

APPENDIX

T

INLAND
RAIL 

Non-Indigenous Heritage Technical Report

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

ARTC

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

Inland Rail Calvert to Kagaru EIS

Appendix T – Non-Indigenous
Heritage Technical Report

**Australian Rail Track
Corporation**

Reference: 3400

Document Number:
2-0001-340-EAP-10-RP-0220

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1 Introduction

Future Freight Joint Venture (FFJV) was commissioned by Australian Rail Track Corporation (ARTC) to undertake the non-Indigenous (historical) cultural heritage assessment for the Calvert to Kagaru Project (the Project), one of 13 projects that comprise the Inland Rail Program.

FFJV undertook this heritage assessment to inform design and preparation of the Environmental Impact Statement (EIS) for the Project. For the most part, the Project follows the Southern Freight Rail Corridor (SFRC), which was gazetted as a future railway corridor by the Queensland Government in 2010 and links the West Moreton line near Calvert to the interstate rail line near Kagaru, north of Beaudesert. The EIS investigation corridor for the Project was up to 2 km wide, but the cultural heritage study area is taken to be the 50 metres (m) either side of the disturbance footprint (refer Section 1.3 and Figure 1.1).

It should be noted that Indigenous (Aboriginal) cultural heritage is being identified and assessed through a separate process undertaken with the relevant Aboriginal Parties and is outside the scope of this report.

1.1 Project description

ARTC proposes to construct and operate the Project, which consists of approximately 53 kilometres (km) of single track dual gauge railway with four crossing loops to accommodate double stack freight trains up to 1,800 m long. It will also involve the construction of an approximately 1,015 m tunnel through the Teviot Range to facilitate the required gradient across the undulating topography. The corridor will be of sufficient width to accommodate future possible upgrades of the track, including a future possible requirement to accommodate trains up to 3,600 m in length. The Project will be constructed within a greenfield corridor and is one of the 'missing links' within the Inland Rail Program.

Although ARTC are applying for approval to build infrastructure to accommodate trains up to 1,800 m in length, infrastructure will be designed such that the future extension of some crossing loops to accommodate 3,600 m trains is not precluded. ARTC intend to acquire the land for the future 3,600 m crossing loop extension with the initial land acquisition, however, the approval for the construction of future 3,600 m crossing loops will be subject to separate approval applications in the future.

The design has responded to key environmental features and has been developed in line with engineering constraints for a feasible rail design. The rail design is based on minimising environmental impact, minimising disturbance to existing infrastructure and meeting engineering design criteria.

The key components to the Project include:

- Approximately 53 km of single track dual gauge rail line with four crossing loops to ultimately accommodate trains up to 3,600 m long, but initially constructed for 1,800 m long trains
- An approximately 1,015 m Teviot Range tunnel, and bridges to accommodate topography and Project crossings of waterways and other infrastructure
- Tie-in to the existing QR West Moreton System at the Project boundary near Calvert
- Allowance for a future connection to the Ebenezer Industrial Area at Willowbank
- The construction of associated rail infrastructure including maintenance sidings and signalling infrastructure to support the Advanced Train Management System (ATMS)
- Rail crossings including level crossings, grade separations/road overbridges, occupational/private crossings, fauna crossing structures
- Tie-ins to the existing operational Sydney to Brisbane Interstate Line at Kagaru
- Significant embankments and cuttings will be required along the length of the alignment to suit the terrain

- Ancillary works including road and public utility crossings and realignments, signage and fencing and provision of services within the corridor (excluding those undertaken as enabling works)
- Construction worksites, laydown areas and access roads.

1.2 Scope of chapter

Section 11 of the Terms of Reference (ToR) for the Project requires that the: 'The construction and operation of the Project should aim to ensure that the nature and scale of the Project does not compromise the cultural heritage significance of a heritage place or heritage area'. The following information requirements are stipulated to ensure compliance with this aim.

For non-Indigenous historical heritage, Section 11.178 of the ToR identifies the requirement to:

undertake a study of, and describe, the known and potential historical cultural and landscape heritage values of the area potentially affected by the Project. Any such study should be conducted by an appropriately qualified cultural heritage practitioner. Provide strategies to mitigate and manage any negative impacts on non-Indigenous cultural heritage values and enhance any positive impacts.

In accordance with the requirements of the ToR and relevant legislation, this cultural heritage assessment seeks to:

- Identify known and potential historical cultural heritage values of the cultural heritage study area
- Assess the significance of these values
- Assess the Project's potential impacts on these values
- Recommend measures to manage or mitigate impacts on cultural heritage values.

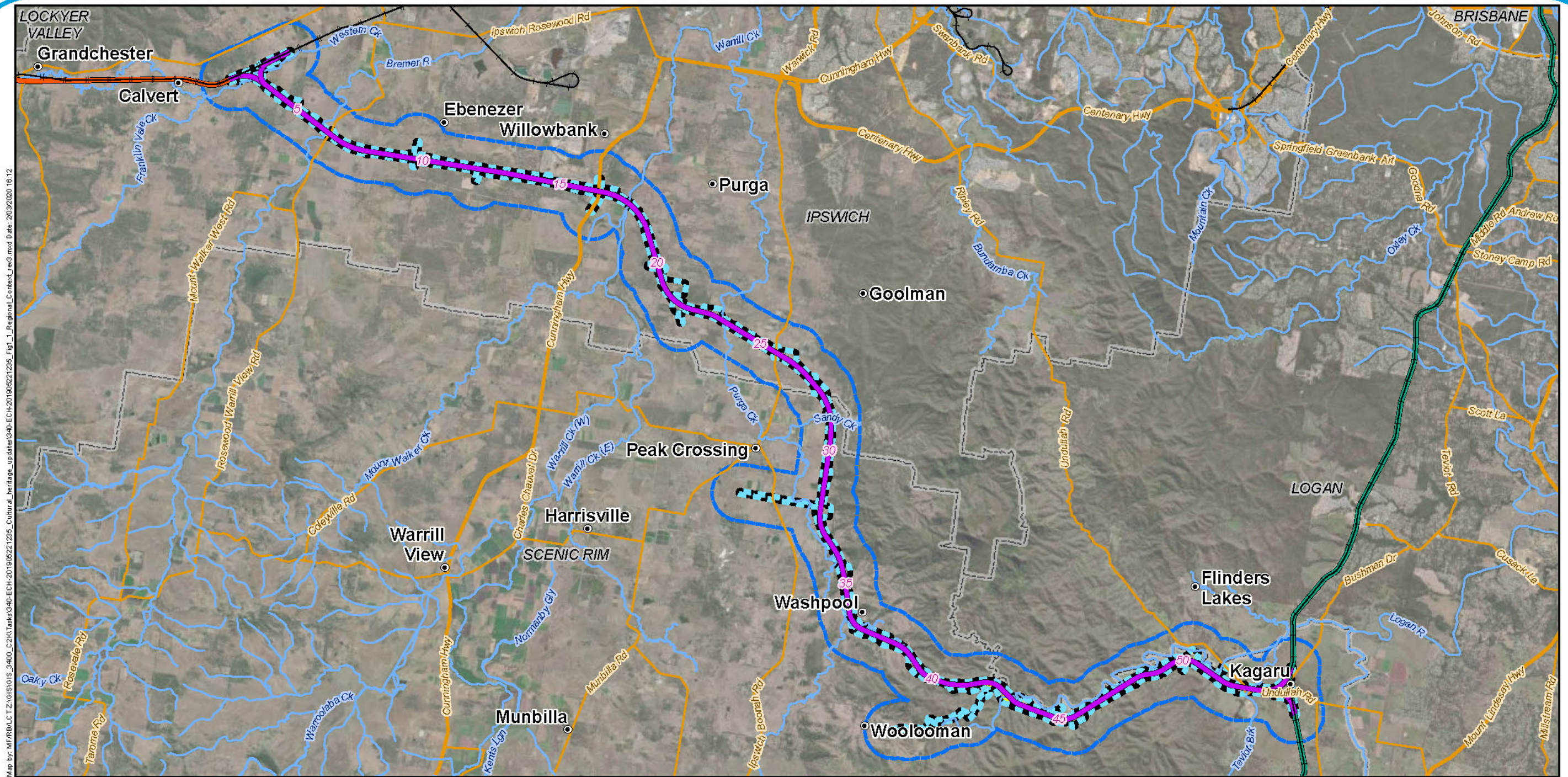
A summary of relevant legislation is provided in Section 2.

1.3 Cultural heritage study area

The following terms are adopted for this assessment:

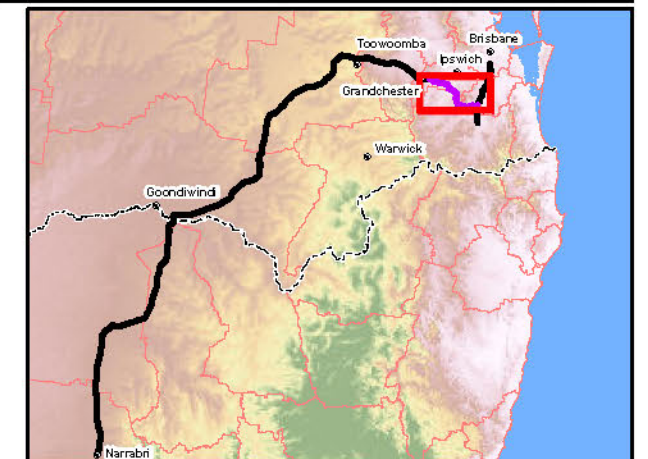
- Disturbance footprint – the disturbance footprint encompasses the rail corridor (minimum width of 40 m, with wider areas to accommodate earthworks and local topography), utility works, roadworks, and temporary access tracks, laydown areas, drainage structures, and erosion and sediment controls. The disturbance footprint captures the extent of ground-disturbing works for the Project.
- Cultural heritage study area – the area of impact assessment. Encompasses the disturbance footprint plus a 50 m buffer to capture indirect impacts on cultural heritage from factors such as increased dust, vibration, or flooding (refer Figure 1.1).

In order to contextualise the heritage assessment process, register searches and analysis of historical mapping has been undertaken over a wider area, comprising the disturbance footprint plus 1 km on either side. This boundary follows that of the original EIS investigation corridor.

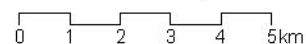


Legend

- 5 Chainage (km)
- Localities
- Existing rail
- H2C project alignment
- C2K project alignment
- K2ARB project alignment
- Watercourses
- Major roads
- Minor roads
- Cultural heritage study area
- 1km buffer
- Local Government Areas



A3 scale: 1:150,000



2 Legislation, policy and guidelines

2.1 Commonwealth legislation

2.1.1 Environment Protection and Biodiversity Act 1999

The primary objective of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) is to provide for the protection of the environment, particularly those aspects that are matters of national environmental significance. On 21 June 2017, the Commonwealth Minister for the Department of the Environment and Energy (DotEE) (now the Department of Agriculture, Water and the Environment (DAWE)) determined the Project is a 'controlled action' under the EPBC Act (reference number EPBC 2017/7944) due to potentially significant impacts on listed threatened species and communities.

The EPBC Act defines 'environment' as both natural and cultural environments and therefore includes Aboriginal and non-Aboriginal historical cultural heritage items. Under the EPBC Act, protected heritage items are listed on the World Heritage List, National Heritage List (items of significance to the nation) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate. The Register of the National Estate has been suspended and is no longer a statutory list; however, it remains as an archive.

Searches of the World Heritage List, National Heritage List, Commonwealth Heritage List and Register of the National Estate were undertaken in May 2019, with no listings identified for the cultural heritage study area.

2.2 State legislation

The *Queensland Heritage Act 1992* (Qld) (QH Act) provides the framework for assessing the significance of items and places of historical cultural heritage value in Queensland and is administered by the Department of Environment and Science (DES), with advice from the Queensland Heritage Council. It makes provision for the conservation of Queensland's cultural heritage by protecting all places and areas listed on the Queensland Heritage Register.

Broadly, a place is considered to be of State cultural heritage significance if:

its heritage values contribute to our understanding of the wider pattern and evolution of Queensland's history and heritage. This includes places that contribute significantly to our understanding of the regional pattern and development of Queensland (Department of Environment and Heritage Protection (DEHP) 2013).

Under Section 35 (1) of the QH Act, a place may be entered on the Queensland Heritage Register if it satisfies one or more of the following criteria:

- The place is important in demonstrating the evolution or pattern of Queensland's history
- The place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage
- The place has potential to yield information that will contribute to an understanding of Queensland's history
- The place is important in demonstrating the principal characteristics of a particular class of cultural places
- The place is important because of its aesthetic significance
- The place is important in demonstrating a high degree of creative or technical achievement at a particular period
- The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- The place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

Part 9, Division 1 of the QH Act also provides protection for places that have potential archaeological significance, as well as for underwater cultural heritage (shipwrecks). Section 89 requires a person to notify DES Chief Executive of an archaeological artefact that is an important source of information about an aspect of Queensland's history. This notice must be given as soon as practicable after the person discovers the item. Section 90 stipulates that it is an offence to interfere with an archaeological artefact once notice has been given of the artefact to the Chief Executive.

Searches of the Queensland Heritage Register were undertaken in May 2019, with no listings identified for the cultural heritage study area.

2.3 Local government planning schemes

Local heritage places are managed under Part 11 of the QH Act, local planning schemes and the *Planning Act 2016*. The QH Act provides a process for establishing a local heritage register and nominating places to be included on a local heritage register. As defined by the former DEHP (2013) (now DES), a place is considered to be of local (rather than State) significance if 'its heritage values do not contribute significantly to our understanding of the wider pattern and evolution of Queensland's history and heritage'. It is noted, however, that, as government supported transport infrastructure, the Project is exempt from local planning scheme provisions.

Different planning schemes refer to places of local heritage value in different ways (refer below). For the sake of consistency and clarity, however, this report will identify all locally listed places as Local Heritage Register places.

2.3.1 Ipswich Planning Scheme 2006

The western most sections of the cultural heritage study area are located within Ipswich City Council and are covered by the Ipswich Planning Scheme 2006. Places of local heritage value are listed in Schedule 2 - Character Places, and places of potential heritage value are listed in Schedule 3 – Identified Places of Interest. Places listed on both these schedules are protected under the Character Places Overlay Code (s11.3.1). The planning scheme does not provide assessments against significance for local heritage places, but these are available for most sites in the Ipswich Heritage Study (Buchanan Architects 1996; University of Queensland Archaeological Services Unit 1992), which forms the basis of the overlay (refer Section 5.2).

A search of Schedules 2 and 3 of the Planning Scheme in May 2019 indicates that there are four local heritage places in the cultural heritage study area. It should be noted, however, that two of these places are actually located within the Scenic Rim Local Government Area (LGA), and so are not eligible for protection under the Ipswich planning scheme, however are considered in this report for completeness.

2.3.2 Logan Planning Scheme 2015

The north eastern section of the cultural heritage study area is located within Logan City Council and is covered by the Logan Planning Scheme 2015. Local heritage places are identified and protected under Planning Scheme Policy 4. A search of the planning scheme in May 2019 indicates that there is one local heritage place in the cultural heritage study area.

2.3.3 Beaudesert Shire Planning Scheme 2007 and Boonah Shire Planning Scheme 2006

The south eastern section of the cultural heritage study area is located in the Scenic Rim Regional Council and is covered by the Beaudesert Shire Planning Scheme 2007 and the Boonah Shire Planning Scheme 2006. Local heritage places are identified and protected by Overlay 4.1 in the Beaudesert Scheme and Overlay 5.37 in the Boonah Scheme. A search of both planning schemes in May 2019 indicates that there are no local heritage places in the cultural heritage study area.

2.3.4 Draft Scenic Rim Planning Scheme

The Scenic Rim Regional Council has drafted a new combined planning scheme for their local government area which includes Section 8.2.8 - Local Heritage Overlay Code. The planning scheme builds on the Beaudesert Shire Planning Scheme and outlines policies for assessable development for three categories:

- Material Change of Use to an Item of Local Heritage
- Reconfiguring a Lot within Local Heritage Curtilage
- Carrying Out Building Work or Operational Work.

A search of the draft planning scheme in May 2019 indicates that there are no local heritage places in the cultural heritage study area.

2.4 Policy and guidelines

2.4.1 The Burra Charter 2013

The Burra Charter: The Australia International Council on Monuments and Sites (ICOMOS) Charter for Places of Cultural Significance (Burra Charter) was originally created in 1979 by the Australian branch of the ICOMOS. Since this time, the Burra Charter has provided the benchmark for cultural heritage management in Australia and is the basis for the majority of Commonwealth, State and local heritage legislation and policy (ICOMOS (Australia) 2013).

The Burra Charter defines a place as being of cultural significance if it possesses aesthetic, historic, scientific or social value, and provides guidance on managing and conserving places in order to preserve this significance.

2.4.2 Assessing Cultural Heritage Significance 2013

Assessing cultural heritage significance: Using the cultural heritage criteria was produced in 2013 by the then DEHP to provide guidance on applying the QH Act criteria to significance assessments in Queensland (DEHP 2013). The document explores the different ways in which heritage places may fulfil each of the criteria and provides guidance on the thresholds that must be reached for a heritage place to be considered of local, State, national or world significance.

2.4.3 Guidance on Heritage Impact Assessments 2011

Guidance on Heritage Impact Assessments for Cultural World Heritage Places was produced by ICOMOS, the peak international body for cultural heritage management (ICOMOS 2011). The document aims to provide an approach by which all types of impacts to heritage values might be identified, measured and managed. Although the document was prepared to inform impact assessments of World Heritage List places, it provides a robust methodology for the evaluation of impacts to all levels and types of heritage significance.

This includes:

- Local, regional and national heritage places
- Built, archaeological, landscape and intangible values
- Direct and indirect impacts
- Immediate and cumulative impacts.

3 Methodology

The historical heritage assessment is informed by legislative and ToR requirements, as well as the guideline *Assessing cultural heritage significance: Using the cultural heritage criteria* (DEHP 2013), which provides a framework for identifying and managing historical significance under the QH Act. In keeping with this framework, the key elements of the assessment are:

- Background research
- Historical cultural heritage inspection
- Significance assessment
- Impact assessment
- Management recommendations.

3.1 Background research

The aim of the background research is to:

- Develop an understanding of the known and potential historical heritage values of the cultural heritage study area
- Identify areas of known or potential heritage value for subsequent inspection
- Provide a context against which the significance of these values can be assessed.

A three-stage process has been used to fulfil these aims, comprising: register searches, analysis of historical mapping, and review of previous studies. Consultation with relevant key stakeholders was undertaken as required, including The Historical Society of Beaudesert, Queensland Transport Museum and Ipswich Rail Museum.

3.1.1 Register searches

Searches of all relevant heritage registers were conducted to identify previously recorded heritage places. Registers consulted include:

- World, National and Commonwealth Heritage Registers
- Queensland Heritage Register
- Register of the National Estate (non-statutory)
- Register of the Queensland National Trust (non-statutory)
- DES Cultural Heritage Information Management System (non-statutory)
- Local Heritage Registers – Ipswich City, Logan City, Beaudesert, Boonah and the draft Scenic Rim Regional Council Planning Schemes.
- Queensland Rail Heritage Register.

3.1.2 Analysis of historical mapping

Analysis of historical maps and other images has been undertaken to develop an appreciation of the creation and evolution of the historical landscape of the cultural heritage study area. Sources consulted include:

- Cadastral mapping (showing property owners, reserves, roads and other infrastructure)
- Topographic mapping (showing the location of structures, types of landforms, the extent of vegetation clearance and the alignment of roads and railway)

- Aerial imagery (showing the location of structures, the extent of vegetation clearance and the alignment of roads and railway).

Each of these resources was georeferenced using GIS software, enabling an accurate understanding of the location of the cultural heritage study area relative to elements of the historical landscape. This facilitated the identification of previously unrecorded heritage sites, such as early structures which are no longer standing, but which have the potential for archaeological deposits.

3.1.3 Review of previous studies

Previous heritage studies of relevance to the cultural heritage study area were reviewed, along with more general primary and secondary historical sources. These included:

- Collyer, Angela. 1991. *The Process of Settlement: Land Occupation and Usage in Boonah*. Unpublished MA Thesis. University of Queensland
- Jacobs Group (Australia) Pty Limited (Jacobs). 2016. *Calvert to Kagaru Inland Rail Project Historical Heritage Investigation*. Unpublished report to ARTC
- Maunsell Australia Pty Ltd. 2008. *Southern Freight Rail Corridor Study Draft Assessment Report: Technical Paper 10 - European Cultural Heritage*. Unpublished report to Queensland Transport
- Nutting, Kathleen. 1974. *Then and Now: The Story of Beaudesert 1874-1974*. Beaudesert Times
- University of Queensland Archaeological Services Unit. 1992. *Ipswich Heritage Study*. Unpublished report to Ipswich City Council.

The information garnered from these sources was used to identify any additional areas of heritage significance, but also to generate an overview of the history of the area, providing a context against which heritage values were assessed.

3.1.4 Consultation

Consultation was undertaken with historical societies and community groups. Groups consulted include:

- The Historical Society of Beaudesert – 7 January 2019 (12:00 to 12:30 pm)
- The Transport Museum, Gatton – 9 January 2019 (1:00 to 1:30 pm)
- Ipswich Rail Museum – 9 January 2019 (3:00 to 3:30 pm).

EIS Appendix C: Consultation Report provides further detail on the stakeholder engagement and community activities undertaken for the Project.

3.2 Selection of sites for inspection

Given the extent of the cultural heritage study area, it was considered neither practical nor desirable to inspect the study area. Instead, a targeted survey strategy was used, focussing on areas of highest heritage potential. These areas of interest (AOI) were identified during the background research, and included:

- Registered heritage places (statutory and non-statutory)
- Previously identified but unregistered places
- New places identified during historical research.

The inspection of AOI was prioritised based on their proximity to Project works (and hence likelihood of impacts) and their heritage potential (high, medium or low) (refer Table 3.1 and Table 3.2).

Table 3.1 Areas of interest levels of heritage potential

Potential	Description	Example
High	Places that have potential for early or complex structures and archaeological deposits Registered heritage places	Homestead complexes Early slab huts
Medium	Places that have the potential for simple or later structures and archaeological deposits	Later single dwellings
Low	Places that have the potential for very simple or modern structures and archaeological deposits	Dips, bridges

Table 3.2 Areas of interest inspection priority

Priority		Heritage potential		
		High	Medium	Low
Within cultural heritage study area	Yes	1	2	3
	No	3	4	5

3.3 Significance assessment

The significance of historical heritage places was assessed in accordance with the QH Act and *Assessing cultural heritage significance: Using the cultural heritage criteria* (DEHP 2013). In general, a place may be considered to be of heritage significance if it meets one or more of the following criteria:

- The place is important in demonstrating the evolution or pattern of history
- The place demonstrates rare, uncommon or endangered aspects of cultural heritage
- The place has potential to yield information that will contribute to an understanding of history
- The place is important in demonstrating the principal characteristics of a particular class of cultural places
- The place is important because of its aesthetic significance
- The place is important in demonstrating a high degree of creative or technical achievement at a particular period
- The place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- The place has a special association with the life or work of a particular person, group or organisation of importance.

These criteria may be fulfilled at a number of thresholds, ranging from world to local, depending on the importance of the place, and the contribution it makes to our understanding of the past (refer Table 3.3).

Table 3.3 Levels of cultural heritage significance

Significance	Description
World	Heritage values contribute to our understanding of the pattern and evolution of world history and heritage and the place is considered to be of outstanding value to humanity.
National	Heritage values make an outstanding contribution to our understanding of the pattern and evolution of Australia's history and heritage.
State	Heritage values contribute to our understanding of the wider pattern and evolution of Queensland's history and heritage.
Local	Heritage values contribute to our understanding of the pattern and evolution of local history and heritage.

Source: DEHP (2013)

3.3.1 Historical themes

To assist in the assessment of historical significance, the then DEHP developed a thematic framework that identifies the most important events, processes and trajectories in Queensland history (refer Table 3.5) (DEHP 2013). Places that demonstrate one or more of these themes are more likely to be of historical heritage significance.

3.4 Impact assessment

The potential impacts on the heritage values are assessed using criteria developed from the *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011). This document was prepared by ICOMOS, the peak professional body working for the conservation of cultural heritage places and provides a comprehensive method for assessing impacts at all types of heritage places.

Under ICOMOS guidelines, cultural heritage places can be of differing levels of importance, or significance: local, State, national and world (refer also ICOMOS (Australia) 2013). Places of local significance are important only to their immediate community, places of State significance to the wider region, and places of national significance to the country as a whole. Places of world significance are important to all of humanity, possessing one or more Outstanding Universal Values.

Places of differing heritage significance have differing sensitivity to impact. Places of World Heritage significance will be more vulnerable to change than a local heritage site, and aspects of a World Heritage place that represent Outstanding Universal Values are the most sensitive of all. The differing significance of a place's heritage values and their relative sensitivity to impact is summarised in Table 3.4.

Table 3.4 Levels of cultural heritage sensitivity

Sensitivity	Justification	Status
Extreme	Attributes which convey Outstanding Universal Values of World Heritage Place	Fulfils criteria for local, State, national and international listing.
Very high	Exceptional, rare or outstanding attributes demonstrating important themes in national or international history and heritage.	Fulfils criteria for local, State, national or potentially international listing.
High	Attributes demonstrating important themes in state history and heritage.	Fulfils criteria for local and State listing.
Moderate	Attributes demonstrating important themes in local history and heritage.	Fulfils criteria for local listing and may fulfil criteria for state listing.
Low	Attributes demonstrating minor themes in local history and heritage.	May fulfil criteria for local listing and does not fulfil criteria for State listing.
Negligible	Attributes that have no heritage significance.	Does not fulfil criteria for local or State listing.

Table 3.5 Queensland thematic framework

<p>1. Peopling places</p> <p>1.1 the first inhabitants</p> <p>1.2 migration from outside and within</p> <p>1.3 encounters between indigenous and non-indigenous peoples</p> <p>1.4 family and marking the phases of life</p>	<p>5. Moving goods, people and information</p> <p>5.1 utilising human environment</p> <p>5.2 using draught animals</p> <p>5.3 using rail</p> <p>5.4 using shipping</p> <p>5.5 using motor vehicles</p> <p>5.6 using air transport</p> <p>5.7 telecommunications</p> <p>5.8 postal services</p>
<p>2. Exploiting, utilising and transforming the land</p> <p>2.1 exploring, surveying and mapping the land</p> <p>2.2 exploiting natural resources</p> <p>2.3 pastoral activities</p> <p>2.4 agricultural activities</p> <p>2.5 managing water</p> <p>2.6 managing flora and fauna</p> <p>2.7 experimenting, developing technologies and innovation</p> <p>2.8 protecting and conserving the environment</p> <p>2.9 valuing and appreciating the environment and landscapes</p>	<p>6. Building settlements, towns, cities and dwellings</p> <p>6.1 establishing settlements</p> <p>6.2 planning and forming settlements</p> <p>6.3 developing urban services and amenities</p> <p>6.4 dwellings</p>
<p>3. Developing secondary and tertiary industries</p> <p>3.1 feeding Queenslanders</p> <p>3.2 developing manufacturing capacities</p> <p>3.3 developing engineering and construction industries</p> <p>3.4 developing economic links outside Queensland</p> <p>3.5 struggling with remoteness, hardship and failure</p> <p>3.6 inventing devices</p> <p>3.7 financing</p> <p>3.8 marketing, retailing and service industries</p> <p>3.9 informing Queenslanders</p> <p>3.10 entertaining for profit</p> <p>3.11 lodging people</p> <p>3.12 catering for tourists</p> <p>3.13 adorning Queenslanders</p>	<p>7. Maintaining order</p> <p>7.1 policing and maintaining law and order</p> <p>7.2 government and public administration</p> <p>7.3 customs and quarantine services</p> <p>7.4 local government</p> <p>7.5 withstanding physical threats to order</p> <p>7.6 defending the country</p>
<p>4. Working</p> <p>4.1 organising workers and workplaces</p> <p>4.2 caring for workers' dependent children</p> <p>4.3 working in offices</p> <p>4.4 unpaid labour</p> <p>4.5 trying to make crime pay</p> <p>4.6 surviving as indigenous people in a white-dominated economy</p> <p>4.7 working as exploited/indentured labour</p>	<p>8. Creating social and cultural institutions</p> <p>8.1 worshipping and religious institutions</p> <p>8.2 cultural activities</p> <p>8.3 organisations and societies</p> <p>8.4 festivals</p> <p>8.5 sport and recreation</p> <p>8.6 commemorating significant events</p>
	<p>9. Educating Queenslanders</p> <p>9.1 primary schooling</p> <p>9.2 secondary schooling</p> <p>9.3 educating adults</p> <p>9.4 tertiary education</p>
	<p>10. Providing health and welfare services</p> <p>10.1 health services</p> <p>10.2 caring for the homeless and destitute</p> <p>10.3 caring for women and children</p>

Source: DEHP 2013

The degree of impact an activity will have on a heritage place is assessed in terms of the magnitude of change to the acknowledged heritage values of a place as summarised in Table 3.6. These impacts may be direct, such as the demolition of heritage buildings, or indirect, such as changes to the views or setting of a heritage place. In some cases, indirect impacts might also cause physical damage to a heritage place, such as excessive vibration causing structural damage, or excessive pollution causing damage to surfaces.

Table 3.6 Determining magnitude of change

Magnitude	Example criteria
Major	Change to all or most significant aspects of the place, such that its heritage values are substantially reduced or destroyed.
Medium	Change to some significant aspects of the place, such that some of its heritage values are partially reduced.
Low	Minor change to significant aspects of the place, such that some of its heritage values are slightly reduced.
Negligible	Changes to insignificant aspects of the places, such that its heritage values are not reduced.
No Change	No change.

The final assessment of the significance of impact on a heritage place is a factor of the cultural heritage sensitivity of the place, combined with the predicted magnitude of change, as outlined in Table 3.7. A prediction of impact significance can be made both before and after the implementation of identified mitigation measures, allowing the efficacy of the measures to be assessed and revealing residual impacts that need to be taken into account.

Table 3.7 Estimating impact significance

Significance of impact		Magnitude of change				
		Major	Medium	Low	Negligible	No change
Cultural heritage sensitivity	Extreme	Very large	Large/very large	Moderate/large	Slight	Neutral
	Very high	Very large	Large/very large	Moderate/large	Slight	Neutral
	High	Large/very large	Moderate/large	Slight/ moderate	Slight	Neutral
	Moderate	Moderate/large	Moderate	Slight	Neutral/slight	Neutral
	Low	Slight/ moderate	Slight	Neutral/slight	Neutral/slight	Neutral
	Negligible	Slight	Neutral/slight	Neutral/slight	Neutral	Neutral

4 Historical context

4.1 Overview

4.1.1 Exploration and penal settlement

The first explorer to enter the cultural heritage study area was Captain Patrick Logan, Commandant of the Moreton Bay Penal Colony established in 1824 at what is now Brisbane (refer Figure 4.1). Logan was keen to explore the area inland of the settlement, and set out on a number of expeditions along the area's major watercourses during his six year tenure (Nutting 1974).

In his first year, Logan traced the eponymous Logan River south and west to what is now Kagaru, at the far south east of the cultural heritage study area. Logan was highly complementary of this well-watered area, describing it as part of the 'finest tract of land I have seen in this or any other country' (Logan 1826 in Smith and Hall 1996:29). Returning to the area in 1827 and 1828, Logan further commented on the exceeding rich soil of the plains, and the availability of good quality timber (Smith and Hall 1996:31).

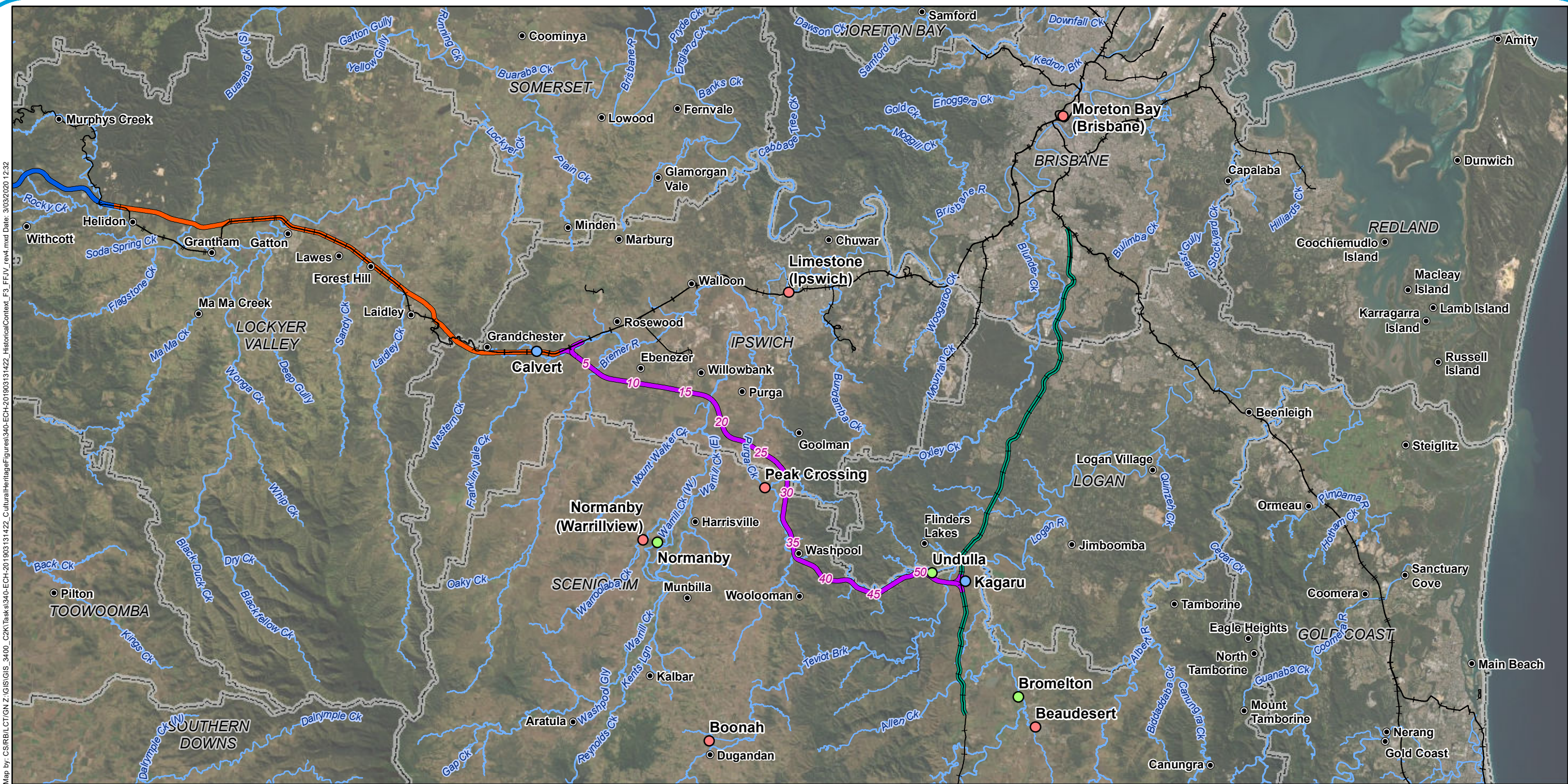
In between his expeditions to the Logan River, Logan also ventured along the Brisbane River and, from there, the Bremer River. Some 30 km from the main penal colony he discovered an area rich in limestone and coal which he dubbed the 'Limestone Hills' (refer Figure 4.1). Located some 10 km north of the cultural heritage study area, this became the location of a penal outstation, established by Logan in 1827 to quarry and burn limestone for the manufacture of mortar. Shortly thereafter, the settlement now known simply as 'Limestone', expanded to include a small farm station (Johnston 1988).

Despite this investment however, the penal settlement of Queensland proved to be short lived. Transportation to Moreton Bay ceased in the early 1830s and the penal facilities, including the Limestone outstation, began to close. In 1839, the last remaining convicts were relocated to the southern colonies and, three years later, the Moreton Bay Colony was opened to free settlement (Johnston 1988).

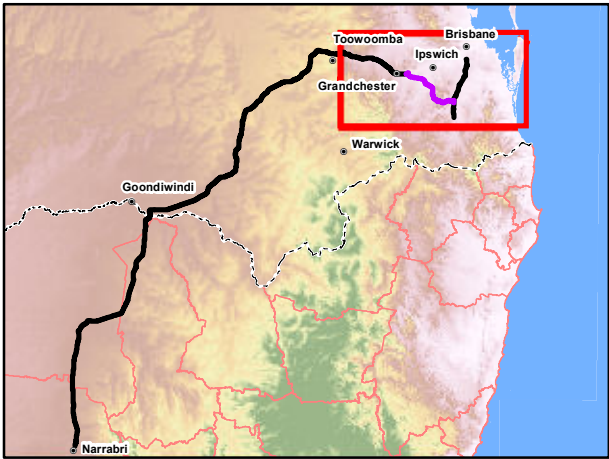
4.1.2 Free settlement

No doubt encouraged by the positive reports of Logan and other early explorers, people were quick to take up land for pastoral farms in the new Moreton Pastoral District. Like those earlier explorers, the settlers initially followed the major water courses inland to find suitable holdings, travelling along the Brisbane and Bremer Rivers to Limestone – which had become the town of Ipswich – and along the Logan River to what became Beaudesert. The area in between, including the cultural heritage study area, was predominately occupied by four large pastoral runs: Bromelton, Undullah, Mt. Flinders and Normanby (refer Figure 4.2).

These early runs focussed on sheep grazing with some growing of crops, mostly grains. By the end of the 1840s, however, it was discovered that the poorly draining alluvial soils of the plains rendered sheep prone to footrot, particularly in the eastern section of the cultural heritage study area, and that the lack of a road or rail network made the transport of harvest to market prohibitively expensive. Consequently, these ventures were largely abandoned in favour of the raising of cattle (Smith and Hall 1996).



- Legend**
- 5 Chainage (km)
 - Localities
 - Historical Locations**
 - Locality
 - Pastoral Head Station
 - Population Centre
 - Existing rail
 - G2H project alignment
 - H2C project alignment
 - C2K project alignment
 - K2ARB project alignment
 - Watercourses
 - Local Government Areas



A3 scale: 1:400,000
0 3 6 9 12 15 km



Future Freight
Integrating Community, Environment and Engineering

Issue date: 02/03/2020 Version: 4
Coordinate System: GDA 1994 MGA Zone 56

Calvert to Kagaru

Figure 4.1: Historical context map

4.1.3 Closer settlement

In the 1850s and 1860s, the government of what became the Colony of Queensland started to split up the large pastoral runs to encourage closer settlement and the establishment of small but productive agricultural farms (Camm 1968). Gradually, all of the runs in the cultural heritage study area were subdivided, sold as freehold lots and developed as dairying and mixed agricultural concerns (Collyer 1991; Smith and Hall 1996; Surveyor General's Office 1888). Dairying was particularly important in the early decades of the 20th century, actively promoted by the government as a way to alleviate rural poverty, with mixed results (Johnston 1982).

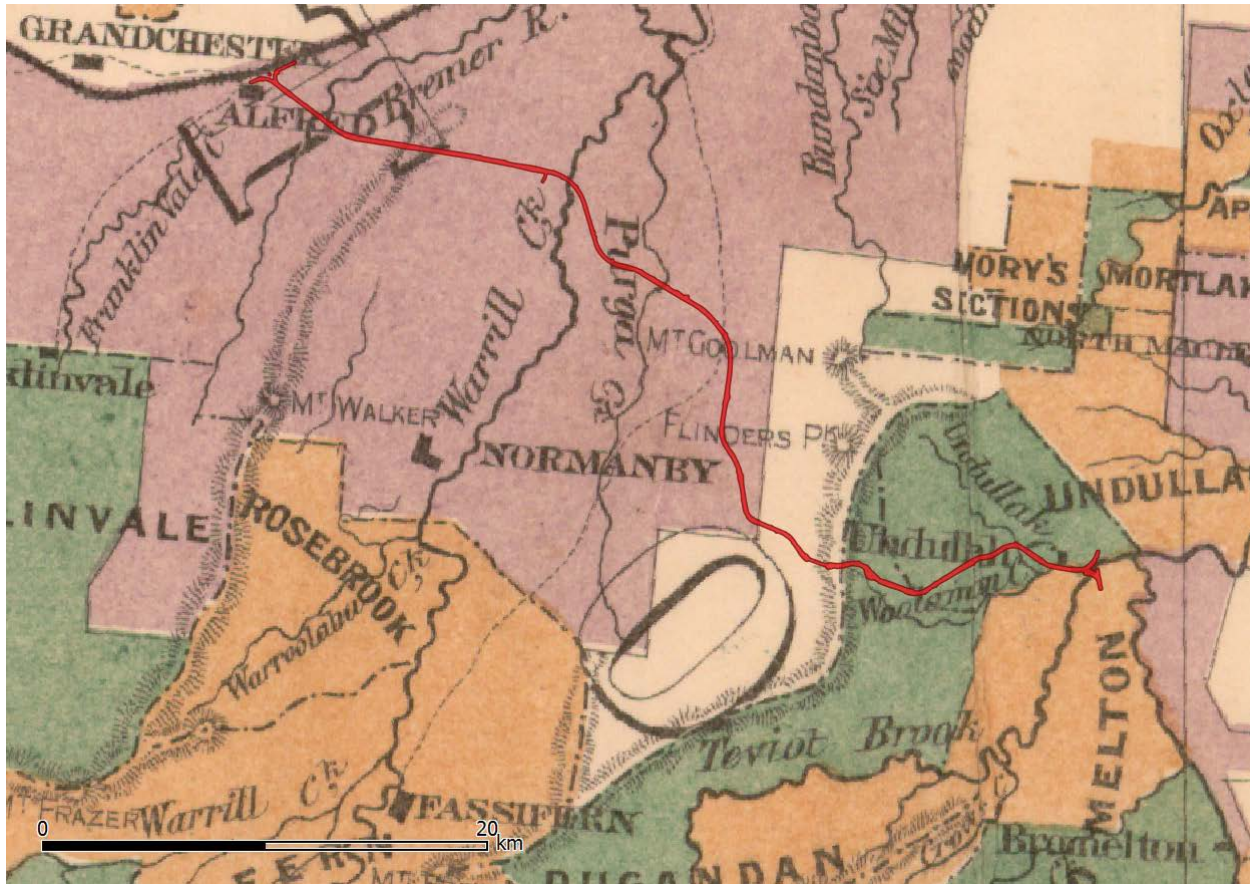


Figure 4.2 Detail of 1872 Moreton Pastoral District run map, showing approximate cultural heritage study area

Source: Surveyors General's Office 1872

The process of closer settlement altered not just the way land was used, but also wider settlement patterns, transport links and ancillary industries. Dairying was particularly influential in this respect, producing a perishable commodity that required prompt processing. These demands provided added impetus for the development of a local rail network in and around the cultural heritage study area in 1888. To the east was the Beaudesert line and, towards the centre of the cultural heritage study area, the Fassifern (or Dugandan) line, both of which ultimately joined to the Main Western Line which had been constructed in stages from 1865 to 1874 (Meston 1890) (refer Figure 4.1). Butter factories were established along the local lines, at Beaudesert and Boonah respectively, allowing milk produced at local farms to be quickly transported and processed for sale (Camm 1974; Nutting 1974).

Although changes in transport and food technology have seen the closure of the butter factories, and much of the rail lines, mixed agriculture continues to be an economic staple in and around the cultural heritage study area.

4.2 Pastoral runs

4.2.1 Bromelton Run

The Bromelton Run was established at the far eastern end of the cultural heritage study area in 1844. Initially taken up by Thomas Murray-Prior, it soon passed into the hands of the McDonalds, who built a fine house for themselves on the banks of Bromelton (or Bungoroo-pin) Lagoon (refer Figure 4.1 and Figure 4.3). The McDonalds raised their 14 children on the property, as well as several orphaned nieces and nephews from the nearby Undullah Run (refer Section 4.2.2) (Collyer 1991; Gray-Woods 1990).

In the early 1860s, the Bromelton Run, like all runs in the area, was partly resumed for subdivision and closer settlement. The McDonald family retained the southern half of the land - which included Bromelton House, the lagoon, and the permanent Allan Creek - while the northern half was offered as free-hold lots (refer Figure 4.2).

In 1898, Mr Frederick Lumley-White bought sections of the former Bromelton Run at the far eastern end of the cultural heritage study area, naming the property 'Brooklands'. Here he and his family established a 'beautiful old homestead nestling amongst the lovely green trees and lawns' (The Beaudesert Times 1948, 1955; The Courier-Mail 1949). The Brooklands property became synonymous with the local area, which continues to be known as Brooklands (refer Figure 4.4) and was a hub for community social life and charity events, particularly during the world wars (The Beaudesert Times 1948, 1955; The Courier-Mail 1949).



Figure 4.3 Bromelton House c1872 (SLQ 134937)

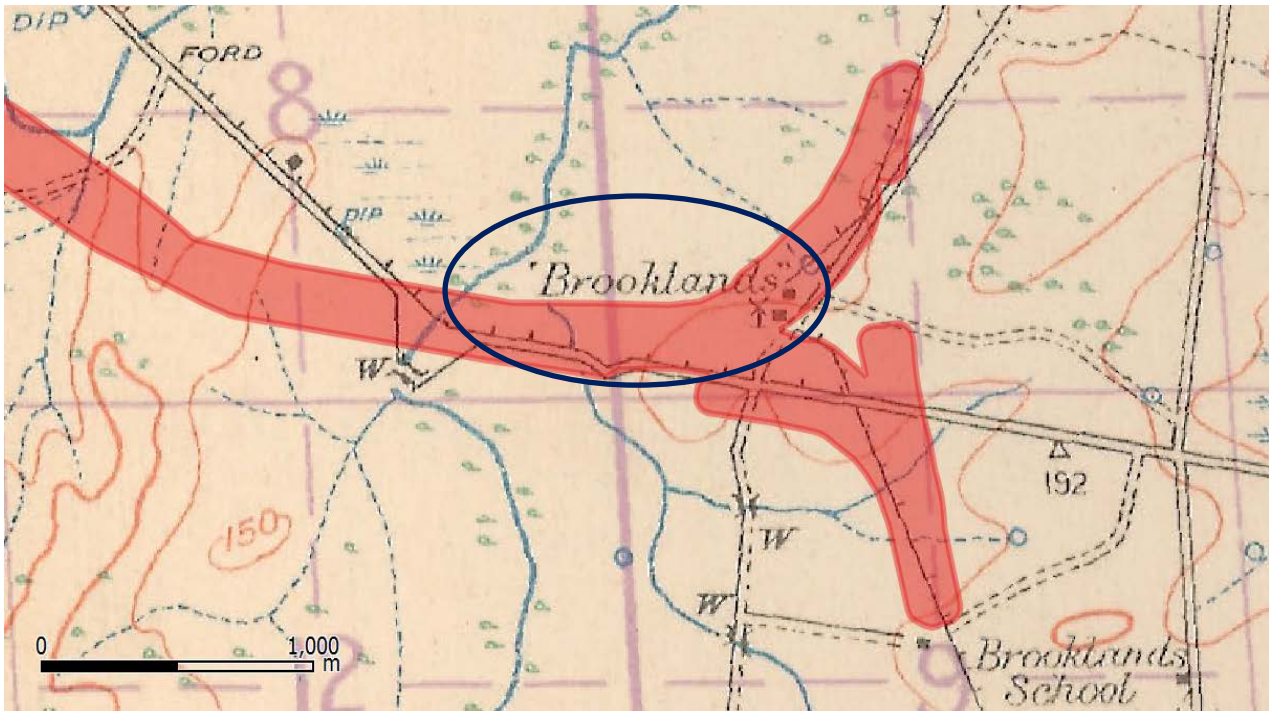


Figure 4.4 Detail of 1927 topographic map showing Brooklands and approximate cultural heritage study area

Source: Australian Section Imperial General Staff 1927

In the 1920s, a standard gauge railway line was constructed between Sydney and Brisbane, finally overcoming the impediment of the different gauges between the two states, and the need to change trains at the border. This new alignment ran along the eastern boundary of Brooklands and a station was constructed some 300 m from the homestead. Named Kagaru, believed to be the local Yugerapul language name for the kookaburra (Watson 1950), the station soon expanded into a considerable complex including various railway structures, houses, and fettlers huts (refer Figure 4.5). It is likely this easy access to the railway that encouraged the Lumley-Whites to expand what had been a predominately beef cattle concern to include some dairying (Noel Cannon pers. comm., 15 January 2019) (refer Section 4.1.3).

Brooklands remained in the Lumley-White family until Frederick died in 1955. Aerial images suggest the original homestead remained in place for another decade but by the time property was bought in the 1970s by the current owners, the Cannons, the building had been demolished (Noel Cannon pers. comm., 15 January 2019).

By the time the Cannons moved to Brooklands, the Beaudesert Line was also in the slow process of closing. The Kagaru Station was closed, and the buildings gradually removed. The last structure, one of the fettler's huts, was removed in the mid-2000s, and is understood to be housed at the Beaudesert Historical Society.

The sites of the former Brooklands homestead and Kagaru Station are within the cultural heritage study area (refer Figure 4.4 and Figure 4.5).

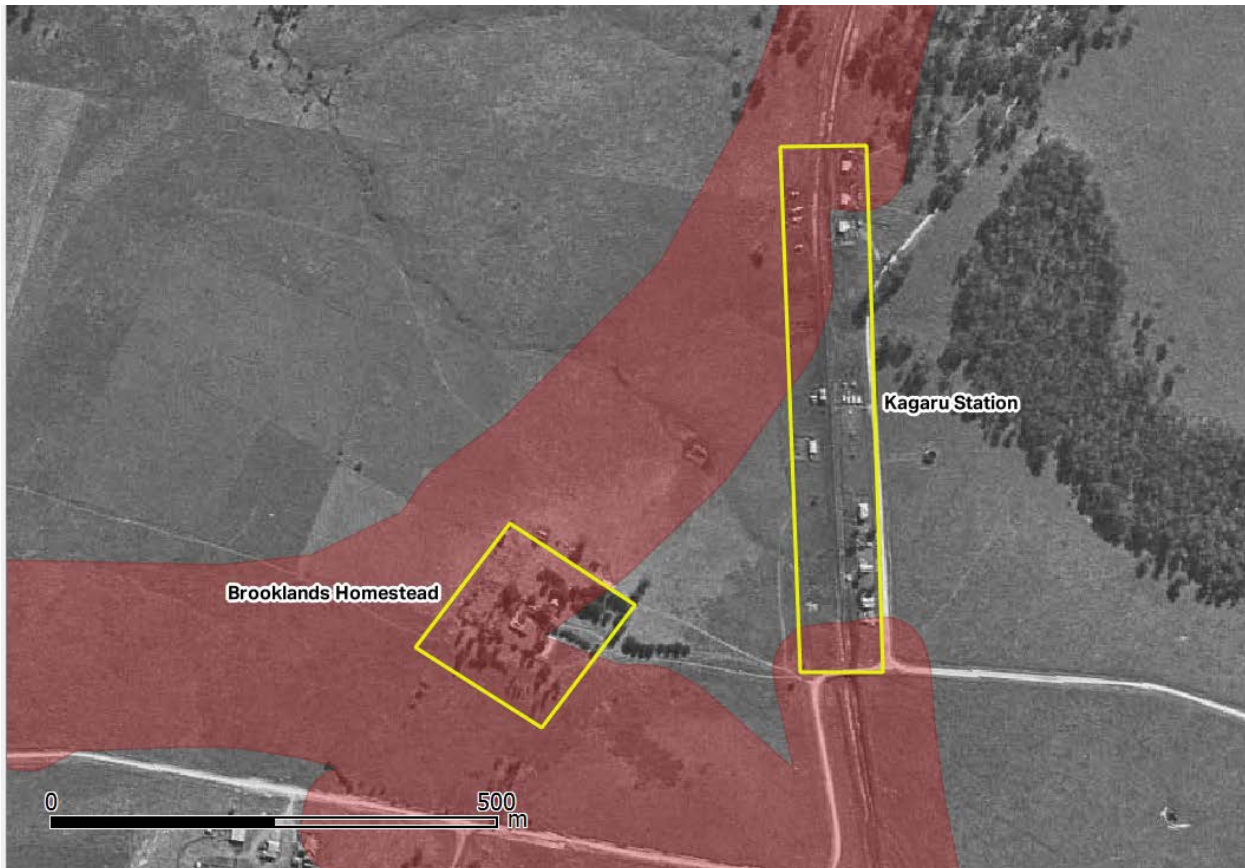


Figure 4.5 Detail of 1959 aerial image showing approximate cultural heritage study area, original Brooklands Homestead and Kagaru Station (QAP0890113)

4.2.2 Undullah Run

In around 1848, Undullah was taken over by John and Emmeline Cameron and their family, relatives to the McDonalds on the adjoining Bromelton Run (Collyer 1991) (refer Figure 4.2). The Camerons established a home on the northern bank of Teviot Brook, and lived there with their seven children until Emmeline died in 1860. Facing a range of personal and financial difficulties, John took his life some two years later, and the children were taken in by the McDonald family. The former Undullah Homestead, located some 200 m north of the Project, is the site of three heritage listed graves (Logan Planning Scheme, GS - Undullah – 1), presumably those of John and Emmeline, and perhaps one of their children (refer Section 5.1).

Undullah was subdivided in the early 1860s, a response not only to the death of the Camerons, but the progress of closer settlement. Large sections of the run were purchased by Lawrence O'Neill, who named the new property 'Kilmoylar' (The Beaudesert Times 1947; The Brisbane Courier 1897). The location of the Kilmoylar homestead is unclear – perhaps the family moved into the old Undullah buildings – but the O'Neill's constructed other buildings across their holdings. One of these, marked as 'O'Neill's Hut' on a 1920s topographic map, is located within the cultural heritage study area on Woollaman Creek (refer Figure 4.6). A second hut, referred to as 'Kenny's Hut' is located some 3 km east of O'Neill's Hut, and a stock yard is situated between the two. It is unclear if these two latter buildings are also related to the O'Neill's, but the three structures are certainly contemporaneous.

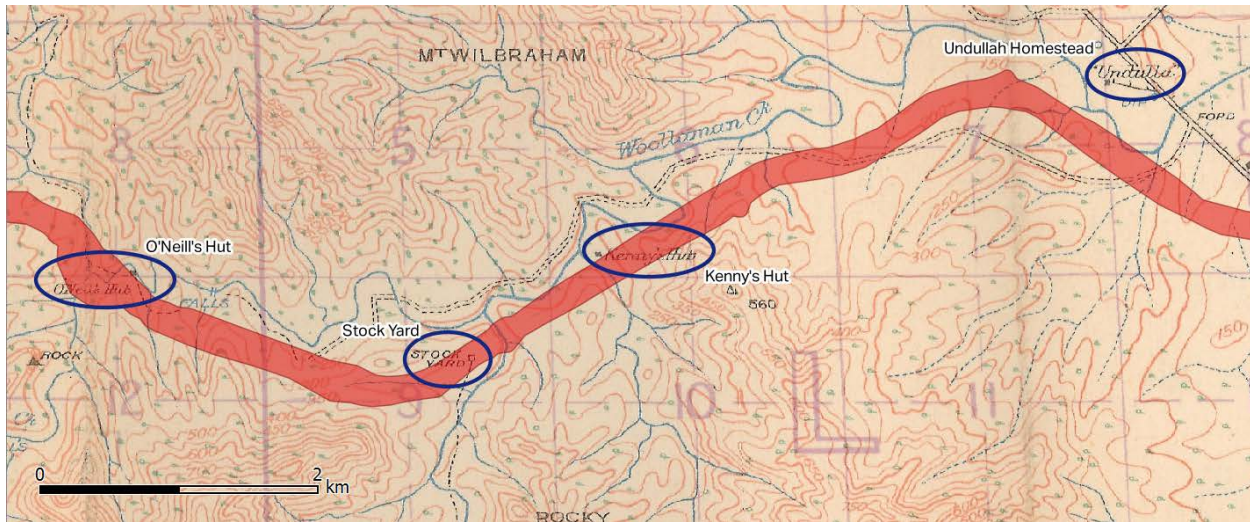


Figure 4.6 Detail of 1927 topographic map showing approximate cultural heritage study area, Undullah and other structures

Source: Australian Section Imperial General Staff (1927)

4.2.3 Mt Flinders Run

The Mt Flinders Run was taken up in 1844 by the Wilson brothers, who constructed a homestead near a lagoon on the eastern bank of Purga Creek, approximately 700 m west of the Project (refer Figure 4.1). The brothers almost immediately had 7 hectares under wheat cultivation, along with 9 cattle and 5,500 sheep (Collyer 1991). Like other landholders in the area, the Wilsons quickly realised that cultivation was far less profitable than sheep and cattle grazing, and the amount of cultivated land at Mt Flinders gradually decreased, before the practice was abandoned by the end of the decade. By this time, the number of sheep on the property had swelled to an enormous 18,500 (Collyer 1991).

Mt Flinders started to be resumed for closer settlement from the 1850s. This was a decade earlier than the runs to the south (refer previous Sections) and likely a reflection of the property's prime location near Ipswich. Most of the northern areas of the Mt Flinders Run were incorporated into the Ipswich Agricultural Reserve and, just to the north of the homestead, the village of Peak Crossing was established (refer Figure 4.1). An early focus of the Agricultural Reserve was the cultivation of cotton, a focus that intensified in the following decade, when the American Civil War, and attendant disruption of the cotton industry, saw prices sky-rocket. It was hoped that Queensland cotton might replace the American product, ending the practice of slavery and boosting the colonial economy (Collyer 1991).

The Wilson brothers did not purchase much of the Mt Flinders land when it was offered for sale, possibly because they were not interested in cultivation, or possibly because they lacked the funds to do so. In the late 1860s, the brothers sold their Mt Flinders lease to the Weinholts, a notable pastoral and political family from the Darling Downs. The Weinholts broke up and sold much of the remaining run and, like the agricultural reserve to the north, most of this land was initially given over to the production of cotton (Collyer 1991).

The expansion of the cotton industry created a demand for local processing facilities, and the 1870s saw the construction of at least three cotton gins in and around the former Mt Flinders Run. It is difficult to identify precisely where these complexes were built but one, the Pioneer Gin built by G.F.C. Lang, appears to have been located in the cultural heritage study area near the Washpool on Purga Creek (Queensland Times, Ipswich Herald and General Advertiser 1869) (refer Figure 4.1). At the time Lang built his gin in 1870, the location was already known as the 'Washpool' suggesting that it had been used for sheep washing during the time Mt Flinders operated as a pastoral run. The practice of washing wool while still on the sheep was intended to remove dirt and debris, reducing the weight of the wool and therefore transportation costs. By the late 19th century, however, it was realised that it was far easier to wash the wool *after* shearing, and washpools were replaced by woolscours (Blake 1992).

The ginning complex built by Lang was quite an extensive enterprise:

The store is fifty-six feet by sixteen, and very substantial. The ginning, blow, and pressing rooms are commodious, and built entirely of iron, except the beams and flooring. This building will be connected with the large store by means of a small tramway and trolly [sic], as will also another small store about the same distance on the other side of the ginning-house, in which the clean cotton will be packed. These trollies will save some labour, and facilitate operations. The engine is six horsepower, and there will be two gins, one of sixty and the other of forty saws. There is a good supply of water at hand in case of fire. A neat cottage is being put up for the manager, and several huts will be built for the workmen. (Queensland Times, Ipswich Herald and General Advertiser 1869).

It is unclear for how long Lang's gin was in operation, or what use it may have been subsequently put to, but buildings are evident at the Washpool site both in the 1920s topographic maps, and the 1944 aerial photographs (refer Figure 4.7 and Figure 4.8).



Figure 4.7 Detail of 1944 aerial showing Washpool, structures (blue) and cultural heritage study area (red) (MAP1539489)

By the late 1870s, cotton prices had dropped and growers had realised that the plant was quite difficult to cultivate (Collyer 1991). Once again, crop growing was largely abandoned in favour of beef and dairy cattle grazing, and small pastoral holdings operated throughout the former Mt Flinders Run. Topographic maps from the 1920s show several homesteads and other buildings in or adjacent to the cultural heritage study area.

During the same period, closer settlement and the development of the Ipswich coal industry highlighted the need for reliable transport links in the Moreton district and, in 1865, the first railway was established. A section of what would become the West Moreton Railway, this line stretched between Grandchester (at the far west of the Project) and the port town of Ipswich (refer Figure 4.1). In 1875, the line was extended from Ipswich to Brisbane and, the following decade, a number of branch lines were opened. One of these, the Fassifern (or Dugandan) line ran from the Western Railway down through Peak Crossing and the former Mt Flinders Run, and onto the rich dairying districts around Boonah and Dugandan (refer Figure 4.1).

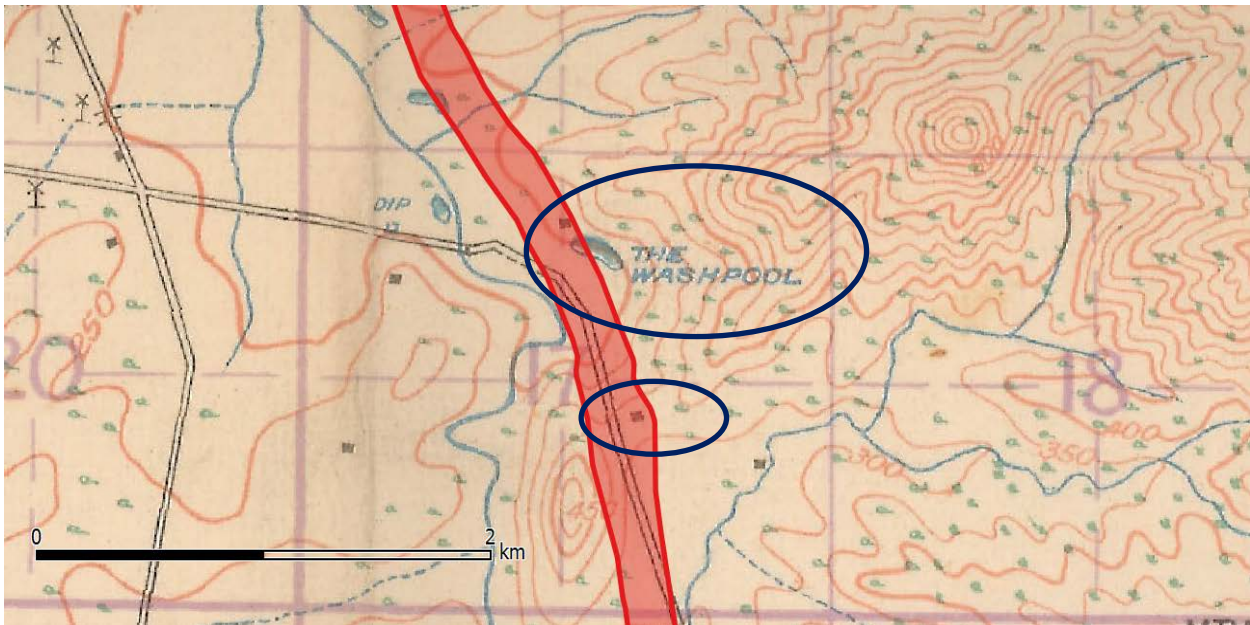


Figure 4.8 Detail of 1927 topographic map showing Washpool and other buildings (blue) in middle section of cultural heritage study area (red)

Source: Australian Section Imperial General Staff (1927)

4.2.4 Normanby Station

Rosebrook Run was established on the Normanby Plains by Donald McLaughlin in about 1843. McLaughlin established a head station towards the middle of the run, on Warroolaba Creek (approximately 10 km south of the cultural heritage study area), and built a homestead, dairy and shearing shed (Collyer 1991) (refer Figure 4.1). By the following year, the run was reported to have 4 hectares under cultivation, 105 cattle, 15 horses and 1,200 sheep (Collyer 1991).

McLaughlin had little time to work his land however. Incarcerated for assault in 1845, McLaughlin defaulted on his loan and the land passed to the mortgagee, George Thorn. A prominent local businessman, Thorn would later become known as the 'father of Ipswich' (Collyer 1991). Thorn took over the daily running of the Rosebrook Run, and like the other landholders in the area, focussed his efforts on sheep and cattle grazing (Collyer 1991).

Like the adjoining Mt Flinders Run, the 1850s saw Rosebrook Run being broken up for closer settlement. Unlike the owners of Mt Flinders, however, Thorn took the opportunity to purchase many of these parcels of land, eventually accumulating a freehold station of almost 13,000 hectares. A small village named Normanby (now Warrill View) was established near the Rosebrook homestead and, gradually, the new freehold station took on its name (Collyer 1991).

Thorn continued to use Normanby Station predominately for wool growing over the ensuing years, bucking the local trend towards beef cattle and, later, the growing of cotton. After his death in 1877, however, the station was broken into a series of smaller farms concerned with beef and dairy cattle grazing, and some small-scale agriculture. Topographic maps from the 1920s show several homesteads and other buildings in or adjacent to the cultural heritage study area (refer Figure 4.9).

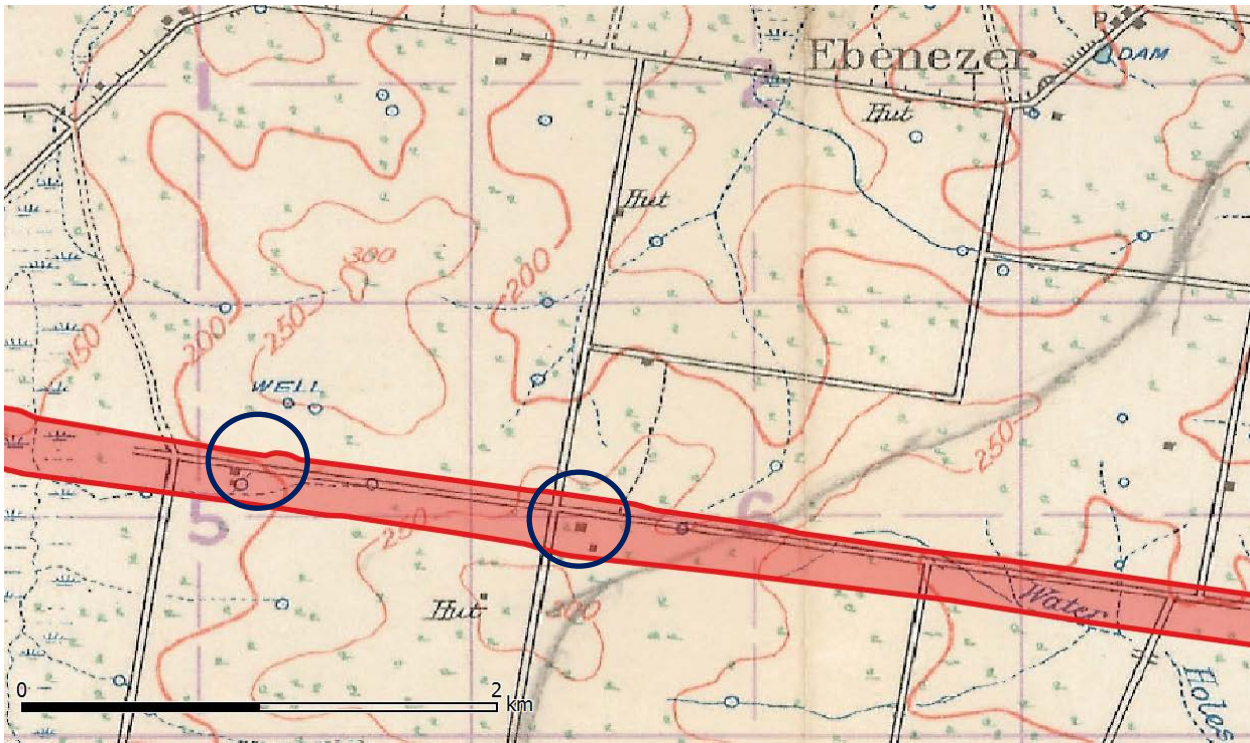


Figure 4.9 Detail of 1928 topographic map showing buildings (blue) in north west of cultural heritage study area (red)

Source: Australian Section Imperial General Staff (1928)

5 Existing heritage context

5.1 Register searches

A search of all relevant statutory and non-statutory heritage registers in May 2019, indicated that there are five local heritage places within 1 km of the Project, but none in the cultural heritage study area (refer Table 5.1 and Table 5.2).

It should be noted that two of the local heritage places are included on the current Ipswich heritage register – Rockton and 1137 Ipswich Boonah Road - but are actually located within the Scenic Rim LGA and have not been included in the draft Scenic Rim Planning Scheme. These items currently have no legislative protection under either the Ipswich, Boonah, Beaudesert or the new draft Scenic Rim Planning Scheme. However, as the sites have previously been identified as being of local heritage significance, they have been included here for the sake of completeness.

Table 5.1 Summary register searches

Register	Within 1 km of Project	Within cultural heritage study area
World Heritage List	None	None
National Heritage List	None	None
Commonwealth Heritage List	None	None
Register of the National Estate (non-statutory)	None	None
State Heritage Register	None	None
Cultural Heritage Information Management System (non-statutory)	None	None
Ipswich Planning Scheme 2006	4*	None
Logan Planning Scheme	1	None
Boonah Shire Planning Scheme 2006	None	None
Beaudesert Shire Planning Scheme 2007	None	None
Scenic Rim Planning Scheme (draft)	None	None

Table note:

* Two places are located within Scenic Rim LGA and not eligible for protection under the Ipswich Planning Scheme 2006

Table 5.2 Local heritage places within 1 km of Project

Name	Description	Planning scheme	Location	Proximity to Project
Rockton*	Farmhouse, main house	Ipswich	2/RP187329	Within 1 km
1137 Ipswich Boonah Road, Peak Crossing*	Dwelling, main house	Ipswich	3/RP851801	Within 1 km
Lot 1 Middle Road, Purga	Farmhouse, main house	Ipswich	1/RP168958	Within 1 km
Dwelling	House and rear wing	Ipswich	23/RP123059	Within 1 km
Cameron Family Graves	Three individual grave sites	Logan	200/SP133189	Within 1 km

Table note:

* Originally recorded on the Ipswich Planning Scheme, now located within Scenic Rim LGA and currently not listed on the local Planning Scheme

5.2 Previous heritage assessments

A number of previous heritage assessments have been undertaken for various parts of the cultural heritage study area and are summarised below.

5.2.1 University of Queensland Archaeological Services Unit 1992 Ipswich Heritage Study

The Ipswich Heritage Study was commissioned to identify and document places of heritage value within the then boundaries of the City of Ipswich, and to make recommendations to manage these places (University of Queensland Archaeological Services Unit 1992). This study was subsequently updated when changes were made to the city boundaries in 1996 (Buchanan Architects 1996). Together, these studies form the basis of the Ipswich Planning Scheme local heritage overlay (refer Section 5.1).

5.2.2 Maunsell Australia 2008 Southern Freight Rail Corridor Study Draft Assessment Report: Technical Paper 10 - European Cultural Heritage

The Maunsell 2008 cultural heritage study assessed a 1 km corridor on either side of the SFRC which forms the basis of the Project alignment (Maunsell Australia 2008). The assessment focussed on places that had previously been identified and was limited to searches of relevant registers (refer Section 3.1.1). No additional heritage places were identified.

5.2.3 Jacobs 2016 Calvert to Kagaru Inland Rail Program Historical Heritage Investigation

The Jacobs 2016 cultural heritage study assessed a 100 m corridor on either side of the then alignment, much of which remains unchanged (Jacobs Group (Australia) 2016). From a review of previous reports and historical aerials, Jacobs identified some 29 places of potential heritage significance, 19 of which were then subject to cultural heritage survey. Of the 19 surveyed sites, 7 were found to contain places of potential heritage value, all of which are in the current cultural heritage study area (refer Table 5.3).

Table 5.3 Potential heritage places identified by Jacobs (2016)

Jacobs reference	Lot	Plan	Description
Site 3	51	CH3120	Dairy Complex
Site 7	76	SP131580	Creamery and archaeological remains of dairy
Site 45	4	RP178669	Yards and stock route
Site 48	1	SP163227	Slab Hut
Site 68	77	RP218829	Dip and yards, blacksmith, dwelling, sheds
Site 79	94	SP157507	Dairy archaeological remains
Site 87	256	CH3159	Butchery

5.3 Historical mapping review

The early topographic maps were georeferenced and analysed for early structures and other points of interest located within 1 km of the Project (Australian Section Imperial General Staff 1927, 1928). Where possible, these identified sites were cross referenced with early cadastral mapping (Surveyor General's Office 1888, 1890, 1925) and 1940s aerial photography.

Through this process, some 56 AOI were identified (refer Table 5.4).

Table 5.4 Summary areas of interest identified within 1 km of Project

Category	Count
Bridge	5
Dairy	3
Dip	2
Homestead	6
House	1
Hut	7
Multiple structures	20
Railway station	4
Single structure	7
Washpool	1
Total	56

5.4 Heritage areas of interest within the cultural heritage study area

Of the 56 heritage AOI identified within 1 km of the Project, 20 are within the cultural heritage study area. These are shown in Table 5.5, along with their potential and priority rankings determined using the methodology outlined in Section 3.2. Based on this assessment, 13 of the 20 AOI are Inspection Priority 1.

Table 5.5 Areas of interest within the cultural heritage study area

Description	Lot/Plan	Jacobs reference	Study area	Potential	Inspection priority
Creamery and dairy	76/SP131580	Site 7	Y	H	1
Yards and shed	94/SP157507	Site 79	Y	H	1
Multiple structures	77/RP218829	Site 68	Y	H	1
Homestead (Brooklands)	1/RP180942	n/a	Y	H	1
Hut and yards	1/SP163227	Site 48	Y	H	1
Hut (Kenny's)	22/RP908750	n/a	Y	H	1
Hut (O'Neill's)	259/RP809310	n/a	Y	H	1
Homestead complex	256/CH3159	Site 87	Y	H	1
House	2/RP22586	n/a	Y	H	1
Dairy and creamery	4/RP186730	n/a	Y	H	1
House	53/SP148223	n/a	Y	H	1
Railway station (Kagaru)	232/SP130091	n/a	Y	H	1
Washpool	146/CC3359	n/a	Y	H	1
Single structure	12/CH3150	n/a	Y	M	2
Single structure	24/CC158	n/a	Y	M	2
Single structure	3/SP239551	n/a	Y	M	2
Single structure	12/CH3150	n/a	Y	M	2
Single structure	24/CC158	n/a	Y	M	2
Single structure	51/CH31185	n/a	Y	M	2

6 Site inspections

Site inspections were undertaken over three days between 7 January and 9 January 2019 by FFJV heritage specialists, Dr Kate Quirk (Senior Heritage Specialist) and Perri Braithwaite (Professional Heritage Specialist).

6.1 Inspection strategy

Following the process outlined in Section 3.2 and 5.4, all 13 'Priority 1' AOI were selected for inspection and of these, landholder access was granted for 10 (refer Table 6.1). The location of each of these AOI is shown in the mapping in Appendix A.

Pedestrian inspections were conducted for each of the AOI for which access was granted, and any standing structures, significant views, garden plantings, surface archaeological deposits, or areas of subsurface archaeological potential were identified and recorded using GPS, written notes and photography.




Those sites for which access was not granted were viewed from adjacent public areas, and photographs taken if possible.

Table 6.1 Calvert to Kagaru inspection areas of interest

Inspection ID	Description	Lot/Plan	Access
C2K-19-H1	Brooklands Homestead	1/RP180942	Y
C2K-19-H10	House	2/RP22586	N
C2K-19-H11	Multiple structures	77/RP218829	Y
C2K-19-H12	Dairy and creamery	4/RP186730	Y
C2K-19-H13	Homestead complex	256/CH3159	Y
C2K-19-H2	Kagaru Station	232/SP130091	N
C2K-19-H3	Kenny's Hut	22/RP908750	Y
C2K-19-H4	Hut and yards	1/SP163227	Y
C2K-19-H5	O'Neill's Hut	259/RP809310	Y
C2K-19-H6	Creamery and dairy	76/SP131580	Y
C2K-19-H7	Washpool	146/CC3359	Y
C2K-19-H8	Yards and shed	94/SP157507	Y
C2K-19-H9	House	53/SP148223	N

6.2 Inspection results

Table 6.2 Inspection results – Brooklands Homestead (C2K-19-H1)

Description		
The site of Brooklands established in 1898 (refer Section 4.2.1). Located on a rise on Lot 1/RP180942, 700 m east of Teviot Brook. The original homestead was demolished in mid-20 th century, but other original elements remain, including garden plantings and a ruined dairy.		
Current imagery	Historical imagery (1959 QAP0890113)	
		
Key elements		
Remnant plantings	Easting (GDA94 Z56)	Northing (GDA94 Z56)
Remnant garden plantings – a row of six mature bougainvillea bushes (<i>Bougainvillea sp.</i>) interspersed with later jacaranda trees (<i>Jacaranda mimosifolia</i>) along the drive (Photograph 6.1). A row of hoop pine (<i>Araucaria cunninghamii</i>) has been planted to the north. A new set of cattle yards has been constructed amongst the plantings.	492159mE	6918052mN
	492173mE	6918056mN
	492204mE	6918032mN
	492207mE	6918035mN
	492195mE	6918040mN
	492187mE	6918029mN
		
Photograph 6.1 C2K-19-H1 plantings		

Concrete slab	Easting (GDA94 Z56)	Northing (GDA94 Z56)
Small concrete slab (approximately 2 m x 2 m) adjacent to large bougainvillea bush (Photograph 6.2). Current landholders believe this may have been part of the dairy, or else a small shed (Noel Cannon pers. comm., 15 January 2019).	492192mE	6918039mN




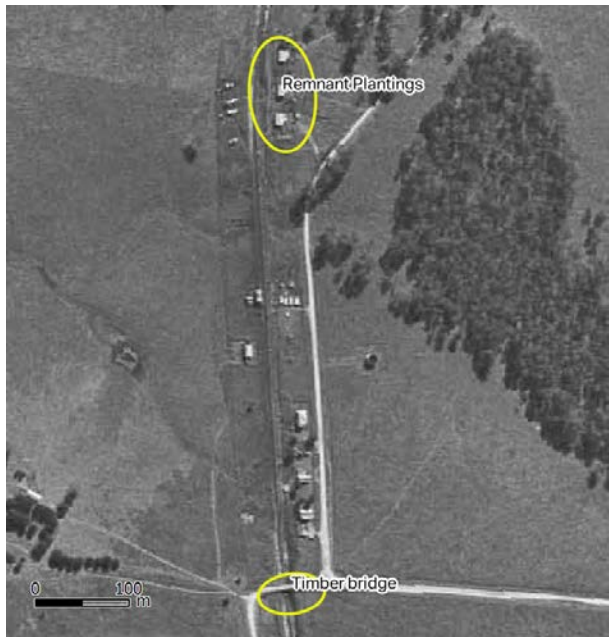

Photograph 6.2 C2K-19-H1 concrete slab

Dairy	Easting (GDA94 Z56)	Northing (GDA94 Z56)
Large concrete slab (approximately 12 m x 7 m) with low concrete walls forming two rooms (Photograph 6.3). A small fenced pen adjoins the larger of the two rooms, and a shallow concrete drain runs downhill from the northwest corner of pen. Believed to have been a dairy (Noel Cannon pers. comm., 15 January 2019), the structure is littered with a variety of building and farming refuse.	492192mE	6918039mN



Photograph 6.3 C2K-19-H1 dairy

Table 6.3 **Inspection results – Kagaru Station (C2K-19-H2)**

Description		
Location of former Kagaru Station, constructed c.1930 as a part of the Sydney to Brisbane Line (Section 4.2.1). Situated on Lot 232/SP130091, the site could not be inspected due to access and safety constraints, but a number of elements were noted from adjacent areas, including a timber road bridge, water standpipes and remnant plantings.		
Current imagery	Historical imagery (1959 QAP0890113)	
		
Key elements		
Remnant plantings	Easting (GDA94 Z56)	Northing (GDA94 Z56)
Remnant garden plantings including crepe myrtle (<i>Lagerstroemia</i> sp.) and Brazilian peppertree (<i>Schinus terebinthifolius</i>) at the far northern extent of the site (Photograph 6.4). Historical aerials show what appear to be three houses in this location.	492476mE	6918500mN
	492479mE	6918459mN
	492474mE	6918528mN
	492476mE	6918457mN
	492486mE	6918445mN
	492484mE	6918484mN
		
Photograph 6.4 C2K-19-H2 plantings		

Timber bridge	Easting (GDA94 Z56)	Northing (GDA94 Z56)
The bridge at the southern end of the Kagaru Station is part of Undullah Road, providing road access over the rail line, and appears to be a standard girder timber bridge as constructed in Queensland from 1925 onwards (Department of Main Roads 2005). The structure consists of driven timber piles surmounted by timber headstock, corbels and girders, and a plywood deck finished with bitumen (Photograph 6.5). The individual elements of the bridge are of various different ages – a result of the regular replacement of failing components – but the overall structure appears consistent with the original design.	492449mE	6917994mN



Photograph 6.5 C2K-19-H2 bridge

Standpipes	Easting (GDA94 Z56)	Northing (GDA94 Z56)
Much of the rail corridor was thickly grassed, making it difficult to identify what rail infrastructure may remain. However, two water standpipes were noted towards the middle of the former station area (Photograph 6.6). It is understood that these are linked to a large concrete tank on a hill 100m to the east (Noel Cannon pers. comm., 15 January 2019) and outside of the cultural heritage study area.	492478mE	6918097mN
	492457mE	6918419mN



Photograph 6.6 C2K-19-H2 standpipes

Table 6.4 **Inspection results – Kenny’s Hut (C2K-19-H3)**

Description

Location of site referred to as ‘Kenny’s Hut’ on a 1927 topographic map (Australian Section Imperial General Staff 1927) (refer Section 4.2.2). Discussions with nearby landholders suggest that the site continues to be known by this name to the present day (Noel Cannon pers. comm., 15 January 2019).

The site of Kenny’s Hut is located on a low-lying creek flat on the eastern side of Woollaman Creek on Lot 22/RP908750. The area is bounded to the south by an unnamed tributary of Woollaman Creek and to the north and east by a wide, shallow gully that curves around the site. This gully likely forms a lagoon during the wet season, turning Kenny’s Hut site into a small island.

No evidence of a dwelling was found at this location, but a well-built set of yards was identified, along with an isolated bottle that may mark the former hut site.

Current imagery

Historical imagery (1944 MAP1539510)

Key elements

Yards	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The yards were partly overgrown with dense lantana, but at least 9 posts could be identified, forming a circle of approximately 45 m in diameter. The posts are all of unmilled bush timber, around 2 m tall and spaced 3 m apart. Each of the posts is morticed to hold four bush timber rails, the ends of which are tenoned to fit into the posts.</p> <p>Such construction methods were in use in Australia from at least 1789, and are typical of yards, which required a sturdier barrier than the two-rail fences that generally sufficed for paddocks (Pickard 1998, 2005, 2009). However, these fences are time and resource intensive and, from the 1850s, were gradually replaced with wire and metal alternatives, before becoming obsolete in the first decades of the 20th century.</p>	485820mE	6917965mN
	485854mE	6917959mN
	485823mE	6917959mN
	485818mE	6917968mN
	485841mE	6917956mN
	485864mE	6917984mN
	485821mE	6917987mN
	485854mE	6917978mN
	485854mE	6917977mN



Photograph 6.7 C2K-19-H3 post and rail fencing



Photograph 6.8 C2K-19-H3 post and rail fencing

Isolated bottle

An isolated bottle was identified approximately 60 m south of the yards. The bottle is amber glass, two piece mould and the base is embossed with Australian Glass Manufacturers mark dated to 1912-1922 (Arnold 2002; Boow 1991). It is possible that this bottle indicates the approximate location of the former hut.

Easting (GDA94 Z56)

485856mE

Northing (GDA94 Z56)

6917889mN


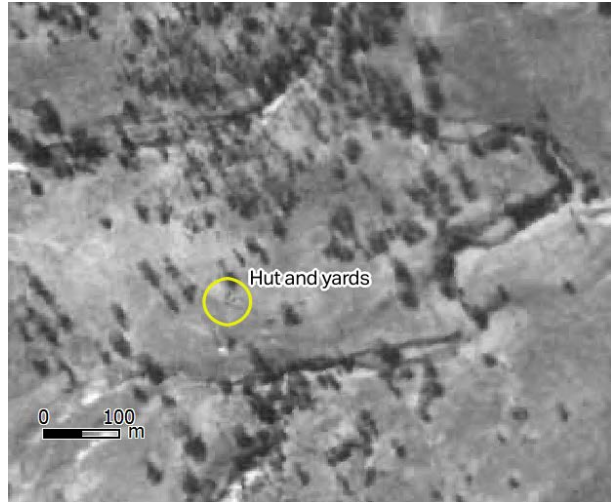




Photograph 6.9 C2K-19-H3 bottle



Photograph 6.10 C2K-19-H3 bottle base

Table 6.5 Inspection results – Hut and yards (C2K-19-H4)

Description		
<p>Location of site referred to as a ‘Stock Yard’ on a 1927 topographic map (Australian Section Imperial General Staff 1927) and as a ‘Slab Hut’ (Site 48) in the previous Jacobs report (Jacobs Group (Australia) Pty Limited 2016).</p> <p>The site is located on a creek flat approximately 200 m south of the confluence of Wild Pig Creek and Woollaman Creek on Lot 1/SP163227, and consists of a small hut, built partially of timber slabs, and a dilapidated set of yards. To the east of this complex is a 20th century metal clad shed.</p>		
Current imagery	Historical imagery (1944 MAP1539510)	
		
Key elements		
Yards	Easting (GDA94 Z56)	Northing (GDA94 Z56)
The yards are rectangular, measuring approximately 20 m x 30 m with a ramp in the south east corner. The original construction appears to have been bush timber post and four rails, suggesting an establishment date in the early 20 th century (Pickard 1998, 2005, 2009), but none of the tenoned rails remain, replaced instead by milled timber wired onto the posts.	484902mE	6917194mN
	484888mE	6917172mN
	484906mE	6917162mN
	484919mE	6917188mN
		
Photograph 6.11 C2K-19-H4 yards and ramp	Photograph 6.12 C2K-19-H4 yards	

Hut	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The hut is a small structure, measuring approximately 5 m x 6 m, and features a corrugated iron gable roof. In front of the building is a lean-to with a corrugated iron skillion roof that forms a small verandah.</p> <p>The front wall of the structure is of bush timber slabs, but the remainder is a standard timber frame constructed from a mixture of milled and unmilled timber, and clad in corrugated iron.</p>	484935mE	6917180mN



Photograph 6.13 C2K-19-H4 hut exterior


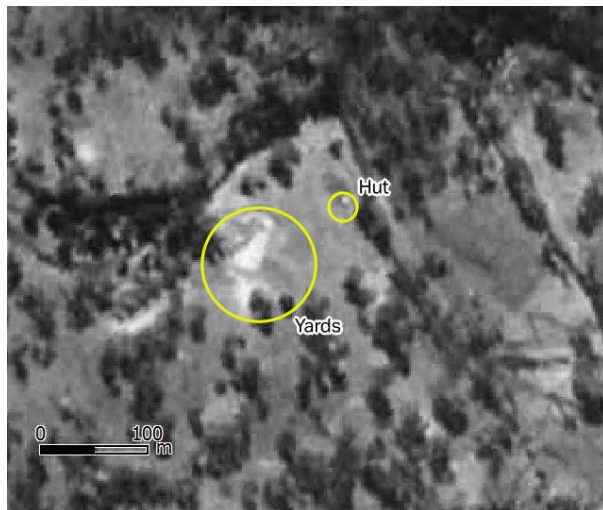




Photograph 6.14 C2K-19-H4 hut exterior



Photograph 6.15 C2K-19-H4 hut interior

Table 6.6 Inspection results – O'Neill's Hut (C2K-19-H5)

Description		
<p>Location of a site referred to as ‘O’Neill’s Hut’ on a 1927 topographic map (refer Section 4.2.2) (Australian Section Imperial General Staff 1927). Discussions with nearby landholders indicate that the site operated as a cattle yard until the late 20th century, during which time it was used by a number of local families to cooperatively muster stock (Noel Cannon pers. comm., 15 January 2019).</p> <p>The site is located on a creek flat on the southern side of Dugandan Creek. It is part of Lot 259/RP809310 and is bisected by the gazetted but unconstructed Wild Pig Creek Road. The site includes a corrugated iron clad hut and a sprawling set of yards and cattle dip. The area is littered with a variety of modern refuse, and it is possible that the remnants of other structures are located in the dense lantana that surrounds the site.</p>		
Current imagery	Historical imagery (1944 MAP1539513)	
		
Key elements		
Yards	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The yards are large and roughly rectangular, measuring approximately 75 m x 45 m, with a dip located in the south west corner (Photograph 6.16). The complex has been constructed over a long period, using a variety of materials including bush timber, milled timber, metal, and concrete (Photograph 6.17). There is no evidence of the rail and post construction seen at C2K-19-H4 and C2K-19-H3, suggesting that the extant yards are from a later period, perhaps the mid-20th century (Pickard 2005).</p>	482479mE	6917701mN
	482508mE	6917676mN
	482487mE	6917618mN
	482443mE	6917666mN
		
Photograph 6.16 C2K-19-H5 dip	Photograph 6.17 C2K-19-H5 yards and ramp	



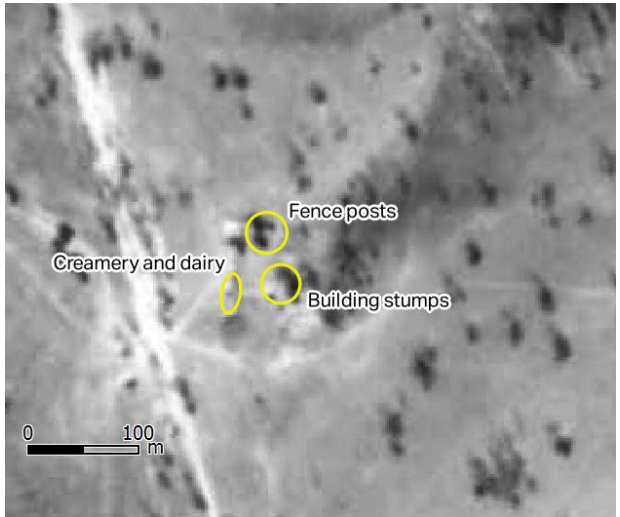



Hut	Easting (GDA94 Z56)	Northing (GDA94 Z56)
Inspection of the hut was hampered by refuse and dense vegetation, but the structure appears to be very small, approximately 4 m x 4 m, half of which is open verandah. Visible timber elements were unmilled, and the whole structure was clad in corrugated iron (Photograph 6.18).	482556mE	6917710mN
		
Photograph 6.18 C2K-19-H5 hut		

Table 6.7 Inspection results – Creamery and dairy (C2K-19-H6)

Description	
<p>Location of a structure on a 1927 topographic map (Australian Section Imperial General Staff 1927), and of a site identified as a creamery and dairy (Site 7) by the previous Jacobs report (Jacobs Group (Australia) Pty Limited 2016). At the time of the Jacobs inspection, only the creamery was standing, the dairy reportedly having been destroyed by fire.</p> <p>The site is located on a rise on Lot 76/SP131580, approximately 500 m east of Purga Creek, and includes the creamery shed, a concrete slab marking the location of the former dairy, a set of building stumps, and a row of fence posts, likely from the dairy yard. Assorted building debris was noted in low mounds to the north west of the site, suggesting that the ground surface had been scraped with earth moving equipment, possibly during a clean-up following the fire.</p>	
Current imagery	Historical imagery (1944 MAP1539489)
	

Key elements		
Dairy	Easting (GDA94 Z56)	Northing (GDA94 Z56)
The dairy site consists of an approximately 10 m x 5 m concrete slab (Photograph 6.19). A shallow drain has been formed in the northern side of the slab, and there are remnants of reinforced concrete blocks, likely used to mount equipment.	476468mE	6922125mN
		
Photograph 6.19 C2K-19-H6 dairy		
Creamery	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The creamery is a small, square structure, measuring approximately 5 m x 5 m with a corrugated iron hipped roof (Photograph 6.20, Photograph 6.21, Photograph 6.22). The building rests on timber stumps and, at some point, the sub-floor has been filled with rubble and a concrete slab laid. The frame is of milled timber, as are the walls, which feature tongue and groove interior cladding and exposed exterior stud work. As is usual for a creamery, the interior cladding does not extend the full height of the wall, leaving a gap at the top to improve ventilation. A later ceiling has been installed, possibly using asbestos-bearing materials.</p> <p>The bowl of a milk separator was noted in the corner of the building (Photograph 6.23). The rounded, kettle-like shape of the bowl is consistent with separators manufactured after 1913 (Arnold 1999)</p>	476477mE	6922139mN
		
Photograph 6.20 C2K-19-H6 creamery	Photograph 6.21 C2K-19-H6 creamery subfloor	



Photograph 6.22 C2K-19-H6 creamery interior

Photograph 6.23 C2K-19-H6 milk separator bowl

Building stumps

A collection of six building stumps were identified 30 m east of the creamery, forming a building approximately 8 m x 10 m. There is no indication of what type of building originally stood here, but it was likely associated with the adjacent dairy.

Easting (GDA94 Z56)

Northing (GDA94 Z56)

476517mE

6922146mN

476515mE

6922148mN

476507mE

6922145mN

476522mE

6922144mN

476508mE

6922144mN

476508mE

6922144mN



Photograph 6.24 C2K-19-H6 building stumps

Fence posts

Three fence posts were noted 50 m north of the creamery, all of which had been colonised by a species of strangler fig (*Ficus sp.*). The size of the figs suggests that the fence posts had been in place for some time, and were likely contemporaneous with the dairy and creamery.

Easting (GDA94 Z56)

Northing (GDA94 Z56)

476507mE

6922186mN

476509mE

6922192mN

476495mE

6922194mN


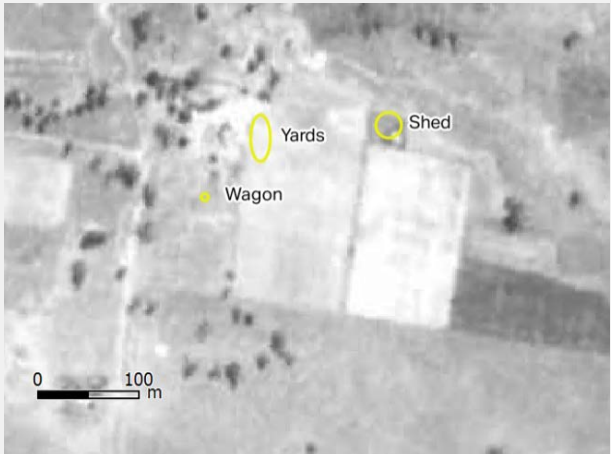



Photograph 6.25 C2K-19-H6 fence post

Table 6.8 Inspection results – Washpool (C2K-19-H7)

Description	
<p>Location of site referred to as 'The Washpool' on a 1927 topographic map, and of cluster of buildings shown on a 1944 aerial photograph (refer Section 4.2.3) (Australian Section Imperial General Staff 1927).</p> <p>The site is located across Lots 146/CC3359 and 1/RP22592 on the low-lying flats 100 m north of Purga Creek and is most likely a relict creek line. No evidence of historical structures or other heritage items was identified during the survey. This is possibly a factor of the flood-prone nature of the land, which has been subject to regular inundation and subsequent recovery efforts.</p>	
Current imagery	Historical imagery (1944 MAP1539489)

Table 6.9 Inspection results – Yards and shed (C2K-19-H8)

Description		
<p>Location of a structure on a 1927 topographic map (Australian Section Imperial General Staff 1927), and of a site identified as a possible dairy (Site 79) by the previous Jacobs report (Jacobs Group (Australia) Pty Limited 2016). Due to access constraints, Jacobs was not able to inspect the area.</p> <p>The site is located on Lot 94/SP157507, in a low lying area 1 km east of Purga Creek, and 50 m south of an unnamed intermittent creek. Key elements noted include a large hay shed, a set of yards, and the remains of a horse-drawn wagon. A modern metal-clad shed is located to the south of the yards.</p>		
Current imagery	Historical imagery (1944 MAP1539489)	
		
Key elements		
Shed	Easting (GDA94 Z56)	Northing (GDA94 Z56)
The shed is a large structure, measuring approximately 8 m x 10 m, and is constructed from a mixture of milled and unmilled timber, clad in corrugated iron. The size and shape of the shed suggests it may have been used for storing hay, and historical aerial imagery (MAP1539489) indicates it has been on the site since at least 1944.	475912mE	6925452mN
		
Photograph 6.26 C2K-19-H8 shed		

Yards	Easting (GDA94 Z56)	Northing (GDA94 Z56)
The yards are partly collapsed and overgrown with lantana, but appear to measure approximately 6 m x 20 m. The posts are extremely sturdy, and feature the morticing associated with post and rail fencing, a construction method which generally dates to before WWII (Pickard 2005). A few of the original rails remain on the southern side of the yards. In more recent times, the yards appear to have been converted into a small animal enclosure. No evidence was found of a dairy or other structures.	475784mE	6925455mN
	475784mE	6925444mN
	475785mE	6925439mN
	475786mE	6925433mN



Photograph 6.27 C2K-19-H8 yards

Wagon	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The remains of a horse-drawn wagon are located 70 m south west of the yards. The wagon is in a state of advanced dilapidation, and the leather and many of the wooden elements have perished. However, the vehicle appears to have decayed in place, and many metal components, including wheel rims and suspension, remain.</p> <p>The bed of the wagon has been enclosed with a timber frame clad in red-painted metal, the interior of which has been horizontally divided by a wooden shelf. There are doors located on the rear and both sides of the wagon, and it was likely a delivery vehicle for perishable goods, such as bread or milk. The interior of the wagon is now filled with refuse, most of which dates to the late 20th century.</p>	475730mE	6925381mN



Photograph 6.28 C2K-19-H8 wagon

Table 6.10 Inspection results – House (C2K-19-H9)

Description		
Location of multiple structures shown on 1927 topographic map (Australian Section Imperial General Staff 1927). The site on Lot 53/SP148223 could not be inspected due to access constraints, but it would appear to contain a house and a number of out-buildings.		
Current imagery	Historical imagery (1944 MAP1539443)	
		
Key elements		
House	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The house is a large structure clad in weatherboards with a corrugated iron roof, and appears to have been constructed in at least two phases, with a rectangular rear wing added to an earlier building.</p> <p>The earlier building, now the front half of the house, features a hipped, pyramid roof with a stepped, convex roofed verandah on at least three sides. Such designs were generally constructed in the late colonial period, from the 1880s to the turn of the century (Rechner 1998).</p> <p>Aerial imagery (1970 QAP209815) suggests the later extension was added in the 1960s, which is consistent with the casements windows on this part of the building. During these renovations, the roofline was reconfigured, making the original roof a transverse hip, and the entire structure was reclad. The current roof cladding is in very good condition, suggesting that it has since been replaced at least once.</p>	475511mE	6925173mN
		
Photograph 6.29 C2K-19-H9 house		

Table 6.11 Inspection results – House (C2K-19-H10)


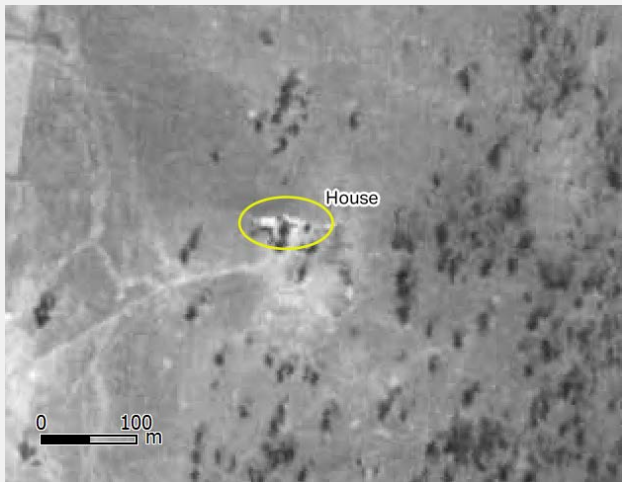







Description		
Location of multiple structures shown on 1928 topographic map (Australian Section Imperial General Staff 1928). The site on Lot 22/RP22586 could not be inspected due to access constraints, but it would appear to contain a house and a number of out-buildings.		
Current imagery	Historical imagery (1944 MAP1539443)	
		
Key elements		
House	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>From what could be observed from nearby public areas, the house would appear to be a wooden structure with a hipped roof which is gabled on the northern façade, and extends over an enclosed verandah on the southern side (Photograph 6.30). Windows appear to be casements, and the front door to be partially glazed French doors. This design is consistent with that of the ‘Bungalow with L-shaped verandah’ which was common in Queensland from 1900-1930 (Rechner 1998).</p> <p>The roof cladding appears in good condition, showing few signs and corrosion, and suggesting that it has been replaced at least once since the building was constructed.</p>	475849mE	6927487mN
		
Photograph 6.30 C2K-19-H10 House		

Table 6.12 Inspection results – Multiple structures (C2K-19-H11)

Description		
<p>Location of a structure on a 1927 topographic map (Australian Section Imperial General Staff 1927), and of a site identified as a Homestead Complex (Site 68) by the previous Jacobs report (Jacobs Group (Australia) Pty Limited 2016).</p> <p>The site is located on Lot 77/RP218829, in a low-lying area 2 km east of Purga Creek and features 12 buildings ranging from large sheds to small huts. Analysis of historical aerials suggests that only two of these buildings – the Creamery and House 1 – are original to the site.</p> <p>The remainder of the buildings have been constructed on or relocated to the site since the late 1960s. This interpretation was borne out by the site inspection, during which some buildings were noted to be blocking the entrances to others.</p>		
Current imagery		
		
Key elements		
Creamery	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The creamery is of very similar construction to that at C2K-19-H6, measuring approximately 4.5 m x 4.5 m, with a corrugated iron hipped roof. The frame is of milled timber, the cladding of weather boards, and the floor is concrete. There is a concrete block to one side of the floor that appears to have been used to mount machinery – likely the milk separator. As noted, the creamery appears to be one of only two pre-1940s building at the site, and it is in poor condition.</p> <p>A ship's tank has been placed on the northern side of the building to act as a rainwater tank.</p>	474369mE	6929878mN
		
Photograph 6.31 C2K-19-H11 creamery exterior	Photograph 6.32 C2K-19-H11 creamery interior	

Shed 1, 2, 3 and 4		Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>Sheds 1-4 are all large structures, suitable for hay or machinery storage, framed with a mixture of milled and unmilled timber, and clad in corrugated iron. Aerial imagery suggests Sheds 1, 2 and 4 were built in the 1960s (QAP0798073, QAP2066013), and Shed 3 in the 1970s (QAP28841172). All of the buildings appear to be structurally sound, although the cladding is failing or missing in a number of locations.</p>		474353mE	6929871mN
		474335mE	6929882mN
		474387mE	6929870mN
		474383mE	6929859mN
			
Photograph 6.33 C2K-19-H11 shed 4 exterior		Photograph 6.34 C2K-19-H11 shed 1 interior	
House 1		Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>House 1 is a small, single room timber framed building clad in weatherboards and featuring a corrugated iron gable roof, and measures approximately 5 m x 7 m. A skillion-roofed stove alcove extended from the northern side of the building. The building currently rests on small wooden stacks, suggesting that restumping or relocation was planned. Most of the windows have been removed, the glazing replaced with corrugated iron, and the building is in poor condition.</p> <p>As noted, House 1 appears to be one of only two pre-1940s building at the site.</p>		474336mE	6929903mN
			
Photograph 6.35 C2K-19-H11 house1 exterior			
Shed 5 and 6		Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>Sheds 5 and 6 are small structures with frames of milled and unmilled timber, and clad in corrugated iron. Both appear to have been used most recently as animal shelters. Aerial imagery suggests Shed 5 was constructed in the early 1970s, and Shed 6 in the late 1970s or early 1980s. Given the mixture of construction materials, it seems likely both were built at least partly from materials scavenged from the site or elsewhere.</p>		474306mE	6929903mN
		474307mE	6929912mN



Photograph 6.36 C2K-19-H11 shed 5 exterior



Photograph 6.37 C2K-19-H11 shed 6 exterior

House 2

House 2 is located in a small space next to Shed 1, which partly blocks the entrance to the dwelling. The building is timber framed, with a corrugated iron gable roof, and measures some 5 m x 6 m. The original cladding was of weatherboards, but these have been replaced in several places with sheeting. The building is in very poor condition.

Aerial imagery suggests the building was built or moved to this location in the early 1970s (QAP28841172).

Easting (GDA94 Z56)

474362mE

Northing (GDA94 Z56)

6929867mN



Photograph 6.38 C2K-19-H11 house 2 exterior

Shed 7

Shed 7 is of similar size, construction and era to Sheds 5 and 6, featuring a frame of milled and unmilled timber, and corrugated iron cladding. While Sheds 5 and 6 were used as animal shelters, however, Shed 7 was the site of a makeshift forge made from a ship's tank.

Easting (GDA94 Z56)

474318mE

Northing (GDA94 Z56)

6929911mN



Photograph 6.39 C2K-19-H11 shed 7 exterior



Photograph 6.40 C2K-19-H11 shed 7 interior

Cattle dip

The cattle dip consists of a narrow, deep, concrete lined channel, over which a milled timber and corrugated iron structure has been erected. A small set of yards are located at the northern end. Historical aerals suggest the dip was constructed in the early 1970s (QAP28841172).

Easting (GDA94 Z56)

474302mE

Northing (GDA94 Z56)

6929884mN



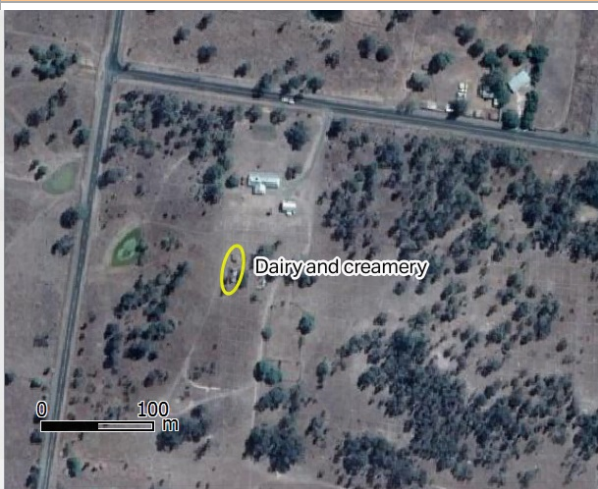
Photograph 6.41 C2K-19-H11 dip exterior

Table 6.13 Inspection results – Dairy and creamery (C2K-19-H12)

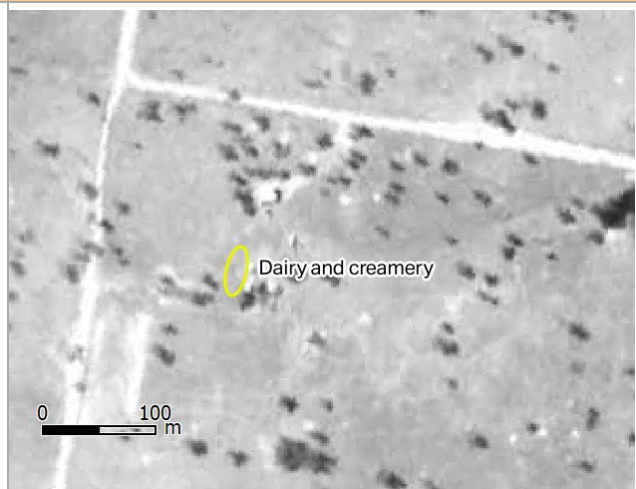
Description

The location of two structures on a 1928 topographic map (Australian Section Imperial General Staff 1928), the site is located on a rise on Lot 4/RP186730. Key elements include the remains of a possible dairy and creamery. A modern house is located 70 m to the north of the site, and a modern set of yards 40 m to the south east.

Current imagery



Historical imagery (1948 SVY04305029)



Key elements		
Creamery	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The creamery is of a slightly different construction to that identified at C2K-19-H11 and C2K-19-H6, featuring a gable rather than hipped roof. However, the overall size is very similar – 4.5 m x 4.5 m – as is the concrete floor, internal tongue and groove internal cladding and the exposed exterior studs. As with the other creameries, the wall cladding does not extend the full height of the structure, leaving a gap for ventilation under the eaves.</p> <p>At some point, a skillion roof has been added to the western side of the building, creating a lean-to. The overall structure is in fair condition.</p>	461155mE	6936980mN



Photograph 6.42 C2K-19-H12 creamery

Dairy	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The likely dairy is a long structure, measuring some 10 m x 4 m, and appears to have been constructed in two distinct phases (Photograph 6.43). The earliest phase is that of a slab hut, which occupies what is now the southern-most half of the building (Photograph 6.44). Pieces of slab walling remain on both the southern and northern sides of the original hut (the latter now being an internal wall) (Photograph 6.45).</p> <p>At some later point, the building has been extended, creating the current 10 m length, and the floor of the original hut in-filled with concrete. The extension features a milled timber frame with weatherboards, and the whole structure has a corrugated iron gable roof.</p> <p>Given the presence of the nearby creamery (and the prevalence of dairying in this area) it seems likely that the renovation of the slab hut was undertaken to convert the space into a dairy. The structure is in poor condition.</p>	461155mE	6936966mN



Photograph 6.43 C2K-19-H12 dairy exterior



Photograph 6.44 C2K-19-H12 dairy exterior



Photograph 6.45 C2K-19-H12 dairy interior

Table 6.14 Inspection results – Homestead complex (C2K-19-H13)

Description	
<p>The location of two structures on a 1928 topographic map (Australian Section Imperial General Staff 1928) (refer Section 4.2.4), and of a site identified as a Butchery (Site 87) in the previous Jacobs report (Jacobs Group (Australia) Pty Limited 2016). The landholder indicated that a homestead had been located in this area, but had burnt down (Mr Hopper pers. comm., 15 January 2019).</p> <p>The site is located on Lots 157/CH3159 and 256/CH3159, on either side of a gazetted but unconstructed section of Paynes Road. The site is predominately archaeological in nature, with four main zones noted:</p> <ul style="list-style-type: none"> ■ Dairy and yard ■ Cattle yards and crush ■ Possible house site ■ Possible shed site. <p>In addition, the area surrounding these main zones features remnants of post and rail fencing, as well as notable items of rural industry, including vernacular molasses troughs and a re-purposed boiler tank.</p> <p>No evidence of a butchery or slaughterhouse was identified.</p>	
Current imagery	Historical imagery (1948 SVY04305029)

Key elements

Dairy and yard	Easting (GDA94 Z56)	Northing (GDA94 Z56)
<p>The dairy is located on 256/CH3159, on the northern side of Paynes Road, and consists of a concrete slab approximately 9 m x 5 m, with a long concrete drain running downhill from the south east corner (refer also C2K-19-H1). Milled and unmilled timber has been used to create an enclosure, and possible milking bail at the western end (Photograph 6.46). The eastern end appears to have been more open, and the remains of a milk separator – including both centrifugal pump and bowl – were identified in this area (Photograph 6.47). The kettle-like shape of the bowl is consistent with separators manufactured after 1913 (Arnold 1999) while the pump, manufactured by Kelly & Lewis Ltd, dates to after 1940 (Moore n.d.). Aerial imagery indicates that the dairy was standing, and possibly in use, into the 1980s.</p> <p>The dairy is surrounded by the remains of a post and rail yard, a type of construction that generally dates to before WWII (Pickard 2005) Photograph 6.48. The fence extends 10 m to the north of the dairy, 15 m to the south, and 30 m to the east. A gate and area of sandstone paving is located in the centre of the eastern fence (Photograph 6.49).</p>	459917mE	6937351mN



Photograph 6.46 C2K-19-H13 dairy



Photograph 6.47 C2K-19-H13 milk separator



Photograph 6.48 C2K-19-H13 post and rail fence



Photograph 6.49 C2K-19-H13 gate

Cattle yards and crush	Easting (GDA94 Z 56)	Northing (GDA94 Z56)
The cattle yards and crush are located 20 m south of the dairy, on the opposite side of Paynes Road (Photograph 6.50, Photograph 6.51). The yard measures 20 m x15 m and features a combination of post and rail and wire fencing. The cattle crush, which is located at the western end of the yard, similarly mixes old and new building methods.	459912mE	6937314mN



Photograph 6.50 C2K-19-H13 crush





Photograph 6.51 C2K-19-H13 yard

Possible house site	Easting (GDA94 Z56)	Northing (GDA94 Z56)
The possible house site is marked by a wide array of building, domestic and garden remnants (Photograph 6.52). These include housing stumps and an area of sandstone paving, bed frames and parts of a refrigerator, bougainvillea bushes and peppertrees (<i>Schinus molle</i>).	459856mE	6937304mN



Photograph 6.52 C2K-19-H13 possible house site

Possible shed site	Easting (GDA94 Z56)	Northing (GDA94 Z56)
The possible shed site is marked by peppertree, two slightly raised earthen pads, a number of building stumps and posts, and an array of metal artefacts, including the suspension from a cart or wagon (Photograph 6.53, Photograph 6.54).	459889mE	6937280mN
		
Photograph 6.53 C2K-19-H13 possible shed site	Photograph 6.54 C2K-19-H13 suspension	
Boiler tank	Easting (GDA94 Z56)	Northing (GDA94 Z56)
A large boiler tank, measuring some 6 m, is located to the south of the site, next to a dam, and was likely used to provide water to the nearby yards (Photograph 6.55).	459918mE	6937248mN
		
Photograph 6.55 C2K-19-H13 boiler tank		

Makeshift troughs	Easting (GDA94 Z56)	Northing (GDA94 Z56)
Two troughs, made from hollow logs capped with concrete, were noted to the east of the dairy yard (Photograph 6.56). It seems likely that these were used to provide cattle with molasses, a drought relief food (Alexander 1978). A more typical molasses delivery apparatus – a drum lick – was noted in another paddock (Photograph 6.57).	459964mE	6937301mN
		
Photograph 6.56 C2K-19-H13 trough	Photograph 6.57 C2K-19-H13 drum lick	

7 Significance assessment

An assessment against significance criteria is provided for each site in accordance with the methodology outlined in Section 3.3. This assessment is summarised in Table 7.1, and detailed in the following sections.

Table 7.1 Summary assessment indicating threshold of significance

Site	A – historical	B – rarity	C – research	D – representativeness	E – aesthetic	F – creative/technical	G – social	H – associational
C2K-19-H1	Local	Not met	Not met	Not met	Not met	Not met	Not met	Not met
C2K-19-H10	Local	Not met	Not met	Not met	Not met	Not met	Not met	Not met
C2K-19-H11	Not met	Not met	Not met	Not met	Not met	Not met	Not met	Not met
C2K-19-H12	Local	Local	Local	Not met	Not met	Local	Not met	Not met
C2K-19-H13	Local	Not Met	Local	Not met	Not met	Not met	Not met	Not met
C2K-19-H2	Local	Not met	Local	Not met	Not met	Not met	Not met	Not met
C2K-19-H3	Local	Local	Local	Not met	Not met	Not met	Not met	Not met
C2K-19-H4	Local	Local	Local	Not met	Not met	Not met	Not met	Not met
C2K-19-H5	Local	Not met	Local	Not met	Not met	Local	Local	Not met
C2K-19-H6	Local	Not met	Local	Local	Not met	Not met	Not met	Not met
C2K-19-H7	Not met	Not met	Not met	Not met	Not met	Not met	Not met	Not met
C2K-19-H8	Not met	Not met	Not met	Not met	Not met	Not met	Not met	Not met
C2K-19-H9	Local	Not met	Not met	Not met	Not met	Not met	Not met	Not met

Table 7.2 Significance assessment – Brooklands Homestead (C2K-19-H1)

Criterion	Assessment	Threshold
A – historical	The Brooklands Homestead site demonstrates some of the principal historical themes of the local area, including initial pastoral settlement as part of the Bromelton pastoral run, subsequent subdivision for closer settlement, and the early 20 th century experimentation with dairying.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	No elements of the Brooklands Homestead site are known to be rare or unusual.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	Given the removal of the original homestead and subsequent building activities, the potential for archaeological remains is considered low.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	The removal of the original homestead and the ruined state of the dairy means that the Brooklands Homestead site is not a good representative of its type.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The original Brooklands Homestead was well-sited on a hill top overlooking the surrounding pastoral land. However, this aesthetic value has been diminished by the homestead's removal.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The Brooklands Homestead site does not contain any elements of known technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State

Criterion	Assessment	Threshold
G – social	The original Brooklands Homestead was a noted hub for the local community in the early part of the 20 th century. However, this function has not continued to the present day, and the site is of no known social significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The Brooklands Homestead site does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	2.3 pastoral activities	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.3 Significance assessment – Kagaru Station (C2K-19-H2)

Criterion	Assessment	Threshold
A – historical	Kagaru Station is of historical significance as local representation of the Sydney to Brisbane Rail Line, the first single gauge railway to connect Queensland and NSW. This line obviated the need for passengers and freight to change trains at the border, facilitating better local, regional and inter-regional transport and industry links.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	Timber road bridges such as that at the southern extent of Kagaru Station are becoming increasingly rare on the Queensland network. Further assessment is required to determine the degree of this rarity.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is good potential for archaeological remains related to railway activities and associated domestic contexts to be preserved at Kagaru Station.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	The timber road bridge at the southern extent of Kagaru Railway Station appears to be in good condition and is a good representative of its type.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	Kagaru Station has no known aesthetic significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	Kagaru Station does not contain any elements of known technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	Kagaru Station does not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	Kagaru Station does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	3.4 developing economic links outside Queensland 5.3 using rail	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.4 Significance assessment – Kenny’s Hut (C2K-19-H3)

Criterion	Assessment	Threshold
A – historical	Kenny’s Hut is of historical significance as a representation of the pastoral industry that dominated the local economy throughout the 19 th and 20 th centuries.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	The post and rail construction method used for the yard was largely abandoned in the middle of the 20 th century and standing examples of the fences are becoming rare.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is some potential for archaeological remains related to pastoral activities and associated domestic contexts to be preserved at Kenny’s Hut.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	Kenny’s Hut is not sufficiently intact to be a good representative of its type.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	Kenny’s Hut site has no known aesthetic significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	Kenny’s Hut site does not contain any elements of known technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	Kenny’s Hut site does not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	Kenny’s Hut site does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	2.3 pastoral activities	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.5 Significance assessment – Hut and yards (C2K-19-H4)

Criterion	Assessment	Threshold
A – historical	The hut and yards are of historical significance as a representation of the pastoral industry that dominated the local economy throughout the 19 th and 20 th centuries.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	The slab construction used in the hut is a rare example of an early building technique.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is some potential for archaeological remains related to pastoral activities and associated domestic contexts to be preserved at the hut and yards.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	The hut and yards are not sufficiently intact to be a good representative of their type.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The hut and yards have no known aesthetic significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State

Criterion	Assessment	Threshold
F – creative/technical	The hut and yards site does not contain any elements of known technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The hut and yards does not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The hut and yards does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	2.3 pastoral activities 6.4 dwellings	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.6 Significance assessment – O'Neill's Hut (C2K-19-H5)

Criterion	Assessment	Threshold
A – historical	The O'Neill's Hut site is of historical significance as a representation of the pastoral industry that dominated the local economy throughout the 19 th and 20 th centuries. However, the site's ability to represent this history is lessened by its relatively recent construction, which would appear to date to the late rather than early 20 th century.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	No elements of the O'Neill's Hut site are known to be rare.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is some potential for archaeological remains related to pastoral activities and associated domestic contexts to be preserved at O'Neill's Hut site.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	O'Neill's Hut and the associated yards appear to be highly idiosyncratic in construction and layout and are not a good representation of type.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The O'Neill's Hut site has no known aesthetic significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The yards at the O'Neill's Hut site appear to have been built in several stages, using a variety of materials and approaches, and have the potential to provide insight into vernacular, <i>ad hoc</i> construction methods.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
G – social	O'Neill's Hut has some social significance as the site of cooperative mustering drives in the late 20 th century.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The hut and yards does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	2.3 pastoral activities	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.7 Significance assessment – Creamery and dairy (C2K-19-H6)

Criterion	Assessment	Threshold
A – historical	The creamery and dairy site is of historical significance as a representation of the rapid expansion of dairying in the local area in the late 19 th and early 20 th centuries.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	No elements of the creamery and dairy site are known to be rare.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is some potential for archaeological remains related to dairying activities to be preserved at the creamery and dairy site.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	Although the creamery is in poor condition, it is one of the more intact examples noted in the cultural heritage study area, and is a good representative of its type.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The creamery and dairy has no known aesthetic significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The creamery and dairy do not contain any elements of known technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The creamery and dairy do not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The creamery and dairy does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	2.3 pastoral activities 3.1 feeding Queenslanders	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.8 Significance assessment – Washpool (C2K-19-H7)

Criterion	Assessment	Threshold
A – historical	The Washpool may have an association with the early sheep industry, and with the late 19 th century cotton industry, but there is insufficient historical or archaeological evidence to confirm this.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	N/A	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	Given the removal of the buildings and subsequent disturbance, the potential for archaeological remains is considered low.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	N/A	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The Washpool has no particular aesthetic value.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State

Criterion	Assessment	Threshold
F – creative/technical	N/A	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The Washpool does not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The Washpool does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	None	
Overall significance		<input checked="" type="checkbox"/> None <input type="checkbox"/> Local <input type="checkbox"/> State

Table 7.9 Significance assessment – Yards and shed (C2K-19-H8)

Criterion	Assessment	Threshold
A – historical	The structures at C2K-19-H8 have the potential to be related to the pastoral industry, but there is insufficient historical or physical evidence to confirm the nature or extent of association.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	The remains of the delivery wagon have the potential to be rare, although this rarity is diminished by the poor condition.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	The removal of many of the early buildings on the site, combined with subsequent construction activities suggests the potential for archaeological remains is low.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	The structures at C2K-19-H8 are not sufficiently intact to be a good representative of type.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The structures at C2K-19-H8 have no particular aesthetic value.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The structures at C2K-19-H8 do not contain any known elements of technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The structures at C2K-19-H8 do not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The structures at C2K-19-H8 not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	None	
Overall significance		<input checked="" type="checkbox"/> None <input type="checkbox"/> Local <input type="checkbox"/> State

Table 7.10 Significance assessment – House (C2K-19-H9)

Criterion	Assessment	Threshold
A – historical	The house is of some historical significance as a late 19 th century dwelling.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	The house has no known rarity values.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	The extensive renovations suggest the potential for archaeological remains is low.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	There is insufficient information about the house to determine its representatives.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The house has no known aesthetic values	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The house has no known creative or technical values.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The house has no known social value.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The house has no known special association with the life or work of a particular person, group or organisation of importance in Queensland's history.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	6.4 dwellings	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.11 Significance assessment – House (C2K-19-H10)

Criterion	Assessment	Threshold
A – historical	The house is of some historical significance as an early 20 th century dwelling.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	The house has no known rarity values.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is some potential for archaeological remains related to early 20 th century domestic life to be preserved in, under and around the residence, but these are considered unlikely to contribute new or important information about the area.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	There is insufficient information about the house to determine its representatives.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The house has no known aesthetic values	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State

Criterion	Assessment	Threshold
F – creative/technical	The house has no known creative or technical values.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The house has no known social value.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The house has no known special association with the life or work of a particular person, group or organisation of importance in Queensland's history.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	6.4 dwellings	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.12 Significance assessment – Multiple structures (C2K-19-H11)

Criterion	Assessment	Threshold
A – historical	The structures at C2K-19-H11 have the potential to be related to the pastoral industry, but there is insufficient historical or physical evidence to confirm the nature or extent of association.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	No elements of C2K-19-H11 are known to be rare.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	The removal of many of the early buildings on the site, combined with subsequent construction/relocation activities suggests the potential for archaeological remains is low.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	The structures at C2K-19-H11 are not sufficiently intact to be a good representative of type.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The structures at C2K-19-H11 have no particular aesthetic value.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The structures at C2K-19-H11 do not contain any known elements of technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The structures at C2K-19-H11 do not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The structures at C2K-19-H11 not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	None	
Overall significance		<input checked="" type="checkbox"/> None <input type="checkbox"/> Local <input type="checkbox"/> State

Table 7.13 Significance assessment – Dairy and creamery (C2K-19-H12)

Criterion	Assessment	Threshold
A – historical	The creamery and dairy at C2K-19-H12 are of historical significance as a representation of the rapid expansion of dairying in the local area in the late 19 th and early 20 th centuries. The dairy, which has been remodelled from a slab hut, has the potential to represent earlier phases of settlement.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	The slab construction used in the older part of the dairy is a rare example of an early building technique.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is good potential for archaeological remains related to dairying and perhaps domestic activities at the site. This potential is particularly high at the dairy, which is an older, repurposed building, and where the later concrete floor may have sealed deposits <i>in situ</i> .	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	The structures at C2K-19-H12 are not sufficiently intact to be a good representative of type	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
E – aesthetic	The creamery and dairy have no known aesthetic significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The dairy appears to have been built in at least two stages, using a variety of materials and approaches, and have the potential to provide insight into vernacular, <i>ad hoc</i> construction methods.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
G – social	The creamery and dairy do not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The creamery and dairy does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	2.3 pastoral activities 3.1 feeding Queenslanders 6.4 dwellings	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

Table 7.14 Significance assessment – Homestead complex (C2K-19-H13)

Criterion	Assessment	Threshold
A – historical	The homestead complex, which includes dairy, yards and domestic areas, is of historical significance as a representation of the pastoral and dairying industry that dominated the local economy throughout the 19 th and 20 th centuries.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
B – rarity	There is not enough information currently available about the site to determine its rarity.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
C – research	There is good potential for archaeological remains related to domestic, pastoral and dairying activities at the site. The potential for deposits to remain <i>in situ</i> is considered high given that the original homestead burnt down in the early 20 th century, and the site has not been redeveloped.	<input type="checkbox"/> Not met <input checked="" type="checkbox"/> Local <input type="checkbox"/> State
D – representativeness	The homestead complex is not sufficiently intact to be a good representative of its type.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State

Criterion	Assessment	Threshold
E – aesthetic	The homestead complex has no known aesthetic significance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
F – creative/technical	The homestead complex does not contain any known elements of technical or creative merit.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
G – social	The homestead complex does not have any known social significance to any community.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
H – associational	The homestead complex does not have any known special association with person or group of people of historical importance.	<input checked="" type="checkbox"/> Not met <input type="checkbox"/> Local <input type="checkbox"/> State
Historical themes	2.3 pastoral activities 6.4 dwellings	
Overall significance		<input type="checkbox"/> None <input checked="" type="checkbox"/> Local <input type="checkbox"/> State

8 Potential impacts and impact mitigation

Potential Project impacts on heritage sites identified in Section 5.4 have been assessed.

Initial assessments included the mitigation measures listed in Table 8.1 which have been factored into the Project.

These measures aim to avoid or minimise impacts to cultural heritage, and therefore contribute to a lowering of the initial significance rating for impacts on cultural heritage.

Table 8.1 Initial mitigations of relevance to cultural heritage

Aspect	Initial mitigation measures
All heritage	<p>The design has responded to the recommendations of the cultural heritage assessment. For example, in the Teviot Range area the alignment has moved approximately 1.5 km north of the original SFRC corridor to reduce the potential for heritage impacts on known cultural heritage sites (Rocky Pool) following consultation with the Traditional Owners and a multi-criteria analysis. The new alignment also reduces the impact on environmentally sensitive sites which include protected vegetation and habitats.</p> <p>The Project extents are minimised to avoid impacts to previously undisturbed areas as far as practicable.</p>

Potential additional mitigation measures proposed to be implemented during subsequent Project phases (for example, detailed design, construction and operational phases) are presented in Section 8.5 and the potential impact on heritage values reassessed.

A discussion of the impact assessment methodology is provided in Section 3.4.

8.1 Project activities

Activities proposed as part of the Project have been categorised into four phases; pre-construction, construction, commissioning and reinstatement, operation and decommissioning. A description of Project related activities is provided in Table 8.2.

Table 8.2 Description of Project related activities associated with construction, commissioning and reinstatement, operation, and decommissioning phase

Phase	Infrastructure activity	Description of activities
Pre-construction, Construction	Site preparation	Vegetation clearing
		Topsoil stripping
		Construction of temporary site compounds
		Construction of rail access roads
		Installation of boreholes and construction water
		Installation of offices, hardstands etc
		Stockpiling
	Utility diversions	Excavation
		Trenching
		Modification, diversion and realignment of utilities and associated infrastructure
	Drainage	Culvert installation
	Structures	Construction of bridges over main waterways
		Road/rail bridge construction

Phase	Infrastructure activity	Description of activities
	Civil works	Cutting construction
		Embankment construction using cut to fill from rail alignment and borrow to fill from external borrow sources, where required
		Construction of temporary haul roads
		Drainage controls
	Road works	Road realignment
		Construction of permanent rail maintenance access roads
	Rail logistics	Sleeper stockpiling
		Rail stockpiling
	Rail construction	Drilling
		Blasting
		Ballast installation
		Sleeper placement
		Rail placement
		Installation train signals and communications infrastructure
		Demobilising site compounds
	Tunnel construction	Removal of construction material and waste
		Roadheader excavation
		Removal of redundant structures
		Decommissioning work site signs
		Decommissioning access roads
	Signals and communications installation	Forming and stabilising of spoil mounds
		Removal of temporary fencing
Commissioning and reinstatement	Demobilisation/ Decommissioning	Establish permanent fencing
		Restoration of disturbed areas, including revegetation where required
	Spoil mounds	Conversion of haul roads and construction access roads into permanent roads
	Restoration	Minor maintenance works
	Rail works	Bridge and culvert inspections
		Sleeper replacement
		Rail welding
		Rail grinding
		Ballast dropping
		Track tamping
		Major periodic maintenance
Operation	Train operations	Train movement along rail
	Operational maintenance	Ongoing vehicle movement within rail corridor
Decommissioning	Trains decommissioned	Decreased vehicle movement within rail corridor

8.2 Assessing sensitivity

The degree of impact an activity will have on a heritage place is partly a factor of the place's heritage significance: the more significant a place is, the more sensitive it will be to change (refer Section 3.4). An assessment of the sensitivity of each heritage place with the cultural heritage study area is provided in Table 8.3 in accordance with the methodology provided in Section 3.4.

Table 8.3 Sensitivity of identified heritage sites

Site ID	Description	Significance	Number of criteria met	Sensitivity
C2K-19-H1	Brooklands Homestead	Local	1	Low
C2K-19-H10	House	Local	1	Low
C2K-19-H13	Homestead complex	Local	2	Moderate
C2K-19-H5	O'Neill's Hut	Local	4	Moderate
C2K-19-H6	Creamery and dairy	Local	3	Moderate
C2K-19-H12	Dairy and creamery	Local	4	Moderate
C2K-19-H7	Washpool	None	None	Negligible
C2K-19-H9	House	Local	1	Low
C2K-19-H8	Yards and shed	None	None	Negligible
C2K-19-H11	Multiple structures	None	None	Negligible
C2K-19-H3	Kenny's Hut	Local	3	Moderate
C2K-19-H2	Kagaru Station	Local	2	Moderate
C2K-19-H4	Hut and yards	Local	3	Moderate

8.3 Potential impacts and magnitude of change

Potential impacts on heritage sites can be divided into two main types: direct and indirect. Direct impacts occur if a heritage place or site is located directly in a development area and/or would be physically impacted by development. Such impacts include the demolition or substantial alteration of a building, or the disturbance of an archaeological site. Indirect impacts, alternatively, are those that alter the surrounding physical environment in such a way that a heritage place or site is affected. Indirect impacts might include extra vibration from construction activities or subsequent traffic load, as well as additional water runoff or sediment deposition due to changing hydrology. The effects of direct or indirect impacts are measured in terms of the extent to which they alter the heritage values of a heritage place. This is represented as the 'magnitude of change' (refer Section 3.4).

Direct impacts to heritage are most likely to occur during site preparation as a part of the construction phase. At this time, clearing and stripping activities will require the demolition of heritage structures and the destruction of archaeological sites within the disturbance footprint. The heritage places that are within this footprint are listed in Table 8.4, along with the potential nature of impact and magnitude of change.

Table 8.4 Heritage places at risk of direct impact

Site ID	Description	Potential impact	Likely magnitude of change
C2K-19-H11	Multiple structures	Removal of all buildings aside from dip	Negligible
C2K-19-H13	Homestead complex	Removal of archaeological deposits relating to house, yards and sheds	Major
C2K-19-H4	Hut and yards	Removal and hut and yards and related archaeological deposits	Major
C2K-19-H5	O'Neill's Hut	Removal of yards	Major
C2K-19-H6	Creamery and dairy	Removal of creamery and dairy and related archaeological deposits	Major

Site ID	Description	Potential impact	Likely magnitude of change
C2K-19-H7	Washpool	Disturbance of entire site	Negligible
C2K-19-H8	Yards and shed	Removal of yards and wagon	Negligible

Indirect impacts may occur during any phase of the Project, when construction, operation, or decommissioning activities result in excessive dust, noise or vibration which damages heritage structures. Sites at risk of indirect impacts are listed in Table 8.5, along with the potential nature of impact and magnitude of change.

Table 8.5 Heritage places at risk of indirect impact

Site ID	Description	Potential Impact	Likely magnitude of change
C2K-19-H1	Brooklands Homestead	Vibration from construction and operation may speed dilapidation of dairy ruin	Medium
C2K-19-H10	House	Dust from construction and operation may speed dilapidation of house. However, elements most likely impacted – such as the roofing iron – are non-original	Negligible
C2K-19-H12	Dairy and creamery	Vibration from construction and operation may speed dilapidation of structures Dairy structure is particularly unsound, and at risk of collapse	Major
C2K-19-H13	Homestead complex	Vibration from construction and operation may speed dilapidation of dairy ruin	Major
C2K-19-H2	Kagaru Station	Vibration from construction and operation may speed dilapidation of bridge	Low
C2K-19-H3	Kenny's Hut	Vibration from construction and operation may speed dilapidation of yard ruin	Medium
C2K-19-H5	O'Neill's Hut	Vibration from construction and operation may speed dilapidation of hut Removal of yards will alter setting of hut, diminishing its heritage value	Major
C2K-19-H9	House	Dust and vibration from construction and operation may speed dilapidation of house. However, elements most likely impacted – such as the roofing iron – are non-original	Negligible

8.4 Assessment of significance of impact

The significance of predicted impacts to each of the sites is assessed in Table 8.6, using the rankings established in the previous sections.

Table 8.6 Assessment of significance of impacts

Site ID	Description	Sensitivity	Magnitude of change	Significance of impact
C2K-19-H1	Brooklands Homestead	Low	Medium	Slight
C2K-19-H10	House	Low	Negligible-Low	Slight – Neutral
C2K-19-H11	Multiple structures	Negligible	Negligible	Neutral
C2K-19-H12	Dairy and creamery	Moderate	Major	Large
C2K-19-H13	Homestead complex	Moderate	Major	Large
C2K-19-H2	Kagaru Station	Moderate	Low	Slight
C2K-19-H3	Kenny's Hut	Moderate	Medium	Moderate
C2K-19-H4	Hut and yards	Moderate	Major	Large

Site ID	Description	Sensitivity	Magnitude of change	Significance of impact
C2K-19-H5	O'Neill's Hut	Moderate	Major	Large
C2K-19-H6	Creamery and dairy	Moderate	Major	Large
C2K-19-H7	Washpool	Negligible	Negligible	Neutral
C2K-19-H8	Yards and shed	Negligible	Negligible	Neutral
C2K-19-H9	House	Low	Negligible	Slight – Neutral

8.5 Proposed additional mitigation measures

The accepted methodology for managing impacts on heritage places is to avoid wherever possible, minimise as far as is practical and then mitigate where avoidance and minimisation is not possible (ICOMOS 2011).

To further avoid or minimise impacts to cultural heritage sites identified in this technical report, a number of additional mitigation measures have been proposed and are presented in Table 8.7. These measures incorporate ARTC's standard practices, as well as standard industry practice and legislative requirements.

Table 8.8 details how these measures are proposed to be applied to each of the heritage places identified in Table 6.1.

Table 8.7 Site-specific mitigation measures for non-Indigenous heritage

Delivery phase	Aspect	Proposed additional mitigation measures
Detailed design	All heritage	Design to avoid direct impacts to identified Indigenous and non-indigenous heritage significance where practicable. Design to respond to the outcomes of any further cultural heritage surveys.
Pre-construction	All heritage	Construction planning avoids directly impacting on identified sites of Indigenous and non-Indigenous heritage significance where practicable. The Heritage Management Sub-plan will be developed and will detail mitigation and management measures to be implemented during construction in relation to cultural heritage. It is expected to include: <ul style="list-style-type: none"> ■ Requirements for site induction, training, heritage monitors, inspections, audits, corrective actions, notification and classification of environmental incidents, record keeping, monitoring and performance objectives for handover on completion of construction ■ Heritage management actions to be undertaken by suitably qualified persons ■ Specific requirements for cultural heritage sites/items that cannot be avoided during construction ■ Unexpected finds procedure, including assessment by a suitably qualified person and notification obligations under the applicable legislation ■ Procedure for encountering potential burial sites or potential human skeletal material including notification obligations under applicable legislation ■ Any other requirements necessary to comply with conditions of approval, subsequent approvals, regulatory requirements or ARTC cultural heritage management plans/agreements.
	Vibration	Building condition surveys will be undertaken at all vibration sensitive receptors identified during detailed design as being subject to potential vibration impacts, which may include structures of heritage value. Surveys will occur before and after undertaking vibration generating works (e.g. pile-driving), with the potential for monitoring during the construction activities as per noise and vibration plans. <ul style="list-style-type: none"> ■ Tailor construction methodology to limit vibration impacts to heritage structures ■ Vibration at heritage places to be kept below 2.5mm/sec where-ever possible (in accordance with DIN4150) ■ Pre-construction and post-construction condition dilapidation surveys to be undertaken at all heritage places at risk of vibration impact ■ Vibration to be monitored at places where thresholds exceedances are possible ■ Where vibration exceedances occur, change design/construction methodology where possible to reduce impact.

Delivery phase	Aspect	Proposed additional mitigation measures
	Non-Indigenous built heritage	<p>If impacts cannot be avoided, the following pre-construction measures may be implemented:</p> <ul style="list-style-type: none"> ■ Archival recording <ul style="list-style-type: none"> – Undertake archival photographic recording in accordance with Department of Environment and Heritage Protection (2013) Guideline: Archival Recording of Heritage Places – Copies of archival records to be lodged with the John Oxley Library, and local libraries or historical societies as appropriate. ■ Relocation <ul style="list-style-type: none"> – Relocation of heritage items is generally undesirable, as setting forms an intrinsic part of heritage value (International Council on Monuments and Sites Australia 2013) <p>However, if impacts cannot be managed in any other way, it may be appropriate to relocate buildings or items of moveable heritage to another location, such as a local historical society. The approach for any such requirements will be defined in the Heritage Management Sub-plan.</p>
	Non-Indigenous archaeological heritage	<p>If impacts to non-Indigenous cultural heritage places cannot be avoided, the following pre-construction measures may be implemented by suitably qualified historical archaeologists:</p> <ul style="list-style-type: none"> ■ Archaeological survey <ul style="list-style-type: none"> – Undertake archaeological survey to map all elements of complex sites and identify areas of possible subsurface deposit. ■ Archaeological excavation <ul style="list-style-type: none"> – If warranted by results of archaeological survey, undertake a two-stage archaeological excavation: <ul style="list-style-type: none"> ■ Stage 1 – test excavation to confirm subsurface deposit ■ Stage 2 – salvage excavation of subsurface deposits (if required). ■ Archaeological surface collection <ul style="list-style-type: none"> – Collect archaeological artefacts on the ground surface – Depending on nature of site may be undertaken in conjunction with, or in place of, excavation.
	Indigenous heritage	<p>Cultural heritage to be managed in accordance with CHMPs. This might include:</p> <ul style="list-style-type: none"> ■ Undertaking comprehensive cultural heritage surveys for both early works and project activities with the Traditional Owners ■ Undertaking archaeological survey (including excavations where necessary) ■ Generating survey reports to provide detailed assessment and management recommendations ■ Assessing significance of any cultural heritage. ■ Recording (where project activities may have a direct impact on cultural heritage values). <p>Archaeological investigations will only be undertaken by archaeologists qualified and experienced in Aboriginal heritage, in consultation with the Aboriginal Parties, in accordance with the CHMPs.</p>
Construction and commissioning	All heritage	<p>Where impacts can be avoided to known Indigenous or non-Indigenous heritage, appropriate precautionary measures, such as informing relevant staff and contractors of the nature and location of the items and need to avoid impacts, detailing location on site maps, along with temporary protective fencing and signage will be implemented for those sites within close proximity of the area of works.</p> <p>Works will not be performed on known or potential heritage items without required approvals and appropriate management plans.</p> <p>If a suspected Aboriginal or historical heritage item or site is identified, any works that may impact the item or site will stop, and the unexpected finds procedure in the Heritage Management Sub-plan will be followed.</p> <p>Any responses to chance finds will only be undertaken by archaeologists qualified and experienced in the relevant discipline.</p>

Delivery phase	Aspect	Proposed additional mitigation measures
		In the event of the discovery of potential human remains, all work in the area will cease and the relevant statutory process for the notification and management of human remains will be instigated, in accordance with the Heritage Management Sub-plan and other relevant plans.
	Non-Indigenous built heritage	Vibration monitoring will be undertaken at vibration sensitive receptors where the potential for building/structural damage risk is identified during the detailed design phase or as part of pre-construction building surveys. Vibration monitoring will be undertaken by a suitably qualified person, in accordance with relevant standards and guidelines. Where monitoring is required occur at a heritage structure, placement of equipment will be carried out on advice from a suitably qualified person (heritage practitioner). Any damage that occurs at heritage places as a result of vibration or other Project activity will be repaired in accordance with Burra Charter principles (Article 1.4)
	Non-Indigenous archaeological heritage	Depending on the outcome of archaeological assessments undertaken during pre-construction, ground breaking activities may be subject to archaeological monitoring by a suitably qualified person. In the case of unexpected archaeological finds anywhere in the Project, the protocol included in the Heritage Management Sub-plan is to be followed.
	Indigenous heritage	Cultural heritage values to be managed in accordance with the CHMP. This will include: <ul style="list-style-type: none"> Constraining of all surface disturbance to areas which have been previously surveyed for cultural heritage Establishing buffer zones around areas of heritage value that are to be retained Monitoring of ground breaking where warranted by the presence of known or potential archaeological values. In the case of unexpected archaeological finds anywhere in the Project, the protocol included in the Heritage Management Sub-plan is to be followed. Archaeological investigations will only be undertaken by archaeologists qualified and experienced in Aboriginal heritage, in consultation with the Aboriginal Parties, in accordance with the CHMPs.

Table 8.8 Proposed mitigation measures for each heritage place

Site ID	Description	Significance of impact	Mitigation
C2K-19-H1	Brooklands Homestead	Low	<ul style="list-style-type: none"> Archival recording of garden and building remnants
C2K-19-H10	House	Slight – Neutral	<ul style="list-style-type: none"> Archival recording Manage indirect impacts
C2K-19-H11	Multiple structures	Neutral	<ul style="list-style-type: none"> Archival recording
C2K-19-H12	Dairy and creamery	Large	<ul style="list-style-type: none"> Archival recording of creamery and dairy Manage indirect impacts <ul style="list-style-type: none"> May require the stabilisation of the dairy If any direct impacts are anticipated: <ul style="list-style-type: none"> Archaeological survey Archaeological excavation
C2K-19-H13	Homestead complex	Large	<ul style="list-style-type: none"> Avoid site Archival recording If avoidance is not possible: <ul style="list-style-type: none"> Archaeological survey Archaeological excavation
C2K-19-H2	Kagaru Station	Moderate	<ul style="list-style-type: none"> Avoid site Archival recording of bridge If avoidance is not possible <ul style="list-style-type: none"> Discuss any additional measures with infrastructure owner

Site ID	Description	Significance of impact	Mitigation
C2K-19-H3	Kenny's Hut	Moderate	<ul style="list-style-type: none"> Archival recording Manage indirect impacts <ul style="list-style-type: none"> May require the stabilisation of the yards <p>If any direct impacts are anticipated:</p> <ul style="list-style-type: none"> Archaeological survey Archaeological excavation
C2K-19-H4	Hut and yards	Large	<ul style="list-style-type: none"> Avoid site Archival recording <p>If avoidance is not possible:</p> <ul style="list-style-type: none"> Archaeological survey Archaeological excavation
C2K-19-H5	O'Neill's Hut	Large	<ul style="list-style-type: none"> Archival recording of yard
C2K-19-H6	Creamery and dairy	Large	<ul style="list-style-type: none"> Avoid site Archival recording
C2K-19-H7	Washpool	Neutral	<ul style="list-style-type: none"> Unexpected finds procedures
C2K-19-H8	Yards and shed	Neutral	<ul style="list-style-type: none"> Archival recording Evaluate options for relocating wagon to historical society
C2K-19-H9	House	Slight – Neutral	<ul style="list-style-type: none"> Archival recording Manage indirect impacts

8.6 Post mitigation impacts

The assessment of significance of predicted post-mitigation impacts for each of the sites is documented in Table 8.9. This assessment uses the rankings established in the previous sections to determine the residual significance of impacts after the mitigations identified in Table 8.8.

Table 8.9 Assessment of significance of mitigated impacts

Site ID	Description	Sensitivity	Magnitude of change after mitigation	Significance of impact after mitigation
C2K-19-H1	Brooklands Homestead	Low	Low	Neutral
C2K-19-H10	House	Low	Negligible	Neutral
C2K-19-H11	Multiple structures	Negligible	Negligible	Neutral
C2K-19-H12	Dairy and creamery	Moderate	Low	Slight
C2K-19-H13	Homestead complex	Moderate	Low	Slight
C2K-19-H2	Kagaru Station	Moderate	Low	Slight
C2K-19-H3	Kenny's Hut	Moderate	Low	Slight
C2K-19-H4	Hut and yards	Moderate	Low	Slight
C2K-19-H5	O'Neill's Hut	Moderate	Low	Slight
C2K-19-H6	Creamery and dairy	Moderate	Low	Slight
C2K-19-H7	Washpool	Negligible	Negligible	Neutral
C2K-19-H8	Yards and shed	Negligible	Negligible	Neutral
C2K-19-H9	House	Low	Negligible	Neutral

8.7 Cumulative impacts

The potential for cumulative impacts emerges when concurrent or consecutive activities bring about incremental change to heritage places and values. These changes may not be captured in an assessment for any single project, and instead need to be considered on a wider physical and temporal scale (ICOMOS 2011).

It should be noted that the results of cumulative impact assessments undertaken for cultural heritage sites and places must be interpreted with caution, not least because they are based (in part) on heritage datasets that are inevitably incomplete and contain various inconsistencies and errors. Godwin (2011), in particular, has questioned the value of cumulative impact assessments to cultural heritage management in Australia, arguing that the ‘fundamentals’ necessary for undertaking such assessments simply do not exist. The ‘fundamentals’ Godwin is referring are robust regional and national data sets for measuring proposed impacts and the determination of acceptable scientific and cultural impact thresholds.

In the case of C2K, the projects most relevant to the cumulative impact assessment are considered to be two adjoining ARTC proposed rail developments: Kagaru to Acacia Ridge and Bromelton (K2ARB) and Helidon to Calvert (H2C).

At the time of writing this report there was no baseline information available for the K2ARB project. The K2ARB project is a brownfield development and expected to be constructed primarily within a previously disturbed rail corridor.

An assessment of the potential impacts of the H2C project was available to the Project team. Using the EIS investigation corridor as the basis of assessment in both cases, an analysis was undertaken of the number of heritage sites impacted by the C2K and H2C projects (refer Table 8.10). The analysis suggests that the two projects will have a similar extent of impact.

Table 8.10 Summary heritage cumulative impacts for the Calvert to Kagaru and Helidon to Calvert EIS investigation corridor

Category	C2K			H2C			Total		
	# Sites	# Impacted	% Impacted	# Sites	# Impacted	% Impacted	# Sites	# Impacted	% Impacted
Bridge	5	0	0	7	5	71%	12	5	42%
Cemetery	0	0	0	3	0	0	3	0	0
Church	0	0	0	4	0	0	4	0	0
Dairy	3	3	100%	0	0	0	3	3	100%
Dip	2	0	0	0	0	0	2	0	0
Hall	0	0	0	4	3	75%	4	3	75%
Homestead	6	2	33%	0	0	0	6	2	33%
Hotel	0	0	0	4	4	100%	4	4	100%
House	2	0	0	51	6	12	53	6	11%
Hut	7	3	43%	1	1	100%	8	4	50%
Industrial	1	1	100%	6	1	17%	7	2	29%
Memorial	0	0	0	4	3	75%	4	3	75%
Multiple structures	20	5	25%	42	14	33%	62	19	31%
Post Office	0	0	0	2	1	50%	2	1	50%
Railway	4	1	25%	12	9	75%	16	10	63%
School	0	0	0	4	1	25%	4	1	25%
Shop	0	0	0	6	2	33%	6	2	33%

Category	C2K			H2C			Total		
	# Sites	# Impacted	% Impacted	# Sites	# Impacted	% Impacted	# Sites	# Impacted	% Impacted
Single structure	6	2	33%	99	28	28%	105	30	29%
Windmill	0	0	0	5	1	20%	5	1	20%
Total	56	17	30%	254	79	31%	310	96	31%

9 Summary and conclusion

This assessment has considered the potential non-Indigenous (historical) cultural heritage impacts of the Project. A search of heritage registers in addition to the analysis of historical mapping identified 13 areas of high cultural heritage potential within the cultural heritage study area. Each of these sites was inspected, and an assessment of heritage significance undertaken, finding that 10 are of local heritage significance (refer Table 9.1).

Potential Project impacts on these places were assessed using ICOMOS standard guidelines both before and after the implementation of mitigations (refer Table 9.1). These impact assessments found that, with appropriate measures, Project impacts could be reduced to neutral/slight for all places.

Table 9.1 Summary cultural heritage significance and impact assessment

Site ID	Description	Cultural heritage significance	Significance of impact before mitigation	Significance of impact after mitigation
C2K-19-H1	Brooklands Homestead	Local	Slight	Neutral
C2K-19-H10	House	Local	Slight – Neutral	Neutral
C2K-19-H11	Multiple structures	None	Neutral	Neutral
C2K-19-H12	Dairy and creamery	Local	Large	Slight
C2K-19-H13	Homestead complex	Local	Large	Slight
C2K-19-H2	Kagaru Station	Local	Moderate	Slight
C2K-19-H3	Kenny's Hut	Local	Moderate	Slight
C2K-19-H4	Hut and yards	Local	Slight	Slight
C2K-19-H5	O'Neill's Hut	Local	Large	Slight
C2K-19-H6	Creamery and dairy	Local	Large	Slight
C2K-19-H7	Washpool	None	Neutral	Neutral
C2K-19-H8	Yards and shed	None	Neutral	Neutral
C2K-19-H9	House	Local	Slight – Neutral	Neutral

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APPENDIX

T

Non-Indigenous Heritage Technical Report

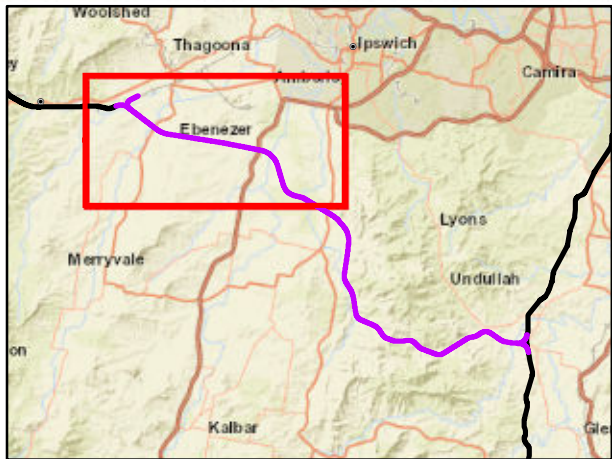
Appendix A Mapping

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

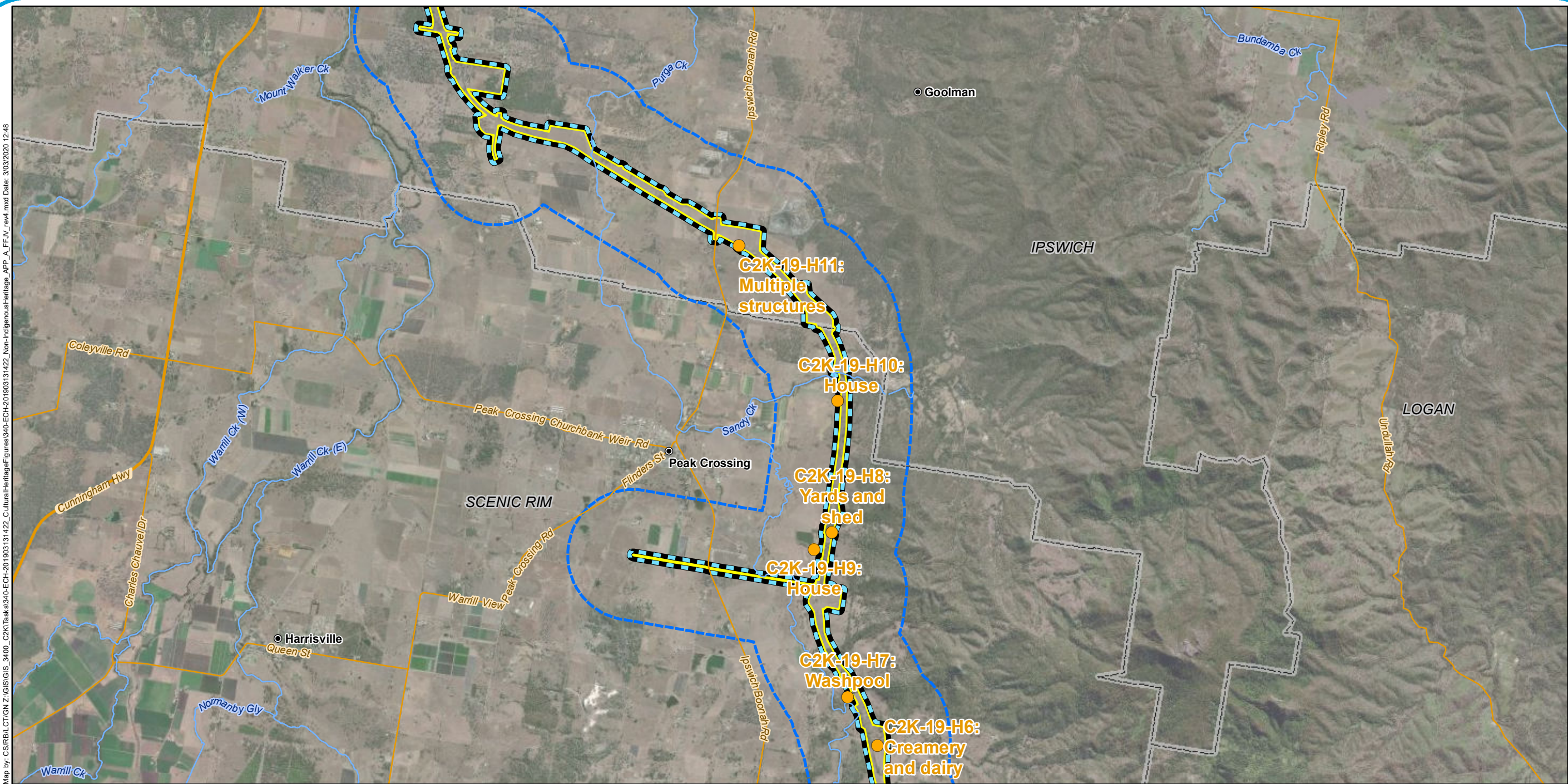


Legend

- | | | |
|-------------------------|----------------|--------------------------------|
| ● Heritage AOI | — Watercourses | ▭ Cultural heritage study area |
| ● Localities | — Major roads | ▭ 1km buffer |
| — Existing rail | — Minor roads | ▭ Local Government Areas |
| — H2C project alignment | | |

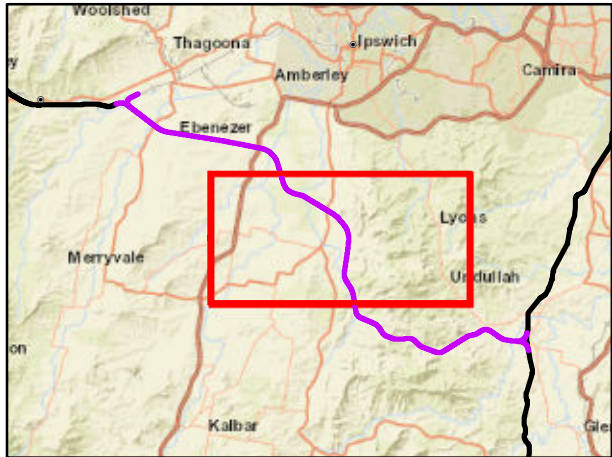


A3 scale: 1:65,000
0 0.5 1 1.5 2 2.5km



Legend

- Heritage AOI
- Localities
- Watercourses
- Major roads
- Minor roads
- Cultural heritage study area
- 1km buffer
- Local Government Areas



A3 scale: 1:65,000
0 0.5 1 1.5 2 2.5km

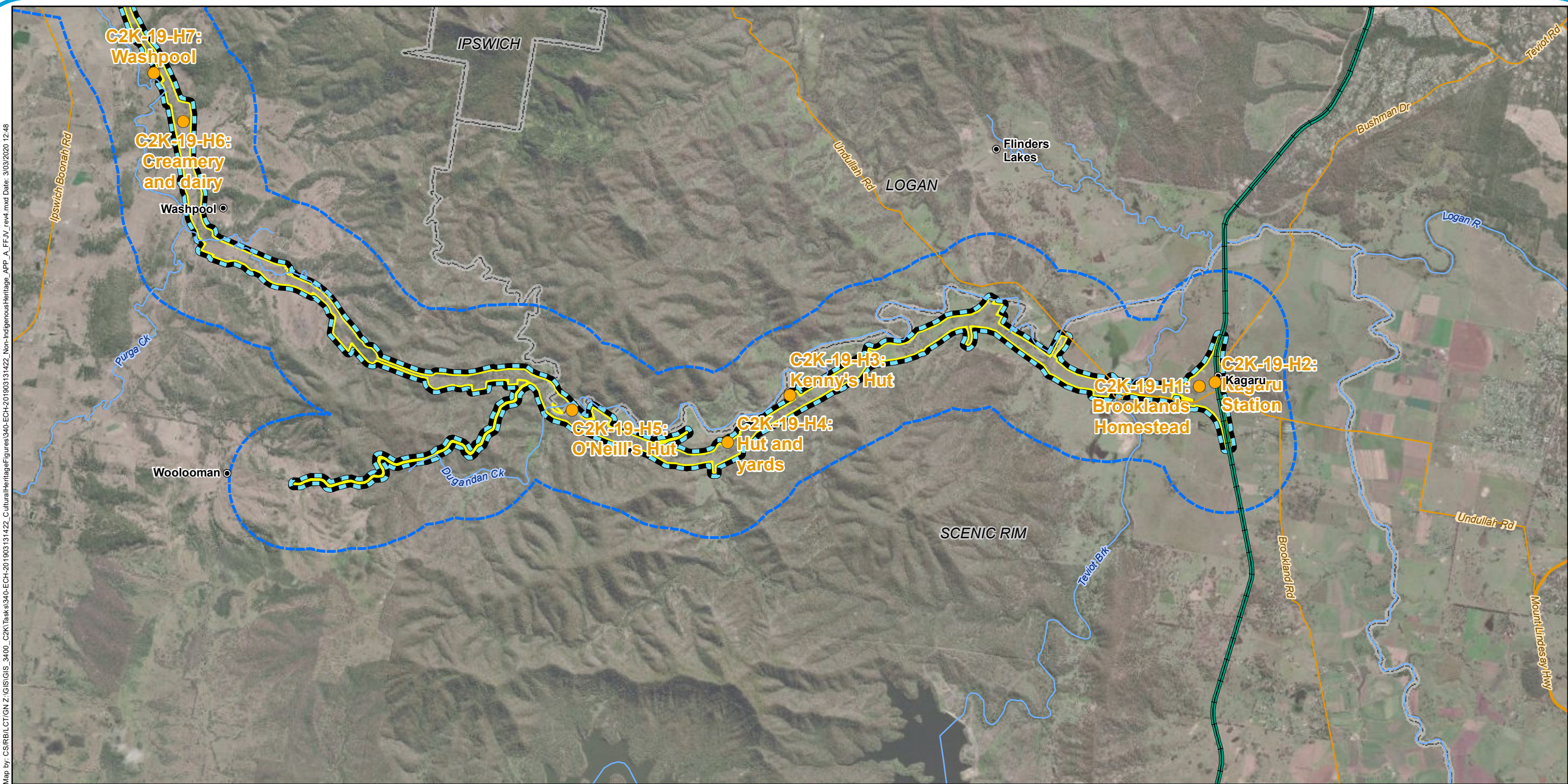


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Coordinate System: GDA 1994 MGA Zone 56

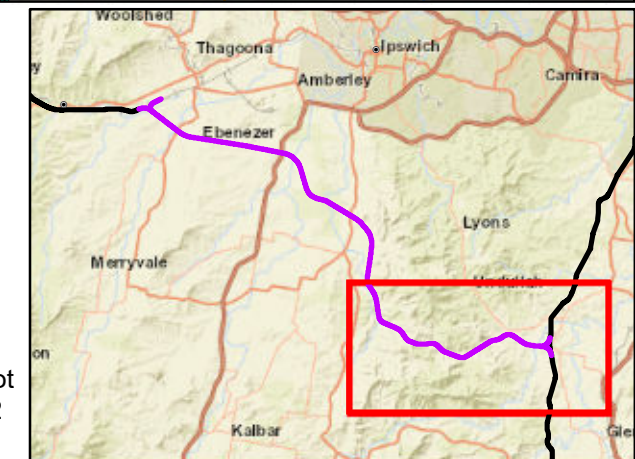
Calvert to Kagaru

Appendix A: Non-indigenous heritage area of interest



Legend

- | | | |
|---------------------------|----------------|--------------------------------|
| ● Heritage AOI | — Watercourses | ▤ Cultural heritage study area |
| ● Localities | — Major roads | ▤ 1km buffer |
| — Existing rail | — Minor roads | ▤ Local Government Areas |
| — K2ARB project alignment | | |



Note that due to topography constraints and the realignment of Wild Pig Creek Road and to minimise impacts on Dugandan Creek, there is a small area not within the disturbance footprint between Chainage 42 and 44.



A3 scale: 1:65,000
0 0.5 1 1.5 2 2.5km