TECHNICAL REPORT

6

Aboriginal cultural heritage assessment report

NARROMINE TO NARRABRI ENVIRONMENTAL IMPACT STATEMENT

INLAND RAIL

ARTC

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

ARTC Inland Rail

Narromine to Narrabri Project

Aboriginal Cultural Heritage Assessment Report

Technical Report 6

2-0001-250-ECH-00-RP-0001

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Just up here to the west on the other fence line, that's where its stone country where the stones were for making tools, weapons and ochre. There are a lot of scarred trees and shelter trees in this area on the first flood plain level (terrace), before it hits the maximum flood plain level. Up top, to the south, is where majority of the scar trees are. Canoe trees were typically used with kids on board collecting and walking next to them collecting geese eggs, turtles, shrimp, traps at different levels, poison grass milky sap to stun the fish. The water is all down here (on the lower terraces), you have to make the canoes up there where all of the scar trees are up here (points to south and upper terrace) to get across.

(Mark Smith, Macquarie River 27/11/2018).

Table of contents

Table index

Figure index

Appendices

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Executive summary

The proposal

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail is a major national program that will enhance Australia's existing national rail network and serve the interstate freight market.

The proposal consists of about 306 kilometres of new single-track standard gauge railway with crossing loops. The proposal also includes changes to some roads to facilitate construction and operation of the new section of railway, and ancillary infrastructure to support the proposal.

The proposal would link the Parkes to Narromine section of Inland Rail located in central western NSW, with the Narrabri to North Star section of Inland Rail located in north-west NSW.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Narromine to Narrabri section of Inland Rail ('the proposal').

The proposal is State significant infrastructure and is subject to approval by the NSW Minister for Planning and Public Spaces under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal is also determined to be a controlled action under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act), and requires approval from the Australian Minister for the Environment.

This report

This Aboriginal Cultural Heritage Assessment (ACHA) has been prepared on behalf of ARTC to assess the potential Aboriginal cultural heritage impacts of the proposal in accordance with the Secretary's environmental assessment requirements (SEARs) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (Code of Practice) (Department of Environment Climate Change and Water (DECCW 2010a) and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage (OEH) 2011). This includes a review of the environmental background, development of a predictive model to identify areas of cultural sensitivity, an outline of the consultation carried out with Aboriginal stakeholders, archaeological survey, cultural values assessment, summary of the archaeological assessment, significance assessment, impact assessment and development of management recommendations specific to each cultural heritage value identified.

Summary of consultation

Aboriginal consultation has been undertaken in accordance with the requirements of *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010c). This has included consultation with relevant organisations and legislated bodies seeking the details of Aboriginal people who may have an interest in the proposal and who hold cultural knowledge about objects and places in the study area. Consultation has also involved the key Aboriginal stakeholders in the area including two Native Title groups and eight Local Aboriginal Land Councils (LALCs). Notification of the proposal, assessment, and registration of interest of key Aboriginal stakeholders was completed and included the identification of 23 registered Aboriginal parties (RAPs) (individuals and groups) and these along with the two Native Title groups and the eight LALCs are the Aboriginal stakeholders for the proposal. Consultation has occurred by letter, email, phone, at Aboriginal Focus Group (AFG) meetings and during fieldwork with nominated sites officers and RAPs.

To date three AFG meetings have been run, the first one AFG #1 was held on the 15 December 2018 and introduced the proposal, provided the results of the preliminary assessment completed to date, discussed land access, and requested cultural knowledge holders to participate in the archaeological survey. The second meeting AFG #2 was held as a series of meetings in Narromine, Gilgandra and Narrabri in late March 2019 and presented the process for identifying the 19 culturally sensitive sites that would be targeted for survey, the archaeological survey methodology and test excavation methodology (including any review comments raised by the registered Aboriginal parties) and survey participation plans and rosters. A third AFG meeting (AFG# 3) was held on the 3 and 4 June 2020 to present the draft ACHA, including the analysis of results, during which the results of sub-surface testing and field surveys will be communicated, and to discuss potential impacts and mitigation measures. This report has been updated based on the review comments received from the RAPs where relevant.

Summary of archaeological survey

During the early phases of the proposal development a two-kilometre wide investigation corridor was identified to allow environmental constraints investigations to commence while the rail alignment was developed. This investigation corridor was refined during the route option assessment and preferred route selection processes. The desktop investigations and field survey reflect this investigation corridor and provide a context for consideration of impacts to Aboriginal heritage with regards to the study area for the proposal. The desktop assessment and survey of the wider investigation corridor enabled the consideration of the wider cultural landscape as well as individual heritage items located within it.

Archaeological assessment for the proposal firstly included desktop assessment that involved searches of statutory heritage registers such (Aboriginal Heritage Information Management System (AHIMS) (an updated search was also completed on the 5 March 2020), Local Environmental Plans (LEPs) including: Narromine LEP 2011; Gilgandra LEP 2011; Coonamble LEP 2011; Warrumbungle LEP 2013 and Narrabri LEP 2012; the Commonwealth Heritage List, the National Heritage List, the World Heritage List and the Register of the National Estate.

An initial survey was undertaken that included physical walk overs in areas of interest in publicly accessible areas along the proposal length and at proposed geotechnical locations. For the remainder of the study area, a predictive model was developed using previous reporting in the region, available knowledge sources, including the Heritage NSW Aboriginal Sites Decision Support Tool (ASDST), AHIMS, existing landforms, topography and spatial datasets and results of the initial walkover, to identify areas of heritage sensitivity in accordance with due diligence guidelines. Areas of cultural sensitivity were identified in the predictive modelling and areas of moderate and high sensitivity were targeted for further survey. This approach was discussed and agreed with Heritage NSW (3 February 2019) and presented to the RAPs at the second AFG meeting.

Test excavation of two geotechnical investigation locations was undertaken as part of the survey program. Assessments of significance were prepared of the sites identified and these were registered on the AHIMS.

A total of 152 Aboriginal heritage sites and 13 areas of Potential Archaeological Deposits (PADs) were identified during the archaeological survey of the two kilometre wide investigation corridor.

These included:

- 93 culturally modified trees
- 13 PADs

- eight artefact scatters with PAD
- 24 artefact scatters
- 17 isolated artefacts
- three Aboriginal ceremony and dreaming sites
- two grinding groove sites
- one artefact reburial site
- one shelter tree
- one ochre quarry
- one historic burial site
- one cultural crossing.

Significance assessments examining social, historical, scientific, aesthetic values for the 152 new archaeological sites identified during the archaeological survey were undertaken and these have bene provided to AHIMS. All the identified sites were identified as having high social significance, specifically an area around the Macquarie River which was identified by knowledge holders as a significant traditional and historic camping ground.

Summary of known cultural values

Onsite discussions with Aboriginal knowledge holders have identified a variety of cultural heritage values within the study area. The understanding and perception of the cultural landscape expressed by the knowledge holders is that it is an area traversed by an interconnecting network of physical, social and spiritual places. Cultural values identified during on-site discussions with knowledge holders regarding the types of sites considered to be of significance include:

- campsites
- resource gathering locations and techniques
- modified (scarred) trees
- pathways through the landscape
- water courses, water holes or springs
- aboriginal plants and animals
- burial sites
- Aboriginal ceremony and dreaming
- post-contact sites.

Summary of impact assessment

An impact assessment has been completed for the proposal site as part of the EIS and includes areas that are directly and indirectly impacted during construction and operation of the proposal and is defined as the proposal study area. The results of the impact assessment indicate that 48 Aboriginal sites/PADs are potentially impacted by the proposal. This includes 46 sites and two PADs in the total number impacted, although it is noted that there are also four artefact scatter sites that have PADs associated with them. For the purpose of this impact assessment, it has been assumed that all Aboriginal heritage sites occurring within or adjacent to the proposal site would be directly or potentially impacted by construction activities if no mitigation measures were adopted.

The following sites have been identified as either likely or potentially to be impacted:

- 29 culturally modified trees: Backwater Cowal (4), Macquarie River (10), Ewenmar Creek (1), Boothaguy Creek (3), Berida Road, Castlereagh River (2), Box Ridge Road, Baronne Creek (3), Mungery Creek (4), Cumbil Forest Creek (1) and Etoo Creek (1)
- eight artefact scatters: Macquarie River (2), Calga and Looking Glass Creeks (1), Noonbar Creek (1), Baradine Creek (1), Cumbil Forest Creek (2) and Bohena Creek (1)
- four artefact scatters with PAD: Castlereagh River (1), Gulargambone Creek (2) and Calga and Looking Glass Creeks (1)
- two grinding groove sites: Cumbil Forest Creek (2)
- two PADs: Ewenmar Creek (1) and Baradine Creek (1)
- one archaeological deposit: Macquarie River (1)
- two isolated finds: Baradine Creek (2).

All Aboriginal heritage sites are considered to have high social significance and cultural value. The sites include:

- Campsites – traditional campsites are related to artefact scatters and association of low gradient alluvial landforms and includes sites located at the Macquarie River, Castlereagh River, Gulargambone Creek, confluence of Calga and Looking Glass Creeks, Noonbar Creek, Baradine Creek, Cumbil Forest Creek and Bohena Creek.
- Resource gathering locations and techniques – locations identified by the RAPs included Backwater Cowal, Macquarie River, confluence of Calga and Looking Glass Creek and Cumbil Forest Creek.
- Modified (scarred) trees – 23 sites identified.
- Aboriginal plants and animals - Aboriginal plants and animals are significant to traditional owners. During field work the fauna and flora were often mentioned in context with spiritual importance. Throughout the consultation process plants and animals were often mentioned in discussion with resource collection.
- Aboriginal ceremony and dreaming – RAPs, including knowledge holders, identified areas of spiritual and significance marked by prominent landforms such as Table Top Mountain and Cumbil Forest Creek and expressed a desire for implementation of cultural protocols in respect to these places during construction as part of the heritage inductions. These sites are not impacted by the proposal.

The principal impact to Aboriginal cultural values by the proposal is the potential loss of Aboriginal heritage sites that confirm long standing links of Aboriginal people to the region.

Twenty-five sites/PADs would be directly impacted by the construction of the proposal. Those directly impacted include:

- Backwater Cowal: one modified scar tree site (#35-3-0175).
- Macquarie River: two artefact scatter sites (#35-3-0195 and #35-3-0276) and one confirmed archaeological deposit (#35-3-0196).
- Ewenmar Creek: one modified scar tree site (#27-6-0035) and one PAD (#27-6-0036).
- Boothaguy Creek: three sites, all modified scar trees (#27-6-0042, #27-6-0041 and #27-6-0037).
- Castlereagh River: one PAD (#28-4-0280).
- Gulargambone Creek: two sites - artefact scatter with PAD (#28-1-0090 and (#28-1-0060).

- Baronne Creek: three modified scar tree sites (#28-1-0062, #28-1-0063 and #28-1-0064).
- Mungery Creek: four sites, all modified scar trees (#28-1-0083, #28-1-0084, #28-1-0086 and #28-1-0087).
- Calga and Looking Glass Creeks: two sites both artefact scatters one with PAD (#28-1-0059 - with PAD and #28-1-0095).
- Noonbar Creek: one artefact scatter site (#28-1-0096).
- Baradine Creek: one artefact scatter site (#19-5-0226) and one PAD (#19-5-0230).
- Bohena Creek one artefact scatter site (#19-6-0180).

Further sites have been identified in close proximity to the proposal site that are at risk of being inadvertently impacted during construction if mitigation measures are not implemented. Twenty-three sites would potentially be vulnerable to indirect impacts, these being:

- Backwater Cowal: four sites both modified scar trees (#35-3-0173, #35-3-0174, #35-3-0183 and #35-3-0268).
- Macquarie River: nine sites all modified scar trees (#35-3-0021, #35-3-0200, #35-3-0201, #35-3-0202, #35-3-0210, #35-3-0225, #35-3-0244, #35-3-0250, #35-3-0254).
- Castlereagh River, Berida Road: two sites both modified scar trees (#28-4-0283 and #28-4-0284).
- Baradine Creek: two sites both isolated finds (#19-5-0223 and #19-5-0224).
- Cumbil Forest Creek: five sites including two grinding grooves (#19-5-0229 and #19-5-0225), one modified scar tree (#19-5-0121) and two artefact scatters (#19-5-0115 and #19-5-0116).
- Etoo Creek: one modified scar tree site (#19-5-0239).

Eight areas of high cultural sensitivity identified by the due diligence predictive modelling results were not able to be physically accessed during survey. Based on the predictive modelling and consultation with the RAPs, these sites are likely to have moderate to high archaeological potential. These comprise the following areas:

- Wallaby Creek
- Ewenmar Creek
- Marthaguy Creek
- Castlereagh River
- Gulargambone Creek
- Tenandra Creek
- Baradine Creek
- Namoi River.

Interpretation of results

The results of this assessment clearly indicate that the distribution of sites within this linear alignment reflect the use of waterways as primary transit and camping areas within the lowland alluvial plains and river terraces of the study area. RAPs and other knowledge holders maintain that all sites and objects within the cultural landscape are significant. Surveyed locations such as the Macquarie River contain scores of culturally modified trees along with artefact scatters, camping sites and ochre quarries indicating the use of this area was intensive. This is backed

up by oral histories of knowledge holders that show occupation and use of these areas extended well into the historical period and continue to this day.

In accordance with the guidelines, the mitigation measures include requirements for further archaeological investigation of all directly impacted sites and PADs and the analysis of artefact assemblages contained within them. This will confirm the length of occupation of all affected sites and provide further understanding as to what is known for prehistoric settlement and material culture of the region.

Management recommendations

If construction impacts (direct and indirect) cannot be avoided to the 48 Aboriginal heritage sites and PADs identified in the impact assessment then additional consultation, assessment and possible salvage will be required for Aboriginal heritage sites/PADs. These will need to be the focus of appropriate management in consultation with Heritage NSW and RAPs as per the *Aboriginal Cultural Heritage Consultation Requirements For Proponents (DECCW 2010c)*, the *Code of Practice for Archaeological Investigation of Aboriginal Objects* in *NSW* (DECCW 2010a) and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). Suggested recommendations and mitigation measures have been developed following the principles of avoid, minimise and mitigate. These have been provided to the RAPs for comment, in accordance with stated guidelines. Any changes or further recommendations provided have been included in this report.

For identified Aboriginal heritage sites with the potential to be impacted by the proposal, the management measures proposed have been reviewed in consultation with the RAPs as part of AFG#3. Potential measures would include:

- Avoidance of direct impacts on the identified items/sites of Aboriginal heritage significance during detailed design and construction planning where practicable.
- Investigation of all PADs within proposal site (including test excavation and potentially salvage) prior to commencement of construction.
- Preparation of an Aboriginal cultural heritage management plan prior to construction to include measures to minimise the potential for impacts as far as practicable, manage Aboriginal heritage, and procedures for any unexpected finds. The plan would be prepared in consultation with the RAPs, LALCs, Native Title groups and other knowledge holders and take into account the outcomes of recommended further investigations.
- Undertaking targeted archaeological surveys and investigations before construction commences for areas of cultural sensitivity identified from the predictive modelling within the proposal site where survey was not completed.
- Further investigation for PADs identified within the proposal site that would be directly impacted, comprising archaeological test excavation in accordance with the approved methodology. The aim of the test excavation would be to determine the nature and extent of any archaeological deposits located within the PAD areas to be impacted. Where these investigations confirm the location of archaeological deposits then management and mitigation measures must be established in consultation with the relevant RAPs.
- Salvage (artefact collection).
- Protection of sites that are close to the proposal site to avoid inadvertent impacts.

Any further impacts proposed beyond those assessed in this report or beyond the boundary of the assessed areas must be subject to further assessment and consultation with the RAPs, consistent with the process outlined in this report. Impact mitigation requirements for sites within or adjacent to the proposal site are provided in section 10 of this ACHA.

Glossary and abbreviations

Acronym/term	Definition
Aboriginal cultural heritage	The material (objects) and intangible (mythological places, dreaming stories etc) traditions and practices associated with past and present-day Aboriginal communities.
Aboriginal Cultural Heritage Assessment Report	A report combining an Aboriginal archaeological assessment and Aboriginal cultural assessment, required to be submitted to Heritage NSW for any Part 6 *National Parks and Wildlife Act 1974* approval or prepared for projects under Part 5.1 (now Division 5.2) of the *Environmental Planning and Assessment Act 1979* where Aboriginal cultural heritage is identified as a key issue.
Aboriginal object	Defined by the NSW *National Parks and Wildlife Act 1974* as 'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains'.
Aboriginal heritage site	A place where physical remains or modification of the natural environment indicate past and 'traditional' activities by Aboriginal people. Site types include artefact scatters, isolated artefacts, burials, shell middens, scarred trees, quarries and contact sites. Includes sites listed on the AHIMS and may include Aboriginal objects.
Aboriginal place	Declared by the NSW Minister for the Environment, in accordance with section 84 of the *National Parks and Wildlife Act 1974* and by an order published in the Gazette, as a place that, in the opinion of the Minister, is or was of special significance with respect to Aboriginal culture.
Aboriginal places of heritage significance	Defined in the *Standard Instrument - Principal Local Environmental Plan* as an area of land, the general location of which is identified in an Aboriginal heritage study adopted by the Council, and that may be shown on the Heritage Map. The term may include (but is not limited to) places that are declared as Aboriginal places under section 84 of the *National Parks and Wildlife Act 1974*.
ACD	Aboriginal ceremony and dreaming (site). A classification of site type having a high level of significance to the Aboriginal community comprising an important part of the cultural landscape.
ACHA	Aboriginal Cultural Heritage Assessment
ACHCRP	*Aboriginal Cultural Heritage Consultation Requirements for Proponents*
AFG	Aboriginal Focus Group
AFT	Artefact Scatter
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal heritage impact permit
Alluvium	A deposit left by the flow of water. It can include sediments of gravel, mud or sand.
ALR Act	*Aboriginal Land Rights Act 1983* (NSW)

Acronym/term	Definition
Archaeological site	A location that has evidence of past Aboriginal activity (both material and mythological/ritual).
Area of archaeological sensitivity	A part of the landscape that contains demonstrated occurrences of cultural material. The precise level of sensitivity will depend on the density and significance of the material.
Area of cultural sensitivity	A part of the landscape that has indicated cultural sensitivity not necessarily confirmed by the presence of archaeological objects or potential but more so areas that have intangible sensitivity such as song lines or story places important to Aboriginal tradition.
ARTC	Australian Rail Track Corporation
ASDST	Aboriginal Sites Decision Support Tool
BBSB	Brigalow Belt South Bioregion
BH	Bore hole
CEMP	Construction Environmental Management Plan
Code of Practice	*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*
Core (tool)	A stone piece from which a flake has been removed by percussion (striking) or by pressure. It is identified by the presence of flake scars showing the negative attributes of flakes, from where flakes have been removed.
Culturally modified (carved) trees	Carved trees exhibit evidence of purposeful removal of bark but differ from scarred trees in that geometric patterns and figures are cut into the tree. These are often associated with Aboriginal ceremony and dreaming sites.
Culturally modified (scarred) trees	Trees that feature Aboriginal derived scars are distinct due to the scar's oval or symmetrical shape and the occasional use of steel, or more rarely, stone axe marks on the scar's surface. Scarred trees are identified by the purposeful removal of bark for use in the manufacture of artefacts such as containers, shields and canoes. The bark was also used for the construction of shelters. Other types of scarring include toeholds cut in the trunks or branches of trees for climbing purposes and the removal of bark to indicate the presence of burials in the area.
Construction compound	An area used as the base for construction activities, usually for the storage of plant, equipment and materials and/or proposal site offices and worker facilities.
Construction footprint	Defined as the area that would be directly affected by construction of the proposal. It includes the location of proposal infrastructure, the area that would be directly disturbed by the movement of construction plant and machinery, and the location of the compounds and laydown areas that would be used during construction.
Direct impacts	The direct consequences of the proposal on Aboriginal heritage.
DPIE	Department of Planning, Industry and Environment
DRPB	Darling Riverine Plains Bioregion
EES	The Environment, Energy and Science Division of the Department of Planning, Industry and Environment formerly the Office of Environment and Heritage

Acronym/term	Definition
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Flake	A stone piece removed from a core by percussion (by striking) or by pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.
GG	Grinding Groove
Holocene	The Holocene epoch forms part of the late Quaternary period and extends from about 11,000 years ago to the present day.
ICOMOS	International Council on Monuments and Sites
IF	Isolated Find
Indirect impacts	Defined as the area where Aboriginal heritage may be accidentally or incidentally affected during construction and operation of the proposal. This includes Aboriginal sites or places that are close to the construction footprint that require protection to ensure sites are not inadvertently impacted. Secondary consequences or downstream impacts that may be the product of interactions of multiple factors, of which the proposal is a contributing factor.
Inland Rail program (Inland Rail)	The Inland Rail program encompasses the design and construction of a new inland rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba. The route for Inland Rail is about 1,700 kilometres in length. Inland Rail will involve a combination of upgrades of existing rail track and the provision of new track.
In situ	A description of any cultural material that lies undisturbed in its original point of deposition.
Investigation corridor	During the early phases of the proposal development a two-kilometre wide investigation corridor was identified to allow environmental constraints investigations to commence in order to inform refinement of the design and minimise impacts to Aboriginal heritage were possible.
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
Manuport	A piece of stone (artefactual in nature) transported to a site by humans.
Midden	The term midden is a Danish word meaning a mound of kitchen refuse. In archaeological terms, a midden refers to an accumulation of shell deposited after people had collected and eaten shellfish. These could contain estuarine and fresh water shellfish species in addition to faunal remains, stone artefacts and charcoal from cooking fires. In western NSW in many areas, burials have been recorded in direct association with midden deposits.
Mudstone	A sedimentary rock formed from mud/clay.
Muller	A large stone artefact which differs in construction depending on the environment. These were used as an aide for processing seeds and other low return plant material or ochre.
NPW Act	*National Parks and Wildlife Act 1974*

Acronym/term	Definition
NSW	New South Wales
NNTT	National Native Title Tribunal
NT	Native Title
OEH	Office of Environment and Heritage (former)
Operation footprint	Defined as the area that would be directly affected by operation of the proposal.
PAS	Potential Archaeological Sensitivity
Potential Archaeological Deposit (PAD)	A PAD is a location that is considered to have a potential for sub-surface cultural material. This is determined from a visual inspection of the site, background research of the area and the landform's cultural importance.
Preform Scar	Culturally modified scars on suitable trees that consist of circular, oval or elongated shapes resulting in the removal of a pre-formed artefact, such as a canoe or container that takes its shape from a curved section of either a tree bole, trunk, a major limb or a large burl.
Proposal site	Defined as the area that would be directly affected by construction and operation of the proposal.
Quartz	A mineral composed of silica with an irregular fracture pattern. The quartz used in artefact manufacture is generally semi-translucent, although it varies from milky white to glassy. Glassy quartz can be used for conchoidal flaking, but poorer quality material is more commonly used for block fracturing techniques. Quartz can be derived from water worn pebbles, crystalline or vein (terrestrial) sources.
Quartzite	A form of metamorphosed sandstone. It is often white or grey in colour but can occur in other shades due to mineral impurities.
Rail corridor	The corridor within which the rail tracks and associated infrastructure would be located.
RAP	Registered Aboriginal Party
Sandstone	A sedimentary rock formed from sand-sized predominantly quartz grains.
SEAR	Secretary Environmental Assessment Requirements
Sediment	A mineral that has undergone erosion or weathering and that is then deposited via Aeolian or fluvial means.
SSI	State Significant Infrastructure
State significant infrastructure	Infrastructure which has been declared to be State significant infrastructure for the purposes of Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979.*
Stratigraphy	Soil stratification (layers) and deposition often found in consolidated archaeological sites.
Study area	The study area is defined as the wider area including and surrounding the proposal site, with the potential to be directly or indirectly affected by the proposal. For the Aboriginal heritage assessment this includes sites within 400 metres from the operation and construction footprints. (Refer to section 3.3).

Acronym/term	Definition
Sub-surface testing	An archaeological method used to identify the nature and extent of PADs by excavating small (0.5 metres by 0.5 metres) pits and recording the stratigraphy, material remains (such as stone tools) and disturbance.
The proposal	Inland Rail corridor between Narrabri and Narromine with associated ancillary areas. Defined as the construction and operation of the Narromine to Narrabri section of Inland Rail. It includes the location of proposal infrastructure, the area that would be directly disturbed by the movement of construction plant and machinery, and the location of the compounds and laydown areas that would be used during construction.
Tuff	A light, porous rock formed by consolidation of volcanic ash under pressure.
UNESCO	United Nations Educational, Scientific and Cultural Organization
WLALC	Weilwan Local Aboriginal Land Council

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1. Introduction

1.1 Overview

1.1.1 Inland Rail and the proposal

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail is a major national program that will enhance Australia's existing national rail network and serve the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres long, involves:

- using the existing interstate rail line through Victoria and southern NSW
- upgrading about 400 kilometres of existing track, mainly in western NSW
- providing about 600 kilometres of new track in NSW and south-east Queensland.

The Inland Rail program has been divided into 13 sections, seven of which are located in NSW. Each of these projects can be delivered and operated independently with tie-in points on the existing railway.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Narromine to Narrabri section of Inland Rail ('the proposal').

1.1.2 Approval and assessment requirements

The proposal is State significant infrastructure and is subject to approval by the NSW Minister for Planning and Public Spaces under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal is also determined to be a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and requires approval from the Australian Minister for the Environment.

This report has been prepared by the JacobsGHD Joint Venture as part of the environmental impact statement (EIS) for the proposal. The EIS has been prepared to support the application for approval of the proposal, and address the environmental assessment requirements of the Secretary of the NSW Department of Planning, Industry and Environment (the SEARs), dated 9 September 2020.

1.2 The proposal

The proposal consists of about 306 kilometres of new single-track standard gauge railway with crossing loops. The proposal also includes changes to some roads to facilitate construction and operation of the new section of railway, and ancillary infrastructure to support the proposal.

The proposal would be constructed to accommodate double-stacked freight trains up to 1,800 metres long and 6.5 metres high. It would include infrastructure to accommodate possible future augmentation and upgrades of the track, including a possible future requirement for 3,600 metre long trains.

The land requirements for the proposal would include a new rail corridor with a minimum width of 40 metres, with some variation to accommodate particular infrastructure and to cater for local topography. The corridor would be of sufficient width to accommodate the infrastructure currently proposed for construction, as well as possible future expansion of crossing loops for 3,600 metre long trains. Clearing of the proposal site would occur to allow for construction and to maintain the safe operation of the railway.

1.2.1 Location

The proposal would be located between the towns of Narromine and Narrabri in NSW. The proposal would link the Parkes to Narromine section of Inland Rail located in central western NSW, with the Narrabri to North Star section of Inland Rail located in north-west NSW.

The location of the proposal is shown in Figure 1.1.

1.2.2 Key features

The key design features of the proposal include:

Rail infrastructure

- a new 306 kilometre long rail corridor between Narromine and Narrabri
- a single-track standard gauge railway and track formation within the new rail corridor
- seven crossing loops, at Burroway, Balladoran, Curban, Black Hollow/Quanda, Baradine, The Pilliga and Bohena Creek
- bridges over rivers and other watercourses (including the Macquarie River, Castlereagh River and the Namoi River/Narrabri Creek system), floodplains and roads
- level crossings
- new rail connections and possible future connections with existing ARTC and Country Regional Network rail lines, including a new 1.2 kilometre long rail junction between the Parkes to Narromine section of Inland Rail and the existing Narromine to Cobar Line (the Narromine West connection)

Road infrastructure

- road realignments at various locations, including realignment of the Pilliga Forest Way for a distance of 6.7 kilometres
- limited road closures.

The key features of the proposal are shown in Figure 1.2.

Further information on the proposal is provided in the EIS.

Figure 1.1 **Location of the proposal**

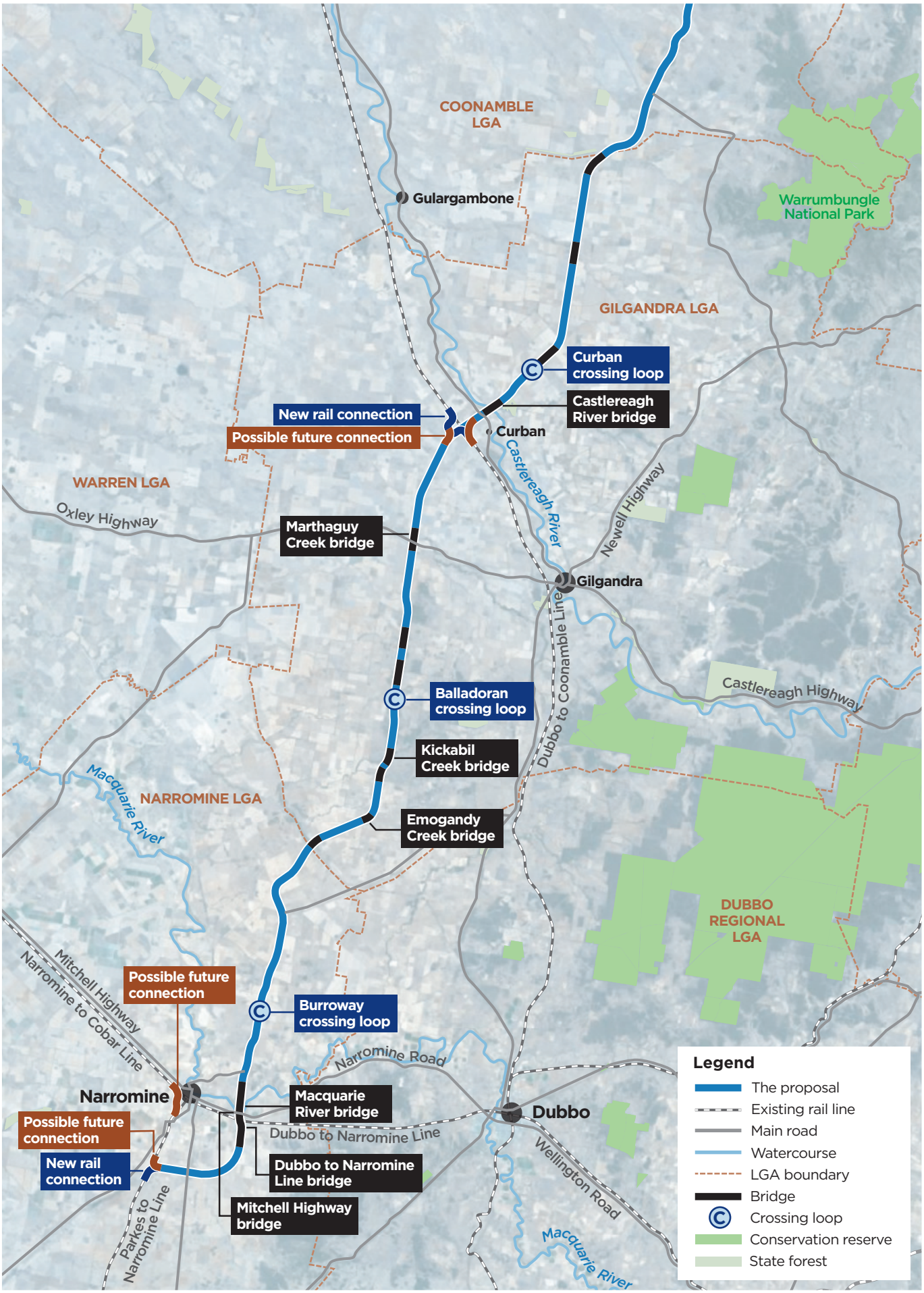

Figure 1.2a **Key features of the proposal**

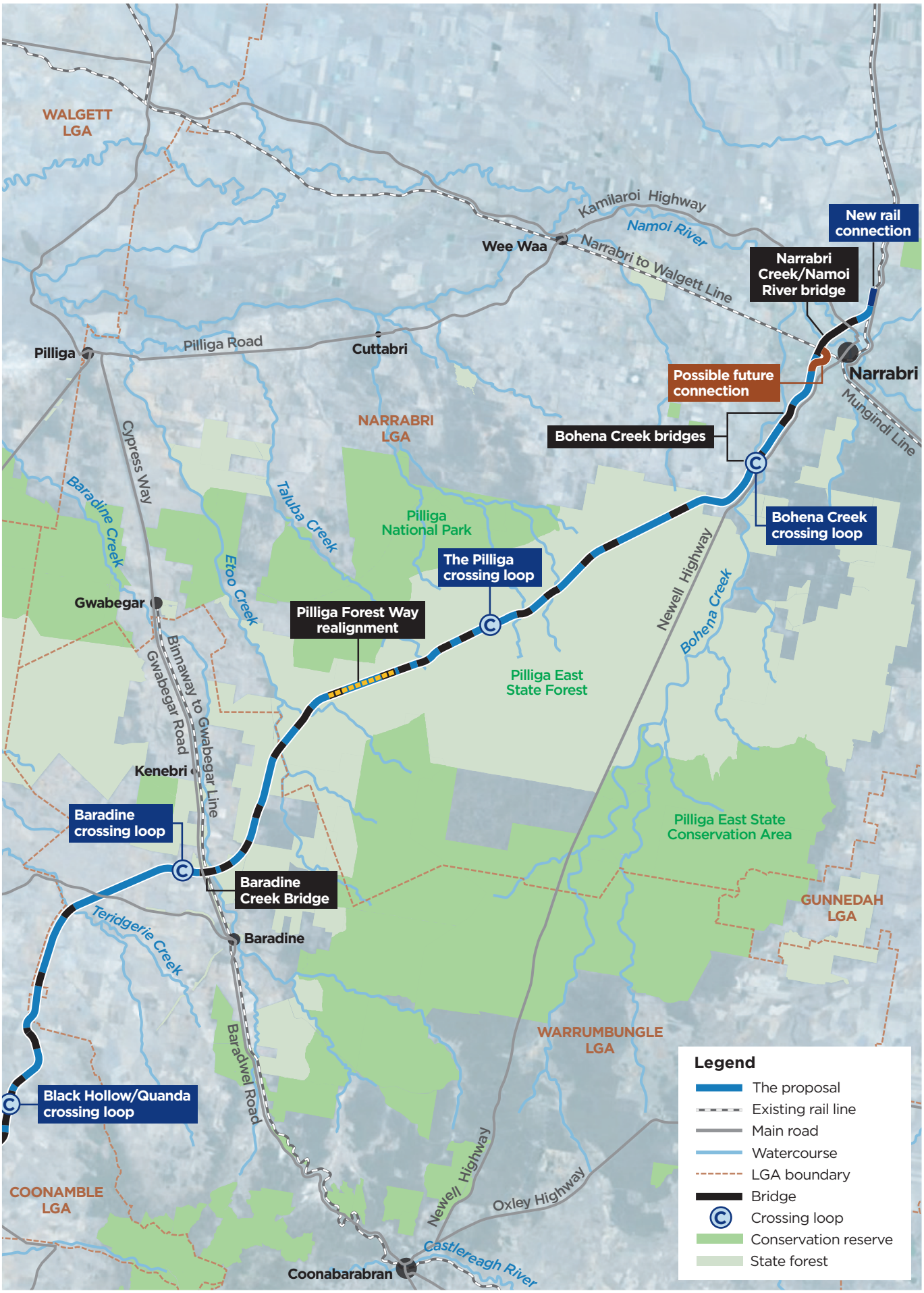

Figure 1.2b **Key features of the proposal**

1.2.3 Construction overview

An indicative construction strategy has been developed based on the current reference design to be used as a basis for the environmental assessment process. Detailed construction planning, including programming, work methodologies, staging and work sequencing would be undertaken once construction contractor(s) have been engaged and during detailed design.

Timing and work phases

Construction of the proposal would involve five main phases of work as outlined in Table 1.1. It is anticipated that the first phase would commence in late 2021, and construction would be completed in 2025.

Table 1.1 Main construction phases and indicative activities

Phase	Indicative construction activities
Pre-construction	• Establishment of areas to receive early material deliveries • Delivery of certain materials that need to be bought to site before the main construction work
Site establishment	• Establishment of key construction infrastructure, work areas and other construction facilities • Installing environmental controls, fencing and site services • Preliminary activities including clearing/trimming of vegetation
Main construction works	• Construction of the proposed rail and road infrastructure, including earthworks, track, bridge and road works
Testing and commissioning	• Testing and commissioning of the rail line and communications and signalling systems
Finishing and rehabilitation	• Demobilisation and decommissioning of construction compounds and other construction infrastructure • Restoration and rehabilitation of disturbed areas

Key construction infrastructure

The following key infrastructure is proposed to support construction of the proposal:

- borrow pits:
  - borrow pit A – Tantitha Road, Narromine
  - borrow pit B – Tomingley Road, Narromine
  - borrow pit C – Euromedah Road, Narromine
  - borrow pit D – Perimeter Road, Narrabri
- three main compounds, which would include a range of facilities to support construction ('multi-function compounds'), located at:
  - Narromine South
  - Curban
  - Narrabri West
- temporary workforce accommodation for the construction workforce:
  - within the Narromine South multi-function compound
  - Narromine North
  - Gilgandra
  - Baradine
  - within the Narrabri West multi-function compound.

The key construction infrastructure are shown in Figure 1.3.

Other construction infrastructure would include a number of smaller compounds of various sizes located along the proposal site, concrete batching plants, laydown areas, welding yards, a concrete pre-cast facility and groundwater bores for construction water supply.

Operation

The proposal would form part of the rail network managed and maintained by ARTC. Train services would be provided by a variety of operators. Inland Rail as a whole would be operational once all 13 sections are complete, which is estimated to be in 2025.

It is estimated that Inland Rail would be trafficked by an average of 10 trains per day (both directions) in 2025, increasing to about 14 trains per day (both directions) in 2040. This rail traffic would be in addition to the existing rail traffic using other lines that the proposal interacts with.

The trains would be a mix of grain, bulk freight, and other general transport trains. Total annual freight tonnages would be about 10 million tonnes in 2025, increasing to about 17.5 million tonnes in 2040.

Train speeds would vary according to axle loads, and range from 80 to 115 kilometres per hour.

1.3 Purpose and scope of this report

The purpose of this report is to assess the potential Aboriginal heritage impacts from constructing and operating the proposal. The report:

- addresses the relevant SEARs listed in Table 1.2
- describes the existing environment with respect to Aboriginal heritage
- assesses the impacts of constructing and operating the proposal on Aboriginal heritage
- recommends measures to mitigate and manage the impacts identified.

The methodology for the assessment is described in section 3.

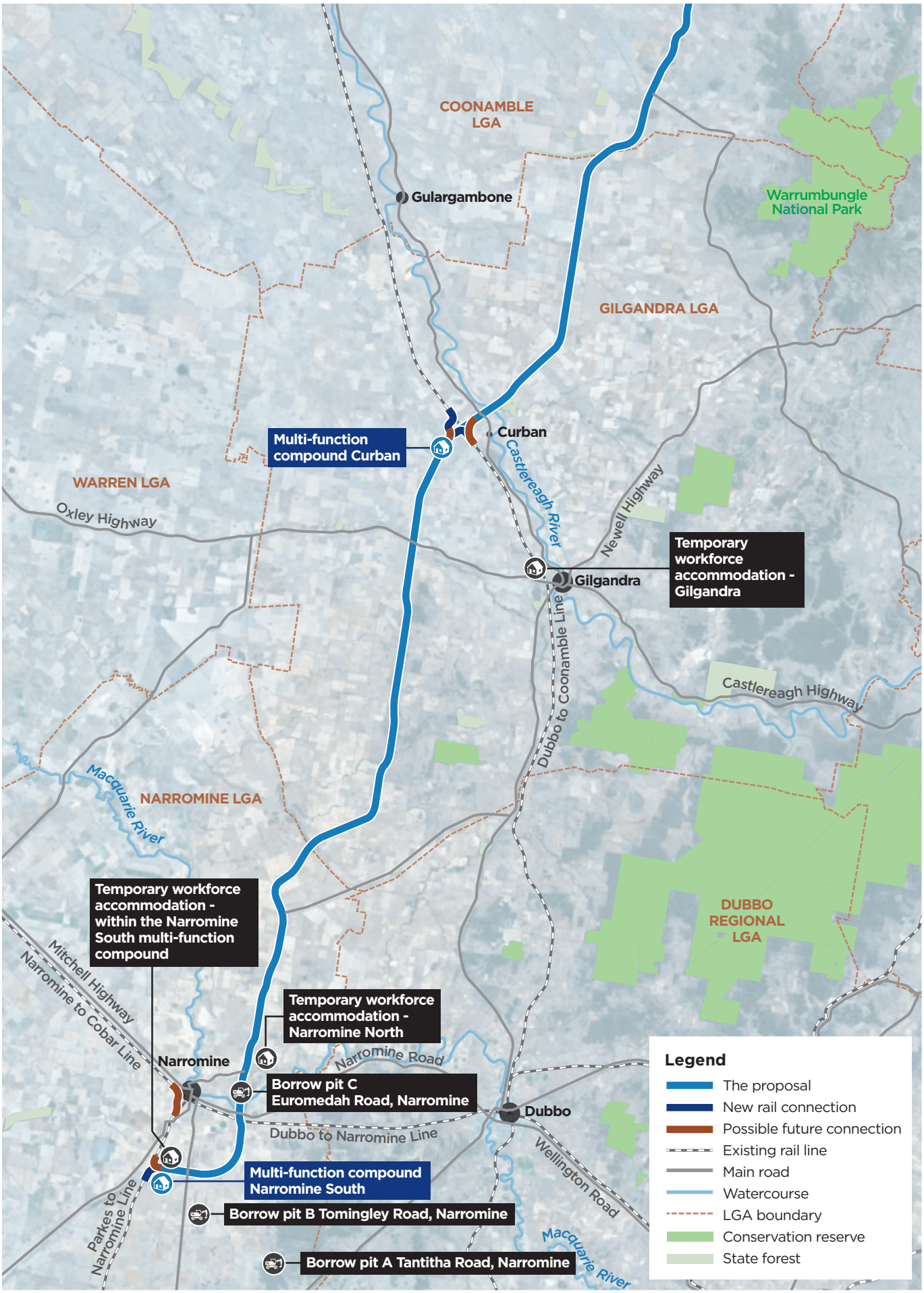

Figure 1.3a **Key construction infrastructure**

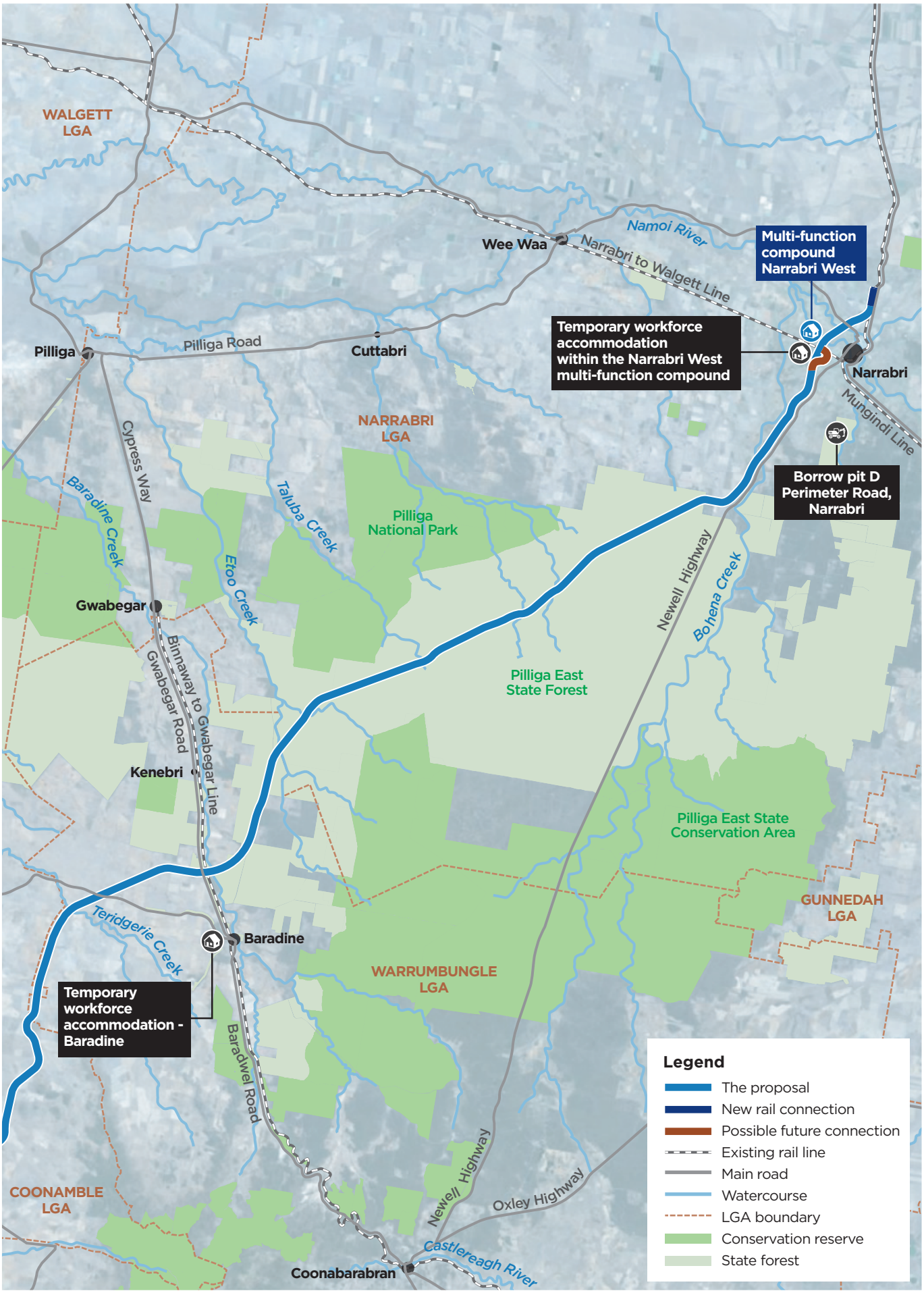

Figure 1.3b **Key construction infrastructure**

Table 1.2 SEARs relevant to this assessment

SEAR number	Requirements	Where addressed in this report
14.1	The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of:	Section 9 provides the impact the proposal would have on Aboriginal heritage. Section 9.1.1 describes the impacts to Aboriginal sites within or adjacent to the proposal site and section 9.1.2 describes impacts to Aboriginal cultural values. A summary of the Aboriginal sites and potential archaeological deposits (PADs) directly and indirectly impacted by the proposal is provided in Table 9.1. Impacts associated with construction of the rail and road infrastructure components of the proposal is provided in section 9.2 and 9.3 respectively. This includes a breakdown of impacts during the construction and operational phases. A discussion on impacts associated with the key construction infrastructure is included in section 9.4 and cumulative impacts are addressed in section 9.5.
	(a) Aboriginal places and objects, as defined under the *National Parks and Wildlife Act 1974* and in accordance with the principles and methods of assessment identified in the current guidelines.	Guidelines used in this assessment are summarised in Table 2.1 and the methodology used to undertake the assessment of Aboriginal places and objects is described in section 7.1. Aboriginal places identified within the study area are identified in section 6.7 and the assessment of impacts to Aboriginal places and objects identified under the *National Parks and Wildlife Act 1974* is included in sections 9.1 to 9.5.
	(b) Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan.	The local environment plans that are relevant to the proposal are listed in section 2.3 and locally listed Aboriginal items and places are discussed in section 6.7.
	(d) Items listed on the National and World Heritage lists.	The search results of Commonwealth and World heritage items located within or near to the proposal is included in section 6.6.
14.2	Where archaeological investigations of Aboriginal objects are proposed these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a).	The introduction paragraph of section 7 identifies the archaeologists who completed this assessment and lists their qualifications.

SEAR number	Requirements	Where addressed in this report
14.3	Impacts to Aboriginal objects and/or places must be assessed and documented in an ACHA. Consultation must be undertaken with Aboriginal people in accordance with the *Aboriginal Cultural Heritage Consultation requirements for proponents* (DECCW 2010). The ACHA must document the outcomes of consultation with Aboriginal people and outline measures proposed to mitigate impacts. The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHA.	This document is an Aboriginal Cultural Heritage Assessment (ACHA) and details the assessment of the impacts to Aboriginal objects and/or places by the proposal. Section 4 includes a discussion of consultation with the Aboriginal community for the proposal which has been completed in accordance with the *Aboriginal Cultural Heritage Consultation requirements for proponents* (DECCW 2010). Section 4.1 describes the consultation process for the impact assessment. Section 4.2 discusses the consultation log that is included in Appendix A. Cultural values are identified in sections 6.4 and 6.6. An assessment of the impact of the proposal to cultural values is included in section 9.1.2. Section 10 details the measures to be implemented to mitigate impacts from the proposal. A discussion of the general measures and site specific measures are included in section 10.1 and section 10.2 respectively. Site specific measures to be implemented during detailed design / pre-construction and construction are included in Table 10.1 and Table 10.2 respectively.

The aim of this report is to assess the potential impacts on the Aboriginal cultural heritage values of the proposal site based upon the results of the archaeological field survey and investigation as per the *Code of Practice* requirements as follows:

- requirements 5-10: Archaeological survey (refer to Section 7.2)
- requirement 23: Recording of culturally modified trees (refer Section 7.2).

1.3.1 Structure of this report

The structure of the report is outlined below.

- Section 1 – provides an introduction to the report
- Section 2 – describes the legislative framework
- Section 3 – provides an overview of the scope of the report, the study area, methodology and limitations associated with undertaking the ACHA
- Section 4 – presents a summary of the consultation undertaken for the proposal with the Aboriginal community
- Section 5 – provides the environmental and ethnographic context for the study area
- Section 6 – provides a summary of the Aboriginal cultural values of the landscape in the three main catchments as well as oral testimonies recorded during the field work
- Section 7 – provides a summary of the archaeological assessment and survey

- Section 8 – provides the significance assessments for sites to be impacted by the proposal
- Section 9 – provides the impact assessment of the proposal
- Section 10 – provides recommended mitigation measures.

2. Legislative framework

2.1 Key legislative requirements

The protection of Aboriginal cultural heritage in NSW is governed by a set of interrelated local, state and Commonwealth legislation and planning instruments. The following local, State and Commonwealth legislation is relevant to this investigation. These Acts and how their relevant sections and associated regulatory documents (eg codes of practice, guidelines, etc) relate to the proposal are described in the following sections.

2.2 NSW legislation

New South Wales legislation relevant to this ACHA include the:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *National Parks and Wildlife* Act *1974* (NPW Act)
- *Native Title (New South Wales) Act 1994*
- *Aboriginal Land Rights* Act *1983*.

2.2.1 Environmental Planning and Assessment Act 1979

The proposal is State significant infrastructure by operation of Division 5.2 of the EP&A Act, State Environmental Planning Policy (State and Regional Development) 2011 (the State and Regional Development SEPP) and State Environment Planning Policy (Infrastructure) 2007 (the Infrastructure SEPP). As State significant infrastructure, the proposal needs to be approved by the NSW Minister for Planning and Public Spaces, and the application for approval needs to be supported by an EIS.

Under section 5.23 of the EP&A Act, the requirement for specified authorisations, and the specified provisions of any legislation that may prohibit a State significant infrastructure project, including the requirement in the NPW Act for an Aboriginal heritage impact permit (AHIP), do not apply if planning approval has been given for the project.

2.2.2 National Parks and Wildlife Act 1974

Under Section 85 of the NPW Act, the Chief Executive is responsible for the protection of Aboriginal objects and Aboriginal places in NSW.

Section 90 of the NPW Act requires an AHIP to impact on an Aboriginal object or Aboriginal place. As noted above, an AHIP will not be required of the proposal if planning approval is granted. However, as required by the SEARs, the proposal has been assessed with regard to the various codes, guidelines and other agency documents issued by the Chief Executive and the National Parks and Wildlife Service (NPWS) which are outlined in Table 2.1.

2.2.3 Native Title (New South Wales) Act 1994

The *Native Title (New South Wales) Act 1994* was introduced to ensure that the laws of NSW are consistent with the Commonwealth *Native Title Act 1993*. It validates past and intermediate acts which may have been invalidated because of the existence of native title.

2.2.4 Aboriginal Land Rights Act 1983 (NSW)

The *Aboriginal Land Rights Act 1983 (NSW)* (ALR Act) was established to provide for the return of land in NSW to Aboriginal peoples through a process of lodging claims for certain Crown lands. The Act provides a land compensatory regime which recognises that land is of spiritual, social, cultural an economic importance to Aboriginal people. The Act establishes the NSW Aboriginal Land Council (NSWALC) and a network of over 120 autonomous Local Aboriginal Land Councils (LALCs) and requires these bodies:

a) to take action to protect the culture and heritage of Aboriginal persons in the LALC's area, subject to any other law; and

b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the LALC's area.

LALCs constituted under the ALR Act can make land claims. The Registrar of the ALR Act has responsibility for maintaining the Register of Aboriginal Land Claims under section 166 of the Act.

Land claims that have been made since the Act came into force in 1983 should be recorded in the Register.

These Acts and their relevant sections and associated regulatory documents (eg codes of practice, guidelines, etc) that are relevant to the assessment of the proposal are described in Table 2.1.

Table 2.1 Relevant codes of practice associated with Aboriginal cultural heritage legislation in NSW

Reference	Requirements
Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010 (DECCW 2010b)	This document sets out a process for individuals and organisations to follow to determine whether an Aboriginal object will be harmed by an activity, whether further investigation is needed, and whether the application to harm requires an Aboriginal heritage impact permit. A proponent has a defence to the offence of harming an Aboriginal object if it can be proved that the proponent demonstrated due diligence in investigating the likelihood of impact to Aboriginal heritage by the proposed activity.
Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRP) 2010 (DECCW 2010c)	The ACHCRP establishes the requirements for consultation (under part 6 of the NPW Act) with Aboriginal stakeholders as part of the heritage assessment process to determine potential impacts of proposed activities on Aboriginal objects and places. The ACHCRP comprises four stages with associated timeframes which must be adhered to: **Stage 1** – Notification of proposal and registration of interest (14 days from date letter sent to register as a registered Aboriginal stakeholders). **Stage 2** – Presentation of information about the proposal. **Stage 3** – Gathering information about cultural significance (28 days for registered Aboriginal stakeholders to provide a review and feedback on consultant methodology). **Stage 4** – Review of draft cultural heritage assessment report (registered Aboriginal stakeholders have 28 days from sending of the report to make a submissions).

Reference	Requirements
Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010a)	The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) (Code of Practice) sets out the detailed requirements for archaeological investigations of Aboriginal objects in NSW for activities that require assessment under Part 4 or Part 5 of the EP&A Act. An AHIP to undertake sub-surface test excavations is not required if complying with this code, as sub-surface testings complying with the Code are excluded from the definition of harm to an Aboriginal object. The code sets out in detail: • minimum qualifications for anyone undertaking archaeological investigation under the Code in NSW • assessment steps required to be undertaken for all archaeological investigation • assessment steps that may be required to be undertaken to adequately characterise the Aboriginal objects being investigated.

2.3 Local environment plans

The responsibility for identifying, assessing and managing items of local significance rests with local government. Local government responsibility for heritage management is enshrined within two acts – the *Heritage Act 1977* and the EP&A Act.

Local heritage items listed in local environment plans can include Aboriginal heritage items such as:

- an Aboriginal object
- an archaeological site
- an Aboriginal place of significance.

Local heritage items are discussed in section 6.6 and includes a review of the LEPs of the following councils that traverse the proposal to identify if any Aboriginal heritage items were listed:

- Narromine Shire Council
- Gilgandra Shire Council
- Coonamble Shire Council
- Warrumbungle Shire Council
- Narrabri Shire Council.

Development consent is sometimes required from the relevant local council for development of land containing Aboriginal heritage items listed in an LEP. However as described in section 2.2.1 development consent is not required for the proposal because it is SSI.

2.4 Commonwealth legislation

Commonwealth legislation relevant to this ACHA is described in Table 2.2 and include:

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*
- *Native Title Act 1993.*

Table 2.2 Legislative framework for Aboriginal cultural heritage (Commonwealth)

Reference	Requirements
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* provides for the preservation and protection from injury or desecration of places and objects in the Commonwealth, that are of particular significance to Aboriginals in accordance with Aboriginal tradition and for which state or territory laws do not provide adequate protection. Among other things, the Act empowers the responsible Minister to make declarations in specified circumstances protecting particular objects or places from injury or desecration.
EPBC Act	The EPBC Act provides a legal framework to protect and manage prescribed Matters of National Environmental Significance (MNES). The MNES relevantly include the World heritage values of a listed World heritage place and the National heritage values of a listed National heritage place. The EPBC Act also provides for the management by Commonwealth agencies of National heritage places and separately listed Commonwealth heritage places. ARTC is not a Commonwealth agency under the EPBC Act, but the National heritage list and the Commonwealth heritage list provide important resources for evaluating heritage significance and impacts as part of this report. Under the EPBC Act, an action will need approval from the Minister for the Environment if the action has, will have, or is likely to have a significant impact on MNES. The proposal has been declared a controlled action and approval under the EPBC Act is required, but only in relation to specified threatened species and ecological communities which are listed under the EPBC Act. Therefore, EPBC Act approval in relation to heritage matters is not required. In determining whether to grant approval, the Environment Minister must consider, relevantly, the likely impact on MNES for which approval is required and economic and social matters. Lists and registers made under the EPBC Act include: • National Heritage List of places of natural, Indigenous and historic places that of outstanding heritage value to the nation • Commonwealth Heritage List of heritage places owned or managed by the Commonwealth.
Native Title Act 1993	The *Native Title Act 1993* (Cth) establishes a framework for the protection and recognition of native title. In particular, the Act: (a) provides a procedural framework for indigenous people to claim native title rights in relation to land and waters, and then for the courts to determine who the rightful holders are and what their native title rights and interests are; (b) validates past actions by the Commonwealth, State and Territory governments which, because of the existence of native title, would otherwise be invalid; (c) provides a framework within which Commonwealth, State and Territory governments can undertake a range of acts (such as the grant of statutory approvals or of land tenure) that may impact on native title; and (d) provides a mechanism by which holders of native title can claim, and have determined, compensation for acts done that in some way impact on their native title rights.

Reference	Requirements
	The National Native Title Tribunal is a Commonwealth Government agency set up under this Act and mediates native title claims under the direction of the Federal Court of Australia. The National Native Title Tribunal maintains the following registers: • National Native Title Register • Register of Native Title Claim • Unregistered claimant applications • Register of Aboriginal land use agreements.

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3. Methodology and assessment scope

3.1 Scope of the report

The scope of the ACHA detailed in this report is as follows:

- Comply with the SEARs for the proposal. Full details of the SEARs for the proposal relating to Aboriginal cultural heritage are provided in Table 1.2.
- Comply with the legislative requirements, codes of practice and assessment procedures relevant to the proposal as identified in Table 2.1. This report has been prepared following the guidelines set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in* NSW (Code of Practice) (DECCW 2010a) and the *Guide To Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in* NSW (OEH 2011).
- Conduct a desktop assessment of the investigation corridor and study area (refer to section 3.3), including a search of the Aboriginal Heritage Information Management System (AHIMS), to identify known Aboriginal heritage sites within the investigation corridor and to identify areas of cultural sensitivity that will require further assessment, namely archaeological field survey (*Code of Practice requirements 1-4*).
- Undertake archaeological field survey with nominated site officers for the registered Aboriginal parties (RAPs) for the proposal to investigate known sites, and to investigate areas of potential cultural sensitivity for the presence of previously unknown Aboriginal cultural heritage values, including PADs (Code of Practice requirement 5). The methodology for the archaeological assessment is described in Appendix D.
- Undertake consultation with the nominated site officers for the RAPs during field investigations.
- Where required, provide recommendations for any further archaeological examination required, namely archaeological test excavation of PADs to establish the extent and nature of any extant sub-surface cultural deposits.
- Undertake a significance assessment of Aboriginal cultural heritage values identified to be potentially impacted by the proposal. This includes both scientific (archaeological) and cultural significance for Aboriginal heritage sites and places. Cultural significance will be determined in consultation with RAPs for the proposal.
- Provide an assessment of the potential impact to Aboriginal heritage sites.
- Provide an ACHA which documents the archaeological investigation undertaken to locate, identify and study Aboriginal objects, archaeological deposits, and historical, oral and environmental sources to assist in assessing the impact of the proposal on Aboriginal cultural heritage values.

3.2 Methodology

The methodology adopted for this ACHA was conducted generally in accordance with the Code of Practice and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011). The assessment broadly consisted of the following:

- Desktop review of archaeological literature and data (refer further to section 7.1.1) to determine if Aboriginal sites have been previously identified within the study area, including a search/review of:
  - Aboriginal Heritage Information Management System (AHIMS) in January 2019 using the investigation corridor boundary to inform site survey and was repeated for the ACHA in March 2020 using the study area boundary.
  - EPBC Act Protected Matters Search Tool to identify any federally listed Aboriginal heritage sites or places near the proposal site.
  - The Narromine LEP 2011; Gilgandra LEP 2011; Coonamble LEP 2011; Warrumbungle LEP 2013 and Narrabri LEP 2012.
  - Previous archaeological investigations.
- Development of a predictive model (refer to section 7.1.2) in accordance with requirement 4 of the Code of Practice to identify area that were likely to be of cultural sensitivity (refer to section 7.1.3) within the study area and would require further assessment in the form of archaeological survey. The model was developed using aerial imagery, the results of desktop assessment and literature review, results of the initial site survey, spatial datasets (including watercourses and contour mapping to identify important landforms), and information from the Heritage NSW Aboriginal Sites Decision Support Tool (ASDST) and AHIMS.
- Archaeological surveys (where access was available) of moderate to high culturally sensitive areas identified from the predictive model and where known Aboriginal heritage sites and Aboriginal cultural places were identified in the study area. The archaeological survey (refer to sections 7.3 and 7.4) aimed to identify any visible surface evidence of cultural heritage sites and landforms (described more below) and any areas of cultural value.
- Undertaking consultation with key Aboriginal stakeholders in the area (refer to section 4.1).
- Assessing the significance of sites/areas (refer to section 8) of potential archaeological sensitivity within the proposal site this includes an assessment of social values, historic values, scientific values and aesthetic values. A geographic scale of significance is included and uses local, regional, State, National and World classifications.
- Assessing the potential impacts of the proposal on Aboriginal sites, places, objects and values and preparing an Aboriginal cultural heritage assessment in accordance with the relevant guidelines (refer to section 9). Potential impacts on Aboriginal heritage included:
  - Direct (physical) impacts - areas where Aboriginal heritage would be directly impacted during construction and operation of the proposal.
  - Indirect (potential) impacts - areas where Aboriginal heritage may be accidentally or incidentally affected during construction and operation of the proposal. This includes Aboriginal sites or places that are close to the proposal site that require protection to ensure sites are not inadvertently impacted. Secondary consequences or downstream impacts that may be the product of interactions of multiple factors, of which the proposal is a contributing factor.
- Providing management and mitigation measures for the proposal (refer to section 10).

3.3 Study area

During the early phases of the proposal development a two-kilometre wide investigation corridor was identified to allow environmental constraints investigations to commence in order to inform refinement of the design and minimise impacts to Aboriginal heritage were possible (refer to

Figure 3.1). This investigation corridor was refined during the route option assessment and preferred route selection processes. The desktop investigations and field survey reflect this two kilometre wide investigation corridor and provide a context for consideration of impacts to Aboriginal heritage with regards to the impacts from the proposal. The desktop assessment and survey of the wider investigation corridor enabled the consideration of the wider cultural landscape as well as individual heritage items located within it. Once the preferred rail alignment was confirmed, an impact assessment was completed for the proposal site as part of the EIS (refer to section 9) and includes areas that are directly and indirectly impacted during construction and operation of the proposal. The areas that will be directly and indirectly impacted is defined as the study area and includes all areas within 400 metres from the proposal site and includes the operation and construction footprints as shown in Appendix E.

3.4 Limitations and exclusions

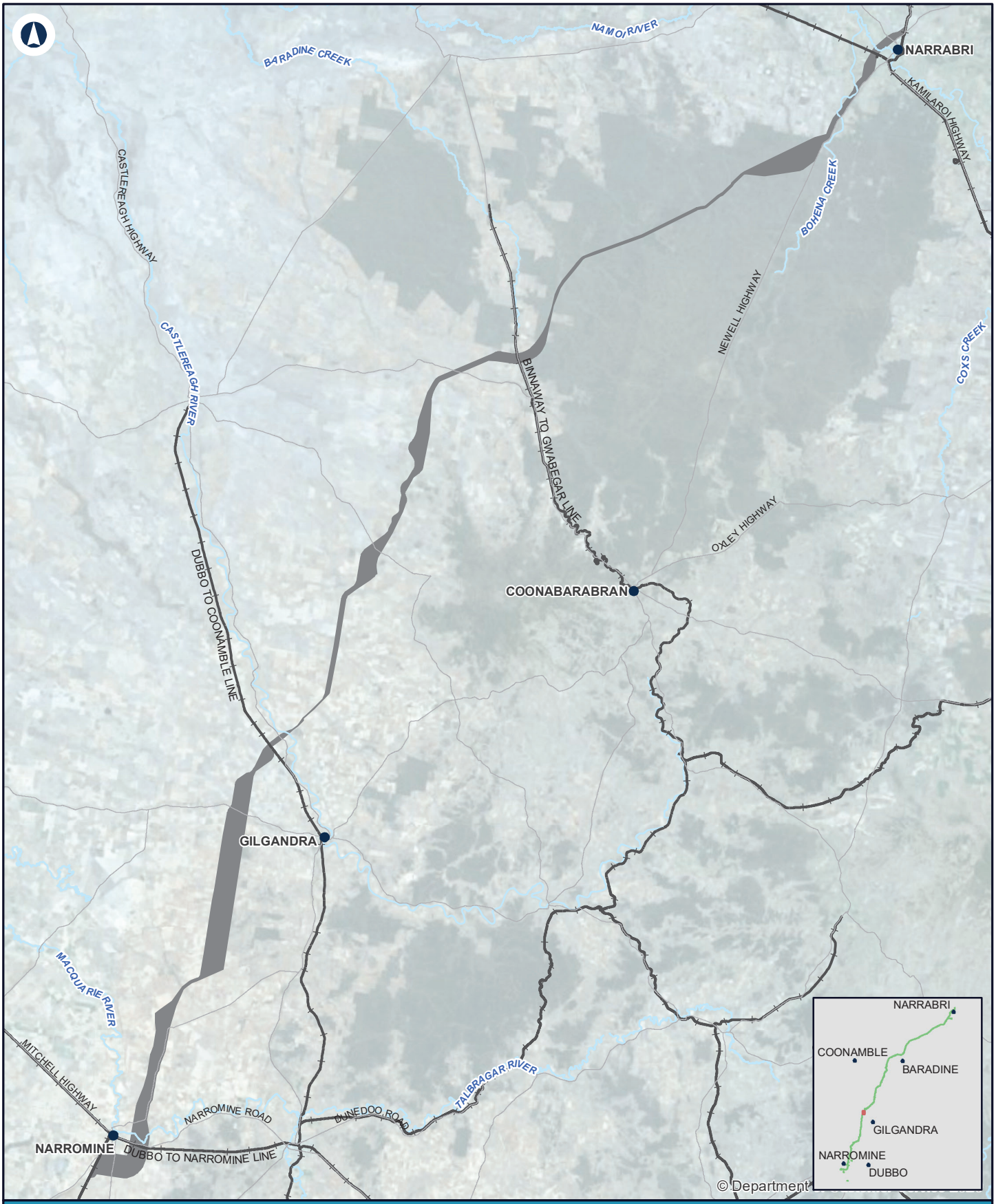
ARTC has undertaken consultation with stakeholders and the community for Inland Rail since 2006. Targeted consultation for the Narromine to Narrabri section of Inland Rail commenced in 2015, with the aims of keeping all stakeholders and the community informed of the proposal status. Throughout this consultation, ARTC has requested access to properties in the form of formal written land access agreements, to enable field investigations to be undertaken to inform the route selection, design development and environmental assessment phases. Where access was not granted by the property owner no field investigations have been undertaken. This has been a constraint to the heritage assessment and a staged investigation program was developed to manage the property access limitation.

The staged investigation program involved an initial stage that included physical walk overs in areas of interest in publicly accessible areas along the proposal length and at proposed geotechnical locations. For the remainder of the study area, a predictive model was developed using available knowledge sources, including the Heritage NSW ASDST, AHIMS, existing landforms, topography and spatial datasets and results of the initial walkover, to identify areas of heritage sensitivity in accordance with due diligence guidelines. Areas of cultural sensitivity and archaeological potential were identified in the predictive modelling and areas of moderate and high sensitivity were targeted for further survey. The intent of the survey was to obtain a high level confirmation of site locations, potential and significance, and was focussed on areas of moderate to high sensitivity. This approach was discussed and agreed with the then DPIE EES (now Heritage NSW) Heritage Officer (3 February 2019) and presented to the RAPs at the second Aboriginal Focus Group meeting. The RAPs were generally supportive of this approach.

Archaeological survey and investigation was completed in a large number of areas identified as culturally sensitive, however eight areas of moderate to high sensitivity were not able to be surveyed in the proposal site due to property access restrictions.

The access constraints have been addressed in discussions with RAPs during field survey and culturally sensitive areas that require physical examination prior to construction have been identified in section 7.1.3. For the purposes of the assessment in this EIS it has been conservatively assumed that they contain moderate to high archaeological potential and the areas that fall within the proposal site would be impacted by the proposal.

However it is important that the sites are physically surveyed to document the findings and for the prioritisation of the cultural heritage management plan. The recommendations in this report will reflect the requirements for additional survey and investigation work required on the ground prior to the commencement of construction. A commitment for additional investigation and survey of the eight areas of cultural sensitivity and archaeological potential has also been included as a mitigation measure (refer to section 10.4).



NARROMINE TO NARRABRI

Study area

Figure 3.1

0 20 40 Km

LEGEND

Study area

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/07/2020 Paper: A4
Author: JACOBS Scale: 1:1,000,000
Data Sources: Alignment: GHDJACOBS: Imagery, base layers: NSW Spatial Services: all other layers: IR ARTC

INLAND RAIL ARTC

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

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4. Aboriginal community consultation

Aboriginal stakeholder engagement and involvement is important for the identification of Aboriginal cultural values within the study area. Aboriginal stakeholder consultation has been completed in accordance with the ACHCRP (DECCW 2010). The consultation procedures outlined in the requirements were designed to aid compliance the NPW Act which acknowledges that Aboriginal people:

- should have the right to maintain culture, language and identity
- should have the right to directly participate in matters that may affect their heritage
- are the primary determinants of the cultural significance of their heritage.

The requirements include a process of community consultation with Aboriginal people who hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) and the opportunity to participate in decision making regarding the management of their cultural heritage by providing proponents with information regarding cultural significance and providing input into management options.

A consultation log for this proposal is located in Appendix A. This chapter details the consultation process undertaken to inform the EIS.

4.1 The consultation process

Consultation completed to date for the proposal in relation Aboriginal heritage has been undertaken in accordance with the ACHCRP (DECCW 2010) and consisted of six actions that are described in the following sections.

4.1.1 Action 1 - Identification of key Aboriginal stakeholders

The Australian Institute of Aboriginal and Torres Strait Islander Studies 1996 map of indigenous language groups identifies the survey area as being situated within the *Traditional Language, Nation or Social Areas* of the Kamilaroi [Gomeroi] and Wailwan [Weilwan] people (https://aiatsis.gov.au/explore/articles/aiatsis-map-indigenous-australia accessed 13 May 2019).

A search of the National Native Title Tribunal register of native title determinations, claims, and Indigenous land use agreements was undertaken on 13 September 2018. There are two current registered native title claims in the study area. The Gomeroi (Federal Court file no. NSD2308/2011, NNTT file no. NC2011/006) which was registered on 20 January 2012, and the Ngemba, Ngiyampaa, Wangaaypuwan and Wailwan claim (Federal Court file no. NSD38/2019, NNTT file no. NC2012/001) which was lodged on 12 April 2012 and registered on 14 March 2012.

It is noted that LALCs are statutory organisations established by the NSW Government under the *Aboriginal Land Rights Act 1983* (ALR Act) to assist their respective members living within each LALC boundary. The study area is situated across the boundaries of eight neighbouring LALCs:

- Narrabri LALC
- Pilliga LALC
- Weilwan LALC
- Gilgandra LALC
- Coonamble LALC
- Coonabarabran LALC

- Baradine LALC
- Narromine LALC.

LALCs are not, by definition, distinct Aboriginal traditional/cultural groups. However, they do support a membership which may contain people with either an historical or traditional link to Country. Additionally, LALCs have responsibility for lands within their territories registered on under the *ALR Act*. JacobsGHD emailed the Office of the Registrar Aboriginal Land Rights Act 1983 (NSW) for notification and request for information. Office of the Registrar responded and concluded that no Registered Aboriginal Owners in the proposal area and suggested contacting the related LALCs. This was done during the course of consultation and fieldwork. There were no lands within the proposal area that are registered under the Act. A follow up email and request for search of the register was submitted on 28 April 2020 to the Office of the Registrar for completeness. No response was provided by the 6 July 2020.

Regardless of the language group, cultural and/or historical affiliations to Country, all Aboriginal participants involved in the recent survey identified their own personal connections to the region.

Gomeroi

The Gomeroi People claim was registered over more than 11 million hectares of northern NSW, becoming one of the largest registered claims in Australia, and the second largest filed by NSW and ACT representative body NTSCORP. The Gomeroi claimant group includes most of the Aboriginal population of the NSW North-West Slopes and Plains, represented by a procedural description of 114 apical ancestors. The Gomeroi claim area covers approximately 182 kilometres of the proposal route between the Kamilaroi Highway and Castlereagh Highway.

Ngemba, Ngiyampaa, Wangaaypuwan and Wayilwan

The Ngemba, Ngiyampaa, Wangaaypuwan and Wailwan claim was registered over more than 10 million hectares of western NSW, again one of the largest registered claims in Australia. The claim area covers approximately 16 kilometres of the proposal route between the Oxley and Castlereagh Highways. The claimants are represented by a procedural description of 45 apical ancestors.

The Ngemba, Ngiyampaa, Wangaaypuwan and Wailwan application area is bounded by the towns of Brewarrina, Bourke, Coonamble, Gulargambone, Warren, Nyngan, Hillston, Mossgiel and Ivanhoe. It includes the Bogan, Castlereagh, Barwon, Darling and Lachlan Rivers in western NSW.

Local Aboriginal Land Councils

Letters were sent to the eight LALCs on 04 October 2018 inviting their participation in the ACHA.

Legislated bodies

Letters were also sent to the following legislated bodies on or around 13 September 2018:

- NSW Land Council (Head Office)
- NSW Land Council Western
- Office of the Registrar Aboriginal Land Rights Act 1983 (NSW)
- National Native Title Tribunal New South Wales - Sydney Office
- NTSCorp Redfern Head Office
- DPIE (Dubbo)
- Central West Local Land Services

- Narrabri Shire Council
- Warrumbungle Shire Council
- Coonamble Shire Council
- Gilgandra Shire Council
- Narromine Shire Council.

Advertisements were subsequently placed in local and regional newspapers seeking registrations for the proposal throughout October 2018 as follows:

- Koori Mail
- National Indigenous Times
- The Border News (Moree)
- The Courier (Narrabri)
- The Gilgandra Weekly
- Namoi Valley Independent
- Coonabarabran Times
- Dubbo Daily Liberal
- Narromine News
- Coonamble Times.

Referred Indigenous interest groups

Based upon the responses received from the legislated bodies, potential Indigenous interest groups were identified and subsequently approached on 19 October 2018 including the following:

- Ellmax
- Gomilaroi Cultural Consultancy
- Bigundi Biame Gunnedarr Traditional People
- Bunda Consultants
- Cucatua Culture Consultants
- Gomeroi Murri Ganurr Yuuray Wadi Palinka
- Gomeroi Narrabri Aboriginal Corporation
- Gunida Gunyah
- Heilamon Cultural Consultants
- ME Griffiths Cultural Management
- Min Aboriginal Corporation
- T and G Culture Consultants
- Wiradjuri Council of Elders
- Pilliga Nature Reserve Consultative Committee
- Wellington Valley Wiradjuri Aboriginal Corporation.

In addition to the eight LALCs, two Native Title (NT) groups, 23 RAPs (individuals and groups) subsequently registered for the proposal including the following groups (refer to Appendix A.6.4) for complete list including individuals):

- Gomeroi Dreaming
- Wahgunyah Aboriginal Housing Corporation
- Dhinawan-Dhigaraa Culture and Heritage Pty Ltd
- Cacatua Cultural Consultants
- AGA Services
- Cutmore
- Didge Ngunawal Clan
- Kamaliroi Yankuntjar
- Wailwan Aboriginal Group
- Gamilaraay Council of Elders.

4.1.2 Action 2 - Engage Aboriginal stakeholders to undertake a field survey

Nominated site officers from two NT groups, eight LALCs and the 23 RAPs were engaged to participate in the archaeological surveys. In the proposal notification letter participants were informed of the need to meet minimum safety and insurance requirements and that registration for the proposal did not guarantee employment. To date there have been 52 participants in the archaeological survey from the two NT applicant groups, eight LALCs as well as other RAPs over a period of 48 days of survey. It is acknowledged that some registered parties did not get an opportunity to participate in the surveys. It is also acknowledged that preference has been given to both the LALCs staff and NT applicant groups in the targeted surveys. This preference was from negotiations with the LALCs and NT applicant groups. Comments received from registered parties are included in the consultation log for the proposal (refer to Appendix A).

Meetings were held with the relevant LALCs who nominated field staff for surveys in September 2018 as follows:

- 25 September 2018 at Narrabri LALC
- 25 September 2018 at Pilliga LALC
- 26 September 2018 at Baradine LALC
- 26 September 2018 at Coonamble LALC
- 27 September 2018 at Coonabarabran LALC
- 27 September 2018 at Gilgandra LALC
- 10 October 2018 at Narromine LALC
- 11 October 2018 at Weilwan LALC.

4.1.3 Action 3 - Undertake the field survey

Consultation was conducted with nominated sites officers for the LALCs during the archaeological surveys. Numerous surveys occurred over the course of eleven months. In late 2018 information was forwarded to registered parties about the geotechnical investigations proposed for late September and October 2018. Field surveys were undertaken throughout 2019:

- Survey of the geotechnical boreholes with nominated site officers for the relevant LALCs and NT groups occurred on:
  - 24 to 27 September 2018
  - 26 to 30 November 2018
- Survey of the targeted sensitive areas occurred on:
  - 10 to 17 December 2018
  - 20 to 26 January 2019
  - 7 to 14 April 2019
  - 18 to 29 May 2019
  - 30 to 31 May 2019
- Survey of proposed borrow pit locations and haulage roads occurred on:
  - 26 September to 5 October 2019
  - 26 to 27 October 2019.

Consultation conducted during survey provided an opportunity for the site officers to provide:

- comment on the potential for Aboriginal cultural material to be present within the study area. See Appendix A.6.4 for site officers that participated during the surveys
- comment on the cultural significance of any Aboriginal cultural heritage sites identified during the survey
- comment on proposed management recommendations, including recommendations for further investigations.

4.1.4 Action 4 - Communicate with the registered parties through Aboriginal focus group meetings

Invitations were sent to registered parties for Aboriginal focus group (AFG) #1 meetings held in Narrabri and Narromine in late December 2018. These invitations requested cultural knowledge holders to participate in the archaeological survey and provide information on:

- any Aboriginal objects of cultural value to Aboriginal people located in the area of the proposal including places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic, social, spiritual and/or cultural significance.

Over the course of the archaeological field survey informal interviews have been held with knowledge holders in respect to the cultural significance of places mentioned in the text. On occasion these interviews were taped with permission of the knowledge holder and this is detailed in relevant sections. The first AFG meeting was held on the 15 December 2018 in Narromine and (for convenience) repeated on 17 December 2019 in Narrabri. A copy of the presentation, minutes and actionable items are provided in Appendix A. Agenda items discussed at these meetings included:

- proposal background
- proposal is lodged as State Significant infrastructure

- public exhibition of EIS
- ARTC's Indigenous Participation Plan
- the role of the Minister for Planning regarding approvals
- payments for cultural heritage fieldwork
- land access
- cultural values assessments to be undertaken concurrent with surveys
- aim of cultural heritage surveys and steps that need to be completed.

Invitations were sent to the NT groups, LALCs and RAPs for AFG #2 meetings held in Narromine in late March 2019. This second AFG presented information on the proposal, the assessment methodology and the proposed survey work (refer to Appendix A.5.5). Minutes from AFG#2 are included in Appendix A.5.5.

Invitations were sent on 21 May 2020 to the NT groups, LALCs and RAPs for four AFG#3 meetings held on 3 and 4 June 2020. Due to COVID-19 restrictions, these meetings were conducted via teleconference. A copy of this draft ACHAR was sent to each party along with a copy of the full presentation. The meeting presented the survey results for those sites within the proposal site, asking for comment by 18 June 2020 on mitigation measures proposed for sites that would require management. Responses from the formal submissions are included in the consultation log (refer to Appendix A) and summarised in section 4.3. Minutes from AFG#3 are included in Appendix A.5.7.

4.1.5 Action 5 - Presentation of information about the proposal to all RAPs and Native Title representatives

This task involved presenting the archaeological survey and test excavation methodologies on 05 November 2018 (refer to Appendix D) and requesting consideration and information regarding the Aboriginal cultural values of the study area. A notification of upcoming targeted surveys of areas identified as culturally significant for Aboriginal heritage accompanying a targeted archaeological survey and test excavation methodology was emailed to all RAPs, LALCs and Native Title representatives on 15 March 2019. The letter explained that during late 2018, 19 culturally sensitive areas were identified during preliminary surveys for the *Due Diligence Assessment of Geotechnical Investigation Work* (JacobsGHD 2019). The notification letter stated that the ARTC was proposing to undertake targeted surveys of these locations in April 2019 to register Aboriginal heritage sites, places and objects and assess the significance of these places. Additionally, RAPs were informed that, test investigations would be undertaken at two geotechnical borehole sites near the Macquarie River as well as areas identified with potential cultural sensitivity during the targeted survey. Responses were invited to be received by 11 April 2019.

Further to these notifications, information such as maps of the study area, details about staffing including rates of pay for field staff, third party employer details, rates for mileage to attend surveys, accommodation rates were sent to individual LALCs, Native Title representatives and RAPs throughout October and November 2018 (refer to Appendix A).

The proposed methodology for the assessment was provided to the RAPs for their review and feedback on 15 March 2019. Phone conversations were had with most RAPs over the next few weeks. One response was received by mail and discussions and updates held with individual RAPs by phone where possible (refer to Appendix A.1). This feedback concentrated on the cultural significance of the study area was used to inform survey strategies to ensure Aboriginal heritage values were fully recorded or where they had in some instances been compromised by land use and rural development. Additional attempts were made to elicit comment on the survey

strategy by phone in early April 2019 and updates were provided February and April 2020 (refer to Appendix A).

4.1.6 Action 6 - Department of Planning, Industry and Environment consultation

The Environment, Energy and Science (EES) Division of DPIE (now Heritage NSW) have been involved in regular communication regarding the proposal and the assessment methodology including formal meetings on 28 September 2018, 10 October 2018 and 30 October 2018 to discuss the following:

- the consultation held with the Aboriginal community
- the provision of access to background information on the cultural heritage landscape
- the potential for cultural offsets
- previous research in the region
- predictive modelling for the study area
- testing under the Code of Practice
- later informal meetings were held to discuss the following
- an archaeological survey methodology
- additional references and reporting for the study area.

Consultation is ongoing with Heritage NSW.

4.2 Consultation log

A log summarising all consultation carried out with Aboriginal stakeholders including NT groups, LALCs and RAPs in relation to the proposal to date is provided in Appendix A.

4.3 Feedback from the review of the draft ACHA

In accordance with the ACHCRP (DECCW 2010b), a copy of this report was provided to the NT groups, LALCs and RAPs for review and comment on 21 May 2020. A review period of 28 days was provided, and a third AFG meeting was held on 3 June 2020 and 4 June 2020 to provide a forum for the discussion of the proposal impacts and proposed mitigation recommendations documented in this report. Comments made on the ACHA during the review by the NT groups, LALCs and RAPs are summarised in Table 4.1 and detailed in Appendix A.6.4.

This report has been updated based on the review comments received from the RAPs where relevant.

Table 4.1 Summary of comments made during the review of the draft ACHA and response to comments

Respondent group	Comment made	Response to comment
RAP	One respondent highlighted the traditional affiliations his people had with water and the importance of considering cultural values and natural habitats in these areas.	The traditional affiliations the Aboriginal people had with water and the importance of considering cultural values and natural habitats in these areas has been noted. Cultural values have been assessed in section 9.1.2.
RAP	One respondent was concerned about some wording in the draft report.	The wording in question was amended in the final report as requested.
RAP	One respondent indicated that they were happy with the recommendations and would like to be involved in the next stage.	The request to be involved in any additional work associated with the proposal has been noted.
RAP	One respondent noted that they were happy with the consultation undertaken for the proposal and that it had been broad and engaging. The respondent noted that the cultural landscape, cultural significance, cultural values and cultural objects were all important to the Aboriginal culture and that you could not separate one from the other. The large number of sites identified in the results of the ACHA show the Aboriginal people's existence in our tribal country and attaches us in a spiritual way to country. The respondent requested that the following principles be utilised in the Cultural and Heritage Management Plan to manage and minimise impacts to Aboriginal cultural heritage: • realignment • avoidance • collection and salvage of objects • preservation and protection • leave alone out of disturbance area • new sites located. The respondents final recommendations was to support the nation building project with the required management plans from this report.	It is noted that the respondent was happy with the consultation undertaken for the proposal. The large number of sites and the Aboriginal connection to cultural landscape, cultural significance, cultural values and cultural objects is noted. A mitigation measure has been included in this ACHA that includes the requirement to prepare an Aboriginal cultural heritage management plan (refer to MM10 identified in Table 10.1). The plan would be prepared in consultation with the RAPs and would include: • measures to avoid and minimise impacts to Aboriginal heritage • salvage strategies for collection of Aboriginal heritage items impacted • management strategies for salvaged Aboriginal objects • protection strategies for Aboriginal heritage items that are potentially indirectly impacted • strategies for management of any new sites / unexpected finds that are identified. The support for the overall proposal is noted.

Respondent group	Comment made	Response to comment
RAP	Five of the respondents who reviewed the ACHA would like an arborist to check on the age of scarred trees in Etoo Creek.	The respondents are happy for this to be addressed in the Aboriginal cultural heritage management plan and detail has been added to MM14 in Table 10.2.
RAP	One respondent was happy with the recommendations made.	It is noted that the respondent is happy with the recommendations made in the ACHA.

4.4 Further consultation

Consultation with Heritage NSW, NT groups, LALCs and RAPs will extend past the investigation phase (as documented in this report). Further field surveys and archaeological investigations will follow the EIS approval and into the next phases of the proposal as detailed in section 10.

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5. Background information

This section describes the study area and the environmental context in relation to where the proposal is located including landscape regions, geology and soils, vegetation, climate, historical and current land use and the ethnographic background. This information was principally obtained from research completed for NSW western regional assessments (NPWS 2000a; NPWS 2000b; DECCW 2018)

5.1 Environmental context

The proposal is located within two bioregions, the Brigalow Belt – Southern Bioregion (BBSB), and the Darling Riverine Plains Bioregion (DRPB) (refer to Figure 5.1). Both bioregions are examined in relation to their climate, geography, soils, hydrology, landform, and biodiversity. An assessment of these factors enables the archaeological context of the proposal to be understood in more depth. This section is in accordance with requirement 2 of the Code of Practice.

5.1.1 Brigalow Belt – Southern Bioregion

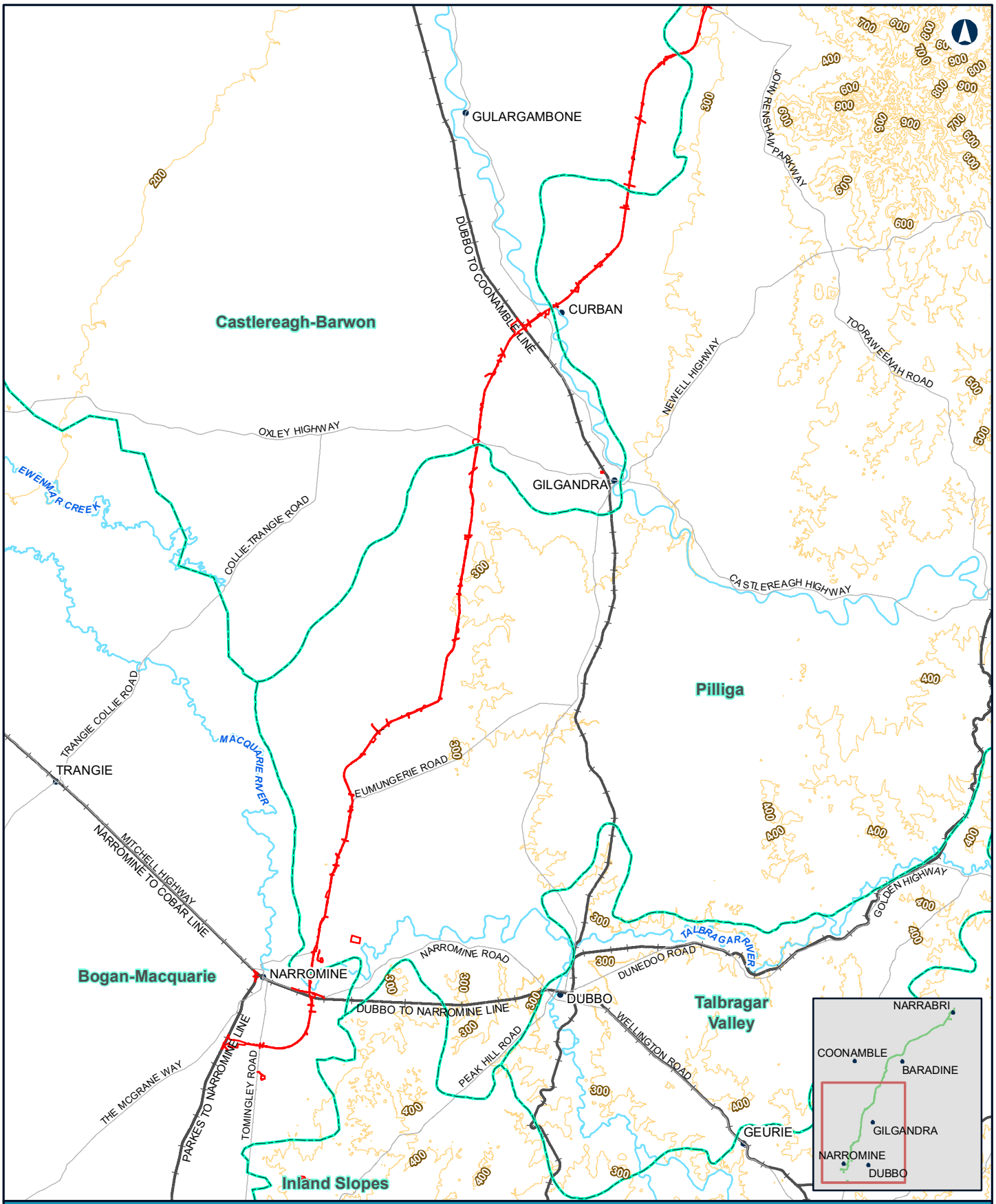
The proposal is in the southern portion of the BBSB (refer to Figure 5.1). The BBSB lies in northern NSW and southern Queensland (QLD), extending from south of Dubbo in central-western NSW to the mid-QLD coast (OEH 2018). The bioregion has a total area of 27,196,933 hectares, of which 5,333,469 hectares (19.61 per cent) fall within NSW, occupying 6.7 per cent of the State (OEH 2018). The majority of information in this section was obtained directly from the Biodiversity reform documentation available online NPWS (2000a); NPWS (2000b) and OEH (2018).

The towns of Baradine, Binnaway, Coonabarabran, Dubbo, Gunnedah, Merriwa, Moree and Narrabri occur within the bioregion. The proposed route runs for 239 kilometres through four sub-regions within the BBSB, from north to south:

- the Northern Basalts (0.58 kilometres)
- the Pilliga Outwash (76.6 kilometres)
- the Pilliga (156.5 kilometres)
- the Liverpool Plains (5.21 kilometres).

Climate

The bioregion is located within the eastern sub-humid region of Australia (NPWS 2000a). A sub-humid climate, with no dry season and a hot summer, characterises the south-eastern section of the bioregion, while a generally dry subtropical climate dominates to the northwest. Minor patches to the southeast of the bioregion fall within the temperate zone, with no dry season and a warm summer. To the far west of the bioregion and in the outlier enclosed within the DRPB, the climate can be described as hot and semi-arid (NPWS 2000a; NPWS 2000b; OEH 2018). Narrabri in the north of the proposed alignment is situated near the transition between arid and temperate climates. Narrabri has a sub-humid to temperate climate. It experiences a maximum mean temperature of 35.30 C in January and a minimum mean temperature of 3.40 C in July (Bureau of Meteorology 2017). Narrabri has a mean rainfall of 646 millimetres annually with the summer months being the wettest.



NARROMINE TO NARRABRI Bioregions of the study area Figure 5.1 a

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Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- The proposal
- Bioregions
- 100m contours

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:600,000
Data Sources: Basemap layers: NSWSS; Bioregions: DSEWPaC, All other project data: GHDJACOBS

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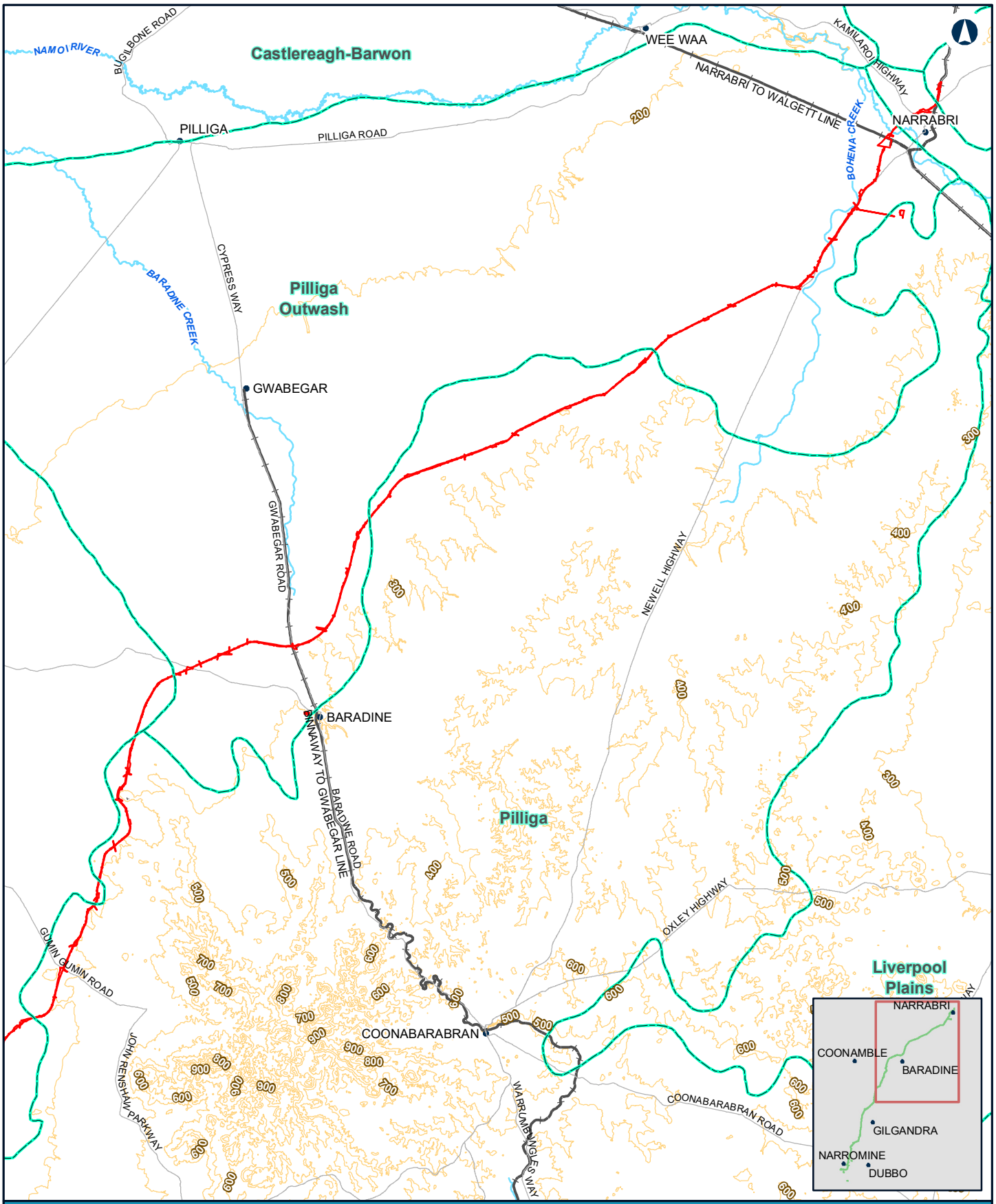

NARROMINE TO NARRABRI Bioregions of the study area Figure 5.1 b

0 8 16 Km

Coordinate System: GDA 1994 MGA Zone 55

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- The proposal
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Geology

The BBSB's bedrock comprises horizontally bedded Jurassic and Triassic quartz sandstone and shale with limited areas of conglomerate or basalts (refer to Figure 5.2). Some of the sandstone at the heads of streams form a low but rugged topography of cliffs and small plateau features. Streams follow the direction of major joint planes in the narrow sandstone gorges, depositing colluvial fans of coarse sands and gravels in the wider valleys (NPWS 2000a; NPWS 2000b; OEH 2018). Even further down valley the topography is more subdued, partly buried in alluvial debris and largely eroded to rolling plains. Evidence of larger stream courses of Quaternary age occur in the long, sand-filled channels and clay plains with gilgai (small ephemeral lake formed from a depression in the soil surface) between ridges in which rainwater collects (NPWS 2000a; NPWS 2000b; OEH 2018).

Within the **Northern Basalts sub region**, the geology consists of Tertiary basalts over Jurassic quartz sandstones and alluvial sediments derived from these.

Within the **Pilliga Outwash sub region**, the geology consists of quaternary alluvial fans largely derived from Jurassic quartz sandstone.

Within the **Pilliga sub region**, the geology consists of horizontal Jurassic quartz sandstones, limited shales, Tertiary basalt caps and plugs plus the sediments derived from these rocks.

Within the **Liverpool Plains sub region**, the geology consists of Quaternary floodplains and outwash fans derived from Tertiary basalts. Permian and Triassic quartz sandstones with minor basalt caps.

Soils

Soils vary greatly across this topography, as do microclimate and aspect, so it is necessary to differentiate areas of hill tops and plateau from slopes and valley floors in both sandstone and basalt areas as all these factors affect the vegetation (NPWS 2000a; NPWS 2000b; OEH 2018).

Within the **Northern Basalts sub region**, the soils consist of black loams on basalt ridges, deep sands on sandstone and texture contrast soils on slopes. Heavy grey clay on alluvial flats.

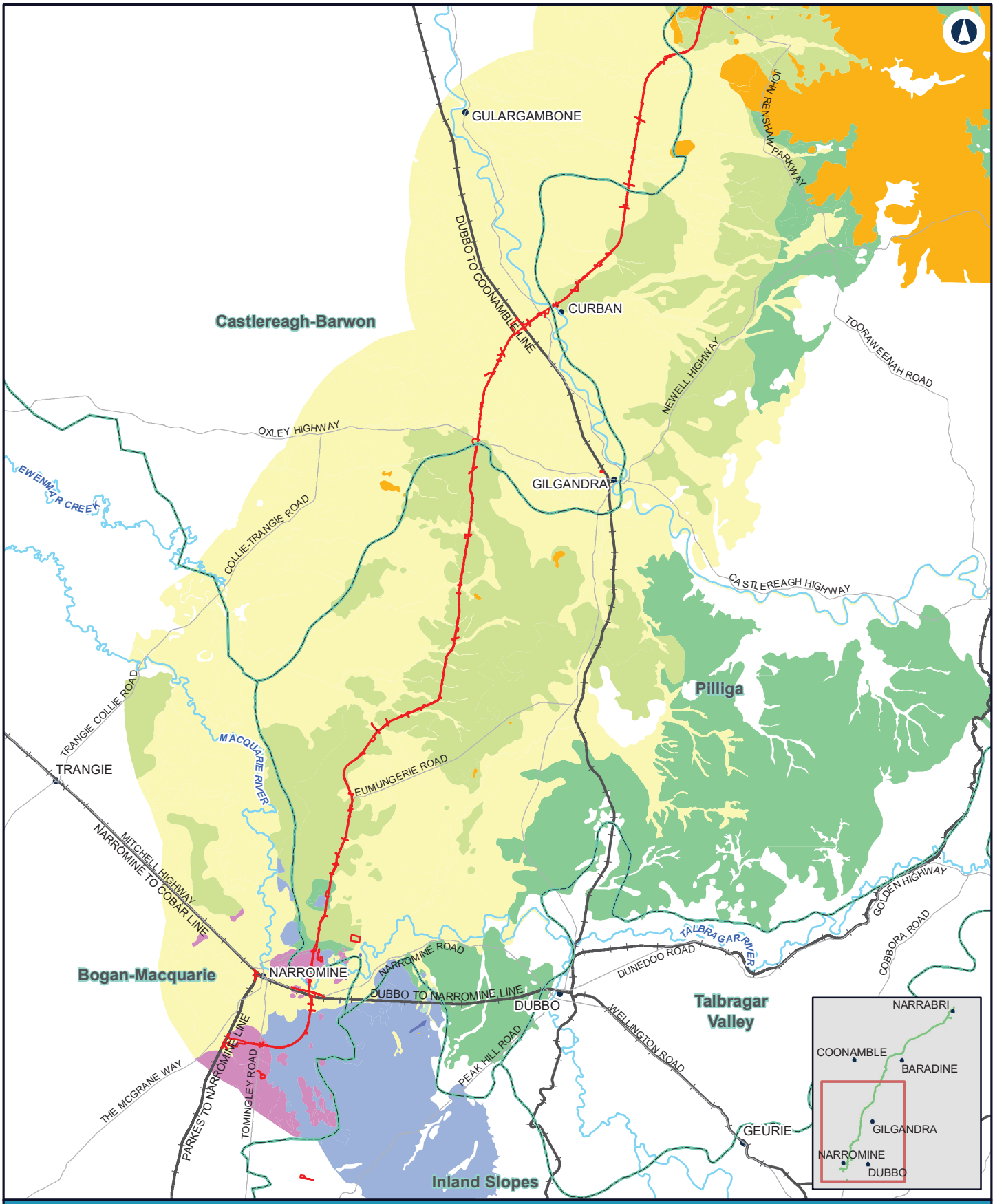
Within the **Pilliga Outwash sub region**, the soils consist of Deep texture contrast soils with harsh clay subsoils, grey clay with gilgai.

Within the **Pilliga sub region**, the soil consists of Shallow black earths and red loams on basalts. Extensive harsh texture contrast soils, linear patterns of deep yellow sand, stony red brown earths.

Within the **Liverpool Plains sub region**, the soils consist if extensive black earths on low angle slopes. Brown clays, alluvial soils and red or brown texture contrast soils on slopes below sandstone.

Hydrology

Several major rivers flow through the bioregion including the MacIntyre, Gwydir, Namoi, Castlereagh, Goulburn, Talbragar and Macquarie Rivers, their catchments forming an integral part of the Murray-Darling River System. The Liverpool Range in the south-eastern corner of the bioregion feeds the headwaters of the Hunter and Namoi Rivers (NPWS 2000a; NPWS 2000b; OEH 2018).



NARROMINE TO NARRABRI Geology of the study area

Figure 5.2 a

0 8 16 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- The proposal
- Bioregions

Brigalow Belt South Bioregion Geology

- Quaternary alluvium and colluvial outwash
- Tertiary volcanics
- Cretaceous sedimentary rocks
- Jurassic sedimentary rocks
- Triassic sedimentary rocks
- Devonian granites
- Silurian-Devonian granites
- Ordovician metasediments

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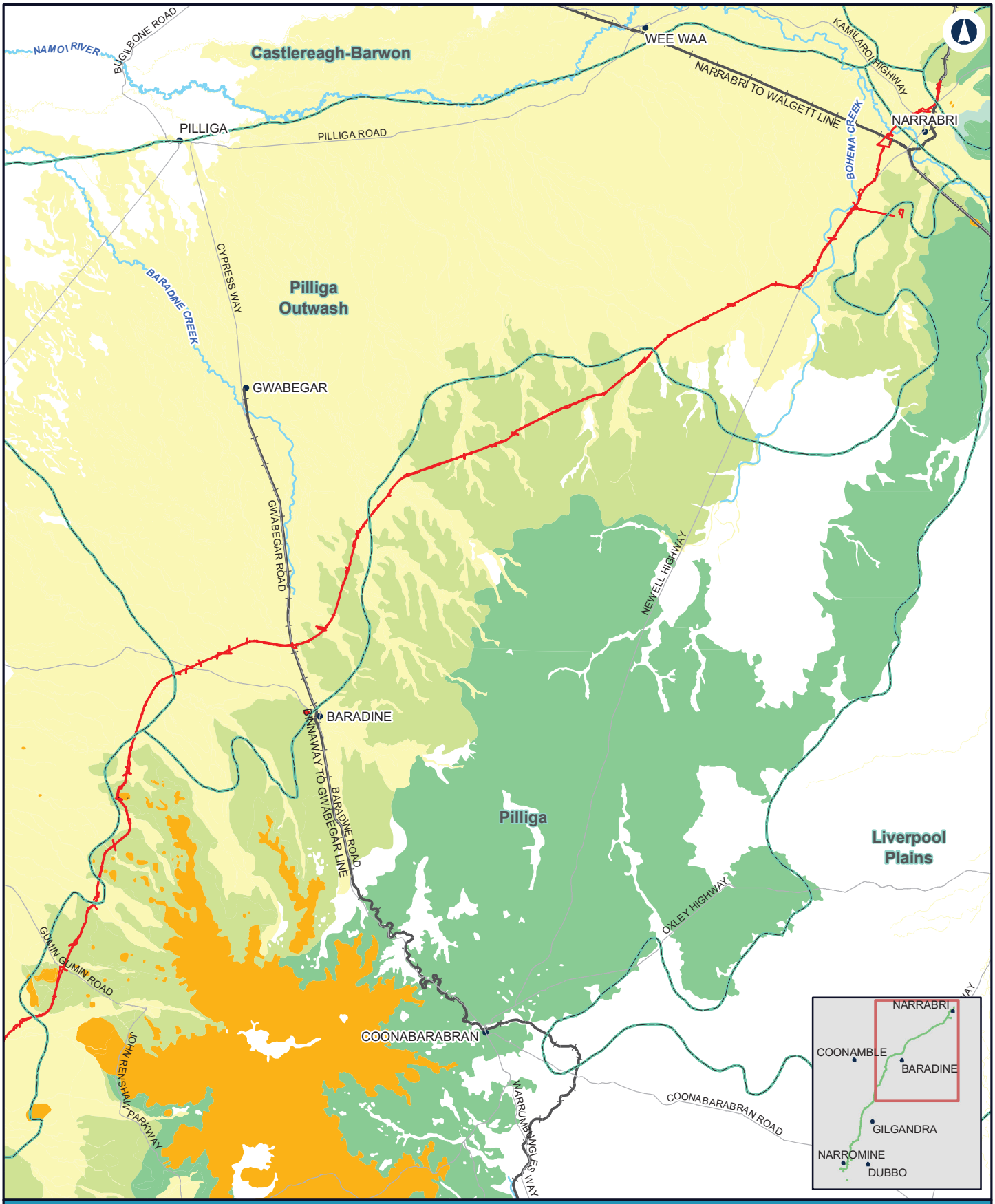

NARROMINE TO NARRABRI Geology of the study area Figure 5.2 b

0 8 16 Km

Coordinate System: GDA 1994 MGA Zone 55

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Brigalow Belt South Bioregion Geology

- Quaternary alluvium and colluvial outwash
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Landforms

The landscape of the bioregion is dominated by Quaternary sediments in the form of alluvial fans and outwash slopes that resemble the larger fans of the adjacent DRPB to the west but are composed of coarser sediment and fan out at slightly steeper angles. The relative distribution of sediment from basalt or sandstone has a major impact on soil quality and vegetation (OEH 2018; RACD 2002a; 2002b).

Within the **Northern Basalts sub region**, the landforms consist of undulating low stony hills, long slopes with sandy wash and heavy clays in the valley floors.

Within the **Pilliga Outwash sub region**, the landforms consist of long slopes broken by sandy abandoned stream channels, patches of heavy grey clay and incised stream channels.

Within the **Pilliga sub region**, the landforms consist of stepped sandstone ridges with low cliff faces and high proportion of rock outcrop. Long gentle outwash slopes intersected by sandy stream beds and prior stream channels. A few patches of heavy clay. Includes the spectacular mountain landscape of volcanic domes, plugs and dykes in the Warrumbungles.

Within the **Liverpool Plains sub region,** the landforms consist of undulating hills and sloping plains with alluvial channels and floodplains.

Biodiversity

The sandstone areas of the bioregion support various forests and woodlands. Woodlands dominated by Blue-leaved Ironbark (*Eucalyptus fibrosa*), Scribbly Gum (*Eucalyptus rossii*), Black Cypress Pine (*Callitris endlicheri*), Whitewood (*Atalaya hemiglauca*) and Rough-Barked Apple (*Angophora floribunda*) are found on stony sandstone plateaus and streams (NPWS 2000a; NPWS 2000b; OEH 2018).

Although few systematic surveys have been conducted in the bioregion, records from a variety of surveys can be used to illustrate the vertebrate fauna of the bioregion, which consists of 18 amphibian species, 68 reptiles, 281 birds and 82 mammal species.

5.1.2 Darling Riverine Plains Bioregion

The DRPB occupies most of the upper catchments of the Darling and Barwon Rivers in northern NSW and southern QLD and includes the channels and floodplains of the lower reaches of these catchments (OEH 2018). The majority of information in this section was obtained directly from the NSW government biodiversity reform documentation available online (NPWS 2000a; NPWS 2000b; OEH 2018). In respect to the central west study area, the DRPB includes the upper reaches of the Macquarie, Castlereagh, Namoi Rivers. The proposal runs for through two of its sub-regions of the DRPB within its eastern extent incorporating the townships of Narromine, Gulargambone and Gilgandra:

- Castlereagh-Barwon sub region
- Bogan-Macquarie sub region.

Climate

The DRPB lies in the semi-arid climatic zone which is hot and persistently dry (Stern 2000). This semi-arid area occupies most of the western arm of the bioregion, accompanied by very small patches of both arid and warm semi-arid climate. The bioregion also contains minor patches of subtropical climate in the east with sub-humid areas in the southeast.

On average, the eastern portion of the bioregion receives higher and more reliable rainfall, with flooding occurring mainly in summer, while irregular cyclonic depressions can occur to the north of the bioregion (Morgan and Terrey 1992).

Geology

Sheets of alluvium up to 100 metres thick have been deposited on older sedimentary rocks and contain marine sediments of an inland sea of Cretaceous age (OEH 2018).

Almost all bedrock features have been buried in this sedimentary basin, with only a few high points of basement rocks such as Mt Foster rising above the plain, and more extensive areas of the Cretaceous sandstones forming low rises around Lightning Ridge and in the Collarenebri interfluve.

Within the **Castlereagh-Barwon sub region**, the geology consists of extensive plains on overlapping low angle alluvial fans of several rivers. Sediment derived from Jurassic sandstones on the Castlereagh fan and from basalts on the Namoi fan. Same structure as Bogan-Macquarie (OEH 2018).

Within the **Bogan-Macquarie sub region**, the landforms consist of Bogan and Macquarie River alluvial fans of Quaternary age. Western margin is bedrock of the Cobar bioregion. Alluvial sediments from mixed Palaeozoic bedrock bury basement rock to 100 metres. Underlying sediments of Cretaceous and Jurassic age form part of the Great Artesian Basin (OEH 2018).

Soils

Sandy soils are found in linear belts along the older stream channels, sometimes with local source dunes on their border. Texture contrast soils, often badly eroded, are found marginal to channels of all ages, and most of the plains are dominated by deposits of heavy dark-coloured clays. Many clay areas have gilgai micro-relief patterns, most crack extensively, and others are more or less permanently wet in swamplands (NPWS 2000a; NPWS 2000b; OEH 2018).

The sandy soils have low nutrient levels and drain rapidly. The clay soils vary more depending on source rocks in the catchment, but all have only a limited amount of free water available to plants. Most soils contain high levels of calcium carbonate and some are saline (NPWS 2000a; NPWS 2000b; OEH 2018).

Within the **Castlereagh-Barwon sub region**, the soils consist Grey and brown clays on the plains and depressions with texture contrast soils on the low rises of former levees and channels.

Within the **Bogan-Macquarie sub region**, the soils consist of Grey and brown clays on the plains and depressions with texture contrast soils on the low rises of former levees and channels.

Hydrology

The DRPB occupies most of the upper catchments of the Darling and Barwon Rivers in northern NSW and southern Queensland and includes the channels and floodplains of the lower reaches of these catchments. The main streams contributing water and sediment to the alluvial fans of the plains are the Bogan, Macquarie, Castlereagh, Namoi, Gwydir, Macintyre, Narran, Bokhara and Culgoa rivers. The upper catchment landscape is a series of overlapping, low gradient alluvial fans. The lower tract of the river is a narrow floodplain confined between bedrock landscapes, or by extensive sandplains and dune fields (OEH 2018).

Discharge from past and present streams control patterns of sediment deposition, soils, landscapes and vegetation. Much of the geology and geomorphology of the region is similar to that of the Riverina Bioregion (OEH 2018).

Within the **Castlereagh-Barwon sub region**, the landforms consist of channels, floodplains, crevasse splays, levees, source bordering dunes and through flow swamps of past and present river systems.

Within the **Bogan Macquarie sub region**, the landforms consist of channels, floodplains, and through flow swamps of past and present river systems.

Each main stream carries different sediments depending on catchment geology and rainfall. The Namoi deposits clays derived from volcanic rock so the floodplains below Narrabri are some of the most productive soils in the state (OEH 2018).

Landforms

The sub regions contain deep alluvial soils, typically dark brown sandy clay-loam**.** Much of the study area has been cleared of larger stones within the plough zone (approximately the upper 30 centimetres), but drifts of small river-rounded stones were observed. These appeared to be quartz sandstone in fabric.

The upper catchment landscape is a series of overlapping, low gradient alluvial fans. Discharge from past and present streams control patterns of sediment deposition, soils, landscapes and vegetation. Soils and micro-climate vary greatly across this region, so areas of hill tops and plateau must be differentiated from slopes and valley floors in both sandstone and basalt areas, as these factors affect the vegetation (OEH 2018).

The sandstone ridge tops carry thin, discontinuous soils with stony, sandy profiles and low nutrient status. Downslope, soils that have a sharp increase in texture, such as an increase in clay content from surface soil layers to subsoil, are more common and are typically found with harsh clay sub-soils, while in the valley floors sediments tend to be sorted into deep sands with yellow earthy profiles, harsh grey clays, or more texture contrast soils with a greater concentration of soluble salts (OEH 2018).

Biodiversity

Open grasslands with occasional Myall (*Acacia pendula*), White Box (*Eucalyptus albens*), Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*), Bimble Box (*Eucalyptus populnea*), and Wilga (*Geijera parviflora*) are common in the sub regions (Mitchell 2002 as cited by OEH 2013). River Red Gum (*Eucalyptus camaldulensis*) occurs along streams.

Vegetation directly reflect past patterns of sedimentation and today's flooding regime, with some variation in plant species across the region relating to summer or winter rainfall dominance (NPWS 2000a; NPWS 2000b; OEH 2018).

Only the hardiest trees can survive the heavy clays of the backplains. These species include Myall (*Acacia pendula*), Poplar Box (*Eucalyptus populnea*) and Belah (*Casuarina cristata*) on the Macquarie, and Coolabah (*Eucalyptus coolabah*) and Grey Box (*Eucalyptus microcarpa*) on northern streams. Many plains are treeless, supporting only shrubs and grasses such as Old Man Saltbush (*Atriplex nummularia*), Bladder Saltbush (*Atriplex vesicaria*) and Mitchell Grass (*Astrebla sp.*) Bioregion (OEH 2018).

Landscapes closer to the hills support western plains woodlands, which consist of Grey Box (*Eucalyptus microcarpa*), Blakely's Red Gum (*Eucalyptus blakelyi*), Silver-leaf Ironbark (*Eucalyptus melanophloia*), Poplar Box (*Eucalyptus populnea*), Wilga (*Geijera parviflora*), Rosewood (*Heterodendrum oleifolium*), Belah (*Casuarina cristata*), Kurrajong (*Brachychiton populneum*), White Cypress Pine (*Callitris glaucophulla*), Yarran (*Acacia homalophylla*), some Brigalow (*Acacia harpophylla*) and several other species of Acacia.

Sandy soils on levees of old channels and dunes often have stands of White Cypress Pine (*Callitris columellaris*). Lake beds may be bare or covered by clumped Lignum (*Muehlenbeckia cunninghamii*) with a fringe of Black Box (*Eucalyptus largiflorens*). Lunettes support stands of Belah (*Casuarina cristata*), some Mallee, Eastern White Pine (*Pinus strobus*), Prickly Wattle (*Acacia victoriae*), Black Bluebush (*Maireana pyramidata*), and Sandhill Canegrass (*Zygochloa paradoxa*).

The bioregion is home to 25 amphibian species, 104 reptile species, 319 bird species and 58 mammal species. Of these, 63 species are listed in the *Biodiversity Conservation Act 2016*: nine as extinct, 12 as endangered and 47 as vulnerable (OEH 2018).

5.1.3 Historic land use and disturbance

This section explores the nature of land use from the earliest days of European exploration through to the present in the DRPB and BBSB. The principal change in land use however came about with the exclusion of Aboriginal people from their traditional lands since the mid nineteenth century and the subsequent changes in the ecology that resulted from this exclusion largely due to the discontinuance of land use practices such as the use of fire to manage forests and grasslands (Bickford 1980). Section 6 describes these land use practices and the attachment Aboriginal people have with the land in more detail. The following is a description of the land use changes brought about by European foresters and farmers that settled in the district and is sourced from regional history and principal histories.

The proposal is located within the region referred to as the Darling Plains by the Heritage Council in their regional histories (OEH 1996). This area is defined as that bounded by the Warrumbungle and Nandewar ranges in the east, the Western Division in the west and the Liverpool Plains in the south. The region is characterised by the upper reaches of the Namoi, Macquarie and Bogan Rivers draining into the Upper Darling River. The major agricultural pursuits are wool, wheat and cotton-growing, with oats in the east, oil and fodder grains elsewhere.

Exploration

John Oxley, then Surveyor General of NSW, undertook a survey of the interior of New South Wales from Bathurst. He first visited the bioregion in 1817 and again the following year when he reached the junction of the Macquarie and Talbragar Rivers near the current site of Dubbo. He noted the presence of the local Aboriginal people on the Macquarie River northwest of Dubbo and the suitability of the land for agriculture (OEH 2018). The Pilliga on the other hand was not quite so appealing as indicated by Oxley's journal entries (in John Murray London http://nla.gov.au/nla.obj-386035124).

According to Oxley (1820) the appearance of the country passed over was most desolate and forbidding, but quite open, interspersed with miserable rocky crags, on which grew the cypress and eucalyptus, and another of its genus (the iron bark), were the principal if not the only trees. Many of the rocks were pointed and basaltic, but the general species was a course sandstone. Miserable as the country was in other respects, it was fruitful in new plants.

As Oxley moved further into the Pilliga he noted that:

> *'Our course this day led us over a barren, rocky country, consisting of low, stony ranges, divided by valleys of pure sand, and usually wet and marshy: latterly we appear to be descending from a considerable height into a lower country to the north east. The whole was a mere scrub covered with dwarf iron barks, apple trees and small gums; the soil scarcely anything but sand, on which grass grew in single, detached roots. The horses fell repeatedly in the course of the day, and they were now so weak that they sank at every soft place... In our track we saw no sign of natives, and the country seemed abandoned of every living thing. Silence and desolation reigned around'* (Oxley 1820).

Oxley's explorations opened the Liverpool Plains to agriculture. However, they also suggested the presence of an inland sea, to which the explored rivers flowed.

A decade later, in 1828, Captain Charles Sturt received permission to trace the course of the Macquarie River with fellow explorer, Hamilton Hume. The party left the government station at Wellington Valley in December 1828. On 31 December Hume and Sturt conducted independent reconnaissance's of the course of the Macquarie River to the Macquarie Marshes and the Bogan River respectively (Gibbney 1967).

Shortly afterwards, in 1831 surveyor Sir Thomas Livingstone Mitchell was granted permission to explore the area between the Castlereagh and Gwydir Rivers. The party left Armidale in November 1831 and explored the Namoi as far as Narrabri, then cut across to the Gwydir near Moree. Mitchell charted the tributaries between the Gwydir and the Barwon rivers, however following the death of two of his party and theft of stores in skirmishes with Aboriginal people, the expedition was terminated in February 1832 (Baker 1967).

Pastoralism

The land covering the study area was once taken up by squattages; large pastoral properties "squatted" on by entrepreneurial landholders operating outside of the limits of the nineteen counties that made up the colony of New South Wales. Government land grants were made within those Nineteen Counties, while grants were not made in the remainder of the country, owing to the inability of the early government to provide services such as police and post (High Ground Consulting 2009:33).

Nonetheless, large landowners and former convicts alike began grazing large flocks and herds outside of the nineteen counties. Some squattages went on to become large pastoral properties that gave their names to their localities, some were large but only operated by one or two people. Andrew Brown's *Barradean*, for example, was thought to have been run by one or two convicts and an overseer, whilst others, such as *Narrabri*, became so well-known that towns grew up around them (High Ground Consulting 2009:33).

For the next twenty years squatters leased enormous parcels of land, leaving little for smaller farmers. By the 1860s, a series of reforms designed to break the squatters' hold on land were introduced, most notably with the introduction of the *Crown Lands Alienation Act 1861* and the *Crown Lands Occupation Act 1861*, known informally as the *Robertson Acts*. These acts allowed the free selection of Crown land on certain conditions, such as the requirement that selectors live on the land selected for at least three years, and to make improvements to the value of no less than £1 per acre. The legislation spelt the end of the domination of land tenure by the squatters (High Ground Consulting 2009:33). One of the early settlers in the Narromine region was John Christie who is memorialised to the east of the study area on the southern bank of the Macquarie River.

Travelling stock routes

As part of the activities associated with large pastoral stations, stock would often need to be moved from one place to another. In 1836, Charles Darwin noted when visiting James Walker's property, Wallerawang, near Lithgow that sheep were moved over a hundred miles from their grazing lands to be shorn (High Ground Consulting 2009:33). Referred to as the "long paddock", the routes used to move stock from place to place became a network of travelling stock routes (TSRs).

The origins of TSRs have not been extensively studied, although it has been suggested that at least some TSR followed existing traditional pathways of Aboriginal people (Spooner Firman and Yalmambirra 2010:330). As many traditional Aboriginal pathways followed rivers, floodplains, lakes and marshes, it is feasible that drovers also followed these pathways to be close to water (Ibid:331). McKnight suggested that the first stock routes were developed in two stages: the first to "overland" stock to and from the pastoral stations, and the second to move the stock to key markets once they were established (McKnight in Bombell 2014:13). Over time TSRs were surveyed, notified and gazetted, resulting in a network of TSRs across the eastern seaboard (refer to Figure 5.3). Many of the original TSRs have been destroyed or neglected. Three is a TSR at Webb's Siding on the southern terrace of the Macquarie River was known to be both a traditional and historical campsite for local people.

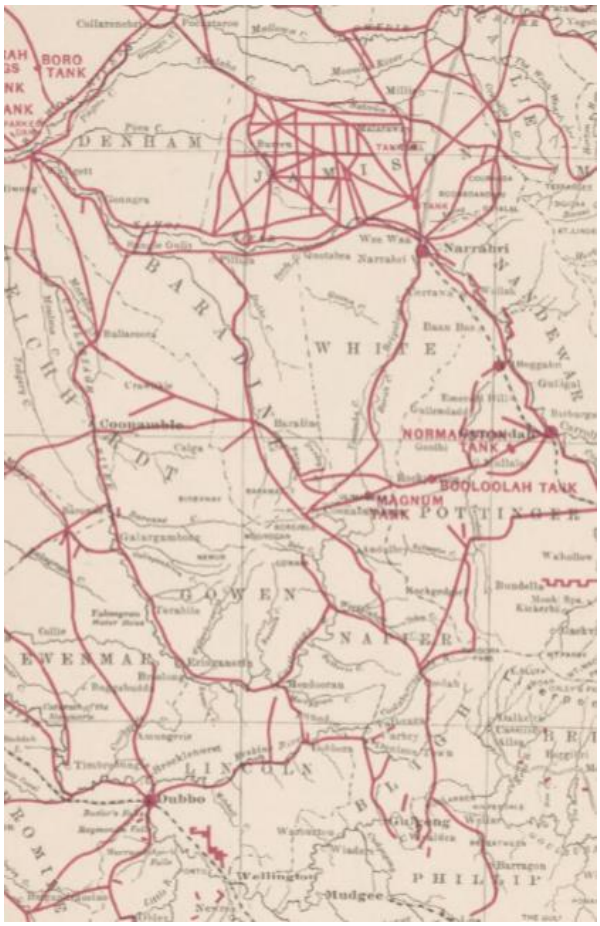

Figure 5.3 Network of stock routes, tanks and wells, c.1888 (Courtesy: National Library of Australia)

Mining

The mineral industry in the bioregion has historically been based mainly on coal, as the region lies mostly within the Gunnedah Basin, which is a major coal-bearing sedimentary basin. Current mining titles are held for coal and some industrial minerals while exploration titles are held for coal, petroleum, gold, base metals, zeolites and clay minerals (Hartley 2000) . The majority of coal produced in the region, although comprising a small yield, is for export to overseas markets (Hartley 2000). Gas seam exploration is currently awaiting approval in the Pilliga Forest.

History of townships in region

Further details of the history of individual townships in the study area is located in *ARTC Inland Rail Narromine to Narrabri Non-Aboriginal Heritage Assessment and Statement of Heritage Impact* (JGHD 2020).

5.1.4 Implications for the distribution of Aboriginal cultural heritage

Cultural landscapes, landforms, places and areas are terms used among heritage practitioners and government agencies to express the Aboriginal cultural linkage to the environment. These terms, often used interchangeably, reflect the notion of conserving Aboriginal cultural heritage at the landscape scale, rather than on a site-by-site basis. Landforms indicate the features that make up physical landscapes and are identified by set criteria for example, the type of water feature, degree of slope, morphology, size in area and soil type.

Three major catchments are located within the study area:

- the Macquarie River
- the Castlereagh River
- the Namoi River.

Macquarie River catchment

The Macquarie River catchment, also referred to as the Macquarie-Bogan catchment covers more than 74,000 square kilometres and is located within the Murray- Darling Basin. The catchment contains the headwaters of the Macquarie River, which begins on the Great Dividing Range and flows north west before hitting the Barwon River near Brewarrina (Gree et al. 2011: 1). Within the study area of the Macquarie River catchment the following minor hydrolines occur:

- Backwater Cowal
- Ewenmar Creek
- Marthaguy Creek
- Boothaguy Creek.

Vegetation within the Macquarie River catchment can be separated into two regions. In the upper catchment there are dry sclerophyll forests and grassy woodlands of the Southern Tablelands, with the main tree species being Red Stringybark (*Eucalyptus macrorhyncha)* and Scribbly Gum (*Eucalyptus rossii*) (Gree et al. 2011: 7). Around Mudgee and Dubbo this environment community gives way to dry sclerophyll woodlands and grassy woodlands which are dominated by species of Grey Box (*Eucalyptus microcarpa*), Kurrajong (*Brachychiton populneus*), and Cypress pine (*Callitris sp*.). Within the lower catchment, the riverine and floodplain woodlands with River Red Gum (*Eucalyptus camaldulensis)* along the watercourses and Black Box on the floodplain. Within the Macquarie River catchment are the Macquarie

Marshes which are listed as being of international importance. The wetland contains a wide variety of vegetation communities as well as over 211 bird species, eight species of native mammal, 15 frog species, 56 reptile species and 24 native fish species (DEWHA 2009; Gree et al. 2011: 8).

Castlereagh River catchment

Located within the Murray-Darling basin in central-western NSW, the Castlereagh River catchment covers around 17,400 square kilometres. The catchment is boarded by the Namoi catchment to the east and the Macquarie River catchment to the west. Within the catchment, the Castlereagh River flows from the Warrumbungle Ranges, flows east to Coonabarabran, and south to Binnaway, before sweeping around to the north-west before entering the Macquarie River. Within the catchment there are a small number of wetlands, with woodlands and shallow wetland complexes dominate the lower river basin effluents (Australian Government 2018).

The catchment supports a wide variety of vegetation communities, these include grassy woodlands of White Gum (*Corymbia aparrerinja*) and Narrow Leaved Ironbark (*Eucalyptus crebra*), Rough-barked Apple (*Angophora floribunda*) and River Red Gum (*Eucalyptus camaldulensis*) along the waterlines, and low shrubby heathlands on more exposed rocky sites (Rabbidge 2016:9). There are a few wetlands present within the catchment, predominantly due to the steep and hill terrain which does not promote wetland growth (Rabbidge 2016:9).

GIS pathway analysis conducted by (Ridges and Simpson 2016) identified likely access routes into the Warrumbungle Ranges for both the Gomeroi and Weilwan people that concentrated on the lower order streams of the Castlereagh River watershed as likely access routes for both the Gomeroi and Weilwan people to access the westerly extent of the Warrumbungle Ranges. The likely access routes identified by Ridges and Simpson provide valuable context for the broader landscape usage by Gomeroi and Weilwan people and may inform the differential distribution of stone material and artefact typology identified throughout the region. These indicative pathways include the majority of creeks that were identified as culturally sensitive, and therefore incorporated into the recent survey for investigation, namely:

- Gulargambone Creek
- Baronne Creek
- Calga and Looking Glass Creeks
- Bucklanbah Creek
- Coonamble Creek
- Mungery Creek
- Noonbar Creek
- Tenandra Creek.

The Heritage NSW 2019 Major Rivers Database identifies these creeks as tributaries of the Castlereagh River. Some examples of landforms identified and mapped in the Pilliga and Goonoo State Forests include, floodplain, soil mantled slopes, terrace, rocky ground and alluvium. Each category of landform occurs in various areas of the forest, often in repeated relationship with other landforms highlighting the make–up of the landscape overall.

The Namoi River catchment

The Namoi River catchment stretches westward from the Great Dividing Range to the floodplains of northern New South Wales and is bounded by the Nandewar Ranges and Mount Kaputar in the north and the Liverpool and Warrumbungle ranges in the south (Australian Government 2019). Covering over 42,000 square kilometres, the catchment contains the Namoi River, the Barwon River, the Macdonald River, Peel River, and the Manilla River (NSW Government 2010). Within the study area of the Namoi River catchment the following minor hydrolines occur:

- Baradine Creek
- Coolangla Creek
- Cumbil Forest Creek
- Stockyard Creek
- Rocky Creek
- Etoo Creek
- Bundock Creek
- Bohena Creek.

Vegetation within the Namoi catchment contains open box woodlands, temperate and subalpine forest, and endangered native grasslands. The Riverine vegetation is dominated by River Oak Willows, and River Red Gums (Office of Water 2011). Within the Lower Namoi River, there are over six broad vegetation communities. These include Carbeen woodlands on flats and gentle slopes, riparian woodland with Coolibah (*Eucalyptus coolabah*) in association with River Red Gum (Angophora floribunda) or Black Box (*Eucalyptus largiflorens*) on frequently flooded areas of the floodplain, Coolibah or Black Box woodland on higher areas of the floodplain, Bimble Box woodland on elevated floodplains and ridges, River Red Gum (*Eucalyptus camaldulensis*) forest and woodland along riverbanks and river flats, and Weeping Myall (an acacia) on flats or gentle rises that are above inundation (Cotton Catchment Communities CRC 2009).

Within the Namoi River catchment there are seven different landscape zones. Each of these contain a variety of geological and landform processes. To the east of the study area the Warrumbungles, and Mt Kaputar Ranges present as rugged volcanic landscape which is dominated by steep slopes and coarse cobble deposits. The middle to lower landform is a moderate relief landscape which extends between Tamworth and the Melville Range, to Goonoo Goonoo Creek in the south to Borah Creek in the north. The Liverpool Plains are relatively flat, and low-lying alluvial sediments throughout the landscape. Within the Pilliga there is a sandstone plateau and an outwash. The plateau is composed of rolling hills, while the outwash is a result of the plateau which contains a low-lying landscape of undulating alluvial sediments. Lastly, but the largest occupied by the study area, is the lowland plain which is an aggregational landscape of low relief consisting of flat to gently undulating alluvial plains. These different landscapes inform what vegetation and water sources are present and consequently where cultural material may be located. Surveys have subsequently concentrated on these alluvial features of the lowland plains that dominate the study area.

5.2 Ethnographic background

Ethnographic information relating to Aboriginal peoples' occupation of the area is derived from publications and other surviving forms of documentation which were compiled by early non-Aboriginal explorers, settlers, missionaries and government officials who went to the region during the mid to late 19th century. Problems encountered with these sources of information are well documented and include language barriers, cultural bias and ethnocentricism (ie Martinez 2010). The following information was compiled from a number of written sources based on language research and ethno-historic observations. It should be noted that the information provided here does not necessarily reflect the beliefs of the RAPs for the proposal regarding their tribal affiliations and boundaries.

5.2.1 Brief ethnography and Aboriginal local and regional land use

The Gamilaroi

The northern portion of the study area falls within the traditional lands of the Gamilaroi (Gamilaraay, Kamilaraay or Kamilaroi) who are one of the largest language groups in Australia. Gamilaroi people (also known as the Gamilaroi 'nation') have traditional territory that extends north to the townships of Quirindi, Tamworth, and Narrabri, Moree and Mungindi in northern NSW south to Muswellbrook and west to Walgett. Gamilaroi people were confronted with rapid depopulation in the early to mid-nineteenth century soon after first expeditions entered their country (Mitchell 1839). Pressure from European settlers, particularly in the Liverpool plains on the north western slopes to the east of the study area led to resistance by the Gamilaroi people in the area and a rapid rise in conflict. The introduction of small pox, venereal diseases and other introduced infections after initial settlement was also responsible for significant mortality. It has estimated the population of Gamilaroi cultural group to have been at least 15,000 people before settlement. By 1842 it is thought there were approximately 1,000 people left (Sveiby 2006: 25).

Villages of the Gamilaroi

Mitchell (1918) describes the social life of the Gamilaroi involving various sized groups depending upon societal circumstances such as ceremonial gatherings or smaller residential groupings sometimes involving ten people of the 'hearth group' or many hundreds during the summer months. First written reports of these gatherings described villages with solidly built huts as having '*bark floors and conical roofs scattered through thick woodland*' to the west of Cox's Creek in 1825 (Mitchell 1839).

Mathews (1918) describes in great detail the activities of a large group of Gamilaroi attending a bora at Terry-Hie-Hie and Kunopia where between 600-800 people attended. The initiation site it centred upon was lined with carved trees and by ritual designs cut into the soil.

Material culture of the Gamilaroi

Balme (1985) provides a long list of material culture objects used by the Gamilaroi to include axes (both steel and stone, bark coolamons, spear throwers, short (60 centimetre) hunting and long (3.2 metres) fighting spears, clubs (up to one metre), stone fish traps, shields, grass baskets, nets, bullroarers plus personal adornments including necklaces and fur coats. Other material culture objects known for the region include tjuringa or sacred boards (Balme 1985).

Resource use of the Gamilaroi

Resource use by the Gamilaroi people is described by a number of early commentators (ie Mitchell 1839) as being seasonal in nature and incorporating a range of available food types including terrestrial, avian, aquatic. Stone tool sources are more difficult to determine given the paucity of research in the region, however it is clear from previous research (RACC 2002) that raw materials were principally available from river cobbles eroded from sandstone landforms.

Burial of the Gamilaroi

In about 1830, it is said that among the southern Gamilaroi loud cries were raised when a death in the camp occurred (Fison and Howitt 1880). Female relatives were known to inflict wounds on their heads during mourning (a practice that was widespread in traditional Aboriginal society). After death the body was flexed with the knees brought to the chin and then the body was wrapped in possum rugs, placed in a shallow hole which was then filled in with soil and covered with logs and deadwood to keep carnivores from disturbing the remains. Burials were also known to take place in soft ground or if unavailable a hollow tree.

Tribal leaders might be buried in a *Bora* ground, under one of its carved trees, and it is also reported by Howitt that to cheat the *Kruben* (an evil being), other trees were sometimes marked, and other graves dug, without any bodies in them. Carved trees therefore may not always represent a burial site.

Gamilaroi ceremonies

According to Fison and Howitt (1880) Kamilaroi ceremonies took place at the full moon, and same place being located near water and on level ground. Trees were carved 'with curious devices' to the height of the limbs. The greatest Bora of the Gamilaroi tribes was reported to be held at Terry Hei.

> *At the time and place, only the Headman come together; the youths to be initiated are brought to them later on. They are then instructed in the rules relating to food, the support of the aged and infirm, and their duties to those who have large families. Old and infirm people stand first for their share, then those who have large families.*
>
> *Hitherto the youth has been Wonal, that is, only allowed to eat certain animals, and only the females of these; but he is now allowed to eat the males of some one's animal, sat [sic] opossum, but not the males of any other. The males of these others which he may find and kill he must bring home to the camp and lay at the huts of those who from sickness or infirmity cannot hunt, or who have large families. He is also told that he may eat the "sugar-bag", that is the honey from one particular kind of tree (*Fison and Howitt 1880: 593)*.*
>
> *At the Boras following the first, the youth is advanced step by step until he can eat of all the animals and all "sugar-bags"; and after his last Bora he can take a wife. All the lads go through the same grades and the same experience. No women or child is allowed to come near the Bora ground. No tooth was knocked out by the Northern Kamilaroi but was by the blacks of Maitland and Newcastle.*
>
> *The Kamilaroi tribe at the Gwydir River used a bull-roarer made of Brigalow wood, or the Brimble, and it is said to be about eight inches long by four inches wide. A sinew is tied to it, or sometimes put through a hole in the small end. The young of both sexes are forbidden to eat of the following foods: snakes, emu eggs, body of lace-lizard (they might eat the tail), honey from a gum-tree, and some other things* (Fison and Howitt 1880: 593-595).

The rivers and the lowland alluvial plains that emanate from Warrumbungle mountains are part of the wider cultural landscape of the Gomeroi. Aboriginal cultural heritage within the study area forms part of a much wider interconnected network of sites and places that are important to Aboriginal people.

Ngemba, Ngiyampaa, Wangaaypuwan and Wailwan

The application area for the Ngemba, Ngiyampaa, Wangaayuwan and Wailwan native Title application is bounded by the towns of Brewarrina, Bourke, Coonamble, Gulargambone, Warren, Nyngan, Hillston, Mossgiel and the Ivanhoe, Bogan, Castlereagh, Barwon, Darling and Lachlan Rivers in New South Wales.

The Ngemba community is located in and around the townships of Brewarrina, Lightning Ridge, Walgett and Bourke on the banks of the Barwon River in north western NSW. Ngiyampaa, Wangaaypuwan and Wailwan people are focussed here on townships such as Gulargambone and Gilgandra.

Water is considered by these people to have high spiritual significance and the environmental health of the rivers and waterways are of paramount importance. They conceptualise water sources and rivers as having derived from the actions of mythic beings during the Dreaming, when the world attained its present shape and the socio-cultural institutions governing water use were formed (Maclean 2012).

The Ngemba people are traditional owners of the Indigenous Protected Area and National Heritage listed Brewarrina Fish traps, and a related stretch of the Barwon River. While the traps are outside of the study area, it points to the intensity of fishing and resource use in the Barwon system.

The following account is taken directly from MGoals (2018) in respect to the Ngiyampaa / Ngemba.

> *The traditional homelands or Ngurrampaa (camp-world) of Ngiyampaa/Ngemba family groups extend north from around the Lachlan (Kaliyarr) to the Darling (Paawan) Rivers, east to the Bogan River and west to the Darling. The Mayi (Aboriginal people) of this language area speak the Wangaaypuwan (Wongaibon) way. 'Wangay' meaning 'no' and 'puwan' meaning 'having/plentiful/committed to'*
>
> *The main clan groups are Nelia Tree, Belah Tree, Stone county, Muttagah (Marthaguy Creek), Duck Creek and the Bogan gull (Nyngan area on the Bogan river) and their areas of responsibility overlap each other.*
>
> *It is recounted that in the past, the Ngiyampaa people followed Willandra Creek westwards to Lake Mungo, thus creating the cultural heritage links which are recognised in current times to the Willandra Lakes Region World Heritage Area.*
>
> *'Ngiyampaa people have two different types of country. The north end is all beautiful scrub country and stone rock country and there is a lot of bush tucker there. Then you go to the south and it is mostly plain country. They call us the dryland people and out only running water was the Willandra Creek so in the dry times we would come out of the scrub to the creek country. That creek was our life line as far as water goes. We would naturally go back into the scrub in the winter time where there was plenty of firewood and plenty of food. Ngiyampaa country has more different types of plants than any other country I have been through and that is how the people survives so well.'*

When it rained, some of the lakes would hold water for at least two years. In some places the aboriginal people filled logs with water from time to time and plugged the ends, so they had water available when the swamps dried up.

Young Jurrabar trees (White Cypress Pine) make good spears as they are usually always straight. The spears made from this pine tree will float, unlike other spears. The sap is used as an antiseptic for cuts and burns.

Bilah provides very good firewood, especially for cooking, as it burns for a long time and produces white ash. The leaves of Bilah are also used in fire pits when cooking animals lie the Thikarrpila (echidna) to flavour the meat.

The bark of Wunba (River Red Gum) is used for canoes and coolamons. The snotty gobbles that grow on Wunba are very bitter.

The leaves of Mallee trees, such as White Mallee, are used by Ngiyampaa people for ceremonies. The leaves are collected and burned. The Ngiyampaa people walk through the smoke that is produced from the leaves to keep the bad spirits away. The leaves are also used for stuffing Ngurruy (emu) as they give the Ngurruy a nice flavour and they have a lovely smell.

The wood of Mallee trees is used for didgeridoos and boomerangs. Ngiyampaa people determine if the wood is suitable for didgeridoos by tapping it to see if it is hollow. The termites come up through the branches of the tree and hollow them out. Straight branches and stems of this mallee are made into spears. Silver Needlewood provides good material for artefacts. Water can be obtained from the roots and from hollows in the wood. The seeds inside the fruit of Tharrii contain a red poison inside that Ngiyampaa people use to put on the tips of spears to numb the animal when it is speared. The leaves from Kuwanthaang are used in smoking ceremonies. However, the leaves have a slight toxicity (MGoals 2018).

The Ngiyampaa language is comprised of two dialects, Wayilwan and Wangaaypuwan and was spoken across a wide area of central NSW including long segments of the upper Macquarie and Bogan Rivers, along the southern bank of Barwon River west of Walgett and the arid area to the south-west of Cobar. It was closely related to the Wiradjuri, Gamilaraay and Yuwaalaraay languages to the east and north (Wafer & Lissarrague 2008 in Rose n.d.).

Apart from personal inherited dreamings, all Ngiyampaa speakers also shared a common belief in a single all-powerful creator named *Baiami*, together with a pantheon of lesser mythical figures associated with him. These included *Baiami's* wife, children, his hunting dogs, and his nemesis Darumulan. Baiami, together with this pantheon, are traditionally considered to have created the physical world as it appears today, and to have introduced language and traditional technologies to Aboriginal people. They all played important roles in Bora and Burbung ceremonies and are associated with a great number of songs, legends, and sacred sites across far western New South Wales (Donaldson 1979).

Aboriginal identity and the natural environment

Aboriginal cultural identity and heritage is inherently linked with the natural environment. The land and its flora and fauna are deeply significant and form a fundamental component of Aboriginal identity. Maintenance of intimate relationships with the natural world is extremely important to Aboriginal people, and from these relationships comes much of the oral history and traditions of their culture. The persistence and utilisation of the natural resources left in the bioregions are important to Aboriginal people trying to maintain cultural identity (NPWS 2000a: 2). Sensitive incorporation of values and criteria for cultural heritage as it relates to the natural environment, including culturally significant natural resources and archaeological/historical places are recognised by regional planning instruments as warranting attention (NPWS 2000a: 2).

The role of water in Aboriginal life

A theme of the research undertaken by the *NSW Regional Assessments* (NPWS 2000a) was to assess the role of water in Aboriginal life. Apart from the obvious fact that water sustains life, water played an important part in the ability of Aboriginal people to traverse the landscape and take advantage of the various habitats associated with waterways.

> *Because they all lived along the rivers. And a little way out, far enough to walk so they didn't die of thirst. And why would they have to go any further when everything come to the water to have a feed or a drink. That's what I was taught. "Why're you goin' over there, missy?" "Oh, might be kangaroo." "No missy, he'll be back here on dark." "Oh!" so I learnt, well you don't go walkin' to buggery out in the middle of the day, because they're all hidden'. So, you wait, and they all come to you.* (Denelle Gravenor as cited in NPWS 2000a: 22).

Aboriginal involvement in land and water management

There are currently limitations to Aboriginal involvement in land management within the DRPB. Most land tenure is freehold with various types of Crown lease which means that areas for traditional Aboriginal land management activities are particularly limited (see (NPWS 2000b). Nevertheless, the Aboriginal communities throughout the BBSB have expressed a strong desire to be involved where they can in the active management of Aboriginal heritage sites and places and that they can teach the history of these sites to younger generations (Geering and Roberts 2014) (Peter Harris pers. comm. 29 November 2018). There are similar limitations to Aboriginal people's involvement in the DRPB as again most land tenure is freehold. The alliance of Aboriginal nations is interested in taking an active role in the management of water in the BBSB through the Northern Basins Aboriginal Nations Alliance (NBAN 2018).

European and Aboriginal interaction

During the early days of European settlement local Aboriginal people were subjected to violence, disease and sexual exploitation and populations of local tribal groups suffered as a consequence. Traditional affiliations with endemic species were broken by the changes that took place such as widespread clearing to 'improve' pasture and thus the fecundity of the many species of animal that Aboriginal people relied upon was affected. Similarly changes to the traditional fire regime used by Aboriginal people to manage their estates caused widespread changes to the distribution of flora and fauna (Gammage 2012).

Conflict was particularly severe on the Namoi and Gwydir Rivers. Many Aboriginal people are known to have lost their lives throughout this period as did settlers that had appropriated their lands (Bottoms 2013; Dennis et al. 2008).

One example, at Waterloo Creek, known as the Australia Day massacre saw a New South Wales Mounted Police detachment, despatched by acting Lieutenant Governor of New South Wales Colonel Kenneth Snodgrass, attack an encampment of Gamilaroi people at a place called Waterloo Creek in remote bushland. Official reports spoke of between eight and 50 killed. The missionary Lancelot Threlkeld set the number at 120 as part of his campaign to garner support for his Mission. Threlkeld later claimed Major Nunn boasted they had killed 200 to 300 Aboriginal people, a statement endorsed by historian Roger Milliss. Other estimates range from 40 to 70 (Manne 2001; Milliss 1994; Southey 2010).

In 1849 native police were sent to the area and much of the Aboriginal resistance was suppressed by the mid-1850s (Bickford 1980). However, despite losing their lands or being forced to share them with the new settlers, the local Aboriginal people of the bioregion resisted covertly, holding onto their traditional practices, including knowledge of languages, stories and sacred sites (Bickford 1980). In some cases, retention of traditional practices was not so covert. Aborigines were known to perform corroborees for audiences of Europeans, performances involving Aboriginal participants from throughout the region. On some occasions, European settlers also observed other traditions such as funerals and burial ceremonies (NPWS 2000a).

With the loss of their traditional lands, Aboriginal people were even more dependent on European landholders for use of the land than they had been previously. They obtained work on the lands, engaged in timber cutting, feral animal shooting, shearing, domestic labour and worked as farm hands and stock hands. In this way they were involved in the local economy while remaining on their lands (NPWS 2000a). Those who were unable to remain on their traditional lands and who lived on reserves or in fringe camps came increasingly under the control of the government which established the Aborigines Protection Board in the 1880s. While the Board was initially responsible only for the distribution of blankets and rations on the reserves, it began to exert a tighter grip on the lives of Aboriginal People, placing ever more restrictions on the rights of the communities (NPWS 2000a).

The conditions that had allowed dual occupation to occur in the past had now ceased. As a result, Aboriginal communities were driven from their homelands and onto reserves on the outskirts of towns. This served to alienate the Aboriginal community who could now no longer use the land as they had traditionally, due both to their limited access to the land and its changing ecology under agricultural production (NPWS 2000a).

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6. Aboriginal cultural values and places

This section describes the process used to inform, and summarises the outcomes from, the cultural values assessment.

6.1 Introduction

The cultural values assessment in this report includes cultural information collected during consultation conducted during meetings, field survey and during the test excavation program.

Aboriginal Focus Group and other meetings were held on the following dates:

- 25 September 2018 at Narrabri LALC
- 25 September 2018 at Pilliga LALC
- 26 September 2018 at Baradine LALC
- 26 September 2018 at Coonamble LALC
- 27 September 2018 at Gilgandra LALC
- 27 September 2018 at Coonabarabran LALC
- 10 October 2018 at Narromine LALC
- 11 October 2018 at Weilwan LALC
- 15 December 2018 at Narromine (AFG #1a)
- 17 December 2018 at Narrabri LALC (AFG #1b)
- 28 March 2019 at Narromine LALC (AFG #2)
- 3 June 2020 teleconference (AFG #3)
- 4 June 2020 teleconference (AFG #3).

The Aboriginal cultural values assessment was carried out by the proposal archaeologists.

6.2 Aboriginal cultural values assessment methodology

The cultural values assessment involved a number of methods of consultation with knowledge holders as identified by the registered Aboriginal parties for the proposal (refer to **Appendix E** for further details on consultation). The cultural values assessment was based on:

- reviewing archaeological fieldwork and consultation previously conducted for the concept design (Reeves 2006)
- reviewing ethnographic literature relevant to the proposal and the surrounding landscape (refer to section 5.2)
- consultation with knowledge holders for the region during AFG meetings (Appendix A)
- consultation with knowledge holders at arranged meetings (for example, oral history recording during site visits with knowledge holders) (Appendix A)
- consulting with Aboriginal site officers during field work regarding Aboriginal objects and cultural values and as part of the AFG meetings (refer to Appendix A).

The information provided has contributed to an understanding of the cultural value of the broader landscape within which the proposal is located. Knowledge holders have provided information about the traditional presence of Aboriginal people in the landscape, ceremonial sites and the impact of European land management practices on their traditional land, and subsequently their culture. The cultural assessment identified locations of Aboriginal cultural heritage significance relevant to the proposal.

6.2.1 Cultural significance

Cultural significance can be associated with or attached to any place, places, and objects by any individual, group or groups of people. Cultural significance is embodied in the place itself; its fabric, setting, use, associations, meanings, records, connected places and objects. Place is a geographically defined area and may include tangible features that embody the physically identifiable landscape; as well as intangible features such as conceptual ideas or spiritual beliefs held over places or landscapes irrespective of observable physical evidence (Australia ICOMOS 2013).

Australia ICOMOS (2013) defines cultural significance as:

- Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.
- Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

6.2.2 Cultural landscape

The World Heritage Convention of United Nations Educational, Scientific and Cultural Organization (UNESCO) define an associative cultural landscape as one which has ‘powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent’ (UNESCO 1991). The relationship between Aboriginal Australians and the land can often be conceived in spiritual terms rather than primarily in material terms (Andrews et al. 2006).

Aboriginal cultural knowledge is inherently linked to the interpretation of cultural landscapes and has been defined as:

> *‘Accumulated knowledge which encompasses spiritual relationships, relationships with the natural environment and the sustainable use of natural resources, and, relationships between people, which are reflected in language, narratives social organisation, values, beliefs and cultural laws and customs.’* (Andrews et al. 2006).

Aboriginal cultural knowledge was traditionally bequeathed through oral traditions from generation to generation. Within all Aboriginal communities there was a time of dislocation and upheaval associated with the arrival of European settlers. This widespread disruption resulted in the loss of varying degrees of detailed knowledge and understanding of many of the elements of the cultural landscape from Aboriginal communities. A recognition and concern regarding this loss of knowledge of the cultural landscape and the meanings embedded in the landscape was expressed by several of the stakeholders during consultation for the proposal.

Ridges and Simpson (2016) identified three levels of Aboriginal cultural values that are relevant to the Warrumbungle Ranges and its surrounding landscape context. The Warrumbungles are part of the wider cultural landscape of the Gomeroi. Sites located there are part of the same interconnected network of sites and places that extend into the study area. They include:

- generic values that Aboriginal people apply to everything within Country
- social values affecting cultural affiliation with Country or individual places within it
- values relating to archaeology and the scientific study of features/objects.

6.3 Generic Aboriginal values

The following values are universally applied by Aboriginal people across Country:

- Aboriginal heritage is inseparably connected to nature (OEH 2012: 11)
- all lands and waters are connected to Aboriginal spirituality, mythology and identity
- natural resources, landforms and landscapes are foundational elements for the transmission of cultural knowledge which includes kinship and social systems, landscape knowledge, resource procurement, risk mitigation and the strengthening of social bonds see also (OEH 2012: 11)
- natural resources provide for:
  - the use and enjoyment of foods and medicines
  - the provision of raw materials for manufacture of tools and art
  - commodities to support exchange networks, and
  - materials to facilitate ceremony.

6.4 Identified Aboriginal cultural values

Onsite discussions with Aboriginal knowledge holders have identified a variety of cultural heritage values within the study area. The understanding and perception of the cultural landscape expressed by the knowledge holders is that it is an area traversed by an interconnecting network of physical, social and spiritual places. Table 6.1 summarises the results of on-site discussions with knowledge holders regarding the types of sites considered to be of significance.

Table 6.1 Cultural value types identified in the study area

Site type	Cultural value
Campsites	Knowledge holders identified campsites as culturally significant as they provide a link between family units, the gathering of resources, pathways through the landscape, land care rejuvenation and communication between other groups. In the course of the fieldwork, the identified site locations containing hearths and/or stone artefact scatters were noted as having these types of cultural significance.
Resource gathering locations and techniques	Knowledge holders noted that fish, plants and other foods are still collected throughout the region. The primary resource gathering locations, and the techniques used, are known and passed down through the generations.

Site type	Cultural value
Modified (scarred) trees	Scarred trees are of great importance to knowledge holders as they are tangible links to the past. Bark was a useful and versatile material that could be used for a range of commonplace tasks, including the construction of shelters, watercraft and containers. Due to European land use and agricultural practices, scarred trees can often be the only remaining markers of Aboriginal settlement.
Pathways through the landscape	Registered Aboriginal knowledge holders identified pathways that intersected the proposal. These pathways link spiritual and ceremonial sites, as well as travel corridors throughout the landscape. During the assessment, knowledge holders commented on the importance of spurs and ridgelines as routes for travel. These pathways link spiritual and ceremonial sites, artefact scatters often occur along these pathways, as well as scarred trees which may be located at junctions, ceremonial sites or other significant points in the pathways. The Table Top Mountain area has been identified by knowledge holders throughout the course of the cultural values assessment as having widespread contemporary cultural values including pathways throughout the landscape involving the Warrumbungles and areas further afield.
Water courses, water holes or springs	Permanent water bodies are culturally significant as a central location for gathering of people, resource collection and camping. During field work RAPs indicated certain water courses as important sources of food as well as significant for ceremonial practices. Watercourses are often associated with spiritual beings.
Aboriginal plants and animals	Aboriginal plants and animals are significant to traditional owners. During field work the fauna and flora were often mentioned in context with spiritual importance. Throughout the consultation process plants and animals were often mentioned in discussion with resource collection.
Burial sites	Burial sites are of great importance and are generally of high concern to Aboriginal people as the locations of burials are rarely documented. One 1877 burial site belonging to William Haines a great grandfather of a Gomeroi applicant was located 320 metres to the east of the Newell Highway near Bohena Creek.
Aboriginal ceremony and dreaming	Registered Aboriginal knowledge holders identified areas of spiritual and significance marked by prominent landforms such as Table Top Mountain and others by scarred trees potentially marking burial sites.
Post-contact sites	Post-contact sites are those that have gained significance to Aboriginal people since the arrival of European settlers. One of these is the memorial of John Christie near Narromine. The memorial is also reported to be associated with his Aboriginal partner, a young woman who passed away shortly after his untimely suicide. Additionally, areas such as the TSR at Webb's Siding on the southern terrace of the Macquarie River was known to be both a traditional and historical campsite for local people.

6.5 Oral testimonies and statements of cultural significance

Oral testimonies related to the survey areas within the principal catchments are summarised below.

6.5.1 Macquarie River (including Backwater Cowal and Ewenmar Creeks)

The Macquarie River represents a major traditional thoroughfare for the Wiradjuri people of Western NSW. Significant changes in local land-use practices and hydrology since colonisation have altered both the community's accessibility to resources and the ecological fecundity of the river and its associated alluvial floodplains.

An oral history was received from Mark Smith of the Mayne tribe of the Wiradjuri on 27 November 2018 that highlighted the cultural knowledge held by the Aboriginal community regarding this location. The local area (including Backwater Cowal) was described as being a culturally sensitive area and an established camp site. He described in detail the use of the area for food procurement of aquatic and terrestrial resources, as an established traditional and historic camp site, as a cultural crossing, for its stone and bark resources, ochre quarries, and as a place for obtaining bark for canoe trees, less commonly coolamon scars. Mr Smith highlighted the cumulative impacts that the area has witnessed since European settlement, including the construction of a rail embankment, highway, transmission line and land clearing

The Backwater Cowal was traditionally a resource area for geese and duck hunting during summer months (Mark Smith *pers. comm*. 27/11/2018). It was traditionally known to be a place where boys learnt how to hunt and how to use different boomerangs.

The area surrounding Ewenmar Creek was reported by Mark Smith of the Mayne tribe of the Wiradjuri to have been culturally significant to the Wiradjuri people an important site due to the presence of standing water late in the season. The artefact types found in a nearby cache held by a local landowner (refer to section 6.5.1), the reported carved trees, scarred tree nearby the creek and a large artefact scatter point to the area having been a significant camping area in the past. Tool types present in the cache include grinding stone manuports (mullers and stones), pounders and cleavers pointing to the utilisation of grass seeds, trees, shrubs, succulents and ferns to obtain starch for cooking.

6.5.2 Castlereagh River (including Gulargambone, Baronne, Tenandra and Noonbar Creeks)

Knowledge holders reported that the Castlereagh River was a major traditional thoroughfare for both the Ngemba, Ngiyampaa, Wangaaypuwan, Wailwan and Gomeroi people of Western NSW. Significant changes in local land-use practices and hydrology since colonisation have altered both the community's accessibility to resources and the ecological fecundity of the river and its associated floodplains. The Castlereagh River is an important hydrological link to and from the Warrumbungle Ranges, a place of resources and ceremony according to knowledge holders.

The Castlereagh River and its catchments such as the Gulargambone, Baronne and Tenandra Creeks are integral elements of the traditional cultural landscape, and by extension, integral to the very identity of people who consider themselves part of these language/cultural groups.

Tenandra Creek survey area contained one area of potential archaeological deposit, four artefact scatters, four isolated finds, eight scarred trees some six of which are reported to be marking two potential Aboriginal ceremony and dreaming (ACD) sites that potentially relate to areas of burial. Both ACD sites suggest a potential to contain archaeologically secure deposits of considerable social, spiritual and educational value to the Aboriginal community.

Additionally, Gomeroi representatives also identified that Table Top Mountain (Noonbar Creek) as significant to Gomeroi culture. It is thought to be linked to, and share cultural values with, the Warrumbungle Ranges. It is known for its stone (basalt) resources, as a signalling station, and as a vantage point for a large section of Gomeroi Country where landscape-based knowledge transference can occur, and the location of distant visitors or occupants can be identified.

6.5.3 Namoi River (including Baradine, Cumbil Forest, Etoo and Bundock and Bohena Creeks)

The broader Namoi River drainage system represents a major traditional thoroughfare for the Gomeroi people of Western NSW. Significant changes in local land-use practices and hydrology since colonisation have altered both the community's access to resources and the ecological fecundity of the creek and its associated flood plains.

Cumbil Forest Creek contains an 0.5 hectare grinding groove site that is highly significant to Gomeroi people as it is currently the only registered grinding groove site in the Pilliga State Forest. The area is also reported by knowledge holders to have cultural sensitivity for resource plants. Aboriginal community representatives who participated in the survey of Cumbil Forest Creek noted the following two key points specific to this survey area:

> *This site is important to Gomeroi men, being a place where Aboriginal men once worked to create both ceremonial and utilitarian implements. The community hold a certain cultural responsibility for the well-being of their members and visitors to this region, and cultural practices should be respected in these areas.*
>
> *Given the extensive historical land clearing that has occurred in this area, the grinding grooves represent a key remaining visible aspect of past Aboriginal life-ways and important evidence for the Aboriginal occupation of the broader region. Importantly, this site provides a link to other sites such as basalt stone quarries, where the raw material sources for edge-ground axe blanks may be procured* (summary of conversation with Raymond Weatherall and Steven Talbot on 8 April 2019)

The Aboriginal community representatives who participated in the survey of Etoo Creek noted the following two key points specific to this survey area:

- The area is purported to be the home of an ancestral demon (Yowie, Yaya) and care must be exercised by people working in this area. The community hold a certain cultural responsibility for the well-being of visitors to this region and believe that remedial ceremony should be abided by in order to mitigate harm.
- Given the extensive historical logging that has occurred in this area, the scarred trees now represent the only visible evidence of Aboriginal occupation of the area.

Bundock Creek is cultural sensitivity for resource plants as it is rich in biodiversity and seen by knowledge holders to have been a suitable camping area given the large number of food species contained within it.

6.6 Aboriginal cultural values within or adjacent to the proposal

In-field discussions during the archaeological survey identified that all Aboriginal knowledge holders maintained a cultural affiliation to the Warrumbungle Ranges, and that the cultural values applied to the Ranges should be extended to the areas and waterways surrounding and connecting it to the study area. These values and their application to specific survey locations are discussed below.

Within the range of values in Table 6.1, this assessment has identified a number of Aboriginal cultural values within the study area. These Aboriginal cultural values are not gazetted Aboriginal Places under section 86(4) of the NPW Act but are values with local significance identified during the archaeological field surveys. Details of each of these cultural values and their locations within the study area are listed in Table 6.2 below.

A search of the EPBC Act protected matters search tool on 6 July 2018 (as part of the proposal's state significance infrastructure application) indicated that there were no Commonwealth or World heritage items within or near the proposal.

Table 6.2 Aboriginal cultural values within the study area

Sites in areas with cultural values	Description
Macquarie River catchment: Backwater Cowal: one newly registered site and two previously registered sites Macquarie River: two previously registered and five newly registered sites Ewenmar Creek: one newly registered sites and a PAD Boothaguy Creek: three newly registered sites	Traditional thoroughfare Important resource areas Traditional and historical campsites Permanent water (Ewenmar Creek) Surface artefact scatters Scarred trees Potential Archaeological deposits Resource areas
Castlereagh River catchment: Berida Road: Two newly registered sites Castlereagh River: one newly registered site and one PAD Box Ridge Road: three newly registered sites Gulargambone Creek: one newly registered site. Mungery Creek: four newly registered sites. Calga and Looking Glass Creeks: two newly registered sites. Noonbar Creek: one newly registered site	Traditional thoroughfare Established camp sites ACD (Tenandra Creek) Landform with cultural sensitivity for burials/ significant site Stone quarries (Table Top Mountain) Signalling station and vantage point (Table Top Mountain) Story place (Table Top Mountain) Surface artefact scatters Scarred trees Resource areas PADs
Namoi River catchment: Baradine Creek: three newly registered sites and one PAD Cumbil Forest Creek: two newly registered sites, two previously registered sites. Etoo Creek: one newly registered sites Bohena Creek: one newly registered site	Traditional thoroughfare Established camp sites Surface artefact scatters Scarred trees Burial site (William Haines) Potential Archaeological Deposits Bundock Creek is home to ancestral demon Resource areas

6.7 Aboriginal places

A search of Aboriginal places, as defined under the NPW Act identified two Aboriginal places in the vicinity of the study area and includes Bridge Reserve and Mack Reserve. These places are located approximately five kilometres to the west of the proposal on the northern bank of the Macquarie River. These places are listed on the NSW State Heritage Register and are historic camping places in the vicinity of the Narromine township that were occupied by Aboriginal people. These places were described as 'fringe camps' between the 1860s and 1960s. Both sites are located in TSRs. Other Aboriginal objects and sites listed under the NPW Act are summarised in the desktop assessment in section 7.1.1.

A search of the relevant LEPs for locally listed Aboriginal heritage items and places was completed in September 2018 but no sites or places were identified.

7. Summary of archaeological assessment

This section summarises the results of the archaeological survey of the investigation corridor carried out to inform this ACHA. The investigation corridor encompassed an area up to two kilometre wide which enabled consideration of a final construction footprint and refinement of the design to avoid areas of cultural heritage where possible. For the purposes of the EIS and the ACHA a study area was developed that focuses on the areas of Aboriginal cultural heritage that would be directly and indirectly impacted by the proposal and includes an area that extends 400 metres from the proposal site, refer further to section 3.3. This has enabled progression to the ACHA which identifies specific impacts and mitigation measures for those sites within or adjacent to the proposal site that would potentially be directly or indirectly impacted. Additionally, this section provides the results of a limited archaeological test investigation of two borehole locations in a culturally sensitive area at the Macquarie River (refer to section 7.5.1).

The archaeological assessment was carried out by fully qualified and experienced archaeologists and heritage consultants:

- Andy Roberts (Bachelor of Arts, Master of Letters, 27 years of experience)
- Peter Saad (Bachelor of Archaeology with Honours, 15 years of experience)
- Neville Baker (Bachelor of Archaeology with Honours, 26 years of experience)
- Alexandra Seifertova (Bachelor of Archaeology with Honours, two years of experience)
- Alison Lamond (Bachelor of Archaeology with Honours, 10 years of experience).

7.1 Archaeological assessment methodology

The archaeological assessment was conducted generally in accordance with the Code of Practice and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011). The assessment broadly consisted of the following:

1. Desktop assessment to develop a predictive model
2. Archaeological survey
3. Test excavation of geotechnical borehole locations
4. Consultation with RAPs
5. Significance assessment.

7.1.1 Desktop assessment

Existing data was reviewed (including any previous archaeological investigations, AHIMS searches etc) to identify any gaps in the assessments across the investigation corridor and study area and to develop a predictive model to aid in identifying areas more likely to contain archaeological sites (refer to Appendix F). In order to complete the desktop assessment, heritage and spatial data relating to the study area was collated. This included searches of all available Aboriginal heritage registers for the study area on 15 January 2019 including the following:

- AHIMS (a second search was also completed on the 5 March 2020), LEPs including: Narromine LEP 2011; Gilgandra LEP 2011; Coonamble LEP 2011; Warrumbungle LEP

2013 and Narrabri LEP 2012; the Commonwealth Heritage List, the National Heritage List, the World Heritage List and the Register of the National Estate.

- Obtaining relevant reports from DPIE/Heritage NSW, undertaking searches of relevant databases to identify any other known Aboriginal places/objects and or places of heritage significance. The review identified any gaps in the survey and or methodologies for the study area.
- A literature review including archival research of early maps, plans, land records, previous heritage assessments and conservation management plans to identify known Aboriginal heritage items.

Use of the Web GIS system established for this assessment analysed the following data sets:

- data from AHIMS searches undertaken on 17 September 2018 and updated on 15 January 2019 and 05 March 2020 (refer to Appendix B)
- the Heritage NSW ASDST
- data from previous archaeological assessments, including areas of PAD and potential archaeological sensitivity, Aboriginal heritage sites and Aboriginal cultural places (refer to Appendix F)
- aerial imagery
- the assessment area (the study area)
- soil landscape data
- contour data (one metre).

This spatial data was then used to determine the areas of the study area which were likely to be of cultural sensitivity and require further assessment in the form of archaeological survey.

Archaeological survey was recommended where:

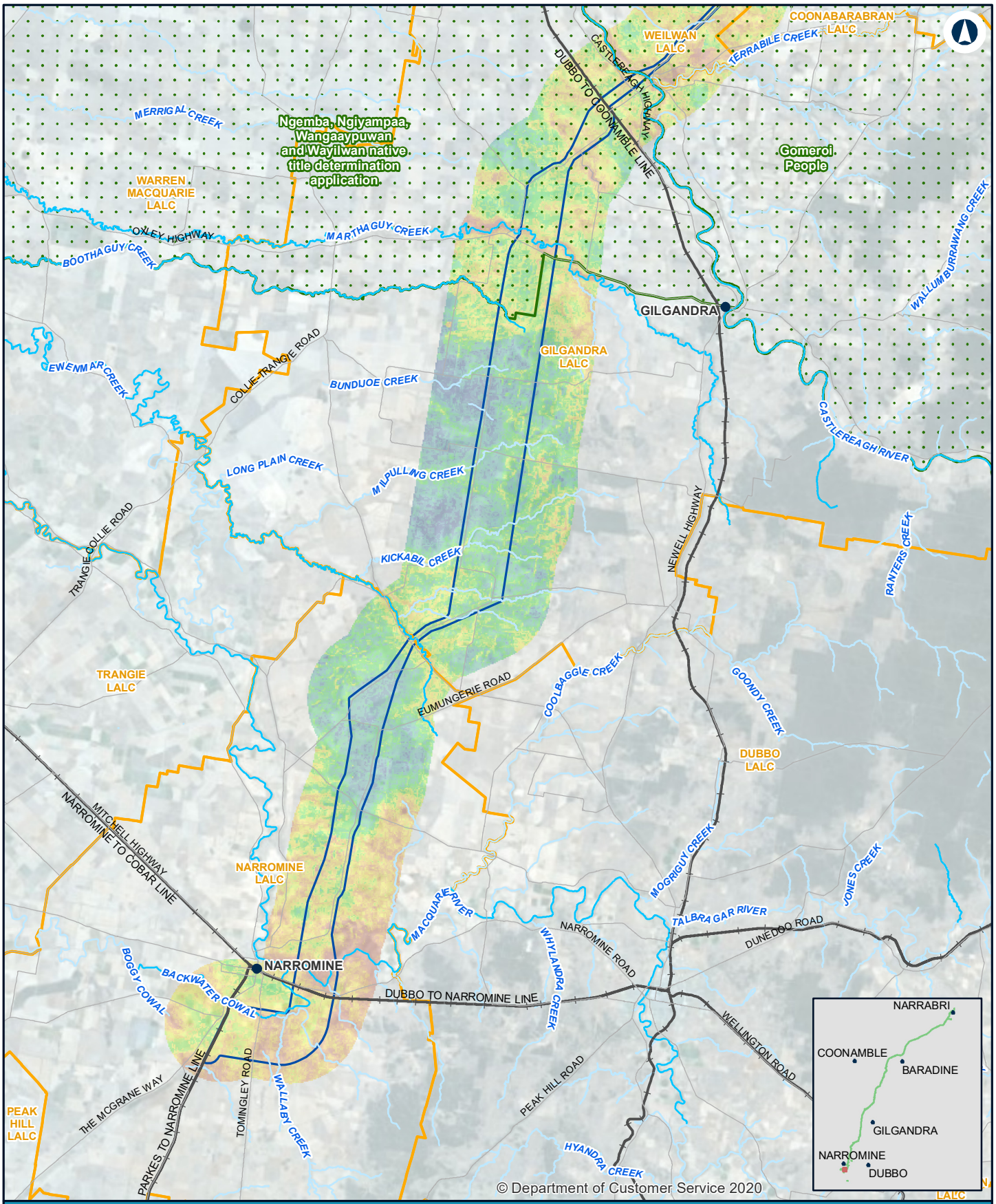
- there were known Aboriginal heritage sites and Aboriginal cultural places within the study area
- Landforms of moderate to high cultural sensitivity were identified.

Sixty-two previously registered Aboriginal heritage sites including five areas of PAD were identified by previous research in the investigation corridor. The majority of these were recorded within the Macquarie River catchment (n=48).

7.1.2 Predictive model for study area

A predictive model of the study area is a requirement (4) of the Code of Practice. A predictive model combines the archaeological context for a study area with landscape information to propose likely site types, as well as their distribution and intactness within the area. An assessment of cultural sensitivity and archaeological potential was undertaken as part of the predictive modelling. The model was based on the distribution of known sites as identified in the review of literature and information from the AHIMS and LALCs, sensitive landscapes, resource areas and waterways. The model also included the results of the preliminary survey of geotechnical sites and the information in the ASDST. The likelihood of Aboriginal heritage sites occurring in the study area is influenced by a range of factors, including the durability of the material evidence and the subsequent level of disturbance.

Figure 7.1 shows the results of the predictive modelling including the identification of landforms and cultural features identified as having cultural sensitivity and archaeological potential.



NARROMINE TO NARRABRI Areas of cultural sensitivity identified within the study area Figure 7.1a

0 10 20 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Study area
- LALC boundaries
- Native Title boundaries

Aboriginal sites pre 1750 model (combined features)
High : 989
Low : 211

Date: 6/07/2020 Paper: A4
Author: JACOBS Scale: 1:450,000
Data Sources: Study area: GHDJACOBS; NT: OEH; Imagery, base layers, LALC: NSW Spatial Services: all other layers: IR ARTC

INLAND RAIL ARTC

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

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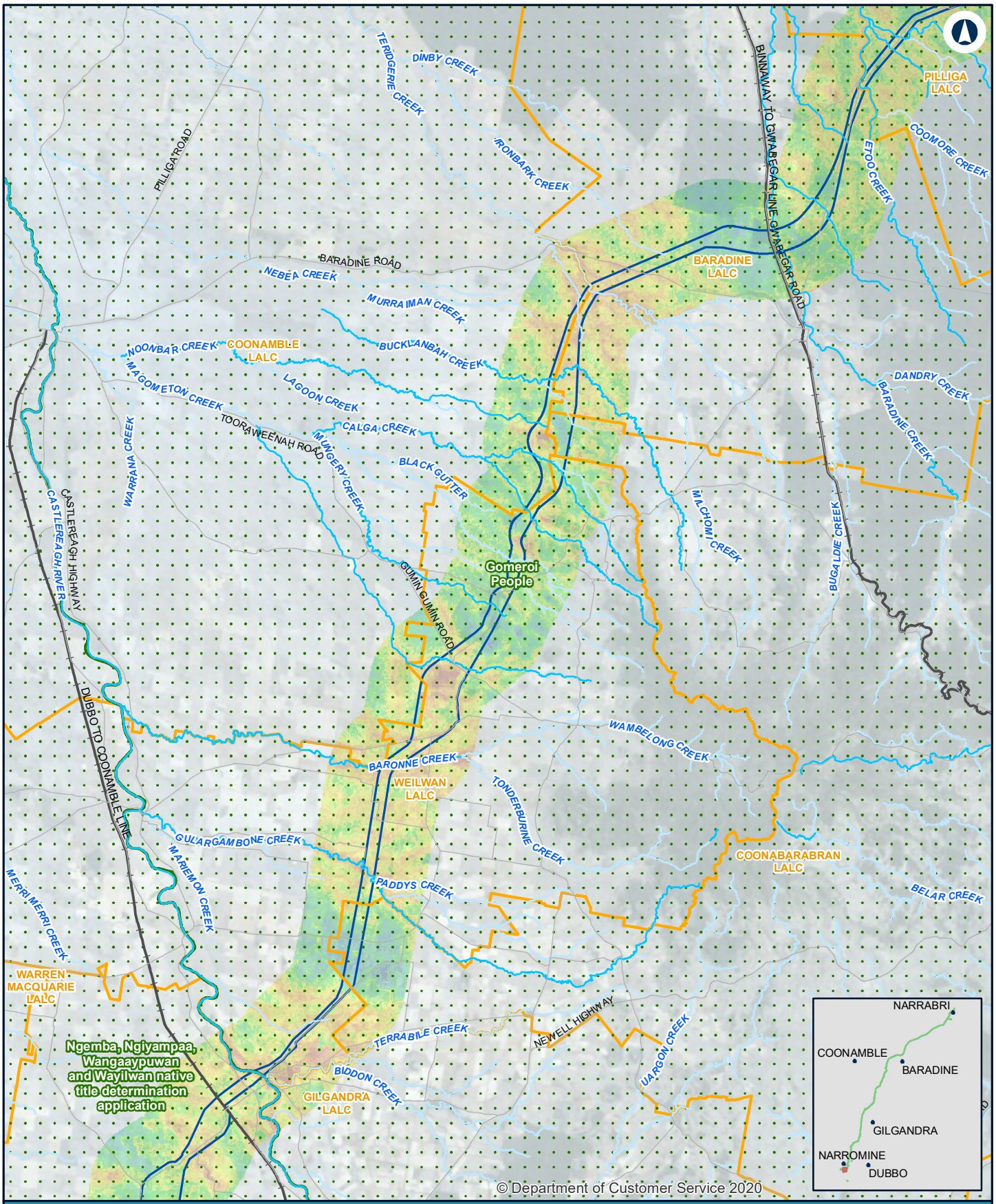

NARROMINE TO NARRABRI Areas of cultural sensitivity identified within the study area Figure 7.1b

0 10 20 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Study area
- LALC boundaries
- Native Title boundaries

Aboriginal sites pre 1750 model (combined features)
High : 989
Low : 211

Date: 6/07/2020 Paper: A4
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Data Sources: Study area: GHDJACOBS; NT: OEH; Imagery, base layers, LALC: NSW Spatial Services: all other layers: IR ARTC

INLAND RAIL ARTC

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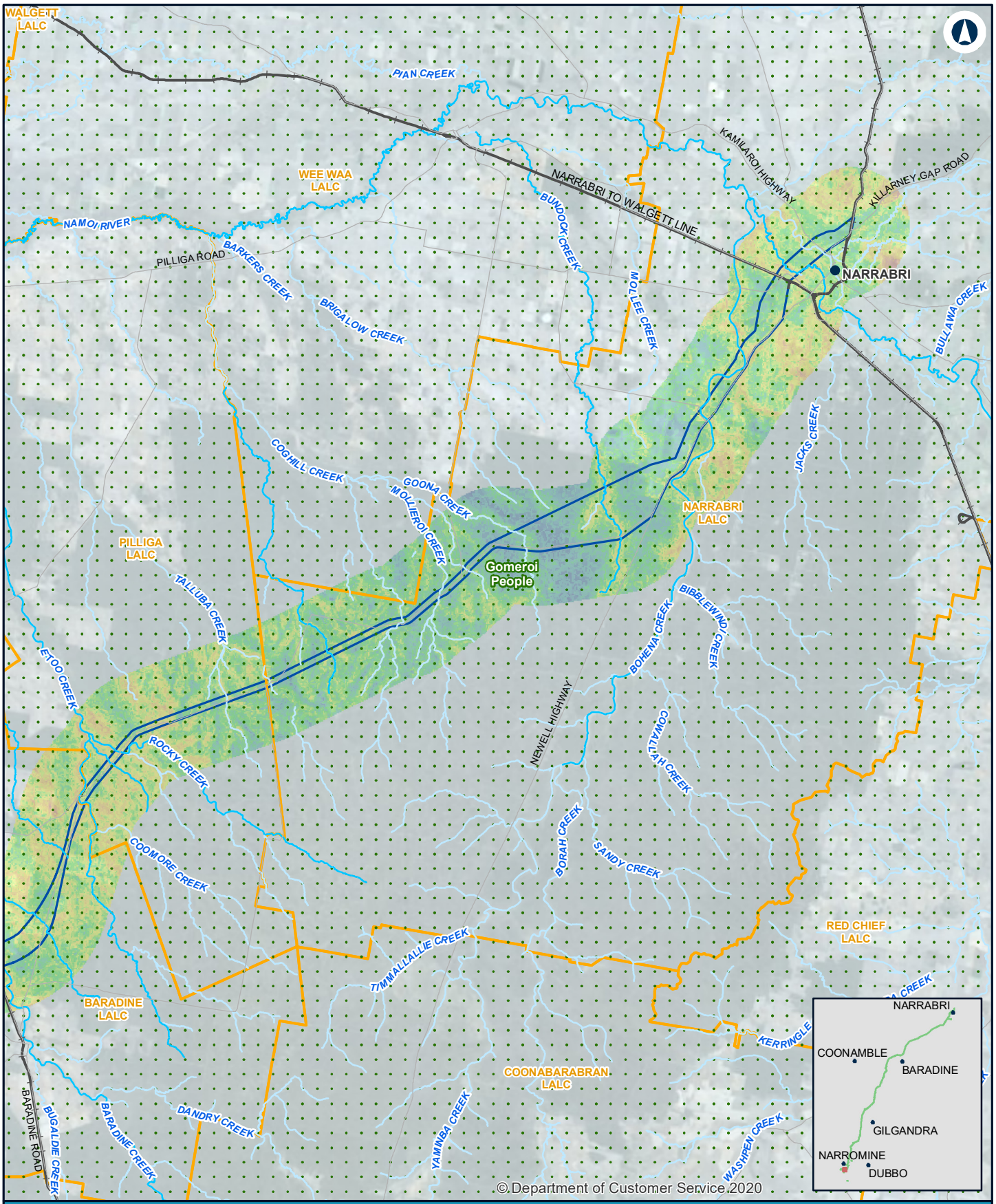

NARROMINE TO NARRABRI Areas of cultural sensitivity identified within the study area Figure 7.1c

0 10 20 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Study area
- LALC boundaries
- Native Title boundaries

Aboriginal sites pre 1750 model (combined features)
High : 989
Low : 211

Date: 6/07/2020 Paper: A4
Author: JACOBS Scale: 1:450,000
Data Sources: Study area: GHDJACOBS; NT: OEH; Imagery, base layers, LALC: NSW Spatial Services: all other layers: IR ARTC

INLAND RAIL ARTC

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

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Landforms with potential sensitivity

The following landforms have the potential for cultural sensitivity:

- landforms characterised by a relatively deep soil profile in soft alluvial or aeolian sands
- elevated, flat or low-gradient landform elements associated with drainage lines
- well drained ground adjacent to sources of fresh water (creeks or swamps)
- creek confluences
- areas of remnant vegetation close to waterways
- vantage points such as Tabletop Mountain.

Potential site types and landscape features of potential cultural significance

The following site types are likely within these landforms:

- Creeks are reported to have been **transit corridors** and raw materials used for stone tools are likely to provide evidence for this movement through country.
- Dominant site types will include culturally modified trees and open campsites.
- Landforms characterised by a relatively deep soil profile in soft alluvial or aeolian sands may be associated with **burial sites and culturally modified (carved) trees.**
- Small hills or flat land near creek confluences will potentially contain **campsites.**
- Open campsites will contain **artefact scatters** and possible including **portable grinding stones.**
- Quartz river pebbles would likely be the dominant **raw stone artefact material type** in open camp sites.
- **Ceremonial sites** will be located away from campsites.
- **Stone arrangements** associated with bora are similarly located away from campsites in isolated places and tend to be associated with small hills or flat land.
- **Carved trees** associated with **burial grounds** and other ceremonial places have been recorded in the wider region and are a common class of heritage item in the study area.
- **Burials** are unlikely to occur in the Pilliga forest due to unfavourable soils.
- Well drained ground adjacent to sources of fresh water (creeks or swamps), will contain **open scatters of stone artefacts.**
- Areas of remnant vegetation close to waterways will contain **culturally modified trees** if of sufficient age.
- **PADs** are generally shallow and are likely to be present on and the crests of spurlines, close to water.
- Rock shelters with deposit, rock art, petroglyph engravings and grinding grooves are likely to be rare.

Table 7.1 shows previously listed Aboriginal cultural heritage sites in the vicinity of the study area identified through desktop research (refer to maps in Appendix E). Older AHIMS registrations are notoriously inaccurate and are sometimes hundreds of metres from their reported location due to changes in the map datums since they were recorded. For this reason sites are referred to here that are within the study area. AHIMS survey results and site registration forms are provided in Appendix B and Appendix C.

Table 7.1 Previously listed heritage items near and within the study area

AHIMS ID	Location	Listing and significance	Distance from proposal site (m)	Property ID	LALC
#35-3-0173	Backwater Cowal	Scarred tree: High	38	Road Reserve	Narromine
#35-3-0174	Backwater Cowal	Scarred tree: High	36	Road Reserve	Narromine
#35-3-0175	Backwater Cowal	Scarred tree: High	Within proposal site	3930053	Narromine
#35-3-0176	Backwater Cowal	Scarred tree: High	66	Road Reserve	Narromine
#35-3-0177	Backwater Cowal	Scarred tree: High	87	Road Reserve	Narromine
#35-3-0180	Backwater Cowal	Scarred tree: High	365	Road Reserve	Narromine
#35-3-0181	Backwater Cowal	Scarred tree: High	325	Road Reserve	Narromine
#35-3-0182	Backwater Cowal	Scarred tree: High	112	3930053	Narromine
#35-3-0183	Backwater Cowal	Scarred tree: High	107	2674203	Narromine
#35-3-0184	Backwater Cowal	Scarred tree: High	280	2674203	Narromine
#35-3-0019	Macquarie River	Scarred trees: High	105	2674218	Narromine
#35-3-0020	Macquarie River	Scarred tree: High	141	2674218	Narromine
#35-3-0021	Macquarie River	Canoe tree: High	10	3448629	Narromine
#35-3-0022	Macquarie River	Scarred tree: High	86	2674218	Narromine
#35-3-0080	Macquarie River	Scarred tree: High	275	3533442	Narromine
#35-3-0081	Macquarie River	Scarred tree: High	185	3448975	Narromine
#35-3-0171	Macquarie River	Scarred tree: High	86	3448975	Narromine
#35-3-0172	Macquarie River	Scarred tree: High	189	3448975	Narromine
#35-3-0194	Macquarie River	Scarred tree: High	280	3533442	Narromine
#35-3-0195	Macquarie River	Artefact	Within proposal site	3688385	Narromine
#35-3-0196	Macquarie River	Confirmed archaeological deposit	Within proposal site	3688385	Narromine

AHIMS ID	Location	Listing and significance	Distance from proposal site (m)	Property ID	LALC
#35-3-0200	Macquarie River	Scarred tree: High	10	3448975	Narromine
#35-3-0201	Macquarie River	Scarred tree: High	9	3448629	Narromine
#35-3-0202	Macquarie River	Scarred tree: High	15	3448629	Narromine
#35-3-0205	Macquarie River	Scarred tree: High	78	3448629	Narromine
#35-3-0210	Macquarie River	Scarred tree: High	21	Road Reserve	Narromine
#35-3-0211	Macquarie River	Scarred trees: High	332	Road Reserve	Narromine
#35-3-0212	Macquarie River	Scarred trees: High	218	3915794	Narromine
#28-4-0039	Curbin Berida Road	Scarred tree: High	309	2638887	Gilgandra
#28-4-0040	Curbin Berida Road	Scarred tree: High	309	2638887	Gilgandra
#28-4-0046	Curbin Berida Road	Scarred tree: High	380	3575072	Gilgandra
#19-5-0023	Baradine Creek	Scarred trees: High	261	3847672	Baradine
#19-5-0024	Baradine Creek	Scarred tree: High	220	3847672	Baradine
#19-5-0025	Baradine Creek	Scarred tree: High	283	3847672	Baradine
#19-5-0106	Baradine Creek	Habitation structure: Low	173	2628603	Baradine
#19-5-0110	Coolangla Creek	Artefact: High	230	3838830	Baradine
#19-5-0121	Cumbil Forest	Scarred tree: High	31	State Forest	Narrabri
#19-5-0115	Cumbil Forest	Artefact: Low	26	State Forest	Narrabri
#19-5-0116	Cumbil Forest	Artefact: Low	70	State Forest	Narrabri

7.1.3 Areas of identified cultural sensitivity and archaeological potential

As the archaeological sensitivity of the study area is dependent upon the various landscape regions it traverses, the results of the desktop assessment (and the subsequent archaeological surveys) are discussed in relation to twenty-four areas of cultural sensitivity identified in the three main catchment areas. The Macquarie, Castlereagh and Namoi Rivers were each identified by knowledge holders as having potential cultural sensitivity, (refer to section 6.5) as well as through predictive modelling (refer to section 7.1.2). Areas of identified cultural sensitivity are provided (refer to Table 7.2) to emphasises the importance of cultural values in a regional context.

Table 7.2 Areas of identified cultural sensitivity within the study area

Area	Native Title group/ language group	LALC
Backwater Cowal Creek	Wiradjuri	Narromine
Macquarie River	Wiradjuri	Narromine
Ewenmar Creek	Wiradjuri	Gilgandra
Boothaguy Creek	Ngemba, Ngiyampaa, Wangaaypuwan, Wayilwan	Gilgandra
Marthaguy Creek	Ngemba, Ngiyampaa, Wangaaypuwan, Wayilwan	Gilgandra
Castlereagh River (Berida Road)	Gomeroi People	Gilgandra
Castlereagh River (terraces)	Ngemba, Ngiyampaa, Wangaaypuwan, Wayilwan (south of River) Gomeroi People (north of River)	Gilgandra
Gulargambone Creek	Gomeroi People	Weilwan
Baronne Creek	Gomeroi People	Weilwan
Tenandra Creek	Gomeroi People	Weilwan
Mungery Creek	Gomeroi People	Weilwan
Salty Springs Creek	Gomeroi People	Weilwan
Calga and Looking Glass Creeks	Gomeroi People	Weilwan and Coonamble
Noonbar Creek	Gomeroi People	Coonamble
Bucklanbah Creek	Gomeroi People	Coonamble and Coonabarabran
Baradine Creek	Gomeroi People	Baradine
Coolangla Creek	Gomeroi People	Baradine
Cumbil Forest Creek	Gomeroi People	Baradine
Etoo Creek	Gomeroi People	Baradine
Stockyard Creek	Gomeroi People	Pilliga
Rocky Creek	Gomeroi People	Pilliga
Bundock Creek	Gomeroi People	Narrabri
Bohena Creek	Gomeroi People	Narrabri
Namoi River	Gomeroi People	Narrabri

7.2 Constraints to archaeological and cultural surveys

The desktop analysis used the results of predictive modelling that was based on the Heritage NSW ASDST, AHIMS, existing landforms, topography and spatial datasets and results of the initial walkover to identify culturally sensitive areas that were targeted for survey. The predictive model was prepared in accordance with Requirement 4a of the Code of Practice. Eight areas of high sensitivity (refer to Table 7.3) were not able to be physically surveyed due to limited property access (refer to section 3.4).

These constraints have been addressed as far as possible by completing the due diligence predictive modelling and discussions with RAPs during field survey. The locations identified in Table 7.3 are considered to be of high potential and would require targeted archaeological survey and investigation prior to construction.

Table 7.3 Areas where property access constrained survey coverage

Area	Notes
Wallaby Creek	Access restrictions to the west of study area (1,500 metres of river frontage).
Ewenmar Creek	Access restrictions on properties along Old Mill Road within 200 metres of creek.
Marthaguy Creek	Full extent of creek not accessible (1,350 metres of creek frontage).
Castlereagh River	Access restrictions on properties within 200 metres of river.
Gulargambone Creek	Access restrictions on properties within 200 metres of creek to the west of those surveyed not accessible (350 metres of creek frontage).
Tenandra Creek	Access restrictions on properties within 200 metres of creek to the east and west of surveyed area not accessible (850 metres of creek frontage). Extended to north to incorporate creek confluences.
Baradine Creek	Access restrictions on properties within 200 metres of creek (2,000 metres of creek frontage).
Namoi River	Access restrictions on properties to the north and south of Namoi River (750 metres of river frontage on north bank).

7.3 Archaeological survey

The test excavation used sampling survey techniques as defined in Section 3 of the Code of Practice. The proposal traverses 300 kilometres of inland NSW between Narromine and Narrabri. Limitations were placed on the survey as a consequence of restricted property access to some areas (refer to section 3.4). Several surveys were undertaken as part of the ACHA. These included:

- An initial archaeological survey and site inspection of publicly available areas along the proposal site and priority geotechnical investigation sites to assess the nature and extent of Aboriginal sites and to identify culturally sensitive areas. This enabled a rapid survey of the proposal site to ground-truth areas identified in preliminary desktop review and to obtain survey results to include in the predictive modelling.

- Targeted archaeological foot surveys and site inspections completed with RAPs of the areas of moderate to high cultural based on the results of the predictive modelling. The survey focussed on known heritage items, culturally sensitive areas identified by knowledge holders and areas identified from predictive modelling.
- Additional surveys were undertaken of borrow pit locations and haul routes once these locations were identified.

The site surveys included consultation with the Aboriginal community in accordance with the DECCW (2010) *Aboriginal cultural heritage consultation requirements for proponents*.

The archaeological survey had the following objectives:

- to identify and map any new Aboriginal sites and PADs
- to verify the location and extent of existing Aboriginal sites and PADs
- to conduct consultation with the nominated Aboriginal site officers with regard to the mitigation of impact to Aboriginal archaeological values
- to consider ways that potential impacts to significant places can be avoided
- to target areas of higher visibility and exposures of the ground surface for the presence of Aboriginal objects
- to inspect mature trees in the proposal site for cultural modification and scarring
- to inspect rocky outcrops, close to waterways for grinding grooves, waterholes and wells
- to record the following details for each surveyed area:
  - landform
  - ground surface exposure and nature of exposure
  - visibility as a result of vegetation
  - degree of disturbance
  - nature of current and historical land use.

AHIMS site recording forms were completed for new Aboriginal sites and PADs and then submitted to AHIMS. Consultation with the Aboriginal community was undertaken throughout the survey to identify areas with cultural values that were not evident from desktop research or predictive modelling based upon technical understandings.

The following abbreviations are used in tabulation of results:

- AFT: Artefact scatter
- ST: Culturally modified (scarred) tree
- CT: Culturally modified (carved) tree
- IF: Isolated find
- GG: Grinding groove
- ACD: Aboriginal ceremony and dreaming site
- Habitation: A tree used as shelter.

An area of 29,709,928 square metres (2,907 hectares) was subject to survey, totalling approximately 30 per cent of the study area.

In general, surveys were afforded with good to excellent conditions as the 2019 survey were undertaken at the height of the recent drought. The overall survey effectiveness was high for this reason. River terraces were hampered by low soil surface exposure in most instances. Alluvial floodplains were hampered by poorer ground surface visibility sometimes caused by recent deposition of alluvial deposits obscuring older soils. Stream bank channels provided high soil surface exposure and generally allowed excellent visibility as well as examination of soil profiles in some instances. Lower slopes were likewise afforded excellent visibility.

The entire survey yielded an effective coverage (accounting for visibility and proportion of the sub-surface exposed) of approximately six per cent which was higher for river terraces (7.6 per cent) than alluvial floodplain (6.1 per cent), stream bank/channels (1.0 per cent) or lower slopes (0.5 per cent).

Table 7.4 presents the results of the landform summary for the study area and Table 7.5 the archaeological survey results for newly identified and known sites. Appendix E maps the survey results for previously registered sites and those identified during field survey in proximity to the proposal site that might be impacted during construction or operation of the proposal.

Table 7.4 Landform summary

Landform	Landform (sq m)	Area effectively surveyed (sq m)	% of landform effectively surveyed	Number of sites
River terraces	19,250,744	1,463,056	7.6%	91
Alluvial floodplain	9,360,800	571,008	6.1%	57
Stream banks/channels	613,500	6,135	1.0%	6
Lower slopes	100,429	5,021.45	0.5%	3

Table 7.5 Summary of survey results and newly identified and known sites

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
Backwater Cowal/ Wallaby Creek	SU1 Channel	208,746	45	10	4.5	BCZAD1 #35-3-0274	Artefact Scatter (AFT)	#35-3-0213	Identified resource area for geese and duck hunting during summer months (Mark Smith pers. comm. 27 November 2018) It was traditionally known to be a place where boys learnt how to hunt and how to use different boomerangs. Macquarie River represents a major traditional thoroughfare for the Wiradjuri people of Western NSW. Was occupied through to the modern period and is still considered an important part of the cultural landscape for knowledge holders.
	SU2 Floodplain	729,511	25	10	2.5	BCST1 #35-3-0265 Modified Tree (Scarred)	AFT	#35-3-0206	
	SU3 Floodplain	376,350	25	10	1.5	BCST5 #35-3-0266 Modified Tree (Scarred)	AFT	#35-3-0208	
						BCST6 #35-3-0270 Modified Tree (Scarred)	Culturally modified (scarred) tree (ST)	#35-3-0211	
						BCST7 #35-3-0271 Modified Tree (Scarred)	ST	#35-3-0177	
						BCST8 #35-3-0263 Modified Tree (Scarred)	ST	#35-3-0145	
						BCST9 #35-3-0264 Modified Tree (Scarred)	ST	#35-3-0173	
						BCASS1 #35-3-0279 Artefact scatter	ST	#35-3-0207	
						BCASS2 # 35-3-0278 Artefact scatter	ST	#35-3-0174	

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						BCST2 #35-3-0267 Modified Tree (Scarred)	ST	#35-3-0175	
						BCST3 #35-3-0268 Modified Tree (Scarred)	ST	#35-3-0176	
							ST	#35-3-0179	
							ST	#35-3-0180	
							ST	#35-3-0181	
							ST	#35-3-0183	
							ST	#35-3-0184	
							ST	#35-3-0186	
							ST	#35-3-0206	
							ST	#35-3-0211	
							ST	#35-3-0212	
							ST	#35-3-0140	
							ST	#35-3-0011	

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
Macquarie River	SU1 River Terrace (north)	2,645,000	15	15	2.2	Macquarie River Crossing: # 35-3-0257; Cultural Crossing	ST	#35-3-0193	The local area is described as being a culturally sensitive area/camp site.
	SU2 River Terrace (south)	2,911,211	45	15	6.75	MR ASD1: #35-3-0251; Artefact Scatter	ST	#35-3-0200	
						MR AS and PAD 1: #35-3-0260; Artefact scatter and PAD	ST	#35-3-0212	
						MR Shelter Tree: #35-3-0245; Shelter Tree (Habitation)	ST	#35-3-0211	
						MRN AS1: #35-3-0259; Artefact Scatter	ST	#35-3-0210	
						MRN AS2: #35-3-0258; Artefact Scatter	ST	#35-3-0020	
						MRN AS3 & PAD: #35-3-0275; Artefact Scatter and PAD	ST (canoe)	#35-3-0021	
						MRN AS4: #35-3-0243; Artefact Scatter	ST (canoe)	#35-3-0019	
						MRN AS5: #35-3-0242; Artefact Scatter	ST	#35-3-0199	
						MRN AS6: #35-3-0276; Artefact Scatter	Confirmed archaeo-logical deposit	#35-3-0196	

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						MRNOQ1: #35-3-0261; Ochre Quarry	PAD	#35-3-0195	
						MRNST: #35-3-0273; Modified Tree (Scarred)	ST	#35-3-0202	
						MRNST2: #35-3-0262; Modified Tree (Scarred)	ST	#35-3-0205	
						MRST1: #35-3-0240; Modified Tree (Scarred)	ST	#35-3-0171	
						MRST2: #35-3-0218; Modified Tree (Scarred)	ST	#35-3-0172	
						MRST3: #35-3-0219; Modified Tree (Scarred)	PAD	#35-3-0194	
						MRST4: #35-3-0221; Modified Tree (Scarred)	ST	#35-3-0180	
						MRST5: #35-3-0220; Modified Tree (Scarred)	ST	#35-3-0081	
						MRST6: #35-3-0283; Modified Tree (Scarred)	PAD	#35-3-0194	
						MRST7: #35-3-0222; Modified Tree (Scarred)	Habitation tree	#35-3-0032	

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						MRST8: #35-3-0223; Modified Tree (Scarred)	ST	#35-3-0079	
						MRST9: #35-3-0224; Modified Tree (Scarred)	AFT and PAD	#35-3-0159	
						MRST10: #35-3-0225; Modified Tree (Scarred)	ST	#35-3-0014	
						MRST11: #35-3-0226; Modified Tree (Scarred)	Grinding Groove (GG)	#35-3-0004	
						MRST12: #35-3-0228; Modified Tree (Scarred)			
						MRST13: #35-3-0227; Modified Tree (Scarred)			
						MRST14: #35-3-0229; Modified Tree (Scarred)			
						MRST15: #35-3-0230; Modified Tree (Scarred)			
						MRST16: #35-3-0231; Modified Tree (Scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						MRST17: #35-3-0217; Modified Tree (Scarred)			
						MRST18: #35-3-0216; Modified Tree (Scarred)			
						MRST19: #35-3-0215; Modified Tree (Scarred)			
						MRST20: #35-3-0214; Modified Tree (Scarred)			
						MRST21: #35-3-0232; Modified Tree (Scarred)			
						MRST22: #35-3-0233; Modified Tree (Scarred)			
						MRST23: #35-3-0234; Modified Tree (Scarred)			
						MRST24: #35-3-0235; Modified Tree (Scarred)			
						MRST25: #35-3-0237; Modified Tree (Scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						MRST26: #35-3-0238; Modified Tree (Scarred)			
						MRST27: #35-3-0239; Modified Tree (Scarred)			
						MRST28: #35-3-0236; Modified Tree (Scarred)			
						MRST29: #35-3-0244; Modified Tree (Scarred)			
						MRST30: #35-3-0254; Modified Tree (Scarred)			
						MRST31: #35-3-0250; Modified Tree (Scarred)			
						MRST32: #35-3-0249; Modified Tree (Scarred)			
						MRST33: #35-3-0248; Modified Tree (Scarred)			
						MRST34: #35-3-0247; Modified Tree (Scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						MRST35: #35-3-0241; Modified Tree (Scarred)			
						MRST36: #35-3-0246; Modified Tree (Scarred)			
						MRST37: #35-3-0253; Modified Tree (Scarred)			
						MRW AS2: #35-3-0272; Artefact Scatter			
						MRW ST1: #35-3-0256; Modified Tree (Scarred)			
						MRW1: #35-3-0252; Artefact Scatter			
						MRWST3: #35-3-0255; Modified Tree (Scarred)			
Ewenmar Creek	SU1 Channel	259,261	80	10	20,748	ECAS1; #27-6-0048; Artefact Scatter	ST	#27-6-0009	Reported by Mark Smith of the Mayne tribe of the Wiradjuri to have been an important site due to the presence of standing water late in the season.
	SU2 Lower slope	34,429	50	10	1,721	ECST1; #27-6-0035; Scarred Tree			
						ECPAD1; #27-6-0036; PAD			
						EC (Cache; # 27-6-0049			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						ECST2; #27-6-0050; Modified Tree (Scarred)			
Boothaguy Creek	SU1 Floodplain	3,200,261	80	60	1,536.125	Boothaguy Creek ST1; #27-6-0047; Modified tree (scarred)	None registered		No specific cultural values were identified in this area other than the position that all Aboriginal cultural heritage sites were important connections to the Ancestral past.
						Boothaguy Creek ST2; #27-6-0046; Modified tree (scarred)			
						Boothaguy Creek ST3; #27-6-0045; Modified tree (scarred)			
						Boothaguy Creek ST4; #27-6-0044; Modified tree (scarred)			
						Boothaguy Creek ST5; #27-6-0043; Modified tree (scarred)			
						Boothaguy Creek ST6; #27-6-0042; Modified tree (scarred): Canoe tree			
						Boothaguy Creek ST7; #27-6-0041; Modified tree (scarred)			
						Boothaguy Creek ST8; #27-6-0040; Modified tree (scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						Boothaguy Creek ST9; #27-6-0039; Modified tree (scarred)			
						Boothaguy Creek ST10; #27-6-0038; Modified tree (scarred)			
						Boothaguy Creek ST11; #27-6-0037; Modified tree (scarred)			
Marthaguy Creek	SU1 Creek Terrace	5,616	80	60	2,695	Marthaguy Creek IF1; #27-6-0034; Isolated Find (ground axe)	None registered		No specific cultural values were identified in this area other than the position that all Aboriginal cultural heritage objects were important connections to the Ancestral past.
	SU2 Creek Terrace	2,942	80	60	1,412.16				
Castlereagh River: Berida Road	SU1 Floodplain	1,370,600	90	90	1,110,186	Berida Road; ST1; #28-4-0283; Modified tree (scarred)	ST	#28-1-0022	No specific cultural values were identified in this area other than the position that all Aboriginal cultural heritage objects were important connections to the Ancestral past.
						Berida Road; ST2; #28-4-0284; Modified tree (scarred)	ST	#28-4-0030	
							ST	#28-4-0031	
							ST	#28-4-0032	
							ST	#28-4-0033	
							ST	#28-4-0034	

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
							ST	#28-4-0035	
							ST	#28-4-0036	
							ST	#28-4-0037	
							ST	#28-4-0038	
							ST	#28-4-0041	
							ST	#28-4-0042	
							ST	#28-4-0043	
							ST	#28-4-0044	
							ST	#28-4-0045	
							ST	#28-4-0046	
Castlereagh River	SU1: River Terrace	150,000	15	10	2,250	Castlereagh River Terrace AFT and PAD; # 28-4-0280; Artefact Scatter and PAD	None registered		The area has high sensitivity for Aboriginal heritage including scarred trees, artefact scatters and PADs. The Castlereagh River is a major traditional thoroughfare for both the
						Castlereagh River ST1; # 28-4-0282; Modified tree (scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						Castlereagh River ST2; #28-4-0281; Modified tree (scarred)			Ngemba, Ngiyampaa, Wangaaypuwan, Wailwan and Gomeroi people of Western NSW. Traditional use as a significant camp site was reported by Oxley (1820).
Gulargambone Creek	SU1 Creek Terrace	105,300	60	705101,84	22,660	Gulargambone AS and PAD1 and PAD; # 28-1-0060; Artefact Scatter and PAD	Burial	#28-1-0039	Gulargambone Creek is an important hydrological link to and from the Warrumbungle Ranges, a place of resources and ceremony.
	SU2 Creek Terrace	207,839	80	15	24,940	Gulargambone AS and PAD1; # 28-1-0091; Artefact Scatter and PAD	AFT	#28-4-0006	
						Gulargambone AS and PAD2; # 28-1-0090; Artefact Scatter and PAD			
						Gulargambone Creek ST1; # 28-1-0089; Modified tree (scarred)			
Baronne Creek: Box Ridge Road	Floodplain	411,676	5	1	205	Box Ridge Road ST1; #28-1-0262; Modified tree (scarred)	None registered		The Baronne Creek, as part of the broader Castlereagh River drainage area, represents a major traditional thoroughfare in the
						Box Ridge Road ST2; #28-1-0063; Modified tree (scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						Box Ridge Road ST3; #28-1-0064; Modified tree (scarred)			traditional cultural landscape for Aboriginal people of Central Western NSW.
Tenandra Creek	SU1: Floodplain	90,300	1	1	9.3	Tenandra Creek AFT1 and PAD; #28-1-0061; Artefact Scatter and PAD	ST	#28-1-0022	Tenandra Creek is part of the broader Castlereagh River drainage area which represents a major traditional thoroughfare for traditional Aboriginal people of western NSW. Potential ACD sites in survey area.
	SU2: Floodplain	50,000	1	5	25	Tenandra Creek AFT2; #28-1-0057; Artefact Scatter			
	SU3: Floodplain	103,500	10	15	1,552	Tenandra Creek AFT3; #28-1-0073; Artefact Scatter			
						Tenandra Creek AFT4; #28-4-0072; Artefact Scatter			
						Tenandra Creek IF1; #28-4-0068; Isolated find			
						Tenandra Creek IF2; #28-4-0071; Isolated find			
						Tenandra Creek IF3; #28-4-0067; Isolated find			
						Tenandra Creek IF4; #28-4-0066; Isolated find			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						Tenandra Creek ST1; #28-4-0069; Modified tree (scarred)			
						Tenandra Creek ST2; #28-4-0070; Modified tree (scarred)			
						Tenandra Creek ST3; #28-4-0074; Modified tree (scarred)			
						Tenandra Creek ST4; #28-4-0075; Modified tree (scarred)			
						Tenandra Creek ST5; #28-4-0076; Modified tree (scarred)			
						Tenandra Creek ST6; #28-4-0077; Modified tree (scarred)			
						Tenandra Creek ST7; #28-4-0079; Modified tree (scarred)			
						Tenandra Creek ST8; #28-4-0078; Modified tree (scarred)			
						Tenandra Creek ACD1; #28-4-0082; Aboriginal ceremony and dreaming			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						Tenandra Creek ACD2; #28-4-0081; Aboriginal ceremony and dreaming			
Mungery Creek	SU1 Floodplain	1,629,000	4	3	1,944	Mungery Creek ST1; #28-1-0088; Modified tree (scarred)	ST	#28-1-0023	No specific cultural values were identified in this area other than the position that all Aboriginal cultural heritage sites were important connections to the Ancestral past.
						Mungery Creek ST2; #28-1-0087; Modified tree (scarred)			
						Mungery Creek ST3; #28-1-0086; Modified tree (scarred)			
						Mungery Creek ST4; #28-1-0085; Modified tree (scarred)			
						Mungery Creek ST5; #28-1-0084; Modified tree (scarred)			
						Mungery Creek ST6; #28-1-0083; Modified tree (scarred)			
Calga and Looking Glass Creeks	SU1: Floodplain	92,000	5	5	230	Calga Creek AFT and PAD; #28-1-0059; Artefact scatter and PAD	ST	#28-1-0040	The area is part of the broader Castlereagh River drainage system which represents a major traditional thoroughfare for Aboriginal people of the central west of NSW.
	SU2 Floodplain	49,000	5	2	122.5	Calga Creek ST1; #28-1-0065; Modified tree (scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
	SU3 Floodplain	49,500	0	0	0	Calga Creek ST2; #28-1-0080; Modified tree (scarred)			
						NB-AS-04; #28-1-0095; artefact scatter			
Noonbar Creek	SU1: Lower slope	660,000	4	3	792	Table Top Mountain ACD; #28-10058; Aboriginal ceremony and dreaming	ST	#28-1-0041	Gomeroi representatives identified that Table Top Mountain as significant to Gomeroi culture. It is thought to be linked to, and share cultural values with, the Warrumbungle Ranges. It is known for its stone (basalt) resources, as a signalling station, and as a vantage point for a large section of Gomeroi Country where landscape-based knowledge transference can occur, and the location of distant visitors or occupants can be identified. This area was identified by knowledge holders as having cultural sensitivity and as likely to have been a campsite location.
						NB-AS-02; #28-1-0094: artefact scatter			
						NB-AS-03; #28-1-0096; artefact scatter			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
Baradine Creek	SU1 Creek Terrace	272,000	5	10	1,360	Baradine Creek IF1; #19-5-0223; Isolated Find	ST	#19-5-0023	Baradine Creek is part of the broader Namoi River drainage system which represents a major traditional thoroughfare for the Gomeroi people of Western NSW.
						Baradine Creek IF2; #19-5-0224; Isolated Find	ST	#19-5-0024	
						Baradine Creek IF3; #19-5-0228; Isolated Find	ST	#19-5-0025	
						Baradine Creek AS1; #19-5-0226; Artefact scatter	AFT	#19-5-0010	
						Baradine Creek ST1; #19-5-0237; Modified tree (scarred)	Convict Road	#19-5-0106	
						Baradine Creek ST2; #19-5-0236; Modified tree (scarred)			
						Baradine Creek PAD; #19-5-0230; PAD			
Coolangla Creek	SU1 Creek Terrace	10,000	5	5	25	Coolangla Creek IF1; #19-5-0227; Isolated find	AFT	#19-5-0110	Whilst limited Aboriginal cultural material was identified within this survey area, the lower order creek lines of Baradine Creek (including Coolangla
	SU2 Creek Terrace	10,000	5	5	25	Coolangla Creek IF2; #19-5-0233; Isolated find	AFT	#19-5-0111	

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
	SU3 Channel	145,000	0	0	0	Coolangla Creek IF3; #19-5-0232; Isolated find	AFT	#19-5-0112	Creek) and the greater Namoi River catchment are integral elements of the traditional cultural landscape. Coolangla Creek has the potential to contain grinding groove sites in areas of exposed sandstone.
						Coolangla Creek IF4; #19-5-0231; Isolated find			
						Coolangla Creek IF5; #19-5-0241; Isolated find			
Cumbil Forest Creek	SU1 Creek Channel	1500	5	10	7.5	Cumbil Forest Creek GG1; #19-5-0229; Grinding grooves	AFT	#19-5-0115	This site is important to Gomeroi men, being a place where Aboriginal men once worked to create both ceremonial and utilitarian implements. The community hold a certain cultural responsibility for the well-being of their members and visitors to this region, and cultural practices should be respected in these areas.
						Cumbil Forest Creek GG2; #19-5-0225; Grinding grooves	AFT	#19-5-0116	
							AFT	#19-5-0112	
							GG ST	LALC only #19-5-0121	
Etoo Creek	SU1 Floodplain (south)	291,000	5	15	2,182	Etoo Creek ST1; #19-5-0235; Modified tree (scarred)	None registered		The area is purported to be the home of an ancestral demon (Yowie, Yaya) and care must be exercised by people working in this area. The
	SU2 Floodplain (north)	920,000	50	10	47,000	SU1: Etoo Creek ST2; #19-5-0234 Modified tree (scarred)			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
	SU3 Terrace	20,000	50	10	1,000	Etoo Creek ST3; #19-5-0239; Modified tree (scarred)			community hold a certain cultural responsibility for the well-being of visitors to this region and believe that remedial ceremony should be abided by in order to mitigate harm.
						Etoo Creek ST4; #19-5-0240; Modified tree (scarred)			
Bundock Creek	SU1: Creek Terrace	850,000	50	40	17,000	NB-AS-11; #19-6-0176; artefact scatter	None registered		Bundock Creek is cultural sensitivity for resource plants as it is biodiverse and seen by knowledge holders to have been a suitable camping area given the large number of food species contained within it.
						NB-AS-12; #19-6-0175; artefact scatter SU1:			
						NB-AS-15; #19-6-0173; artefact scatter			
						NB-AS-13; #19-6-0171; Isolated find			
						NB-AS-14; #19-6-0172; Isolated find			
						NB-AS-16; #19-3-0174; Isolated find			
Bohena Creek	SU1: Creek Terrace	12,000,000	50	40	2,400,000	Bohena Creek IF1; #19-3-0170; Isolated find	None registered		The Bohena Creek is an integral element of the traditional cultural landscape of the Gomeroi people is part of the broader Namoi River drainage area which represents a major traditional thoroughfare for
						Bohena Creek IF2; #19-3-0166; Isolated find			
						Bohena Creek PAD 1; #19-3-0169; PAD			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						Bohena Creek PAD 2; #19-3-0168; PAD			traditional Aboriginal people of western NSW.
						Bohena Creek ST1; #19-3-0167; Modified tree (scarred)			
						NB-AS-17, #19-6-0180; artefact scatter			
						William Haines Grave site; #19-3-0170; Burial			
Namoi River	SU1: River Terrace (north)	20,000	50	25	25,000	Namoi River ST2; #19-3-0172; Modified(scarred) tree	None registered		The area is part of the Namoi River drainage system represents a major traditional thoroughfare for traditional Aboriginal people of the central west of NSW. Representatives from the Aboriginal community indicated the area was a known cultural camp site and many locally significant bush foods and medicinal plants were identified near gilgais in the area.
	SU2: River Terrace (north)	42,186	50	50	10,546	Namoi River ST1; #19-3-0171; Modified(scarred) tree			
						Namoi River ST3; #19-3-0173; Modified(scarred) tree			
						Namoi River ST4; #19-3-0174; Modified(scarred) tree			
						Namoi River ST5; #19-3-0175; Modified(scarred) tree			
						Namoi River ST6; #19-3-0176; Modified(scarred) tree			

Catchment	Survey units/ landscapes	Total area surveyed (m^2)	Visibility (%)	Exposure (%)	Effective cover (m^2/%)	New sites (Site name, AHIMS ID, site site)	Known sites		Notes on cultural sensitivity
							Type	AHIMS ID	
						Namoi River ST7; #19-3-0179; Modified(scarred) tree			
						Namoi River ST8; #19-3-0178; Modified(scarred) tree			
						Namoi River ST9; #19-3-0177; Modified(scarred) tree			
						Namoi River AS1; #19-3-0170; Artefact scatter			

7.4 Summary of survey results

Archaeological assessment of the investigation corridor, including desktop assessment, archaeological survey and test excavation, identified a total of 152 sites and 13 areas of PAD. These included:

- 93 culturally modified trees
- 13 PADs
- eight artefact scatters with PAD
- 24 artefact scatters
- 17 isolated artefacts
- three ACD sites
- two grinding groove sites
- one artefact reburial site
- one shelter tree
- one ochre quarry
- one historic burial site
- one cultural crossing.

Mapping of all sites identified within 400 metres of the proposal site is provided in Appendix E. Site forms for the 152 newly identified sites registered on the AHIMS are provided in Appendix C.

The results of this survey clearly indicate that the distribution of sites within this linear alignment reflect the use of waterways as primary transit and camping areas within the lowland alluvial plains of the study area. RAPs and other knowledge holders maintain that all sites and objects within the cultural landscape are significant. Surveyed locations such as the Macquarie River contain scores of culturally modified trees, artefact scatters, camping sites and ochre quarries indicating the use of these areas was intensive. This is backed up by oral histories of knowledge holders that show occupation and use of these areas extended well into the historical period and continue to this day. Further archaeological investigation of sites and PADs and the analysis of artefact assemblages contained within them will allow an assessment of the length of occupation of these sites and inform upon what is known for prehistoric settlement of the region.

Assessment of the proposal site indicates that 48 Aboriginal sites/PADs are within or directly adjacent to it. For the purpose of this impact assessment, it has been assumed that all Aboriginal heritage sites occurring within or adjacent to the proposal site would be directly or potentially impacted by construction activities if no mitigation measures were adopted. Table 7.6 lists the 25 sites/PADs that have been identified as being within the proposal site and will be directly impacted by the proposal. This consists of 23 sites including four artefact scatters that have PADs (#28-4-0280 at Castlereagh River, #28-1-0090 and #28-1-0060 at Gulargambone Creek, #28-1-0059 at Calga and Looking Glass Creeks) and two PADs (#27-6-0036 at Ewenmar Creek and #19-5-0230 at Baradine Creek).

Table 7.6 Sites/PADs that are within the proposal site and would be directly impacted by the proposal

Name (AHIMS ID#) Catchment	Description
#35-3-0175* TNWP-ST19 Backwater Cowal	Culturally modified tree reported to be within proposal site* at chainage 558.6.
#35-3-0195* DNOS01 Macquarie River	Artefact scatter reported to be within proposal site to the east of chainage 562.4 but not confirmed.
#35-3-0196* DNOS01 Open Site 1 PAD Macquarie River	Confirmed archaeological deposit reported to be within proposal site at chainage 562.4 but not confirmed.
#35-3-0276 MRAS6 Macquarie River	Artefact scatter extends across and beyond proposal site at chainage 563.4 to 563.8
#27-6-0035 ECST1 Ewenmar Creek	Culturally modified tree within proposal site at chainage 595.3.
#27-6-0036 ECPAD1 Ewenmar Creek	PAD within proposal site at chainage 595.3
#27-6-0042 Boothaguy Creek ST6 Boothaguy Creek	Culturally modified tree within proposal site at chainage 628.1
#27-6-0041 Boothaguy Creek ST7 Boothaguy Creek	Culturally modified tree within proposal site at chainage 630.2
#27-6-0037 Boothaguy Creek ST11 Boothaguy Creek	Culturally modified tree within proposal site at chainage 633.5
#28-4-0280 CR AFT & PAD Castlereagh River	PAD crosses proposal site on north terrace located at chainage 641.5
#28-1-0090 Gulargambone Creek AFT & PAD2	Artefact scatter located on the boundary of the proposal site and PAD likely to extend through it at chainage 673.5
#28-1-0060 Gulargambone Creek AFT & PAD	Artefact scatter located on the boundary of the proposal site and PAD likely to extend through it at chainage 672.9
#28-1-0062 BRR ST1 Baronne Creek	Culturally modified tree within proposal site at chainage 686
#28-1-0063 BRR ST2 Baronne Creek	Culturally modified tree within proposal site at chainage 685.7

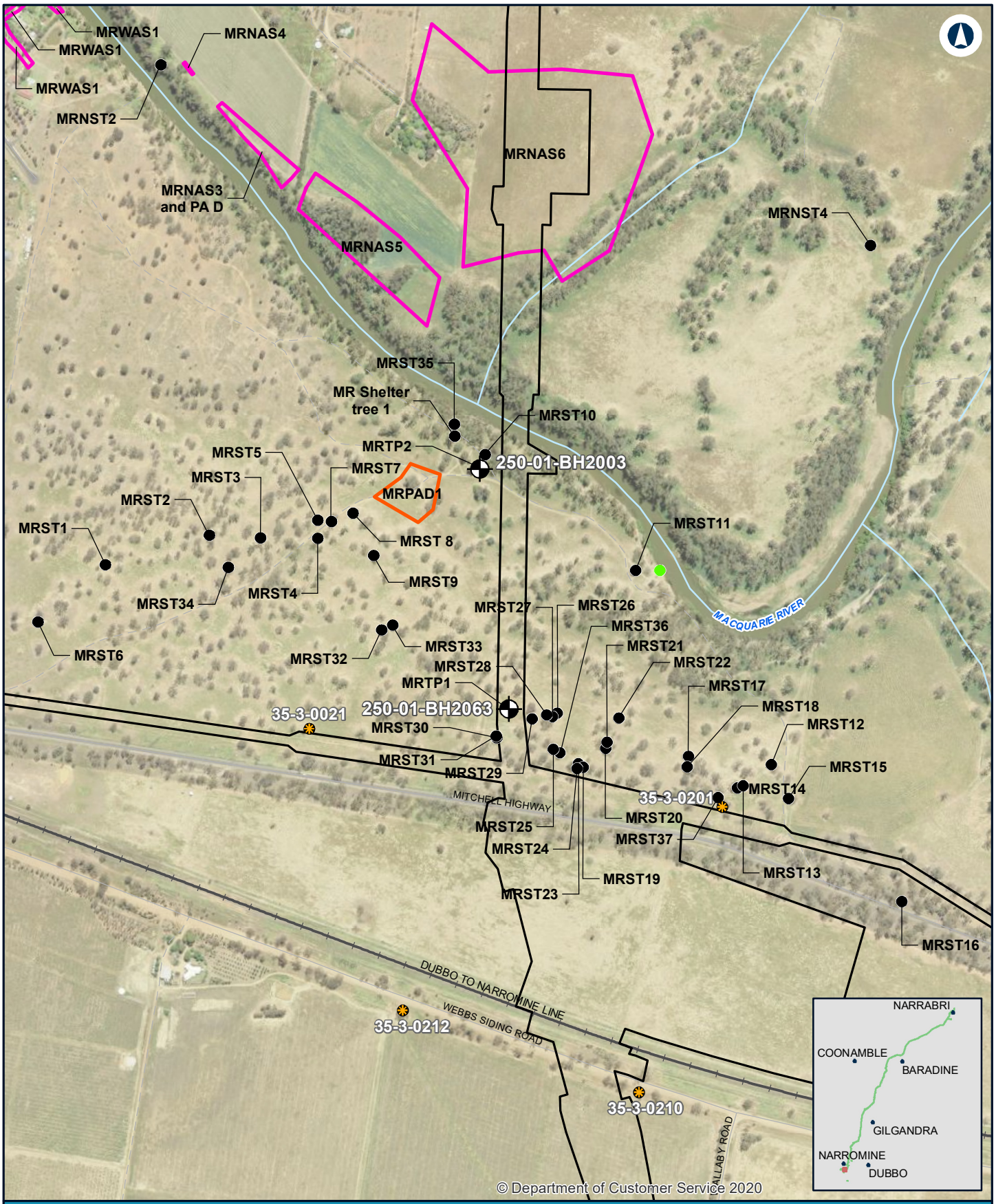
Name (AHIMS ID#) Catchment	Description
#28-1-0064 BRR ST3 Baronne Creek	Culturally modified tree within proposal site on the northern boundary at chainage 685.5
#28-1-0086 Mungery Creek ST3	Culturally modified tree within proposal site at chainage 701.2
#28-1-0083 Mungery Creek ST6	Culturally modified tree within proposal site at chainage 701.5
#28-1-0087 Mungery Creek ST2	Culturally modified tree within proposal site at chainage 701.1
#28-1-0084 Mungery Creek ST5	Culturally modified tree within proposal site at chainage 701.5
#28-1-0059 CC AFT & PAD Calga and Looking Glass Creeks	Artefact scatter and PAD partially within proposal site at chainage 714.4
#28-1-0095 NB-AS-04 Calga and Looking Glass Creeks	Artefact scatter within proposal site at chainage 714.6
#28-1-0096 NB-AS-03 Noonbar Creek	Artefact scatter within proposal site near chainage 716.3
#19-5-0226 BC AS-1 Baradine Creek	Artefact scatter within proposal site near chainage 747.7
#19-5-0230 Baradine Creek PAD	PAD across proposal site near chainage 747.8
#19-6-0180 Bohena Creek AFT	Artefact scatter within proposal site at chainage 835.5

*Sites not able to be confirmed in the reported locations.

7.5 Archaeological test excavation

7.5.1 Summary of archaeological sites investigated

A PAD was identified in the vicinity of the proposal site on the southern terrace of the Macquarie River during surveys of 185 geotechnical investigations locations between November 2018 and January 2019 (refer to Appendix E Map 2). Two borehole (BH) locations were considered too culturally sensitive by the Aboriginal community for boreholing to go ahead unless preceded by test investigation to ensure the borehole sites were culturally sterile. Whereas these locations were not initially considered to encompass the PAD identified on an upper terrace in this area, the proximity of the borehole sites to the PAD and other cultural sites in the vicinity was enough for the community to request these areas be tested archaeologically. The test excavation was undertaken in accordance with the test excavation methodology that was prepared in accordance with Section 3.1 of the Code of Practice and was approved by the RAPs (refer to Appendix D).



NARROMINE TO NARRABRI Location of BH-2-003 and BH-2-063 on the south bank of the Macquarie River Figure 7.2

0 0.2 0.4 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Study area
- Construction footprint
- Borehole
- Registered AHIMS sites
- Cultural site
- Culturally modified tree (scarred)
- Test pit location (refer to Section 9.27)
- Artefact scatter
- PAD

Date: 6/07/2020 Paper: A4
Author: JACOBS Scale: 1:7,163,937
Data Sources: Study area, boreholes, registered sites: GHDJACOBS; Imagery, base layers: NSW Spatial Services: all other layers: IR ARTC

INLAND RAIL ARTC

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

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Archaeological testing was therefore undertaken at the following locations (refer to Figure 7.2):

- BH-2-003 located at 622108.00 metres East and 6431858.00 metres south.

BH-2-063 located at 622165.00 metres East and 6431399.00 metres south. The remainder of the boreholes investigated were assessed as being located away from areas of archaeological sensitivity and thus were not required to be investigated.

7.5.2 Timing and personnel

Test investigations of the proposed borehole locations were undertaken on 10 April 2019. Details of fieldwork activities and participants are provided in Table 7.7.

Table 7.7 Test excavation timing and personnel

Dates	Jacobs archaeologists	Aboriginal stakeholder involvement
10 April 2019	Andy Roberts Alexandra Seifertova	Mark Smith (Narromine LALC) Mickey Edwards (Narromine LALC) Kenny Edwards (Narromine LALC)

7.5.1 Results of test excavation

In total, test excavation consisted of two 500 x 500 millimetres test pits that were both taken to a depth of between 250 and 265 millimetres. These test pits were shown to be culturally sterile and were continued until 'B' level soil horizons comprised of clayey soils were encountered in each test pit. No sub-surface cultural objects were identified at these locations.

7.6 Sites and PADs within or adjacent to proposal site

Thirty-nine sites and two PADs are within or adjacent to the proposal site (refer to mapping in Appendix E). It is noted that are also four artefact scatter sites that have PADs associated with them.

Table 7.6 details the locations of 23 sites within the proposal site requiring appropriate mitigation measures, including sites that require salvage and six PADs requiring archaeological investigation (this includes the two standalone areas of PAD and the four sites that are artefact scatters and have PADs associated with them).

Table 7.8 details the location of 23 sites would potentially be vulnerable to indirect impacts from the proposal. These 23 Aboriginal heritage sites are adjacent to the proposal site would be able to be protected through mitigation measures (such as avoidance zones and cultural heritage training) so they are not inadvertently damaged during construction. Eleven sites that are potentially indirectly impacted (#35-3-0021, #35-3-0173, #35-3-0174, #35-3-0183, #35-3-0200, #35-3-0201, #35-3-0202, #35-3-0210, #19-5-0115, #19-5-0116 and #19-5-0121) and three sites that are potentially directly impacted (#35-3-0175, #35-3-0195 and #35-3-0196) would need a pre-construction survey to confirm their locations.

Table 7.9 details a further eight areas considered to have high potential for Aboriginal heritage. These are recommended for further targeted archaeological survey and investigation.

Table 7.8 Sites adjacent to the proposal site that would potentially be indirectly impacted by the proposal

Name (AHIMS ID#) Catchment	Description
#35-3-0183* TNWP-ST27 Backwater Cowal	Site within 40 m of proposal site* at chainage 553.1
#35-3-0268 BCST3 Backwater Cowal	Site within 50 m of proposal site at chainage 559.8
#35-3-0173* TNWP_ST17 #35-3-0174	Site within 40 m of proposal site* at chainage 558.3
#35-3-0174* TNWP_ST18 #35-3-0174	Site within 40 m of proposal site* at chainage 558.3
#35-3-0200* Macquarie River	Site reported (not confirmed) within 10 m of proposal site* to the east of chainage 562.1
#35-3-0201* Macquarie River	Site reported (not confirmed) within 10 m of proposal site* to the east of chainage 562.1
#35-3-0202* Macquarie River	Site reported (not confirmed) within 15 m of proposal site* to the east of chainage 562.1
#35-3-0210* Macquarie River	Site reported (not confirmed) within 20 m of proposal site* at chainage 561.8
#35-3-0250 MRST31 Macquarie River	Site within 20 m of proposal site at chainage 562.6
#35-3-0254 MRST30 Macquarie River	Site within 10 m of proposal site at chainage 562.5
#35-3-0021* Macquarie River	Site reported (not confirmed) to be within 10 m of proposal site east of chainage 562.5
#35-3-0244 MRST29 Macquarie River	Site within 20 m of proposal site at chainage 562.6
#35-3-0225 MRST10 Macquarie River	Site within 40 m of proposal site at chainage 563.1
#28-4-0283 Berida Rd ST1 Castlereagh River	Site within 10 m of proposal site at chainage 641.5
#28-4-0284 Berida Rd ST2 Castlereagh River	Site within 10 m of proposal site at chainage 641.7

Name (AHIMS ID#) Catchment	Description
#19-5-0223 BCIF1 Baradine Creek	Site within 10 m of proposal site near chainage 747.8
#19-5-0224 BCIF2 Baradine Creek	Site within 10 m of proposal site near chainage 747.8
#19-5-0229 CFCGG1 Cumbil Forest Creek	Site within 30 m of proposal site near chainage 756.8
#19-5-0225 CFCGG2 Cumbil Forest Creek	Site within 50 m of proposal site chainage 756.8
#19-5-0115* Cumbil Forest Creek	Site reported (not confirmed) within 30 m of proposal site chainage 756.9 according to the site card description
#19-5-0121* Cumbil Forest Creek ST	Site reported (not confirmed) within 40 m of proposal site at chainage 756.8
#19-5-0116* Cumbil Forest Creek	Site reported (not confirmed) within 70 metres of proposal site chainage 756.9
#19-5-0239 Etoo Creek	Site within 15 metres to proposal site at chainage 763.6

*Sites not able to be confirmed in the reported locations.

Table 7.9 Culturally sensitive areas within proposal site that require targeted investigation

Location	Description
Wallaby Creek	Reported culturally modified trees in 1500 metre section of 3rd order creek frontage between chainage 552.9 and 554.6 require additional survey and investigation to verify these reported sites.
Ewenmar Creek	Lower slopes and forested areas between chainage 595.3 and 595.6 are in an area known for dry season water requires additional survey and investigation. Unassessed area at creek confluence at this location. Large artefact cache in possession of nearby landowner.
Marthaguy Creek	Forested area between chainage 634 to 634.9 at third order confluence of creek requires additional survey and investigation.
Castlereagh River	Southern bank between chainage 652 to 652.2 requires additional survey and investigation.
Gulargambone Creek	Forested areas, banks and upper terraces between chainage 672.9 to 674 require additional survey and investigation.
Tenandra Creek	Low terraces of creek between chainage 694.1 and 694.7 require additional survey and investigation.

Location	Description
Noonbar Creek	Recommended for further survey and investigation due to high potential for Aboriginal cultural heritage at chainage 718.1 to 718.2.
Baradine Creek	Low terraces of creek between chainage 747.8 and 748.6 require additional survey and investigation.

7.7 Analysis and discussion

JacobsGHD have accessed the ASDST to identify areas of potential cultural value across the study area. The ASDST suggests that the study area once contained large swathes of culturally modified trees. Until this survey had been undertaken there were only 50 recorded culturally modified trees in the vicinity of the study area registered on AHIMS. The survey completed for the investigation corridor for the proposal has added an additional 101 instances to that record. These results imply that given the accumulated impact of the past 250 years, the likelihood of identifying extant culturally modified trees has significantly reduced. Importantly, the sheer reduction in numbers of probable trees increases the rarity and representative value of each extant culturally modified tree, which therefore adds to the significance value of any identified in the future.

The results of this assessment clearly indicate that the distribution of sites within the proposal site reflect the use of waterways as primary transit and camping areas within the lowland alluvial plains and river terraces of the study area. Surveyed locations such as the Macquarie River contain scores of culturally modified trees along with artefact scatters, camping sites and ochre quarries indicating the use of these areas was intensive. This is backed up by oral histories of knowledge holders that show occupation and use of these areas extended well into the historical period and continue to this day. Further archaeological investigation of sites and PADs and the analysis of artefact assemblages contained within them will allow an assessment of the length of occupation of these sites and inform upon what is known for prehistoric settlement of the region. All of the predictive modelling (refer to section 7.1.2) developed for the desktop assessment has been confirmed, especially in regard to the association of campsites with elevated low gradient landforms near drainage lines such as river terraces. The dominant site type was confirmed to be culturally modified tees. Stone tools raw material types were confirmed to be dominated by quartz and sandstone grinding implements. The importance of vantage points was also confirmed as was the rarity of grinding groove sites.

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8. Significance assessment

8.1 Methodology

8.1.1 Basis for assessment

A significance assessment is made up of several significance criteria that attempt to define why a site is important. Such assessment recognises that sites may be important for different reasons to different people, and even at different times. The assessment of Aboriginal cultural heritage in this assessment is based upon the four values of the Australia ICOMOS Burra Charter (Australia ICOMOS 2000).

- social values
- historical values
- scientific values
- aesthetic values.

Each of these values is assessed below for newly identified Aboriginal heritage items, and an overall significance is assigned based on an average across the values. This is inherently a reductive process, and which seeks to synthesise what is important for different reasons to a range of different stakeholders and is a necessary process in being able to create comparative values between sites. The significance of each site ultimately informs the management of sites and places. Guidelines that assist in significance assessment are provided in the *Guide to Investigation, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2010b).

A total of 48 sites/PADs are located within or directly adjacent to the proposal site and have been assessed for significance. As the nature (and indeed even the presence) of Aboriginal objects associated with a PAD is unknown, it is not possible to assess the significance of a PAD. As such the two PADs (#27-6-0036 Ewenmar Creek and #19-5-0230 Baradine Creek) are not included in this section. The four artefact scatter sites that have PADs associated with them (#28-4-0280, #28-1-0090, #28-1-0060 and #28-1-0059) have been included but significance assessments only completed on the artefact scatter elements of the site in accordance with due diligence guidelines. A mitigation measure has been included to undertake investigation of PADs prior to construction to establish their significance in accordance with due diligence guidelines.

8.1.2 Social values

The significance of a site does not relate only to its scientific or research value. Aboriginal people's views on the significance of archaeological sites are usually related to traditional, cultural and educational values, although some Aboriginal people also value any scientific information a site may be able to provide.

Aboriginal cultural significance was assessed based on consultation with RAPs, knowledge holders and LALC field staff during and following field surveys. It should be noted that cultural significance assessed in this manner may not reflect the views of all members of the Aboriginal community. AFG#3 provided an opportunity to reconcile any potentially divergent views and this report was updated based on the review comments received from the RAPs.

8.1.3 Historic values

The historic value of a site is determined through its association with historically important people, events or activities.

8.1.4 Scientific values

Research potential or scientific significance of an Aboriginal archaeological site can be assessed by utilising the criteria set out below. Each criterion is rated as low, moderate or high.

- Site integrity – The integrity of a site refers to its state of preservation, or condition. A site can be disturbed through a number of factors including natural erosion processes, destructive land use practices or repeated use of a site in the past by both humans and animals.
- Site structure – Structure refers to a site's physical dimensions, that is, size and stratigraphy. A large site or a site with stratified deposits has more research potential than small sites and/or surface scatters. Sometimes however, specific research questions may be aimed at smaller sites in which case they would be rated at a higher significance than normal. Site structure cannot be assessed for scarred trees or isolated artefacts.
- Site contents – This category refers to the range and type of occupation debris found in a site. Generally, complex art sites, extensive quarries with associated debris and surface sites that contain a large and varied amount of organic and non-organic materials are considered to have greater research potential than those sites with small, uniform artefacts, single motif art sites and small quarries with little or no debris. For scarred trees, contents may refer to the size and type of scar and/or how many scars there are on the one tree.
- Representativeness and rarity – Representativeness refers to how much variability exists between the subject site and others inside or outside the subject area. It also considers the types of sites already conserved in the area and how much connectivity between sites exists. Rarity considers how often a particular site type occurs in an area. Assessment of representativeness and rarity requires some knowledge of the background archaeology of the area or region in which a study is being carried out. Rarity also relates to whether the subject site or area is important in demonstrating a distinctive way of life, custom, process, land use, function or design which is no longer practiced (OEH 2011).

8.1.5 Aesthetic values

This refers to the sensory value of a place, and can include aspects such as form, texture, and colour, and can also include the smell and sound elements associated with use or experience of a site (Australia ICOMOS 2000). Aesthetic significance can be closely linked to the social value of a site.

8.1.6 Scale of values

Significance of sites and places is assigned to different geographic scales, such as local, regional, State and National, appropriate to the scale of importance. For example, Uluru is significant at a National (and World) scale, whereas a local historic building may only be significant on a local scale. This is reflected in the variety of heritage lists held by local councils, up to State and Federal government. In scale of significance, the criteria presented above as well as educational or research potential, representativeness and rarity (Australia ICOMOS 2000) have been considered in determinations of significance.

Each site has been assessed and its scale of significance has been given a grading of its significance overall based on the grading of each of the individual values. The grading of low, moderate and high has been assigned comparatively across the sites investigated in the region.

8.2 Statements of significance of sites within or close to the proposal site

Significance assessments for the new archaeological sites and PADs identified during the archaeological survey that could potentially be impacted by the proposal are presented below. As mentioned above the assessment of significance is based upon a review of the similarities of sites within a culturally sensitive area.

8.2.1 Backwater Cowal

In addition to 18 culturally modified (scarred) trees, a culturally modified (carved) tree, three artefact scatters and an artefact reburial site were previously recorded at the Backwater Cowal and Wallaby Creek in or near the survey area, this recent survey has identified nine culturally modified (scarred) trees and two artefact scatter sites (refer to Appendix E).

One culturally modified tree (#35-3-0175) in the Backwater Cowal catchment area is located within the proposal site and four culturally modified trees ((#35-3-0173, #35-3-0174, #35-3-0183, #35-3-0268) in the Backwater Cowal catchment area are near to the proposal site (refer to section 7.5.1). Four previously recorded sites were not confirmed during survey (#35-3-0173, #35-3-0174, #35-3-0175 and #35-3-0183).

TNWP ST 17 (#35-3-0173) Modified Tree (Scarred)

TNWP-ST 17 (#35-3-0173) could not be confirmed at its reported location but is reported to be within 40 metres of the proposal site.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 17 (#35-3-0173) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 17 (#35-3-0173) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP ST 18 (#35-3-0174) Modified Tree (Scarred)

TNWP-ST 18 (#35-3-0174) could not be confirmed at its reported location but is reported to be within 40 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 18 (#35-3-0174) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 18 (#35-3-0174) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP-ST19 (#35-3-0175) Modified Tree (Scarred)

TNWP-ST 19 (#35-3-0175) could not be confirmed at its reported location but is reported to be within the proposal site. It is reported (refer to Appendix C) as a possible scarred tree only. This is likely to be as a result of changes in the AHIMS datums since survey.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

TNWP-ST 19 (#35-3-0175) is well preserved however has only been assigned a ‘possible’ scarred tree status and thus has low research potential.

Aesthetic significance

Scarred trees meet this criterion as they contain significant sensory, scenic and creative qualities due to the Aboriginal scarring they contain as well as the form, colour and texture of the trees themselves. All are therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and as it TNWP-ST 19(#35-3-0175) only a ‘possible status been assigned low representativeness and rarity, low research potential and therefore low significance at the local level.

TNWP ST 20 (#35-3-0176) Modified Tree (Scarred)

TNWP-ST 20 (#35-3-0176) could not be confirmed at its reported location but is reported to be within 70 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 20 (#35-3-0176) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 20 (#35-3-0176) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP ST 21 (#35-3-0177) Modified Tree (Scarred)

TNWP-ST 21 (#35-3-0177) could not be confirmed at its reported location but is reported to be within 90 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 20 (#35-3-0177) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 20 (#35-3-0177) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP ST 24 (#35-3-0180) Modified Tree (Scarred

TNWP-ST 24 (#35-3-0180) could not be confirmed at its reported location but is reported to be within 380 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 24 (#35-3-0180) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 24 (#35-3-0180) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP ST 25 (#35-3-0181) Modified Tree (Scarred)

TNWP-ST 25 (#35-3-0181) could not be confirmed at its reported location but is reported to be within 350 metres of the proposal site.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 25 (#35-3-0181) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 25 (#35-3-0181) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP ST 26 (#35-3-0182) Modified Tree (Scarred)

TNWP-ST 26 (#35-3-0182) could not be confirmed at its reported location but is reported to be within 120 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 26 (#35-3-0182) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 26 (#35-3-0182) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP-ST 27 (#35-3-0183) Modified Tree (Scarred)

TNWP-ST 27 (#35-3-0183) could not be confirmed at its reported location but its reported location is reported to be within 110 metres of the proposal site. This is likely to be as a result of changes in the AHIMS datums since survey.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage values are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

TNWP-ST 27 (#35-3-0183) is reported (refer to Appendix C) as a well-preserved mature tree with an elongated scar with moderate research potential as it is a good representation of an elongated and curved (preform) scar.

Scarred trees are relatively common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP-ST 27 (#35-3-0183) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring they contain as well as the form, colour and texture of the trees themselves. All are therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and TNWP-ST 27 (#35-3-0183) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP ST 28 (#35-3-0184) Modified Tree (Scarred)

TNWP-ST 28 (#35-3-0184) could not be confirmed at its reported location but is reported to be within 120 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP-ST 28 (#35-3-0184) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP-ST 28 (#35-3-0184) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

BCST3 (#35-3-0268) Modified Tree (Scarred)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

BCST3 (#35-3-0268) is well preserved with moderate research potential as it is a good representation of an elongated and curved (preform) scars.

Scarred trees are relatively common in the local area and BCST3 (#35-3-0268) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

BCST3 (#35-3-0268) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

8.2.2 Macquarie River

The large number of scarred trees in the vicinity of the Macquarie River (n=60) gives an indication of the intensity of the use of this landscape and the numbers of Aboriginal people living within this area. Eighteen culturally modified trees (#35-3-0171, #35-3-0172, #35-3-0019, #35-3-0020, #35-3-0021, #35-3-0022, #35-3-0080, #35-3-0081, #35-3-0194, #35-3-0200, #35-3-0201, #35-3-0202, #35-3-0205, #35-3-0211, #35-3-0250, #35-3-0254, #35-3-0244 and #35-3-0255) in the Macquarie River catchment area (south terrace) are located in or near to the proposal site (refer to section 7.5.1). Additionally, one artefact scatter (#35-3-0276) and an artefact scatter with a confirmed archaeological deposit (#35-3-0195 and #35-3-0196 respectively) are located within the proposal site on the southern terrace.

TNWP ST 15 (#35-3-0171) Modified Tree (Scarred)

TNWP ST 15 (#35-3-0171) could not be confirmed at its reported location but is reported to be within 90 metres of the proposal site.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 15 (#35-3-0171) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 15 (#35-3-0171) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

TNWP ST 16 (#35-3-0172) Modified Tree (Scarred)

TNWP ST 16 (#35-3-0172) could not be confirmed at its reported location but is reported to be within 190 metres of the proposal site on the southern upper terrace of the river.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and TNWP ST 16 (#35-3-0172) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

TNWP ST 16 (#35-3-0172) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

WB-Canoe Tree 2 (#35-3-0019)

WB-CT-2 (#35-3-0019) could not be confirmed at its reported location but is reported to be within 110 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

WB-CT-2 (#35-3-0019) exhibits a long and narrow elongated scar likely to be as a result of the construction of a canoe tree as is reported to be common in the local area (refer to section 6.5.1). Scarred trees are relatively common in the local area and WB-CT-2 (#35-3-0019) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

WB-CT-2 (#35-3-0019) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Webb Siding 2 (#35-3-0020) Modified Tree (Scarred)

Webb Siding 2 (#35-3-00020) could not be confirmed at its reported location but is reported to be within 140 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and Webb Siding 2 (#35-3-00020) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Webb Siding 2 (#35-3-00020) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

No.4 Webb's Siding Canoe Tree (#35-3-0021)

No.4 Webb's Siding Canoe Tree (#35-3-0021) could not be confirmed at its reported location but is reported to be within 10 metres of the proposal site on the southern upper terrace of the river.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

No.4 Webb's Siding Canoe Tree (#35-3-0021) meets this criterion. There is a 1980 AHIMS card recorded by Sabu Dunn in October 1980 that references this site with a photograph by Ray Kelly therefore it has low historical significance.

Scientific significance

No.4 Webb's Siding Canoe Tree (#35-3-0021) exhibits a wide preform scar likely to be as a result of the construction of a canoe that are relatively common in the local area (refer to section 6.5.1). No.4 Webb's Siding Canoe Tree (#35-3-0021) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level. Note, the record is 40 years old and the tree has not been reconfirmed in its' reported position.

Aesthetic significance

No.4 Webb's Siding Canoe Tree (#35-3-0021) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Whereas it has not been possible to reassess this tree in its current condition, wide preform scarred trees are not common in the local area and therefore No.4 Webb's Siding Canoe Tree (#35-3-0021) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high significance at the local level.

Webb's Siding Canoe Tree (#35-3-0022)

Webb's Siding Canoe Tree (#35-3-0022) could not be confirmed at its reported location but is reported to be within 90 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Webb's Siding Canoe Tree (#35-3-0022) exhibits a long and narrow elongated scar likely to be as a result of the construction of a canoe tree as is reported to be common in the local area (refer to section 6.5.1). Scarred trees are relatively common in the local area and Webb's Siding Canoe Tree (#35-3-0022) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Webb's Siding Canoe Tree (#35-3-0022) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Mitchell Highway ST 17 (#35-3-0080) Modified Tree (Scarred)

Mitchell Highway ST 17 (#35-3-0080) could not be confirmed at its reported location but is reported to be within 280 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and Mitchell Highway ST 17 (#35-3-0080) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Mitchell Highway ST 17 (#35-3-0080) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Mitchell Highway ST 18 (#35-3-0081) Modified Tree (Scarred)

Mitchell Highway ST 18 (#35-3-0081) could not be confirmed at its reported location but is reported to be within 185 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and Mitchell Highway ST 18 (#35-3-0081) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Mitchell Highway ST 18 (#35-3-0081) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

DNST7 (#35-3-0194) Modified Tree (Scarred)

DNST7 (#35-3-0194) could not be confirmed at its reported location but is reported to be within 280 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and DNST7 (#35-3-0194) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

DNST7 (#35-3-0194) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

DNOS1 with PAD (#35-3-0195 and #35-3-0196)

DNOS1 (#35-3-0195 and #35-3-0196) is the remnants of an open artefact scatter and a confirmed archaeological deposit respectively located near Webbs Siding to the south of the Macquarie River. It is reported to be within the construction footprint yet has been partially destroyed.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site type meets this criterion. The site has been subject to investigation and assessment in 2012. There are no other known written or oral historical references to the artefact scatters located at the Macquarie River. Its significance in this regard is therefore low.

Scientific significance

DNOS1 (#35-3-0196 and #35-3-0195) artefact was initially assessed (Ozarch 2012) as having moderate scientific significance yet has since been impacted by the development of a road and transmission line. Ozarch (2012) investigated the PAD and determined the deposits were of low density. It is therefore reassessed as having low integrity, low structure, moderate contents and moderate representativeness/rarity. The integrity and structure of this site is low as it consists principally of surface artefacts in disturbed contexts. It has low to moderate contents rankings as it comprises common artefact types and raw materials common to the area. The site has a low representativeness ranking as large artefact scatters have been identified at the Macquarie River in recent times. It currently has moderate research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a terrace overlooking the Macquarie River.

Summary statement of significance

Overall, DNOS1 (#35-3-0196 and #35-3-0195) is of moderate significance at the local level. It is of high social significance as tangible evidence of the use of the area by Aboriginal people. It has low scientific significance due to its poor integrity and structure, density and common raw materials. It is of moderate aesthetic significance given its location on a prominent landform. The site has moderate research and educational potential about the way local Aboriginal populations used this type of landform.

DNST1 (#35-3-0200) Modified Tree (Scarred)

DNST1 (#35-3-0200) scarred tree could not be confirmed at its reported location but is reported to be within 10 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and DNST1 (#35-3-0200) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

DNST1 (#35-3-0200) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

DNST2 (#35-3-0201) Modified Tree (Scarred)

DNST2 (#35-3-0201) could not be confirmed at its reported location but is reported to be within 10 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and DNST2 (#35-3-0201) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

DNST2 (#35-3-0201) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

DNST3 (#35-3-0202) Modified Tree (Scarred)

DNST3 (#35-3-0202) could not be confirmed at its reported location but is reported to be within 15 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and DNST3 (#35-3-0202) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

DNST3 (#35-3-0202) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

DNST4 (#35-3-0205) Modified Tree (Scarred)

DNST4 (#35-3-0205) is reported (but not confirmed during survey) to be within 80 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and DNST4 (#35-3-0204) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

DNST4 (#35-3-0205) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

WS-RU-ST3 (#35-3-0211) Modified Tree (Scarred)

WS-RU-ST3 (#35-3-0211) could not be confirmed at its reported location but is reported to be within 335 metres of the proposal site on the southern upper terrace of the River.

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

Scarred trees are relatively common in the local area and WS-RU-ST3 (#35-3-0211) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

WS-RU-ST3 (#35-3-0211) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

MRST31 (#35-3-0250) Modified Tree (Scarred)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

MRST31 (#35-3-0250) contains two scars, both elongated and likely to be as a result of the construction of coolamons. Scarred trees are relatively common in the local area and MRST31 (#35-3-0250) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

MRST31 (#35-3-0250) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

MRST30 (#35-3-0254) Modified Tree (Scarred)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

MRST30 (#35-3-0254) does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

MRST30 (#35-3-0254) exhibits a long and narrow elongated scar likely to be as a result of the construction of a canoe tree as is reported to be common in the local area (refer to section 6.5.1). Scarred trees are relatively common in the local area and MRST30 (#35-3-0254) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

MRST30 (#35-3-0254) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

MRST29 (#35-3-0244) Modified Tree (Scarred)

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

MRST29 (#35-3-0244) does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

MRST29 (#35-3-0244) exhibits a wide preform scar likely to be as a result of the construction of a shield or coolamon that are not common in the local area (refer to section 6.5.1). MRST29 (#35-3-0244) has therefore been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

MRST29 (#35-3-0244) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Wide preform scarred trees are not common in the local area and therefore MRST29 (#35-3-0244) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high significance at the local level.

MRST10 (#35-3-0225) Modified Tree (Scarred)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

The site does not meet this criterion. There are no known written or oral historical references to the site.

Scientific significance

MRST10 (#35-3-0225) contains an elongated preform and likely to be as a result of the construction of a canoe tree. Scarred trees are relatively common in the local area and MRST10 (#35-3-0225) has therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

MRST10 (#35-3-0225) meets this criterion as it exhibits significant sensory, scenic and creative qualities due to the Aboriginal scarring as well as the form, colour and texture of the tree itself. It is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees are common in the local area and have been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

MRAS6 (#35-3-0276) Artefact scatter

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites are considered to be of high cultural (social) significance. This area has been identified by registered Aboriginal parties during the proposal as having widespread historical and contemporary cultural values including being a significant area for wetland resources. Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site type does not meet this criterion. There are no known written or oral historical references to the artefact scatters located at the Macquarie River.

Scientific significance

MRAS6 (#35-3-0276) is located on the north bank of the Macquarie River has moderate scientific significance as it is currently ranked as having low integrity, low structure, moderate contents and moderate representativeness/rarity. The integrity and structure of this site is low as it consists of surface artefacts in disturbed agricultural contexts. It has low to moderate contents rankings as it comprises common artefact types and raw materials common to the area. The site has a moderate representativeness ranking as few have been identified at the Macquarie River. It currently has moderate research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a terrace overlooking the Macquarie River.

Summary statement of significance

Overall, the Macquarie River artefact scatter MRAS6 is of moderate significance at the local level. It is of high social significance as tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to its poor integrity and structure, density and common raw materials, although being a relatively rare site type in the immediate region. It is of moderate aesthetic significance given its location on a prominent landform. The site has moderate research and educational potential about the way local Aboriginal populations used this type of landform.

8.2.3 Ewenmar Creek

A culturally modified tree is located within the proposal site at Ewenmar Creek (refer to section 7.5.1).

ECST1 (#27-6-0035) Modified Tree (Scarred)

Social significance

The scarred trees in this area are evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

ECST1 (#27-6-0035) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

ECST1 (#27-6-0035) at Ewenmar Creek is a well preserved and old scar with moderate research potential and is good representations of elongated and curved (preform) scar. Scarred trees are less common in the local area and have therefore been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

ECST1 (#27-6-0035) meet this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the maturity, form, colour and texture of the tree itself. ECST1 (#27-6-0035) is therefore attributed moderate aesthetic values.

Summary statement of significance

Scarred trees have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people. They have moderate scientific significance due to being well preserved with moderate research potential and are good representations of elongated and curved (preform) scars that are poorly represented in the local area. The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource to exploit this area. Additionally, ECST1 (#27-6-0035) has moderate aesthetic values. Overall, ECST1 (#27-6-0035) is considered to have moderate significance at the local level.

8.2.4 Boothaguy Creek

The large number of scarred trees in the vicinity of the Boothaguy Creek (n=11) on road reserve in an area that has been extensively modified through vegetation clearance and agricultural gives an indication of the intensity of the use of this landscape and the numbers of Aboriginal people living within this area. Three of these scarred trees (#27-6-0042, #27-6-0041 and #27-6-0037) are located within the proposal site.

Boothaguy Creek ST6 (#27-6-0042) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site does not meet this criterion at the local level as there is no oral are no historical references to the use of this site.

Scientific significance

Boothaguy Creek ST6 (#27-6-0042) is within the proposal site and is well preserved with moderate research potential as is a good representation of elongated and curved (preform) canoe scar. Canoe trees are not common in the local area and therefore Boothaguy Creek ST6 (#27-6-0042) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

Boothaguy Creek ST6 (#27-6-0042) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Boothaguy Creek ST6 (#27-6-0042) is therefore attributed moderate aesthetic value.

Summary statement of significance

Boothaguy Creek ST6 (#27-6-0042) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate to high scientific significance due to it being a well-preserved canoe scar with moderate to high research potential and is a good representation of an elongated and curved (preform) canoe scar that are not well represented in the region. The site has moderate to high research and educational potential as it informs about the way local Aboriginal populations used this type of resource, in particular for the construction of canoes to exploit the wetland areas. Overall, Boothaguy Creek ST6 (#27-6-0042) scarred tree is considered to have moderate to high significance at the local level.

Boothaguy Creek ST7 (#27-6-0041) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site does not meet this criterion at the local level as there is no oral are no historical references to the use of this site.

Scientific significance

Boothaguy Creek ST7 (#27-6-0041) is within the proposal site and is well preserved with moderate research potential as is a good representation of elongated scar however it extends to ground level and does not exhibit preform characteristics yet is the same age as other scars in the vicinity. Therefore Boothaguy Creek ST7 (#27-6-0041) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

Boothaguy Creek ST7 (#27-6-0041) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Boothaguy Creek ST7 (#27-6-0041) is therefore attributed moderate aesthetic value.

Summary statement of significance

Boothaguy Creek ST7 (#27-6-0041) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate to high scientific significance due to it being a well-preserved canoe scar with moderate to high research potential and is a good representation of an elongated and curved (preform) scar that are not well represented in the region. The site has moderate to high research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, Boothaguy Creek ST7 (#27-6-0041) scarred tree is considered to have moderate to high significance at the local level.

Boothaguy Creek ST11 (#27-6-0037) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Boothaguy Creek ST11 (#27-6-0037) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

Boothaguy Creek ST11 (#27-6-0037) is within the proposal site and is well preserved with moderate research potential as they are good representations of elongated and curved (preform) canoe scar. Canoe trees are not common in the local area and therefore Boothaguy Creek ST11 (#27-6-0037) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

Boothaguy Creek ST11 (#27-6-0037) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the trees themselves. These trees are therefore attributed moderate aesthetic value.

Summary statement of significance

Boothaguy Creek ST11 (#27-6-0037) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate to high scientific significance due to it being a well preserved, canoe scar with moderate to high research potential and is a good representation of an elongated and curved (preform) canoe scar that are not well represented in the region. The site has moderate to high research and educational potential as it informs about the way local Aboriginal populations used this type of resource, in particular for the construction of canoes to exploit the wetland areas. Overall, Boothaguy Creek ST11 (#27-6-0037) scarred tree is considered to have moderate to high significance at the local level.

8.2.5 Castlereagh River: Berida Road

The large number of registered scarred trees in the vicinity of Berida Road (n=16) gives an indication of the intensity of the use of this landscape and the numbers of Aboriginal people living within this area. In addition to the known sites (two within 300 metres of the proposal described below), two further scarred trees were located during the survey. Two of these sites (#28-4-0283 and #28-4-0284) are within five and 15 metres of the proposal site respectively (refer to section 7.5.1 and Appendix E).

MS-ST-10 (#28-4-0039) Modified Tree (Scarred)

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

MS-ST-10 (#28-4-0239) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

MS-ST-10(#28-4-0239) is well preserved with moderate research potential as is an excellent representation of an elongated and curved (preform) scar. MS-ST-10 (#28-4-0239) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

MS-ST-10 (#28-4-0239) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. MS-ST-10 (#28-4-0239) is therefore attributed moderate aesthetic value.

Summary statement of significance

MS-ST-10 (#28-4-0239) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate to high scientific significance due to it being an excellent representation of an elongated and curved (preform) scar that are not well represented in the region. The site has moderate to high research and educational potential as it informs about the way local Aboriginal populations used this type of resource, in particular for the construction of canoes to exploit the wetland areas. Overall, MS-ST-10 (#28-4-0239) scarred tree is considered to have moderate to high significance at the local level.

MS-ST-11 (#28-4-0040) Modified Tree (Scarred)

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

MS-ST-11 (#28-4-0240) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

MS-ST-11 (#28-4-0240) is well preserved with moderate research potential as is an excellent representation of an elongated and curved (preform) scar. MS-ST-11 (#28-4-0240) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

MS-ST-11 (#28-4-0240) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. MS-ST-11 (#28-4-0240) is therefore attributed moderate aesthetic value.

Summary statement of significance

MS-ST-11 (#28-4-0240) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate to high scientific significance due to it being an excellent representation of an elongated and curved (preform) scar that are not well represented in the region. The site has moderate to high research and educational potential as it informs about the way local Aboriginal populations used this type of resource, in particular for the construction of canoes to exploit the wetland areas. Overall, MS-ST-11 (#28-4-0240) scarred tree is considered to have moderate to high significance at the local level.

Berida Rd ST1 (#28-4-0283) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Berida Rd ST1 (#28-4-0283) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

Berida Rd ST1 (#28-4-0283) is well preserved with moderate research potential as is an excellent representation of an elongated and curved (preform) canoe scar. Canoe trees are not common in the local area and therefore Berida Rd ST1 (#28-4-0283) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

Berida Rd ST1 (#28-4-0283) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Berida Rd ST1 (#28-4-0283) is therefore attributed moderate aesthetic value.

Summary statement of significance

Berida Rd ST1 (#28-4-0283) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate to high scientific significance due to it being a well preserved, canoe scar with moderate to high research potential and is an excellent representation of an elongated and curved (preform) canoe scar that are not well represented in the region. The site has moderate to high research and educational potential as it informs about the way local Aboriginal populations used this type of resource, in particular for the construction of canoes to exploit the wetland areas. Overall, Berida Rd ST1 (#28-4-0283) scarred tree is considered to have moderate to high significance at the local level.

Berida Rd ST2 (#28-4-0284) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Berida Rd ST2 (#28-4-0284) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

Berida Rd ST2 (#28-4-0284) is well preserved with moderate research potential as is an excellent representation of an elongated and curved (preform) scar. Berida Rd ST2 (#28-4-0284) has been assigned moderate to high representativeness and rarity, moderate research potential and therefore moderate to high scientific significance at the local level.

Aesthetic significance

Berida Rd ST2 (#28-4-0284) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Berida Rd ST2 (#28-4-0284) is therefore attributed moderate aesthetic value.

Summary statement of significance

Berida Rd ST2 (#28-4-0284) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate to high scientific significance due to it being an excellent representation of an elongated and curved (preform) scar that are not well represented in the region. The site has moderate to high research and educational potential as it informs about the way local Aboriginal populations used this type of resource, in particular for the construction of canoes to exploit the wetland areas. Overall, Berida Rd ST2 (#28-4-0284) scarred tree is considered to have moderate to high significance at the local level.

8.2.6 Castlereagh River

The principal feature of the survey area is an alluvial terrace dominated by grassland and verged with *Eucalyptus macrocarpa* (Blue Bush) woodland. A total of three newly-identified sites were located in the survey area including two culturally modified (scarred) trees and an artefact scatter with PAD (refer to Appendix E). CR AFT & PAD (#28-4-0280) crosses the proposal site (refer to section 7.5.1).

CR AFT & PAD (#28-4-0280)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are considered to be of high cultural (social) significance. CR AFT & PAD (#28-4-0280) therefore has high social significance as it provides tangible evidence of the use of the area by Aboriginal people.

Historical significance

CR AFT & PAD (#28-4-0280) does not meet this criterion. There are no known written or oral historical references to the artefact scatter located at the Castlereagh River.

Scientific significance

CRT AFT and PAD has low to moderate scientific significance it is currently ranked as having low integrity, low structure, moderate contents and moderate representativeness/rarity. The integrity and structure of this site is low as it consists of a surface artefact scatter in highly disturbed agricultural context. It has low to moderate contents ranking as it contains common artefact types and raw materials. The site has a moderate representativeness ranking as no other artefact scatter has been identified near the Castlereagh River. It has low to moderate research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on terraces overlooking the Castlereagh River

Summary statement of significance

Overall, CRT AFT and PAD is of low to moderate significance at the local level. It is of high social significance as tangible evidence of the use of the area by Aboriginal people yet has low to moderate scientific significance due to its poor integrity and structure, density and common raw materials, although being a relatively rare site type in the immediate region. It is of moderate aesthetic significance given its location on a prominent well-watered River terrace. The site has low to moderate research and educational potential about the way local Aboriginal populations used this type of landform.

8.2.7 Gulargambone Creek

Two previously registered AHIMS sites are recorded for Gulargambone Creek outside the study area to the north west. These include a registered traditional burial (The Nemzie Burial 1: AHIMS #28-1-0039) and an open camp site (AHIMS #28-1-006) (refer to Appendix E). Four additional sites were located during the recent survey including three artefact scatters (with PAD) and a single culturally modified (scarred) tree. One of these artefact scatters and PAD (#28-1-0060) is located within the proposal site and one of these artefact scatters with PAD (#28-1-0090) is located on the boundary of the proposal site and is likely to extend across it into unsurveyed areas.

Gulargambone Creek AFT & PAD (#28-1-0060)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are considered to be of high cultural (social) significance. Gulargambone Creek AFT & PAD (#28-1-0060) has high social significance as it provides tangible evidence of the use of the area by Aboriginal people.

Historical significance

Gulargambone Creek AFT & PAD (#28-1-0060) does not meet this criterion. There are no known written or oral historical references to the artefact scatter located at the Castlereagh River.

Scientific significance

Gulargambone Creek AFT & PAD (#28-1-0060) has low to moderate scientific significance it is currently ranked as having low integrity, low structure, moderate contents and moderate representativeness/rarity. The integrity and structure of this site is low as it consists of a surface artefact scatters in highly disturbed agricultural context. It has low to moderate contents ranking as it contains common artefact types and raw materials. The site has a moderate representativeness ranking as no other artefact scatter has been identified near the Castlereagh River. It has low to moderate research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on terraces overlooking the Gulargambone Creek

Summary statement of significance

Gulargambone Creek AFT & PAD (#28-1-0060) is of low to moderate significance at the local level. It is of high social significance as tangible evidence of the use of the area by Aboriginal people yet has low to moderate scientific significance due to its poor integrity and structure, density and common raw materials, although being a relatively rare site type in the immediate region. It is of moderate aesthetic significance given its location on a prominent well-watered River terrace. The site has low to moderate research and educational potential about the way local Aboriginal populations used this type of landform.

AFT & PAD2 (#28-1-0090)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are considered to be of high cultural (social) significance. AFT & PAD2 (#28-1-0090) has high social significance as it provides tangible evidence of the use of the area by Aboriginal people.

Historical significance

AFT & PAD2 (#28-1-0090) does not meet this criterion. There are no known written or oral historical references to the artefact scatter located at the Castlereagh River.

Scientific significance

AFT & PAD2 (#28-1-0090) has low to moderate scientific significance it is currently ranked as having low integrity, low structure, moderate contents and moderate representativeness/rarity. The integrity and structure of this site is low as it consists of a surface artefact scatter in highly disturbed agricultural context. It has low to moderate contents ranking as it contains common artefact types and raw materials. The site has a moderate representativeness ranking as no other artefact scatter has been identified near the Castlereagh River. It has low to moderate research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on terraces overlooking the Gulargambone Creek

Summary statement of significance

AFT & PAD2 (#28-1-0090) is of low to moderate significance at the local level. It is of high social significance as tangible evidence of the use of the area by Aboriginal people yet has low to moderate scientific significance due to its poor integrity and structure, density and common raw materials, although being a relatively rare site type in the immediate region. It is of moderate aesthetic significance given its location on a prominent well-watered River terrace. The site has low to moderate research and educational potential about the way local Aboriginal populations used this type of landform.

8.2.8 Box Ridge Road (Baronne Creek)

There are no previously registered sites within the Box Ridge Road (Baronne Creek) survey area, yet it has cultural sensitivity for scarred trees. Three culturally modified (scarred) mature trees were located along the northern road verge of Box Ridge Road during recent surveys. All three (#28-1-0062, #28-1-0062 and #28-1-0064) are located within the proposal site and would be directly impacted (refer to section 7.5.1).

BRR ST1 (#28-1-0062) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

BRR ST1 (#28-1-0062) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

BRR ST1 (#28-1-0062) is within the proposal site. It is well preserved with moderate research potential as is a good representation of a curved (preform) possible coolamon scar. These are not common in the local area although another is located nearby (see below) and therefore BRR ST1 (#28-1-0062) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

BRR ST1 (#28-1-0062) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. BRR ST1 (#28-1-0062) is therefore attributed moderate aesthetic value.

Summary statement of significance

BRR ST1 (#28-1-0062) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to it being a well preserved, possible coolamon scar with moderate research potential that is not well represented in the region. The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, BRR ST1 (#28-1-0062) scarred tree is considered to have moderate significance at the local level.

BRR ST2 (#28-1-0063) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

BRR ST2 (#28-1-0063) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

BRR ST2 (#28-1-0063) is within the proposal site. It is well preserved with moderate research potential as is a good representation of a curved (preform) possible coolamon scar. These are not common in the local area and therefore BRR ST2 (#28-1-0063) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

BRR ST2 (#28-1-0063) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. BRR ST2 (#28-1-0063) is therefore attributed moderate aesthetic value.

Summary statement of significance

BRR ST2 (#28-1-0063) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to it being a well preserved, possible coolamon scar with moderate research potential that is not well represented in the region although another is located nearby (see above). The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, BRR ST2 (#28-1-0063) scarred tree is considered to have moderate significance at the local level.

BRR ST3 (#28-1-0064) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

BRR ST3 (#28-1-0064) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

BRR ST3 (#28-1-0064) is within the proposal site. It is well preserved with moderate research potential as is a good representation of a curved (preform) possible coolamon scar. These are not common in the local area and therefore BRR ST3 (#28-1-0064) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

BRR ST3 (#28-1-0064) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. BRR ST3 (#28-1-0064) is therefore attributed moderate aesthetic value.

Summary statement of significance

BRR ST3 (#28-1-0064) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to it being a well preserved, possible coolamon scar with moderate research potential that is not well represented in the region although another is located nearby (see above). The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, BRR ST3 (#28-1-0064) scarred tree is considered to have moderate significance at the local level.

8.2.9 Mungery Creek

Six culturally modified (scarred) trees were located during recent surveys (refer to section 7.5.1). Four of these culturally modified (scarred) trees (#28-1-0087, #28-1-0086, #28-1-0084 and #28-1-0083) are located within the proposal site.

Mungery Creek ST2 (#28-1-0087) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Mungery Creek ST2 (#28-1-0087) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

Mungery Creek ST2 (#28-1-0087) is within the proposal site. It is well preserved with moderate research potential as is a good representation of a curved (preform) possible coolamon scar. These are not common in the local area and therefore Mungery Creek (#28-1-0087) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Mungery Creek ST2 (#28-1-0087) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Mungery Creek (#28-1-0087) is therefore attributed moderate aesthetic value.

Summary statement of significance

Mungery Creek ST2 (#28-1-0087)) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to it being a well preserved, possible coolamon scar with moderate research potential that is not well represented in the region. The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, Mungery Creek (#28-1-0087) is considered to have moderate significance at the local level.

Mungery Creek ST3 (#28-1-0086) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Mungery Creek ST3 (#28-1-0086) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

Mungery Creek ST3 (#28-1-0086) is within the proposal site. It is well preserved with moderate research potential as is a good representation of an elongated curved (preform) canoe scar. These are not common in the local area and therefore Mungery Creek ST3 (#28-1-0086) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Mungery Creek ST3 (#28-1-0086) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Mungery Creek ST3 (#28-1-0086) is therefore attributed moderate aesthetic value.

Summary statement of significance

Mungery Creek ST3 (#28-1-0086) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to it being a well preserved, canoe scar with moderate research potential that is not well represented in the local area. The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, Mungery Creek ST3 (#28-1-0086) is considered to have moderate significance at the local level.

Mungery Creek ST5 (#28-1-0084) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Mungery Creek ST5 (#28-1-0084) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

Mungery Creek ST5 (#28-1-0084) is within the proposal site. It is well preserved with moderate research potential as is a good representation of an elongated curved (preform) canoe scar. These are not common in the local area and therefore Mungery Creek ST5 (#28-1-0084) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Mungery Creek ST5 (#28-1-0084) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Mungery Creek ST5 (#28-1-0084) is therefore attributed moderate aesthetic value.

Summary statement of significance

Mungery Creek ST5 (#28-1-0084) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to it being a well preserved, canoe scar with moderate research potential that is not well represented in the local area. The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, Mungery Creek ST5 (#28-1-0084) is considered to have moderate significance at the local level.

Mungery Creek ST6 (#28-1-0083) Modified Tree (Scarred)

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types therefore have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Mungery Creek ST6 (#28-1-0083) does not meet this criterion at the local level as there are no oral or historical references to the use of this site.

Scientific significance

Mungery Creek ST6 (#28-1-0084) is within the proposal site. It is well preserved with moderate research potential as is a good representation of an elongated curved (preform) canoe scar. These are not common in the local area and therefore Mungery Creek ST6 (#28-1-0083) has been assigned moderate representativeness and rarity, moderate research potential and therefore moderate scientific significance at the local level.

Aesthetic significance

Mungery Creek ST6 (#28-1-0083) meets this criterion as it contains significant sensory, scenic and creative qualities due to the Aboriginal scarring it contains as well as the form, colour and texture of the tree itself. Mungery Creek ST6 (#28-1-0083) is therefore attributed moderate aesthetic value.

Summary statement of significance

Mungery Creek ST6 (#28-1-0083) has high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to it being a well preserved, canoe scar with moderate research potential that is not well represented in the local area. The site has moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource. Overall, Mungery Creek ST6 (#28-1-0083) is considered to have moderate significance at the local level.

8.2.10 Calga and Looking Glass Creeks

Two culturally modified (scarred) trees, an artefact scatter, and an artefact scatter with PAD were identified in the recent survey. One artefact scatter with PAD (#28-1-0059) and an artefact scatter (#28-1-0095) are located within the proposal site (refer to section 7.5.1).

CC AFT & PAD (#28-1-0059)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site type does not meet this criterion. There are no known written or oral historical references to CC AFT & PAD (#28-1-0059) located at the confluence of Calga and Looking Glass Creeks.

Scientific significance

CC AFT & PAD (#28-1-0059) has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this site is low as it consists of surface artefacts in disturbed agricultural contexts. CC AFT & PAD (#28-1-0059) has low contents rankings as it comprises common artefact types and raw materials common to the area. The site has low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

The site has low aesthetic significance as they are located on foot slopes with poor vantage of the local area.

Summary statement of significance

Overall, CC AFT & PAD (#28-1-0059) artefact scatter is of moderate significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people. It has low scientific significance due to its poor integrity and structure, density and common raw materials. CC AFT & PAD (#28-1-0059) is of moderate aesthetic significance given its location on a foot slope. The site has moderate research and educational potential about the way local Aboriginal populations used this type of landform.

NB-AS-04 (#28-1-0095)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site type does not meet this criterion. There are no known written or oral historical references to NB-AS-04 (#28-1-0095) located at the Calga and Looking Glass Creeks.

Scientific significance

NB-AS-04 (#28-1-0095) has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this site is low as it consists of surface artefacts in disturbed agricultural contexts. NB-AS-04 (#28-1-0095) has low contents rankings as it comprises common artefact types and raw materials common to the area. The site has low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

These sites have low aesthetic significance as they are located on foot slopes with poor vantage of the local area.

Summary statement of significance

Overall, NB-AS-04 (#28-1-0095) artefact scatter is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people. It has low scientific significance due to its poor integrity and structure, density and common raw materials. NB-AS-04 (#28-1-0095) is of low aesthetic significance given its location on a foot slope. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

8.2.11 Noonbar Creek

This area surrounding Table Top Mountain has been identified as culturally sensitive by knowledge holders. The recent survey has identified one ACD site as well as two artefact scatters (refer to section 7.5.1). One artefact scatter (#28-1-0096) is located within the proposal site on a lower slope.

NB-AS-03 (#28-1-0096)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

NB-AS-03 (#28-1-0096) does not meet this criterion. There are no known written or oral historical references to this artefact scatters located at Noonbar Creek.

Scientific significance

NB-AS-03 (#28-1-0096) has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this site is low as it consists of surface artefacts in disturbed agricultural contexts. It has low contents rankings as it contains common artefact types and raw materials common to the area. It has low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has low aesthetic significance as it is located on foot slopes with poor vantage of the local area.

Summary statement of significance

Overall, NB-AS-03 (#28-1-0096) is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people. It has low scientific significance due to its poor integrity and structure, density and common raw materials. It is of low aesthetic significance given its location on a foot slope. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

8.2.12 Baradine Creek

Five previously registered sites are located within the investigation corridor at Baradine Creek including three culturally modified trees (#19-5-0023, #19-5-0024, #19-5-0025), an artefact scatter (#19-5-0010) and an extant cobble stone road (#19-5-0106) built by convict (and Aboriginal) labour (refer to Appendix E). An additional seven sites and one PAD were identified during the current survey including three isolated finds (#19-5-0000, #19-5-0223, #19-5-0224), three culturally modified trees (#19-5-0237, #19-5-0236, #19-5-0235) and one artefact scatter (#19-5-0226). One artefact scatter (#19-5-0226) is within the proposal site and two isolated finds (#19-5-0223, #19-5-0224) are located around 10 metres to the north of the proposal site.

BC AS-1 (#19-5-0226)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

BC AS-1 (#19-5-0226) does not meet this criterion. There are no known written or oral historical references to BC AS-1 (#19-5-0226) located at Baradine Creek.

Scientific significance

BC AS-1 (#19-5-0226) at Baradine Creek has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of BC AS-1 (#19-5-0226) is low as it consists of surface artefacts in disturbed agricultural contexts. BC AS-1 (#19-5-0226) has low contents rankings as it comprises artefact types and raw materials common to the area. The site has low representativeness rankings and low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a terrace overlooking the creek.

Summary statement of significance

Overall, BC AS-1 (#19-5-0226) is of low to moderate significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people yet low scientific significance due to its poor integrity and structure, density and common raw materials. BC AS-1 (#19-5-0226) has moderate aesthetic significance given its location on a prominent hydroline. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

BC IF-1 (#19-5-0223)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

BC IF-1 (#19-5-0223) does not meet this criterion. There are no known written or oral historical references to BC IF-1 (#19-5-0223) located at Baradine Creek.

Scientific significance

BC IF-1 (#19-5-0223) at Baradine Creek has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this sites is low as it consists of a single surface artefact in disturbed agricultural contexts. BC IF-1 (#19-5-0223) has low contents rankings as it comprises artefact types and raw material common to the area. The site has low representativeness ranking and low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a terrace overlooking the creek.

Summary statement of significance

Overall, BC IF-1 (#19-5-0223) is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people yet low scientific significance due to its poor integrity and structure, density and common raw materials. BC IF-1 (#19-5-0223) has moderate aesthetic significance given its location on a prominent hydroline. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

BC IF-2 (#19-5-0224)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

BC IF-2 (#19-5-0224) does not meet this criterion. There are no known written or oral historical references to BC IF-2 (#19-5-0224) located at Baradine Creek.

Scientific significance

BC IF-2 (#19-5-0224) at Baradine Creek has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this sites is low as it consists of a single surface artefact in disturbed agricultural contexts. BC IF-2 (#19-5-0224) has low contents rankings as it comprises artefact types and raw material common to the area. The site has low representativeness ranking and low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a terrace overlooking the creek.

Summary statement of significance

Overall, BC IF-2 (#19-5-0224) is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people yet low scientific significance due to its poor integrity and structure, density and common raw materials. BC IF-2 (#19-5-0224) has moderate aesthetic significance given its location on a prominent hydroline. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

8.2.13 Cumbil Forest Creek

Three registered AHIMS artefact scatters and a grinding groove site are recorded on the LALC site register supplied by DPIE within the survey area at this location (refer to section 7.5.1). The grinding groove site was re-recorded and registered on the AHIMS register as two separate sites during the recent survey (as it was incorrectly plotted on the register provided by DPIE). One artefact scatter (#19-5-0115) is reported to be within the proposal site and one artefact scatter (#19-5-0116) and one scar tree (#19-5-0121) are reported to be within 70 and 40 metres respectively of the proposal site (refer to section 7.6). These three reported locations could not be verified yet the site card places them in proximity to the grinding grooves which are located around 50-70 metres from the proposal site. The two grinding groove sites (#19-5-0229 and #19-5-0225) are located within 50 metres of the proposal site.

CFCGG1 (#19-5-0229)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

CFCGG1 (#19-5-0229) does not meet this criterion. There are no known written or oral historical references to the grinding groove sites located at Cumbil Forest Creek.

Scientific significance

CFCGG2 (#19-5-0229) has high scientific significance as it is currently ranked as having high integrity, structure, contents, representativeness and rarity. The integrity and structure of this sites is also high as it consists of grooves ground into the rock substrate and will have a considerable lifespan. There has been some graffiti carved into the rock in the vicinity, but this has not impacted any of the grooves. The site also has high contents rankings as it comprises an uncommon site type to the area. CFCGG2 (#19-5-0229) has moderate to high research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a minor hydroline.

Summary statement of significance

Overall, the Cumbil Forest Creek grinding groove sites are of high significance at the local level. They are of high social significance as tangible evidence of the use of the area by Aboriginal people. They have high scientific significance due to their high integrity and structure, density and uncommon type for the local area. They are of moderate aesthetic significance given their location on minor hydroline. The sites have moderate research and educational potential about the way local Aboriginal populations used this type of landform.

CFCGG2 (#19-5-0225)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

CFCGG2 (#19-5-0225) does not meet this criterion. There are no known written or oral historical references to the grinding groove sites located at Cumbil Forest Creek.

Scientific significance

CFCGG2 (#19-5-0225) has high scientific significance as it is currently ranked as having high integrity, structure, contents, representativeness and rarity. The integrity and structure of this sites is also high as it consists of grooves ground into the rock substrate and will have a considerable lifespan. There has been some graffiti carved into the rock in the vicinity, but this has not impacted any of the grooves. The site also has high contents rankings as it comprises an uncommon site types to the area. CFCGG2 (#19-5-0225) has moderate to high research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a minor hydroline.

Summary statement of significance

Overall, the Cumbil Forest Creek grinding groove sites are of high significance at the local level. They are of high social significance as tangible evidence of the use of the area by Aboriginal people. They have high scientific significance due to their high integrity and structure, density and uncommon type for the local area. They are of moderate aesthetic significance given their location on minor hydroline. The sites have moderate research and educational potential about the way local Aboriginal populations used this type of landform.

Cumbil Forest Creek AFT (#19-5-0115)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Cumbil Forest Creek AFT (#19-5-0115) does not meet this criterion. There are no known written or oral historical references to the grinding groove sites located at Cumbil Forest Creek.

Scientific significance

Cumbil Forest Creek AFT (#19-5-0115) has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this site is low as it consists of surface artefacts in disturbed forestry contexts. Cumbil Forest Creek AFT (#19-5-0115) has low contents rankings as it comprises artefact types and raw materials common to the area. The site has low representativeness ranking and low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

The site has moderate aesthetic significance as it is located on a terrace overlooking the creek.

Summary statement of significance

Overall, Cumbil Forest Creek AFT (#19-5-0115) is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people yet low scientific significance due to its poor integrity and structure, density. Cumbil Forest Creek AFT (#19-5-0115) is of moderate aesthetic significance given its location on a prominent hydroline. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

Cumbil Forest Creek AFT (#19-5-0116)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Cumbil Forest Creek AFT (#19-5-0116) does not meet this criterion. There are no known written or oral historical references to the grinding groove sites located at Cumbil Forest Creek.

Scientific significance

Cumbil Forest Creek AFT (#19-5-0116) has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this site is low as it consists of surface artefacts in disturbed forestry contexts. Cumbil Forest Creek AFT (#19-5-0116) has low contents rankings as it comprises artefact types and raw materials common to the area. The site has low representativeness ranking and low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform

Aesthetic significance

The site has moderate aesthetic significance as it is located on a terrace overlooking the creek.

Summary statement of significance

Overall, Cumbil Forest Creek AFT (#19-5-0116) is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people yet low scientific significance due to its poor integrity and structure, density. Cumbil Forest Creek AFT (#19-5-0116) is of moderate aesthetic significance given its location on a prominent hydroline. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

Cumbil Forest Creek ST (#19-5-0121) Modified Tree (Scarred)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. These sites therefore have high social significance as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

Cumbil Forest Creek ST (#19-5-0121) does not meet this criterion. There are no known written or oral historical references to the Scar tree located at Cumbil Forest Creek.

Scientific significance

Cumbil Forest Creek ST (#19-5-0121) has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this site is low as it consists of surface artefacts in disturbed forestry contexts. Cumbil Forest Creek ST (#19-5-0121) has low contents rankings as it comprises artefact types and raw materials common to the area. The site has low representativeness ranking and low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform

Aesthetic significance

The site has moderate aesthetic significance as it is located on a terrace overlooking the creek.

Summary statement of significance

Overall, Cumbil Forest Creek ST (#19-5-0121) is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people yet low scientific significance due to its poor integrity and structure, density. Cumbil Forest Creek ST (#19-5-0121) is of moderate aesthetic significance given its location on a prominent hydroline. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

8.2.14 Etoo Creek

There are no registered sites within the Etoo Creek proposal area. Four culturally modified (scarred) trees were identified in the field surveys. One culturally modified tree (#19-5-0239) is located around 15 metres from the proposal site (refer to section 7.6).

Etoo Creek ST3 (#19-5-0239) Modified Tree (Scarred)

Social significance

Scarred trees are significant evidence of Aboriginal occupation of this area in what is now a highly modified agricultural landscape. These site types have high social significance at the local level as they provide tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site does not meet the threshold for this criterion as there are no oral or historical references to the use of this site type in the local area.

Scientific significance

The scarred tree on the alluvial terrace of Etoo Creek is well preserved with moderate research potential as it is a good representation of a curved (preform) scars likely representing the construction of a utilitarian item such as coolamon. Scarred trees are not common in the local area and it has therefore been assigned moderate representativeness and rarity, moderate research potential and low to moderate scientific significance at the local level.

Aesthetic significance

Scarred trees meet this criterion as they contain significant sensory, scenic and creative qualities due to the Aboriginal scarring they contain as well as the form, colour and texture of the trees themselves.

Summary statement of significance

Etoo Creek ST3 (#19-5-0239) has low to moderate at the local level. It has high social significance as it provides tangible evidence of the use of the area by Aboriginal people. It has moderate scientific significance due to being uncommon in the local area. Etoo Creek ST3 (#19-5-0239) has low to moderate research and educational potential as it informs about the way local Aboriginal populations used this type of resource in the local area and are therefore considered to have moderate significance at the local level.

8.2.15 Bohena Creek

The area had been targeted for survey on the ground of predicted creek-side cultural sensitivity (DPIE 2019). The area comprised typical Pilliga Scrub forest regrowth with rare mature trees on sandy soil derived from weathered sandstone bedrock. Two isolated finds, an artefact scatter and culturally modified (scarred) tree were located during the recent surveys (refer to Appendix E). One artefact scatter is located within the proposal site at Bohena Creek (refer to section 7.5.1).

Bohena Creek AFT (#19-6-0180)

Social significance

Consultation with RAPs both in the field and during AFG meetings has identified that all Aboriginal cultural heritage sites in the study area are of high cultural (social) significance. This site therefore has high social significance as it provides tangible evidence of the use of the area by Aboriginal people.

Historical significance

This site does not meet this criterion. There are no known written or oral historical references to artefact scatters at Bohena Creek.

Scientific significance

The artefact scatter at Bohena Creek has low scientific significance as it is currently ranked as having low integrity, low structure, low contents and low representativeness/rarity. The integrity and structure of this site is low as it consists of a single artefact scatter with sixteen quartz flakes and two isolated finds (one mudstone flake and an edge ground axe) in a disturbed forestry context. It has low contents rankings as it contains low numbers of common artefact types and raw materials to the area. The site has a low representativeness ranking and low research and educational potential for researching and teaching the way local Aboriginal populations used this type of landform.

Aesthetic significance

This site has moderate aesthetic significance as it is located on a terrace overlooking the creek.

Summary statement of significance

Overall, the Bohena Creek artefact scatter is of low significance at the local level. It has high social significance as tangible evidence of the use of the area by Aboriginal people yet low scientific significance due to their poor integrity, structure, density and common raw materials, although being a relatively rare site type in the immediate region. It has moderate aesthetic significance given its location on a prominent landform. The site has low research and educational potential about the way local Aboriginal populations used this type of landform.

8.3 Summary of significance

The summary of the significance assessment of Aboriginal cultural heritage sites located within the proposal site is presented in Table 8.1. Detailed significance assessments are presented in section 8.2. Mapping of all Aboriginal cultural heritage values identified within or near proposal site is provided in Figure 7.2.

Table 8.1 Summary of significance

Name	Social significance	Historical significance	Scientific significance	Aesthetic significance	Overall significance
Backwater Cowal TNWP-ST 27 (#35-3-0183) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 17 (#35-3-0173) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 18 (#35-3-0174) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP-ST19 (#35-3-0175) Modified Tree (Scarred)	High	N/A	Low	Moderate	Low
Backwater Cowal TNWP ST 20 (#35-3-0176) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 21 (#35-3-0177) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 24 (#35-3-0180) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 25 (#35-3-0181) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 26 (#35-3-0182) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 27 (#35-3-0183) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Backwater Cowal TNWP ST 28 (#35-3-0184) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate

Name	Social significance	Historical significance	Scientific significance	Aesthetic significance	Overall significance
Backwater Cowal BCST3 (#35-3-0268)	High	N/A	Moderate	Moderate	Moderate
Macquarie River WB-Canoe Tree 2 (#35-3-0019) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River Webb Siding 2 (#35-3-0020) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
No.4 Webb's Siding (#35-3-0021)	High	Low	Moderate	Moderate	Moderate to high
Macquarie River Webb Siding Canoe Tree (#35-3-0022) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River Mitchell Hwy ST 17 (#35-3-0080) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River Mitchell Hwy ST 18 (#35-3-0081) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River TNWP ST 15 (#35-3-0171) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River TNWP ST 16 (#35-3-0172) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate

Name	Social significance	Historical significance	Scientific significance	Aesthetic significance	Overall significance
Macquarie River DNST7 (#35-3-0194) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River DN0S1 (#35-3-0195 artefact scatter	High	Low	Moderate	Moderate	Moderate
Macquarie River DN0S1(#35-3-0196) confirmed archaeological deposit (partially destroyed)	High	Low	Moderate	Moderate	Moderate
Macquarie River DNST1 (#35-3-0200) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River DNST2 (#35-3-0201) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River DNST3 (#35-3-0202) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River DNST4 (#35-3-0205) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River WS-RU-ST3 (#35-3-0211) Modified Tree (Scarred)	High	N/A	Moderate	Moderate	Moderate
Macquarie River MRST31 (#35-3-0250)	High	N/A	Moderate	Moderate	Moderate

Name	Social significance	Historical significance	Scientific significance	Aesthetic significance	Overall significance
Macquarie River MRST30 (#35-3-0254)	High	N/A	Moderate	Moderate	Moderate
Macquarie River MRST29 (#35-3-0244)	High	N/A	Moderate	Moderate	Moderate to high
Macquarie River MRST10 (#35-3-0225)	High	N/A	Moderate	Moderate	Moderate
Macquarie River MRAS6 (#35-3-0276)	High	N/A	Moderate	Moderate	Moderate
Ewenmar Creek ECST1 (#27-6-0035)	High	N/A	Moderate	Moderate	Moderate
Boothaguy Creek ST6 (#27-6-0042)	High	N/A	Moderate	Moderate	Moderate to high
Boothaguy Creek ST7 (#27-6-0041)	High	N/A	Moderate	Moderate	Moderate to high
Boothaguy Creek ST11 (#27-6-0037)	High	N/A	Moderate	Moderate	Moderate to high
Berida Rd ST1 (#28-4-0283)	High	N/A	Moderate	Moderate	Moderate to high
Berida Rd ST2 (#28-4-0284)	High	N/A	Moderate	Moderate	Moderate to high
Berida Rd MS-ST-10 (#28-4-0039)	High	N/A	Moderate	Moderate	Moderate to high
Berida Rd MS-ST-11 (#28-4-0040)	High	N/A	Moderate	Moderate	Moderate to high
Castlereagh River CR AFT and PAD (#28-4-0280)	High	N/A	Low to Moderate	Moderate	Low to Moderate
Baronne Creek BRR ST1 (#28-1-0062)	High	N/A	Moderate	Moderate	Moderate
Baronne Creek BRR ST2 (#28-1-0063)	High	N/A	Moderate	Moderate	Moderate

Name	Social significance	Historical significance	Scientific significance	Aesthetic significance	Overall significance
Baronne Creek BRR ST3 (#28-1-0064)	High	N/A	Moderate	Moderate	Moderate
Gulargambone Creek AFT & PAD2 (#28-1-0090)	High	N/A	Low to Moderate	Moderate	Low to Moderate
Gulargambone Creek AFT & PAD (#28-1-0060)	High	N/A	Low to Moderate	Moderate	Low to Moderate
Mungery Creek ST2 (#28-1-0087)	High	N/A	Moderate	Moderate	Moderate
Mungery Creek ST3 (#28-1-0086)	High	N/A	Moderate	Moderate	Moderate
Mungery Creek ST5 (#28-1-0084)	High	N/A	Moderate	Moderate	Moderate
Mungery Creek ST6 (#28-1-0083)	High	N/A	Moderate	Moderate	Moderate
Calga and Looking Glass Creeks CC AFT & PAD (#28-1-0059)	High	N/A	Moderate	Moderate	Moderate
Calga and Looking Glass Creeks NB-AS-04 (#28-1-0095)	High	N/A	Moderate	Moderate	Low
Noonbar Creek NB-AS-03 (#28-1-0096)	High	N/A	Low	Low	Low

Name	Social significance	Historical significance	Scientific significance	Aesthetic significance	Overall significance
Baradine Creek BC AS-1 (#19-5-0226)	High	N/A	Low	Moderate	Low to Moderate
Baradine Creek BC IF-1 (#19-5-0223)	High	N/A	Low	Low	Low
Baradine Creek BC IF-2 (#19-5-0224)	High	N/A	Low	Low	Low
Cumbil Forest Creek CFCGG1 (#19-5-0229)	High	N/A	High	Moderate	High
Cumbil Forest Creek CFCGG2 (#19-5-0225)	High	N/A	High	Moderate	High
Cumbil Forest Creek AFT (#19-5-0115)	High	N/A	Low	Moderate	Low to Moderate
Cumbil Forest Creek AFT (#19-5-0116)	High	N/A	Low	Moderate	Low to Moderate
Cumbil Forest Creek ST (#19-5-0121)	High	N/A	Low	Moderate	Low to Moderate
Etoo Creek ST (#19-5-0239)	High	N/A	Moderate	Moderate	Moderate
Bohena Creek (#19-6-0180)	High	N/A	Low	Moderate	Low

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9. Impact assessment

This section describes the impacts on Aboriginal cultural heritage associated with the proposal. The strategic need for the proposal is discussed in chapter A4 of the EIS and options and alternatives considered in the proposal development are provided in chapter A5 of the EIS.

This impact assessment is based upon a review of potential impacts on Aboriginal sites and Aboriginal heritage values within the proposal site that would be directly impacted (refer to Table 7.6) and near to the proposal site that would potentially be indirectly impacted (refer to Table 7.8). Table 9.1 includes a summary of the impact assessment and includes all sites/PADs that are directly and indirectly impacted and whether this is by the rail or road infrastructure components of the proposal. It describes what landform the site/PAD is located in and the type and degree of impact. Mapping of all sites directly and indirectly impacted is included in Appendix E. It also describes the proposal development and impact considerations, as well as, cumulative impacts as required by the SEARs (refer to Table 1.2).

9.1 Proposal development and impact considerations

A principle of cultural heritage management is so far as is practicable, avoid impact before applying mitigation. During the development of the proposal, the following activities were carried out to identify Aboriginal cultural heritage so where possible, to confirm the presence of Aboriginal cultural heritage sites/places and to develop strategies to avoid impacts:

- desktop assessment using the ASDST to identify regionally or nationally significant features
- consultation with relevant Aboriginal stakeholders and Heritage NSW
- archaeological field survey
- targeted archaeological test investigations to confirm presence or absence of Aboriginal heritage in early investigation locations for geotechnical work at the Macquarie River.

The development of the proposal has sought to minimise impacts to the fullest extent practicable while meeting operational design requirements. Design and alignment refinements were made and the location of ancillary facilities including borrow pits and borrow pit access tracks, were selected to avoid impacts to Aboriginal cultural heritage sites, while having regard to engineering, environmental, social-economic considerations. For example, the design for the proposal has adopted as narrow a footprint as possible in all areas in order to minimise the impacts to Aboriginal heritage sites. In two instances the design has been realigned to avoid significant Aboriginal sites at Cumbil Forest Creek and at and Webb's siding on the Macquarie River. During detailed design there would be further opportunities to refine the proposal footprint.

Further targeted archaeological investigations would be required prior to construction to identify potential heritage values in the eight culturally sensitive areas where property access was restricted at the time of the field survey (refer to Table 7.9).

9.1.1 Impacts to Aboriginal sites within or adjacent to the proposal site

For the purpose of this impact assessment, it has been assumed that all Aboriginal heritage items occurring within or adjacent to the proposal site would be directly or potentially impacted by construction activities if no mitigation measures were adopted. Table 10.1 and Table 10.2 identifies specific proposed impact mitigation measure for 48 sites/PADs within or adjacent to the proposal site. This includes 46 sites and 2 PADs although it is noted that there are also four artefact scatter sites that also have PADs associated with them.

Maps depicting the study area and the Aboriginal heritage items identified in this assessment are presented in Appendix E which show the proposal site including the construction and operational footprints. Specific and potential impacts to the 48 Aboriginal heritage sites/PADs that would be directly or indirectly impacted by the proposal are summarised in Table 9.1.

Table 9.1 Impact assessment for Aboriginal sites and PADs in and near to the proposal site

Name (AHIMS ID#) Hydrology	Site type	Status (new item or previously registered)	Overall significance	Landform	Type of impact	Degree of impact	Description
#35-3-0183* TNWP-ST27 Backwater Cowal	Modified Tree (Scarred)	Previously listed	Moderate	Stream bank/ channel	Indirect rail	Potential	Site within 40 m of proposal site* at chainage 553.1.
#35-3-0175* TNWP-ST19 Backwater Cowal	Modified Tree (Scarred)	Previously listed	Moderate to high	Stream bank/ channel	Direct rail	Whole	Site reported to be within proposal site* at chainage 558.6.
#35-3-0268 BCST3 Backwater Cowal	Modified Tree (Scarred)	New site	Moderate to high	Stream bank/ channel	Indirect rail	Potential	Site within 50 m of proposal site at chainage 559.8
#35-3-0173* TNWP_ST17 Backwater Cowal	Modified Tree (Scarred)	Previously listed	Moderate to high	Stream bank/ channel	Indirect rail	Potential	Site within 40 m of proposal site* at chainage 558.3
#35-3-0174* TNWP_ST18 Backwater Cowal	Modified Tree (Scarred)	Previously listed	Moderate to high	Stream bank/ channel	Indirect rail	Potential	Site within 40 m of proposal site* at chainage 558.3
#35-3-0195* Macquarie River	Artefact scatter	Previously listed	Moderate	River terrace	Direct rail	Whole	Site within proposal site* at chainage 562.4.
#35-3-0196* Macquarie River	Confirmed archaeological deposit	Previously listed	Moderate	River terrace	Direct rail	Whole	Site within proposal site* at chainage 562.4
#35-3-0200* Macquarie River	Modified Tree (Scarred)	Previously listed	Moderate	River terrace	Indirect rail	Potential	Site within 10 m of proposal site* at chainage 562.1
#35-3-0201* Macquarie River	Modified Tree (Scarred)	Previously listed	Moderate	River terrace	Indirect rail	Potential	Site within 10 m of proposal site* at chainage 562.1

Name (AHIMS ID#) Hydrology	Site type	Status (new item or previously registered)	Overall significance	Landform	Type of impact	Degree of impact	Description
#35-3-0202* Macquarie River	Modified Tree (Scarred)	Previously listed	Moderate	River terrace	Indirect rail	Potential	Site within 15 m of proposal site* at chainage 562.1
#35-3-0210* Macquarie River	Modified Tree (Scarred)	Previously listed	Moderate	River terrace	Indirect rail	Potential	Site within 20 m of proposal site* at chainage 562.1
#35-3-0250 MRST31 Macquarie River	Modified Tree (Scarred)	New site	Moderate to high	River terrace	Indirect rail	Potential	Site within 20 m of proposal site at chainage 561.8
#35-3-0254 MRST30 Macquarie River	Modified Tree (Scarred)	New site	Moderate to high	River terrace	Indirect rail	Potential	Site within 10 m of proposal site at chainage 562.5
#35-3-0021* Macquarie River	Modified Tree (Scarred)	Previously listed	Moderate to high	River terrace	Indirect rail	Potential	Site reported (not confirmed) to be within 10 metres of proposal site east of chainage 562.5
#35-3-0244 MRST29 Macquarie River	Modified Tree (Scarred)	New site	Moderate to high	River terrace	Indirect rail	Potential	Site within 20 m of proposal site at chainage 562.6
#35-3-0225 MRST10 Macquarie River	Modified Tree (Scarred)	New site	Moderate to high	River terrace	Indirect rail	Potential	Site within 40 m of proposal site at chainage 563.1
#35-3-0276 MRAS6 Macquarie River	Artefact scatter	New site	Moderate to high	Lower slope	Direct rail	Partial	Site extends across and beyond proposal site at chainage 563.4 to 563.8
#27-6-0035 ECST1 Ewenmar Creek	Modified Tree (Scarred)	New site	Moderate	Lower slope	Direct rail	Whole	Site within proposal site at chainage 595.3. Larger scatters to west in same context.

Name (AHIMS ID#) Hydrology	Site type	Status (new item or previously registered)	Overall significance	Landform	Type of impact	Degree of impact	Description
#27-6-0036 ECPAD1 Ewenmar Creek	PAD	New site	N/A	Stream bank/ channel	Direct rail	Whole	Site within proposal site at chainage 595.3
#27-6-0042 Boothaguy Creek ST6 Boothaguy Creek	Modified Tree (Scarred canoe)	New site	Moderate to high	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 628.1
#27-6-0041 Boothaguy Creek ST7 Boothaguy Creek	Modified Tree (Scarred)	New site	Moderate to high	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 630.2
#27-6-0037 Boothaguy Creek ST11 Boothaguy Creek	Modified Tree (Scarred)	New site	Moderate to high	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 630.25
#28-4-0283 Berida Rd ST1 Castlereagh River	Modified Tree (Scarred)	New site	Moderate to high	Alluvial plain	Indirect rail	Potential	Site within five m of proposal site at chainage 641.5
#28-4-0284 Berida Rd ST2 Castlereagh River	Modified Tree (Scarred)	New site	Moderate to high	Alluvial plain	Indirect rail	Potential	Site within 15 m of proposal site at chainage 641.5
#28-4-0280 CR AFT and PAD Castlereagh River	Artefact scatter and PAD	New site	Low to Moderate	River terrace e	Direct rail	Partial	Site crosses proposal site on north terrace located at chainage 641.5
#28-1-0060 Gulargambone Creek AFT & PAD	Artefact scatter and PAD	New site	Low to Moderate (AFT)	River terrace	Direct rail	Potential	Site on the boundary of the proposal site and likely extends through it, located at chainage 672.9

Name (AHIMS ID#) Hydrology	Site type	Status (new item or previously registered)	Overall significance	Landform	Type of impact	Degree of impact	Description
#28-1-0090 Gulargambone Creek AFT and PAD2	Artefact scatter and PAD	New site	Low to Moderate (AFT)	River terrace	Direct rail	Potential	Site on the boundary of the proposal site and likely extends through it, located at chainage 673.5
#28-1-0062 BRR ST1 Baronne Creek	Modified Tree (Scarred)	New site	Moderate	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 686
#28-1-0063 BRR ST2 Baronne Creek	Modified Tree (Scarred)	New site	Moderate	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 685.7
#28-1-0064 BRR ST3 Baronne Creek	Modified Tree (Scarred)	New site	Moderate	Alluvial plain	Direct rail	Whole	Site within proposal site on northern boundary at chainage 685.5
#28-1-0087 Mungery Creek ST2	Modified Tree (Scarred)	New site	Moderate	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 701.2
#28-1-0086 Mungery Creek ST3	Modified Tree (Scarred)	New site	Moderate	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 701.2
#28-1-0084 Mungery Creek ST5	Modified Tree (Scarred)	New site	Moderate	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 701.5
#28-1-0083 Mungery Creek ST6	Modified Tree (Scarred)	New site	Moderate	Alluvial plain	Direct rail	Whole	Site within proposal site at chainage 701.5
#28-1-0059 CC AFT and PAD Calga and Looking Glass Creeks	Artefact scatter and PAD	New site	Moderate	River terrace	Direct rail	Whole	Site within proposal site at chainage 714.4

Name (AHIMS ID#) Hydrology	Site type	Status (new item or previously registered)	Overall significance	Landform	Type of impact	Degree of impact	Description
#28-1-0095 NB-AS-04 Calga and Looking Glass Creeks	Artefact scatter	New site	Low	River terrace	Direct rail	Whole	Site within proposal site at chainage 714.6
#28-1-0096 NB-AS-03 Noonbar Creek	Artefact scatter	New site	Low	River terrace	Direct rail	Whole	Site within proposal site at chainage 716.3
#19-5-0226 BC AS-1 Baradine Creek	Artefact scatter	New site	Low	River terrace	Direct rail	Whole	Site within proposal site near chainage 747.7
#19-5-0223 BCIF1 Baradine Creek	Isolated find	New site	Low	River terrace	Indirect rail	Potential	Site within 10 m of proposal site near chainage 747.8
#19-5-0224 BCIF2 Baradine Creek	Isolated find	New site	Low	River terrace	Indirect rail	Potential	Site within 10 m of proposal site near chainage 747.8
#19-5-0230 Baradine Creek PAD	PAD	New site	N/A	Stream bank/ channel	Direct rail	Partial	Site across proposal site near chainage 747.8
#19-5-0229 CFCGG1 Cumbil Forest Creek	Grinding grooves	New site	High	Stream bank/ channel	Indirect rail	Potential	Site within 30 m of proposal site near chainage 756.8
#19-5-0225 CFCGG2 Cumbil Forest Creek	Grinding grooves	New site	High	River terrace	Indirect rail	Potential	Site within 50 m of proposal site chainage 756.8

Name (AHIMS ID#) Hydrology	Site type	Status (new item or previously registered)	Overall significance	Landform	Type of impact	Degree of impact	Description
#19-5-0115 Cumbil Forest Creek	Artefact Scatter	Previously listed	Low	River terrace	Indirect rail	Potential	Site reported (not confirmed) within proposal site chainage 756.9 however AHIMS survey description indicates the site is next to grinding groove sites (#19-5-0229 and #19-5-0225) that were located within 50-70 metres of the proposal site
#19-5-0116 Cumbil Forest Creek	Artefact Scatter	Previously listed	Low	River terrace	Indirect rail	Potential	Site reported (not confirmed) within 70 m of proposal site chainage 756.9
#19-5-0121* Cumbil Forest Creek ST	Scar Tree	Previously listed	Low	River terrace	Indirect rail	Potential	Site reported (not confirmed) within 40 m of proposal site chainage 756.8
#19-5-0239 Etoo Creek	Modified Tree (Scarred)	New site	Moderate	River terrace	Indirect rail	Potential	Site located 10 m to the north of the proposal site at chainage 763.6
#19-6-0180 Bohena Creek	Artefact scatter	New site	Low	River terrace	Direct rail	Whole	Site within proposal site at chainage 835.5

* not verified (could not be located at given coordinates)

9.1.2 Impacts to Aboriginal cultural values

All Aboriginal heritage sites are considered to have high social significance as discussed in Section 8.2. Identified Aboriginal cultural values for the wider study area were documented in Table 6.1. In addition to archaeological features such as artefact scatters or culturally modified trees, these values include those associated with permanent water sources, traditional thoroughfares, burial sites and those associated with Aboriginal ceremony and dreaming. The management of these impacts will need be assessed with input from the Aboriginal community. A preliminary assessment of potential impacts to the places of cultural value identified in the proposal site is summarised in Table 9.2. These findings and recommendations have been discussed in consultation with the RAPs at AFG#3, as detailed in section 4.3.

Table 9.2 Preliminary impact assessment for Aboriginal cultural values identified in this assessment

Site type	Cultural value
Campsites	Traditional campsites demarcated by artefact scatters and association with low gradient alluvial landforms requiring mitigation measures are located at the Macquarie River (#35-3-0195, #35-3-0196 and #35-3-0276), Castlereagh River (#28-4-0280), Gulargambone Creek (#28-1-0090 and #28-1-0060), Calga and Looking Glass Creeks (#28-1-0059 and #28-1-0095), Noonbar Creek (#28-1-0096), Baradine Creek (#19-5-0226), Cumbil Forest Creek (#19-5-0115 and #19-5-0116) and Bohena Creek (#19-6-0180).
Resource gathering locations and techniques	Resource gathering locations were noted by RAPs to be potentially impacted at the Backwater Cowal, Macquarie River, confluence of Calga Creek and Looking Glass Creeks and Cumbil Forest Creek.
Modified (Scarred) trees	Twenty-eight scarred trees require mitigation measures to be implemented. These are located at Backwater Cowal (#35-3-0175, 35-3-0183 and #35-3-0268), Macquarie River (#35-3-0173, #35-3-0200, #35-3-0201, #35-3-0202, #35-3-0210, #35-3-0250, #35-3-0254, #35-3-0021, #35-3-0244, #35-3-0225), Ewenmar Creek (#27-6-0035), Boothaguy Creek (#27-6-0041, #27-6-0042 and #27-6-0037), Castlereagh River (Berida Road) (#28-4-0283 and #28-4-0284), Baronne Creek (#28-1-0062 #28-1-0063 and #28-1-0064), Mungery Creek (#28-1-0086 and #28-1-0083, #28-1-0087 and #28-1-0084), Cumbil Forest Creek (#19-5-0121) and Etoo Creek (#19-5-0239).
Aboriginal plants and animals	Aboriginal plants and animals are significant to traditional owners. During field work the fauna and flora were often mentioned in context with spiritual importance. Throughout the consultation process plants and animals were often mentioned in discussion with resource collection.
Aboriginal ceremony and dreaming	Registered Aboriginal knowledge holders identified areas of spiritual and significance marked by prominent landforms such as Table Top Mountain and Cumbil Forest Creek and expressed a desire for implementation of cultural protocols in respect to these places during construction as part of the heritage induction.

The principal impact to Aboriginal cultural values by the proposal is the potential loss of Aboriginal heritage sites that confirm long standing links of Aboriginal people to the region. European colonisation had a devastating impact on Aboriginal communities and cultures. Aboriginal people were subjected to a range of injustices, including being displaced from their traditional lands. Cultural practices were denied, and subsequently many were lost. For Aboriginal people, colonisation meant massacre, violence, disease and loss.

During the early days of European settlement local Aboriginal people were subjected to violence, disease and sexual exploitation and populations of local tribal Aboriginal nations suffered as a consequence. Traditional affiliations with endemic species and cultural sites were broken by the changes that took place such as widespread clearing to 'improve' pasture. The destruction of Aboriginal sites including culturally modified trees, campsites and places of spiritual value was accompanied by a loss of the environments that sustained them at these places. Additional losses of these sites and places in the forefront of development make those that are left even more significant for social and scientific research.

9.2 Rail infrastructure

Mapping of the rail infrastructure associated with the proposal site is identified in Figure 1.2 and discussed in relation to potential impacts to Aboriginal heritage in section 9.1 and mapping in Appendix E.

About 306 kilometres of new single-track standard gauge railway would be provided within the new rail corridor. The new main line would consist of the track formation earthworks, railway ballast, concrete sleepers and track. The new track would be located within a corridor with a minimum width of 40 metres, with some variation to accommodate particular infrastructure and to cater for local topography. Forty-eight Aboriginal sites/PADs are within (25) or directly next to (23) the proposal site (refer to Table 9.1). An additional eight areas require targeted investigation to confirm sensitivity prior to construction.

9.2.1 Construction impacts

Direct impacts

Twenty-five sites/PADs would be directly impacted by the rail infrastructure components of the proposal and comprise:

- Backwater Cowal: one modified scar tree site (#35-3-0175)
- Macquarie River: two artefact scatter sites (#35-3-0195 and #35-3-0276) and one confirmed archaeological deposit (#35-3-0196)
- Ewenmar Creek: one modified scar tree site (#27-6-0035) and one PAD (#27-6-0036)
- Boothaguy Creek: three sites, all modified scar trees (#27-6-0042, #27-6-0041 and #27-6-0037)
- Castlereagh River: one PAD (#28-4-0280)
- Gulargambone Creek: two sites - artefact scatter with PAD (#28-1-0090 & #28-1-0060)
- Baronne Creek: three modified scar tree sites (#28-1-0062, #28-1-0063 and #28-1-0064)
- Mungery Creek: four sites, all modified scar trees (#28-1-0083, #28-1-0084 #28-1-0086 and #28-1-0087)
- Calga and Looking Glass Creeks: two sites both artefact scatters one with PAD (#28-1-0059 - with PAD and #28-1-0095)
- Noonbar Creek: one artefact scatter site (#28-1-0096)
- Baradine Creek: one artefact scatter site (#19-5-0226) and one PAD (#19-5-0230)
- Bohena Creek one artefact scatter site (#19-6-0180).

These sites are also listed in Table 7.6 with the full impact assessment of these sites included in Table 9.1.

To the west of Narromine, a new junction would provide connectivity between the Parkes to Narromine Line and the Narromine to Cobar Line, a distance of around 1.2 kilometres. This area to the west of Narromine has not been surveyed for Aboriginal cultural heritage due to property access restrictions at the time of field survey, however in the absence of survey, predictive modelling and assessment indicates this area has moderate to high sensitivity for Aboriginal heritage.

To the east of Narromine, the proposal would cross the Country Regional Network line on a bridge, with no connectivity provided. The bridge also passes over Webb's Siding Road. Webb's Siding is recognised as culturally significant place to local Aboriginal people and contains a large number of registered sites (refer to section 7.5.1). Management of construction impacts in consultation with the Aboriginal community is required. This is likely to involve the establishment of avoidance zones around culturally modified trees and artefact salvage (refer section to 7.5.1)

To the west of Narrabri, the proposal would cross the Narrabri West to Walgett Line on a bridge. This area to the west of Narromine has not been surveyed for Aboriginal cultural heritage due to property access restrictions at the time of field survey. Consultation with RAPs and knowledge holders has confirmed the predictive model that this area is of high archaeological potential and sensitivity. Targeted archaeological investigations would need to take place in this area pre-construction.

Indirect impacts

Further sites have been identified in close proximity to the proposal site that are at risk of being inadvertently impacted during construction if mitigation measures are not implemented. Twenty-three sites would potentially be vulnerable to indirect impacts, these being:

- Backwater Cowal: four sites both modified scar tree (#35-3-0173, #35-3-0174, #35-3-0183 and #35-3-0268)
- Macquarie River: nine sites all modified scar trees (#35-3-0021, #35-3-0200, #35-3-0201, #35-3-0202, #35-3-0210, #35-3-0225, #35-3-0244, #35-3-0250, #35-3-0254)
- Castlereagh River, Berida Road: two sites both modified scar trees (#28-4-0283 and #28-4-0284)
- Baradine Creek: two sites both isolated finds (#19-5-0223 and #19-5-0224)
- Cumbil Forest Creek: five sites including two grinding grooves (#19-5-0229 and #19-5-0225), two artefact scatters (#19-5-0115 and #19-5-0116) and a scar tree (#19-5-0121)
- Etoo Creek: one modified scar tree site (#19-5-0239).

9.2.2 Operation impacts

Access to the rail corridor would be required during routine maintenance and repairs. As these areas would have been previously assessed and disturbed during construction, further impacts on Aboriginal heritage are considered unlikely. The potential for any impacts on Aboriginal sites outside the operational footprint would be managed in accordance with ARTC's standard operational environmental management procedures.

9.3 Road infrastructure

9.3.1 Construction impacts

Construction of the road realignments for the proposal would not impact directly or indirectly on any known Aboriginal cultural heritage sites or places. Impacts associated with the temporary haul roads for construction of the rail components of the proposal have been assessed as part of the rail infrastructure impacts described in section 9.2.2.

9.3.2 Operation impacts

There would be no impacts to known Aboriginal sites or places during operation of the road infrastructure components of the proposal.

9.4 Key construction infrastructure

Borrow pits

Four borrow pits on private land have been selected to provide general and structural fill for construction requirements (refer to Figure 1.3).

- Borrow pit A – Tantitha Road, Narromine (N2N-BP-01)
- Borrow pit B – Tomingley Road, Narromine (N2N-BP-02)
- Borrow pit C – Euromedah Road, Narromine (N2N-BP-03)
- Borrow pit D – Perimeter Road, Narrabri (N2N-BP-26).

All of these locations were investigated and shown to be devoid of Aboriginal cultural heritage sites or places.

Borrow pit access tracks

All borrow pits require an access track to be constructed to provide access to the public road network. Haulage to the proposal would then be via the public road network. All borrow pits were investigated along with their access tracks. Due diligence survey and assessment confirmed there are no known Aboriginal sites or places identified in the vicinity of the borrow pit access tracks.

Compounds

Three multi-function compound sites have been nominated to support construction of the proposal (refer to Figure 1.3). These would be located at Narromine South, Curban and Narrabri West.

Other compounds to support the construction would be required at regular locations along the proposal site. Structure compounds for specialised equipment and laydown areas would be located at the Macquarie River, Castlereagh River and Narrabri Creek/Namoi River bridges.

One proposed minor compound is located near to an Aboriginal cultural heritage site (# 35-3-0276), refer to Table 9.3 and may be indirectly impacted during construction and would require protection to avoid be impacted inadvertently. Impacts to this site have been assessed as part of the rail assessment refer to section 9.2.1.

Table 9.3 Compound within proximity to known Aboriginal cultural heritage sites

Compound Chainage /type	Location	AHIMS ID	Type	Distance	Significance
Minor Compound 563.6 to 563.8	Macquarie River	#35-3-0276	Artefact scatter	Within	Low to moderate

Workforce accommodation

It is proposed to establish temporary workforce accommodation for the construction workforce at the following locations (refer Figure 1.3):

- within the Narromine South multi-function compound
- Narrabri West multi-function compound
- Narromine North
- Gilgandra
- Baradine.

Workforce accommodation in the Narromine North minor compound between chainage 563.6 - 563.8 is located within the site boundary of #35-3-0276 artefact scatter (refer to section 9.4).

The Narromine south multi-function compound between chainage 549.55 and 550 is not expected to have impacts on Aboriginal cultural heritage sites or places.

The Narrabri West multi-function compound is located at chainage 843.9 to the west of Narrabri. This area has not been surveyed for Aboriginal heritage sites (refer to section 9.4 above). This area exhibits prior development disturbance (pastoralism and dam construction), is in an area of low to moderate cultural sensitivity according to the predictive modelling and is more than 400 metres away from the sensitive area on the Namoi River so there is less likelihood of impacts to Aboriginal heritage objects.

9.5 Cumulative impact assessment

9.5.1 Overview

For an EIS, cumulative impacts can be defined as the successive, incremental, and combined effect of multiple impacts, which may in themselves be minor, but could become significant when considered together. The methodology and projects considered for the cumulative impact assessment are provided in detail in the EIS (Part D chapter D1). Six major projects were identified as having a cumulative impact and provide sufficient information to undertake a cumulative impact assessment. These include:

- APA - Western Slopes Pipeline
- Inland Rail – Narrabri to North Star
- Inland Rail – Parkes to Narromine
- Narrabri Gas Project
- Silverleaf Solar Farm, Narrabri
- Gilgandra Solar Farm
- Narromine Solar Farm.

9.5.2 Construction and operation

The proposal site exhibits pastoral, agricultural, forestry and urban development patterns of land use that have been occurring since colonisation, refer to section 5.1.3. These activities have occurred over two hundred years and have impacted the landscape in a way that has significantly altered the surface archaeological record, resulting in a low representation of recorded Aboriginal archaeological sites within a region that has been occupied by Aboriginal people for millennia.

Prior to environmental and heritage legislation being made law in NSW in the 1970s, an unknown but presumably large number of Indigenous cultural sites were likely to have been lost to development, particularly along the margins of creeks and rivers.

Heritage NSW maintain a geospatial assessment tool that clearly illustrates the effect of development pressure across the NSW landscape since the advent of non-Aboriginal occupation. Utilising information from the Heritage NSW AHIMS, the Heritage NSW ASDST illustrates the effects of cumulative impact on individual archaeological site types across any given landscape in NSW.

JacobsGHD have accessed the ASDST to identify areas of potential cultural value across the study area. The ASDST suggests that the study area once contained large swathes of culturally modified trees. Until this survey had been undertaken there were only 50 recorded culturally modified trees within the study area registered on AHIMS. This research has added an additional 101 instances to that record. These results imply that given the accumulated impact of the past 250 years, the likelihood of identifying extant culturally modified trees has significantly reduced. Importantly, the sheer reduction in numbers of probable trees increases the rarity and representative value of each extant culturally modified tree, which therefore adds to the significance value of any identified in the future.

The cumulative impacts of the historical development on the cultural landscape where the proposal is located have been significant. While the current proposal is a relatively narrow linear infrastructure proposal through the landscape, in combination with previous development the overall impact on the remaining resource is considered to be comparatively high in the Macquarie River/Webb's Siding area including rail, road, civic development as reported by knowledge holders:

> *That highway, broke it (the Black wattle area at Webb's Siding) all up, then the railway line come and your left with a strip. Then they put the other road on. That broke the rest of it up so there were two little thin strips (of trees) about twenty metres wide which gradually just wiped it all out. Now we only have that little patch of black wattle up there (to the west) (Mark Smith pers. comm*. 27/11/2018).

It should be noted that two similar historic camping areas are listed on the NSW State Heritage Register in the vicinity of the Narromine township that were occupied by Aboriginal people and described as 'fringe camps' between the 1860s and 1960s. These places are located approximately five kilometres to the west of the proposal on the northern bank of the Macquarie River. Bridge Reserve and Mack Reserve Aboriginal Places are both located within the travelling stock route reserves similar to Webb's Siding. The existence of these listed Aboriginal places is pertinent to the assessment of cumulative impact to the wider area at Webb's Siding in that these areas and associated cultural heritage sites and places located within them are protected by these listings and therefore the protection of sites that represent the historical fringe camp era has already been satisfied to some extent.

A number of other rail infrastructure and energy projects are planned in the vicinity of the proposal as identified above and shown in Figure 9.1. Table 9.4 provides a discussion of the potential contributory impacts of these projects to Aboriginal heritage in the region. One of these (Narromine Solar Farm), is located in an area that has recognised cultural values assessed in this report. Two culturally modified trees on the north side of the Macquarie River are expected to be impacted by the solar farm proposal that were not identified in the reporting for that project (Zenith 2019).

Table 9.4 Projects in the vicinity of the proposal and potential contributory impacts on Aboriginal heritage

Project	Contributory impacts
APA - Western Slopes Pipeline	Heritage assessment not yet undertaken. Proposal involves a A400 to 450 mm diameter, buried, steel, high pressure gas pipeline approximately 450 km in length to connect the Narrabri Gas Project (NGP) to the NSW gas transmission network. Largely passes through agricultural land with previous disturbance from vegetation clearing etc so no impacts on Aboriginal heritage are anticipated.
Inland Rail - Narrabri to North Star	The proposal is generally located within the existing rail corridor between Narrabri and the town of North Star. The proposal consists of 188 kilometres of upgraded track and associated facilities. Three disturbed artefact scatters are adjacent to proposal however impacts on Aboriginal heritage not anticipated.
Inland Rail - Parkes to Narromine	The proposal consists of 106 kilometres of upgraded track and associated facilities and is generally located in the existing rail corridor between the towns of Parkes and Narromine, via Peak Hill. Impacts on Aboriginal heritage not anticipated however two registered sites (artefact scatter) are considered for mitigation if they cannot be avoided.
Narrabri Gas Project (Santos)	Up to 850 exploration and production wells throughout the Pilliga Forest. Includes construction of access tracks, gas processing facility, water management facility, gas and water pipelines, power generation facility and ancillary facilities such as accommodation for staff. Impacts on Aboriginal heritage not anticipated and avoidance principal in management and mitigation should they be.
Silver Leaf Solar Farm	450 hectares on agricultural land with previous disturbance from vegetation clearing and drainage channels. Located adjacent to this proposal on the western side of proposal site. No impacts on Aboriginal heritage are anticipated.
Gilgandra Solar Farm	188 hectare area extensively cleared for grazing and cropping. Impacts on Aboriginal heritage not anticipated.
Narromine Solar Farm	The location is on the western boundary of the current proposal. Reporting (Zenith 2019) indicates no Aboriginal heritage sites will be impacted however there are now two registered sites in their project area recorded during current proposal field work. These are: • MRST3: #35-3-0219; Modified Tree (Scarred) • MRST4: #35-3-0221; Modified Tree (Scarred). If these are impacted in the construction of the proposed solar farm, then the cumulative impacts from this proposal in this area which has known cultural values would be more significant on scarred trees.

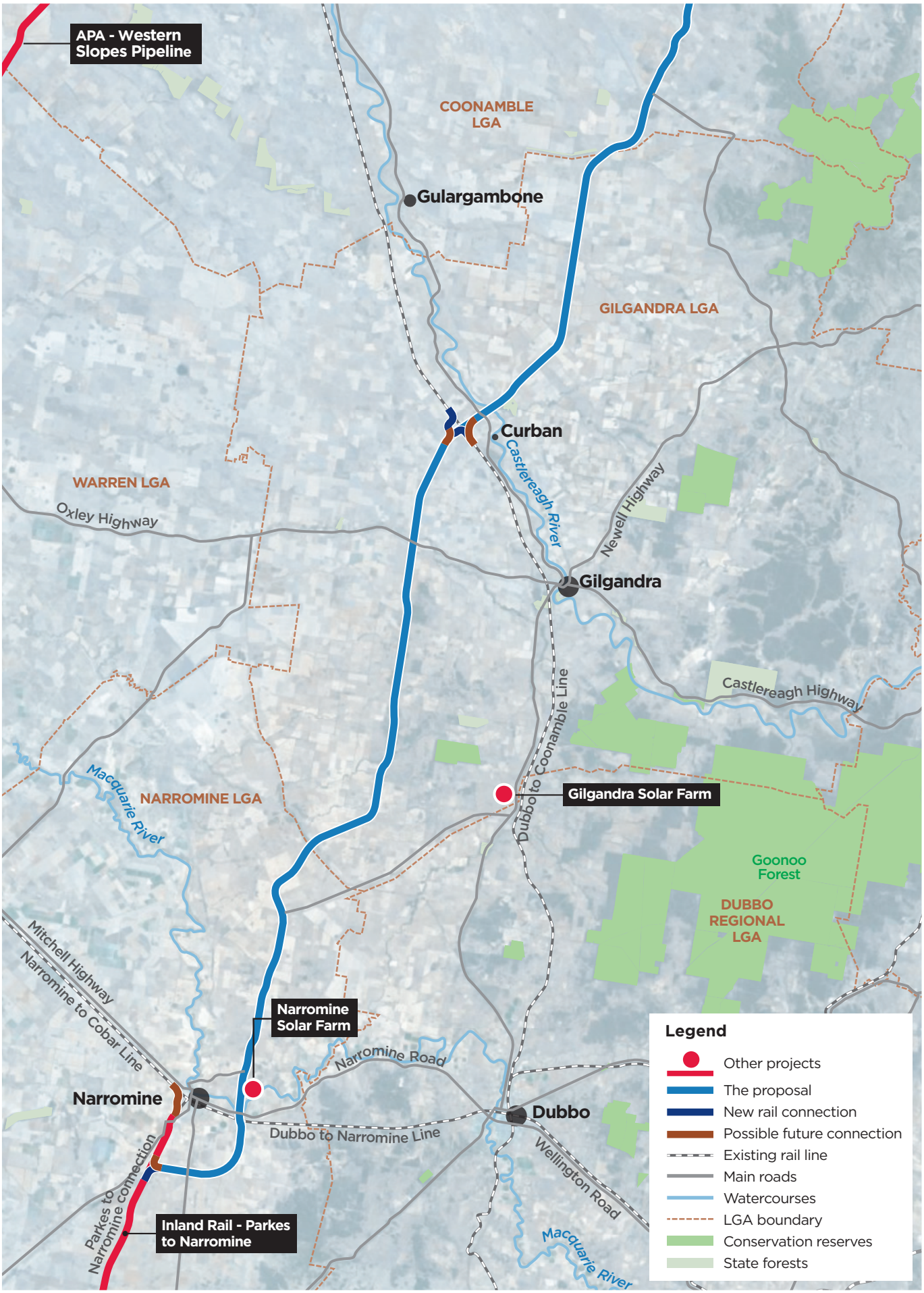


Figure 9.1 **Projects with the potential for cumulative impacts (map 1)**

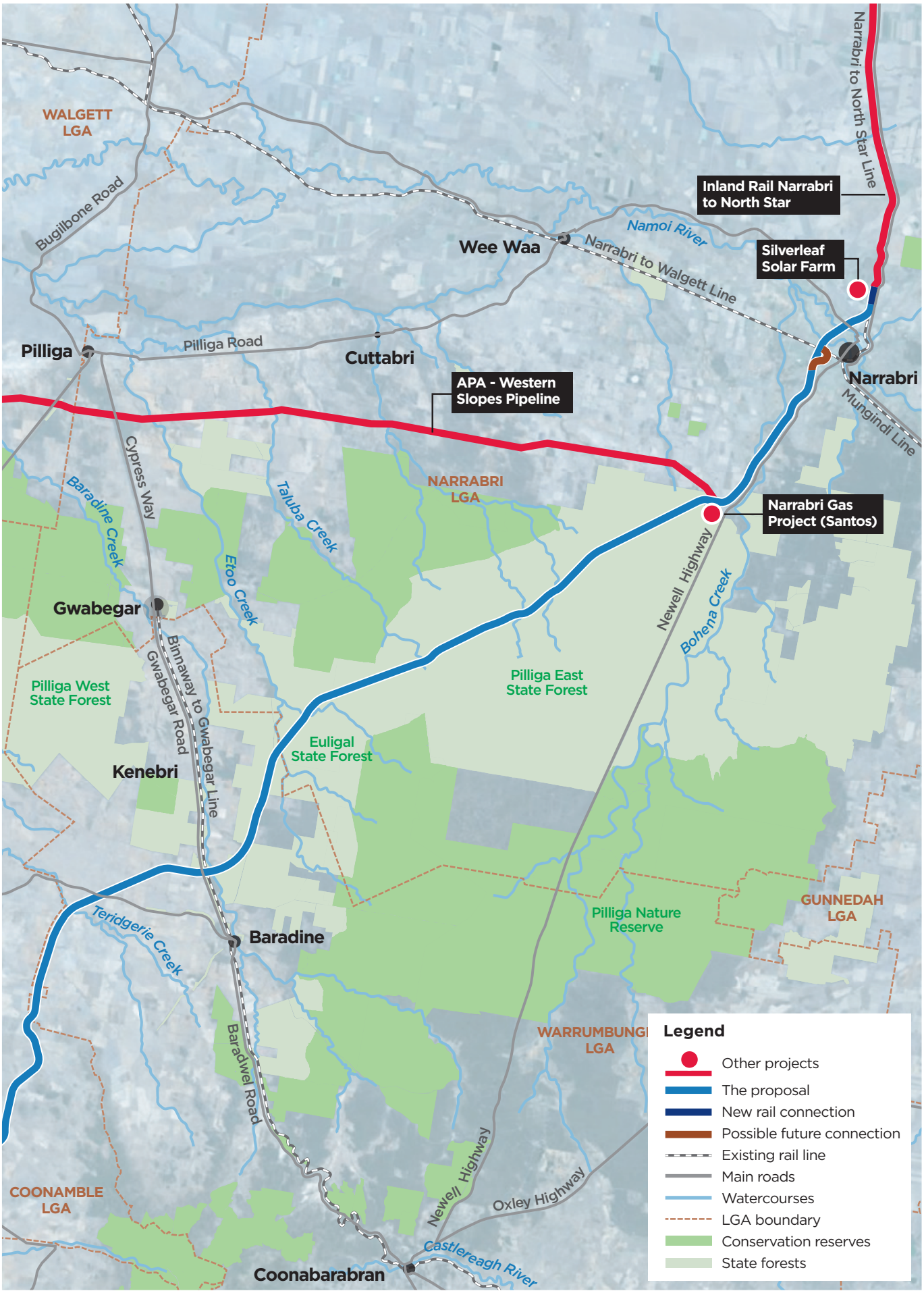


Figure 9.1 **Projects with the potential for cumulative impacts (map 2)**

Cumulative impacts are moderate to high in the Macquarie River catchment but are less so in the smaller catchment areas that have been subject to land clearance and pastoralism.

Cumulative impacts are lesser in the Castlereagh River catchment (moderate cumulative impact) and even less so in smaller catchment areas that have been subject to land clearance and pastoralism.

Cumulative impacts are significant in the Namoi River catchment close to Narrabri, with similar developments of roads, bridges, train lines, power lines and civic infrastructure that has almost eradicated the visibility of Aboriginal cultural heritage sites and places within the local landscape. With smaller catchments in the Pilliga Forest, the cumulative impacts are low.

10. Recommended mitigation measures

10.1 General management recommendations

Where complete avoidance of sites by the proposal is not possible, mitigation measures have been provided as presented in Table 10.1. Management recommendations have been made with consideration of the likely degree of impact to each heritage item and the assessed significance of each site.

For identified Aboriginal heritage sites with the potential to be impacted by the proposal, it is recommended that management measures for each be determined in consultation with the RAPs for the proposal. These are referred to as actions in Table 10.1 below. Potential measures could include:

- Detailed design and construction planning would seek to avoid direct impacts on the identified items/sites of Aboriginal heritage significance where practicable (refer to Table 10.1: MM1, MM2 and MM3).
- Salvage (artefact collection) of all artefacts within proposal site (refer to Table 10.1: MM4, MM5, MM7 and MM8).
- Investigation of all PADs within proposal site (including test excavation and potentially salvage) prior to commencement of construction (refer to Table 10.1: MM6).
- Preparation of an Aboriginal cultural heritage management plan as part of the Construction environmental management plan (CEMP) prior to construction to include measures to minimise the potential for impacts as far as practicable, manage Aboriginal heritage, and procedures for any unexpected finds. The plan would be prepared in consultation with the RAPs, LALCs, NT groups and other knowledge holders and take into account the outcomes of recommended further investigations (refer to Table 10.2: MM10).
- Before construction commences, targeted archaeological surveys and investigations should be undertaken for areas of the proposal that have a high cultural sensitivity as identified by the predictive modelling but were not confirmed during survey (refer to Table 9.1).
- The site specific management measures outlined in section 10.2 will be strengthened by effective education and inductions of ARTC construction management staff as to their responsibilities in ensuring Aboriginal heritage sites are protected and effectively managed (refer to Table 10.2: MM11).

Additional areas not yet surveyed will need to be investigated to confirm archaeological potential and if necessary, additional mitigation measures applied. Residual impacts associated with the future operation of the rail corridor should be considered in the Aboriginal cultural heritage management plan.

10.2 Site specific mitigation measures for sites within the proposal site

Table 10.1 identifies specific proposed impact mitigation measure during detailed design/pre-construction and Table 10.2 identifies specific proposed impact mitigation measure during construction for the 48 sites/PADs within or adjacent to the proposal for the following:

- 29 culturally modified trees: Backwater Cowal (4), Macquarie River (10), Ewenmar Creek (1), Boothaguy Creek (3), Castlereagh River Berida Road (2), Baronne Creek (3), Mungery Creek (4), Cumbil Forest Creek (1) and Etoo Creek (1)

- eight artefact scatters: Macquarie River (2), Noonbar Creek (1), Calga and Looking Glass Creeks (1), Baradine Creek (1), Cumbil Forest Creek (2) and Bohena Creek (1)
- four artefact scatters with PAD: Castlereagh River (1), Gulargambone Creek (2) and Calga and Looking Glass Creeks (1)
- two grinding groove sites: Cumbil Forest Creek (2)
- two PADs: Ewenmar Creek (1) and Baradine Creek (1)
- one archaeological deposit: Macquarie River (1)
- two isolated finds: Baradine Creek (2).

Table 10.1 Detailed design/pre-construction mitigation measures

No.	Impact	Measure
MM1	Avoiding and minimising impacts on Aboriginal heritage	Detailed design and construction planning would avoid direct impacts on identified items/sites of Aboriginal heritage significance as far as reasonably practicable. The location of construction compounds and associated access routes would be reviewed to ensure, as far as practicable, to avoid and minimise impacts on Aboriginal heritage.
MM2	Avoiding and minimising impacts on Aboriginal heritage	Before construction commences a targeted archaeological survey and investigation would be undertaken for areas identified as culturally sensitive requiring further investigation including: • Wallaby Creek • Ewenmar Creek • Marthaguy Creek • Castlereagh River • Gulargambone Creek • Tenandra Creek • Baradine Creek • Namoi River. The additional investigation would be undertaken with the RAPs in accordance with the archaeological survey and test excavation methodologies approved for the proposal once property access is available. Areas or items of Aboriginal cultural heritage significance identified as part of this additional investigation would be managed in accordance with measures developed in consultation with RAPs. These measures would be included in an Aboriginal cultural heritage management plan (mitigation measure MM10). If salvage is required it would be undertaken in accordance with mitigation measure MM4.

No.	Impact	Measure
MM3	Avoiding and minimising impacts on Aboriginal heritage	A pre-construction survey would need to be undertaken to confirm the locations of the previously listed AHIMS sites: • Backwater Cowal site: #35-3-0173, #35-3-0174, #35-3-0175 and #35-3-0183 • Macquarie River site: #35-3-0021, #35-3-0195, #35-3-0196, #35-3-0200, #35-3-0201, #35-3-0202, and 35-3-0210 • Cumbil Forest site: #19-5-0115, #19-5-0116 and #19-5-0121. Surveys would be undertaken with registered Aboriginal parties in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010a). If located, impacts to the site/s would be avoided so far as is practicable and protection measures put in place as per mitigation measure MM10. If it is determined that the sites have the potential to be impacted, they would be managed in accordance with the agreed salvage methodology (mitigation measure MM4).
MM4	Management of salvaged items	A detailed salvage methodology would be prepared by a suitably qualified archaeologist in consultation with relevant registered Aboriginal parties. The methodology would be included in the Aboriginal cultural heritage management plan (mitigation measure MM10) to ensure any artefacts salvaged are managed in accordance with the requirements of the *National Parks and Wildlife Act 1974*. The methodology would include the process for consultation with the Department of Planning, Industry and Environment and registered Aboriginal Parties in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010a) the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010c) and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011). Registered Aboriginal parties would be engaged to assist in the salvage that would be managed by an appropriately qualified archaeologist who would be engaged to support the process. Detailed analysis and reporting of cultural material collected would be provided to the Department of Planning, Industry and Environment.
MM5	Management of salvaged items	A Care and Control Agreement between the Department of Planning, Industry and Environment and the relevant LALC would need to be facilitated to ensure any artefacts salvaged are protected in compliance with section 85A of the *National Parks and Wildlife Act 1974*.

No.	Impact	Measure
MM6	Impacts on PADs	Detailed archaeological investigations would be undertaken at the following six PADs and the one confirmed archaeological deposit that may be directly impacted by the proposal: • Macquarie River: #35-3-0196 (confirmed archaeological deposit) • Ewenmar Creek #27-6-0036 • Castlereagh River #28-4-0280 (also an artefact scatter) • Gulargambone Creek #28-1-0060 and #28-1-0090 (also an artefact scatter) • Calga and Looking Glass Creeks #28-1-0059 (also an artefact scatter) • Baradine Creek #19-5-0230. Sub-surface archaeological test excavations would be undertaken to confirm the nature (and extent, if verified) of any archaeological deposits. The test excavation will be carried out in accordance with the approved methodology produced for the proposal. If test excavation confirms that the PAD is a heritage site, and has the potential to be impacted by the proposal, the site would be managed in consultation with Heritage NSW and registered Aboriginal parties. If salvage is required it would be managed in accordance with the agreed salvage methodology, as per mitigation measure MM4.
MM7	Impacts on artefact scatters	Surface collection (salvage) of the artefact scatters directly impacted by the proposal would occur prior to construction: • Macquarie River #35-3-0276 and #35-3-0195 • Castlereagh River #28-4-0280 • Gulargambone Creek #28-1-0090 and #28-1-0060 • Calga and Looking Glass Creeks #28-1-0059 and #28-1-0095 • Noonbar Creek #28-1-0096 • Baradine Creek #19-5-0226 • Bohena Creek #19-6-0180. The collection would be in accordance with the agreed salvage methodology (mitigation measure MM4).

No.	Impact	Measure
MM8	Impacts to modified trees	Impacts to the following modified trees would be avoided so far as is practicable: • Backwater Cowal #35-3-0175 • Ewenmar Creek #27-6-0035 • Boothaguy Creek #27-6-0037 and #27-6-0041 and #27-6-0042 (scarred canoe tree) • Baronne Creek #28-1-0062, #28-1-0063 and #28-1-0064 • Mungery Creek #28-1-0083, #28-1-0084, #28-1-0086 and #28-1-0087. If impacts are unavoidable the tree would be photographed and catalogued prior to being cut down in consultation with the RAPs by an appropriately qualified archaeologist who would be engaged to support the process. Any salvaged artefacts would be managed in accordance with the agreed salvage methodology (mitigation measure MM4).
MM9	Work outside approved area	Any proposal impacts that arise that are located beyond the proposal site assessed in this report would require further assessment by an appropriately qualified archaeologist in consultation with RAPs and in accordance with the relevant guidelines and policies.

Table 10.2 Construction mitigation measures

No.	Impact	Measure
MM10	Protecting Aboriginal heritage and minimising impacts during construction	An Aboriginal cultural heritage management plan would be prepared in consultation with the RAPs and would include measures to minimise impacts to Aboriginal heritage including: • unexpected finds procedure (refer to mitigation measure MM13) • detailed site salvage strategy (mitigation measure MM4) • management and Care and Control plans of salvaged Aboriginal objects (mitigation measure MM5) • plans and installation procedures for fencing and protective coverings • heritage components of induction package for construction workers and supervisors (mitigation measure MM11) • outcomes of further investigations post-EIS approval.
MM11	Protecting Aboriginal heritage and minimising impacts during construction	A requirement for cultural and historic heritage awareness training would be included in the Aboriginal cultural heritage management plan. Cultural heritage awareness training would be provided by an Aboriginal representative at the commencement of substantial works for the proposal.

No.	Impact	Measure
MM12	Avoidance of indirect impacts	Aboriginal heritage items located adjoining the proposal site would be fenced and marked on site plans contained within the CEMP as areas to be avoided during construction as far as practicable. If these sites cannot be avoided, salvage of artefacts would be undertaken prior to construction in accordance with the agreed salvage procedure (mitigation measure MM4).
MM13	Unexpected finds	An unexpected finds procedure would be developed and included in the CEMP to provide a consistent method for managing any unexpected Aboriginal heritage items discovered during construction, including potential heritage items or objects, and human skeletal remains. Where unknown skeletal remains are found on the site, works must stop in the immediate area, the area made secure from further disturbance and the project manager notified. In accordance with the *Coroners Act 2009*, the NSW Police must be called to enable them to investigate whether the remains are human and if they are associated with a crime. In the case where the NSW Police determine that the remains are historic, Heritage NSW and all RAPs will be notified of the historic heritage find. ARTC will consult with Heritage NSW to gain their advice and to direct a detailed management plan for the skeletal remains. An appropriately qualified archaeologist will be engaged to support the process.
MM14	Potential impacts to Aboriginal cultural values at Etoo Creek #19-5-0239	Prior to construction commencing and once rehabilitation is complete a smoking ceremony would be undertaken at the location of Etoo Creek #19-5-0239. Prior to construction commencing the age of the culturally modified (scarred) tree is to be verified by an arborist.

10.3 Conservation outcomes

As discussed in section 9.1, the development of the proposal has sought to minimise impacts to the fullest extent practicable while meeting operational design requirements.

Design and alignment refinements were made and the location of ancillary facilities including borrow pits and borrow pit access tracks, were selected to avoid impacts to Aboriginal cultural heritage sites, while having regard to engineering, environmental, social-economic considerations.

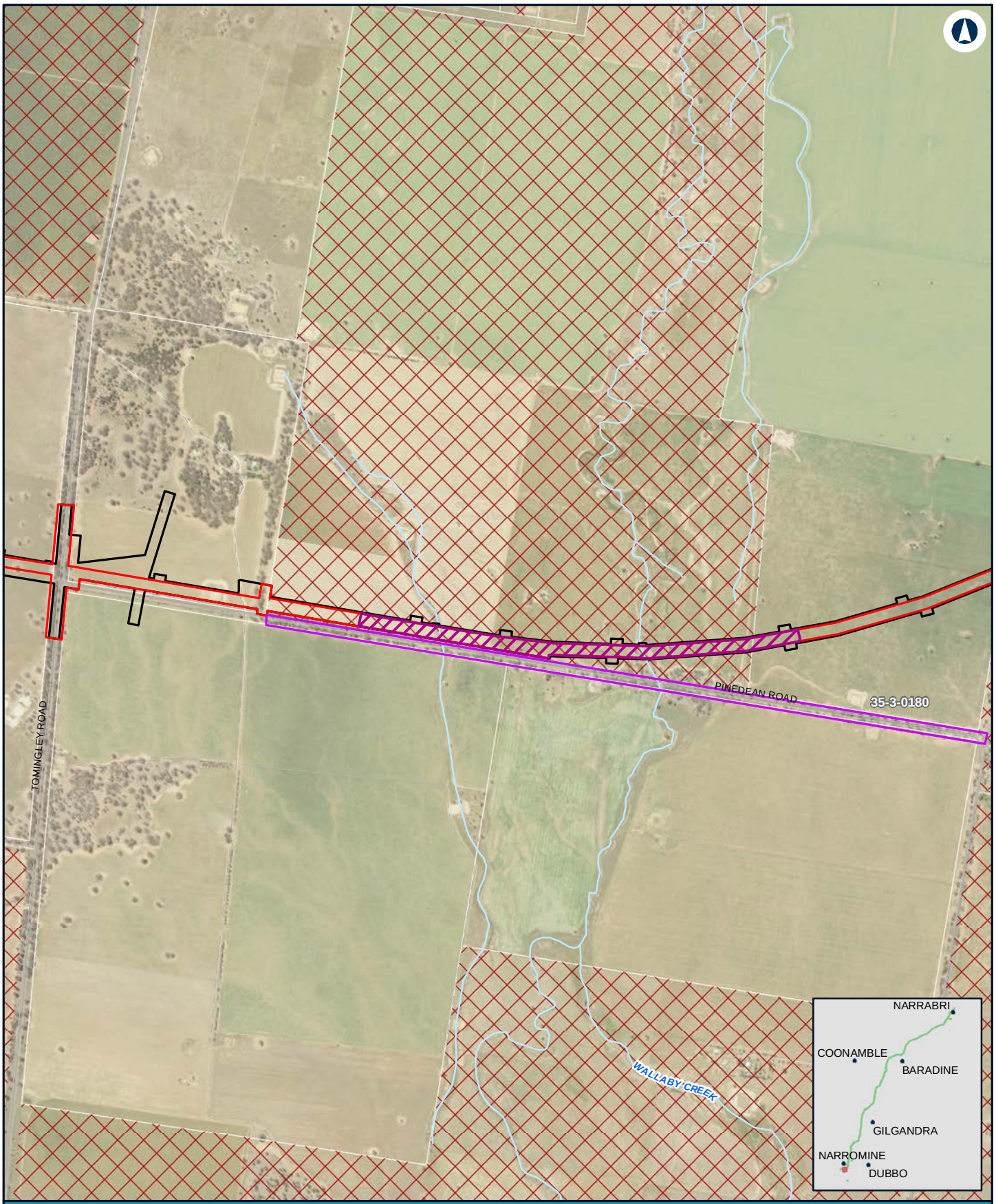
For example, the design for the proposal has adopted as narrow a footprint as possible in all areas in order to minimise the impacts to Aboriginal heritage sites. For instance it has been realigned to avoid significant Aboriginal sites at Cumbil Forest Creek and Webb's siding on the Macquarie River.

10.4 Additional investigations

As discussed in section 7.1.3, there are areas with moderate to high sensitivity (refer Figure 10.1) within the proposal site that were not able to be surveyed due to property access constraints. These will require further physical examination prior to any construction work commencing on these sites, including preparatory works. These areas are detailed in Table 10.3. This should be undertaken in accordance with the archaeological survey and test excavation methodologies provided in Appendix D).

Table 10.3 Areas requiring further investigation within proposal site

Area	Notes
Wallaby Creek	Reported culturally modified trees in 1500 metre section of 3rd order creek frontage between chainage 552.9 and 554.6 require additional survey and investigation to verify these reported sites.
Ewenmar Creek	Lower slopes and forested areas between chainage 595.3 and 595.6 are in an area known for dry season water requires additional survey and investigation. Unassessed area at creek confluence at this location. Large artefact cache in possession of nearby landowner.
Marthaguy Creek	Forested area between chainage 634 to 634.9 at third order confluence of creek requires additional survey and investigation.
Castlereagh River	Southern bank between chainage 652 to 652.2 requires additional survey and investigation.
Gulargambone Creek	Forested areas, banks and upper terraces between chainage 672.9 to 674 require additional survey and investigation.
Tenandra Creek	Low terraces of creek between chainage 694.1 and 694.7 require additional survey and assessment.
Baradine Creek	Low terraces of creek between chainage 747.8 and 748.6 require additional survey and investigation.
Namoi River	Lower and upper terraces of river between chainage 844.4 and 844.6 require additional survey and investigation.



NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Wallaby Creek Figure 10.1a

0 0.25 0.5 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Survey areas

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:20,000
Data Sources: Basemap layers: NSWSS, All other heritage data: GHDJACOBS

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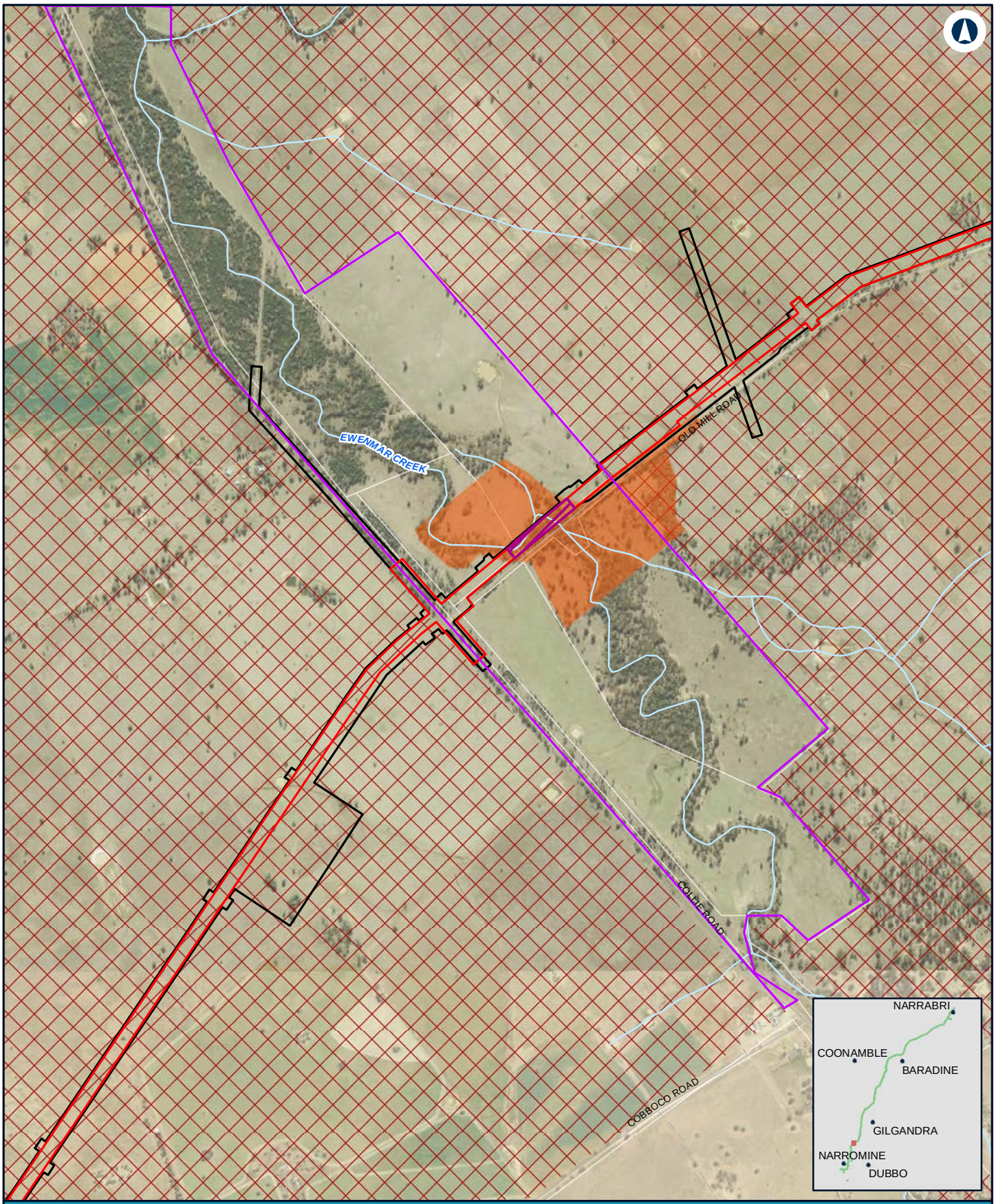

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Ewenmar Creek Figure 10.1b

0 0.25 0.5 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Areas of archaeological sensitivity
- Survey areas

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:20,000
Data Sources: Basemap layers: NSWSS, All other heritage data: GHDJACOBS

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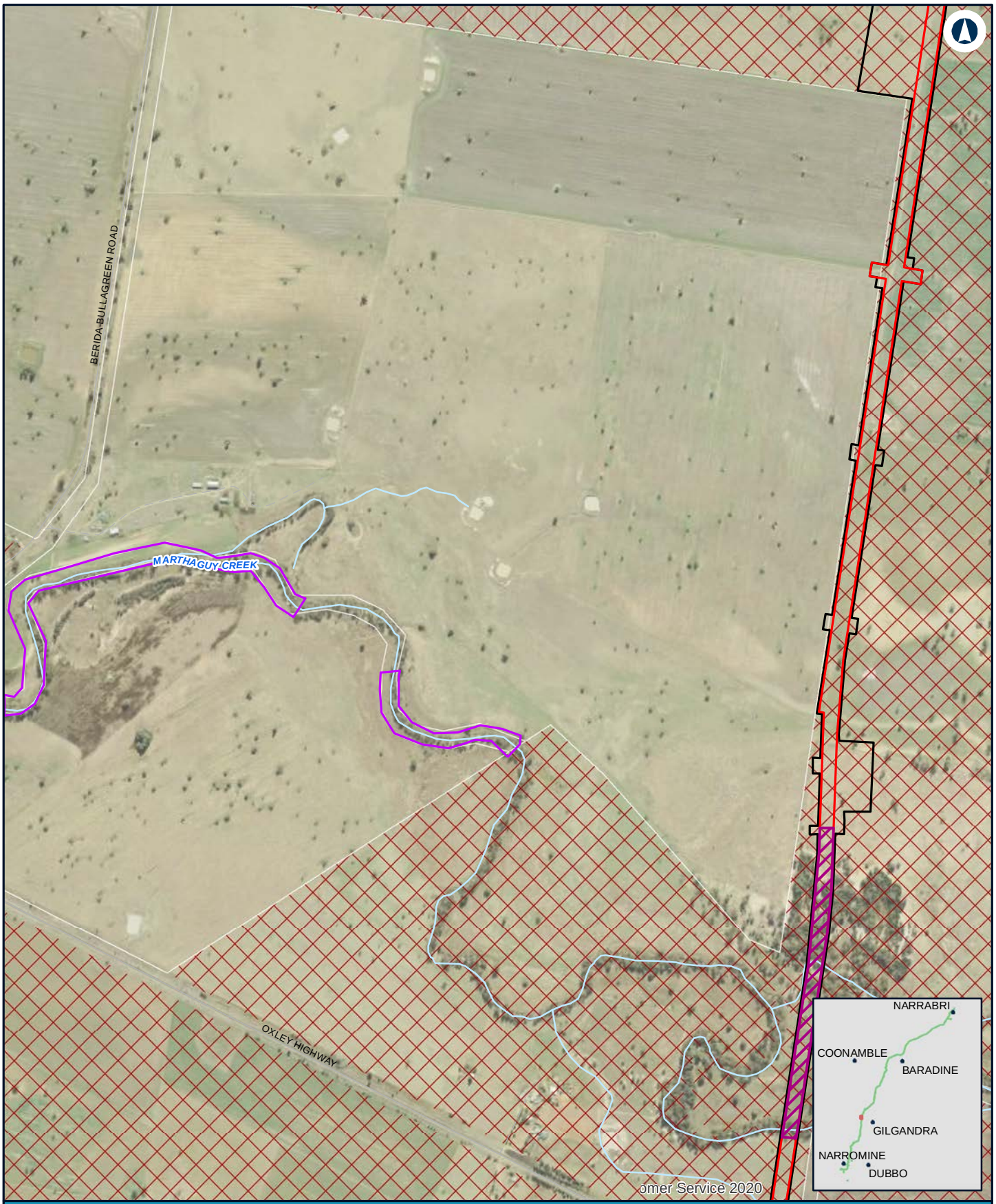

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Marthaguy Creek Figure 10.1c

0 0.2 0.4 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Survey areas

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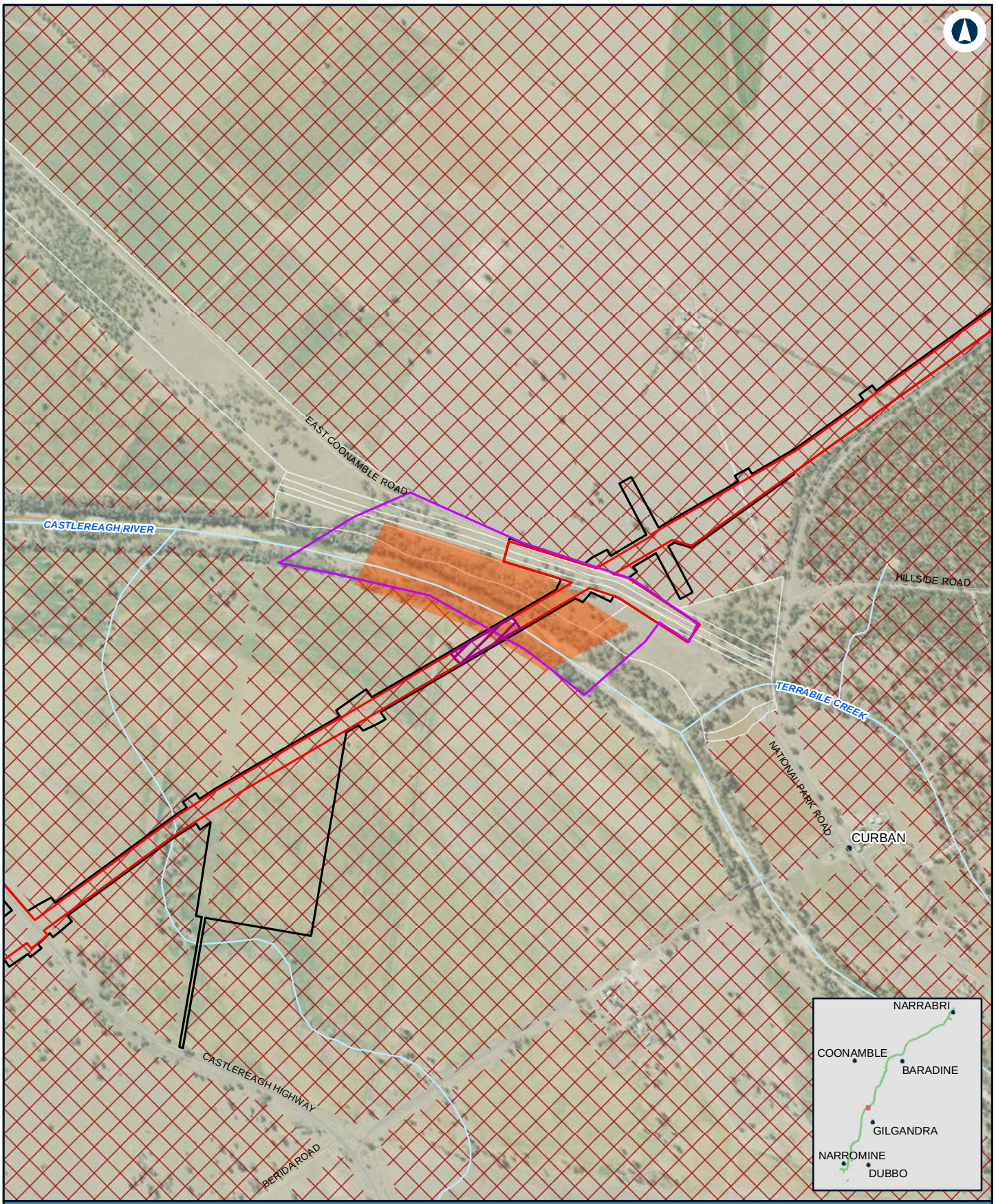

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Castlereagh River Figure 10.1d

0 0.2 0.4 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Areas of archaeological sensitivity
- Survey areas

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:15,000
Data Sources: Basemap layers: NSWSS, All other heritage data: GHDJACOBS

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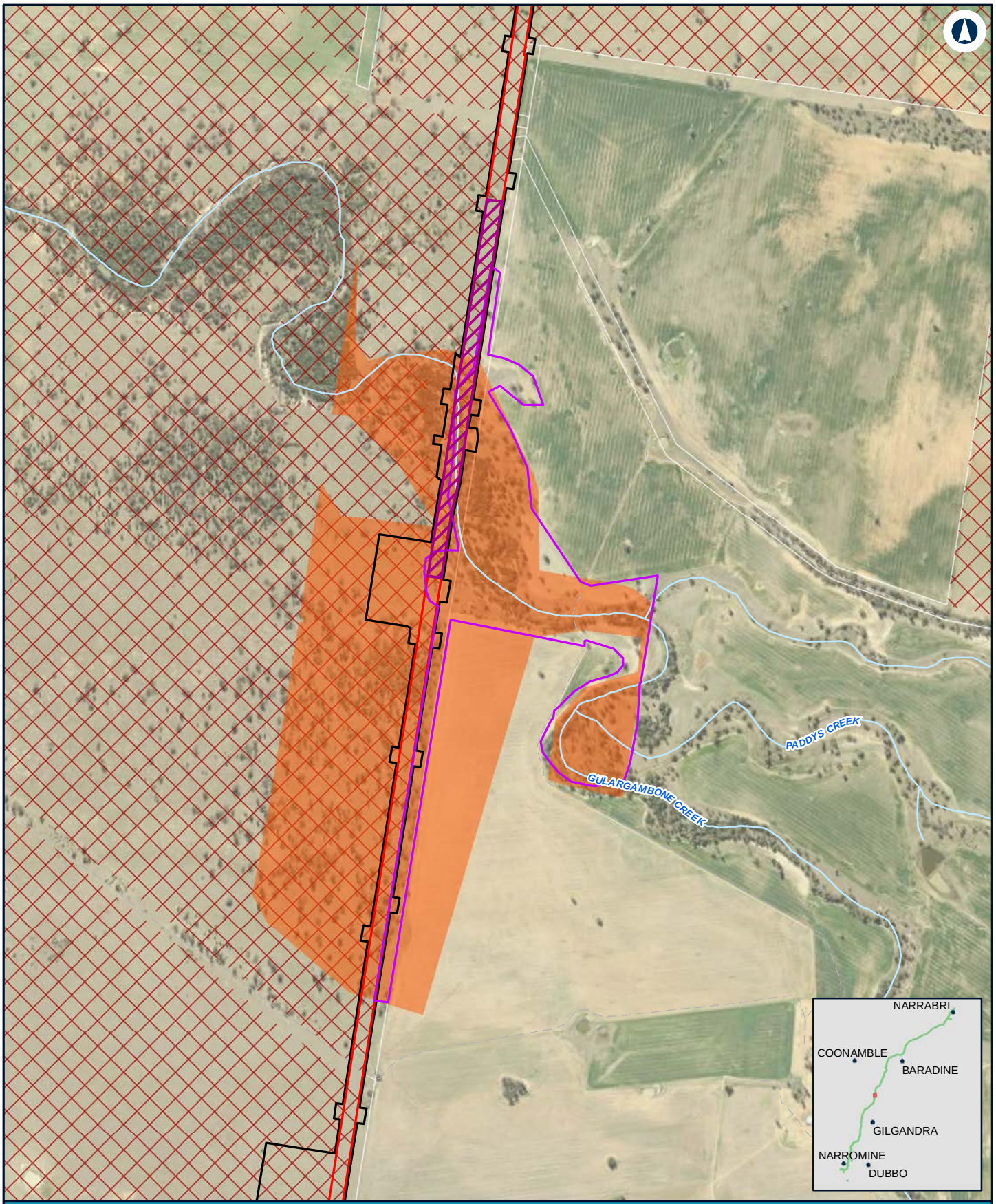

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Gulargambone Creek Figure 10.1e

0 0.2 0.4 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Areas of archaeological sensitivity
- Survey areas

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:15,000
Data Sources: Basemap layers: NSWSS, All other heritage data: GHDJACOBS

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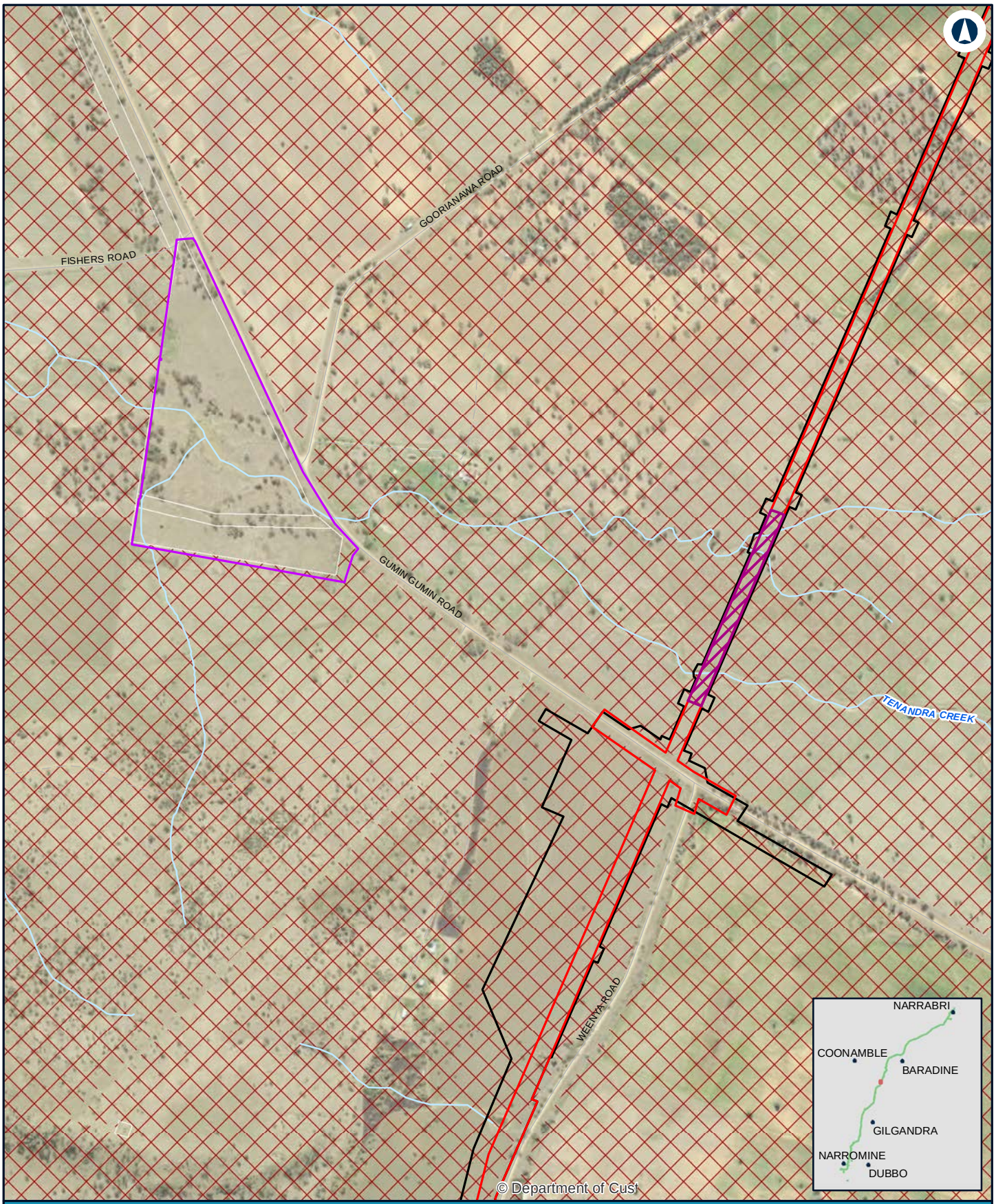

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Tenandra Creek Figure 10.1f

0 0.2 0.4 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Survey areas

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:15,000
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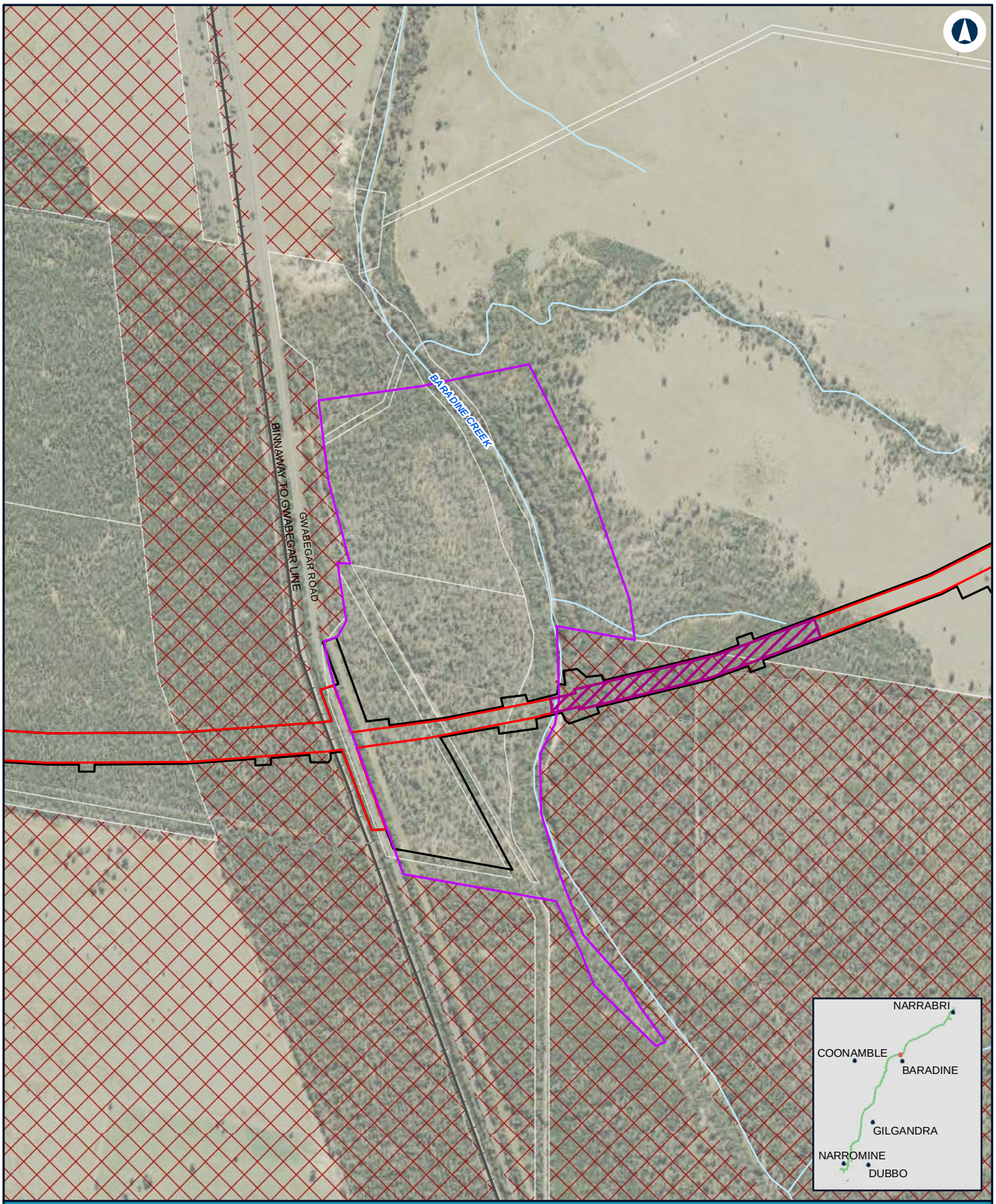

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Baradine Creek Figure 10.1g

0 0.2 0.4 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Survey areas

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:15,000
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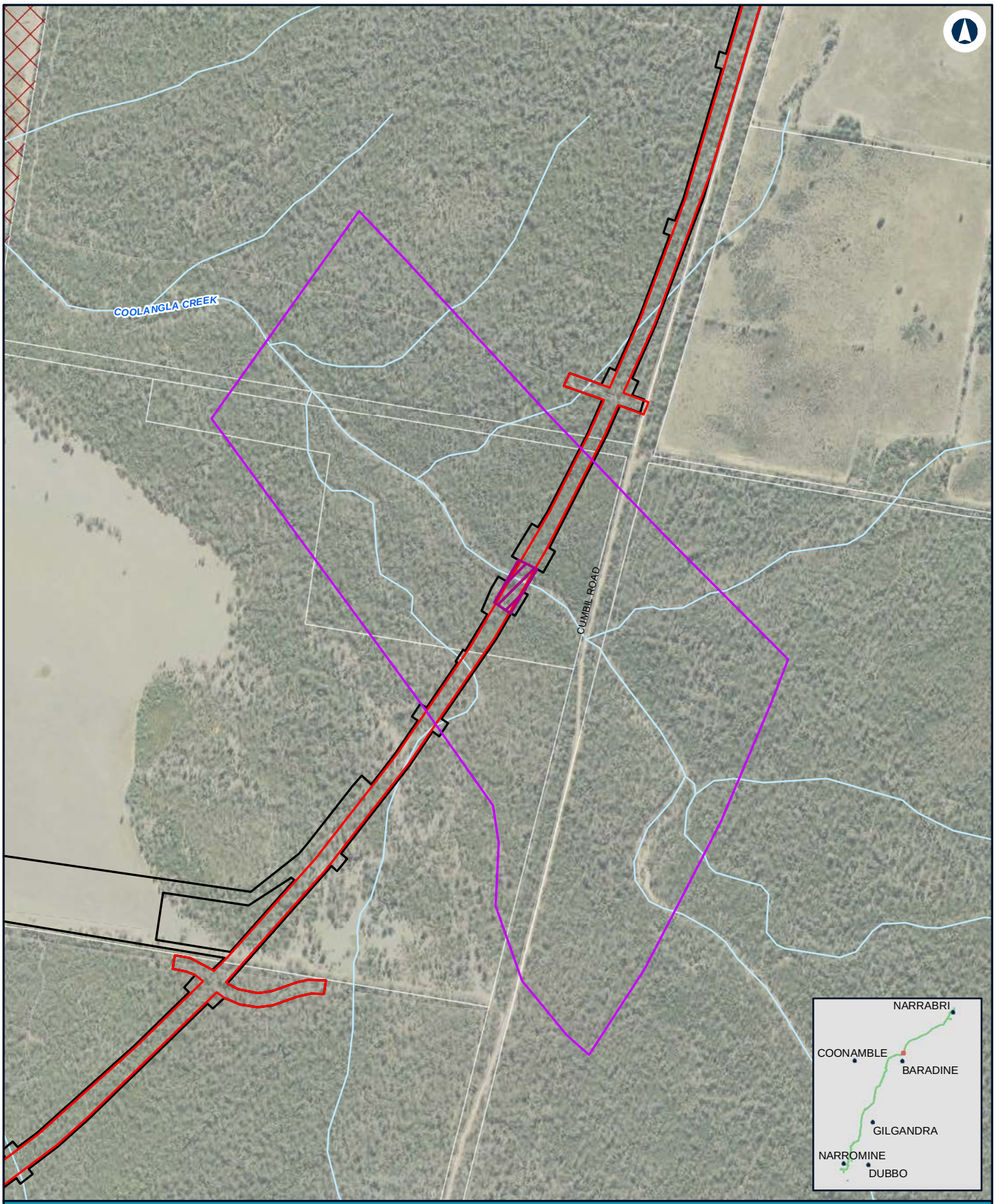

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Coolangla Creek Figure 10.1h

0 0.2 0.4 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Survey areas

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Author: JacobsGHD Scale: 1:15,000
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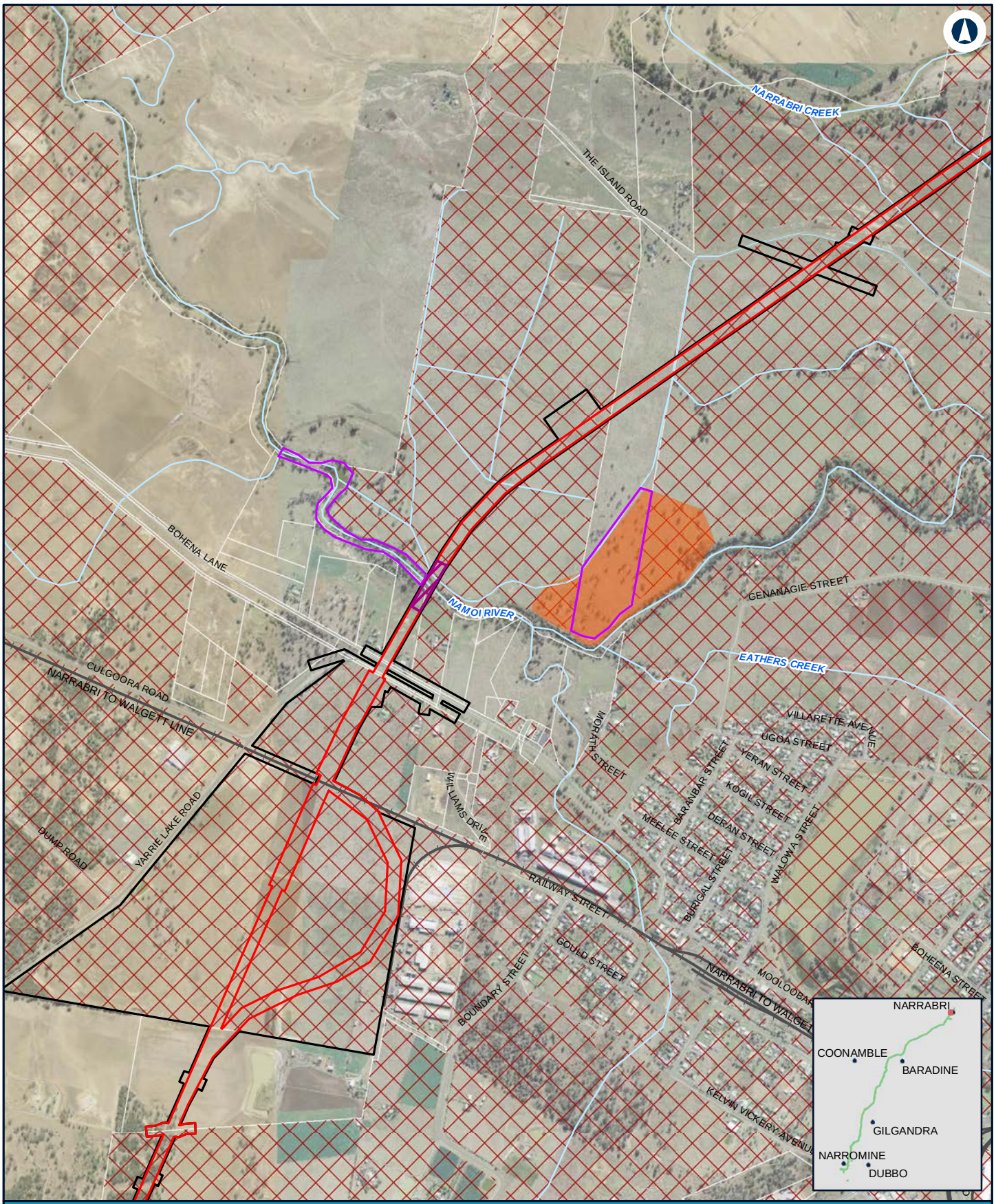

NARROMINE TO NARRABRI Areas requiring further assessment within the construction footprint - Namoi River Figure 10.1i

0 0.25 0.5 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Operational footprint
- Construction footprint
- Areas requiring further assessment within construction footprint
- Properties not accessible at time of survey
- Areas of archaeological sensitivity
- Survey areas

Date: 6/07/2020 Paper: A4
Author: JacobsGHD Scale: 1:20,000
Data Sources: Basemap layers: NSWSS, All other heritage data: GHDJACOBS

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10.5 Proposed research questions to guide future analysis

Culturally sensitive areas along river terraces identified during this assessment often contain deep stratified soils compared to the alluvial plains that surround them. Investigation of these areas has the potential to provide opportunities to further our understanding of the temporal context of site use by Aboriginal people and how this relates to our wider understanding of cultural patterning through time. Archaeological salvage of surface artefact scatters and sub-surface artefact assemblages proposed in the mitigation measures pose considerable research potential and allow a positive consequence of the salvage to be achieved.

A number of research questions are proposed below to guide the analysis of findings from the survey results and proposed archaeological investigations. These questions would inform the prioritisation of the cultural heritage management plan. They relate to the types of information that could be gleaned from the analysis of site distribution, stone tools, temporal changes within or between sites or proximity to certain resource areas or landscapes as they are encountered across the proposal.

Due to their durability and abundance throughout cultural deposits, stone tools are most often the principal evidence that informs analysis of past modes of behaviour and subsequently provide the greatest opportunity to delve deeper into archaeological analysis. The following preliminary research question concentrate on the stone tool evidence and dates that are expected to result from test excavations:

1. Are there any variations in stone tool typologies across the different landscape regions, between sites or even within sites?

   The following types of questions could be asked of the stone tool analysis during further salvage excavation including the following:

   - Are there variations in cortex percentages on stone tools at various sites?
   - Are these changes related to material types?
   - If so, what do these variations suggest?
   - Does previous research in the region inform on these results?
   - Are there variations in the tool typology, density and distribution across sites in the study area and are these comparable to other sites in the broader region or variations in the Australian Small Tool Tradition / late Holocene assemblages?
   - Is there evidence for intra-site temporal changes in tool typology?
   - How does this inform on cultural changes in adaptations to the local environment?
   - When hearths are identified at a particular site is this reflected in the amount of heat treatment observed on stone tools?

2. What is the chronology of the sites identified in the study area and are there variations in stone tool typologies across time?

   - Does dating across sites provide insights into temporal changes in landscape use?
   - Are there different uses of landscape systems reflected in the stone tool typology, density and distribution?

10.6 Management of salvaged cultural material

The identification of suitable locations for temporary storage of salvaged material (during investigations, salvage and/or construction) would be completed in consultation with the RAPs and Heritage NSW as per the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010c) and with regard to Requirement 26 of the Code of Practice requiring appropriate cataloguing and storage.

Long term storage locations will need to be identified following salvage and agreed with prior to Care and Control Agreements being resolved to the satisfaction of Heritage NSW and all RAPs.

10.6.1 Care and control of reburied or salvaged artefacts

For all salvaged material, long term arrangements for the storage of objects would need to be done in consultation with RAPs under Care and Control Agreements. The curators of these objects would be required to ensure compliance with the *NPW Act*. This will involve the submission of relevant applications to Heritage NSW which will include an accurate catalogue of any objects collected/transferred. Given the possible unique nature of the salvage collection crossing three major catchments it is likely to have significant research potential.

10.7 Cultural and historic awareness training

A requirement for cultural and historic heritage awareness training would be included in the salvage management plans/environmental work method statement (EWMS) and the Construction Environmental Management Plan. Cultural heritage awareness training would be provided by an Aboriginal representative at the commencement of substantial works for the proposal.

10.8 Skeletal remains

Where unknown skeletal remains are found on the site, works must stop in the immediate area, the area made secure from further disturbance and the project manager notified.

In accordance with the *Coroners Act 2009*, the NSW Police must be called to enable them to investigate whether the remains are human and if they are associated with a crime. In the case where the NSW Police determine that the remains are historic, Heritage NSW and all RAPs will be notified of the historic heritage find.

ARTC will consult with Heritage NSW and/or DPIE to gain their advice and to direct a detailed assessment and management of the skeletal remains. An appropriately qualified archaeologist would be engaged to support the process.

10.9 Work outside of approved area

Any proposal impacts that arise that are located beyond the proposal site assessed in this report would require further archaeological investigation by an appropriately qualified archaeologist in consultation with RAPs and in accordance with the relevant guidelines and policies.

This assessment should begin with a desktop assessment of the additional impact areas. If the desktop assessment concludes that impacts to Aboriginal heritage values are likely, further investigation would be required. This should be generally consistent with the process documented in the approved archaeological methodologies (refer to Appendix D).

10.10 Unexpected finds of cultural material during construction

Consultation with the RAPs on any unexpected find and proposed management measures will occur over the next period of consultation. An unexpected finds procedure would be developed and included in the CEMP to provide a consistent method for managing any unexpected Aboriginal heritage items discovered during construction, including potential heritage items or objects, and human skeletal remains.

Further consultation with RAPs and Heritage NSW will occur if further archaeological salvage or management is recommended and a modification to the project approval may be sought. The above process will be detailed in the CEMP.

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11. References

Andrews, G., D. Daylight and J. Hunt 2006 *Aboriginal Cultural Landscape Mapping of Coastal NSW*, Report to the Comprehensive Coastal Assessment (Department of Planning) by the Department of Natural Resources, Sydney.

APA Group (2017). *Preliminary Environmental Assessment*. Western Slopes Pipeline Project.

ARTC (2017). *Inland Rail-Parkes to Narromine Environmental Impact Statement Main Report*.

ARTC (2019). *Inland Rail Programme – Narrabri to North Star Project. Environmental Impact Statement*. Main Report

Australia ICOMOS 2000 *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999*. Burwood, Victoria: Australia ICOMOS Incorporated.

Australian Government 2018 *Bioregional Assessment Program: Central West subregion*. Retrieved from <https://www.bioregionalassessments.gov.au/assessments/central-west-subregion>.

Australian Government 2019 *Murray- Darling Basin Authority: Namoi*. Retrieved from <https://www.mdba.gov.au/discover-basin/catchments/namoi>.

Baker, D.W.A. 1967 *Mitchell, Sir Thomas Livingstone (1792-1855)*. Canberra, ACT: National Centre of Biography, Australian National University. 2.

Balme, J. 1985 *A preliminary archaeological assessment of the Moree Plans Shire Council region*. Report to Moree Plains Shire Council.

Bickford, A. 1980 Contact History: Aborigines in NSW after 1788. In: Brayshaw, H., McBryde, I., Dallas, M. and Bickford, A. 1980. *A History of Aboriginal Occupation in New South Wales.* NPWS, Hurstville.

Bombell, A. 2014 The Long Paddock: A Legislative History of Travelling Stock Reserves in NSW. *Briefing Paper No 07/2014* Published by the NSW Parliamentary Research Service, Canberra, ACT.

Bottoms, T. 2013 *Genocide in Colonial Queensland, Australia, a Prelude to 'Conspiracy of Silence, Queensland's frontier killing times*. Retrieved from <http://honesthistory.net.au/wp/bottoms-timothy-genocide-in-colonial-queensland-australia/>.

Bruck, J. and M. Goodman. 1999 Introduction: Themes for a critical archaeology of prehistoric settlement. In J. Bruck and M. Goodman (eds), *Making Places in the World: Themes in Settlement Archaeology*, pp.1-19. London: University College London.

Bureau of Meteorology 2017 *Climate statistics for Australian locations: Wagga Wagga (073127)*. Retrieved 8 March 2017 from <http://www.bom.gov.au/climate/averages/tables/cw_073127.shtml>.

Claims, R.O.N.T. *2012 Gomeroi People v Attorney General of New South Wales (Gomeroi People) Federal Court number: NSD37/2019.* NNTT number: NC2011/006

Cotton Catchment Communities CRC 2009 *Common Plants of Grazing Pastures on the Lower Namoi Floodplain*.

CQCHM 2016 *Aboriginal Cultural Heritage Assessment Report for the Narrabri Gas Project.* Prepared by Central Queensland Cultural Heritage Management Pty Ltd. November 2016.

DECCW 2010a *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW.*

DECCW 2010b *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010*.

DECCW 2010c *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* Sydney: Department of Environment, Climate Change and Water.

Dennis, P., J. Grey, E. Morris, R. Prior and J. Bou 2008 *The Oxford Companion to Australian Military History*. Oxford: Oxford University Press.

DEWHA 2009 *The Macquarie Marshes. Australian Wetlands Database*. Retrieved from <http://www.environment.gov.au/cgi-bin/wetlands/ramsardetails.pl?refcode=28>.

Donaldson, T. *(1979)* "Translating Oral Literature – Aboriginal Song Texts" *Aboriginal History* Vol. 3, No, 1, 1979

DPIE 2019 *Aboriginal sites decision support tool (ASDST)*. Retrieved from <https://www.environment.nsw.gov.au/topics/aboriginal-cultural-heritage/protect-and-manage/aboriginal-heritage-information-management-system/aboriginal-sites-decision-support-tool>.

Fison, L. and A.W. Howitt 1880 Kamilaroi and Kurnai: group-marriage and relationship, and marriage by elopement, drawn chiefly from the usage of the *Australian Aborigines : Also the Kurnai Tribe, Their Customs in Peace and War.* Melbourne: George Robertson.

Gammage, B. 2012 *The biggest estate on earth : how Aborigines made Australia*. Crows Nest, N.S.W.: Crows Nest, N.S.W. Allen & Unwin.

Gaynor, P.a.W., J. 1999 *The archaeological survey and subsurface testing of areas proposed for the development of cabins and the redevelopment of existing campground facilities within the Warumbungle National Park*. Gaynor and Wilson Archaeological Consultants.

Geering and Roberts 2014 Current limitations on Aboriginal Involvement in Aboriginal site management in central west and northwest NSW. In J. Birkehead, T. De Lacy and L. Smith (eds), *Aboriginal involvement in parks and protected areas. Australian Institute of Aboriginal and Torres Strait Islander Studies* Australian Institute of Aboriginal and Torres Strait Islander Studies

GHD/ENGIE (2018). *Silverleaf Solar Farm. Preliminary Environmental Investigation.* June 2018.

GHD (2019). *Report for NEOEN Australia Pty Ltd - Gilgandra 40MW Solar Farm, 2125942: Appendix C Aboriginal Heritage*.

Gibbney, H.J. 1967 *Sturt, Charles (1795-1869)*. Canberra, ACT: National Centre of Biography, Australian National University. 2.

Gree, D., J. Petrovic, P. Moss and M. Burrell 2011 *Water resources and management overview-Macquarie-Bogan catchment*, NSW Office of Water, Sydney.

Hartley, J. 2000 *The indigenous public sphere : the reporting and reception of Aboriginal issues in the Australian media*. Oxford: Oxford : Oxford University Press.

High Ground Consulting 2009 *Gilgandra Shire Thematic History*, Unpublished report to the Gilgandra Shire Council.

JacobsGHD 2019 *Aboriginal Heritage Due Diligence Assessment of Geotechnical Investigation Work*. ARTC.

Koettig, M. 1985 *Assessment of Aboriginal sites in the Dubbo City area*. Report to Dubbo City Council.

Langdon, M. 2002 in *Background Briefing Papers* Lingiari Foundation Broome WA pages 43-64.

Maclean, K. 2012 *Ngemba Water Values and Interests: Ngemba Old Mission Billabong and Brewarrina Aboriginal Fish Traps (Baiame's Nguunhu).*

Manne, R. 2001 *In Denial: The Stolen Generations and The Right: Black Inc.*

Martinez, C.K. (2010). *Bias and Ethnocentrism in Anthropology*. Retrieved 26 January from http://www.associatedcontent.com/article/2632281/bias_and_ethnocentrism_in_anthropology.html.

Matthews, R.H. 1918 *The Bora Ground at Terry-Hie-Hie*. Royal Society of NSW, 7 November: vol. L1.

Memmott, P. 2007 *Gunyah, Goondie and Wurley: The Aboriginal Architecture of Australia*: University of Queensland Press.

MGoals 2018 *Wangaaypuwan (Wongaibon) Language Groups*. retrieved from https://nyngan.storylines.com.au/2015/12/17/languagegroups/

Milliss, R. 1994 *Waterloo Creek: the Australia Day massacre of 1838, George Gipps and the British conquest of New South Wales*. Sydney: University of New South Wales Press.

Mitchell, T. 1839 *Three Expeditions into the Interior of Eastern Australia: with a Description of the Recently Explored Province of Australia Felix and of the Present Colony of New South Wales.* (2 vols.) Second Edition. London: T. Boone.

Morgan, G. and J. Terrey 1992 *Nature Conservation in Western NSW*, National Parks Association.

Morwood, M.J. 1990 The prehistory of Aboriginal land use on the Upper Flinders River, North Queensland Highlands. *Queensland Archaeological Research* 6.

NBAN 2018 *Northern Basins Aboriginal Nations: Keeping our water spirits and our connections alive.* Retrieved from http://nban.org.au/

NPWS 1993 *Aboriginal Site Survey: Proposed Wee Waa to Narrabri Transmission Line*. Unpublished Report to Namoi Valley Electricity.

NPWS 2000a *Preliminary Overview of the Brigalow Belt South Bioregion (Stage 1).* NSW Western Regional Assessments, Resource and Conservation Assessment Council (RACAC).

NPWS, N. 2000b A*boriginal Cultural Heritage Assessment - Preliminary Report Brigalow Belt South (Stage 1)*. NSW Western Regional Assessments. Resource and Conservation Assessment Council (RACAC), Planning NSW, Sydney. Retrieved from

NSW Government 2010 *State of the Catchments - Riverine Ecosystems: Namoi Region.*

OEH 2011 *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage In NSW*

OEH 1996 *Regional Histories: Regional Histories of NSW*. Sydney: NSW Heritage Office.

OEH 2012 *Plan of management. Warrumbungle National Park*. NSW National Parks and Wildlife Service.

OEH 2018 *Colebee and Nurragingy Land Grant*. Retrieved 18/09/2018 from <https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5056189>.

Office of Water 2011 *Water Resources and Management Overview: Namoi Catchment.* Sydney.

Owen, T.D. and D.R. Cowie 2017 Four predictive models to describe Aboriginal lithic artefact site patterning on the Cumberland Plain. *Journal of the Australian Association of Consulting Archaeologists* 5:1-13.

Oxley, J. 1820 *Journals of two expeditions into the interior of New South Wales,* undertaken by order of the British government in the years 1817-18.

OzArk 2015 *Aboriginal Heritage Due Diligence Assessment: Therribri Road Upgrade.* Unpublished report for Constructive Solutions Pty Ltd.

Purcell, P. 2002 *Aboriginal Cultural Heritage Assessment NSW: Western Regional Assessments Brigalow Belt South Bioregion (Stage 2).* National Parks and Wildlife Service, New South Wales Government.

Rabbidge, T. 2016 *Water sharing plan for the Castlereagh Unregulated and Alluvial Water Sources: Background document for amended plan 2016*. NSW Department of Primary Industries, Sydney.

RACD 2002a D*evelopment of Conservation Criteria for Brigalow Belt Southern Region. NSW western regional assessments. Brigalow Belt South Bioregion. Stage 2.* Resource and Conservation Directorate. Project WRA-36 undertaken for the Western Regional Assessment within the NSWBBSB. Final September 2002.

RACC 2002 *Aboriginal Cultural Heritage Assessment for Brigalow Belt Southern Region. NSW western regional assessments. Brigalow Belt South Bioregion. Stage 2.* Resource and Conservation Assessment Council. NSW Western Regional Assessments WRA-18. Final September 2002.

Ridges, M. and G. Simpson 2016 *Warrumbungles Post-fire Research Project Report*. Aboriginal Cultural Values. Office of Environment and Heritage, Armidale.

Roberts, C. 1991 *Investigation of the Aboriginal archaeological resources of the Pilliga Forest*. Unpublished report to the Forestry Commission of NSW.

Rose, J. (n.d.) Ngiyampaa: https://pathfindersnsw.org.au/languages/ngiyampaa/

Santos (2019). *Parkes to Narromine Project Environmental Impact Statement Main Report. Chapter 20 Aboriginal Heritage*.

Sneddon, A. and M. Whincop 2017 A*boriginal Conservation Strategy: Maules Creek Coal Mine, Tarrawonga Coal Project, Boggabri Coal Mine, and Related Biodiversity Offset Areas*. Prepared for: Whitehaven Coal Limited and Idemitsu Australia Resources.

Southey, R.J. 2010 *Clarke, Sir Rupert Turner (1865–1926)*. Retrieved 25 July 2019 from <http://adb.anu.edu.au/biography/clarke-sir-rupert-turner-5672>.

Spooner Firman and Yalmambirra, P.G.a.M. 2010 Origins of Travelling Stock Routes. 1. Connections to Indigenous Traditional Pathways. *The Rangeland Journal* 32.

Stern, N.e.a. 2000 *Objective Classification of Australian Climates*. Australian Bureau of Meteorology, Melbourne.

Sveiby, K.a.S., T. 2006 *Treading Lightly: The Hidden Wisdom of the World's Oldest People* Crow's Nest, NSW, Allen and Unwin.

Umwelt. 2017 *Aboriginal Cultural Heritage and Archaeological Assessment.* Inland Rail -Parkes to Narromine. Report to ARTC.

UNESCO. 1991. *1972 World Heritage Convention*.

Wafer, J. & Lissarrague, A. (2008)*. A handbook of Aboriginal Languages of New South Wales and the Australian Capital Territory*, Muurrbay Aboriginal Language and Culture Co-operative, 2008.

White, B. and J. McDonald 2010 Lithic Artefact Distribution in the Rouse Hill Development Area, Cumberland Plain, New South Wales. *Australian Archaeology*(70):29-38.

Zenith (2019). *Lots 41 & 46 DP 752581*, 6 Euromedah Road, Narromine, NSW Wahroonga Solar Farm.

Appendices

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TECHNICAL REPORT

6

Aboriginal cultural heritage assessment report

Appendix A Consultation log

NARROMINE TO NARRABRI ENVIRONMENTAL IMPACT STATEMENT

Appendix A – Consultation log

SENSITIVE INFORMATION REMOVED FOR PUBLIC DISPLAY

TECHNICAL REPORT

6

Aboriginal cultural heritage assessment report

Appendix B AHIMS searches (updated 05/03/20)

NARROMINE TO NARRABRI ENVIRONMENTAL IMPACT STATEMENT

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : IA191801 section 1a

Client Service ID : 489120

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0140	N-ST-1	AGD	55	617010	6430650	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	4340
	Contact	**Recorders**	Central West Archaeological and Heritage Services Pty Ltd					**Permits**		
36-1-0155	Yarraba Ck;	AGD	55	621650	6441700	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
35-3-0019	Webb's Siding Canoe Tree 2	AGD	55	623295	6430572	Open site	Valid	Modified Tree (Carved or Scarred) : 1	Scarred Tree	
	Contact	**Recorders**	Sabu Dunn					**Permits**		
35-3-0274	Backwater Cowal PAD1	GDA	55	621054	6429708	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
35-3-0275	MRN AS3 and PAD	GDA	55	621689	6432475	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
35-3-0032	Wynsley Lane;Mitchell Highway;	AGD	55	624231	6430465	Open site	Valid	Modified Tree (Carved or Scarred) : 2	Scarred Tree	578
	Contact	**Recorders**	P McKenzie					**Permits**		
35-3-0079	Mitchell Highway 16	AGD	55	624400	6430700	Open site	Valid	Modified Tree (Carved or Scarred) : 6	Scarred Tree	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
35-3-0080	Mitchell Highway 17	AGD	55	624000	6430500	Open site	Valid	Modified Tree (Carved or Scarred) : 5	Scarred Tree	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
35-3-0081	Mitchell Highway 18	AGD	55	623900	6430500	Open site	Valid	Modified Tree (Carved or Scarred) : 1	Scarred Tree	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
35-3-0004	Acton;Narromine;	AGD	55	620150	6433242	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	Unknown Author					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0011	Narromine	AGD	55	616948	6427656	Open site	Valid	Modified Tree (Carved or Scarred) : -, Burial : -	Burial/s,Carved Tree	65
	Contact	**Recorders**	David Bell,R Etheridge,T Elliot,E Milne,Euromedha Dick					**Permits**		
35-3-0014	Woodlands	AGD	55	624205	6433206	Open site	Valid	Modified Tree (Carved or Scarred) : -	Carved Tree	65,1320
	Contact	**Recorders**	Unknown Author					**Permits**		
35-3-0145	MD36	AGD	55	618870	6430530	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
35-3-0020	Webb's Siding 2	AGD	55	623047	6430607	Open site	Valid	Modified Tree (Carved or Scarred) : 1	Scarred Tree	
	Contact	**Recorders**	Sabu Dunn					**Permits**		
35-3-0021	Webb's Siding Canoe Tree 4	AGD	55	621666	6431172	Open site	Valid	Modified Tree (Carved or Scarred) : 1	Scarred Tree	102792
	Contact	**Recorders**	Sabu Dunn					**Permits**		
35-3-0022	Siding Canoe Tree/Webb's Siding	AGD	55	623489	6430537	Open site	Valid	Modified Tree (Carved or Scarred) : 1	Scarred Tree	
	Contact	**Recorders**	Sabu Dunn					**Permits**		
35-3-0283	MRST6	GDA	55	621258	6431560	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
35-3-0276	MRN AS6	GDA	55	622176	6432336	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
35-3-0174	TNWP-ST18	AGD	55	621985	6427312	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Doctor.Jodie Benton					**Permits**		
35-3-0175	TNWP-ST19	AGD	55	621923	6427311	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Doctor.Jodie Benton					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0176	TNWP-ST20	AGD	55	621925	6426951	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0177	TNWP-ST21	AGD	55	621828	6426366	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0179	TNWP-ST23	AGD	55	621737	6425766	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0180	TNWP-ST24	AGD	55	619467	6424356	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0181	TNWP-ST25	AGD	55	619386	6424375	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0182	TNWP-ST26	AGD	55	618563	6424489	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0183	TNWP-ST27	AGD	55	617840	6424831	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0184	TNWP-ST28	AGD	55	617250	6424944	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0186	TNWP-ST30	AGD	55	616357	6424080	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
Contact		Recorders	Doctor.Jodie Benton					Permits		
35-3-0159	TNWP-OS1 with PAD	AGD	55	624398	6431248	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Doctor.Jodie Benton					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0171	TNWP-ST15	AGD	55	623925	6430436	Open site	Valid	Modified Tree (Carved or Scarred) : 1		102792
	Contact	**Recorders**	Doctor.Jodie Benton					**Permits**		
35-3-0172	TNWP-ST16	AGD	55	623929	6430430	Open site	Valid	Modified Tree (Carved or Scarred) : 1		102792
	Contact	**Recorders**	Doctor.Jodie Benton					**Permits**		
35-3-0173	TNWP-ST17	AGD	55	622169	6428427	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Doctor.Jodie Benton					**Permits**		
35-3-0193	Narromine Scarred Tree	GDA	55	618713	6432416	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Mr.John Shipp					**Permits**		
35-3-0194	Dubbo-Naromine open site 1 PAD	GDA	55	623702	6430790	Open site	Partially Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Doctor.Jodie Benton,OzArk Environmental and Heritage Management					**Permits**	3548	
35-3-0208	GDM 3	GDA	55	614423	6430236	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Ms.Vanessa Hardy,Cultural Heritage Connections Pty Ltd					**Permits**		
35-3-0199	Dubbo To Narromine ETL Scarred Tree 1 (DN-ST1)	GDA	55	620623	6431519	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		
35-3-0200	Dubbo To Narromine ETL Scarred Tree 2 (DN-ST2)	GDA	55	622574	6431206	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		
35-3-0201	Dubbo To Narromine ETL Scarred Tree 3 (DN-ST3)	GDA	55	623733	6430695	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		
35-3-0202	Dubbo To Narromine ETL Scarred Tree 4 (DN-ST4)	GDA	55	623906	6430651	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0205	Dubbo To Narromine ETL Scarred Tree 7 (DN-ST7)	GDA	55	624134	6430569	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		
35-3-0196	DUBBO - NARROMINE OPEN SITE 1 PAD	GDA	55	623702	6430790	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		
35-3-0195	DUBBO - NARROMINE OPEN SITE1 PAD	GDA	55	623702	6430790	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	OzArk Environmental and Heritage Management					**Permits**		
35-3-0206	GDM 1	GDA	55	614373	6429946	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Cultural Heritage Connections Pty Ltd,Mr.Benjamin Streat					**Permits**		
35-3-0207	GDM 2	GDA	55	614370	6430118	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Cultural Heritage Connections Pty Ltd,Mr.Benjamin Streat					**Permits**		
35-3-0213	Macquarie-OS1 Reburial	GDA	55	621225	6427848	Open site	Valid	Artefact : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management,Miss.Stephanie Rusden					**Permits**		
35-3-0210	Webbs Siding Road – Road Upgrade – Scarred Tree 3 (WS-RU-ST3)	GDA	55	622414	6430657	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management,Doctor.Chris Lovell					**Permits**		
35-3-0211	Webbs Siding Road – Road Upgrade – Scarred Tree 6 (WS-RU-ST6)	GDA	55	623048	6430506	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management,Doctor.Chris Lovell					**Permits**		
35-3-0212	Webbs Siding Road – Road Upgrade – Scarred Tree 5 (WS-RU-ST5)	GDA	55	621959	6430814	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management,Doctor.Chris Lovell					**Permits**		
35-3-0241	MRST35	GDA	55	622058	6431941	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
35-3-0242	MRN AS5	GDA	55	621908	6432275	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
35-3-0243	MRN AS4	GDA	55	621546	6432625	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0244	MRST29	GDA	55	622207	6431375	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0245	MR Shelter Tree	GDA	55	622058	6431918	Open site	Valid	Habitation Structure : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0246	MRST36	GDA	55	622261	6431309	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0247	MRST34	GDA	55	621623	6431666	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0248	MRST33	GDA	55	621939	6431555	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0249	MRST32	GDA	55	621918	6431545	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0250	MRST31	GDA	55	622138	6431341	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0251	MR ASD1	GDA	55	623468	6432923	Open site	Valid	Artefact : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0252	MRW1	GDA	55	621050	6433035	Open site	Valid	Artefact : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0253	MRST37	GDA	55	622565	6431213	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0254	MRST30	GDA	55	622139	6431382	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0255	MRWST3	GDA	55	621285	6432776	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0256	MRW ST1	GDA	55	620586	6433434	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0257	Macquarie River Crossing	GDA	55	622453	6431660	Open site	Valid	Aboriginal Ceremony and Dreaming : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0258	MRN AS2	GDA	55	620436	6433476	Open site	Valid	Artefact : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0259	MRN AS1	GDA	55	620542	6433468	Open site	Valid	Artefact : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0260	MR PAD 1	GDA	55	621981	6431805	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0261	MRNOQ1	GDA	55	620428	6433532	Open site	Valid	Ochre Quarry : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0262	MRNST2	GDA	55	621493	6432634	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0263	BCST8	GDA	55	620867	6429600	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0264	BCST9	GDA	55	620829	6429603	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0265	BCST1	GDA	55	621258	6431560	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0266	BCST5	GDA	55	620892	6429544	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0267	BCST2	GDA	55	622050	6427193	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0268	BCST3	GDA	55	622024	6427172	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0269	BCST4	GDA	55	622035	6427151	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0270	BCST6	GDA	55	621180	6429772	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0271	Backwater Cowal ST7	GDA	55	620895	6429605	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0272	MRW AS2	GDA	55	620309	6433122	Open site	Valid	Artefact : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0273	MRNST	GDA	55	621119	6433186	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0240	MRST1	GDA	55	621387	6431671	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0281	MRNST3	GDA	55	622783	6432798	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0282	MRNST4	GDA	55	622858	6432284	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0233	MRST22	GDA	55	622374	6431376	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0234	MRST23	GDA	55	622296	6431288	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0235	MRST24	GDA	55	622294	6431279	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0236	MRST28	GDA	55	622235	6431382	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0237	MRST25	GDA	55	622248	6431316	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0238	MRST26	GDA	55	622256	6431386	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0239	MRST27	GDA	55	622246	6431378	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0214	MRST20	GDA	55	622349	6431318	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0215	MRST19	GDA	55	622305	6431282	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0216	MRST18	GDA	55	622505	6431282	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0217	MRST17	GDA	55	622508	6431303	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0218	MRST2	GDA	55	621586	6431728	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0219	MRST3	GDA	55	621685	6431722	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0220	MRST5	GDA	55	621795	6431757	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0221	MRST4	GDA	55	621795	6431721	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0222	MRST7	GDA	55	621821	6431754	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0223	MRST8	GDA	55	621863	6431770	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0224	MRST9	GDA	55	621902	6431689	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0225	MRST10	GDA	55	622116	6431882	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
35-3-0226	MRST11	GDA	55	622406	6431659	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0227	MRST13	GDA	55	622613	6431246	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0228	MRST12	GDA	55	622667	6431286	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0229	MRST14	GDA	55	622602	6431241	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0230	MRST15	GDA	55	622700	6431221	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0231	MRST16	GDA	55	622918	6431023	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0232	MRST21	GDA	55	622350	6431333	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Jacobs Group (Australia) Pty Ltd - Nev					Permits		
35-3-0278	Backwater Cowal ASS1	GDA	55	621072	6429737	Open site	Valid	Artefact : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0279	Backwater Cowal ASS2	GDA	55	621069	6429741	Open site	Valid	Artefact : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
35-3-0280	BCPAD1;	GDA	55	621072	6429737	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1a.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 114

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : IA191801 section 1b

Client Service ID : 489123

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
27-6-0036	Ewenmar Creek PAD1	GDA	55	630365	6461514	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0009	Ewenmor Creek;	AGD	55	629416	6462494	Open site	Valid	Modified Tree (Carved or Scarred) : -	Carved Tree	65
	Contact	**Recorders**	Australian Museum					**Permits**		
27-6-0048	Ewenmar Creek AS1	GDA	55	630028	6461546	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0035	Ewenmar Creek ST1	GDA	55	630340	6461526	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0049	EC(cache)	GDA	55	631432	6461818	Closed site	Valid	Artefact : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0050	Ewenmar Creek ST2	GDA	55	630394	6461521	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1b.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 6

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : IA191801 Section 1c

Client Service ID : 489125

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
27-6-0037	Boothaguy Creek ST11	GDA	55	641088	6491715	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0038	Boothaguy Creek ST10	GDA	55	641153	6491891	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0039	Boothaguy Creek ST9	GDA	55	641248	6492558	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0040	Boothaguy Creek ST8	GDA	55	641162	6491916	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0041	Boothaguy Creek ST7	GDA	55	641089	6491710	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0042	Boothaguy Creek ST6	GDA	55	640743	6489617	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0043	Boothaguy Creek ST5	GDA	55	640205	6489753	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0044	Boothaguy Creek ST4	GDA	55	640185	6489754	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0045	Boothaguy Creek ST3	GDA	55	640170	6489742	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0046	Boothaguy Creek ST2	GDA	55	640185	6489730	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1c.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 12

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : IA191801 Section 1c

Client Service ID : 489125

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
27-6-0047	Boothaguy Creek ST1	GDA	55	640225	6489651	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
27-6-0034	Marthugay Creek IF1	GDA	55	640773	6496566	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_1c.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 12

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : N2N 2 Middle

Client Service ID : 488846

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
28-4-0030	MS-ST-01	AGD	55	644800	6503370	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0031	MS-ST-02	AGD	55	644820	6503382	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0032	MS-ST-03	AGD	55	644750	6503490	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0033	MS-ST-04	AGD	55	644750	6503490	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0034	MS-ST-05	AGD	55	644780	6503580	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0035	MS-ST-06	AGD	55	644830	6503630	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0036	MS-ST-07	AGD	55	644820	6503550	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0037	MS-ST-08	AGD	55	644760	6503730	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0038	MS-ST 09	AGD	55	644730	6503520	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0040	MS-ST-11	AGD	55	644730	6506320	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_2.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 67

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
28-4-0041	MS-ST-12	AGD	55	644640	6503520	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0042	MS-ST-13	AGD	55	644640	6503520	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0043	MS-ST-14	AGD	55	643810	6502320	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0044	MS-ST-15	AGD	55	644690	6502470	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0045	MS-ST-16	AGD	55	644070	6502810	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0046	MS-ST17	AGD	55	644180	6502810	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
Contact		Recorders	Lloyd Nolan					Permits		
28-4-0004	Curban;	AGD	55	653000	6510000	Open site	Valid	Artefact : -	Open Camp Site	
Contact		Recorders	L Richardson					Permits		
28-1-0006	Galargambone Creek;	AGD	55	657200	6529400	Open site	Valid	Artefact : -	Open Camp Site	
Contact		Recorders	Sabu Dunn					Permits		
28-4-0283	Berida Road ST1	GDA	55	643367	6502663	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
28-4-0284	Berida Road ST2	GDA	55	643500	6502784	Open site	Valid	Modified Tree (Carved or Scarred) : -		
Contact		Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
28-1-0094	NB-AS-02	GDA	55	674514	6565374	Open site	Valid	Artefact : -		
Contact		Recorders	Mr.Neville Baker,Sydney Water-Parramatta					Permits		
28-1-0095	NB-AS-04	GDA	55	675312	6563345	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_2.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 67

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : N2N 2 Middle

Client Service ID : 488846

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
28-1-0096	NB-AS-03	GDA	55	674435	6564814	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
28-1-0093	NB-AS-05	GDA	55	674090	6555720	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
28-1-0022	BBS; Coonamble LALC; Tenandra Forrest ST1	AGD	55	662883	6545724	Open site	Valid	Modified Tree (Carved or Scarred) : 1		98925
	Contact	**Recorders**	Phil Purcell,Archaeological Surveys & Salvage ,Coonamble LALC - BBS Survey team					**Permits**		
28-1-0023	BBS; Coonamble LALC; Parmedman ST1	AGD	55	668442	6552525	Open site	Valid	Modified Tree (Carved or Scarred) : 1		98925
	Contact	**Recorders**	Phil Purcell,Archaeological Surveys & Salvage ,Coonamble LALC - BBS Survey team					**Permits**		
28-4-0039	MS-ST-10	AGD	55	644730	6506320	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	**Recorders**	Lloyd Nolan					**Permits**		
28-1-0039	Nemzie Burial 1	GDA	55	655214	6529860	Open site	Valid	Burial : 1		
	Contact	**Recorders**	Phil Purcell					**Permits**		
28-1-0040	Melville HillST1	AGD	55	674236	6562929	Open site	Valid	Modified Tree (Carved or Scarred) : 1		103088
	Contact	**Recorders**	Mr.Patrick Gaynor					**Permits**		
28-1-0083	Mungery Creek ST6	GDA	55	671059	6552027	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0084	Mungery Creek ST5	GDA	55	671042	6552074	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0085	Mungery Creek ST4	GDA	55	670557	6551849	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0086	Mungery Creek ST3	GDA	55	670924	6551814	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_2.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 67

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
28-1-0087	Mungery Creek ST2	GDA	55	670911	6551741	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0088	Mungery Creek ST 1	GDA	55	669941	6552126	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0089	Gulargambone Creek ST1	GDA	55	659713	6527784	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0097	Mt. Tenandra Artefact Scatter	GDA	55	666520	6543000	Open site	Valid	Artefact : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management,Mr.Kirwan Williams					**Permits**		
28-1-0090	Gulargambone Creek PAD2	GDA	55	659703	6528212	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0091	Gulargambone Creek PAD1	GDA	55	660031	6527565	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
28-1-0057	Tenandra Creek AFT2	GDA	55	666620	6546442	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
28-1-0058	Table Top Mountain/Noonbar Creek ACD	GDA	55	675297	6565119	Open site	Valid	Aboriginal Ceremony and Dreaming : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
28-1-0059	Calga Creek AFT and PAD	GDA	55	675529	6563192	Open site	Valid	Aboriginal Resource and Gathering : -, Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
28-1-0061	Tenandra Creek AFT1 PAD	GDA	55	666651	6546651	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
28-4-0280	Castlereagh River North Terrace AFT and PAD	GDA	55	650283	6510470	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_2.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 67

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0062	Box Ridge Road ST1	GDA	55	663875	6539327	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0063	Box Ridge Road ST2	GDA	55	663603	6539278	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0064	Box Ridge Road ST3	GDA	55	663365	6539240	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0065	Calga Creek ST1	GDA	55	675949	6563177	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0066	Tenandra Creek IF4	GDA	55	666726	6546177	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0067	Tenandra Creek IF3	GDA	55	666558	6545928	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0068	Tenandra Creek IF1	GDA	55	666875	6545798	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0069	Tenandra Creek ST1	GDA	55	666596	6546262	Open site	Valid	Aboriginal Resource and Gathering : -, Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-4-0281	Castlereagh River Terrace ST2	GDA	55	650309	6510084	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-4-0282	Castlereagh River Terrace ST1	GDA	55	650409	6510472	Open site	Valid	Aboriginal Resource and Gathering : -, Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_2.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 67

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
28-1-0070	Tenandra Creek ST2	GDA	55	666690	6546292	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0071	Tenandra Creek IF2	GDA	55	666699	6545861	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0072	Tenandra Creek AFT4	GDA	55	666653	6545827	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0073	Tenandra Creek AFT3	GDA	55	666713	6546265	Open site	Valid	Aboriginal Resource and Gathering : -, Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0074	Tenandra Creek ST3	GDA	55	666567	6546081	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0075	Tenandra Creek ST4	GDA	55	666563	6546074	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0076	Tenandra Creek ST5	GDA	55	666566	6545999	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0077	Tenandra Creek ST6	GDA	55	666568	6545998	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0078	Tenandra Creek ST8	GDA	55	666557	6545976	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0079	Tenandra Creek ST7	GDA	55	666567	6545994	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
28-1-0080	Calga Creek ST2	GDA	55	675421	6563403	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_2.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 67

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : N2N 2 Middle

Client Service ID : 488846

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
28-1-0081	Tenandra Creek ACD2	GDA	55	666563	6545988	Open site	Valid	Aboriginal Ceremony and Dreaming : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
28-1-0082	Tenandra Creek ACD1	GDA	55	666564	6546079	Open site	Valid	Aboriginal Ceremony and Dreaming : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_2.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 67

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : N2N 3 North

Client Service ID : 488847

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
19-3-0003	Dangar Village, Old Mission Cemetery	AGD	55	763021	6642000	Open site	Valid	Burial : -, Aboriginal Ceremony and Dreaming : -		
	Contact	**Recorders**	Ray Kelly,Mr.Terry Donovan,Bill Trindal					**Permits**		
19-3-0019	WN25 Narrabri;	AGD	55	764224	6644978	Open site	Valid	Artefact : -	Open Camp Site	84
	Contact	**Recorders**	Rex Silcox					**Permits**		
19-4-0003	Carmel;	AGD	55	683118	6581805	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Glen Morris					**Permits**		
19-4-0004	Bilambil;Biambil;	AGD	55	684945	6581739	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Glen Morris					**Permits**		
19-4-0005	Berdeen;Berdeen Homestead;	AGD	55	689512	6581576	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	
	Contact	**Recorders**	Glen Morris					**Permits**		
19-5-0010	Pilliga 8 Baradine State Forest	AGD	55	694250	6583500	Open site	Valid	Artefact : -	Open Camp Site	1068,1991
	Contact	**Recorders**	Jane Balme,Katrina Geering,Colin Roberts,Dan Witter					**Permits**		
19-5-0011	Cumbil Creek;	AGD	55	698300	6592600	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Katrina Geering,Colin Roberts					**Permits**		
19-5-0012	Cumbil Creek_2;	AGD	55	698300	6592610	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Katrina Geering,Colin Roberts					**Permits**		
19-5-0013	Cumbil Creek_3;Cumbil State Forest 812;	AGD	55	698300	6592620	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0014	Cumbil Creek_4;Cumbil State Forest 812;	AGD	55	698300	6592623	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0015	Cumbil Creek_5;Cumbil State Forest 812;	AGD	55	698250	6592750	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0016	Cumbil Creek_6;Cumbil State Forest 812;	AGD	55	698300	6592750	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_3.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 93

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : N2N 3 North

Client Service ID : 488847

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0017	Cumbil Creek_7;Cumbil State Forest 812;	AGD	55	698340	6592750	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0018	Cumbil Creek_8;Cumbil State Forest 812;	AGD	55	698370	6592740	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0019	Cumbil Creek_9;Cumbil State Forest 812;	AGD	55	698350	6592750	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Katrina Geering					**Permits**		
19-5-0020	Cumbil Creek_10;Cumbil State Forest 812;	AGD	55	698400	6592800	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Katrina Geering,Colin Roberts					**Permits**		
19-5-0021	Cumbil Creek_11;Cumbil State Forest 812;	AGD	55	698500	6592750	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0022	Cumbil Creek_12;Cumbil State Forest 812;	AGD	55	698500	6592740	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0023	Baradine Road 2;Baradine State Forest 672;	AGD	55	694150	6582700	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	2236
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0024	Baradine Road 3;Baradine State Forest 672;	AGD	55	694200	6582690	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0025	Baradine Road 1;Baradine State Forest 672;	AGD	55	694120	6582700	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	**Recorders**	Colin Roberts					**Permits**		
19-5-0052	Cumbil Creek Campsite;	AGD	55	698630	6590950	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Katrina Geering,Colin Roberts					**Permits**		
19-5-0064	Two Dips	AGD	55	698230	6592630	Open site	Valid	Artefact : -	Open Camp Site	

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_3.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 93

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : N2N 3 North

Client Service ID : 488847

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Katrina Geering,Colin Roberts					**Permits**		
19-5-0068	Springfield Campsite;	AGD	55	692300	6584650	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Katrina Geering					**Permits**		
19-5-0069	Springfield Burial Ground;	AGD	55	692250	6584680	Open site	Valid	Burial : -	Burial/s	
	Contact	**Recorders**	Katrina Geering					**Permits**		
19-3-0171	NRST1	GDA	55	764392	6641819	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0172	NRST2	GDA	55	764440	6641785	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0173	NRST3	GDA	55	764500	6641803	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0174	NRST4	GDA	55	764439	6641854	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0175	NRST5	GDA	55	764366	6641898	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0176	NRST6	GDA	55	764464	6641742	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0177	NRST9	GDA	55	764464	6641958	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0178	NRST8	GDA	55	764297	6641643	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0179	NRST7	GDA	55	764271	6641773	Open site	Valid	Modified Tree (Carved or Scarred) : -		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_3.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 93

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : N2N 3 North
Client Service ID : 488847

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0002	Dangar Village Narrabri	AGD	55	765359	6640819	Open site	Valid	Burial : -	Burial/s	
	Contact	**Recorders**	Harry Creamer					**Permits**		
19-6-0171	NB-AS-13	GDA	55	747729	6620934	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
19-6-0172	NB-AS-14	GDA	55	748690	6619726	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
19-6-0173	NB-AS-15	GDA	55	747556	6621185	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
19-6-0174	NB-AS-16	GDA	55	747487	6621351	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
19-3-0180	NB-AS-17	GDA	55	759893	6633802	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
19-6-0175	NB-AS-12	GDA	55	748181	6620200	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
19-6-0176	NB-AS-11	GDA	55	748374	6620069	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Neville Baker,Sydney Water-Parramatta					**Permits**		
19-5-0007	Kienbri Aboriginal Spring	AGD	55	694950	6585314	Open site	Valid	Water Hole : -	Water Hole/Well	
	Contact	**Recorders**	Sabu Dunn					**Permits**		
19-6-0036	BBS; Pilliga East SF; Bohena Creek Drainage Area A1	AGD	55	753716	6620662	Open site	Valid	Artefact : 1		97843
	Contact	**Recorders**	Phil Purcell,Janice Wilson					**Permits**		
19-5-0110	BBS; Cumbil SF; Coolangoola Creek Drainage Area A1	AGD	55	699200	6585150	Open site	Valid	Artefact : 3		97843
	Contact	**Recorders**	Phil Purcell,Leila McAdam					**Permits**		
19-5-0111	BBS; Cumbil SF; Coolangoola Creek Drainage Area A2	AGD	55	698590	6585900	Open site	Valid	Artefact : 1		97843
	Contact	**Recorders**	Phil Purcell,Janice Wilson					**Permits**		
19-5-0112	BBS; Cumbil SF; Coolangoola Creek Drainage Area A3	AGD	55	697900	6586000	Open site	Valid	Artefact : 23		97843
	Contact	**Recorders**	Phil Purcell,Janice Wilson					**Permits**		
19-5-0113	BBS; Cumbil SF; Coolangoola Creek Drainage Area A4	AGD	55	697800	6588120	Open site	Valid	Artefact : 1		97843
	Contact	**Recorders**	Phil Purcell,Leila McAdam					**Permits**		
19-5-0115	BBS; Cumbil State Forest G1	AGD	55	700142	6588970	Open site	Valid	Artefact : 40		97843
	Contact	**Recorders**	Phil Purcell,Archaeological Surveys & Salvage ,Janice Wilson					**Permits**		
19-5-0116	BBS; Cumbil State Forest A1	AGD	55	700289	6589057	Open site	Valid	Artefact : 40		97843
	Contact	**Recorders**	Phil Purcell,Archaeological Surveys & Salvage ,Janice Wilson					**Permits**		
19-5-0117	BBS; Cumbil SF; Cumbil Creek Drainage Area A2	AGD	55	698160	6592083	Open site	Valid	Artefact : 1		97843

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Phil Purcell,Janice Wilson,Leila McAdam					Permits		
19-5-0121	BBS; Cumbil SF; Cumbil Creek Drainage Area ST1	AGD	55	700050	6589013	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Phil Purcell,Leila McAdam					Permits		
19-5-0123	BBS; Cumbil SF; Etoo Creek Drainage Area A1	AGD	55	702825	6590682	Open site	Valid	Artefact : 4		97843
	Contact	Recorders	Phil Purcell,Leila McAdam					Permits		
19-5-0078	BBS; Pilliga LALC; Rocky Ck 1	AGD	55	723742	6611585	Open site	Valid	Artefact : 2		99067
	Contact	Recorders	Leila McAdam,Pilliga LALC					Permits		
19-5-0092	BBS; Talluba Creek Drainage Area A1	AGD	55	718005	6607770	Open site	Valid	Artefact : 109		97843
	Contact	Recorders	Phil Purcell,Leila McAdam					Permits		
19-6-0032	BBS; Les Trindle's Hut Historical Site	AGD	55	741600	6622100	Open site	Valid	Habitation Structure : 1		97843
	Contact	Recorders	Phil Purcell,Archaeological Surveys & Salvage					Permits		
19-5-0106	BBS; Baradine Convict Road	AGD	55	694989	6581725	Open site	Valid	Habitation Structure : 1		97843
	Contact	Recorders	Archaeological Surveys & Salvage					Permits		
19-5-0053	Keinbri Campsite_1;Merriwindi_SF 839;	AGD	55	694200	6586000	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Katrina Geering,Colin Roberts					Permits		
19-3-0133	Collins Park site 2 artefacts	GDA	55	767429	6641486	Open site	Valid	Artefact : 5, Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mr.Allison Stewart					Permits		
19-3-0136	Collins Park site 1 artefact	GDA	55	767458	6641465	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Allison Stewart					Permits		
19-3-0163	Silverleaf IF-1	GDA	55	766916	6647274	Open site	Valid	Artefact : -		104286
	Contact	Recorders	OzArk Environmental and Heritage Management,Doctor.Alyce Cameron					Permits		
19-3-0164	Silverleaf IF-2	GDA	55	767094	6647233	Open site	Valid	Artefact : -		104286
	Contact	Recorders	OzArk Environmental and Heritage Management,Doctor.Alyce Cameron					Permits		
19-3-0165	William Haines Grave	GDA	55	753765	6624219	Open site	Valid	Burial : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
19-6-0170	Bohena Creek IF1	GDA	55	747488	6622595	Open site	Valid	Artefact : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		
19-3-0166	Bohena Creek IF2	GDA	55	759311	6633054	Open site	Valid	Artefact : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					Permits		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
19-3-0167	Bohena Creek ST1	GDA	55	759446	6632981	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0168	Bohena Creek PAD2	GDA	55	759539	6633739	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0169	Bohena Creek PAD1	GDA	55	759458	6633363	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0170	NM AS1	GDA	55	763091	6642134	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts					**Permits**		
19-3-0184	Namoi River Scar tree	GDA	55	766474	6639342	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Paul Houston,Mr.Steven Booby					**Permits**		
19-3-0185	Namoi River IF	GDA	55	766653	6639633	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Paul Houston,Mr.Steven Booby					**Permits**		
19-3-0186	Namoi River IF 2	GDA	55	766653	6639625	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Paul Houston,Mr.Steven Booby					**Permits**		
19-3-0187	Namoi River Artefact with Pattern	GDA	55	766975	6639584	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Paul Houston,Mr.Steven Booby					**Permits**		
19-5-0223	Baradine Creek IF1	GDA	55	695077	6582549	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
19-5-0224	Baradine Creek IF2	GDA	55	695083	6582543	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
19-5-0225	Cumbil Forest Creek GDG2	GDA	55	700344	6589154	Open site	Valid	Grinding Groove : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
19-5-0226	Baradine Creek AS1	GDA	55	695066	6582494	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
19-5-0227	Coolanger Creek IF1	GDA	55	698282	6586037	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
19-5-0228	Baradine Creek IF3	GDA	55	695026	6582956	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
19-5-0229	Cumbil Forest Creek GDG1	GDA	55	700328	6589176	Open site	Valid	Grinding Groove : -		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0230	Baradine Creek PAD	GDA	55	695019	6582711	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0231	Coolanger Creek IF4	GDA	55	698268	6586058	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0232	Coolanger Creek IF3	GDA	55	698299	6586005	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0233	Coolanger Creek IF2	GDA	55	699204	6585253	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0234	Etoo Creek ST2	GDA	55	702414	6595566	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0235	Etoo Creek ST1	GDA	55	702041	6596022	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0236	Baradine Creek ST2	GDA	55	695050	6582610	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0237	Baradine Creek ST1	GDA	55	694990	6583099	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0238	Baradine Creek ST3	GDA	55	694517	6582915	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0239	Etoo Creek ST3	GDA	55	702226	6595652	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		
19-5-0240	Etoo Creek ST4	GDA	55	702378	6595374	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Peter Saad					Permits		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_3.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 93

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : N2N 3 North

Client Service ID : 488847

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
19-5-0241	Coolanger Creek IF5	GDA	55	699460	6584816	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Saad					**Permits**		
19-3-0183	WSP-HTH15	GDA	55	751193	6624594	Open site	Valid	Hearth : -		
	Contact	**Recorders**	Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats					**Permits**		

Report generated by AHIMS Web Service on 05/03/2020 for Alison Lamond for the following area at Search using shape-file NSW_N2N_InvestigationCorridor_Phase_2_AOI_3.SHP with a buffer of 0 meters. Additional Info : Arch Assessment. Number of Aboriginal sites and Aboriginal objects found is 93

TECHNICAL REPORT

6

Aboriginal cultural heritage assessment report

Appendix C AHIMS site cards

NARROMINE TO NARRABRI ENVIRONMENTAL IMPACT STATEMENT

Appendix C – AHIMS site cards

SENSITIVE INFORMATION REMOVED FOR PUBLIC DISPLAY

TECHNICAL REPORT

6

Aboriginal cultural heritage assessment report

Appendix D Targeted archaeological survey and test excavation methodologies

NARROMINE TO NARRABRI ENVIRONMENTAL IMPACT STATEMENT

ARTC Inland Rail

Narromine to Narrabri (N2N)

Targeted Archaeological Survey Methodology

Revision 0

2-0001-250-ECH-00-PR-0001.docx

March 2019

Document control	
Client	Australian Rail Track Corporation
Project:	Narromine to Narrabri (N2N)
Document title:	Targeted Archaeological Survey Methodology
Date issued:	14 March 2019
Revision:	0
Prepared by:	Andy Roberts
Purpose:	Archaeological methodology for targeted surveys
Reviewed by:	Fiona Leslie
Approved by:	Simon Pearce
Date approved:	14 March 2019
Issued to:	Australian Rail Track Corporation
Filename:	2-0001-250-ECH-00-PR-0001.docx
Status	Final

Revision	Date issued	Description
A	21/02/2019	Draft for ARTC Review
B	08/03/2019	Revision after ARTC review
0	14/03/2019	Final

Table of contents

Table index

Acronyms

Acronym	Definition
ACHA	Aboriginal Cultural Heritage Assessment
AFG	Aboriginal focus group
AHIMS	Aboriginal Heritage Information Management System
ARTC	Australian Rail Track Corporation
EIS	Environmental impact Statement
LALC	Local Aboriginal Land Council
NNWW Native Title Group	Ngemba, Ngiyampaa, Wangaaypuwan & Wailwan Native Title Group
NSW	New South Wales
OEH	Office of Environment and Heritage
PAD	Potential archaeological deposit

1. Introduction

Australian Rail Track Corporation Ltd (ARTC) is seeking approval to construct and operate the Narromine to Narrabri section of Inland Rail (the proposal). The proposal consists of about 300 kilometres of new railway to accommodate double stack freight trains up to 1,800 metres long. This document presents an archaeological survey methodology for Aboriginal objects and places for the proposal.

The methodology outlined in this document for the archaeological survey is generally consistent with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage (the Guide) (OEH 2011).

The methodology is also informed by the results of an archaeological survey conducted to inform the *Aboriginal Heritage Due Diligence Assessment of Geotechnical Investigation Work* completed by JacobsGHD in February 2019. This methodology is provided to seek comment from Registered Aboriginal Parties (RAPs) including representatives from the eight Local Aboriginal Land Councils and two Native Title groups. These will be discussed at the second proposed Aboriginal Focus Group (AFG) meeting to be held in March 2019.

2. Targeted survey of areas with cultural sensitivity

The targeted archaeological survey will be undertaken in accordance with requirements of the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). A site inspection of known and potential Aboriginal objects, sites and potential archaeological deposits (PADs) within the proposal corridor will be undertaken to confirm Aboriginal heritage constraints identified as part of the desktop and preliminary site assessments. This will be conducted where property access has been confirmed and involve the RAPs that have been identified in the process as outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment Climate Change and Water (DECCW) 2010).

The targeted archaeological survey will provide opportunities to investigate key registered Aboriginal heritage sites, objects and places as well as areas identified through predictive modelling and in consultation with Aboriginal stakeholders as having the potential to contain Aboriginal objects or other forms of significance. Additionally, it will concentrate on the nineteen culturally sensitive areas identified during the *Aboriginal Heritage Due Diligence Assessment of Geotechnical Investigation Work* (refer to Appendix A).

The field survey will be undertaken in company with Aboriginal knowledge holders and will aim to strategise ways that potential impacts to significant places, sites and objects can be avoided. The objective of the survey would therefore be to identify and map any new Aboriginal sites and PADs, verify the location and extent of existing Aboriginal sites and PADs, and conduct consultation with the nominated RAPs with regard to recommendations for the mitigation of impact to Aboriginal archaeological values.

The survey strategy will involve targeting known Aboriginal sites, sites identified as having cultural values to the Aboriginal community and those areas identified as having medium to high sensitivity through predictive modelling.

The following tasks will be undertaken as part of the targeted archaeological survey for the proposal:

- Inspection of the registered Aboriginal sites and places known to be located within the proposal corridor will be undertaken to validate the existing listings. The targeted archaeological survey will be conducted with a nominated team of Aboriginal site officers identified throughout the consultation process outlined above in liaison with the ARTC Aboriginal Cultural Heritage Officer.
- Inspection of areas identified as having medium to high archaeological potential indicated through the preliminary research and predictive modelling completed as part of the desktop review will also be assessed where property access is possible. Where significant archaeology is indicated a field assessment will take place in company with relevant RAPs.
- Inspection of areas identified during consultation with Aboriginal knowledge holders and native title claimants as having cultural significance will be assessed and documented where appropriate and where property access is possible.
- The site inspections will clarify the potential for impacts to Aboriginal heritage from the proposal and investigate strategies for mitigating impact.
- OEH Aboriginal Heritage Information Management System (AHIMS) site recording forms will be completed for all newly identified Aboriginal sites, objects and places including areas of PAD.

Targeted archaeological survey and site inspection will allow for narrowing of the design corridor to identify a preferred corridor (plus ancillary areas) that will be used for the Aboriginal cultural heritage assessment that will be completed as part of the Environmental Impact Statement.

- A review of significance assessments for registered/known Aboriginal objects, places and sites.

2.1 Software/analytical tools

We will use the following software and analytical tools for the targeted archaeological survey:

- Collector or Avenza mapping
- ArcView or WebGIS
- Cameras and photo scales
- Google Earth
- Theodolite and survey tools.

2.2 Base data

Base data sets required for the targeted archaeological survey will include:

- All relevant spatial data of the study area in the above form, including heritage items identified in preliminary investigations and consultation
- Aerial imagery of the study area
- Relevant background archaeological, ethnographic and other literature.

2.3 Field program

2.3.1 Scope

The targeted archaeological survey would initially target listed Aboriginal sites, objects and places within, and in the vicinity of, the proposal. This survey is however limited by property access permissions. These proposed areas for targeted survey are summarised in Table 2.1, Table 2.2 and Table 2.3. Initially areas with listed Aboriginal heritage items will be targeted as shown in Table 2.1.

Table 2.1 Listed Aboriginal heritage items in the vicinity of the study area (listed from south to north)

Item Name	Location	Listing and Significance	Distance from proposal centre line	Property ID	Local Aboriginal Land Council
35-3-0011	Backwater Cowal Creek	Grave marker: High	650 m	3156064	Narromine
35-3-0184 35-3-0183	Wallaby Creek	Scarred trees: High	30-40 m	2674203	Narromine
35-3-0177 35-3-0176 35-3-0174 35-3-0173	Unnamed Creek flowing into Backwater Cowal Creek	Scarred trees: High	170 m 60 m 60 m 70 m	RR	Narromine

Item Name	Location	Listing and Significance	Distance from proposal centre line	Property ID	Local Aboriginal Land Council
35-3-0175	Near Dappo Road	Scarred tree: High	3 m	3930053	Narromine
35-3-0213		Artefact reburial site: Low	850 m	3930053	
35-3-0212	Backwater Cowal Creek	Scarred trees: High	400-600 m	3915794	Narromine
35-3-0021	Macquarie River	Canoe tree: High	40 m	3448629	Narromine
35-3-0200		Scarred trees: High	1.5 km	RR	
35-3-0201			350 m	3448629	
35-3-0210			50 m	3915794	
35-3-0211			640 m	RR	
35-3-0019			1.05 km	2674218	
35-3-0020			820 m	2674218	
35-3-0004		Grinding groove	1.9 km	I n river	
28-4-0030 28-4-0031 28-4-0032 28-4-0033 28-4-0034 28-4-0035 28-4-0036 28-4-0037 28-4-0038 28-4-0041 28-4-0042 28-4-0043 28-4-0044	Curban Berida Road	Scar Trees High	200-600 m	3575072	Gilgandra
19-5-0023 19-5-0024 19-5-0025	Baradine Creek	Scarred trees High	480 m	3847672	Baradine
19-5-0106	Baradine Creek	Convict Road	590 m	2628603	Baradine
19-5-0110	Coolangla Creek	open site/artefact	230 m	3838830	Baradine
19-5-0111	Coolangla Creek	open sites/artefact	640 m	3669604	Baradine
19-5-0121			190 m		
19-5-0115			80 m		
19-5-0116			20 m		
19-3-0003	Namoi River	Burial/Dangar Village, Old Mission cemetery	920 m	2654806	Narrabri

The targeted archaeological survey would also sequentially target potential Aboriginal objects, site and identified by the preliminary desktop assessment and predictive modelling where property access is available (refer to Table 2.2).

Table 2.2 Areas with high sensitivity for Aboriginal cultural heritage eithin the survey area for the proposal (after Ridges 2010)

Catchment Area	LALC area	Native Title Group	Sensitivity for Aboriginal heritage being present
Wallaby Creek	Narromine	n/a	High
Backwater Cowal Creek	Narromine	n/a	High
Macquarie River	Narromine	n/a	High
Ewenmar Creek	Gilgandra and Narromine	Gomeroi	High
Goulburn Creek	Gilgandra	Gomeroi	High
Marthaguy Creek	Gilgandra	Gomeroi	High
Castlereagh River	Gilgandra and Weilwan	Gomeroi	High
Judes Creek	Weilwan	Gomeroi	High
Mogie Melon and Paddys Creek confluence at Gulargambone Creek	Weilwan	Gomeroi	High
Baronne Creek	Weilwan, Gilgandra and Coonamble	Gomeroi	High
Tenandra Creek	Weilwan, Gilgandra and Coonamble	Gomeroi	High
Quanda Quanda Creek	Weilwan	Gomeroi	High
Salty Springs Creek	Weilwan	Gomeroi	High
Looking Glass Creek Calga creek	Coonabarabran and Coonamble	Gomeroi	High
Bucklanbah Creek	Baradine and Coonamble	Gomeroi	High
Teridgerie Creek	Baradine and Coonamble	Gomeroi	High
Baradine Creek	Baradine	Gomeroi	Moderate
Coolangla Creek	Baradine	Gomeroi	Moderate
Etoo Creek	Pilliga	Gomeroi	Moderate
Stockyard Creek	Pilliga	Gomeroi	High
Rocky Creek	Pilliga	Gomeroi	High
Talluba Creek	Pilliga	Gomeroi	Moderate
Bundock Creek	Narrabri	Gomeroi	Moderate
Bohena Creek	Narrabri	Gomeroi	Moderate
Namoi River	Narrabri	Gomeroi	Moderate

Additionally, the targeted archaeological survey will investigate in more detail culturally sensitive areas identified by the *Aboriginal Heritage Due Diligence Assessment of Geotechnical Investigation Work* undertaken in February where property access is available. The catchment

areas, sensitivity, size in hectares and recommendations for these areas is described below in Table 2.3.

Table 2.3 Culturally sensitive areas identified as part of the *Aboriginal Heritage Due Diligence Assessment of Geotechnical Investigation Work* (January 2019)

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation
Macquarie River: Webb's siding	Archaeological potential & scarred trees	347 ha	Geotechnical investigation be preceded by an archaeological test excavation under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) to ensure no archaeological deposits are impacted. The numerous scarred trees observed in this location will also need to be recorded and registered on AHIMS.
Backwater Cowal	Archaeological potential & scarred trees	164 ha	Full survey and registration of scarred trees (if identified). If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Ewenmar Creek	Archaeological potential & scarred trees	86.6 ha	Targeted survey of the wetland within 200 m of the current alignment to identify the extent of cultural and archaeological sensitivity If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment. The location and extent of the identified stone artefact scatter be registered on AHIMS once a more complete survey has been undertaken.
Goulburn Creek	Archaeological potential & scarred trees	35.5 ha	Full survey of the area be undertaken Aboriginal heritage sites including scarred trees and artefact scatters be registered (if identified) when property access is granted.
Boothaguy Creek	Cultural sensitivity for scarred trees	94 ha	Full survey of the road reserve be undertaken

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation
			Aboriginal heritage sites including the scarred tree and isolated artefact be registered Survey to identify the extent of features along Nancarrows Road between these sites and the Oxley Highway (a distance of approximately 5 km).
Castlereagh River: Curban Berida and Forans Road	Cultural sensitivity for scarred trees	460 ha	It is recommended that targeted survey be undertaken within 200 m of the alignment to identify and register any additional scarred trees and establish the nature and extent of cultural and archaeological sensitivity. If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to construction to inform the alignment.
Castlereagh River	Cultural sensitivity for scarred trees	15 ha	It is recommended that a full survey be undertaken, and registration of scarred trees be undertaken. If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Gulargambone Creek	Archaeological potential & scarred trees	195 ha	Targeted survey of the mature vegetation along Gulargambone Creek be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Baronne Creek: Box Ridge Road	Cultural sensitivity for scarred trees	47 ha	It is recommended that targeted survey of the mature vegetation along Baronne Creek be undertaken within 200 m of the alignment to identify and register scarred trees.

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation
			If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Mungery Creek	Archaeological potential & scarred trees	162 ha	Targeted survey of the mature vegetation along Mungery Creek be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity for scarred trees If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Looking Glass Creek / Calga Creek	Cultural sensitivity	62 ha	It is recommended that targeted survey of the mature vegetation be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and if identified, soils with archaeological potential be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to construction to inform the alignment.
Noonbar Creek	Archaeological potential & scarred trees	103 ha	Targeted survey of the ponded area along Mungery Creek be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Bucklanbah Creek	Archaeological potential	1000 ha	It is recommended that a full survey be undertaken of these areas, and if identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation
			submission of the EIS to inform the final alignment.
Cumbil Forest Creek	Archaeological and cultural sensitivity	0.5 ha	The proposal alignment should avoid the site and be placed to the west of the current crossing. It is recommended that targeted survey undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and if identified, soils with archaeological potential be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to construction to inform the alignment.
Etoo Creek	Cultural sensitivity	302 ha	It is recommended that targeted survey is undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and if identified, soils with archaeological potential be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to construction to inform the alignment.
Rocky Creek	Cultural sensitivity	300 ha	It is recommended that targeted survey be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and, if identified, soils with archaeological potential be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to construction to inform the alignment.
Goona Creek	Cultural sensitivity	158 ha	It is recommended that targeted survey undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and if identified, soils with archaeological potential be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to construction to inform the alignment.
Bohena Creek	Archaeological potential and scarred trees	147 ha	Targeted survey of the mature vegetation along Bohena Creek be undertaken within 200 m of the alignment to identify the extent of

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation
			cultural and archaeological sensitivity If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Namoi River	Archaeological potential and scarred trees	20.4 ha	Full survey and registration of scarred trees If identified, soils with archaeological potential should be test investigated under the *Code of practice for archaeological investigation of Aboriginal objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.

2.4 Timing and personnel

It is proposed to undertake the targeted survey throughout April 2019 in three (approximately 100 km) sections:**1: 1: Macquarie River to Gulargambone Creek:** incorporating the areas identified above as having high sensitivity for Aboriginal cultural heritage including Yellow Creek, Backwater Cowal Creek, Macquarie River, Ewenmar Creek, Goulburn Creek, Marthaguy Creek, Emogandry Creek, Kickabil Creek, Boothaguy Creek, Terrabile Creek, Judes Creek, Moggie Melon, Paddy's Creek, the Castlereagh River and Gulargambone Creek.

2: Gulargambone Creek to Etoo Creek: Incorporating Baronne Creek, Tenadra Creek, Parmiduean Creek, Salty Springs Creek, Looking Glass Creek, Mungery Creek, Calga Creek, Noonbar Creek, Bucklanbah Creek, Teridgerie Creek, Baradine Creek, Coolangla Creek and Cumbil Forest Creek.

3: Etoo Creek to Namoi River: Etoo Creek, Stockyard Creek, Rocky Creek, Talluba Creek, Goona Creek, Bundock Creek, Bohena Creek and Namoi River.

The survey will involve three groups operating separately under the direction of three archaeologists:

- Survey Area 1 will be directed by Andy Roberts in company with personnel from Weilwan, Gilgandra and Narromine Local Aboriginal Land Council (LALCs) as well as the Gomeroi and the Ngemba, Ngiyampaa, Wangaaypuwan & Wailwan (NNWW) native title groups and representatives from the RAPs.
- Survey Area 2 will be directed by Peter Saad in company with personnel from the Weilwan, Coonamble, Coonabarabran, Baradine and Pilliga LALCs and the Gomeroin native title group and representatives from the RAPs.
- Survey Area 3 will be directed by Neville Baker in company with personnel from the Pilliga and Narrabri LALCs and Gomeroi Native title groups and representatives from the RAPs.

It is proposed survey teams are made up of two each from the LALC and Native Title Groups and up to two from the RAPs for the proposal. Due to the large numbers of people registered

for the proposal the field staff will be chosen on a rotating basis so that everyone is given an equal share of the available work dates.

2.5 Reporting

The results of the targeted archaeological survey will be presented in a draft Aboriginal Cultural Heritage Assessment (ACHA) report. Copies of this report will be disturbed to RAPs for their comment and input. Following the receipt of comments from the RAPs the ACHA will be finalised and submitted to ARTC to inform the EIS being prepared for the proposal.

References

Australia ICOMOS (2000). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999.* Burwood, Victoria, Australia ICOMOS Incorporated.

Department of Environment, Climate Change and Water (DECCW) (2010). *Aboriginal Cultural Heritage Consultation Requirements for Proponents.* Sydney.

Environmental Protection and Biodiversity Conservation Act (1999). http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/

JacobsGHD (2019) *Aboriginal Heritage Due Diligence Assessment of Geotechnical Investigation Work.* Report prepared for Australia Rail Track Corporation for the Narromine to Narrabri Inland Rail Proposal.

Office of Environment and Heritage (OEH) (2011). *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*. Sydney, NSW Government.

Appendix A
Culturally sensitive areas

Appendix A Culturally sensitive areas

SENSITIVE INFORMATION REMOVED FOR PUBLIC DISPLAY

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GHD

ARTC Inland Rail

Narromine to Narrabri (N2N)

Aboriginal archaeological test excavation methodology

Revision 0

2-0001-250-ECH-00-RP-0003

March 2019

Document control	
Client	Australian Rail Track Corporation
Project:	Narromine to Narrabri (N2N)
Document title:	Aboriginal archaeological test excavation methodology
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Prepared by:	Andy Roberts
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Revision	Date issued	Description
A	4/3/2019	Aboriginal Archaeological Test Excavation Methodology
0	14/3/2019	Final update to address comments

Table of contents

Table index

Appendices

1. Introduction

Australian Rail Track Corporation Ltd (ARTC) is seeking approval to construct and operate the Narromine to Narrabri section of Inland Rail (the proposal). The proposal consists of about 300 kilometres of new railway to accommodate double stack freight trains up to 1,800 metres long. This document presents an archaeological test investigation methodology for areas of archaeological sensitivity identified in the proposal corridor for the proposal which is generally consistent with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) (CoP), related guidelines and requirements.

The purpose of this methodology is twofold:

Firstly, to have a methodology approved by Registered Aboriginal Parties, Local Aboriginal Land Councils and Native Title applicant groups for archaeological test investigation of Potential Archaeological Deposits (PADs) identified through:

- Desktop assessment.
- Predictive modelling
- Archaeological survey conducted to inform the *Aboriginal Heritage Due Diligence Assessment of Geotechnical Investigation Work* completed by JacobsGHD in February 2019
- Targeted surveys of culturally sensitive areas to be undertaken in April 2019

Secondly, the purpose of this methodology is to have it approved by Registered Aboriginal Parties, Local Aboriginal Land Councils and Native Title applicant groups in accordance with the CoP to investigate and confirm the absence of sub-surface archaeological deposits at two boreholes locations located in an identified culturally sensitive area on river terraces located along the Macquarie River to the east of Narromine, refer to Appendix 1.

This methodology is therefore provided to seek comment from Registered Aboriginal Parties (RAPs) including representatives from the eight Local Aboriginal Land Councils and two Native Title groups. The methodology will be discussed at the second proposed Aboriginal Focus Group (AFG) meeting to be held in mid-March 2019.

Table 1.1 outlines the areas with known cultural sensitivity identified as having archaeological potential within the proposal corridor. These are also shown in Appendix 1.

Table 1.1 Culturally sensitive areas identified during Due Diligence Aboriginal Heritage Assessment for Geotechnical works (January 2019)

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation for testing
Macquarie River: Webb's siding	Archaeological potential and scarred trees	347 ha	Geotechnical investigation be preceded by an archaeological test excavation under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)to ensure no archaeological deposits are impacted.

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation for testing
			The numerous scarred trees observed in this location will also need to be recorded and registered on AHIMS.
Backwater Cowal	Archaeological potential & scarred trees	164 ha	Full survey and registration of scarred trees (if identified). If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) prior to the submission of the Environmental Impact Statement (EIS) to inform the final alignment.
Ewenmar Creek	Archaeological potential and scarred trees	86.6 ha	Targeted survey of the wetland within 200 metres of the current alignment to identify the extent of cultural and archaeological sensitivity. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) prior to the submission of the EIS to inform the final alignment. The location and extent of the identified stone artefact scatter be registered on AHIMS once a more complete survey has been undertaken.
Goulburn Creek	Archaeological potential and scarred trees	35.5 ha	Full survey of the area be undertaken. Aboriginal heritage sites including scarred trees and artefact scatters be registered (if identified) when property access is granted. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)prior to the submission of the EIS to inform the final alignment.
Boothaguy Creek	Cultural sensitivity for scarred trees	94 ha	Full survey of the road reserve be undertaken. Aboriginal heritage sites including the scarred tree and isolated artefact be registered. Survey to identify the extent of features along Nancarrows Road between these

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation for testing
			sites and the Oxley Highway (a distance of approximately 5 km). If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Castlereagh River: Curban Berida and Forans Road	Cultural sensitivity for scarred trees	460 ha	It is recommended that targeted survey be undertaken within 200 m of the alignment to identify and register any additional scarred trees and establish the nature and extent of cultural and archaeological sensitivity. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)prior to construction to inform the alignment.
Castlereagh River	Cultural sensitivity for scarred trees	15 ha	It is recommended that a full survey be undertaken and registration of scarred trees be undertaken. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Gulargambone Creek	Archaeological potential and scarred trees	195 ha	Targeted survey of the mature vegetation along Gulargambone Creek be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)prior to the submission of the EIS to inform the final alignment.
Baronne Creek: Box Ridge Road	Cultural sensitivity for scarred trees	47 ha	It is recommended that targeted survey of the mature vegetation along Baronne Creek be undertaken within 200 m of the alignment to identify and register scarred trees.

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation for testing
			If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Mungery Creek	Archaeological potential and scarred trees	162 ha	Targeted survey of the mature vegetation along Mungery Creek be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity for scarred trees. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Looking Glass Creek / Calga Creek	Cultural sensitivity	62 ha	It is recommended that targeted survey of the mature vegetation be undertaken within 200 metres of the alignment to identify the extent of cultural and archaeological sensitivity. Soils with archaeological potential will be identified.
Noonbar Creek	Archaeological potential and scarred trees	103 ha	Targeted survey of the ponded area along Mungery Creek be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Bucklanbah Creek	Archaeological potential	1000 ha	It is recommended that a full survey be undertaken of these areas, and if identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation for testing
Cumbil Forest Creek	Archaeological and cultural sensitivity	0.5 ha	The proposal alignment should avoid the site and be placed to the west of the current crossing. It is recommended that targeted survey undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and if identified, soils with archaeological potential be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to construction to inform the alignment.
Etoo Creek	Cultural sensitivity	302 ha	It is recommended that targeted survey is undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and if identified, soils with archaeological potential be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to construction to inform the alignment.
Rocky Creek	Cultural sensitivity	300 ha	It is recommended that targeted survey be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and, if identified, soils with archaeological potential be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to construction to inform the alignment.
Goona Creek	Cultural sensitivity	158 ha	It is recommended that targeted survey undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity and if identified, soils with archaeological potential be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to construction to inform the alignment.
Bohena Creek	Archaeological potential and scarred trees	147 ha	Targeted survey of the mature vegetation along Bohena Creek be undertaken within 200 m of the alignment to identify the extent of cultural and archaeological sensitivity. If identified, soils with archaeological potential should be test investigated

Catchment Area	Sensitivity	Size of culturally sensitive area	Recommendation for testing
			under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.
Namoi River	Archaeological potential and scarred trees	20.4 ha	Full survey and registration of scarred trees. If identified, soils with archaeological potential should be test investigated under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) prior to the submission of the EIS to inform the final alignment.

Additionally, a number of catchment areas have been identified through predictive modelling to have high sensitivity for Aboriginal heritage (refer to Table 1.2). These will also be assessed for archaeological sensitivity (i.e. the presence or absence of Aboriginal objects or soils with potential for Aboriginal objects).

Table 1.2 Catchment areas with sensitivity for Aboriginal cultural heritage within the survey area for the proposal

Catchment Area	LALC area	Native Title Group	Sensitivity for Aboriginal heritage being present
Wallaby Creek	Narromine	n/a	High
Backwater Cowal Creek	Narromine	n/a	High
Macquarie River	Narromine	n/a	High
Ewenmar Creek	Gilgandra and Narromine	Gomeroi	High
Goulburn Creek	Gilgandra	Gomeroi	High
Marthaguy Creek	Gilgandra	Gomeroi	High
Castlereagh River	Gilgandra and Weilwan	Gomeroi	High
Judes Creek	Weilwan	Gomeroi	High
Mogie Melon and Paddys Creek confluence at Gulargambone Creek	Weilwan	Gomeroi	High
Baronne Creek	Weilwan, Gilgandra and Coonamble	Gomeroi	High
Tenandra Creek	Weilwan, Gilgandra and Coonamble	Gomeroi	High
Quanda Quanda Creek	Weilwan	Gomeroi	High
Salty Springs Creek	Weilwan	Gomeroi	High

Catchment Area	LALC area	Native Title Group	Sensitivity for Aboriginal heritage being present
Looking Glass Creek Calga creek	Coonabarabran and Coonamble	Gomeroi	High
Bucklanbah Creek	Baradine and Coonamble	Gomeroi	High
Teridgerie Creek	Baradine and Coonamble	Gomeroi	High
Baradine Creek	Baradine	Gomeroi	Moderate
Coolangla Creek	Baradine	Gomeroi	Moderate
Etoo Creek	Pilliga	Gomeroi	Moderate
Stockyard Creek	Pilliga	Gomeroi	High
Rocky Creek	Pilliga	Gomeroi	High
Talluba Creek	Pilliga	Gomeroi	Moderate
Bundock Creek	Narrabri	Gomeroi	Moderate
Bohena Creek	Narrabri	Gomeroi	Moderate
Namoi River	Narrabri	Gomeroi	Moderate

1.1 Timing and personnel

Targeted survey and potential test investigations are proposed throughout April 2019 in three (approximately 100 km) sections:

1: Macquarie River to Gulargambone Creek: incorporating the areas identified above as having high sensitivity for Aboriginal cultural heritage including Yellow Creek, Backwater Cowal Creek, Macquarie River, Ewenmar Creek, Goulburn Creek, Marthaguy Creek, Emogandry Creek, Kickabil Creek, Boothaguy Creek, Terrabile Creek, Judes Creek, Moggie Melon, Paddy's Creek, the Castlereagh River and Gulargambone Creek.

2: Gulargambone Creek to Etoo Creek: Incorporating Baronne Creek, Tenadra Creek, Parmiduean Creek, Salty Springs Creek, Looking Glass Creek, Mungery Creek, Calga Creek, Noonbar Creek, Bucklanbah Creek, Teridgerie Creek, Baradine Creek, Coolangla Creek and Cumbil Forest Creek.

3: Etoo Creek to Namoi River: Etoo Creek, Stockyard Creek, Rocky Creek, Talluba Creek, Goona Creek, Bundock Creek, Bohena Creek and Namoi River.

The field investigations will involve three groups operating separately under the direction of three archaeologists:

- Survey Area 1 will be directed by Andy Roberts in company with personnel from Weilwan, Gilgandra and Narromine LALCs as well as the Gomeroi and Ngemba, Ngiyampaa, Wangaaypuwan and Wailwan (NNWW) Native title groups and representatives from the RAPs.
- Survey Area 2 will be directed by Peter Saad in company with personnel from the Weilwan, Coonamble, Coonabarabran, Baradine and Pilliga LALCs and the Gomeroi native title group and representatives from the RAPs.
- Survey Area 3 will be directed by Neville Baker in company with personnel from the Pilliga and Narrabri LALCs and Gomeroi Native title groups.

It is proposed teams are made up of two each from the LALC and Native Title Groups and up to three from the RAPs for the proposal. Due to the large numbers of people registered for the

proposal the field staff will be chosen on a rotating basis so that everyone is given an equal share of the available work dates.

1.2 Software/analytical tools

The following software and analytical tools would be used to complete the targeted survey:

- Collector.
- ArcView or WebGIS.
- Cameras and photo scales.
- Field excavation kit including dry sieves, Ph test kits, Munsell charts.
- Theodolite and survey tools.

2. Archaeological Investigation

As detailed in the *Due Diligence Aboriginal Heritage Assessment for Geotechnical Works* (JACOBSGHD 2019), an archaeological field survey of the proposal corridor has been undertaken targeting geotechnical locations. This assessment identified 19 areas of cultural sensitivity and these are summarised in Table 1.1. Eleven of these have been identified as needing archaeological investigation to confirm the presence of archaeological deposits. Additionally, one of these areas was deemed too culturally sensitive by the Aboriginal community for boreholing to go ahead unless preceded by test investigation (refer to Section 2.3).

Test investigation under the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) will take place to determine the nature of subsurface deposits and their cultural sensitivity. The test excavations will determine the nature, extent and significance of these deposits to inform the development of appropriate management recommendations for the final alignment prior to EIS being finalised.

The aims of the investigations are therefore to:

- Assess the presence of sub-surface archaeological deposits.
- Identify the nature, depth, extent and indicative significance of archaeological deposits (if any) within the boundary of the proposal.
- Consult with RAPs with regards to the cultural values of the proposal location.
- Develop recommendations to minimise or mitigate potential impacts to any Aboriginal cultural heritage objects identified via the test excavation.

Preliminary management recommendations and Aboriginal significance may be discussed informally in the field with nominated site officers during this time, however recommendations will be discussed more formally at a post excavation AFG meeting.

2.1 Methodology for areas of PAD

The following test excavation methodology is designed to be in accordance with Requirement 15 and 16 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010). The intention of the test investigation is to sample all potential archaeological deposits (PAD) to provide a framework for determining archaeological sensitivity and differentiate those areas with low potential from those with higher significance within the project corridor.

- Within the PAD area test excavation units will be placed on a systematic grid at 20 metre (m) intervals, or other justifiable and regular spacing depending upon observed disturbance of the area, and the predicted sensitivity of the landforms on which the PAD is located. The proposed test pit spacing, number of transects and excavation units required to adequately investigate the PAD within the survey corridor will endeavour to be open and transparent and ultimately be aimed at confirming or otherwise the cultural sensitivity of the area.
- The exact placement and number of excavation units will be determined by the supervising archaeologist in consultation with site officers for the relevant RAPs. Overall it will endeavour to minimise the impact of the exercise.
- Test excavation units will only be placed within the boundaries of the proposal area.
- Test excavation units will not be placed in areas where significant ground disturbance has been identified in consultation with site officers for the relevant RAPs.

- Test excavation units will not be placed in areas where soil contaminants/dumped material has been identified.
- Test excavation units will be excavated using hand tools only (for example shovels or trowels).
- Test excavations will be excavated in 500 millimetre (mm) x 500 mm units.
- Test excavation units may be combined and excavated as necessary to understand the characteristics of any site identified. In general, the maximum continuous surface area of a combination of test excavation units at a single excavation point will be no greater than three square metres. This may, however, be exceeded in cases where deep deposits require benching for safety reasons. For the archaeological investigation of deep soil profiles or in areas that have been identified to contain deep artefact bearing deposits, combined excavation units (generally to 1 m x 1 m) will be used.
- The maximum surface area of all test excavation will be no greater than 0.5 per cent of the PAD area being investigated
- Where test excavations identify sub-surface archaeological deposits, additional excavation units will be placed 5, 10 or 20 m away on the four cardinal points in order to establish the horizontal extent of the site.
- The first excavation unit will be excavated and documented in 50 mm spits at each PAD being investigated. Based on the evidence of the first excavation unit, 100 mm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.
- Test excavation units will be excavated to at least the base of the identified Aboriginal object-bearing units and must continue to confirm the soils below are culturally sterile (B Horizon).
- All material excavated from the test excavation units will be dry sieved using at least a five mm aperture wire-mesh sieve. A three mm sieve will also be available if conditions and results indicate it is worthwhile utilizing.
- Photographic and scale-drawn records will be made of the stratigraphy/soil profile, features and informative Aboriginal objects will be made for each excavation point. This includes recording of the stratigraphy/soil profile of each distinct landform sampled and of each test excavation unit in which an archaeological feature or Aboriginal object were identified.
- Soil colour and type, texture, acidity and stratification will be recorded to increase understanding of the sub-surface conditions of PADs and how they may relate to site formation processes influencing the presence and condition of sub-surface archaeological deposits.
- Soil colours will be recorded from each soil strata identified, using a Munsell colour chart to ensure consistency.
- Soil acidity will be measured for each soil type identified using a pH testing kit.
- Test excavation units will be backfilled as soon as practicable.
- The location of each excavation unit will be recorded using a mobile GIS Unit (Trimble® GeoXH™ GeoExplorer® or the Trimble® Nomad). This allows for the spatial datasets collected in the field to be post-processed to sub-metre level accuracy once the GPS co-ordinates have been differentially corrected.
- All artefacts retrieved during test excavation will be double bagged and labelled with appropriate contextual information. The artefacts will be analysed in the field with assistance from nominated site officers for the RAPs and stored in a secure location (keeping places) near the proposal area. Where feasible, analysis may also be undertaken

at the secure storage locations. Secure storage locations have not yet been identified and will be the subject of discussion at the first AFG.

- The long term management arrangements for any recovered artefacts will be determined in consultation and agreement with the RAPs and in accordance with Section 3.7 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010).
- Following test excavation, an Aboriginal Site Impact Recording Form will be completed and submitted to the Aboriginal Heritage Information Management System (AHIMS) Register as soon as practicable, for each AHIMS PAD/site that has been the subject of test excavation in accordance with the requirements of the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010).
- If suspected human skeletal remains are encountered, works potentially affecting the find would cease immediately and ARTC, RAPs and the local Police contacted.

2.1.1 Mechanical excavation

Mechanical excavation is not proposed to replace manual techniques in this investigation.

2.1.2 Cessation of test excavation

Test excavation will cease if any of the items detailed below are identified:

- Suspected human remains are encountered.
- Culturally sterile deposits.
- Clay.
- Rock base.
- Locally or regionally high density of objects.
- Presence of rare or representative objects.
- Presence of locally or regionally significant deposits.
- Enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.

2.1.3 Radiometric dating

Samples of organic material suitable for radiometric dating (charcoal, bone, shell, wood etc.) will be collected for the dating of archaeological deposits. The number of samples sent for dating will be determined on the suitability of the sample and the significance of the site. Samples will be collected as follows:

- Samples will be collected using clean nitrile gloves and placed in clean plastic sample bags.
- Charcoal samples will also be wrapped in aluminium foil to prevent crushing.
- Samples will be removed to the relevant temporary keeping place and dried out to avoid fungal growth during transport.
- Samples will be packaged within hard plastic cases for transport to a radiocarbon dating laboratory.

2.2 Methodology for borehole locations

Two borehole locations were considered too culturally sensitive by the Aboriginal community for boreholing to go ahead unless preceded by test investigation to ensure the sites were culturally

sterile. These are located at the following locations to the east of Narromine on the southern river terraces of the Macquarie River and include.

- BH-2-063 located at 622165.00 m East and 6431399.00 m South
- BH-2-003 located at 622108.00 m East and 6431858.00 m South.

The following test excavation methodology is to a certain extent *in variance* with Requirement 16 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) in so far as it is designed to test designated borehole locations only and clear them of archaeological sensitivity rather than sample the surrounding area of culturally sensitive area. This sampling is likely to go ahead at a later date if archaeological sensitivity is identified.

The methodology to determine if the borehole locations have archaeological sensitivity is specific to the locations themselves.

The aims of the investigations are therefore to:

- Assess the presence or absence of sub-surface archaeological deposits.
- Identify the nature, depth, extent and indicative significance of archaeological deposits (if any) within the borehole locations.
- Consult with RAPs with regards to the cultural values of the proposal location.
- Develop recommendations to minimise or mitigate potential impacts to any Aboriginal cultural heritage objects identified via the test excavation.
- Locate culturally sterile deposits to enable the completion of borehole investigations.

It is proposed that the work to be undertaken in the Macquarie River to facilitate the digging of boreholes BH-2-003 and BH-2-063 be undertaken with due consideration of the cumulative impacts that have been experienced within this culturally sensitive area. It is therefore proposed that test investigations:

- Be limited to as few 50 x 50 cm test pits as possible to demonstrate archaeological sensitivity.
- Test pitting be curtailed as soon as culturally sterile deposits are located suitable for boreholes to be drilled.
- That vehicular tracks be limited to a single track.
- The vehicular movements be curtailed during wet weather.

In all other ways, the methodology is identical to that described in Sections 2.1 and 2.4 - 2.5.

2.3 Personnel

Test excavation will be conducted by appropriately qualified and experienced archaeologists (as per Section 1.6 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010) and nominated site officers for the relevant RAP. Where sub-surface Aboriginal objects are identified, nominated site officers will be consulted regarding preferred management measures.

In general, it is proposed that a test excavation team consisting of two field archaeologists and a maximum of six nominated site officers would conduct the test excavation. A roster for site officer participation will be developed in consultation with ARTC. If required, a dedicated artefact specialist may also be engaged during the test excavation program to assist with the analysis of large volumes of artefacts. The artefacts will be analysed with assistance from nominated site officers for the RAPs.

2.4 Research questions

Where test excavation identifies a previously unknown Aboriginal cultural heritage value (site) or previously unidentified components of a previously known site, the stratigraphic and artefact analyses detailed above will be utilised to address the following research questions:

- What is the full spatial extent, including depth, of the archaeological deposits?
- What are the key characteristics of the archaeological deposits that constitute the site? Key characteristics might include:
  - Site type (for example artefact scatter, grinding grooves, bora/ceremonial site, burial).
  - Site preservation.
  - Contents of the site, particularly the stone artefact assemblage (where present).
  - Site chronology.
- How do the key characteristics of the site compare with other known sites in the region?
- Given the key characteristics of the site, what is the significance of the site? Significance assessment will be based upon the four values of the *Australia ICOMOS Burra Charter* (Australia ICOMOS 2000):
  - Social values.
  - Historical values.
  - Scientific values. Scientific significance is based upon the following criteria:
    - Site integrity.
    - Site structure.
    - Site contents.
    - Representativeness and rarity.
  - Aesthetic values.

Depending upon the results of the test excavation and the nature of any archaeological deposits identified, the formulation of additional research questions may be required.

2.5 Artefact analysis

2.5.1 Recorded attributes – artefact class

Stone artefacts can be separated into four main categories; flakes, cores, tools, and angular fragments (refer to Table 2.1). It is from these four categories that further distinctions can be made based on identifying specific attributes relating to the reduction process (Holdaway and Stern 2008: 24).

Flakes

Flakes are defined through the presence of attributes relating to conchoidal fracture (Holdaway and Stern 2008: 34). A conchoidal fracture originates from pre-existing flaws and creates what is known as a Hertzian cone (Clarkson 2007: 27). Flakes maintain both a ventral and dorsal surface and can be further categorised based on the completeness of the flake. Flakes are generally described as complete, proximal, medial, distal, complete split flakes, longitudinally split flakes and core rejuvenation flakes.

Cores

Cores are defined by the presence of negative flake scars, marking the location of previous flake removal (Holdaway and Stern 2008: 179). These flake scars can be used to describe the

direction of flake removal (unidirectional, bi-directional, bifacial, multi-directional, and microblade). Cores also include the presence of one or more platforms and can exist as a complete core, or a core fragment, or broken core.

Tools

Tools maintain similar characteristics to flakes but have evidence of retouch or use wear along lateral margins. Tools retain a ventral surface and can also be categorised based on completeness of artefact remaining, in a similar manner to flakes.

Angular fragments

Angular fragments are flaking debris with none of the above identifiable diagnostic features associated with stone reduction processes. Thus, the defining characteristics as detailed in the above three categories are missing on angular fragments (Hiscock 1988: 129).

Table 2.1 Definition of technical categories to be used

Technological category	Definition
Complete flake	Has a ventral surface that preserves a complete fracture plane, has a platform (or impact point), lateral margins and a termination.
Proximal flake	A broken flake that lacks a termination but retains one or more of the following: platform and/or impact point, bulb of percussion, bulbar scar and fissures.
Medial flake	Absence of proximal and distal margins but have an identifiable ventral surface.
Distal flake	Presence of a termination and the absence of a platform or impact point.
Longitudinal split flake	A break that runs parallel to the flaking axis. The flake preserves a portion of the platform and/or impact point and has an identifiable termination.
Angular fragment	A flake fragment that cannot be identified in any more detail.
Core	Negative flake scarring, no positive scars and therefore no ventral surface.

2.5.2 Raw material

Artefact size and morphology are often closely linked to raw material (Hiscock 1988). As such it is important to identify the types of raw material present in the proposal area. Raw material types are expected to primarily include silcrete and silicified volcanic tuff, as identified via desktop review of previous test excavation results in the area.

2.5.3 Cortex

Cortex will be recorded as a percentage of the artefact covered, the type of cortex and its location. The proportion of the artefact covered by cortex refers to the percentage of cortex located on the dorsal surface for flakes and tools. For cores and angular fragments, it refers to the percentage of the whole artefact. Percentages will be given as 0%, 1-50%, 51-99%, and 100%. Cortex type will be defined as either cobble or slab. Cobble refers to water-rounded cortex and slab refers to cortex associated with exposed surfaces or outcrops.

Recording the percentage of remaining cortex on an artefact is important as cortex proportions in lithic assemblages are frequently used as an indicator to suggest reduction intensity. They can also suggest distance from the raw material source (Andrefsky 1998: 101).

2.5.4 Termination

Flake or tool termination refers to the artefact's distal end. Terminations will be recorded as feather, hinge, step, plunge, and crushed. If the termination is not present it will be listed as absent. Differing terminations are the result of different applications of force during the flaking process. For example, a flake with a crushed termination is often the result of bipolar technology.

2.5.5 Platform

Platform types are useful as they indicate the level of work that has been dedicated to a core to enable flake detachment (Holdaway 2004: 28). As a result, it is possible to determine stage of reduction and provide information regarding the face of the core (Andrefsky 1998: 89-96). Platforms will be as flaked, focal, and crushed. If the platform is not present it will be listed as absent.

2.5.6 Tools

Where required an analysis of formal tool types will be made to facilitate comparisons with assemblages previously excavated within or close to the proposal corridor.

2.5.7 Cores

Artefacts with negative flake scars originating from one or more platforms were identified as cores (Holdaway and Stern 2008). As cores are used in the production of flakes, a different set of attributes will be used to describe them. Core scar direction will be detailed as uni-directional, bi-directional, or multidirectional. The number of core platforms, as well as the length of the biggest negative flake scar, will also be recorded.

2.5.8 Metrical attributes

The following metrical attributes will be recorded for all artefacts:

- **Maximum dimension** – Will be measured on all artefacts, irrespective of technological type. This is defined as the furthest points of division on the artefact. Maximum dimension is a useful concept in that all artefacts present have at least two attributes that can be measured; maximum dimension and weight, regardless of technological type.
- **Weight** – All artefacts will be weighed, irrespective of technological type. Artefact weight is probably the most reliable size characteristic for discriminating between reduction stages of stone artefacts. It is easy to take and is replicable and it correlates well with other linear dimensions which all relate to the size of the flake (Andrefsky 1998: 96). Although small flakes may be removed early in the reduction sequence, the heavier material comes from the early stages of knapping and reduces thereafter.

2.5.9 Contaminated soils/dumped material

The following procedure will apply if potentially contaminated material is encountered (or as per the JGHD safety plan for the proposal):

- Stop work immediately and notify the lead archaeologist and JacobsGHD Project Manager.
- Do not handle any dumped material.
- Do not go near or disturb any dumped material.
- Adopt appropriate personal hygiene practices, and all personnel to wear disposable P2 dust masks.

- Adhere to JGHD Asbestos Exposure Risk Management Protocol (2019) where asbestos containing material is identified at a works site.

2.6 Reporting

The results of the Aboriginal survey and archaeological test excavation program will be presented in a draft Aboriginal Cultural Heritage Assessment (ACHA) report. Copies of this report will be disturbed to RAPs for their comment and input. Following the receipt of comments from the RAPs the ACHA will be finalised and submitted to ARTC to inform the EIS being prepared for the proposal.

References

Australia ICOMOS (2000). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999.* Burwood, Victoria, Australia ICOMOS Incorporated.

Andrefsky, W.J. (1998). *Lithics: macroscopic approaches to analysis*. Cambridge, Cambridge University Press.

Department of Environment, Climate Change and Water (DECCW) (2010). *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*. Sydney.

Department of Environment, Climate Change and Water (DECCW) (2010). *Aboriginal Cultural Heritage Consultation Requirements for Proponents.* Sydney.

Hiscock, P. (1988). *Prehistoric Settlement Patterns and Artefact Manufacture at Lawn Hill, Northwest Queensland*, Department of Anthropology and Sociology, University of Queensland,

Holdaway, S.J. and N. Stern (2008). *A Record in Stone: The Study of Australia's Flaked Stone Artefacts.* Melbourne and Canberra, Museum Victoria and Aboriginal Studies Press.

JGHD (2019). Asbestos Exposure Risk Management Protocol - Field investigations archaeology.

Appendix 1
Culturally sensitive locations

Appendix 1. Culturally sensitive locations

SENSITIVE INFORMATION REMOVED FOR PUBLIC DISPLAY

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JACOBS

GHD

TECHNICAL REPORT

6

Aboriginal cultural heritage assessment report

Appendix E Mapping of survey results showing sites within 400 metres of the proposal site

NARROMINE TO NARRABRI ENVIRONMENTAL IMPACT STATEMENT

Appendix E – Mapping of survey results showing sites within 400 metres of the proposal site

SENSITIVE INFORMATION REMOVED FOR PUBLIC DISPLAY

TECHNICAL REPORT

6

Aboriginal cultural heritage assessment report

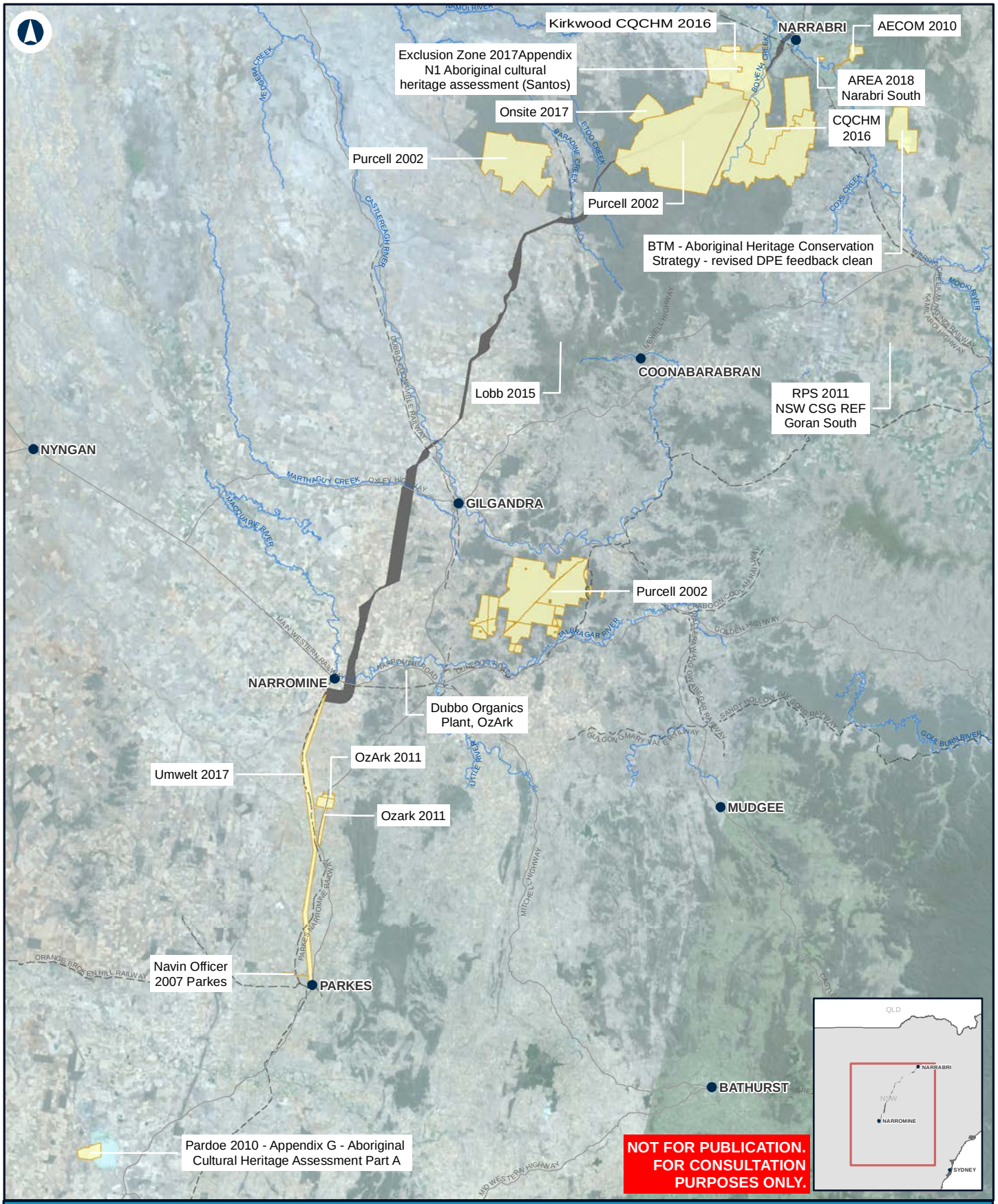
Appendix F Review of previous assessments

NARROMINE TO NARRABRI ENVIRONMENTAL IMPACT STATEMENT

Appendix F – Review of previous assessments

F.1 – Previous assessments in study area

There have been many development-driven archaeological studies in the two bioregions. Some of these assessments are located outside of the study area yet are reviewed to gain a wider context of archaeological site distribution in a cultural and landscape context. The review below summarises a selection of these studies in chronological order to assist in the development of a predictive model for Aboriginal site locations. Figure F.1 locates 18 of the previous assessments in relation to the study area. Not all previous assessments were able to be mapped.



NARROMINE TO NARRABRI Figure F-1 Previous assessments in the vicinity of the study area

0 20 40 Km

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Study area
- Previous assessment areas Main road
- Watercourse
- Existing railway

Date: 25/11/2019 Paper: A4
Author: JACOBS Scale: 1:1,700,000
Data Sources: Study area, previous assessments: GHDJACOBS; Imagery, base layers: NSW Spatial Services: all other layers: IR AR

INLAND RAIL ARTC

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

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Koettig (1985)

(Koettig 1985) undertook a comprehensive study of evidence relating to Aboriginal occupation within the Dubbo area for the Dubbo LEP. The study sampled a variety of landscapes such as rivers, ridges, creeks, valleys and hills testing Pearson's site distribution model. According to Koettig, Aboriginal sites may be expected throughout all the landscape units surveyed although landforms near water were more frequently associated with Aboriginal heritage sites. The most frequently occurring site types were open artefact scatters, scar trees and grinding grooves. Locational determinants included:

- *Proximity to water:* the largest campsites were located close to permanent water, nonetheless. Sites were found all over the landscape including hills and ridges away from obvious water.
- *Geological formation:* Certain sites require specific conditions, eg grinding grooves occur where appropriate sandstone outcrops, quarries are found where suitable stone resources are accessible, burials tend to be found in sandy sediments such as alluvial flats etc.
- *Availability of food resources:* The widest range of potential foods was found along the main water courses due to the supply of permanent water. Some foods would have been seasonal and required foraging away from water courses.

The predictive model for site location developed as a result of Koettig's study can be summarised as follows:

- all site types can be found along watercourses
- stone arrangements occur most frequently on knolls or prominent landscape features
- larger campsites are most frequent along permanent watercourses, near springs or wetlands, although small campsites may be found anywhere. Occupation appears to have been more intensive along major watercourses, and more site complexes will be found there
- modified trees may be found anywhere there are remnant stands of native trees
- campsites would become smaller and more sporadic near the headwaters of creeks
- grinding grooves are most frequent in association with appropriate sandstone
- quarries may be found wherever there are reliable sources of suitable stone
- shell lenses (midden material) would only be found along the rivers or 4th order streams.

Balme (1986)

In 1986 Balme undertook a survey of the Pilliga sand region and the Pilliga Forest as a part of a regional desktop study of north western NSW for the NPWS. This study was based on data within the site register. Open sites were the dominant site type typically identified on erosion surfaces in valleys alongside streamlines. Most sites were small, (20-50 artefacts) dominated by quartz stone tools with jasper, fine grained volcanic and chert also used. Balme surmised that the absence of permanent water might explain why there is a lack of archaeological sites within the Pilliga. A review of additional reporting since this time (see Gaynor (1999); Roberts (1991)) points to a lack of site recording within the region at this time and subsequently her conclusions are based upon a lack of documented evidence rather than the reality of archaeological patterning in the area. The lack of seed grinding technology noted by Balme points to the likely lack of grass resources in the forest, however, and may have some foundation in reality.

Roberts (1991)

Roberts undertook a further survey of the Pilliga Forest on behalf of NSW State Forests identifying a total of 89 sites, 24 open sites, 62 scarred trees and three rock shelters (Roberts 1991). The survey by Roberts was based on a land system approach biased to larger watercourses and stream channels. Ochre, grinding tools and ovens were also noted as being in association with these sites. Roberts made some conclusions regarding site predictions in the locality including the following:

- site types will include scar trees, open campsites, shelters with occupation, rock art and grinding grooves
- quartz river pebbles would likely be the dominant raw stone artefact material type in open sites
- burials are unlikely to occur due to unfavourable soils
- rock engravings and paintings are likely to be rare
- poor ground surface visibility away from water sources restricting site identification
- creeks may have been movement corridors
- Lack of scarred trees likely reflect post contact European activity
- occupation was likely to have been more intense around creeks.

NPWS (1993)

The National Parks and Wildlife Service (NPWS) conducted a survey of a proposed electricity transmission line from Wee Waa to Narrabri (NPWS 1993). No sites were recorded within the survey area. It was noted that the survey area was already significantly disturbed and that there were open campsites and scarred trees to the 'south of the Namoi River'.

Gaynor (1996)

Pat Gaynor researched a number of archaeological reports within the region and confirmed the dominance of quartz, followed by chert, chalcedony, silcrete and petrified wood. Gaynor's research within the region also included evidence of occupation that was radiocarbon dated to 4,000 years before present.

Gaynor and Wilson (1999)

The predictive modelling developed by (Gaynor 1999: 116-7) in the Warrumbungle Ranges is relevant to the broader area subject to the current proposal. Subsequent research in the region has followed similar predictive models which include:

- artefact scatters may occur on the alluvial terraces along the major creeks, but are more likely to be found on the low stony hills, slopes and spurs adjacent to these creeks
- artefact scatters are also likely to occur in elevated areas where water is supplied locally by a spring
- artefact scatters are also likely to be exposed in areas which have been disturbed by recent development allowing erosion to proceed
- axe grinding grooves are most likely to occur where sandstone outcrops in close proximity to creek lines, but not necessarily within them
- axe grinding grooves may also occur in sandstone rock shelters, but these will be rarer than those found in outcrops in close proximity to the creek lines.

Trindall (2002)

Trindall (2002) undertook a cultural heritage assessment for a petroleum exploration license in the Pilliga Forest. Whereas ground surface visibility was notably good, the survey of a 36 kilometre linear transects resulted in a limited number of isolated finds and one scarred tree. Several locations of culturally important trees were noted.

Purcell (2002)

Phil Purcell for NPWS undertook an Aboriginal Cultural Heritage Assessment of the Goonoo and Pilliga State Forests (Stage 1) for the Resource and Conservation Directorate as part of a larger assessment of the Brigalow Belt Southern Bioregion (NPWS 2000a; NPWS 2000b). Aboriginal field survey was carried out in cooperation with Aboriginal communities associated with these areas to determine areas of Aboriginal cultural sensitivity by sampling all landforms within the Goonoo and Pilliga State Forests as well as undertaking a comprehensive oral history program with traditional knowledge holders. Twelve landforms were sampled in the Pilliga State Forest determining that Aboriginal sites occurred with greater frequency in association with alluvium landforms which are dominated by creeks, chains of ponds, flood plains, swamps and creek terraces.

This research project is the principal document for understanding Aboriginal Cultural heritage in the Pilliga Forest. Importantly, it notes that known site distribution is biased to the areas that have been developed for mining and agriculture since European settlement (ie linear developments along river valleys for roads or pipelines or in a suite of landforms associated with non-linear mining development).

The study was designed to distinguish the pattern of site distribution and the extent of Aboriginal land-use across a variety of landforms. To this end, it utilised a landscape sampling methodology to effectively cover the study area. These landforms were identified and mapped using a geomorphological study and 13 separate landform categories were identified within the Pilliga State Forest. These landforms were grouped into two classes: alluvium and elevated.

The proposal aimed to consult with Aboriginal communities associated with the bioregion, undertake archival investigations as well as a undertake a field survey of representative areas using identified landforms. The proposal undertook 110 oral history interviews, documented Aboriginal associations and recorded Aboriginal sites and plant species used in traditional contexts. Notable findings of this report were that:

- 38 useful plant species were identified in the Pilliga
- approximately 50 per cent of all Aboriginal sites were recorded with alluvial landforms demonstrating a strong association with water features in all landform categories and with greater densities of artefacts in major creek systems.

The survey program recorded a total of 912 sites across the Pilliga, 609 in the Pilliga and 303 in the Pilliga Outwash. Purcell found that most recorded sites were located with the alluvial group landforms, with only roughly a fifth occurring in the elevated group landforms. Aboriginal sites were more densely distributed in the alluvial group landforms and were particularly associated with water sources such as intermittent creeks, drainage lines, depressions, and chains of ponds. Broad sandy banks along major creeks were also noted to have the potential to contain burials.

The most common site types were open campsites and isolated finds. A total of 90 per cent of sites were located within 200-300 metres of water. It is also noted by NPWS (2000a: 19) that during the pre-contact period there are likely to have been times of greater rainfall and associated environmental water convenience than has been available in post contact times.

Findings demonstrated that Aboriginal site distribution is influenced by the variety of water features that occur on alluvial landforms including river frontage locations, creek tributaries, swamp, chain of ponds, gilgai and billabong (refer Table F.1).

The NPWS (2000a: 19) identified problems when mapping water features for use in regional scale planning as the only criteria for modelling Aboriginal site locations. Many of these issues relate to the inaccuracies of topographic mapping at larger scale particularly with lower order drainage lines, difficulties with stream ordering in heavily forested areas (such as the Pilliga), the existence of many artificial waterways or eroded gullies plus the fact that many do not indicate adjoining soil types or type of fluvial action.

Table F.1 Distance from water of Aboriginal sites in the BBSB (NPWS 2002a: 49)

Province	Range	Average (metres)
Northern Basalts	1-600	76
Pilliga	1-1000	145
Pilliga Outwash	1-2400	119
Talbragar Valley	0-600	101
Northern Outwash	0-750	102
Liverpool Ranges	20-900	173
Liverpool Plains	1-4000	410

Navin Officer (2007)

Navin Officer (2007) undertook a cultural heritage assessment for the Peaking Power Plant and associated gas pipeline near Parkes. One possible scarred tree was located near the gas pipeline easement. The predictive model used for this study followed the generalised criteria for predicting the location of Aboriginal cultural heritage sites established by Pearson (1981) and Koettig (1985).

The Navin Officer model proposed that:

- *Open scatters of stone artefacts* would be most likely to occur on level, well drained ground adjacent to sources of fresh water (creeks or swamps), particularly minor water courses. The sites are often buried in alluvial or colluvial deposits and are normally only exposed through erosion or ground disturbance.
- *Isolated finds* occur as single artefacts and are part of a background scatter that could be located anywhere.
- *Burial sites* are found in landforms characterised by a relatively deep soil profile in soft alluvial or aeolian sands. Likely only to be in eroded soils or disturbed situations.
- *Ceremonial sites (bora)* are generally located away from campsites on level areas, stone arrangements are similarly located away from campsites in isolated places and tend to be associated with small hills or flat land.
- PADs are general shallow and are likely to be present on elevated, flat or low-gradient landform elements associated with drainage lines and the crests of spurlines, close to water.
- Scarred trees may occur in areas of remnant vegetation which contain trees of sufficient age. Carved trees associated with burial grounds and other ceremonial places have been recorded in the wider region and are a common class of heritage item in the study area.

AECOM (2010)

AECOM conducted an assessment for the Maules Creek Coal Project in 2010. The study area for the assessment covered 4,200 hectares of land, largely within the Leard State Forest 48 kilometres to the south east of Narrabri. A total of 158 Aboriginal cultural heritage sites were identified within a 15 x 15-kilometre area centred on the project site. The majority of these were artefact scatters (44 per cent) or isolated artefacts (38 per cent) with scarred trees being the next most common site type. There were small numbers of grinding grooves, ceremonial or dreaming sites, scarred trees, stone quarries, and rock shelter. The majority (31 per cent) of sites were noted along creek flats or flats (34 per cent) and lower slopes (15 per cent) (AECOM 2010: 43-46).

Findings relevant to this proposal include:

- pre-contact activity was evidenced by stone artefacts in top soils associated with intermittent creeks and some nearby slopes
- high intensity usage of creek junctions was evident (Maules and Back Creek)
- low intensity activity associated with the upper reaches of intermittent creeks where creek margins are more inclined
- a large site was associated with a soak in Leard State Forest
- there is evidence of grinding tools in three sites
- a number of well-preserved scarred trees were noted.

Ozark (2011)

Ozark undertook a Cultural Heritage Assessment of a 46 kilometre water pipeline and a 20 kilometre electricity transmission line from the Mine Site at Peak Hill to south and east of Narromine (the south of Dubbo). A total of 60 Aboriginal sites were recorded during the Indigenous heritage component of the assessment. They consisted of 54 modified trees (43 scarred, nine possibly scarred, one resource gathering and one carved), three artefact scatters (one with PAD), two isolated artefacts and one ceremonial/dreaming site. An artefact scatter with PAD was identified on river terraces/aeolian dunes six kilometres east of Narromine adjacent to the Macquarie River. Test excavations resulted in the recovery of 121 artefacts from sub-surface layers.

The recorded modified trees consisted of box or river red gums, with one ceremonial tree (a birthing tree) identified by an Aboriginal party representative. This site was located adjacent to Brady's Cowal, to the east of proposal area, with the availability of a water resource seen as a key factor in this site's location. In reviewing the outcomes of the assessment, OzArk identified that most sites in the region are located on alluvial valley floors and gentle toe slopes, predominantly close to water (OzArk 2011: 5-79). The following factors were considered critical to site location:

Proximity to water and assuming that there is a high correlation between permanence of a water source and the permanence or complexity of the areas Aboriginal occupation thus where there is ephemeral water so is there sparse evidence for occupation/use of the surrounding area. Conversely where there is more permanent water there will be more permanent camp sites.

Geological formation: Certain sites require specific conditions, eg grinding grooves occur where appropriate sandstone outcrops, quarries are found where suitable stone resources are accessible, burials tend to be found in sandy sediments such as alluvial flats etc.

Availability of food resources: The widest range of potential foods was found along the main water courses due to the supply of permanent water. Some foods would have been seasonal and required foraging away from water courses.

OzArk considered the most likely sites to be found in the area were:

- modified trees in areas possessing remnant native vegetation (ie Bimble Box)
- open campsites within 150 metre of waterways
- isolated artefacts may be found anywhere.

Bryant (2014)

Bryant (2014) undertook a multivariate analysis in western NSW on surface exposures of stone artefacts (open sites) and heat retainer hearths. The study was undertaken near Wilcannia some 500 kilometres to the west of the study area yet has relevance as it enables consideration of possible bias in predictive modelling that connects Aboriginal site patterning with water availability.

A large recorded stone artefact assemblage (over 27,000 stone artefacts) and assemblage of heat retainer hearths (over 90 hearths) from surface deposits in the Rutherfords Creek catchment in western NSW were used to test if water availability has an impact on assemblage composition and behaviour.

Statistical tests were used to investigate the relationship between artefact density, commonly recorded in heritage surveys, and the different environmental parameters within and across the catchments. Bryant found that while there was a relationship between some of the variables, particularly the dominant geomorphic process (deposition, erosion or residual), overall none of these variables could account for the current distribution of stone artefacts across the catchments surveyed. Based on these analyses, the relationship between the distribution of the surface archaeological record and current environmental conditions is not as simple as is generally assumed.

OzArk (2015)

OzArk undertook a survey of a proposed upgrade of Therribri Road, approximately 30 kilometres to the south east of the study area (OzArk 2015). The survey was conducted within the road reserve of a 5.5-kilometre section of the road. Two isolated stone artefacts and a culturally-modified tree, were recorded during the survey. Three more scarred trees had been previously recorded in the survey area.

Lobb (2015)

Lobb undertook a palaeo-environmental and palaeo-fire record from Dunphy Lake, Warrumbungle Mountains. This research suggested a palaeo environmental record of periodic wet and dry conditions during the last 42,000 years. These findings demonstrate a relationship between past fire events and post-fire aggradation, showing that an increase in fire and sedimentation during the Late Holocene is a complex response to environmental change.

Ridges and Simpson (2016)

GIS pathway analysis conducted by Ridges and Simpson (2016: 82) has identified the likely access routes into the Warrumbungle Ranges for both the Gomeroi and Weilwan people. The likely access routes identified by Ridges and Simpson provide valuable context for the broader landscape usage by Gomeroi and Weilwan people and may inform the differential distribution of stone material and artefact typology identified throughout the region.

In the context of the current survey area, Ridges and Simpson (2016: 83) have identified the lower order streams of the Castlereagh River watershed as likely access routes for both the Gomeroi and Weilwan people to access the westerly extent of the Warrumbungle Ranges (refer

to Figure F.2). The OEH 2019 *Major Rivers Database* identifies these creeks as tributaries of the Castlereagh River.

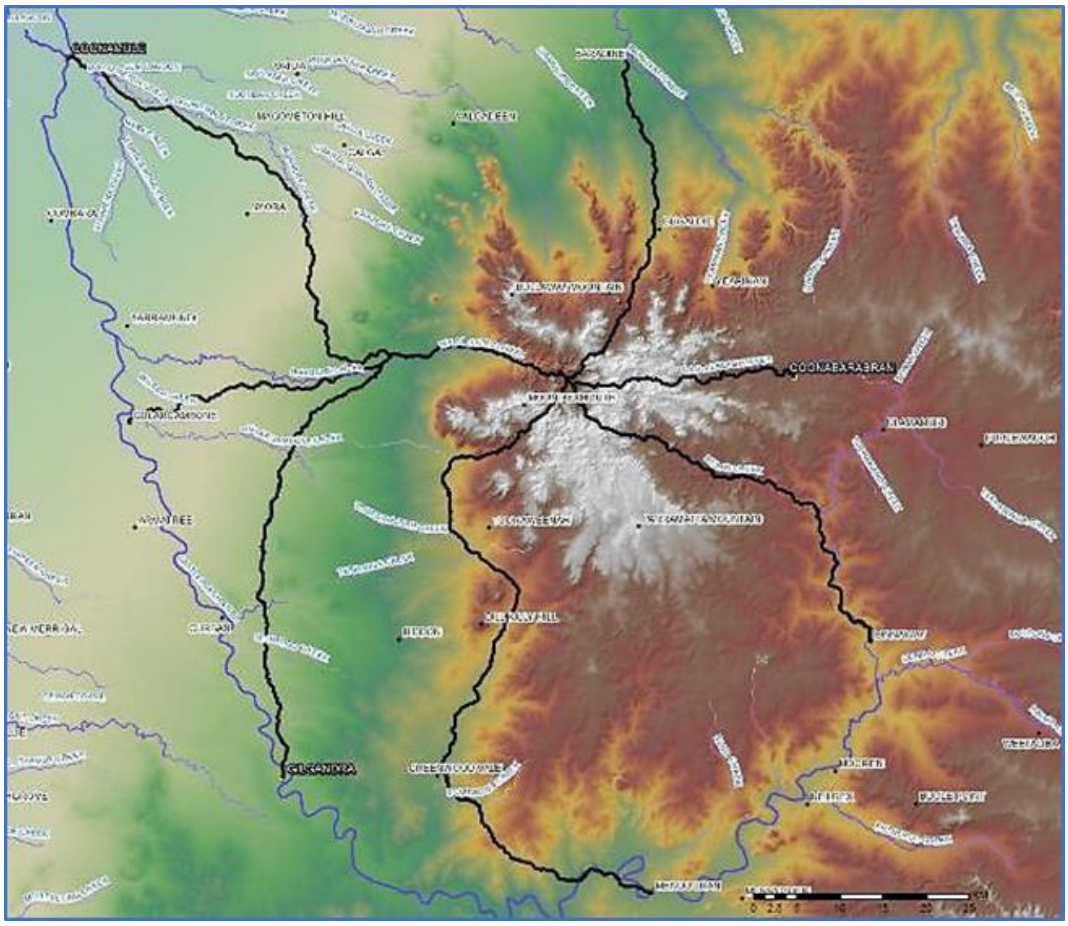

Figure F.2 Regional pathways into the Warrumbungle's from Ridges and Simpson (2016: 83)

Kirkwood CQCHM (2016)

An Aboriginal cultural heritage assessment was undertaken for the Narrabri Gas project in the Pilliga State Forest where Santos is seeking approval to drill up to 850 natural gas wells on approximately 425 sites over the 95,000 hectares project area (Kirkwood CQCHM 2016). CQCHM conducted literature and heritage database searches, reviews of previous studies including cultural values and oral history studies, discussions with the DPIE and Narrabri Land Council to obtain additional cultural heritage data, a data audit, and field surveys to validate existing data as well as Aboriginal consultation. Consultation with the Aboriginal community has been extensive and is ongoing with over 550 Aboriginal parties registering for the project including Native Title Claimant Groups, three Land Councils with the recording of 102 oral histories

The key findings of the cultural heritage impact assessment for the project were that:

- there are 90 known Aboriginal cultural heritage sites including 16 site types within the Santos Project, yet the area is likely to contain additional unidentified sites
- the project verified the existence of 26 sites with more to be verified over the course of the project to be added to the project GIS.

Umwelt (2017)

Umwelt undertook a desktop Aboriginal Cultural Heritage Assessment of the proposed Inland Rail corridor between Parkes and Narromine in 2017. A review of the key environmental factors in predictive modelling of the proposal area demonstrated that the portions of the alignment associated with water resources have a greater archaeological sensitivity, however, historical land use has significantly impacted any archaeological deposits that may be present.

In general terms, the numbers of artefacts identified within these sites were low and typically contained less than five artefacts.

Umwelt noted that the majority of previous archaeological investigations in the region were undertaken as part of the environmental assessment processes and therefore the location of assessed areas reflects those that are subject to development. The report did not collect and cultural significance information from the communities it consulted nor were any of the artefact scatters mentioned in the text considered to have high archaeological (scientific) significance.

(Umwelt 2017: 17) archaeological predictive modelling for the region additionally identified the following areas as archaeologically sensitive:

- Baronne Creek
- Gulargambone Creek
- Castlereagh River.

(Umwelt 2017: 15) also recognised that artefact scatters and scarred trees are relatively common in the region and can be managed with the application of appropriate mitigation strategies. A cumulative impact across the region however indicates caution should be taken with this approach as it does not account for the significant reduction in representativeness in site types since colonisation.

Of relevance to the sites identified as part of the current assessment, Umwelt additionally considered grinding grooves as high-risk sites from a statutory approval perspective, and that obtaining approval to impact this site type may not be possible (Umwelt 2017: 15).

Sneddon and Whincop (2017)

The preparation of a desktop Aboriginal Heritage Conservation Strategy for the three mine sites by (Sneddon and Whincop 2017) is useful to consider for the current proposal as it enables a comparison of the percentages of different site types located within the within the foothills of the Nandewar ranges to the east of the proposal area. Aboriginal sites with known cultural values within the Maules Creek Coal Mine were identified through a combination of detailed archaeological investigations, cultural surveys, literature review, and searches of the AHIMS database. A total of 67 extant Aboriginal sites had been previously recorded at the Maules Creek Coal Mine being artefact scatters (68 per cent) and isolated finds (35 per cent). Three low density artefact scatters/ and two potential grinding groove sites on exposed sandstone outcrops within drainage lines were identified .A number of previously recorded sites were salvaged ahead of approved surface disturbance activities in accordance with the approved Cultural Heritage Management Plan (not referenced in assessment) A total of 133 Aboriginal sites were previously recorded at the Tarrawonga Coal project, being artefact scatters (37 per cent), isolated finds (44 per cent) and scarred trees (18 per cent). No sites or areas of high archaeological significance have been identified at the Tarrawonga Coal project (Kayandel, 2011). Boggabri Coal Mine is known to have 151 Aboriginal cultural heritage sites artefact scatters (20 per cent), isolated artefacts (17 per cent) and scarred trees (3.2 per cent).

Area Environmental Consultants and Communication (2018)

As part of a Development Application for a solar farm, Area Environmental Consultants and Communication (2018) conducted an Aboriginal Heritage Assessment. The project was located 41 kilometres to south west of Narrabri on cleared pasture near Bullawa Creek. Ten Aboriginal sites were recorded during the survey. All were culturally-modified trees. Ground surface visibility was generally very high and 90 per cent of the study area was found to be substantially disturbed. This assessment found there is a low likelihood for significant sub-surface remains of Aboriginal cultural heritage.

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