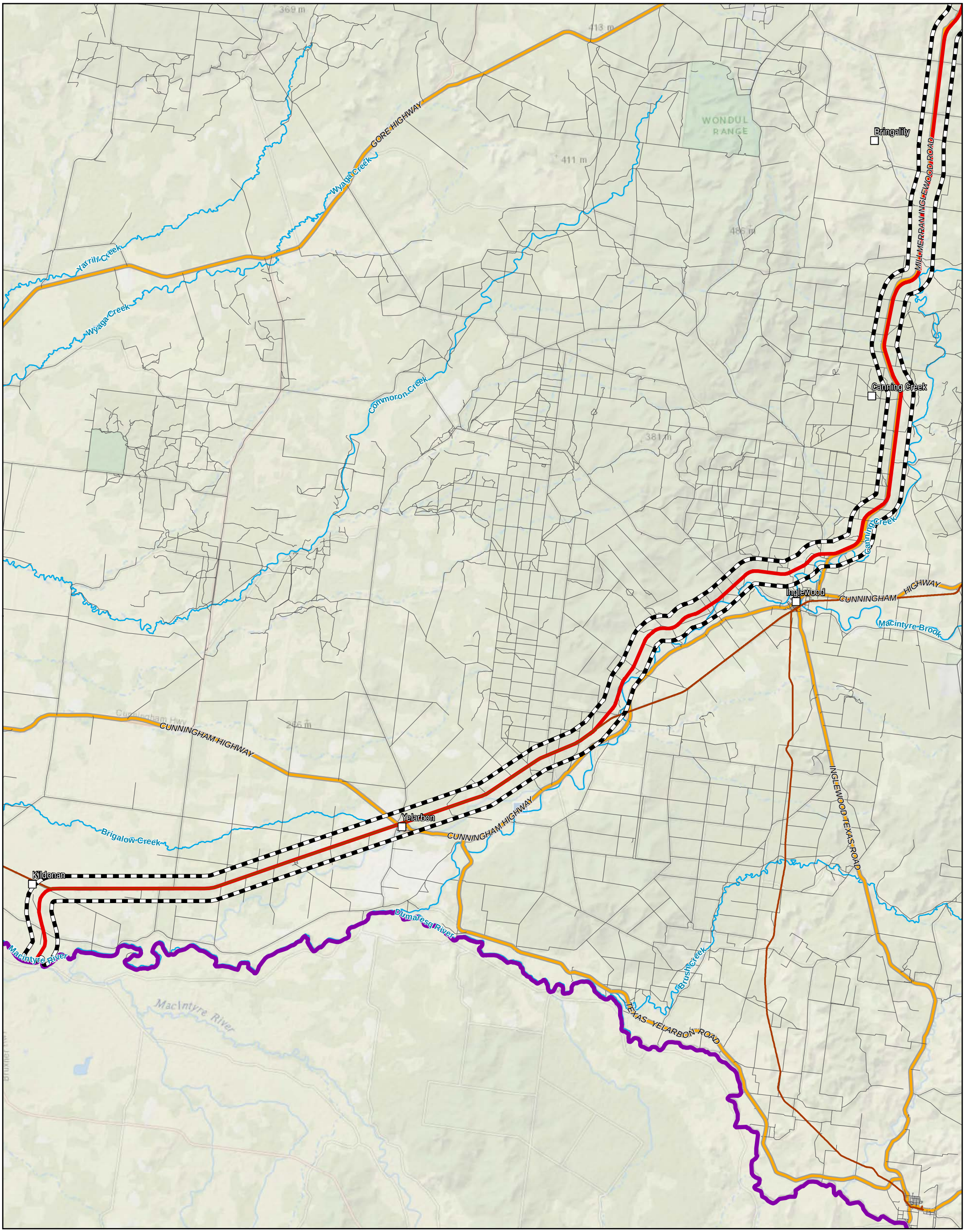

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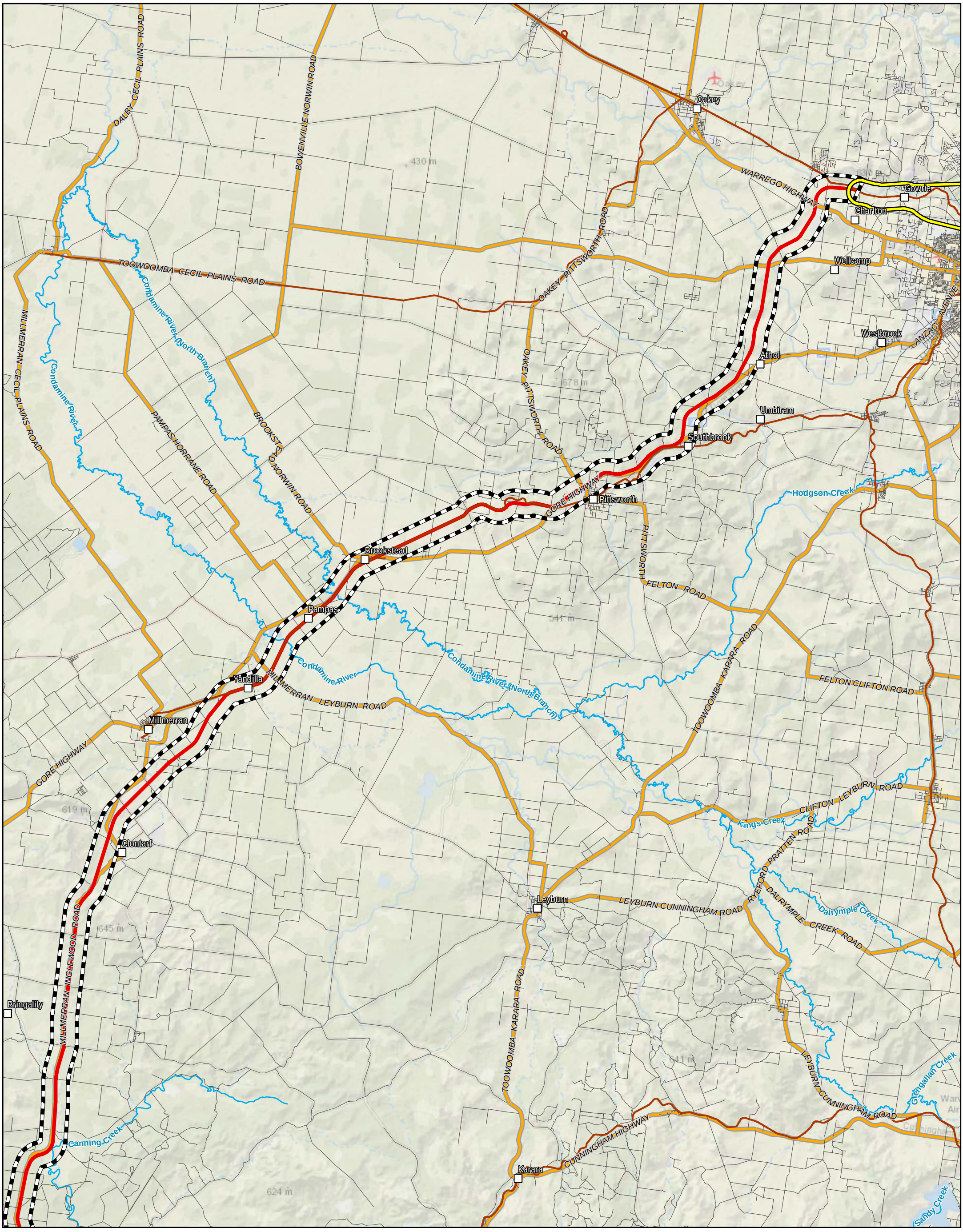

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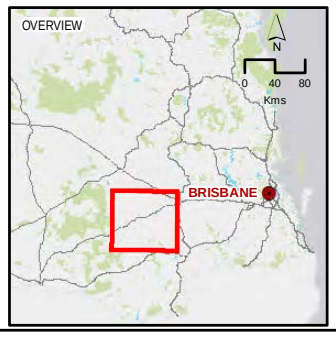
Legend

- Towns
- Existing Rail Network
- Conceptual Alignment
- Major Roads
- Minor Roads
- Study Area
- Adjacent Inland Rail Project
- State Boundary



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3.3. Project Need, Justification and Alternatives Considered

3.3.1. The Melbourne to Brisbane Inland Rail Programme Business Case

The Inland Rail programme has been under development for over ten 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 (IRAS) released in 2010 (ARTC, 2010). A concept business case was prepared in 2014, followed by the preparation of the Programme Business Case in 2015 (ARTC, 2015). The Inland Rail programme is recognised in the National Land Freight Strategy (Standing Council on Transport and Infrastructure 2012) and endorsed by Infrastructure Australia.

The Business Case examines the complex issue of freight movement and forecast freight demand along the east coast of mainland Australia.

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 that 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 per annum (ARTC, 2015). 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 (ARTC, 2015). With the population estimated to grow by 60 per cent over the next 40 years increasing pressure would be placed on freight infrastructure and services.

The Business Case identifies that:

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

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 freight customers want, at a price they are willing to pay;
- Provides significant social and environmental benefits compared with road transport;
- Would cover its ongoing operating and maintenance costs, once operational; and
- Is good for the country's economy – increasing Australia's GDP by an estimated net $16 billion by 2050 meets Australia's strategic, long-term needs'.

The Australian Government through ARTC, is delivering Inland Rail in partnership with the private sector and has to date committed a total of $9.3bn to progress the design, approvals, construction and property acquisition for all 13 Inland Rail projects. The Border to Gowrie Project forms an essential component of the Inland Rail programme.

3.3.2. Queensland Planning Context

ARTC is seeking that the Border to Gowrie Project be declared a 'coordinated project for which an EIS is required' under section 26(1)(a) of the SDPWO Act.

In deciding whether to declare a project to be a coordinated project, the Coordinator General must have regard to:

- 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; and/or
- Any other matter the Coordinator-General considers relevant.

3.3.2.1. Relevant Planning Schemes and Policy Frameworks

The *Planning Act 2016* is the overarching framework for Queensland's planning and development system. It is supported by the Planning Regulation 2017, the State Planning Policy, regional plans and local planning schemes and other statutory instruments.

The Border to Gowrie Project traverses two local government areas (LGAs) being:

1. Goondiwindi Regional Council (GRC)
2. Toowoomba Regional Council (TRC)

The Border to Gowrie traverses areas that are within the following local government planning schemes:

- For Goondiwindi Regional Council:
    - Former Waggamba Shire Council Planning Scheme 2006
    - Former Inglewood Shire Council Planning Scheme 2006
- Toowoomba Planning Scheme 2012

Inland Rail is identified as a priority project in the State Infrastructure Plan Part B: Program – 2017 update (The State of Queensland, 2017). It is also specified as major enabling infrastructure in the South East Queensland Regional Plan 2017 (The State of Queensland, 2017), and is consistent with the intent of the Darling Downs Regional Plan (The State of Queensland, 2013) to create opportunities for a modal shift towards rail and provide new economic development in

the region. Additionally, the Queensland Government's Moving Freight strategy (DTMR 2013) recognises the need for Inland Rail and the potential benefits to the state of Queensland.

The Border to Gowrie Project will support efficient freight movement throughout the region and provide opportunities for increased transportation of agricultural commodities and other goods to service the mining and gas sectors within the region. Importantly, the Inland Rail Progamme will provide opportunities for the development of intermodal facilities in the Toowoomba Enterprise Hub which may enable integrated multi-modal logistics (rail, road and aviation) opportunities to be realised.

3.3.3. Alternatives Considered – Programme wide

Various alternate scenarios to the overall Inland Rail have been considered and are discussed in the Business Case 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
- 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 of the Inland Rail.

3.3.4. Alternatives Considered – Border to Gowrie Project

Several alternate route options have been investigated between the QLD and NSW border and Gowrie. The Conceptual Alignment is the result of several iterations of option assessment, and consultation with the Queensland Government, key stakeholders and community groups. This includes the following:

- The 2006 North South Rail Corridor Study, commissioned by the Commonwealth Department of Transport and Regional Services. 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 IRAS undertaken by ARTC. This study set the blueprint for the development of an inland railway to meet the future freight demands of eastern Australia. The results of the analysis indicated that the route via Toowoomba had stronger transit time and economic merit than routes via Werris Creek and was recommended in the 2010 IRAS study.
- 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.
- 2015 Queensland Department of Transport and Main Roads review of route options between NSW/QLD Border and Toowoomba. The Queensland Department of Transport and Main Roads (DTMR) commissioned SMEC to

undertake a high level examination of feasible alternative route options not previously considered in the ARTC Melbourne to Brisbane Inland Rail freight route in 2010.

- 2016-2017 Yelarbon to Gowrie alignment review and Yelarbon to Gowrie Project Reference Group. This was undertaken between December 2016 and April 2017 and considered four available routes on a like-for-like basis to determine which route option to adopt for future project phases. This alignment review process was extensive and included the following:
  - Multi-Criteria Analysis of the four routes;
  - Comparative construction cost estimates; and
  - Community consultation and validation of the transparency of the assessment process

On 21 September 2017, the then Federal Minister for Infrastructure and Transport (the Hon Darren Chester MP) announced the preferred route of the Australian Government, which is the subject of this IAS.

3.4. Components, developments, activities and infrastructure that constitute the coordinated project

Key components of the Border to Gowrie Project include:

- Establishment of approximately 146 km of new rail corridor and track (greenfield) and upgrade of approximately 78 km of existing rail (brownfield).
- The rail line is to be single track dual gauge with crossing loops for 1,800m long train sets, with the ability to extend in the future to accommodate trains up to 3,600 m long based on business and market needs
- Connections to existing sidings has not been confirmed, but are not precluded
- Crossing of the Condamine River floodplain and associated engineering solutions (culverts, bridges and other elevated structures to maintain hydraulic conditions)
- Crossing of other watercourses and floodplains utilising a combination of bridges and/or culverts
- Tie-ins to the existing South West Railway Line and the West Moreton Railway Line at the project boundary and other potential intermediate locations to be confirmed by operational modelling
- The construction of associated rail infrastructure including on track and trackside monitoring, maintenance sidings and signalling infrastructure to support the Advanced Train Management Systems (ATMS)
- Ancillary works including road and public utility crossings and realignments (including stock crossings where required).
- Construction of temporary site offices and temporary workforce accommodation if required
- Third party infrastructure requirements to be determined during future project stages (refer **Section 3.5**)
- Identification, establishment and use of borrow pits and quarries for construction materials if required
- Construction workspace, laydown areas and access roads.

Construction activities for the project will likely include temporary roads, upgrades and/or alterations to existing roads. The construction of the Border to Gowrie Project may also require relocation of some services, depending on their proximity to the construction zone. These aspects will be further examined in future design stages.

The Border to Gowrie Project description will be further refined in future design development and environmental assessment during the EIS process.

3.5. Third Party Infrastructure Requirements

Third party infrastructure requirements will be determined during future design development. Power and water supply will be required during the construction of the Border to Gowrie Project.

Electricity supply will also be needed for points, signalling and other infrastructure. It is anticipated that the supply of these services would be delivered by relevant providers under the terms of their respective approvals and/or assessment exemptions.

Key elements not included as part of the Border to Gowrie Project include the following:

- Third party rail operator infrastructure requirements
- Complementary infrastructure, such as metropolitan and regional freight terminals
- Upgraded fleet/rolling stock
- Administration, train provisioning, fuelling and maintenance depots
- Train crew change and other intermediate depots/facilities
- Complementary land use and freight precinct developments.

3.6. Timeframes for the Border to Gowrie Project

The indicative program is provided as follows:

- 2017-2019: design, planning and approvals
- 2019-end of 2020: pre-construction and land acquisition
- 2021-2024: Construction
- 2025 Project Opening.

3.7. Construction and Operational Processes

At present, only preliminary information is available about the way in which the Border to Gowrie Project will be designed and delivered, with future stages of design and assessment to provide further clarification of these aspects.

Pre-construction activities are anticipated to include geotechnical investigations, survey, ecological investigations and cultural heritage surveys. This may include establishment of access tracks where required.

Construction will involve the following:

- Site preparation, earthworks and vegetation clearing for construction accesses, depots and laydown areas
- Early works, including ground disturbance and relocation of impacted utilities, roads and fencing at key locations for safety and construction access
- Sourcing all construction and construction related materials, including won material, manufactured materials and construction water
- Earthworks, including construction of embankments and fill
- Construction of bridges and viaducts at watercourses, which may require temporary or permanent stream diversion
- Relocation or protection of services and public utilities

- Construction of drainage and stormwater treatment infrastructure
- Construction of track and signalling
- Construction and implementation of environmental management measures (e.g. fauna crossings, noise treatments, sedimentation control)
- Landscaping and rehabilitation treatments to areas disturbed during construction.

As described in **Section 3.5**, power supplies will be required during the operational phase. It is anticipated that the supply of these services will be delivered by relevant providers under the terms of their respective approvals and/or assessment exemptions.

During the operational phase, maintenance activities will be carried out as required by ARTC or contractors on behalf of ARTC. The dual gauge track will maintain the narrow gauge connectivity to the Brisbane and regional QLD lines along the Inland Rail corridor once the Border to Gowrie Project is operational.

3.8. Workforce requirements during Construction and Operation

The Border to Gowrie Project is part of the larger Inland Rail programme. The Business Case identifies an anticipated additional 16,000 direct and indirect jobs will be created programme-wide at the peak of construction (estimated in 2019 to 2020). An average of 700 additional jobs per annum is anticipated over 50 years of operation (2024 to 2074). It is estimated that approximately 60 per cent of the capital expenditure (CAPEX) for Inland Rail will be expended on projects in Queensland, including the Border to Gowrie Project. Therefore an equivalent proportion of jobs are anticipated to be based in QLD. Based on the capital cost associated with the Border to Gowrie Project (refer to **Section 3.9.1**), a peak workforce for the Border to Gowrie Project may be around 1600.

The expansion in the construction sector would support additional flow on demand through the construction industry supply chain and additional spending on consumer orientated products by the construction workforce in the local area. It is proposed that considerable indirect employment opportunities will also arise as a result of the construction and operation of the Border to Gowrie Project. The associated supply of construction materials, the development of associated external infrastructure and complementary services as described in **Section 3.5** will require additional workforce beyond those directly associated with the construction of Inland Rail, stimulating jobs and growth in the region.

3.9. Economic Indicators

3.9.1. Capital Cost

Inland Rail will be a strategic catalyst for economic development. A conventional economic appraisal was undertaken for the Business Case in line with relevant government guidelines focusing on the direct economic benefits from increased transport efficiency and the standard indirect benefits which flow from moving freight from roads onto rail (such as reduced accident and environmental costs).

Major infrastructure projects like the Inland Rail programme inevitably involve significant construction costs. Delivering Inland Rail is expected to cost approximately $10.9 billion. The Border to Gowrie Project is expected to cost approximately $1.4 billion due to its significant overall length and the significant drainage elements and earthworks associated with the Border Rivers and Condamine River floodplains.

3.9.2. Economic Analysis

An important aspect to assist governments in deciding whether or not to invest in such projects are the benefits to the community as a whole from the investment, and whether the net benefits of the project over the life of the

infrastructure are likely to exceed its net cost. The economic analysis contained within the Inland Rail Business Case compares a scenario where there is an inland railway, to one where road and rail freight would use the existing roads and coastal railway, over a 50-year period (2025 to 2075).

Comparing these two scenarios, the economic analysis indicates that the Inland Rail programme could deliver almost $22.5 billion worth of direct and indirect benefits to the nation, based on 2015 dollars, of which approximately $6.4 billion direct operating cost savings would be accrued by freight users and assumed to flow on directly to consumers. The resulting net economic benefit of the Inland Rail programme is expected to be approximately $16 billion—a benefit-cost ratio (BCR) of 2.62 based on a discount rate of 4 per cent. That is, the benefits of the Inland Rail programme are approximately 2.6 times the cost (when measured at the 4 per cent discount rate).

3.9.3. Local and Regional Benefits

Regional communities along and adjacent to the Inland Rail programme would benefit through more efficient and effective rail access to metropolitan and international markets. While the purpose of Inland Rail is primarily for interstate intermodal freight such as moving shipping containers, whitegoods, steel and other bulk commodities, Inland Rail would also support minerals, regional freight and agriculture. The Inland Rail programme will enable farmers to move agricultural commodities more efficiently to capital cities and ports for export.

3.9.4. Wider Economic Benefits

An assessment of the wider economic benefits (WEBs) of Inland Rail is provided in the Addendum to the ARTC Business Case (PwC, 2016). Since the release of the 2015 Programme Business Case (ARTC, 2015), stakeholder feedback has supported the role of Inland Rail in transforming the economic geography of inter-capital freight and creating additional benefits across the broader economy. This addendum therefore seeks to provide an assessment of these broader benefits in two parts:

- A more expansive calculation of induced freight benefits that considers the benefits that may arise across the supply chain (e.g. to rail operators and retailers in the relevant markets) from the additional freight demand induced by lower supply chain costs of Inland Rail; and
- WEBs that arise because businesses benefit from agglomeration economies (improved accessibility to customers, suppliers and labour markets).

It is considered that improved accessibility to customers, suppliers and labour markets (i.e. effective density or agglomeration) from the operating cost savings delivered by Inland Rail, would result in agglomeration economies. The Inland Rail operating cost savings have been estimated to effectively increase the catchment of customers, suppliers and products that may be accessed in the absence of Inland Rail resulting in an increase in productivity.

The economic appraisal results for each business case scenario including the three alternative calculations of producer surplus are presented in **Table 3-1**. These results are not cumulative.

Table 3-1 Economic appraisal results with expanded benefits*

INLAND RAIL PROGRAMME BUSINESS CASE RESULTS ($ M)	7% DISCOUNT RATE	4% DISCOUNT RATE
Programme Business Case results (August 2015)	1.02	2.62
Programme Business Case results with Wider Economic Benefits	1.06	2.74

INLAND RAIL PROGRAMME BUSINESS CASE RESULTS ($ M)	7% DISCOUNT RATE	4% DISCOUNT RATE
Producer surplus of rail operators	1.08	2.81
Producer surplus of rail operators and from sale of final good	1.17	3.07
Producer surplus of businesses along all supply chain	1.52	4.15

Source: **Addendum to the ARTC 2015 Inland Rail Programme Business Case** (ARTC, 2015)**.**

Notes: Analysed over 50 year appraisal period to 2073-2074 and discounted applying real discount rates; based on P50 cost certainty; excludes Port of Brisbane Extension; assumes complementary investment on the Queensland Rail network (West Moreton Railway Line and Brisbane metropolitan network). Source: (PwC, 2016).

3.9.5. Synergies with Business and Industry

The construction and operation of Inland Rail would present opportunities for local and regional freight hub development. In particular, the Border to Gowrie section is expected to provide benefits to existing and future users of the South-West Railway Line and West Moreton Railway Line by providing improved efficiencies and new opportunities along the Border to Gowrie Project. The Border to Gowrie Project will create new efficiencies with business and industry in the Darling Downs region, linking with the Toowoomba Enterprise Hub and other potential intermodal facilities (e.g. Inglewood).

3.10. Financing Requirements and Implications

The Australian Government has committed $9.3 billion for ARTC to develop and build Inland Rail. Additional funds will come from a partnership with the private sector.

4. LOCATION OF KEY PROJECT ELEMENTS

4.1. Location

The Conceptual Alignment for the Border to Gowrie Project commences at the median line of the Macintyre River south of Kildonan, this point being the state border between QLD and NSW. The Conceptual Alignment continues north to tie into the existing South Western Line between Kildonan and Kurumbul stations, running along this line in a north east direction past Yelarbon. The Conceptual Alignment deviates in a northern direction from the South West Line before Whetstone Station, bypassing Inglewood on the northern side of Macintyre Brook before aligning with Millmerran-Inglewood Road. The Conceptual Alignment then generally follows Millmerran-Inglewood Road in a northern direction, bypassing Millmerran on the eastern side of the township and tying into the existing (but disused) Millmerran Branch line.

The Conceptual Alignment generally follows the Millmerran Branch line through the townships of Pampas and Brookstead, deviating from the existing line to bypass Pittsworth in parallel to the Gore Highway. The Conceptual Alignment departs from the Gore Highway at Linthorp Valley Road, to the west of Southbrook, and heads in a north-north-east direction towards Wellcamp, passing to the east of Athol.

The Conceptual Alignment passes to the west of Brisbane West Wellcamp Airport, crossing over Toowoomba-Cecil Plains Road and the Warrego Highway, turning east to parallel the existing West Moreton Line, before tying into this same line at Draper Road, Charlton. This is the termination point of the Border to Gowrie Project, east of which is the Gowrie to Helidon Project.

The location of the Study Area and Conceptual Alignment are shown in (**Figure 3-1**). The Conceptual Alignment comprises of brownfield and greenfield segments of track, as described in Table 4-1. The brownfield corridor, in parts, does not comply with the project design criteria and as such the Conceptual Alignment will follow the brownfield track where practical, however the construction can be considered as greenfield in nature.

Table 4-1 Overview of Conceptual Alignment segments

START (KM)	END (KM)	FROM - TO	GREENFIELD (KM)	BROWNFIELD (KM)
0	44	QLD/NSW Border to Yelarbon	7	37
44	90	Yelarbon to Inglewood North	32	14
90	150	Inglewood North to Millmerran	60	
150	166	Millmerran to Brookstead		16
166	185	Brookstead to Pittsworth	11	8
185	224	Pittsworth to Gowrie	36	3

4.2. Tenure

The Conceptual Alignment intersects approximately 286 lots, the majority of which are held in freehold title (Appendix A). Other tenure arrangements traversed by the Conceptual Alignment include Lands Lease (e.g. railway land), Reserve and State Forest. While the Australian and Queensland Governments have yet to determine the land acquiring authority for the Border to Gowrie Project, ARTC assumes for the purposes of this IAS that land required for the Border

to Gowrie Project would be acquired in accordance with the provisions of the *Transport Infrastructure Act* 1994 and the *Acquisition of Land Act 1967*.

5. DESCRIPTION OF THE EXISTING ENVIRONMENT

5.1. Natural environment

5.1.1. Land

Topography

From the QLD and NSW border, the Conceptual Alignment generally follows a gradual incline from an approximate elevation of 230 m (Australian Height Datum, AHD) at the border, extending across the flood plains of the Macintyre River and Macintyre Brook, to approximately 470 m AHD at Millwood, south of Millmerran. Topography along the Conceptual Alignment between Millmerran and Yarranlea is generally flat, representative of the Condamine River floodplain.

North of Yarranlea, the Conceptual Alignment passes around the foothills of multiple topographical features encountering frequent variance in elevation. In doing so, the Conceptual Alignment rises from approximately 430 m AHD at Yarranlea to a maximum elevation of approximately 500 m AHD on the western outskirts of Southbrook, returning to 430 m AHD at the crossing of Westbrook Creek. North of Westbrook Creek, the Conceptual Alignment threads between Gowrie Mountain and the adjacent outcrop before tying into the West Moreton Railway Line at an approximate elevation of 460 m AHD.

Topographical contours within the Study Area are shown on **Figure 5-1.**

Geology

Previous geotechnical assessments have highlighted geotechnical conditions for the Study Area (Coffey, 2015) (WSP Parsons Brinckerhoff, 2016). **Table 5-1** describes the geology that is anticipated to be encountered and their potential reuse application. Geological units that occur within the Study Area are shown on **Figure 5-1**.

Table 5-1 GSQ dataset rock type summary (DNRM 2008)

ROCK UNIT NAME	ID	DESCRIPTION	POTENTIAL USE
Quaternary alluvium and lacustrine deposits	Qa	Clay, silt, sand, gravel; flood plain alluvium	Aggregate
Late Cainozoic floodout and residual sand, soil and gravel	Czs	Sand, soil and gravel	Aggregate
Evergreen Formation, Hutton Sandstone, Marburg Formation (in part), Precipice Sandstone	Jlb	Siltstone, mudstone, sandstone, oolitic ironstone, coal	Bulk and select fill material
Texas beds	Ctx	Greywacke, mudstone, slate, local phyllite; subordinate jasper, chert, conglomerate, limestone	Bulk and select fill material
New England Batholith, Unnamed Intrusions	R5	Biotite granite and granodiorite	Capping

ROCK UNIT NAME	ID	DESCRIPTION	POTENTIAL USE
Injune Creek Group, Mulgildie Coal Measures, Walloon Subgroup (Moreton Basin)	Ji	Sandstone, siltstone, mudstone, coal, conglomerate	Fill material
Tertiary volcanics, mainly basalt*	Tv	Basalt flows overlying older sedimentary formations. Relatively permeable, and weather to produce vertosols, creating trafficability and foundation issues.	Select fill and capping
Bungil Formation, Gubberamunda Sandstone, Hooray Sandstone, Kumbarilla beds, Longsight Sandstone, Mooga Sandstone, Orallo Formation, Southlands Formation	JKb	Glauconitic, labile to quartzose, siltstone, mudstone; sandstone, minor conglomerate, siltstone; coal	Bulk fill and some select fill material

*The Toowoowba region and district to the immediate west and south west is dominated by mid-Tertiary (27–18 Ma Lafferty and Golding (1985) and Webb et al. (1967)) basalts, associated volcanics and palaeosols (Toowoomba Volcanics—a member of the Main Range Volcanics). The MRV is the most extensive surface unit. Late Tertiary and Quaternary denudation has resulted in more recent soils and colluvial and alluvial deposits.

The geology is reported as being dominated by extensive alluvial and slope wash sediments on the western slopes of the Great Dividing Range (AECOM, 2016). Within the Study Area, bedrock outcrops and steep topography are almost exclusively restricted to occurring within two bedrock units, i.e. the Tertiary Main Range Volcanics and the Texas Beds.

Areas of hard rock are expected to be encountered from Pittsworth to Gowrie.

Soils

A profile of the soils that are located within the Study Area has been established with reference to the Australian Soil Resource Information System (ASRIS 2014), supported by in-field observations from publicly accessible locations. A descriptive summary of all soil types encountered is provided in **Table 5-2**.

Table 5-2 ASRIS dataset soil type summary (ASRIS 2014)

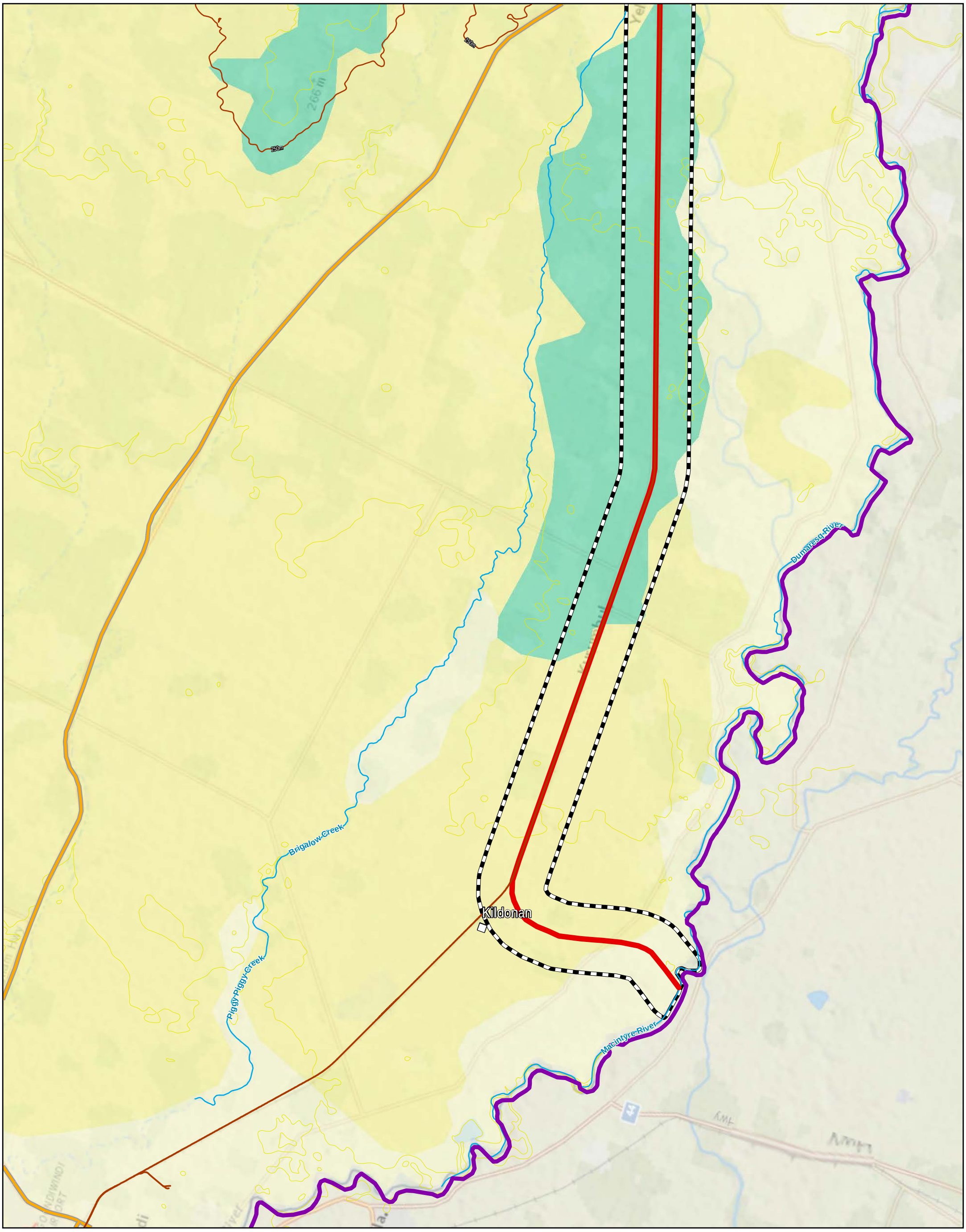
SOIL TYPE	ID	GENERAL DESCRIPTION
Chromosol	CH	Soils with an abrupt increase in clay
Dermosol	DE	Structured soils
Kandosol	KA	Structureless soils
Kurosol	KU	Acidic soils with an abrupt increase in clay
Sodosol	SO	Soils high in sodium and an abrupt increase in clay
Vertosol	VE	Shrink and swell clay soils

Soil development is characterised as dominantly vertosol soils (black cracking and reactive clay soils) however the actual depth of soils may be variable and a function of the underlying parent geology. Where topographic relief is maintained through the presence of more resistant, less eroded and less weathered lava flows, it is reasonable to assume reduced soil thickness and a more rapid transition to weathered rock.

The Condamine River alluvial system is dominantly mapped as vertosol soils as a combined result of alluvial processes and insitu and transported parent geology. Soil thickness is greatly increased through the deposition of alluvial materials and subsequent soil development.

Both mechanisms are supported by geomorphological and agricultural practices. Generally speaking, thicker soils can be correlated with flatter, lower topographic relief and the development of broad acre agricultural cropping practices. Where remnant basalt flows remain, thinner soils can be correlated with a relative increase in topography, reduced cropping and increased livestock grazing. The agricultural values of the Study Area are discussed in Section 5.5.1.3.

Soil development and distribution will be subject to further investigation as part of the EIS.



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Coordinate System: GDA 1994 MGA Zone 56
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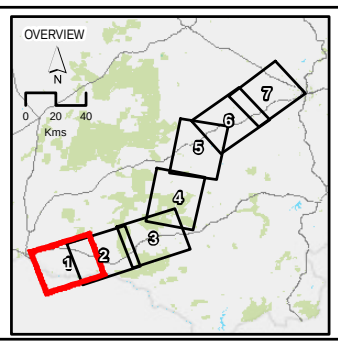
Legend

- Towns
- Existing Rail Network
- Conceptual Alignment
- Major Roads
- Contours (50m interval)
- Contours (10m interval)
- Study Area
- State Boundary

Rock Unit (DNRM regional geology)

Surat Region - Regional surface geology 1974

- Kumbarilla beds (JKk)
- Q-NSB (Q)
- Qa-QLD (Qa)



Data sources:
Contours - DNRM 2017
Roads and Rail Network - DNRM 2017
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Initial Advice Statement
Border to Gowrie Project

Geology and Terrain

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Figure **5.1** (1 of 7)

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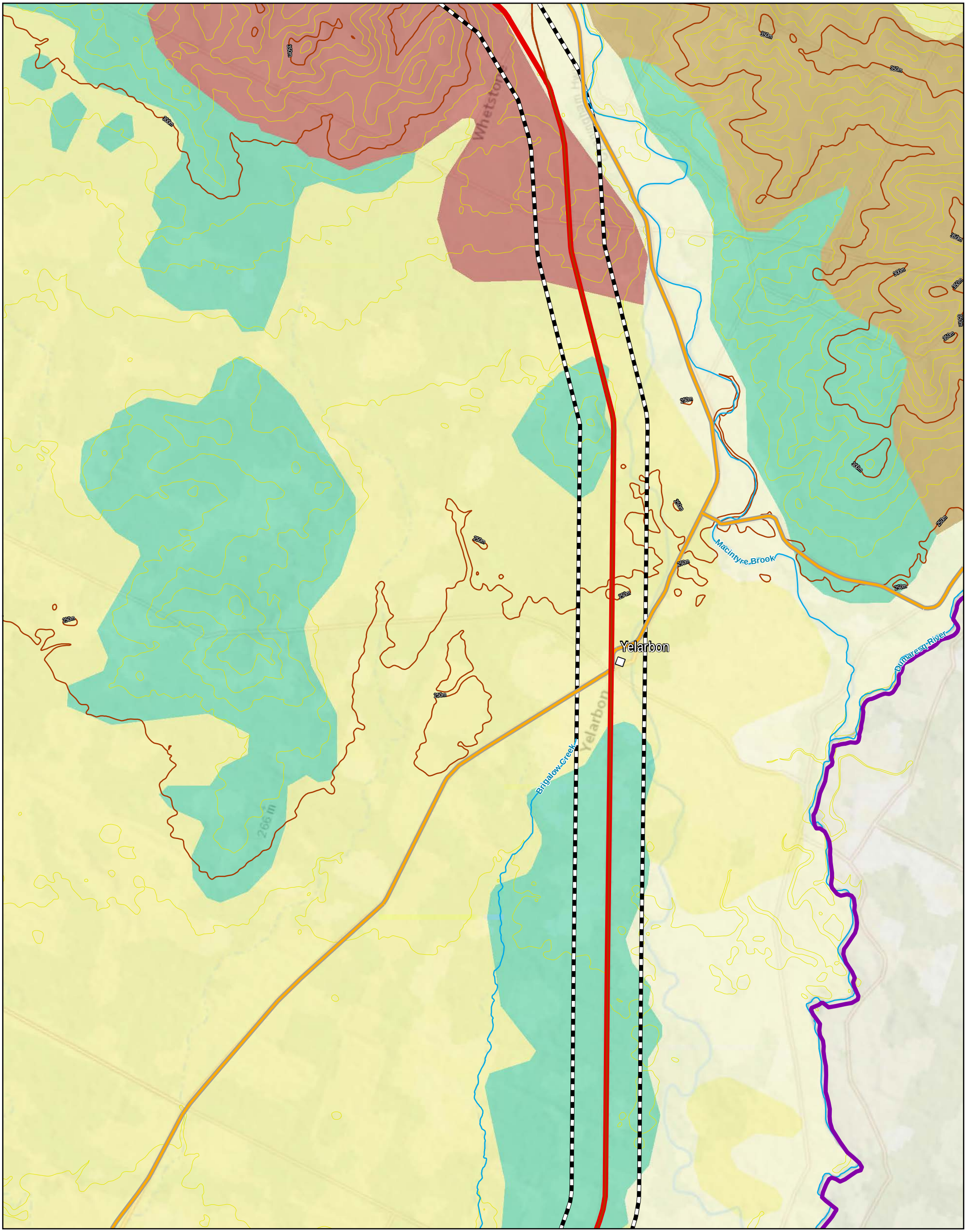

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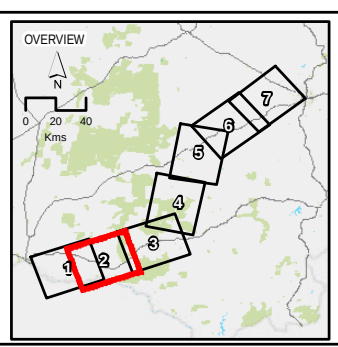
Surat Region - Regional surface geology 1974

- Kumbarilla beds (JKk)
- Pilliga Sandstone (Jp)
- Q-NSB (Q)
- Qa-QLD (Qa)
- Walloon Subgroup (Jw)



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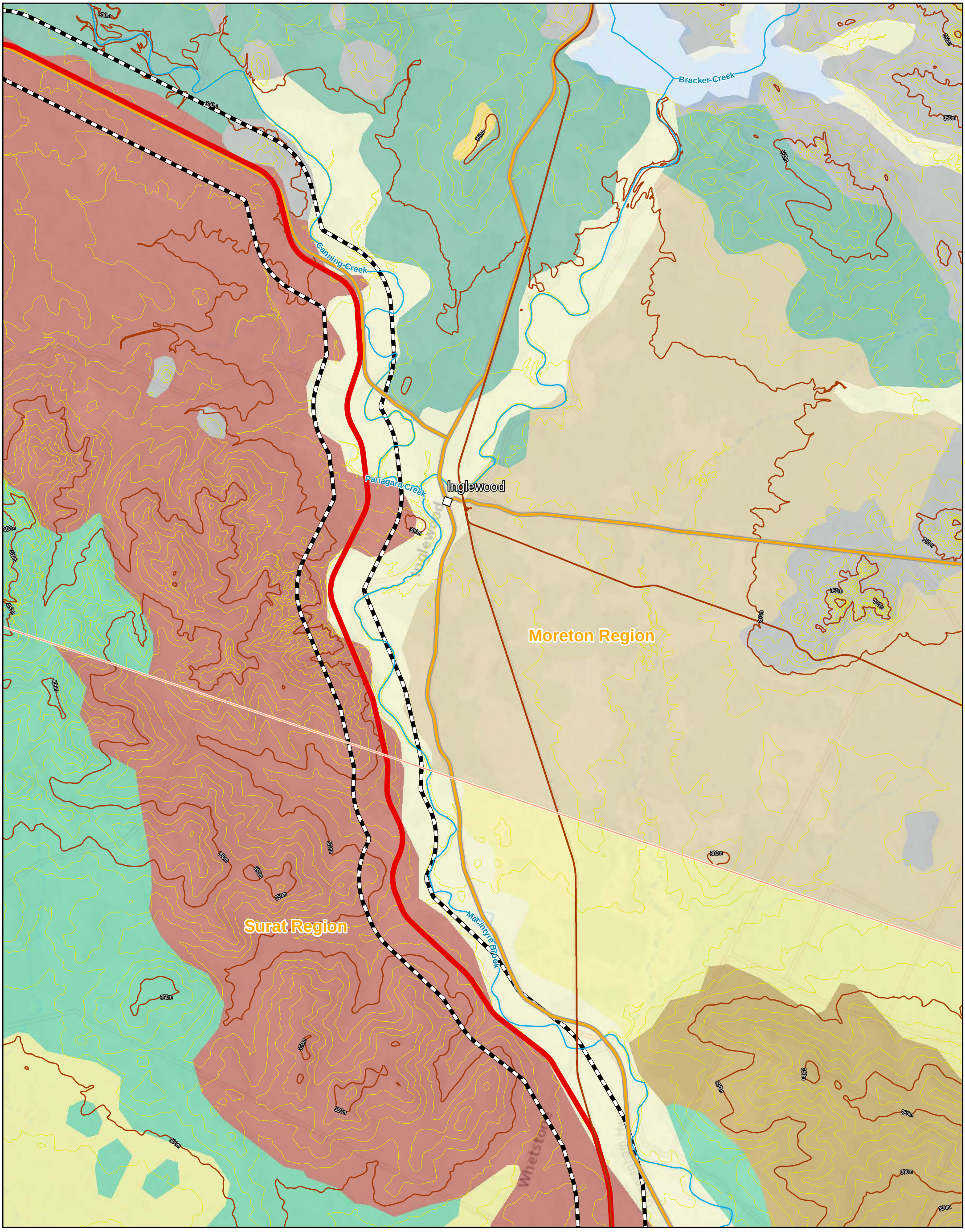

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Legend

- Towns
- Existing Rail Network
- Conceptual Alignment
- Major Roads
- Contours (50m interval)
- Contours (10m interval)
- Study Area
- State Boundary

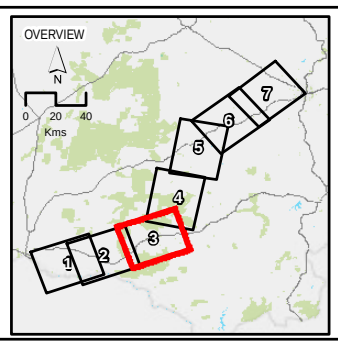
Rock Unit (DNRM regional geology)

Moreton Region - Regional surface geology 1978

- Kumbarilla beds (JKk)
- MG-TQs (TQs)
- Main Range Volcanics (Tm)
- Marburg Subgroup (Jbm)
- Qa-QLD (Qa)
- Texas beds (Ctx)
- Walloon Subgroup (Jw)
- Water body (unspecified) (W)

Surat Region - Regional surface geology 1974

- Kumbarilla beds (JKk)
- Pilliga Sandstone (Jp)
- Q-NSB (Q)
- Qa-QLD (Qa)
- Walloon Subgroup (Jw)



Data sources:
Contours - DNRM 2017
Roads and Rail Network - DNRM 2017
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Initial Advice Statement
Border to Gowrie Project

Geology and Terrain

PROJECT ID: 60492124
CREATED BY: JR
LAST MODIFIED: JR - 2/02/2018
VERSION: 3

Figure **5.1** (3 of 7)

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