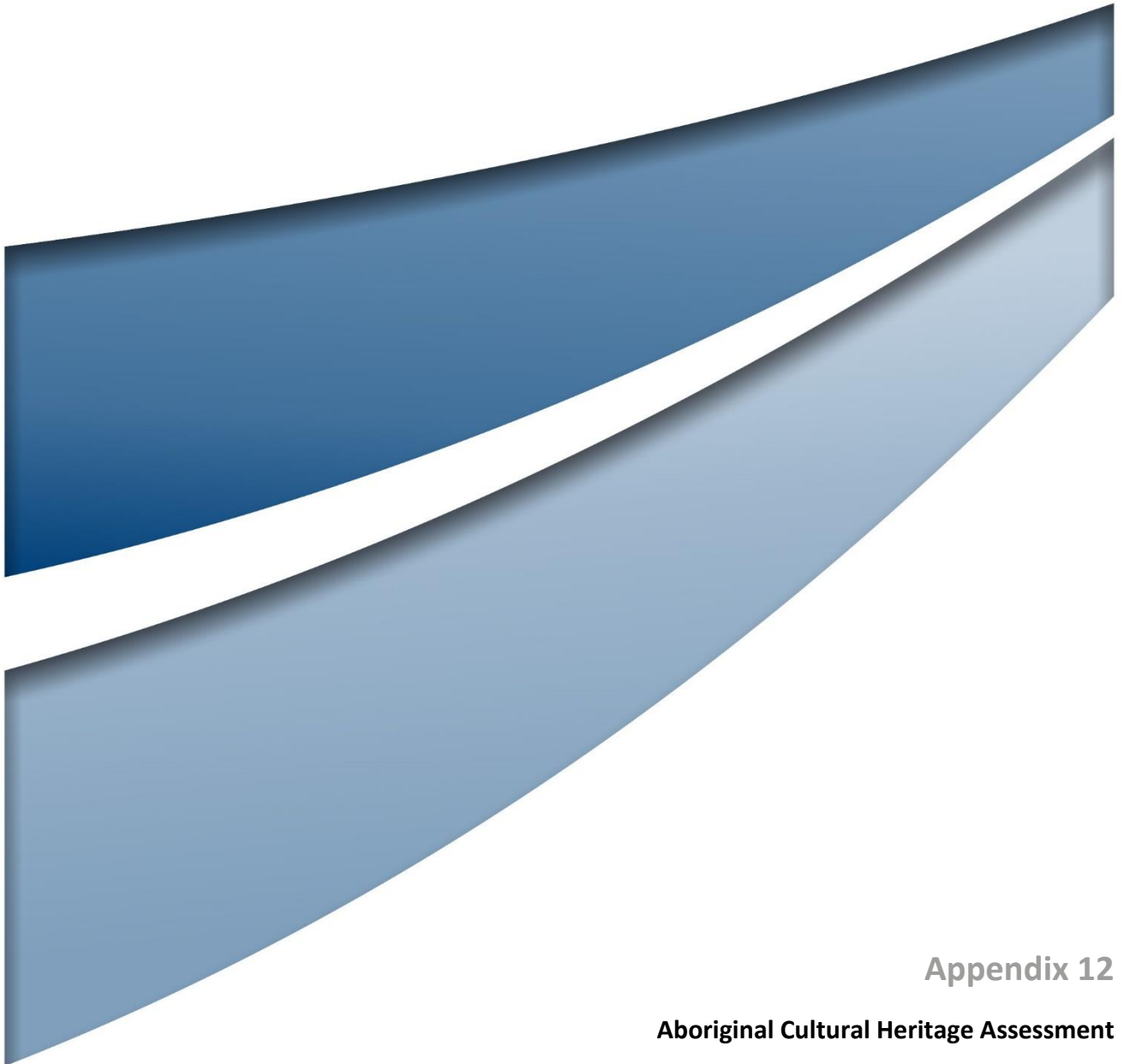




Appendix 12

Aboriginal Cultural Heritage Assessment

Prepared for Windlab Developments Australia

Aboriginal Cultural Heritage Assessment

Junction Rivers Wind Project

April 2024

Project Number: 21-838

Document verification

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Acronyms and abbreviations

ACHA	Aboriginal Cultural Heritage Assessment
ACHCRP	Aboriginal Cultural Heritage Consultation Requirements for Proponents
AFT	Artefact scatter
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ATR	Archaeological Technical Report
BESS	Battery Energy Storage System
CHMP	Cultural Heritage Management Plan
Development corridor	Area of proposed works and ground disturbance for the Junction Rivers Wind Project.
DEM	Digital Elevation Modelling
DPHI	Department of Planning, Housing and Infrastructure (NSW)
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
HHIA	Historical Heritage Impact Assessment
HTH	<i>Hearth</i>
IBRA	Interim Biogeographic Regionalisation for Australia
ICOMOS	International Council on Monuments and Sites
km	kilometres
LALC	Local Aboriginal Land Council
LGA	Local Government Area
m	metres
NGH	NGH Pty Ltd
NOHC	Navin Officer Heritage Consultants Pty Ltd
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>

NSW	New South Wales
OzArk	OzArk Environmental & Heritage Management Pty Ltd
PAD	Potential Archaeological Deposit
Proponent	Windlab Developments Pty Ltd
Project Area	The wider boundary of all affected lots where the proposed Project may be located within the land which is being assessed for the Junction Rivers Wind Project, this includes the proposed development corridor.
PEC-East	Project Energy Connect Eastern Section
RAP	Registered Aboriginal Party
SEARs	Planning Secretary's Environmental Assessment Requirements
SHI	State Heritage Inventory
SSD	State Significant Development
ST	Tree cultural site
SW-REZ	South-West Renewable Energy Zone
The Project	Junction Rivers Wind Project
Windlab	Windlab Developments Pty Ltd
WTG	Wind Turbine Generators

Note: This Project was initially named the Burrawong Wind Farm. In October 2023 the name of this Project was changed to the Junction Rivers Wind Project at the request of the Proponent following consultation with the community, landholders and local First Nation groups. The new Aboriginal sites recorded during this assessment and detailed in this report were registered on AHIMS before this project name change, thus the Aboriginal sites recorded in this Project Area by NGH and referred to in this report refer to “Burrawong” as part of the site names. The AHIMS site names are unable to be changed after they have been registered thus the continuation of the naming convention “Burrawong” for the Aboriginal sites detailed in this report.

Executive summary

Introduction

NGH Pty Ltd (NGH) has been engaged by Windlab Developments Pty Ltd (Windlab) [the Proponent] to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to address potential impacts by the proposed Junction Rivers Wind Project (the Project) on Aboriginal cultural heritage. The Project is located between Yanga and Kyalite in the Murray River Council Local Government Area (LGA), in New South Wales (NSW).

Project Proposal

The proposed Junction Rivers Wind Project is a State Significant Development (SSD) and the ACHA will be used to form part of the Environmental Impact Statement (EIS) for the Project (SSD-30448824). The proposed work for the wind farm includes a number of activities that will require ground disturbance that has the potential to impact on Aboriginal heritage sites and objects which are protected under the *NSW National Parks and Wildlife Act 1974* (NPW Act).

Windlab proposes to develop the Project to provide a reliable and affordable source of energy for the people of NSW and contribute to reducing greenhouse gas emissions associated with energy generation. The Project is located approximately 15 kilometres (km) south of Balranald, 140 km west of Hay and 20 km northeast of the NSW and Victorian border within the southern section of the Murray-Darling Basin. The Project is within the Murray River Council LGA, and immediately east of Balranald Shire LGA. The Project is located within the South-West Renewable Energy Zone (SW- REZ), which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap.

The Project is SSD as defined under State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) and will require development consent under Part 4 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).

The Project will have a generating capacity of approximately 750 megawatts (MW) and would connect to the existing 220 kilovolt (kV) transmission line that traverses the site and/or the proposed Project EnergyConnect transmission line.

The key components of the Project include:

- up to 96 (3 blade) Wind Turbine Generators (WTG) with a total height (tip height) of approximately 300 metres (m);
- electrical connections between the proposed WTGs and substations/switching stations consisting of a combination of underground cables and overhead powerlines;
- substations/switching stations and transmission connections to connect to the existing 220 kV transmission line and/or the proposed Project EnergyConnect transmission line;
- up to four battery energy storage system (BESS) facilities (to a total of 200 megawatts (MW) with a 4 hour delivery capacity), or up to four STATcom facilities.;
- other associated infrastructure including access roads and tracks, operation and maintenance buildings and construction facilities;
- temporary on-site concrete batching plants and rock crushing facilities during the construction phases; and
- targeted road network upgrades to facilitate delivery of WTG components to the site as required.

The Project may be constructed in two stages. Stage 1 may see the construction of up to 30 WTGs and required ancillary infrastructure and Stage 2 may see the construction of the remaining WTGs and required ancillary infrastructure. The construction period would be approximately four years.

For environmental assessment purposes, a Project 'development corridor' has been established consisting of a buffer around the conceptual layout for the Project. The development corridor represents a worst-case assessment scenario and allows for refinement of Project infrastructure, such as micro-siting, during the detailed design phase. The Project may also be constructed in stages.

Aboriginal community consultation

The consultation with Aboriginal stakeholders for this Project was undertaken in accordance with Section 60 of the *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2019* and following the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRP). As a result of this process, six Aboriginal Registered Party (RAP) have registered their interest in the Project. A copy of the draft report was provided to all RAPs for comment.

Desktop assessment and survey results

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database revealed 15 previously recorded Aboriginal sites located within the Project Area- these being two burials, two sites with stone artefacts (1 or more), one hearth and 10 modified trees. Upon further assessment, it was determined that these 15 previously recorded Aboriginal sites were located outside the proposed development corridor and will not be impacted by the proposed development.

As part of the assessment of the Project Area, the entirety of the proposed development corridor was surveyed on foot by NGH archaeologists with representatives from the RAPs as part of the fieldwork undertaken for the Project. During the surveys completed for this assessment, the following additional archaeological features and cultural sites were recorded; stone artefacts, hearths, oven mounds and tree cultural sites.

A summary of the Aboriginal and cultural sites recorded during the field survey for this Project are provided in the table below. The new tree cultural sites were recorded by NGH with the naming convention Burrawong WF ST 01 to Burrawong WF ST 24, while the isolated stone artefact sites were recorded with the naming convention Burrawong 2 to Burrawong 38. The sites with artefact scatters, hearth and mound features were recorded with the naming conventions Burrawong WF AFT 01 to Burrawong WF AFT 06 and Burrawong WF HTH 01 to Burrawong WF HTH 13.

Site Type	Number	%
Isolated finds	37	46.25
Tree cultural site	24	30
Hearths	9	11.25
Artefact scatter	5	6.25
Hearth and mound	2	2.5
Hearth and Artefact	2	2.5
Artefact Scatter, Hearth and mound	1	1.25
Total	80	100

Based on the site types, archaeological features and cultural sites recorded during this assessment, it is likely that the area as a whole was used intermittently over long periods of time for camping while water remained in the landscape, as indicated by the presence of hearths, mounds and stone artefacts. Sites that consist of both hearths/mounds and stone artefacts indicate that camping, cooking and tool manufacturing activities were undertaken in these areas. Additionally, several Aboriginal sites identified in this assessment have a number of hearth features with associated artefacts and/or mounds. This suggests that some sites were repeatedly revisited and reused over time or were the focus of occupation for a relatively large group of people at one time.

It should also be noted that the results of this investigation have substantially increased the number of sites and archaeological features recorded in the local area and it's likely that similar numbers of these sites may occur in areas outside the land surveyed for this Project in the local area.

Potential impacts

It should be noted that significant design changes have occurred throughout the development for this wind farm. Significant effort has also been undertaken both before, during and following the completion of the surveys for this Project to ensure the design and micro-siting for the infrastructure components, where possible, is able to avoid recorded Aboriginal sites through the placement of heritage exclusion zones.

To facilitate refinement of the layout during the detailed design process, an allowance for micro-siting of infrastructure within the development corridor as assessed in this report is sought by the Proponent to ensure that the final design of this Project does not result in greater impacts to Aboriginal heritage than those assessed in this report. This micro-siting approach is a common occurrence on wind farm projects; therefore, a precautionary principle has been applied during the assessment of harm which assumes that within the development corridor (excluding the mapped heritage exclusion zones) that complete impact to sites may occur.

Based on this approach the tables below provide a summary of sites assessed to be impacted and avoided by the proposed development.

Sites impacted	Sites avoided
Burrawong WF AFT 01 to Burrawong WF AFT 04	Burrawong WF ST 01 to Burrawong WF ST 24
Burrawong WF AFT 06	Burrawong WF AFT 05
Burrawong WF HTH 06	Burrawong WF HTH 01 to Burrawong WF HTH 05
Burrawong WF HTH 09	Burrawong WF HTH 07 to Burrawong WF HTH 08
Burrawong WF HTH 13	Burrawong WF HTH 10 to Burrawong WF HTH 12
Burrawong 02 to Burrawong 38	15 Previously recorded AHIMS sites within the Project Area (AHIMS# 47-6-0037, #47-6-0041, #47-6-0093, #47-6-0945, #47-6-0253, #47-6-0147, #47-6-0148, #47-6-0150, #47-6-0255, #47-6-0151, #47-6-0254, #47-6-0146, #47-6-0069, #47-6-0149 and #47-6-0068).

Meanwhile, the table below provides a summary of the degree of harm and the consequence of that harm upon the heritage value of each site type recorded during this assessment within the Project Area.

Site Type	Type of Harm	Degree of Harm	Consequence of harm	No. of Sites	% of site type
Isolated Finds	Direct	Complete	Total loss of value	37	100
Artefact Scatters	Direct	Complete	Total loss of value	5	100
Hearths	Direct	Complete	Total loss of value	3	33.3
	Nil	Nil	No loss of value	6	66.7
Artefact Scatter, Hearth and Mound	Nil	Nil	No loss of value	1	100
Hearth and Mound	Nil	Nil	No loss of value	2	100
Hearth and Artefact	Nil	Nil	No loss of value	2	100
Tree cultural site	Nil	Nil	No loss of value	24	100
Previously recorded AHIMS sites within the Project Area	Nil	Nil	No loss of value	15	100

Recommendations

It is recommended that:

1. The development must avoid all the heritage exclusion zones which are mapped within the Project Area. These heritage exclusion areas should be shown on all construction maps for this Project and if during construction works any ground disturbance activity is proposed within 50 m of any of these heritage exclusion zones then high visibility temporary fencing must be in place along the boundary of the heritage exclusion zone in proximity to the works prior to any ground disturbance and/or construction works commencing nearby to ensure there are no inadvertent impacts to these areas. Given the size of some of these heritage exclusion zones it is acceptable that only the portion of the heritage exclusion zones in proximity to works is demarcated.
2. The development must avoid the 24 tree cultural sites recorded during this assessment as Burrawong WF ST 01 to Burrawong WF ST 24. A minimum 20 m buffer must be in place from the trunk of each tree to prevent any inadvertent impacts to the canopy and/or root system of each recorded cultural site.
3. The development must avoid the 15 previously registered AHIMS sites within the Project Area which are outside the proposed development corridor for this Project. The AHIMS sites to be avoided are: 47-6-0037, 47-6-0041, 47-6-0093, 47-6-0945, 47-6-0253, 47-6-0147, 47-6-0148, 47-6-0150, 47-6-0255, 47-6-0151, 47-6-0254, 47-6-0146, 47-6-0069, 47-6-0149 and 47-6-0068. No works or access tracks are proposed to be implemented during the Project within proximity (within 50 m) to any of these previously registered AHIMS sites within the Project Area, hence no demarcation of these sites is required as part of the Junction Rivers Wind Project.
4. If complete avoidance to any of the isolated finds and artefact scatters recorded within the proposed development corridor is not possible, a reasonable and feasible attempt, through the visual inspection of the site by an archaeologist with an Aboriginal community representative (as selected by the Proponent), must occur in an attempt to collect the surface stone artefacts within the development corridor at each of these recorded locations. This must occur prior to construction, following the development consent which is issued for State Significance Developments.

5. Due to ongoing farming practises in the wider Project Area and the potential for delays in the commencement of construction, the ability to undertake the surface collection salvage within the development corridor (outside the heritage exclusion areas) should be facilitated in any conditions of consent issued for this Project. This should occur following the approval of a Cultural Heritage Management Plan for the Project and in accordance with the development consent. The surface collection salvage would be undertaken in line with the methodology provided in Appendix D of the ACHA report.
6. A surface collection salvage programme must be attempted at each site with stone artefacts recorded that is approved for impacts prior to the proposed construction works commencing for each stage of works proposed within the development corridor for the Junction Rivers Wind Project. The surface collection programme may be staged, if required, to conform to the proposed staged approach of construction works.
7. The collection and relocation of the surface artefacts and any collected cultural material should be undertaken by an archaeologist with a representative/s of the registered Aboriginal parties, as selected by the Proponent, and be consistent with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* and/or the wishes of the Registered Aboriginal Parties.
8. All objects salvaged must have their long term relocation details submitted to the AHIMS database. An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works as approved in the development consent for this State Significant Development.
9. A minimum 5 m buffer should be observed around all stone artefact and hearth sites that are being avoided by the proposed development. If during any works for the Junction Rivers Wind Project, any ground disturbance activity is proposed within 50 m of any recorded valid in situ known Aboriginal sites then high visibility temporary fencing must be in place to demarcate a minimum 5 m buffer around the boundary of the site prior to any works commencing within proximity (within 50 m) of the site.
10. Unmitigated impacts can occur to the hearth sites Burrawong WF HTH 06, Burrawong WF HTH 09, Burrawong WF HTH 13 if they cannot be avoided by works.
11. All works for the Junction Rivers Wind Project must stay within the area assessed for the development corridor and impact areas as detailed in this report to ensure there are no inadvertent impacts to Aboriginal objects.
12. For any proposed future impacts to the Aboriginal sites being avoided and outside the development corridor, as assessed in this report, further assessment and consideration of impacts on Aboriginal Heritage as determined by an archaeologist should occur. Additional Aboriginal consultation and further assessment which may include survey and/or subsurface testing may be required.
13. Further archaeological assessment would be required if the proposal activity and development corridor extends beyond the area assessed in this report. This would include consultation with the registered Aboriginal parties and may involve further field survey.
14. The Proponent should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal artefacts and objects during the construction of the Junction Rivers Wind Project and for the management of known sites within and in proximity to the development corridor which will be avoided. The Plan should include the unexpected finds procedure to manage any objects suspected to be Aboriginal in origin during the construction, maintenance, operation and decommissioning works and include requirements for heritage to be included as part of the site inductions and the monitoring of sites which will be avoided. Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.
15. In the event that suspected human remains are discovered during the construction of the Junction Rivers Wind Project, all work must cease in the immediate vicinity. The appropriate heritage team within Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were ancestral Aboriginal remains or not. If the remains are deemed to be ancestral Aboriginal in origin Heritage NSW would be sought to advise the Proponent on the appropriate

actions required. An unexpected find protocol for suspected human remains must be included in the CHMP for the Project.

16. Prior to any development consent being issued for this Project, the drafted conditions which relate to Aboriginal heritage should be reviewed by a qualified archaeologist to ensure all sites assessed for impacts and avoidance and the management recommendations, as noted in this report, are clearly included and listed in any conditions of consent.

All Aboriginal objects and places in NSW are protected under the *National Parks and Wildlife Act*. It is an offence to disturb an Aboriginal object or site without appropriate consent.

1. Introduction

NGH Pty Ltd (NGH) has been engaged by Windlab Developments Pty Ltd (Windlab) [the Proponent] to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to address potential impacts by the proposed Junction Rivers Wind Project (the Project) on Aboriginal cultural heritage within a number of lots along Balranald Road (the Project Area) between Yanga and Kyalite in New South Wales (NSW). The Project is located approximately 15 kilometres (km) south of Balranald, 140 km west of Hay and 20 km northeast of the NSW and Victorian border within the southern section of the Murray-Darling Basin. The Project is within the Murray River Council Local Government Area (LGA) and immediately east of Balranald Shire LGA. The Project is located within the South-West Renewable Energy Zone (SW-REZ), which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap. The Project will have a generating capacity of approximately 750 megawatts (MW) and would connect to the existing 220 kilovolt (kV) transmission line that traverses the site and/or the proposed Project EnergyConnect transmission line.

The ACHA and Archaeological Technical Report (ATR) are being undertaken to investigate and examine the presence, extent and nature of any Aboriginal heritage sites within the proposed development corridor of the Project Area, assess the potential impacts to Aboriginal sites within the development corridor of the Project Area and provide management strategies that may mitigate any impacts. The ATR documents (see Appendix A) the detailed findings from the field survey conducted as part of the ACHA for the Project.

The proposed Junction Rivers Wind Project is a State Significant Development (SSD) as defined under *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) and will require development consent under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The ACHA will be used to form part of the Environmental Impact Statement (EIS) as required by the Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project (SSD-30448824). The EIS will be submitted to the Department of Planning, Housing and Infrastructure (DPHI) for assessment and determination. The proposed work for the wind farm includes a number of activities that will require ground disturbance that has the potential to impact on Aboriginal heritage sites and objects which are protected under the *NSW National Parks and Wildlife Act 1974* (NPW Act).

The SEARs for the Project also identified Aboriginal heritage as a specific issue to be addressed in the EIS including:

- *an assessment of the impact to Aboriginal cultural heritage items (archaeological and cultural) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), including results of archaeological tests (if required).*
- *evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)*

(Supplementary SEARS 19/12/2023- SSD-30448824).

Throughout the assessment therefore, to ensure compliance with the SEARs and Aboriginal heritage assessment undertaken in NSW, the following codes and guides were followed in relation to this Aboriginal heritage assessment:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011)*
- *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (DECCW NSW 2010a)*
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRP) (DECCW NSW 2010b).*

The Junction Rivers Wind Project is an SSD project that represents an important contribution to renewable energy generation in NSW and is subject to approval by the NSW Minister for Planning and Public Spaces. Under Section 4.41 (1) (d) of the EP&A Act an Aboriginal Heritage Impact Permit (AHIP) is not required for the Junction Rivers Wind Project as the project is an SSD.

1.1 Statutory context

As part of the development impact assessment process, the proposed development application will be assessed under part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The proposed Junction Rivers Wind Project is classified as a SSD under Part 4 of the EP&A Act. SSDs are major projects which require approval from the Minister for Planning and Public Spaces. The archaeological assessment is to support the completion of an EIS to fulfil the requirements of the Secretary of DPHI.

Aboriginal heritage is primarily protected under the NPW Act (1974) and as subsequently amended in 2010 with the introduction of the *National Parks and Wildlife Amendment (Aboriginal Objects and Places) Regulation 2010*. The aim of the NPW Act includes:

The conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including but not limited to places, objects and features of significance to Aboriginal people.

An Aboriginal object is defined 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 the occupation of that area by persons on non-Aboriginal extraction and includes Aboriginal remains.

Part 6 of the NPW Act concerns Aboriginal objects and places and various sections describe the offences, defences and requirements to harm an Aboriginal object or place. The main offences under section 86 of the NPW Act are:

- A person must not harm or desecrate an object that the person knows is an Aboriginal object.
- A person must not harm an Aboriginal object.
- For the purposes of this section, "circumstances of aggravation" are:
 - that the offence was committed in the course of carrying out a commercial activity, or
 - that the offence was the second or subsequent occasion on which the offender was convicted of an offence under this section.
- A person must not harm or desecrate an Aboriginal place.

Under section 87 of the NPW Act, there are specified defences to prosecution including authorisation to harm in accordance with an AHIP or through exercising due diligence or compliance through the regulation.

Section 89A of the Act also requires that a person who is aware of an Aboriginal object must notify the Director-General in a prescribed manner. In effect this section requires the completion of an AHIMS site card for all sites located during heritage surveys.

Section 90 of the NPW Act provides for the issuing of an AHIP, including that the permit may be subject to certain conditions. However, under Section 4.41 (1) (d) of the EP&A Act, section 90 of the NPW Act does not apply.

The EP&A Act is legislation for the management of development in NSW. It sets up a planning structure that requires developers (individuals or companies) to consider the environmental impacts of new proposals. Under this Act, cultural heritage is a part of the environment. This Act requires that Aboriginal cultural heritage and the possible impacts to Aboriginal heritage that development may have formally considered in land-use planning and development approval processes.

1.2 Objectives of assessment

The Project will involve ground disturbance and there is potential to impact on Aboriginal heritage sites and objects, which are protected under the NPW Act. The purpose of this report is to investigate the presence of any Aboriginal sites within the Project Area, assess the impacts to Aboriginal sites within the Project Area and provide management strategies that may mitigate any impacts.

The purpose of this ACHA is to determine if Aboriginal objects are to be harmed by the proposal and to fulfil the SEARs for Aboriginal heritage.

The objectives of the assessment were to:

- Conduct Aboriginal consultation as specified in clause 60 of the National Parks and Wildlife Regulation 2019, using the consultation process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (ACHCRP) (DECCW 2010a);
- Undertake a field survey of the proposed development corridor to identify and record any Aboriginal objects within the area proposed for ground disturbance impacts;
- Undertake an assessment of the archaeological and cultural values of the proposed development corridor and any Aboriginal objects therein;
- Assess the cultural and scientific significance of any archaeological material;
- Assess the possible impacts of the development proposal on the archaeological sites, and
- Provide management recommendations for any Aboriginal objects found.

1.3 Report format

The ACHA report was prepared in accordance with the following guidelines:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011);
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a); and
- *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b)

2. Description of the area

2.1 Project location

Windlab proposes to develop the Project to provide a reliable and affordable source of energy for the people of NSW and contribute to reducing greenhouse gas emissions associated with energy generation. The Project is located approximately 15 km south of Balranald, 140 km west of Hay and 20 km northeast of the NSW and Victorian border within the southern section of the Murray-Darling Basin. The Project is within the Murray River Council LGA, and immediately east of Balranald Shire LGA. The Project is located within the SW-REZ, which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap. The proposed work is for the construction, operation and eventual decommissioning or repowering of a wind farm located along Balranald Road between Yanga and Kyalite.

The Project Area includes the Lot/DP listed in Table 2-1 and the Project Area is shown in Figure 2-1 and Figure 2-2. All proposed infrastructure would be located within a development corridor within the Project Area as shown in Figure 2-3. The Project Area is within the parishes of Burrawang, Condoulpe, Salisbury and Turora in the county of Wakool, and partially within the parish of Wombah in the county of Caira, NSW.

Table 2-1 Freehold and crown land lot within the Project Area

Freehold land Plan Number	Lot Number
16335	10, 14
134424	1, 2, 3
720256	47
725897	84
751243	7, 10, 11, 13, 44
756520	2, 16, 19, 20, 21, 22, 23, 24, 26, 27, 35, 36, 38, 39, 42, 43, 48, 49, 50, 53, 54, 55, 57, 58, 59
756528	20, 21, 22, 23, 24, 28, 29, 30, 51, 58, 60, 62, 63, 64, 65, 67, 68, 69, 71, 72, 75, 80
756588	2, 4, 5, 6, 7, 10, 13
876082	482
1140351	2
Crown Land Plan Number	Lot Number
1158277	7308
1158277	7306
1159244	7300
1159244	7301
725898	86
725897	83

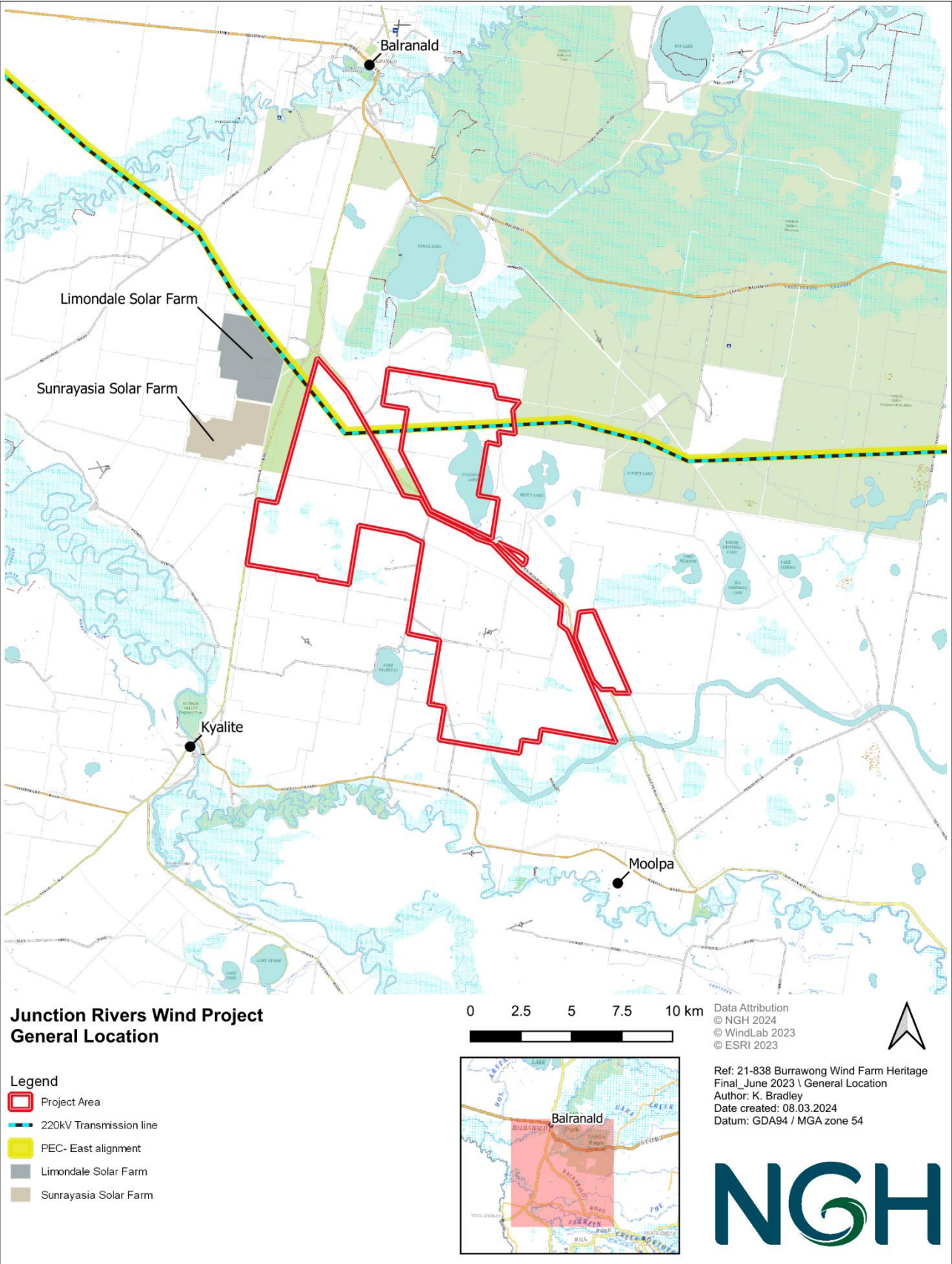


Figure 2-1 General location of the Project Area

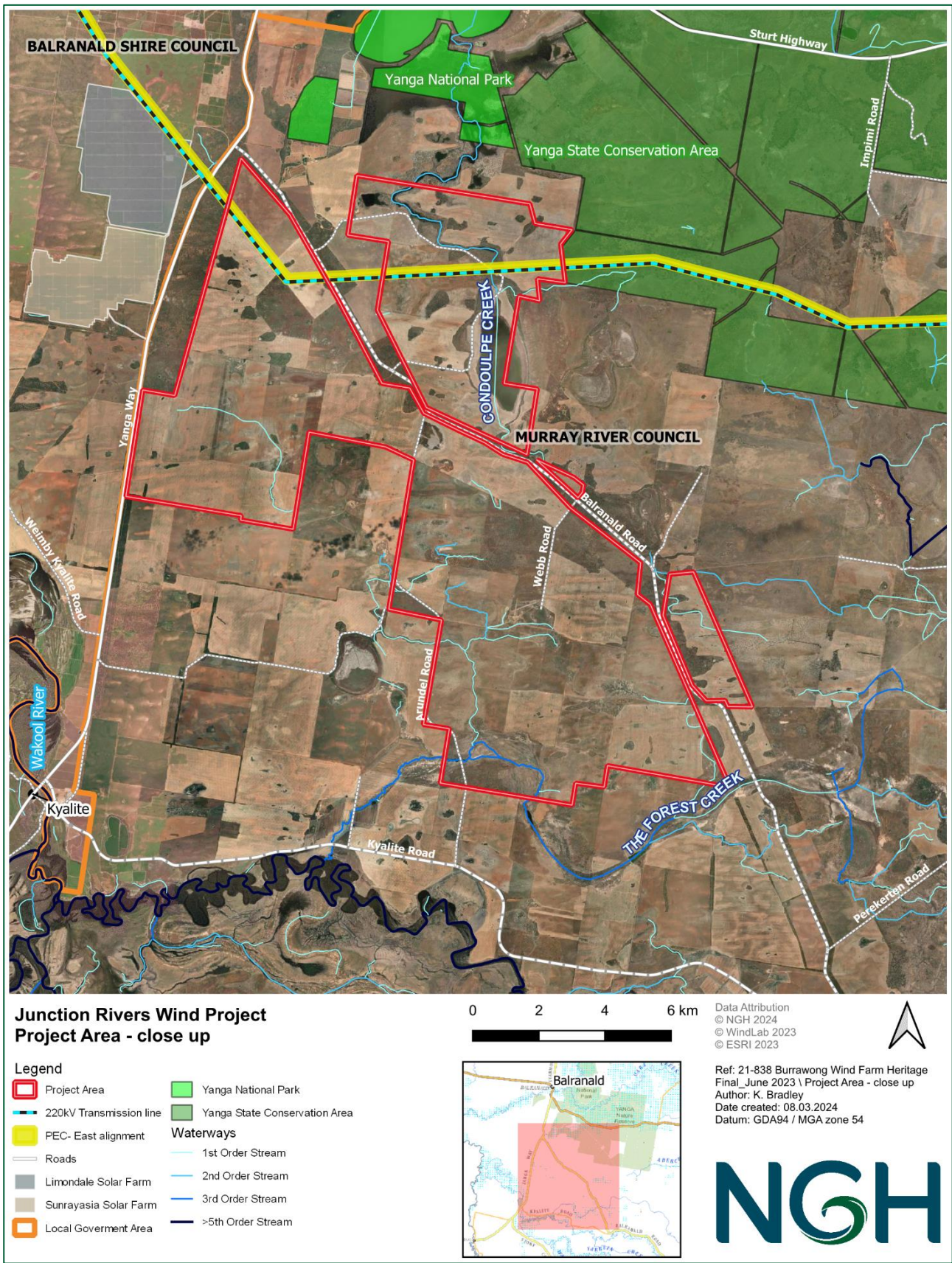


Figure 2-2 Project Area

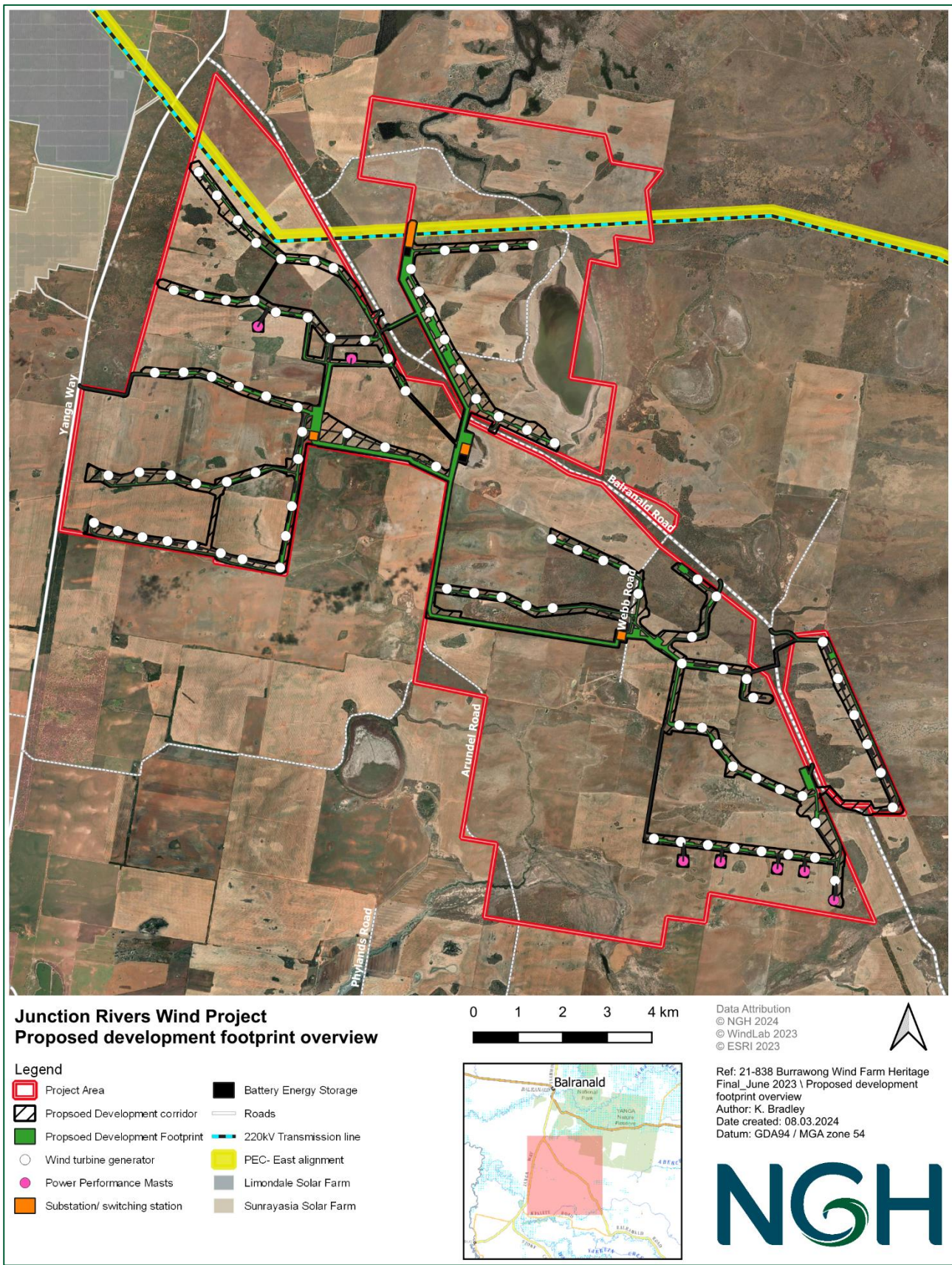


Figure 2-3 Proposed development corridor overview

2.2 Environmental context

Understanding the landscape context of the Project Area may assist us to better understand the archaeological modelling of the area and assist in identifying local resources which may have been used by Aboriginal people in the past. This information can then potentially be used to predict the nature of Aboriginal occupation across the landscapes within the Project Area.

Factors that are typically used to inform the archaeological potential of landscapes include the presence or absence of resources that would have been used by Aboriginal people including water, animal and plant foods, stone and other resources. The environmental context is equally important in terms of the taphonomic process, erosion or other factors that may influence the detectability of Aboriginal heritage sites.

The landscape context assessment for the Project Area is based on a number of classifications that have been made at national, regional and local levels to help us better understand the archaeological modelling of the area based on the geology, topography, hydrology, flora and fauna and past land disturbances within and adjacent to the Project Area.

2.2.1 Geology Topography and Soils

The landscape context assessment is based on several classifications that have been made at national and regional level for Australia that include the National Interim Biogeographic Regionalisation for Australia (IBRA) system, Mitchell landscapes, NSW soil landscapes and geological maps. The combination of these differing resolutions of landform data provides a comprehensive and multi scaled understanding of the landscape within the Project Area and its immediate surroundings.

The national IBRA system identifies that the majority of the Project Area as located within the South Olary Plain Subregion of the Murray Darling Depression Bioregion and a small section in the northeast corner of the Project Area within the Murrumbidgee Subregion of the Riverina Bioregion. The description of the geology, topography and soils within these IBRA subregions is provided in Table 2-2.

Table 2-2 IBRA Subregion descriptions (DE&E 2016).

Unit	Geology	Characteristic Landforms	Dominant Soils
South Olary Plain	Quaternary aeolian sands and lake sediments	Dunefields, sandplains, dry lakes and groundwater basins.	Deep siliceous and calcareous red to yellow sands, sandy earths, brown texture contrast soils on dunes and sandplains. Saline, gypseous and calcareous clays on lake beds, missed sands and pelleted clays in lunettes
Murrumbidgee	Quaternary alluvial sediments, clay and sand with source bordering dunes and lakes.	Soils are red brown earths, grey and brown clays and deep siliceous sands on dunes.	Red brown earths, grey and brown clays and deep siliceous sands on dunes.

The NSW 1:1500K simplified surface geology shows the Project Area mostly comprises of Quaternary Woorinen Formation (Qdw) which consists of poorly consolidated red-brown sands. However, a small area in the north-eastern corner of the Project Area (which is outside the proposed development corridor) has Quaternary lacustrine deposits (Ql) and Cainozoic sand dunes. The lacustrine deposits form when lakes are filled with sediment during wet period and after the water evaporates, mud, silt and sand are left in the now

dry lakebed. A small portion in the south of the Project Area consists of Cainozoic Shepparton Formation which has poorly consolidated clay, silt, sand and gravels.

Review of the Australian Soil classification (ASC) mapping within the Project Area shows that the soils within the Project Area consist primarily of grey-brown and red Calcareous soils (ASC order Calcarosols).

Further landscape mapping as part of the Mitchell landscapes system (DECC 2002) notes that the majority of the Project Area is located within the Murrumbidgee Depression Plains. Three other landscapes are also present in small areas within the Project Area which include the Murrumbidgee Lakes, Swamps and Lunettes, Mallee Cliffs Sandplains, and Murrumbidgee Scalded Plains. These landscapes are described below in Table 2-3 and shown in Figure 2-4.

Table 2-3 Description of the Mitchell Landscape relevant to the Project Area (DECC 2002)

Mitchell Landscape	Characteristic Landforms	Typical Soils
Murrumbidgee Depression Plains	Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters	Grey to brown clays and clay loams with linear patterns of sandy prior streams.
Murrumbidgee Lakes, Swamps and Lunettes	Large active freshwater lakes and swamps frequently flooded by the river, often nestled within larger relic Quaternary lake features.	Beaches, sand and clay pellet lunettes and sand hills on the eastern margins. Lake beds and associated channels of grey cracking clay, beaches of brown to white sands, lunettes of deep cemented yellow to white sands, with or without interbedded strata of pelleted clay. Relief of lakes and channels to 8 m, lunettes to 15 m.
Murrumbidgee Scalded Plains	Quaternary alluvial plains with extensive scalding interpreted as relic floodplains or terraces.	Grey, brown and red cracking clays, red brown texture-contrast soils with scalds. Levees traces evident, relief generally
Mallee Cliffs Sandplains	Extensive, slightly undulating sandplain of Quaternary aeolian sands with east-west trending dunes, often with blowouts, partly scalded broad swales and small depressions, relief 6 to 10 m	Solonized brown soils, calcareous loamy sand, and texture-contrast soils on the plain, red and brown sands on dunes, non-cracking grey or brown clays in depressions.

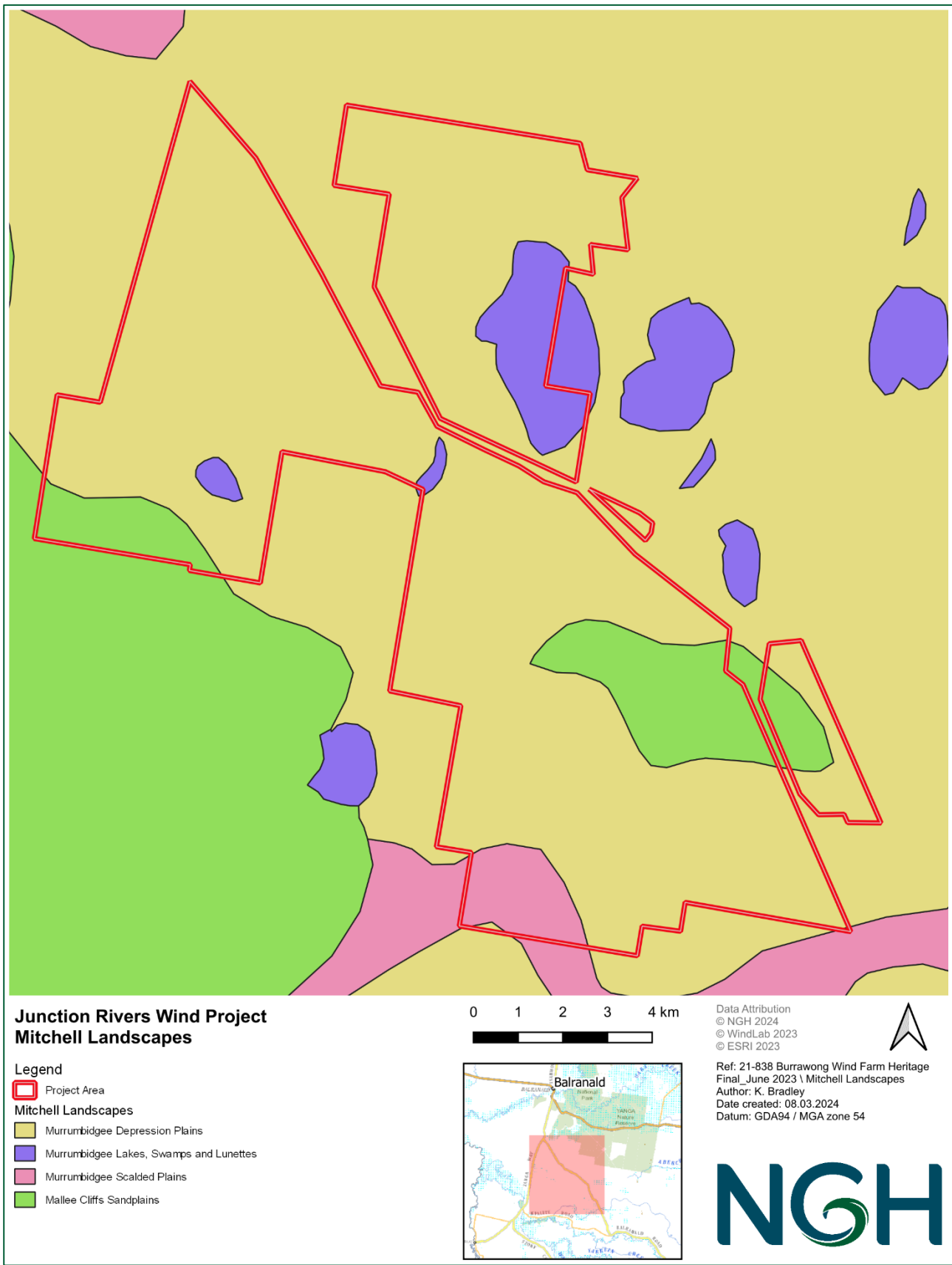


Figure 2-4 Mitchell Landscapes relevant to the Project Area.

In earlier work on the NSW landscape, parts of western NSW were also divided into land systems (Walker 1991), with this mapping extending across the Project Area. Based on land system mapping compiled in “Land Systems of Western New South Wales” (Walker 1991) the Project Area is mostly within the Condoulpe land system which is characterised as a sandplain between dunefields on the Riverine Plain near Balranald. Other notable elements of this system include the aeolian east-west dunes with relief to 5 m. There are small areas of the Murrumbidgee, Marma and Victoria land systems within the Project Area as described below in Table 2-4 and show in Figure 2-5.

Table 2-4 Description of the land systems in western NSW relevant to the Project Area (Walker 1991)

Land system name	Description	Soil and Vegetation	Landform and geomorphology	Summary
Condoulpe (Cd)	Sandplains and dunefields with mallee	Mallee. Plain and flats of predominantly solonized brown soils and areas of red earths; dunes of deep brownish sands; drainage basins of grey cracking clays; generally dense to scattered belah and mallee; areas of dense edible chenopods; drainage basins of dense black box, nitre goosefoot and dillon bush; variable speargrass, annual saltbushes and forbs.	Sandplain of Quaternary aeolian material with large areas of east-west trending dunes; relief to 5m; open flats, terminal drainage basins, locally depressed to 2m.	Sandplain between dunefields and the Riverine Plain near Balranald
Murrumbidgee (Mc)	Floodplains with black box and/or river red gum	Southern Riverine Woodlands. Plains with grey cracking and non-cracking clays; lunettes and rises of deep brownish sands; backplains of scalded yellow texture-contrast soils; moderate to dense black box, lignum, old man saltbush and nitre goosefoot; rises, lunettes and backplains with clumped mallee, white cypress pine, prickly wattle and scattered shrubs; abundant forbs and grasses.	Alluvial plains. Floodplain of grey fine-textured Quaternary alluvium with small rises, relief to 3 m; backplains, scalded levees and swamps. Riverside lunettes of deep sands; relief to 10 m. Irregularly inundated by flooding.	Higher terraces of the Murrumbidgee Murray, lower Lachlan and Wakool Rivers.
Marma (Mh)	Scalded plains	Saltbush Plains. Levees of red and yellow texture-contrast soils and grey cracking clays; sandplains and lunettes of solonized brown soils and red texture-contrast soils; floodplains of grey cracking clays; scattered to dense bluebushes, bladder saltbush and old man saltbush; canegrass in swamps; abundant forbs, copperburrs arid annual saltbushes.	Alluvial plains. Severely scalded levees, with associated swamps, pans and lunettes; relief to 5m; associated floodplain of fine-textured Quaternary alluvium and aeolian sandplains.	Ill-defined scalded drainage tracts associated with the Riverine Plain.

Land system name	Description	Soil and Vegetation	Landform and geomorphology	Summary
Victoria (Vc)	Labebeds and swamps	Southern Riverine Woodlands. Lakebeds, margins and channels of grey cracking clays and brownish sands; lunettes of deep, cemented sands; scattered to dense black box, lignum and nitre goosefoot along margins and channels; sparse prickly wattle and bluebushes on lunettes; copperburrs, forbs and annual grasses.	Playas and Basins. Large active freshwater and saline lakes to 15 km in diameter, depressed to 10 m; crescentic lunettes to 20 km long, relief to 20 m, small interconnecting channels and adjoining alluvial plains of Quaternary alluvium, sometimes saline, and aeolian sand.	Active lakes associated with the Murrumbidgee and Murray Rivers.

Given this mapping it is clear that there is very little topographic variation within the Project Area although there are east-west orientated dunes within close proximity to the Project Area and from aerial imagery, it appears that the Project Area may contain this landform. The relative height difference between the crest and swales varies but is approximately 5 m. The dunes surrounding the Project Area do not; however, comprise a consistent and regular dune sequence but rather an irregular and variable array of dunes, some running almost continuously across the region as micro topographic features while others fade into low swales at their eastern or western extremities.

In general, the soil profiles within the Project Area are expected to be predominantly made up of silty or cracking clays as described above, these soils tend to have low potential for subsurface archaeological deposits. However, any red sandy deposits and lunette features have high potential for Aboriginal objects. Other archaeological assessments in the region have also noted that very few Aboriginal sites were located in the Condoulpe landform which is the main land system within the Project Area and the development corridor.

2.2.2 Hydrology

The Project Area broadly lies between the Edward River in the south (which at its closest point to the Project Area is 3.5 km south) and the Murrumbidgee River in the north (which at its closest point to the Project Area is 13.5 km north). Within the north-eastern portion of the Project Area is Condoulpe Lake and the associated Condoulpe Creek. To the north is Lake Yanga and several other small lakes that surround the Project Area including Lake Talbetts. Forest Creek also intersects a small portion of the southern area of the Project Area. The hydrology of the Project Area and its immediate surrounding area is shown in Figure 2-6.

All the natural creeks and bodies of water in this area are ephemeral. However, in pre-European times, the region would have been subject to seasonal flooding. The Murrumbidgee River would flood and through a distributary system of anastomosing channels, including Forest Creek, water would spread out across the plain. Channels would have assisted in the distribution of the floodwaters into a myriad of seasonal wetlands and lakes. The water eventually made its way west and south, passing through what is now Yanga National Park and re-entering the Murrumbidgee River near Balranald as well as emptying into the Edwards River.

These creeks and bodies of water would have acted as vital waterways in the past and be a reliable and predicted event used to harness certain resources such a fish, water birds and plants.

2.2.3 Flora and fauna

The information provided herein is intended as a generalised summary of the endemic flora and fauna present within the Project Area and is not to be used as a substitute for detailed ecological and biodiversity studies.

As previously mentioned, the Project Area covers two different IBRA subregions. The plant communities within these subregions are summarised below (Table 2-5). These species would have provided a wide variety of resources for the manufacturing of wooden implements, medicine and food, as well as habitats for animals that were also used for food. If mature native trees remain, there is a possibility that scarred trees may be present as Yellow Box are known to have been favoured species for the extraction of bark for use as canoes, shields, and containers by Aboriginal people. The vegetation communities pre European settlement would have also provides numerous habitat types for fauna. Canopy trees provide foraging and nesting/resting habitat for birds and arboreal fauna. The mid-storey provides foraging and nesting habitat for smaller birds, as well as refuge for small-medium sized mammals and reptiles. Ground cover plants, logs and fallen leaves also provide shelter and foraging habitat for terrestrial fauna.

The majority of the Project Area today is cleared and cropped farmland containing exotic species of grass and commercial crops.

Table 2-5 IBRA subregion vegetation types (DE&E 2016).

Bioregion subregion	Vegetation types
South Olary Plains	Diverse mallee on sands with; pointed mallee, congoo mallee, red mallee, lerp mallee, slender-leaf mallee, yorrell, white cypress pine, mallee cypress pine, belah, rosewood, with porcupine grass and shrubs. Belah, rosewood, black bluebush, pearl bluebush, old man saltbush, on sandplains and heavier soils. Black box fringing depressions, halophytes on salinas, and chenopod shrublands on lunettes. lunettes, sometimes with white cypress pine.
Murrumbidgee	River red gum and river cooba on channels, Black box, lignum and old man salt bush on floodplains, Myall and old man saltbush with other saltbush and grasses formerly widespread on backplains. White cypress pine on dunes.

2.2.4 Landscape context

Most archaeological surveys are conducted in areas with topographic variation, and this can lead to differences in assessments of archaeological potential and site modelling for the location of Aboriginal objects. Paleochannel and lunette features and areas on the margins of wetlands and drainage depressions, including where stands of trees are present are landforms known to contain sites. Additionally, any old growth mature native trees within the Project Area have the potential to have been culturally modified. Any landforms with slightly raised red sandy area and areas adjacent to water also have potential sites to be present.

It is considered that the Project Area as a whole would have provided resources, shelter, water and food for Aboriginal people.

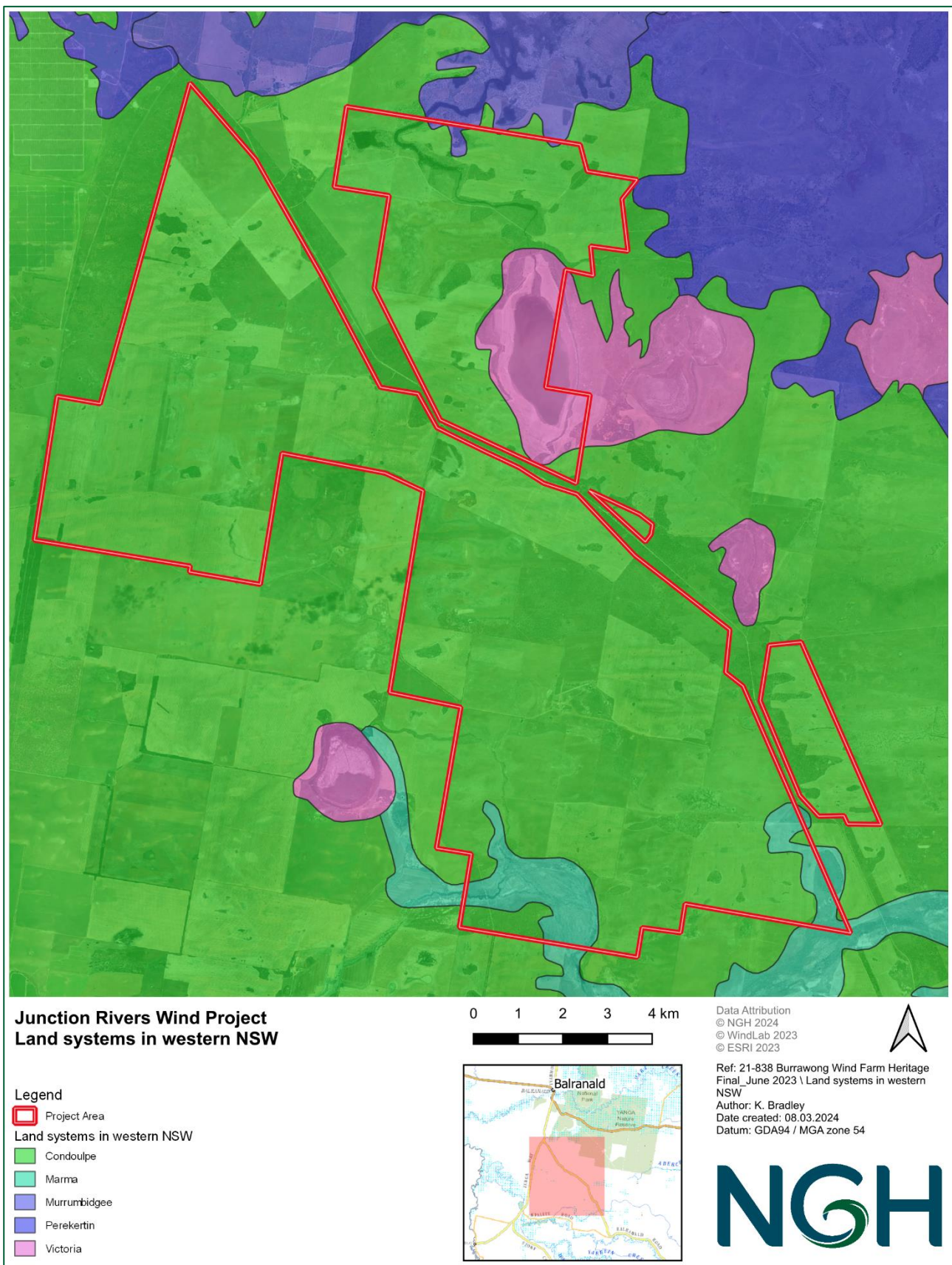


Figure 2-5 Land systems in western NSW relevant to the Project Area.

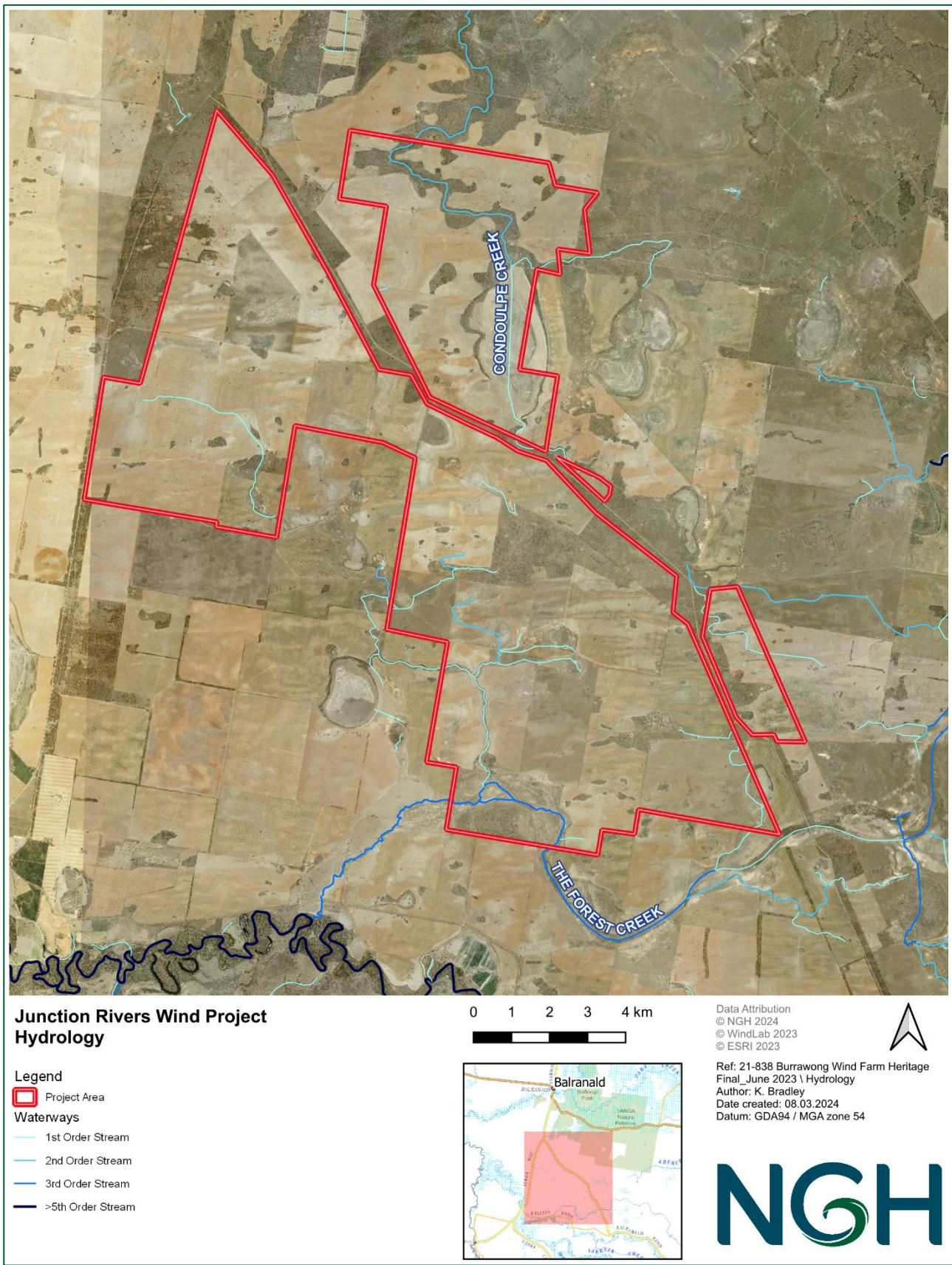


Figure 2-6 Hydrology in the Project Area.

2.2.5 Historic land use and land disturbance

The following section is a brief overview of the historical land use of the Project Area. A comprehensive history of the historic use of the Project Area is available in the Historical Heritage Impact Assessment (HHIA) report prepared by Umwelt (2024).

The Project Area is within the parishes of Burrawang, Condoulpe, Salisbury and Turora in the county of Wakool, and partially within the parish of Wombah in the county of Caira, NSW as show in Figure 2-7. The corresponding parish maps over the Project Area are provided in Plate 2-1 to Plate 2-5 which show that the Project Area initially formed part of the Yanga holding, before being subdivided into a number of smaller holdings.

The Project Area has been diagonally crossed by the Balranald Road and the area generally has a history of intensive agricultural and pastoral use. The majority of the area has been utilised for grazing and crop production since European settlement in the mid 1800's.

From the beginning of the 20th Century, wells and tanks were constructed throughout the area to provide better infrastructure for the stock and allow for an increase in capacity. The region was designated as part of the soldier settler scheme and was surveyed for subdivision in April 1924. By 1964 the region and its various farms were reintegrated into the Yanga Estate.

Homestead ruins were noted as being present within the Project Area (see Plate 2-6). Information regarding these ruins have been further addressed and detailed in Umwelt's HHIA.

The area is also noted to have historically had a very high rabbit populations with rabbit trappers actively employed in the area. In an attempt to control the rabbit numbers in the area the rabbiters are noted to scar and mark trees as part of one of the poisoning techniques historically used. The rabbiters would cut the bark from the Box trees then sprinkle strychnine over the sap on the bark before it was then placed on the ground about 3 meters apart to poison the rabbits (Kelly 2007). This method of cutting the tree would leave very distinctive marks on the trees which are referred to as "Rabbiters Trees" or "Rabbit sapping trees"(see Plate 2-7). However, there is still ongoing debate in regard to the origins of these markings on trees in the area as the members of the local Aboriginal community also identified these as Leaghur Trees, sacred women's sites colloquially known as 'Rabbiters Trees', which are believed to be related to sacred cultural activities of the Muthi Muthi people (Wakool Indigenous Corporation 2016b).

"During the drought periods rabbits were noted to eat the bark from Box trees to get the sap and trappers have been noted to create a cut on the bark an poison the rabbit population on Yanga in the early years was in plague proportion and when in drought time the rabbits were eating of the bark from the Box trees on the creek lines to get the sap out to eat. And the old trappers who seemed to be fighting a losing battle with the rabbits decided to cut of the bark from the Box trees to feed the rabbits with sap. When they carried out the cutting of bark form the trees they used steel axes that left a very distinctive mark in the heartwood of the tree. After cutting the bark off they would then sprinkle strychnine over the sap on the bark and it was then placed on the ground about 3 metres apart to poison the rabbits." (Kelly 2007:2)

An account of Yanga in 1912, by traveller and author Walter Kilroy Harris, who visited many stations along the Murray and Murrumbidgee, notes the number of rabbiters being employed at on the Yanga run:

"Manager Briggs, whom we found hard at work in his little office, told us that even at that moment, in addition to the permanent eighty men, and the almost equally permanent one hundred rabbiters he had a small army of contractors at work completing a job of sinking twenty-one bores in various parts of his run." (NSW and the Office of Environment and Heritage 2013:58)

The current land use of the Project Area, according to eSpade, is a mixture between dryland cropping, irrigated cropping, irrigated pasture, grazing, and modified pasture. Combined with the historic use of the region for seasonal grazing, it is likely that the area has had low to moderate surface disturbance in grazed

areas and moderate surface disturbances in areas which have been ploughed for agricultural crop production.

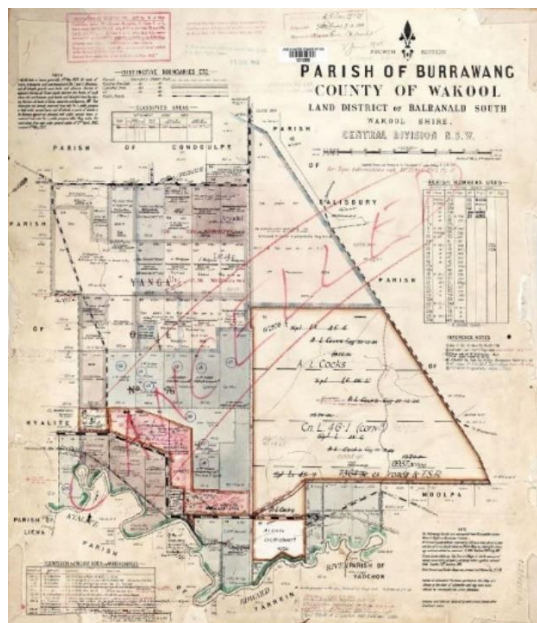


Plate 2-1 Parish of Burrawang map dated 1928.

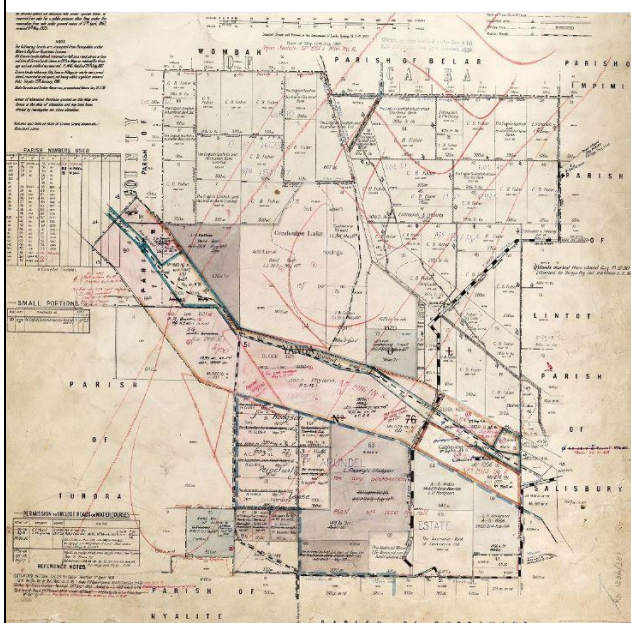


Plate 2-2 Parish of Condoulpe map dated 1928.

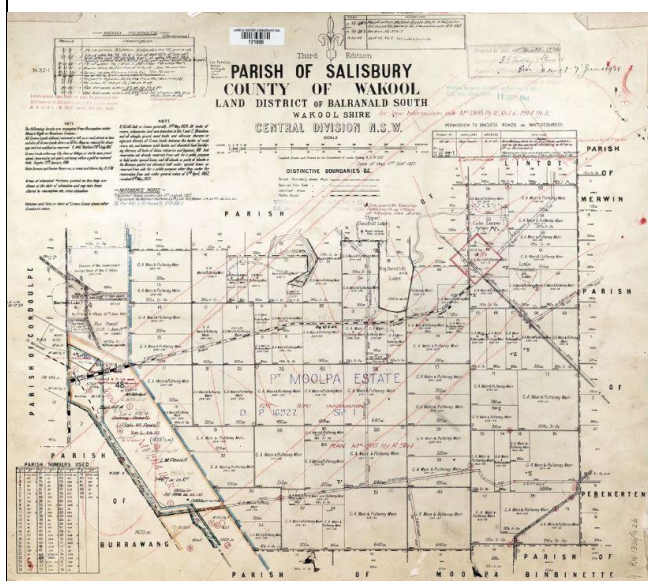


Plate 2-3 Parish of Salisbury map dated 1928.

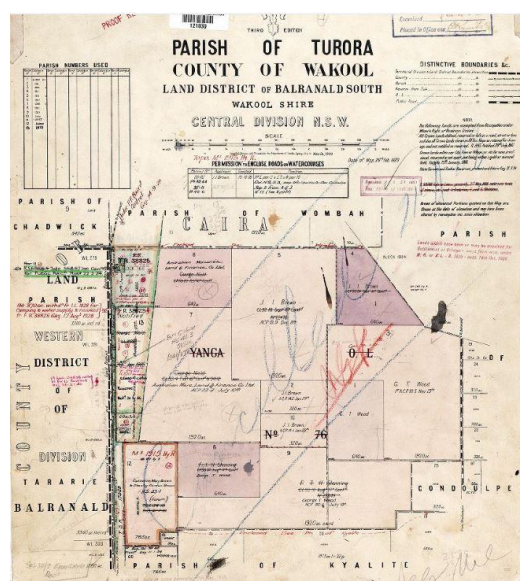


Plate 2-4 Parish of Turora map dated 1920.

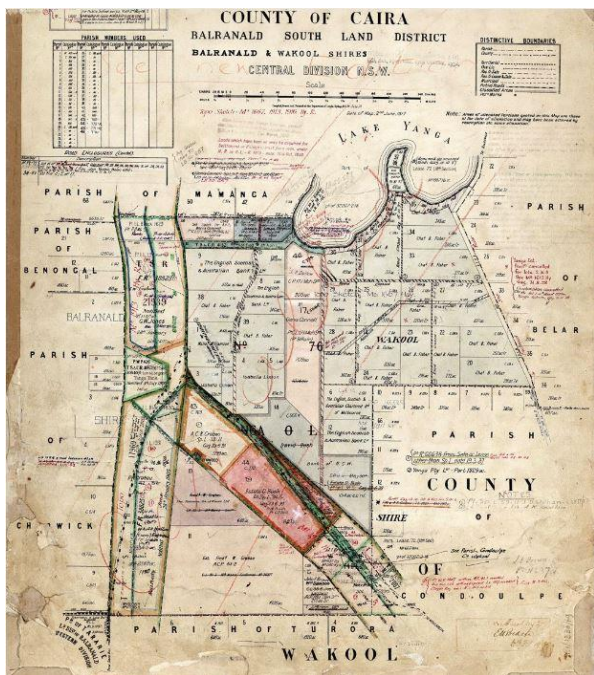


Plate 2-5 Parish of Turora map dated 1920.



Plate 2-6 Lynwood Homestead remains located in the Project Area (see Umwelt 2024 for further details of the historical assessment for this Project).



Plate 2-7 Example of a rabbit sapping tree, historical Rabbiters Trees (image from Kelly 2017).

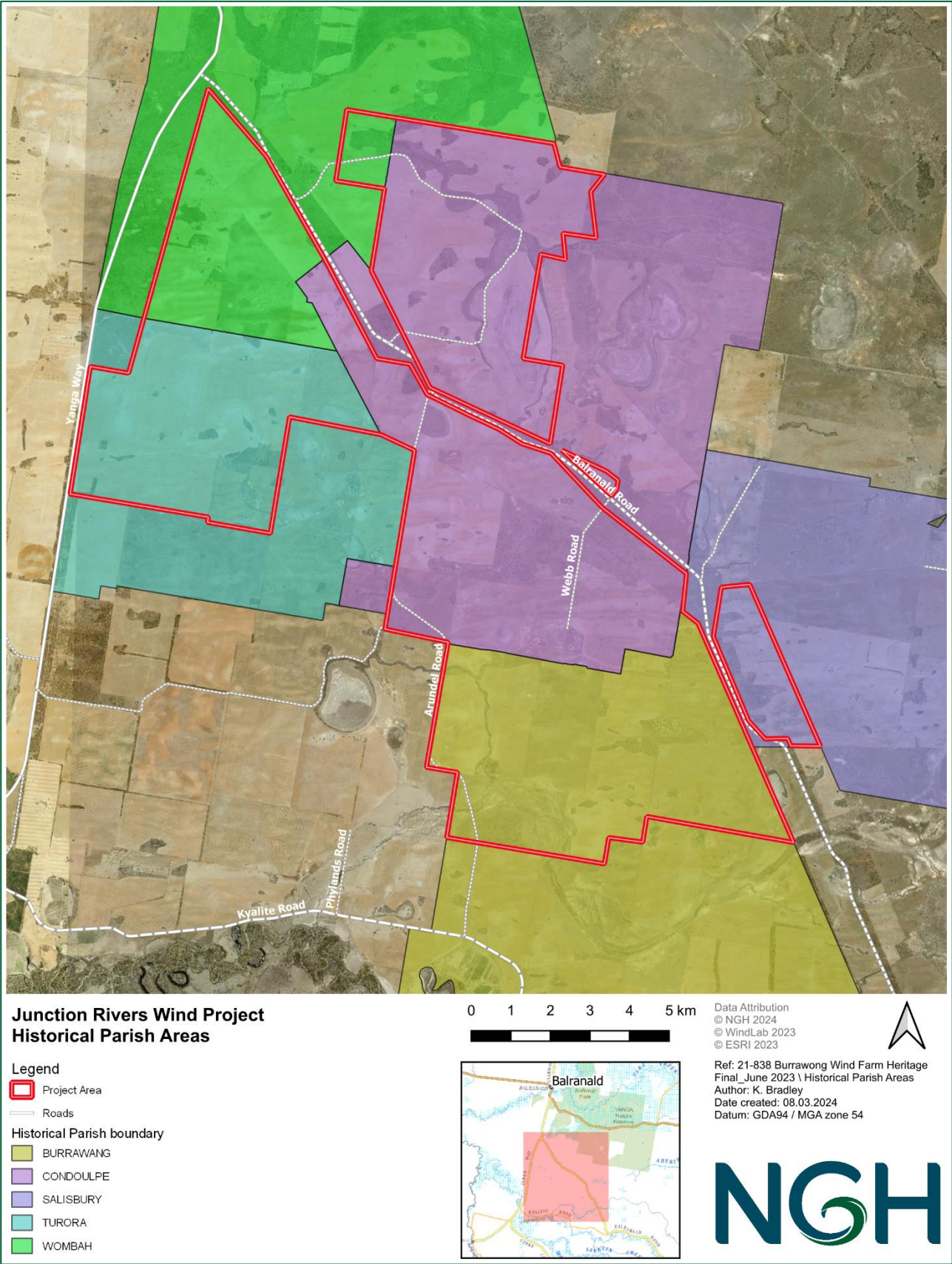


Figure 2-7 Historical Parishes within the Project Area.

2.3 Cultural context

2.3.1 Ethnographic setting

There are several ethnographic recordings of Aboriginal life in the region from the 1800s that notably focus on the prevalence of Aboriginal people around waterways. It is however important to consider that the Aboriginal people alive at the time of such observations were survivors of serious epidemics of infectious disease such as smallpox, brought by Europeans, that greatly affected the population sizes and distribution of people within the landscape. Consequently, European records may not necessarily reflect pre-contact population distributions and traditional ways of life (Dowling 1997; Littleton & Allen 2007).

The dispossession from traditional lands and acts of violence against the Aboriginal people also caused great social upheaval meaning that access to traditional resource gathering and hunting areas, religious life, marriage links and sacred ceremonial sites were disrupted or destroyed. Despite this, Aboriginal people continued to maintain their connections to sites and the landscape in a variety of ways. The Aboriginal people of the region continue to have a strong connection to their land.

Tribal boundaries and social structure

Cultural areas are difficult to define and “must encompass an area in which the inhabitants have cultural ties, that is, closely related ways of life as reflected in shared meanings, social practices and interactions” (Egloff et al. 2005:8). Depending on the culture defining criteria chosen - i.e. which cultural traits and the temporal context (historical or contemporary) - the definition of the spatial boundary may vary. In Australia, Aboriginal “marriage networks, ceremonial interaction and language have been central to the constitution of regional cultural groupings” with the distribution of language speakers being the main determinate of groupings larger than a foraging band (Egloff et al. 2005:8 & 16).

The Balranald area is identified as within the Muthi Muthi language group (Tindale 1974). As with a number of Aboriginal groups in the lower reaches of the Murrumbidgee, Lachlan and Darling River, the groups were known by their repeated word for ‘no’. It should be noted however that Tindale’s tribal boundaries were partially the product of a European system of determining landownership, a system that did not reflect Aboriginal social constructs or their relationship with country. Tindale’s maps imply that the language groups identified, and their defined borders/boundaries should be considered as territorial units. It is important to remember that the boundaries between all the language groups mapped by Tindale are suggestive only and would most likely have changed through time due to changing availability and distribution of edible and raw material resources. Today not all Aboriginal groups agree with the mapped boundaries presented in Tindale and other publications. Borders were most likely not static but fluid, expanding and contracting over time with the movements of smaller family or clan groups. These boundaries ebbed and flowed through contact with neighbours, the seasons and periods of drought and abundance. The close proximity to each other also meant that people likely spoke multiple languages and dialects (Howitt 1904; Tindale 1974; MacDonald 1983; Horton 1994).

The Muthi Muthi language group has also been grouped into a broad language group identified as the Kulin family that also comprises of the Watthi Watthi, Wemba Wemba and Nari Nari languages (Tindale 1974, Horton 1994). Studies of various ethnographic resources in the region by Martin (2006) suggest that the Mutthi Mutthi group was likely to have originally been comprised of two groups with similar languages, the Mutthi Mutthi, located near the junction of the Murray and Murrumbidgee, and the Wathi Wathi, located around present day Balranald (Martin 2006:151). Martin (2006) noted that it is highly likely that these groups combined at some point in recent history to form one group which is today known as the Mutthi Mutthi people. More broadly the Mutthi Mutthi language group is associated with the Kulin language group of western Victoria.

There are numerous variations to the spelling of the Muthi Muthi group which include: Madi Madi, Muti Muti, Mutti Mutti, Mardi, Maadi, Muttee, Muttu Muttu and Murdi (Wakool Indigenous Corporation 2016a).

The Muthi Muthi people occupied the area around Balranald and their country extends to include sections of the Murray and Murrumbidgee Rivers. These rivers were reliable and abundant resources that sustained some the densest populations of Aboriginal people in Australia with the area from Echuca to the Murray Darling junction occupied by a number of Aboriginal clans with relatively small territories that included a portion of the river and back country. The close proximity to each other also meant that people likely spoke multiple languages and dialects and the ethnographic records show that people travelled extensively.

The Project Area is located within what today is regarded as Muthi Muthi Country of the Muthi Muthi language group.

Social structure and Colonisation

It was the small family group that was at the core of Aboriginal society and the basis for their hunting and gathering life. The immediate family camped, sourced food, made shelter and performed daily rituals together. The archaeological manifestations of these activities are likely to be small campsites, characterised by small artefact scatters and hearths across the landscape. Places that were visited more frequently would develop into larger site complexes with higher numbers of artefacts and possibly more diverse archaeological evidence.

The small family units were part of a larger band which comprised a number of families. They moved within an area defined by their particular religious sites. Such groups might come together on special occasions such as pre-ordained times for ceremonies, rituals or simply if their paths happened to cross. They may also have joined together at particular times of the year and at certain places where resources were known to be abundant. Trade between groups was incorporated into such gatherings, as well as important ceremonies, marriage arrangements, and sharing of news. The archaeological legacy of these gatherings would be larger sites than small family camps. They may include large hearth or oven complexes, contain a number of grinding implements and a larger range of stone tools and raw materials. The regular flooding of the region would also have influenced the distribution of resources and campsites at certain times of the year.

Identification and differentiation of such sites are difficult in the field. A family group and their antecedents and descendants occupying a particular campsite repeatedly over a long period of time may leave a similar pattern of archaeological signatures as a large group who camped in an area over a shorter period.

The first account of European exploration into the Balranald areas was by Charles Sturt in 1829-30 as he explored the Lower Murrumbidgee and Murray Rivers (Sturt 1833). Sturt was followed by Mitchell who passed through the area in 1836. European settlers started arriving in the district from 1848 with the township of Balranald gazetted on the 4th of April 1851. The Burke and Wills expedition also crossed the Murrumbidgee River at Balranald in 1860. (Wakool Indigenous Corporation 2016a).

There were three missions or Aboriginal reserves in the Balranald area that operated from 1892 until 1964 (Niche 2012:33). In the 1880's the local police noted that there were 98 "full-bloods" and 8 "half-caste" Aboriginal people in the Balranald district that were employed on stations such as Yanga, Canally and Paika (Feldtmann 1976).

Material culture, food and resources

Like everywhere in Australia, the Muthi Muthi people were adept at identifying and utilising resources either on a seasonal basis or all year round. Terrestrial animals such as the possum was noted by many early observers as a prime food source and the skins were made into fine cloaks that evidently were very warm (Evans 1815, Oxley 1820, Mitchell 1839). Kangaroos were also eaten and their skins made into cloaks as well. A range of reptiles and other mammals were also food sources. Fish, crayfish and mussels would have been prevalent from the rivers and creeks. Insects were also a common food type; in particular grubs, ants and ant eggs (Pearson 1981, Fraser 1892). Birds including emus and their eggs were common as a food

source. Water birds would have been a significant food resource that was also likely to be influenced by the seasonal flooding. Plant foods were equally as important and mostly consisted of roots and tubers, leaves, seeds and fruit. Wood was used to make boomerangs, spears, digging sticks, bark for canoes and shelters, fibre to produce string, and stone to make axes, grinding stones, and spear points. Animals were utilised not only for food, but also for the manufacture of materials.

In an archaeological context, few of these items would survive, particularly in an open site context. Anything made from bark and timber and animal skins would decay quickly in an open environment. However, other items, in particular those made of stone would survive where they were made, placed or dropped. Shell material may also survive in an archaeological context. Sources of raw materials, such as the extraction of wood or bark would leave scars on the trees that are archaeologically visible, although few trees of sufficient age survive in the modern context. There are no outcropping stone sources within the local area and therefore stone had to be brought in for use, most likely traded from source areas such as the Willandra Lakes and elsewhere.

Furthermore, some of the early settlers and pastoralists, surveyors, explorers, administrators and others observed traditional Aboriginal activities, including ceremonies, burial practices and general way of living, and recorded these in letters, journals and books. These early records of Aboriginal lifestyle and society within the region assist in understanding parts of the traditional Aboriginal way of life, albeit already heavily disrupted at the time of the observations and through the eyes of largely ignorant and uninformed observers. Mitchell (1839) recorded what is likely to be the earliest description of heat retainers such as those found in Aboriginal mounds and hearths along the Murrumbidgee River. Mitchell described the heaps of stones used in cooking as an artificial feature in the landscape that he had not observed in other places. The mounds of burnt clay or ashes distinguished the areas frequently used by the local Aboriginal people for cooking.

The common process of natives in dressing their provisions is to lay the food between layers of heated stones; but here, where there are no stones, the calcined clay seems to answer the same purpose, and becomes better or harder the more it is used. Hence the accumulation of heaps resembling small hills. Some of them were so very ancient as to be surrounded by circles of lofty trees; others, long abandoned, were half worn away by the river which, in the course of ages, had so far changed its bed that the burnt ashes reached out to mid-channel; others, now very remote from the river, had large trees growing out of them (Mitchell 1838, Vol. 2 Ch. 3.4)

Mitchell also observed the way Aboriginal people of the Murrumbidgee and Murray buried the dead noting that a small thatched hut was erected over a burial. The huts were enclosed by two or three low ridges of dirt in the shape of an ellipse with pointed ends (Mitchell 1839). These early observations also note that some weapons and tools were carried, some made from wood such as spears, spear throwers, clubs, shields, boomerangs, digging sticks, bark vessels and canoes. Other materials were observed in use such as stone axes, shell and stone scrapers and bone needles.

2.3.2 AHIMS search

The Aboriginal Heritage Information Management System (AHIMS) provides a database of previously recorded Aboriginal heritage sites in NSW. A search provides basic information about any sites previously identified within a search area. However, a register search is not conclusive evidence of the presence or absence of Aboriginal heritage sites, as it requires that an area has been inspected and details of any sites located have been provided to add to the register. As a starting point, the search will indicate whether any sites are known within or adjacent to the Project Area.

While the initial search of the AHIMS database was conducted on the 24th January 2021 (AHIMS Client Service ID was: 653918) it is noted that the results of an extensive AHIMS search are only considered valid for a 12 month period. Consequently, an updated extensive search of the AHIMS database was conducted on the 10th May 2023 for the following area which was also centred on the Project Area Eastings, Northings from: 723310.0, 753310.0 and Easting, Northings to: 6123209.0 - 6153209.0. The AHIMS Client Service ID was: 780380. There were 117 Aboriginal sites and no declared Aboriginal Places in the search area results.

The results of the AHIMS search are shown below in Figure 2-8 and Figure 2-9. There are 15 registered AHIMS sites currently recorded within the Project Area, these are detailed in Table 2-7. None of these 15 registered AHIMS sites are within and/or in close proximity (within 400 m) to the proposed development corridor for this Project as shown in Figure 2-9.

There is a dominance of scarred trees recorded in the AHIMS search area and the Project Area, especially where there are remnant stands of native trees. Scarred trees provide a tangible link to the past and provide evidence of Aboriginal subsistence activities through the deliberate removal of bark or wood. It is however considered likely that the dominance of scarred trees recorded in the area is related to lack of surveys in the area and the more conspicuous nature of scarred trees when compared to small artefact scatters, isolated stone artefacts and hearths. It is also possible that the high number of modified tree in the AHIMS search area is reflective of the debate which continues in the local area about Rabbiters Trees' and Leaghur Trees (culturally sacred trees) as noted above in Section 2.2.5.

Table 2-6 AHIMS Registered Sites

Site Type	Number
Modified Tree (Carved or Scarred)	53
Hearth	15
Earth Mound	8
Artefact (1 or more)	5
Hearth & Potential Archaeological Deposit (PAD)	5
Artefact & Hearth	4
Burial	4
Earth Mound & Shell	4
Artefact, Hearth, PAD & Shell	3
Earth Mound & Hearth	2
Hearth, Shell & Potential Archaeological Deposit (PAD)	2
Hearth & Shell	2
Shell	2
Artefact, Earth Mound & Hearth	1
Artefact, Earth Mound, PAD & Shell	1
Artefact, Earth Mound & Shell	1
Artefact, Hearth & Shell	1
Artefact & PAD	1
Artefact & Earth Mound	1
Artefact, Earth Mound, Habitation Structure & PAD	1
Burial, Artefact, Hearth & Shell	1
Total	117

Table 2-7 Registered AHIMS sites within the Project Area

Site Number	Site Name	Site Type	Site Status on AHIMS	Distance to the proposed development corridor (m)
47-6-0037	Condoulpe	Burial	Valid	1,780
47-6-0041	Condoulpe Creek	Burial	Valid	1,780
47-6-0093	North Dusty Lake-8	Artefact	Partially Destroyed	2,245
47-6-0945	Burrawong 1	Artefact	Valid	450
47-6-0253	Condoulpe Lake 24	Hearth	Partially Destroyed	1,285
47-6-0147	Condoulpe 19	Modified Tree (Carved or Scarred)	Valid	810
47-6-0148	Condoulpe 20	Modified Tree (Carved or Scarred)	Valid	845
47-6-0150	Condoulpe 22	Modified Tree (Carved or Scarred)	Valid	990
47-6-0255	Condoulpe Lake 26	Modified Tree (Carved or Scarred)	Not a site	1,305
47-6-0151	Condoulpe 23	Modified Tree (Carved or Scarred)	Valid	1,025
47-6-0254	Condoulpe Lake 25	Modified Tree (Carved or Scarred)	Valid	1,240
47-6-0146	Condoulpe 18	Modified Tree (Carved or Scarred)	Valid	790
47-6-0069	Condoulpe 2	Modified Tree (Carved or Scarred)	Valid	1,655
47-6-0149	Condoulpe 21	Modified Tree (Carved or Scarred)	Valid	995
47-6-0068	Condoulpe 1	Modified Tree (Carved or Scarred)	Valid	1,620

An additional AHIMS search (AHIMS Client Service ID was 871337) over the Project Area was undertaken on 8th March 2024 in order to ensure the validity of the AHIMS search results. No additional sites were recorded within the search area, which covered the entirety of the Project Area, beyond those recorded by NGH as part of this assessment.

2.3.3 Additional searches

Other heritage register searches were also undertaken to identify any items or places in proximity to the Project Area, with a focus on the Project Area and surrounding landscape. The following resources were used as part of this assessment:

- The *NSW State Heritage Inventory* (SHI), includes items on the State Heritage Register and items listed by state agencies and local Government, to identify any items currently listed within or adjacent to the proposal site.
- The *Australian Heritage Database*, includes items on the National and Commonwealth Heritage Lists, to identify any items that are currently listed within or adjacent to the proposal site.

The results of the NSW SHI database search indicated there are no previously recorded Aboriginal Places listed under the *National Parks and Wildlife Act* within the vicinity of the Project Area.

The results of the NSW SHI database search indicated there are no previously recorded heritage sites listed under the *NSW Heritage Act* within the vicinity of the Project Area.

The results of the Australian Heritage Database search indicated there are no listed items within the vicinity of the Project Area.

No other known previously recorded heritage sites are located within or adjacent to the Project Area.

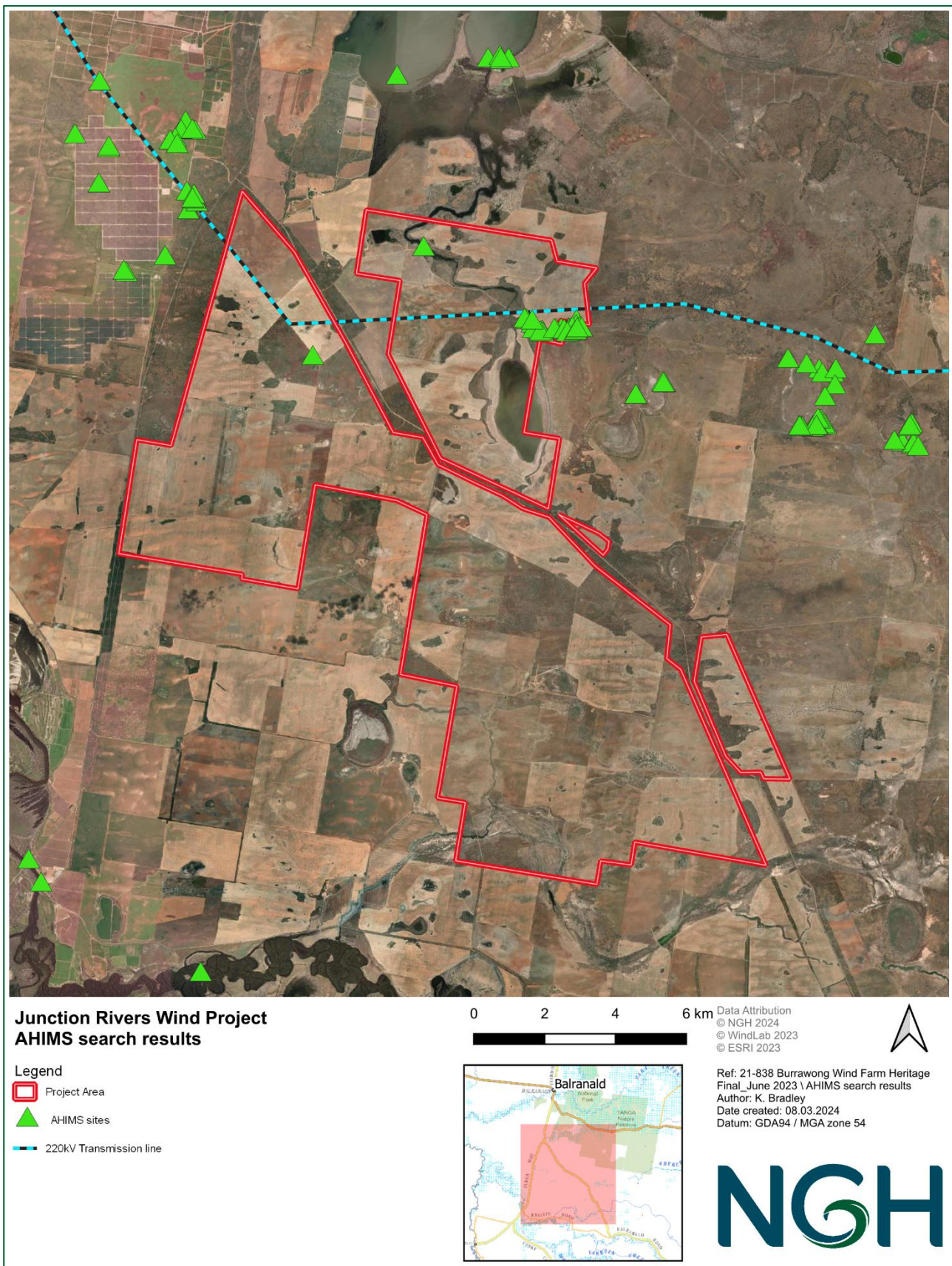


Figure 2-8 AHIMS sites surrounding the Project Area

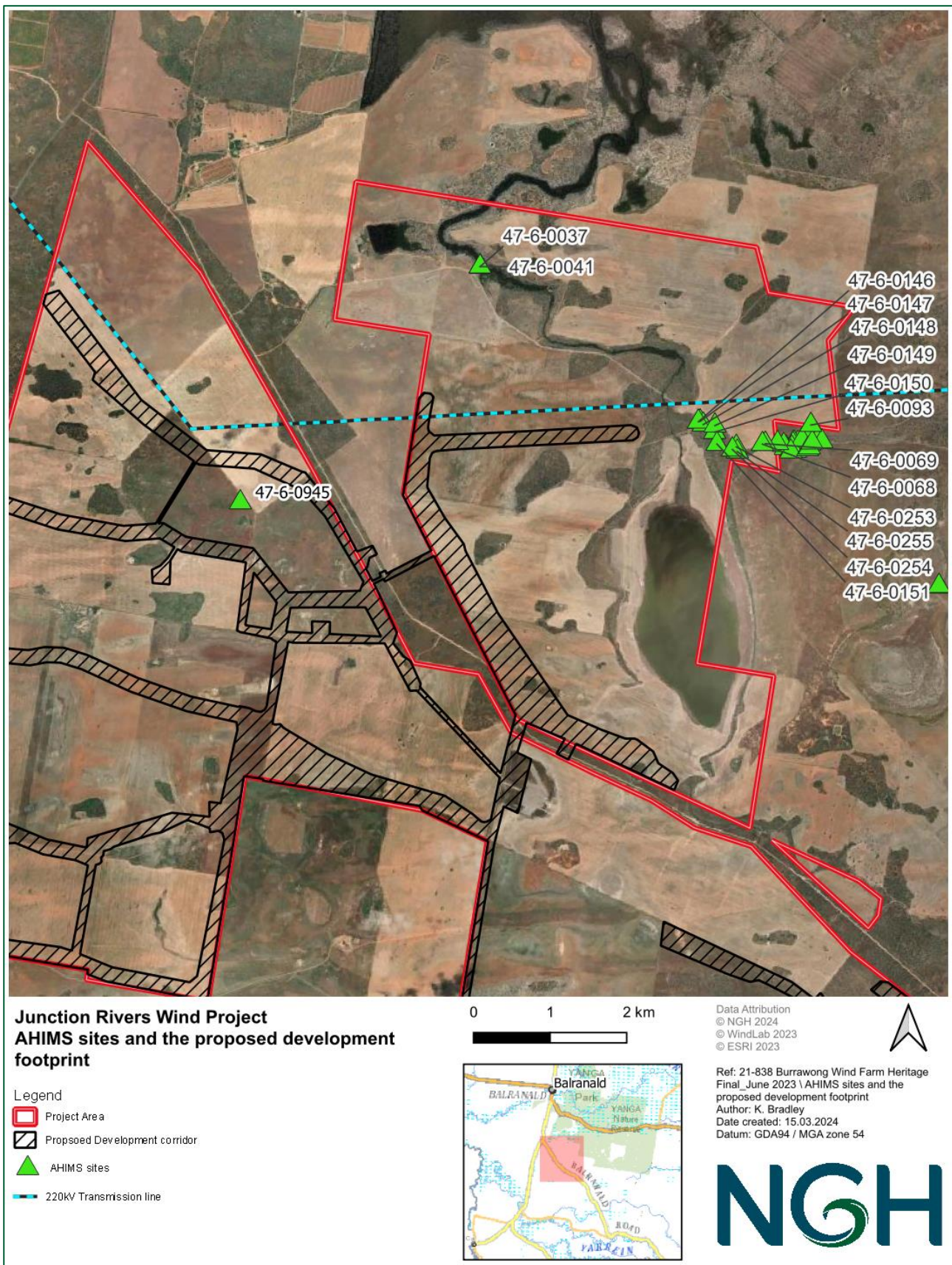


Figure 2-9 AHIMS sites within the Project Area, showing the proposed development corridor

2.3.4 Regional archaeological record

Aboriginal people have occupied what we now know as the Australian continent for at least 40,000 years and perhaps 65,000 years and beyond. There have been no dated excavations in the Balranald area, although the archaeological evidence from Lake Mungo, 100 km to the north-west, provides ample evidence of Aboriginal occupation dating back 40,000 years (Mulvaney & Kamminga 1999; Hiscock 2007).

Within the broader region, several studies have been undertaken that have resulted in a range of Aboriginal sites being recorded that show that the riverine landforms and lunette lake systems in the Murray Basin are rich in Aboriginal cultural material. The major relevant studies are summarised below.

The Willandra Lakes World Heritage Area is a series of dry lake basins within a dune system, approximately 100 km north-west of the current assessment area. Lake Mungo is part of the Willandra Lakes World Heritage Area that has been subject to ongoing archaeological research since the discovery of one of the world's oldest cremated human remains, Mungo Woman (Mungo I), in the late 60's (Tumney 2011). The 1974 discovery of a Pleistocene burial surrounded by ochre stained sands referred to as Mungo Man (Mungo III) (Bowler and Thorne 1976) further established the Willandra Lakes area as an important area that adds to the understanding of the early Aboriginal occupation in Australia. These burials are dated to 42,000 years BP and are the oldest known human remains in Australia and some of the earliest remains of modern humans outside of Africa (Tumney 2011). Studies undertaken in the Willandra Lakes area indicates that most burials occur within sand dunes created from paleo-channels near permanent and ephemeral water sources.

Furthermore, a series of 123 fossilised footprints, known as the Garnpang footprint trackway, were recorded that were impressed into hardened sediment dated to 23,000±1000 BP and 19,200±1000 BP (Webb et al 2006). A number of stone artefacts, human and faunal remains, shell middens, quarries, clay and stone heat retainers and hearths have been recorded across the Willandra Lakes World Heritage Area (Tumney 2011). Tumney's (2011) analysis of three stone artefact assemblages along the Lake Mungo lunette noted that silcrete was the most common lithology utilised for the manufacture of stone tools with lesser amounts of quartzite, quartz and sandstone. Tumney also noted the presence of a soil carbonate or calcrete nodules that occur more frequently on lunettes to have been used as heat retainers in some of the recorded hearths.

During the 1970's and 80's archaeological research in the Murray Valley region between the Edwards and Murray Rivers focused on burials and mounds. Simmons (1980) identified 75 mounds, 17 scarred trees and a range of other site types including isolated artefacts, hearths, shell middens and burials. Mounds were the most common site type that generally consisted of abundant clay nodules in association with burnt fragments of shell or bone, while the scarred trees in the area were generally all mature River Red Gums. The sites identified by Simmons were all located in close proximity and/or associated with the floodplains, anabranches and lake systems of the Murray Valley and clearly showed the importance of aquatic resources to the local Aboriginal populations in the region.

Sample surveys undertaken by Pardoe and Martin (2001) within the Murrumbidgee Province covered an area of approximately 30,000 square kilometres, extending from Balranald to Narrandera and Booligal to Jerilderie. Using an analysis of landforms and identifying gaps in the archaeological knowledge based on the sites recorded in the AHIMS database, they found that there was a bias in the distribution of sites along major waterways and some landforms such as lunettes, but there were also large gaps where no sites had been recorded. Pardoe and Martin surveyed 61 sample areas or quadrants from 22 Stations or locations across their project area. This resulted in 347 new sites being recorded. The major site types (over 90%) were scarred trees (26.2%), mounds (24.2%), open sites (14.4%), ovens (12.4%), burials (7.8%) and hearths (6.1%). Pardoe and Martin analysed their results in order to develop a predictive model for site distribution across the Murrumbidgee Province. They found that mounds varied in size, from 4 m-140 m in diameter and height also varied from 2 cm to 2 m. Mounds were most commonly found along floodplain creeks within River Red Gum and Black Box vegetation communities. They found that as well as being situated along the major rivers, they were also located on the plains to the north and south of the Murrumbidgee, such as around the edge of depressions such as lakes and swamps and also on palaeochannel features. Mounds were often

characterised as being situated on elevated ground such as lunettes, levees and dunes where silty sandy soil was prevalent (Pardoe and Martin 2001:82-87). Burials occurred mostly as individuals within mounds but there were six locations where more than one burial was recorded. Most of the burials were observed as highly fragmented bone disturbed by rabbit activity. Scarred trees were found to be quite variable in the size of the scar with the largest scars being on River Red Gums. Scars were classified into three groups, ceremonial- which were associated with a known burial, extraction- used in extracting food such as honey or grubs, and functional- all other types. The latter varied in size from 0.18 m to 3.6 m in length and width from 0.09 m to 0.55 m with an average width of 0.38 m.

Pardoe and Martin (2001) developed a predictive model of site distribution based on their results and an analysis of variables through the use of GIS mapping. They examined proximity to water and found that no sites were more than 12 km from a major river channel (in this case the Murrumbidgee River, and the Yanco, Box and Mirool Creeks). They also found that 75% of sites were within 3.3 km of such water courses. An assessment of proximity to minor stream was made difficult by the presence of irrigation channels in their GIS layer but nevertheless, they also found that the average distance from a minor stream was 1.8 km and 75% of sites recorded were within 2.2 km (Pardoe and Martin 2001:106).

Martin's PhD thesis (2006) examined the spatial, temporal and socio-cultural relationships of mounds in order to establish a model of human behaviour that could explain the linking of environment, spatial and temporal patterns and cultural change in the archaeology of the Hay Plain. She undertook excavations of two mound complexes, one at the Tchelery property, and one at Ravensworth property about 60 km and 70 km northeast of the current assessment area respectively. The Tchelery mounds were situated northwest of Dry Lake on grey cracking clays. Martin dated the mound to 4,010±170 BP (Martin 2006:119) and the Ravensworth 3 mound was dated to between 4,100±70 BP and 3,860±60 BP (Martin 2006:96). Martin concluded that mound building commenced in the region about 4,300 years ago but there was an increase in mound building after 2,000 BP and that there was a deliberate focus on wetland plants such as *Typha* and *Triglochin* that were baked and steamed in the mounds, along with animal foods.

Martin (2010) also conducted a detailed archaeological survey and modelling project for the Rivers Environmental Restoration Program (RERP). This project area was also focused on the Lowbidgee and concentrated on areas downstream (west) of Maude, areas to the east and west of Oxley on the Lower Lachlan floodplain, the Great Cumbungi Swamp and the western side of the Murrumbidgee north of Balranald. The project utilised GIS modelling to identify areas of archaeological potential and gaps in the archaeological record and targeted field survey to these locations. They recorded 1,306 archaeological features at 1,186 locations with the major site types being mounds (41%), scarred trees (21.7%), hearths (12.7%), artefacts (11.5%), shell middens (5.4%) and burials (4%). The conclusions for the project were that in broad terms there appeared to be a difference in the distribution of sites across the riverine plain. Martin identified that mounds and burials were concentrated on the lower western side of the plain while ovens and artefact scatters were more common on the higher eastern side of the plain. Martin thought the difference was related to the character of the hydrological regimes, because mounds were related to the ecological diversity of the dependable wetlands as food sources. She found that mounds were situated on the higher sand bodies and paleochannels present in the western part of the plain (Martin 2010:78). The RERP survey found burials to be in similar landforms to those identified by Bonhomme, namely lunettes, source bordering dunes, river levees and prior stream levees as well as sand bodies within the clay floodplain.

Several archaeological investigations have also been conducted across the region as part of development applications which been summarised below to provide further information to inform an indication of site modelling for the Project Area being assessed in this report.

Edmonds (1997) identified four Aboriginal sites during the survey for Binbinette Station, approximately 40 km south-east of the current assessment area, including a scarred tree, a midden with an associated scarred tree and two extensive campsites. The two campsites had stone artefact assemblages dominated by quartzite flakes and *in situ* hearths with burnt clay heat retainers on severely scalded soils. It was estimated that both campsites contained over 1,000 artefacts. The soil around the hearths with clay heat retainers was

noted as being eroded up to 15 cm in depth which created a series of mounded hummocks and clay pans. These clay pans fill up with water after rain and provide a temporary water source. Edmonds suggested that these temporary water sources may have made the area an attractive camping place during winter rains as Aboriginal groups ventured further away from the rivers during autumn and winter months to hunt on the plains. Edmonds concluded from this survey that landforms associated with a water source (including temporary clay pans) were the most archaeologically sensitive and that plains have low archaeological sensitivity.

In 2003, Edmonds surveyed the proposed Balranald Levee on behalf of the Balranald Shire Council. The project area was situated on the Condoulpe and Riverland land systems and ran for approximately 3.4 km along the Murrumbidgee River. The predictive model suggested that culturally modified trees, middens and camps sites were the most likely site types to be identified with the high riverbanks and the margins between the Condoulpe and Riverland land systems the most archaeologically sensitive landscapes in the study area. A total of 12 sites were recorded, including 10 modified trees and two shell middens.

Kamminga (2010) examined potential Aboriginal artefacts from three surface sites and an isolated find within Yanga National Park and three collections held by the National Parks and Wildlife Service (NPWS) housed at Yanga Homestead. Two of the stone artefact scatters, Waugorah Road and Lintot Lake, were confirmed to be Aboriginal in origin and comprised of 12 and 54 artefacts respectively. Kamminga noted that the raw material types identified within the Yanga assemblages were mostly quartzite, with lesser numbers of silcrete, quartz, sandstone.

Landskape conducted a preliminary cultural heritage assessment of the Atlas-Campaspe Mine area which is located approximately 100 km northwest of the current assessment area and developed a predictive site model based on the desktop research for the distribution of archaeological sites in the area over various landscapes (as cited in Niche 2012:34). It was predicted that stone artefacts and hearths would be the most common site types in the area which would likely be located near relict lake basins or clay pans that may intermittently hold water. The likelihood of encountering scarred trees, shell middens and burials was assessed as low as these site types are generally found near more permanent water sources. Burials were most likely to occur in bordering dunes and lunettes adjacent to rivers and lakes. Landskape noted that silcrete stone sources have previously been recorded in the Willandra Lakes Region and that silcrete outcrops may occur in areas such as dry lakebeds (as cited in Niche 2012:38).

In 2012 Niche undertook field survey for the Atlas-Campaspe Mine projects using the Landskape predictive model noted above. The field survey included inspection of the proposed mine approximately 90 km north of Balranald and the proposed Ivanhoe Rail Facility. No sites were previously recorded in the project area despite the close proximity to the Mungo National Park and Willandra Lakes Region World Heritage Area. The survey of the proposed development corridor identified 78 Aboriginal sites within the Atlas-Campaspe Mine area and 22 Aboriginal sites within the Ivanhoe Rail Facility. A number of areas of high and moderate Aboriginal heritage value were also identified, consequently the development corridor was modified to allow the conservation of some areas. Niche identified a number of isolated finds, artefact scatters, hearths and a modified tree. The majority of stone artefacts were retouched tools manufactured from silcrete which is common in the area. Fewer chert, sandstone and quartzite artefacts were also recorded. The sites recorded in the Atlas-Campaspe Mine area were all generally located on the margins of ephemeral depressions. A raised dune on the eastern edge of a lake depression near the proposed works footprint was also noted to have archaeological potential. The proposed transport route surveyed had the highest number of sites and it was suggested that this density of sites was reflective of the close proximity to more permanent water sources in the area. Niche concluded that the sandplain and dune fields assessed contained few traces of past land use by Aboriginal people while the playas and relict lake areas contained an abundance of Aboriginal objects.

Niche (2015) undertook survey for the Balranald Mineral Sands Project for Iluka Resources Limited for the proposed development of a mineral sands mine 12 km north-west of Balranald between 2012 and 2014. A total of 548 sites were identified over the course of the project. A database of sites for the project was

created that is referred to as the Balranald Project Aboriginal Heritage Database. Analysis of site distribution and density was used to classify areas as having high, moderate or low archaeological risk to assist in the management of the mine. Niche predicted that stone artefacts and hearths were the most likely site type to occur in the project area while middens, modified trees and burials were less likely to occur. Niche also predicted that mounds were unlikely to occur in the project area. During the field survey an emphasis was placed on visually inspecting alluvial plains, playas and basins while sand plains, sand dunes and areas with reduced archaeological visibility had less of an emphasis placed on them. While 11 land systems were identified and surveyed within the Balranald Mineral Sands Project, very few Aboriginal sites were located in the Condoulpe landform, which is the main land system within the current Project Area.

The artefact density per hectare of surveyed land system by Niche for the Balranald Mineral Sands Project is shown below in Table 2-8. Stone artefact occurrences as isolated finds and clusters were the most common site types identified. A breakdown of the site types recorded by Niche is shown in Table 2-9. Niche noted that there was a strong correlation between the location of sites and dunes, rises, lunettes and exposures associated with depressions or a decrease in elevation in the landscape. The majority of sites (approximately 52%) contained between one to 10 stone artefacts with only eight of the recorded sites containing over 200 artefacts. Silcrete artefacts were dominant and accounted for 93.5% of the recorded assemblage. The bulk of the stone artefacts recorded were complete flakes, broken flakes and angular fragments. Retouched flakes or tools formed 7.9% of the assemblage with a number of tool types identified including burins, burrens, piecers and assorted scrapers. Niche (2015) concluded that within the project area sites fell into either short term occupation or single activity sites or specific long term seasonal nodal sites.

Table 2-8 Artefact density per ha of surveyed land system in the Balranald Project Aboriginal Heritage Database (Niche 2015:103).

Land System	All recorded/ estimated artefacts in the Balranald Project Aboriginal Heritage Database (ha)	Surveyed land system (ha)	Artefacts per hectare of land system surveyed
	Artefact count	Transect ha	Artefact/ha
Arumpo	2	16.7	0.1
Bulgamura	4	7.9	0.5
Condoulpe	31	606	0.1
Gulthul	661	667.6	1
Hatfield	1619	347.5	4.7
Marma	4299	605.6	7.1
Perekertin	82	36.2	2.3
Rata	2777	1037.6	2.7
Riverland	1	19.3	0.1
Wilkurra	28	13.8	2
Youhl	884	198.4	4.5
Total	10388	3556.2	

Table 2-9 Summary of Aboriginal Site Types within the Balranald Project Aboriginal Heritage Database (Niche 2015:91).

Site Type	Sites in Balranald Aboriginal Heritage Database	
	Number	%
Artefact scatter (more than 1)	230	41.97
Isolated Artefact	246	44.89
Artefact scatter and Hearth	42	7.66
Hearth	22	4.01
Hearth and Isolated Artefact	5	0.91
Artefacts, Hearth, Culturally Modified Tree, Shell and PAD	1	0.18
Artefacts, Mound, Mound Scatter, Hearth, Hearth Scatter and PAD	1	0.18
Culturally Modified Tree	1	0.18
Total	548	100.00

NGH (2017) were contracted by GHD on behalf of Murrumbidgee Irrigation Ltd to prepare an ACHA for the proposed Gunbar Water Pipeline Project approximately 130 km north-east of the current assessment area, that would supply water to the Wah Wah Stock and Domestic district between Griffith and Hay, NSW. The assessment area comprised a 20 m wide pipeline corridor of approximately 296 km in length, largely within the road reserves of the area. The Project Area was also within the Murrumbidgee Scalded Plains, the Murrumbidgee Channel and Floodplains, the Lachlan Depression Plains, the Lachlan Channels and Floodplains, and the Lachlan Lakes, Swamps, and Lunettes Mitchell landscapes (DECCW 2002). A total of 93 Aboriginal sites were identified during the survey which included a pedestrian survey of the entire alignment. The site types are shown in Table 2-10 below. NGH concluded that the area had been used intermittently over a period for camping, evident in the distribution of stone artefacts and hearths. They also believed that there was a high potential for similar features to occur within unsurveyed parts of the landscape in the region, with the distribution likely to be focussed on resources such as water and sites therefore found on features such as lunettes, paleochannels, around depressions and waterways.

Table 2-10 Number of different site types identified during the surveys of the Gunbar Water Pipeline (NGH Environmental 2017:17).

Site Types	Number	% of Total Features
Artefact Scatters	54	58
Isolated Finds	33	35.5
Hearths*	6	6.5

* Hearths found in association with a scatter of artefacts were recorded as artefact scatters with hearth features.

Barber (2015) undertook an archaeological survey for the purpose of identifying and recording Aboriginal sites and cultural values of the Nimmie-Caira area, an area of 867 km² between Maude and Balranald and approximately 17 km north-east of the current assessment area. The purpose of the study was to identify sites to assist the future land and water management of the area. Furthermore, it was designed to engage the local Aboriginal communities to enhance and share their knowledge by providing opportunities for involvement in the surveys and recording of archaeological features. Due to the sensitivity of the wetland landscape that made up most of the area, the survey served two purposes. Firstly, it would examine a range of environments and undertake survey to obtain an understanding of likely archaeological resources of the area, to develop site models and clarify the distribution of archaeological features in the landscape. Using both soil mapping, vegetation mapping and sample survey blocks, areas of high, medium, and low archaeological potential were identified. The second aim of the study was to ensure that the area had enough data in relation to the location and type of Aboriginal heritage sites so that the area could be managed effectively in the future. Barber (2015) used GIS to examine environmental data and aerial photography to select a range of survey sample areas for pedestrian survey. A total of 68 separate survey sample areas were examined over a period of 30 days; the total ground coverage of these surveys was 31.68 km², 3.65% of the 867 km² of the Project Area. However, despite being such a small percentage of the total area, the surveys recorded 469 Aboriginal heritage features as shown in Table 2-11 below. Barber also noted that another 39 recordings were made where the archaeologists did not consider the features to be Aboriginal in origin but where the Aboriginal community considered them to be Aboriginal heritage sites; these features were simply called 'Cultural locations'.

Table 2-11 Breakdown of feature types found within the Nimmie-Caira area (Barber 2015).

Feature Type	Number	Percentage of Total Features
Artefact occurrences*	83	17.67
Burial	40	8.53
Hearth	84	17.91
Mound	103	21.96
Modified tree (including ring trees)	46	9.81
Isolated Finds [#]	113	24.09

* Includes artefacts grouped within 50m of other feature types, eg. Mounds

[#] Includes either isolated or small clusters of artefacts situated more than 50m from another feature

Barber (2015) also made mention that the 40 burials were all found within a mound or a sand body that was elevated above the floodplain, which itself was usually close to other archaeological evidence; none of these burials were intact. Furthermore, Barber had expected the mounds to be the most common feature recorded during the survey, they occurred more frequently in association with waters, especially the Uara, Nimmie and Pollen waterways. They most often occurred on the banks of creeks or on elevated sand bodies and lunettes on the edge of the relict lakes in the area. Their size also varied greatly, from only 2 m in length to nearly 160 m. The hearths were an archaeological feature that contained clay heat retainers but without association to a mound. Some of these features were loosely related while isolated clusters spread across several metres. Both the more spread-out features and the discreet and confined clusters were recorded as hearths. The 46 modified trees that were recorded included four Ring trees. Eleven of the modified trees were identified as River Red Gums (*E. camaldulensis*), while 35 were Black Box (*E. largiflorens*). A total of 46 scars were recorded including six possible rings on the four Ring trees. Only nine of these trees were recorded as dead along with four as dying, the remainder were alive (although two were 'lying down' and one had partially fallen). There were 504 stone artefacts recorded in 193 locations and were most often found in association with mounds. The erosion of these mounds had provided a good opportunity to find stone artefacts, Barber noted that the mounds likely contained more artefacts buried within. Some artefacts were also found in

isolated locations far removed from other archaeological features. This could be the result of travel or could potentially represent the very temporary use of that location.

The Nimmie Caira surveys also identified that sites could remain in the landscape, even after intensive agricultural activities. For example, stone artefacts and other material such as burnt clay were recorded within irrigation bays and on channel banks. It was also found that erosion, often because of rabbit infestation, caused significant impacts to mounds, but that cultural material was still identifiable in a landscape context. The land use by Aboriginal people clearly showed widespread activity across multiple soil and vegetation units but higher ground, associated with elevated palaeochannels, lunettes, sand dunes and plains were clearly preferred. While lower lying areas such as lignum and Nitre Goosefoot wetland vegetation did contain some cultural material, it was generally in lower frequency and in smaller site areas (Barber 2015). Further survey at Nimmie Caira by NGH in 2019 recorded an additional 62 mound sites along Uara Creek. The purpose of the survey was obtaining baseline data to assist the Nari Nari Tribal Council in managing heritage locations within Nimmie Caira. The report also provided options for the longer-term management of sites (NGH 2019).

Wakool Indigenous Corporation (2016a) undertook a due diligence archaeological investigation for the proposed Balranald Floating Pontoon on the northern bank of the Murrumbidgee River, near the Balranald Road Bridge, for the Balranald Shire Council. No Aboriginal sites or objects were recorded during the survey.

Wakool Indigenous Corporation (2016b) also undertook a due diligence archaeological investigation for the proposed Kyalite floating Pontoon on the northern bank of the Wakool River, near the Kyalite Road Bridge, for the Balranald Shire Council. The proposed works area covered an area approximately 20 x 30 metres along a steep slope subject to inundation during flood events. Although no Aboriginal sites or objects were recorded during the survey a known shell midden (AHIMS #is 47-8-0004) was located approximately 10 m south of the project area. The close proximity of AHIMS #is 47-8-0004 suggested the possible presence of subsurface material and it was recommended that an AHIP be granted prior to works commencing.

2.3.5 Local archaeological studies

There have been two surveys conducted to the west of the Project Area, both for solar farms (NGH Environmental 2016, (2017a & 2017b), a survey and test excavation programme undertaken as part of the Project EnergyConnect Eastern section assessment which includes part of the Project Area and two due diligence assessments conducted within the Project Area – one for proposed met masts (NGH 2021) and one for Geotechnical Investigations (NGH 2022). These previous assessments are described in detail below and show in Figure 2-10 and Figure 2-11.

NGH Environmental (2016) surveyed 800 ha for the proposed Sunraysia Solar Farm near Balranald approximately 1.5 km west of the current assessment area. The survey recorded three sites comprising two clusters of burnt clay recorded as ovens and a site complex of seven stone artefacts and three hearths. They noted that the absence of scarred trees, which is another common site type in the area, was not surprising as the Project Areas had been cleared of native vegetation for cropping purposes and that most scarred trees occurred near permanent water sources, of which there were none. The nature of the archaeological material within this landscape suggested that Aboriginal use of the landscape was intermittent. These results of this assessment indicated that while sites can occur throughout the landscape, even in areas of highly disturbed farming activities, there is a dominance of Aboriginal cultural material recorded within the Perekertin landscape system and in relatively undisturbed landscapes in the area. The Perekertin landscape is characterised as a transitional area on the riverine plain. This project now has SSD approval.

Biosis (2017a & 2017b) undertook an ACHA for the Limondale Sun Farm in Balranald approximately 1 km west of the current assessment area. There were five previously recorded AHIMS sites within the site boundary. The survey of the study area located a further 11 Aboriginal sites, including artefacts scatters, hearths, earth mounds and a scarred tree. Two of the Aboriginal sites also had historical objects indicating

that they are post-contact sites. The Aboriginal sites recorded within the assessment area were predominantly identified on red sandy rises in disturbed (ploughed and trackways) contexts within the Murrumbidge Scalded Plain landscape. The identification of only one site within the Mallee Cliff soil landscape was expected given that this landscape was noted to have the least archaeological potential. Biosis noted that the location of sites within the study area seems to bear little correlation with their relationship to modern water sources as there was no drainage or creek lines in the study area and none of the sites were located in close proximity to water. The generally poor condition of sites within the study area was noted to be the result of the historic agricultural disturbance and land use history of the area. All stone artefacts identified during the survey were silcrete, which is a common material for the area. This project now has SSD approval.

Navin Officer Heritage Consultants Pty Ltd (NOHC) undertook an ACHA (NOHC 2022) for the Project EnergyConnect Eastern Section (PEC-East) in NSW from the Buronga substation to Wagga Wagga substation. The PEC-East survey included a section of alignment within the Junction Rivers Wind Project Area. The PEC-East project recorded 105 Aboriginal sites within the heritage survey area with an additional 11 sites previously recorded as well as identifying 45 areas of PAD. Isolated finds were the most common site type recorded across the PEC-East project followed by artefact scatters, modified trees, hearths with few mounds, middens and sites with multiple features. Sites were most commonly recorded on alluvial plains and flat plains and were identified near or across high order perennial watercourses. Three areas of PAD were identified in proximity or within the Junction Rivers Wind Project area. PEC-E-PAD05 (Figure 2-10) is within the Junction Rivers Wind Project area. Test excavation within this PAD recovered no stone artefacts or cultural material and this area was subsequently found to not be a PAD and NOHC argued that Condolup Creek was not a focus of past Aboriginal land use (NOHC 2022:129). The other two PADs one to the west and one to the east of the Junction Rivers Wind Project area similarly had no stone artefacts or cultural material recovered and were found to not be PAD.

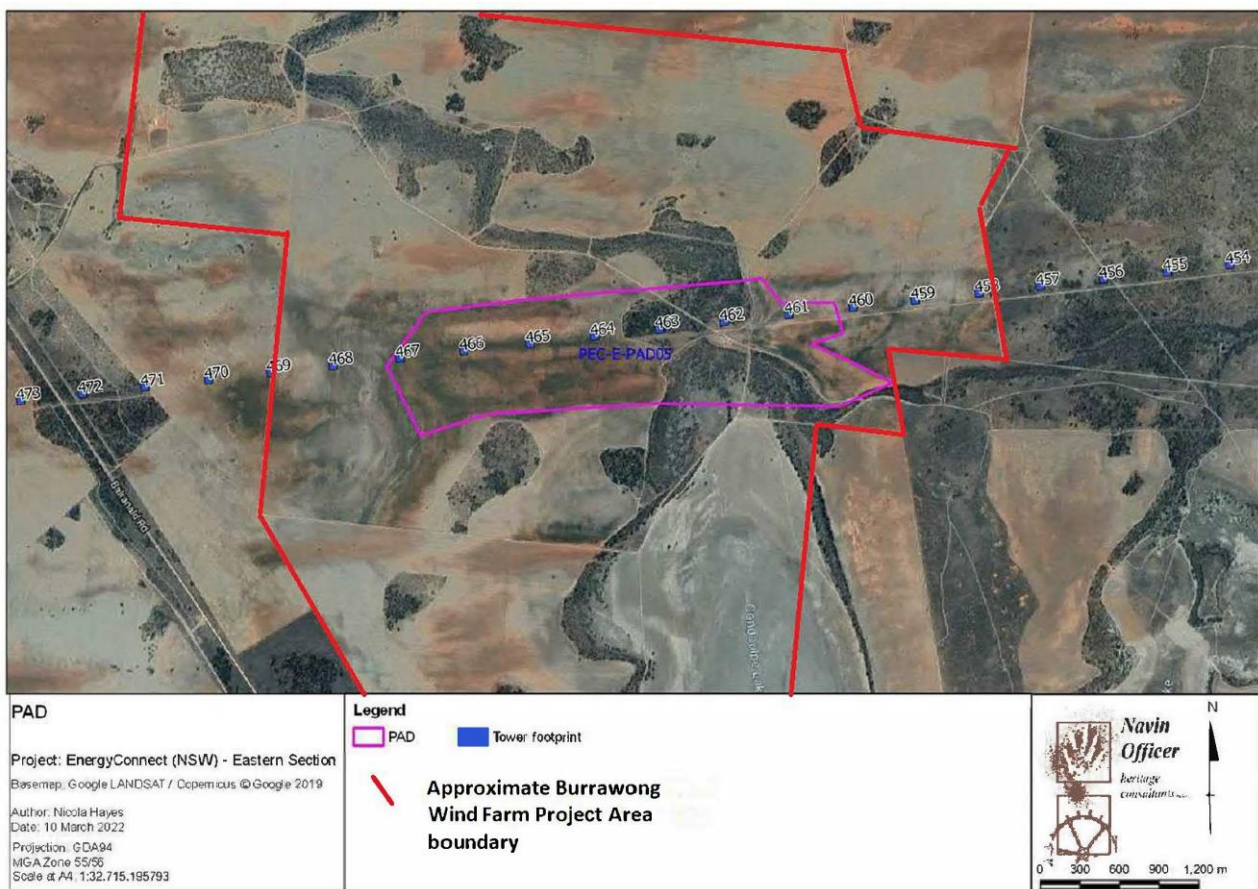


Figure 2-10 PEC-E-PAD05 location from NOHC 2022:32 with approximate boundary of the Junction Rivers Wind Project area marked in red.

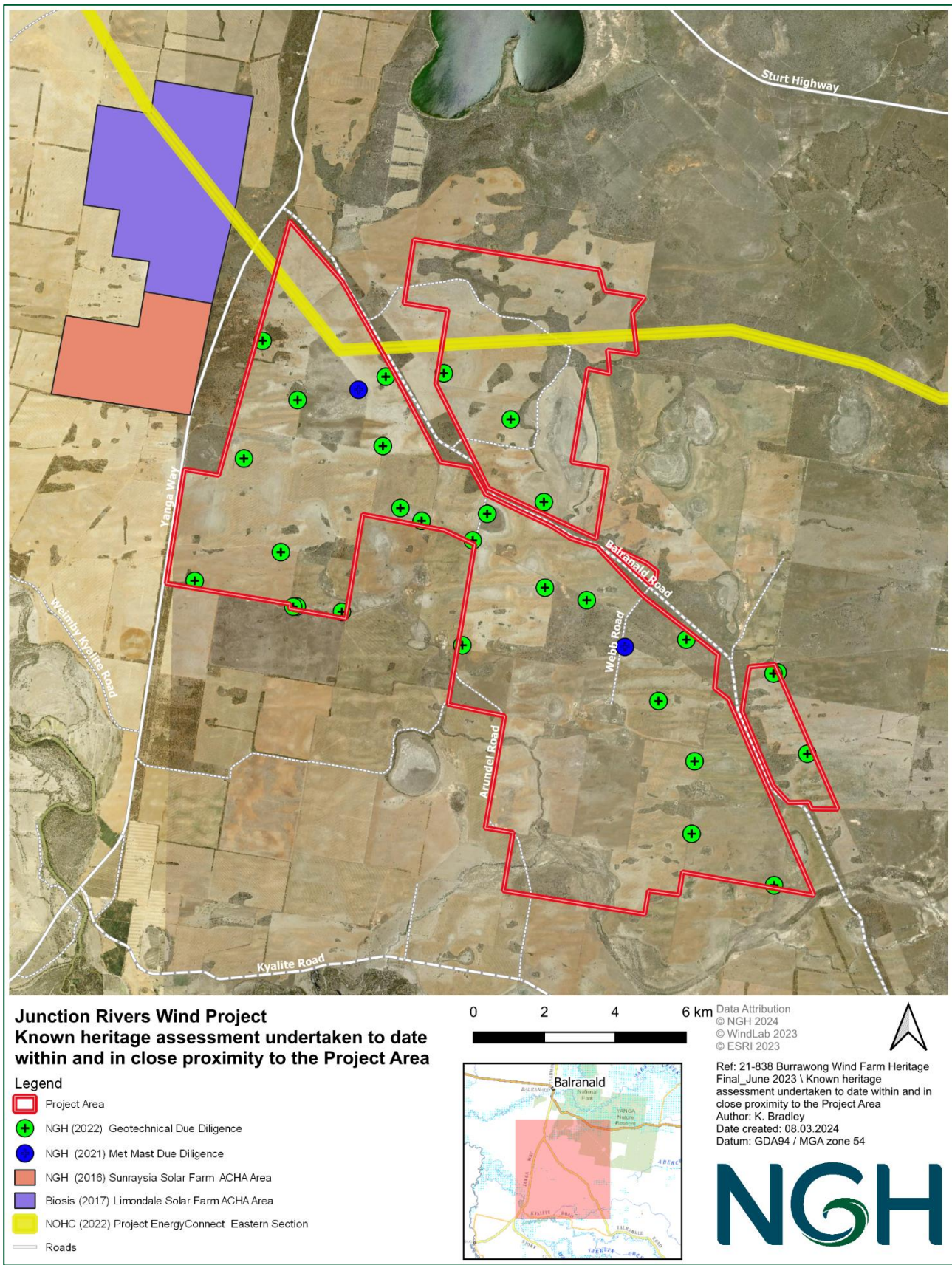


Figure 2-11 Known heritage assessment undertaken to date within and in close proximity to the Project Area.

NGH Pty Ltd (2021) undertook a due diligence assessment for two proposed met mast locations on behalf of Windlab within the boundary of the Junction Rivers Wind Project area (Location 1 [Lat: -34.8139, Lon: 143.5613], Location 2 [Lat: -34.8772, Lon: 143.6451]). The two met mast locations inspected were found to be highly disturbed, predominantly from extensive agricultural cultivation. However, a single silcrete stone artefact was identified on the upper slope of a sandy rise. The due diligence assessment refers to this site as Burrawong 1. Harm was avoided to the place through redesign of the met mast location and the installation of a no-go zone around this site to ensure no inadvertent harm.

NGH Pty Ltd (2022) undertook a due diligence assessment for 15 test pit and eight bore hole locations for geotechnical investigations for the proposed Junction Rivers Wind Project. The survey for the due diligence was undertaken at the same time as the survey undertaken for this ACHA in March 2022. Visibility was approximately 99% across the proposed locations for the geotechnical investigations. These areas were found to be highly disturbed, predominantly from extensive agricultural cultivation. Despite the high levels of disturbance, two stone artefact scatters (Burrawong AFT 1 and Burrawong AFT 2) and five isolated stone artefacts (Burrawong 2, Burrawong 3, Burrawong 4, Burrawong 5, Burrawong 6) were identified. Secondary locations were proposed for geotechnical investigations to avoid harm to the identified Aboriginal sites.

2.3.6 Summary of archaeological context and site location model

Several archaeological surveys have been undertaken in the region and the adjacent ACHA studies undertaken for the Limondale Sun Farm and Sunraysia Solar Farm near Balranald were both conducted within similar landforms and provide reliable data to build a predictive model for the Project Area. In particular, elevated red sandy areas within a markedly flat landscape are considered to likely contain Aboriginal sites. Paleochannels, relict lake and lunette features and areas on the margins of wetlands and black box drainage depressions, including where stands of trees are present are also known to contain sites. Additionally, any old growth mature native trees within the Project Area have the potential to have been culturally modified. These landforms represent the most archaeologically sensitive areas with the highest potential for previously unrecorded Aboriginal heritage sites to occur within the Project Area.

It is considered that while the Project Area as a whole would have provided resources, shelter, water and food for Aboriginal people any slightly elevated red sandy raised areas (which are considered micro topographic features within a markedly flat landscape) in proximity to water sources have a high potential to contain cultural material. It is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape, but the current archaeological record of that activity is limited.

In association with the predictive modelling and known sites within the region, the site types most likely to occur within the Project Area are Aboriginal stone artefacts (in low to moderate densities and/or as isolated finds), scarred trees (within woodland communities on the edges of a depression), earth mounds, hearths, PADs and ancestral burials (in particular within lunettes). As the Project Area has been subject to clearing for grazing and agricultural activities, the chances of scarred trees surviving in the area are greatly reduced. However, there is the potential for the implements used in the scarring of trees (to extract bark and wood used for various purposes) to remain within the vicinity. A lack of stone outcrops throughout the region also suggests that any stone artefacts identified would be the product of trading stone resources and their utilisation.

Given that the landscape context is a plain and there have been a moderate degree of historic disturbance including mass vegetation clearance in recent times it is assessed that whilst there is a moderate to high potential for Aboriginal cultural heritage to occur within the Project Area, there is a relatively low potential for it to be in its primary context.

Based on the results of the previous archaeological investigations in the general area, and through extrapolation of sites from the area, it is possible to provide the following model of site location in relation to the Project Area which is provided in Table 2-12 below.

Table 2-12 Aboriginal Site Prediction Statements

Site Type	Site Description	Potential
Isolated Finds	These sites consist of a single artefact and can occur anywhere. As Aboriginal people traversed the entire landscape for thousands of years, such finds can occur anywhere and indicate the presence of isolated activity, dropped or discarded artefacts from hunting or gathering expeditions or the ephemeral presence of short-term camps.	High potential to occur within the Project Area. This feature is likely to occur.
Artefact scatters	Artefact scatter sites can range from high-density concentrations through to sites containing two artefacts. The size of these sites usually correlates with proximity to sources of fresh water. Representing camp sites or flaking and maintenance activity can occur across the landscape, usually in association with some form of resource or landscape. Water bodies, such as rivers, ephemeral creeks or clay pans can also be a focus of Aboriginal occupation.	High potential to occur within the Project Area in low to moderate densities. This feature is likely to occur.
Modified trees	Trees that have undergone cultural modification. These require the presence of mature native trees and are likely to be concentrated along major waterways and around swamps or depression areas.	Potential to occur within areas where there are remnant mature native trees, isolated paddock trees, and dead or fallen mature trees. There are patches of remnant vegetation within and adjacent to the Project Area. This feature is therefore possible to occur.
Hearths/Ovens	Are identified by burnt clay used for heat retainers. Some are recorded in the district in association with resource locations. However, they could occur either independently or in association with other Aboriginal cultural features such as artefact scatters. Hearths are generally considered to be limited, one-off use or reused but few times and are smaller concentrations. Ovens are considered to represent larger features, often extending over a larger area and can include other material such as bone.	Similar sites have been recorded within region however they tend to be adjacent to major water sources. It is likely that hearth sites are present within Project Area however oven sites are less likely.

Site Type	Site Description	Potential
Mounds	Are accumulations of heat retainer ovens that have built up over time. They are typically round or oval in shape and range in length from just a few metres to over 100 m and range in height from 0.1 m to 2 m. They are identified by the presence of baked clay heat retainers, which have usually been brought to the location from a nearby source of natural clay such as a lakebed, swamp or drainage line.	Mounds are generally found in proximity to wetland areas such as lakes, swamps and creeks, often elevated above these areas by being situated on sandy rises, lunettes, source bordering dunes and paleochannels. Mounds are likely to contain a range of other archaeological features such as bone, shell, stone artefacts and burials. This feature has been recorded in the region and may possibly occur within the Project Area.
Burials	Ancestral Aboriginal burials are generally found in elevated sandy contexts or in association with rivers and major creeks.	The Project Area is characterised by low dunes and therefore such sites may occur as burial sites have been recorded nearby.
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material	PADs have potential to occur in areas that are likely to have reasonable subsurface deposits in archeologically sensitivity landforms. This feature may occur within the Project Area.
Shell Middens	Are the agglomeration of shell material disposed of after consumption. Such places are found along the edges of significant waterways, swamps and billabongs.	Similar sites have been recorded within region it is possible that this site type will be identified within the Project Area.

In summary, the Project Area forms part of the overall landscape in which Aboriginal People lived and given that sites have previously been recorded within landscapes that are present within the Project Area, there is potential for Aboriginal objects to be present, despite the existing level of disturbance. As Aboriginal people have lived in the region for thousands of years, there is potential for archaeological evidence to occur throughout the area; this is most likely to be in the form of stone artefacts, heat retainers and modified trees.

With regard to the limitations of the information available, archaeologists rely on Aboriginal parties to divulge information about places with cultural or spiritual significance in situations where non archaeological sites may be threatened by development. To date, we have not been told of any such places within the Junction Rivers Wind Project area. There is always the potential for such places to exist but insofar as the current proposal is concerned, no such places or values have been identified.

Limits on information

Regarding the limitations of the information available, archaeologists rely on Aboriginal parties to divulge information about places with cultural or spiritual significance in situations where non-archaeological sites may be threatened by development. To date, we have not been told of any such places within the Project Area. There is always the potential for such places to exist but insofar as the current proposal is concerned, no such places or values have been identified.

3. Aboriginal community consultation

The consultation with Aboriginal stakeholders for this project was undertaken in accordance with Section 60 of the *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2019* and following the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRP). The guide outlines a four-stage process of consultation as follows:

- Stage 1 – Notification of project proposal and registration of interest.
- Stage 2 – Presentation of information about the proposed project.
- Stage 3 – Gathering information about cultural significance.
- Stage 4 – Review of draft cultural heritage assessment report.

The full list of consultation steps, including those groups and individuals who were contacted, and a consultation log is provided in Appendix B. A summary of actions carried out in following these stages are as follows.

Stage 1. Letters outlining the development proposal and the need to carry out an ACHA were sent to statutory authorities including Heritage NSW, as identified under the ACHCRP on the 15th of December 2021. An advertisement was placed in the local newspapers, *The Riverine Grazier* on 22nd of December 2021 seeking registrations of interest from Aboriginal people and organisations. Additional advertisement was also placed in *The Guardian Classifieds* on the 21st of December 2021 however, due to a publishing error in text a correction was required to be printed in *The Guardian Classifieds* on the 24th of December 2021. A further series of letters was sent to other organisations identified by Heritage NSW in correspondence with NGH between the 11th of January 2022 and the 14th of January 2022, the closing date for submission was 14 days from the date of the letter.

As a result of this process, six Aboriginal groups registered their interest in the Project. Notification of Registered Aboriginal Parties (RAPs) was provided to Heritage NSW and Balranald LALC on 28th of February 2022.

These were:

- Balranald Local Aboriginal Land Council (LALC)
- Bangerang Aboriginal Corporation
- John Jackson
- Pappin Family Aboriginal Corporation
- Wakool Indigenous Corporation
- Yarkuwa Indigenous Knowledge Centre

The consultation log in Appendix B will be redacted in all public versions of this report.

Stage 2. On the 28th of February 2022, an *Assessment Methodology* document for the Junction Rivers Wind Project was sent to the RAPs listed above. This document provided details of the background to the proposal, a summary of previous archaeological surveys in the area, and the proposed heritage assessment methodology for the proposal. The document invited comments regarding the proposed methodology and sought any information regarding known Aboriginal cultural significance values associated with the Project Area and/or any Aboriginal objects contained therein. A minimum of 28 days was allowed for a response to the document.

None of the registered parties raised any objections to the methodology and many expressed an interest in participating in fieldwork.

Stage 3. The *Assessment Methodology* outlined in Stage 2 included a written request to provide any information that may be relevant to the cultural heritage assessment of the Project Area. It was noted that sensitive information would be treated as confidential. No response regarding cultural information specific to the Project Area was received in response to the methodology.

The survey fieldwork was organised, and four of the RAPs were invited to provide representatives for fieldwork participation by the Proponent. The survey fieldwork was carried out initially over 28 days between the 7th of March 2022 and the 13th of April 2022. Additional survey was also undertaken over five days between the 17th of April 2023 and the 21st of April 2023. Aboriginal representatives from the four RAP groups listed below participated in the fieldwork undertaken for the assessment.

- Balranald LALC
- Bangerang Aboriginal Corporation
- Pappin Family Aboriginal Corporation
- Wakool Indigenous Corporation

Stage 4 Project updates were sent to the RAPs throughout the project and in August 2023 a draft version of the *Aboriginal Cultural Heritage Assessment Report* for the proposal (this document) was forwarded to the RAPs for review. The RAPs were specifically invited to comment on the results, the significance assessment and the recommendations. A minimum of 28 days was allowed for responses to the document and all responses were incorporated into this document prior to it being finalised in October 2023 (Final v1.0).

3.1 Aboriginal community feedback

Community consultation occurred throughout the Project. A single reply to the draft ACHA was received from the Bangerang Aboriginal Corporation via a phone conversation with an NGH archaeologist on the 23rd of August 2023 which has the key points summarised below.

- Any reference in Section 2.2 of the ACHA and throughout the report which reference that Aboriginal people could/may have used the land should be changed to would of/have used instead to ensure it is clear that Aboriginal people in the past did utilise this land for its resources.
- Agreed that if any of the stone artefacts recorded are going to be impacted by the development they need to be attempted to be collected and moved to an area which will not be impacted.
- Noted that if others RAPs want to have the option for any objects collected to use as part of training kit or on display at a Aboriginal community centre there is no issues with this occurring if it was proposed.

Where relevant these comments have been incorporated into the report. No other issues with the report or its recommendations were noted by the Bangerang Aboriginal Corporation.

A single request for a hard copy of the report was requested and subsequently sent to the Pappin Family Aboriginal Corporation.

No other comments from RAPs were received on the draft ACHA which was subsequently finalised in October 2023 following a change in the project name from the Burrawong Wind Farm to the Junction Rivers Wind Project.

A copy of the final report and a project update about the change in the name to this Project was sent to all RAPs in October 2023.

4. Archaeological investigation results

Where possible the proposed development corridor was redesigned to avoid areas of high archaeological sensitivity prior to fieldwork being undertaken for this Project. NGH archaeologists completed the field survey for this project with the participation of members of the Aboriginal Community (RAPs) on foot, targeting the proposed development corridor within the Project Area. The entirety of the proposed development corridor within the Project Area was surveyed on foot as part of the fieldwork undertaken for this Project.

Survey transects were undertaken by foot across the entirety of the proposed development corridor and any initially proposed impact area, primarily over 6 weeks in March and April 2022, with an additional week of survey undertaken in April 2023. Visibility differed between the surveys undertaken for this Project based on rainfall and use of the area in terms of its farming activities (grazing or under crop cultivation) but overall, the ground surface visibility was very good. The ground surface visibility was overall approximately 85% across the development corridor, with the best visibility occurring in ploughed areas, in blowouts and on existing vehicle tracks. Plates 4-1 to 4-6 below show examples of the visibility and landforms surveyed. We believe that the survey strategy was comprehensive and the most effective way to identify the presence of Aboriginal heritage sites within the proposed development corridor.

	
Plate 4-1 High ground surface visibility within ploughed paddock in the development corridor.	Plate 4-2 High ground surface visibility within ploughed paddock in the development corridor.
	
Plate 4-3 Ground surface visibility within ploughed paddock in the development corridor.	Plate 4-4 Ground surface visibility within grassed area in the development corridor.



Plate 4-5 Ground surface visibility within grassed area in the development corridor.



Plate 4-6 High ground surface visibility within the development corridor.

The previously recorded AHIMS sites within the Project Area are largely in the north-eastern section of the Project Area along Condoulpe Creek. All of the previously recorded AHIMS sites within the Project Area are located outside development corridor (as previously shown in Figure 2-9) and no impacts are proposed for works associated with this Project. Given this, none of the previously recorded AHIMS sites within the Project Area were visually inspected during the surveys undertaken for this assessment.

During the survey the following site types and archaeological features were recorded: stone artefacts, hearths, oven mounds and tree cultural sites. It should be noted that where hearths were found in association with high frequencies of artefacts, the naming convention was for the site to be recorded as an artefact scatter (AFT). Where hearths were found in isolation or with a low density of stone artefacts in association, the naming convention was for the sites to be recorded as hearths (HTH).

A summary of the Aboriginal site types/features and cultural sites recorded during the field survey are provided in Table 4-1 and Table 4-2 and their locations shown in Figure 4-1. The site descriptions and the archaeological data recorded at these sites is provided in the ATR for this Project (see Appendix A). Maps of survey results area shown in Figure 4-1 to Figure 4-5.

Table 4-1 Summary of site types recorded during the survey for this Project.

Site Type	Number	%
Isolated finds	37	46.25
Tree cultural sites	24	30
Hearths	9	11.25
Artefact scatter	5	6.25
Hearth and mound	2	2.5
Hearth and Artefact	2	2.5
Artefact Scatter, Hearth and mound	1	1.25
Total	80	100

Table 4-2 Summary of all Aboriginal objects and cultural sites recorded during the surveys for this assessment .

AHIMS#	Name	Type	Brief Site Description
NA	Burrawong WF ST 01	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 02	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 03	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 04	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 05	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 06	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 07	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 08	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 09	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 10	Tree cultural site	1 community identified cultural tree with 2 scars
NA	Burrawong WF ST 11	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 12	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 13	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 14	Tree cultural site	1 community identified cultural tree with 1 scar

AHIMS#	Name	Type	Brief Site Description
NA	Burrawong WF ST 15	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 16	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 17	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 18	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 19	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 20	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 21	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 22	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 23	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 24	Tree cultural site	1 community identified cultural tree with 1 scar
47-6-1159	Burrawong 2	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1161	Burrawong 3	Isolated Stone Artefact Find	1 x Flake
47-6-1160	Burrawong 4	Isolated Stone Artefact Find	1 x Proximal Fragment
47-6-1173	Burrawong 5	Isolated Stone Artefact Find	1 x Flake
47-6-1140	Burrawong 6	Isolated Stone Artefact Find	1 x Flaked Piece

AHIMS#	Name	Type	Brief Site Description
47-6-1141	Burrawong 7	Isolated Stone Artefact Find	1 x Distal flake
47-6-1142	Burrawong 8	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1143	Burrawong 9	Isolated Stone Artefact Find	1 x Flake
47-6-1139	Burrawong 10	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1138	Burrawong 11	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1164	Burrawong 12	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1163	Burrawong 13	Isolated Stone Artefact Find	1 x Proximal Fragment
47-6-1162	Burrawong 14	Isolated Stone Artefact Find	1 x Hammerstone
47-6-1144	Burrawong 15	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1151	Burrawong 16	Isolated Stone Artefact Find	1 x Flake
47-6-1158	Burrawong 17	Isolated Stone Artefact Find	1 x Flake
47-6-1157	Burrawong 18	Isolated Stone Artefact Find	1 x Flake
47-6-1156	Burrawong 19	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1155	Burrawong 20	Isolated Stone Artefact Find	1 x Flake
47-6-1154	Burrawong 21	Isolated Stone Artefact Find	1 x Flake

AHIMS#	Name	Type	Brief Site Description
47-6-1153	Burrawong 22	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1152	Burrawong 23	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1150	Burrawong 24	Isolated Stone Artefact Find	1 x Flake
47-6-1149	Burrawong 25	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1148	Burrawong 26	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1147	Burrawong 27	Isolated Stone Artefact Find	1 x Manuport
47-6-1146	Burrawong 28	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1145	Burrawong 29	Isolated Stone Artefact Find	1 x Flake
47-6-1184	Burrawong 30	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1183	Burrawong 31	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1182	Burrawong 32	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1181	Burrawong 33	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1180	Burrawong 34	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1179	Burrawong 35	Isolated Stone Artefact Find	1 x Muller
47-6-1178	Burrawong 36	Isolated Stone Artefact Find	1 x Flake

AHIMS#	Name	Type	Brief Site Description
47-6-1177	Burrawong 37	Isolated Stone Artefact Find	1 x Core
47-6-1176	Burrawong 38	Isolated Stone Artefact Find	1 x Flake
47-6-1188	Burrawong WF AFT 01	Artefact Scatter	Low to moderate density of stone artefacts recorded (50+ artefacts present).
47-6-1175	Burrawong WF AFT 02	Artefact Scatter	Low to moderate density of stone artefacts recorded (50+ artefacts present).
47-6-1174	Burrawong WF AFT 03	Artefact Scatter	Low density of stone artefacts recorded (4 artefacts).
47-6-1172	Burrawong WF AFT 04	Artefact Scatter	Low to moderate density of stone artefacts recorded (29 artefacts present).
47-6-1192	Burrawong WF AFT 05	Artefact Scatter, Hearth and mound	Low to moderate density of stone artefacts recorded (37 artefacts present) with 5 hearth features and an oven mound feature.
47-6-1170	Burrawong WF AFT 06	Artefact Scatter	Low density of stone artefacts recorded (2 artefacts).
47-6-1191	Burrawong WF HTH 01	Hearth and mound	7 hearth features and 1 oven mound feature.
47-6-1171	Burrawong WF HTH 02	Hearth	1 x hearth feature
47-6-1169	Burrawong WF HTH 03	Hearth	2 x hearth feature
47-6-1190	Burrawong WF HTH 04	Hearth	1 x hearth feature
47-6-1168	Burrawong WF HTH 05	Hearth	1 x hearth feature

AHIMS#	Name	Type	Brief Site Description
47-6-1167	Burrawong WF HTH 06	Hearth	2 x hearth feature
47-6-1189	Burrawong WF HTH 07	Hearth	2 x hearth feature
47-6-1166	Burrawong WF HTH 08	Hearth	1 x hearth feature
47-6-1165	Burrawong WF HTH 09	Hearth	1 x hearth feature
47-6-1193	Burrawong WF HTH 10	Hearth and Artefact	1 x hearth feature and 1 x stone artefact
47-6-1187	Burrawong WF HTH 11	Hearth and Artefact	7 x hearth features and 4 x stone artefacts
47-6-1186	Burrawong WF HTH 12	Hearth and mound	1 x hearth feature and 1 x oven mound feature
47-6-1185	Burrawong WF HTH 13	Hearth	2 x hearth feature

Summary of tree cultural sites recorded.

A total of 24 trees were identified by the Aboriginal community representatives as cultural sites. Some of these trees had obvious horizontal axe cut marks within a scar which were requested by the RAPs onsite to be recorded to have scarring and/or modification which is possible to be Aboriginal in origin. It has however been noted by the NGH archaeologists that the scarring and modification of these trees may be representative of 'rabbiting trees' (see Section 2.2.5) and therefore the modification is unlikely to be Aboriginal in origin. In consideration of this, the trees which were recorded with obvious horizontal axe cut marks within a scar are not considered to be an Aboriginal object under the NPW Act. A number of the other trees with scarring were also requested to be recorded by the RAPs. The scarring on these other trees was determined not to conform with the standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005) and therefore these trees are not considered likely to be an Aboriginal object under the NPW Act by NGH archaeologists. Regardless of the assessment of these trees by NGH archaeologists the Aboriginal community representatives onsite view these 24 trees (which were recorded as the individual sites Burrawong WF ST 01 to Burrawong WF ST 24) as cultural sites. As the previous assessment of similar trees with obvious horizontal axe cut marks within a scar in Yanga National Park was unable to unequivocally determine the origin of horizontal axe cut marks on similar trees, the engagement of an arborist was determined not be warranted by NGH in this instance as the community identify these tree as cultural sites.

The scars recorded at the request of the Aboriginal community representatives were on both living and dead trees with generally only a single scar recorded on each tree. The majority of the trees recorded were Black Box trees associated with depressions and areas of remnant vegetation. Black Box trees have historically also been noted to generally be the tree used for 'rabbiting trees'. While a number of the tree cultural sites recorded are located in stands and groupings of trees it was determined that it was appropriate for each

individual tree to be recorded as a separate site as part of this assessment to ensure the GPS location of each tree was recorded. This is due to the high conservation value of these trees as a site type to the Aboriginal community. Despite a number of the tree cultural sites occurring in stands there was occasion where a cultural tree was also recorded as isolated occurrences, however this may also be reflective of the survey methodology which was only to inspect the proposed development corridor and not all vegetated areas within the Project Area.

Given the ambiguity of the origins of the scarring and/or modification recorded on the tree cultural sites recorded during this assessment, no site cards are proposed to be submitted to AHIMS by NGH for these locations as they have been determined to not meet the definition of an Aboriginal object under the NPW Act. Despite this, these trees are all being avoided by the proposed development given their cultural significance to the Aboriginal community.

	
Plate 4-7 Burrawong WF ST 10 with metal axe marks - possible rabbiting tree.	Plate 4-8 Close up of metal axe marks on Burrawong WF ST 10.

Summary of the isolated stone artefacts recorded.

A total of 37 stone artefacts were recorded within the Project Area as surface isolated finds which were labelled subsequently as Burrawong 02 to Burrawong 38. These surface isolated find stone artefacts included flakes (n=13), flaked pieces (n=7), grindstone fragments (n=6), distal fragments (n= 5), proximal fragments (n=2) and a core (n=1), hammerstone (n=1), manuport (n=1) and muller (n=1). These artefacts were primarily manufactured from silcrete (n=19) which is a common raw material for the region. Other raw materials recorded included quartz (n=5), quartzite (n= 5), sandstone (n=5), fine-grained silicious (n=2) and chert (n=1). The sandstone artefacts were generally attributed to the occurrence of grindstone fragments within the survey area. It was noted that of the objects commonly associated with food processing (seed grinding) activities (grindstone fragments and mullers), that the grindstone fragments recorded as the sites Burrawong 10, Burrawong 12, Burrawong 31 and Burrawong 34 had evidence of residues and silica present. These artefacts may be suitable for further research in the form of residue analysis however the disturbed contexts of these finds may detract from their research potential.

Summary of the artefact scatter sites recorded.

A total of six surface artefact scatter (AFT) sites were recorded which ranged from two surface stone artefacts to 50+ stone artefacts. The sites were named Burrawong WF AFT 01 to Burrawong WF AFT 06 which were generally located on a raised red sandy landform. Of these artefact scatter sites only one also contained hearth features and one contained an oven mound feature. The majority of stone artefacts recorded were flaked including complete flakes, broken flakes, debitage and cores. Grinding stones were present, but generally only as fragments.

Summary of the hearth, oven and mound sites recorded.

The sites described as hearths (HTH) are the remains of ground ovens with heat retainers. The hearths were present as clustered heat retainers (in some cases still buried), and frequently as dispersed heat retainers resting on the ground surface (a scatter of ex situ heat retainers). In some instances mounds were identified as hearth cooking areas which were likely subject to repeated use and which were slightly built up from the surrounding landscape. The hearth sites were recorded as Burrawong WF HTH 01 to Burrawong WF HTH 13. A total of 31 hearth features and three oven mound features were recorded during the survey. They ranged from single use discrete location (20 cm in length x 30 cm in width) to dispersed heat retainers scattered across large open areas (20 m in length x 20 m in width). The mound features were recorded the accumulation of cooking hearths and were generally recorded in association with other hearth features within the sites. Of the 13 hearth sites recorded, only two were also associated low densities of surface stone artefacts.



Plate 4-9 Sample of stone artefacts from Burrawong WF AFT 1.



Plate 4-10 Burrawong WF HTH 03 with range pole at cluster of clay heat retainers.

Consideration of Potential Archaeological Deposits (PAD)

A number of factors have been considered to inform the predictive modelling developed to assess the likelihood of *in situ* subsurface Aboriginal objects to be present within the proposed Junction Rivers Wind Project development corridor. The current development corridor (as assessed in this report) is largely confined to landscapes which generally have deflated surfaces and areas considered to have negligible potential for intact subsurface deposits with high densities of cultural material. As such it was determined by the NGH archaeologists who undertook this survey that the development corridor as mapped in this report contains few landforms, sites or features that warrant subsurface investigation. The exceptions to this are the mounds and hearth features which were recorded at the sites Burrawong WF AFT 05, Burrawong WF HTH 01, Burrawong WF HTH 03, Burrawong WF HTH 11 and Burrawong WF HTH 12 which were noted to be *in situ* and likely to have some potential for subsurface material and deposit. These five sites are considered to

have some further research value and thus higher archaeological conservation value however; it must be noted that they have been excluded from the development corridor and/or captured in heritage exclusion zones to ensure no harm will occur to these sites. Consequently, no subsurface test excavation was determined to be warranted within the proposed development corridor. Further justification of this is provided in Section 8.2.3 of the ATR.

Discussion of Results

The predictions based on the modelling for the region were that stone artefacts, hearths and modified trees (where old growth vegetation remains) were the most likely manifestation of Aboriginal occupation of the area within the proposed development corridor of this Project. Archaeologically sensitive landforms recognised in the region tend to occur in strong association with the presence of potential resources for Aboriginal use. Landforms directly associated with water and/or elevated ground (ie slightly raised red sandy areas, lunettes and basal slopes boarding black box depressions) appear to have the greatest potential for identification of Aboriginal cultural material. The survey results have confirmed this prediction with stone artefacts, hearth features, mounds and tree cultural sites recorded within the surveyed area. Furthermore, these results indicate that Aboriginal sites can occur throughout the landscape, even in areas highly disturbed by farming activities.

Based on the site types and archaeological features recorded during this assessment, it is likely that the area as a whole was used intermittently over long periods of time for camping while water remained in the landscape, as indicated by the presence of hearths, mounds and stone artefacts. Sites that consist of both hearths/mounds and stone artefacts indicate that camping, cooking and tool manufacturing activities were undertaken in these areas. Additionally, sites such as Burrawong WF AFT 5, Burrawong WF HTH 01 and Burrawong WF HTH 11 which have a number of hearth features with associated artefacts and/or mounds suggest that sites were repeatedly revisited and reused over time or were the focus of occupation for a relatively large group of people.

It is most likely that the Aboriginal cultural material recorded within the Project Area reflects the use of the area by small family groups on multiple occasions as they moved through the landscape exploiting the increased range of available resources associated with the prolonged presence of water after annual flooding. The spatial analysis of the sites recorded clearly shows that sites with multiples features and/or a density of cultural material recorded (ie Burrawong WF AFT 01, Burrawong WF AFT 02, Burrawong WF AFT 04, Burrawong WF AFT 05, Burrawong WF HTH 01 and Burrawong WF HTH 11) tend to be focused along the outer boundaries of black box swamps, depression areas and paleochannels, thus confirming the modelling of the area and that access to resources, in particular water, were favourable locations utilised for camping.

It should also be noted that the results of this investigation have substantially increased the number of sites and archaeological features recorded in the area and it's likely that similar numbers of these sites may occur in areas outside the land surveyed for this Project in the local area. The implications for this relate to significance assessments and the related appraisal of site representativeness.

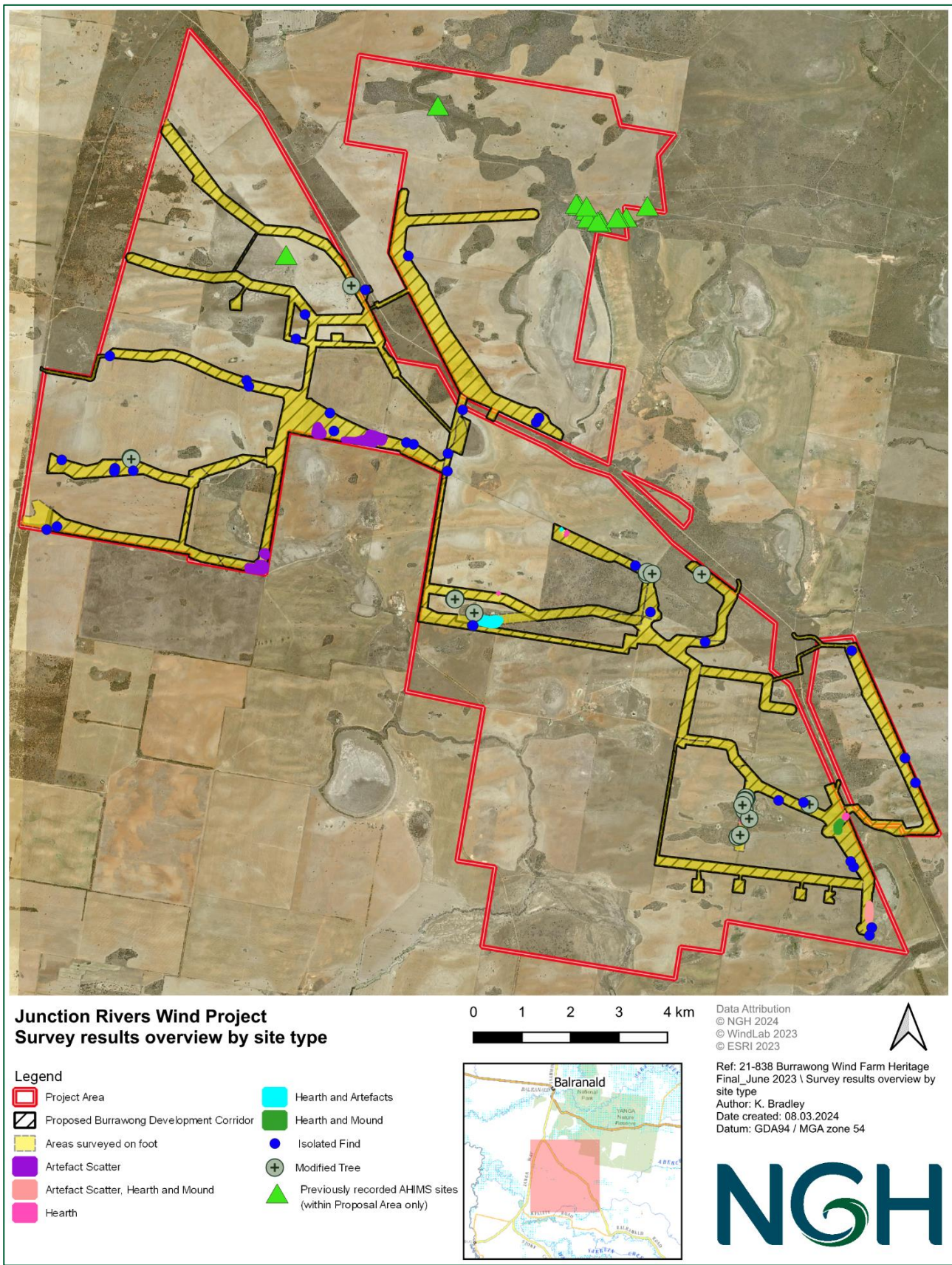


Figure 4-1 Location of the sites recorded during the survey.

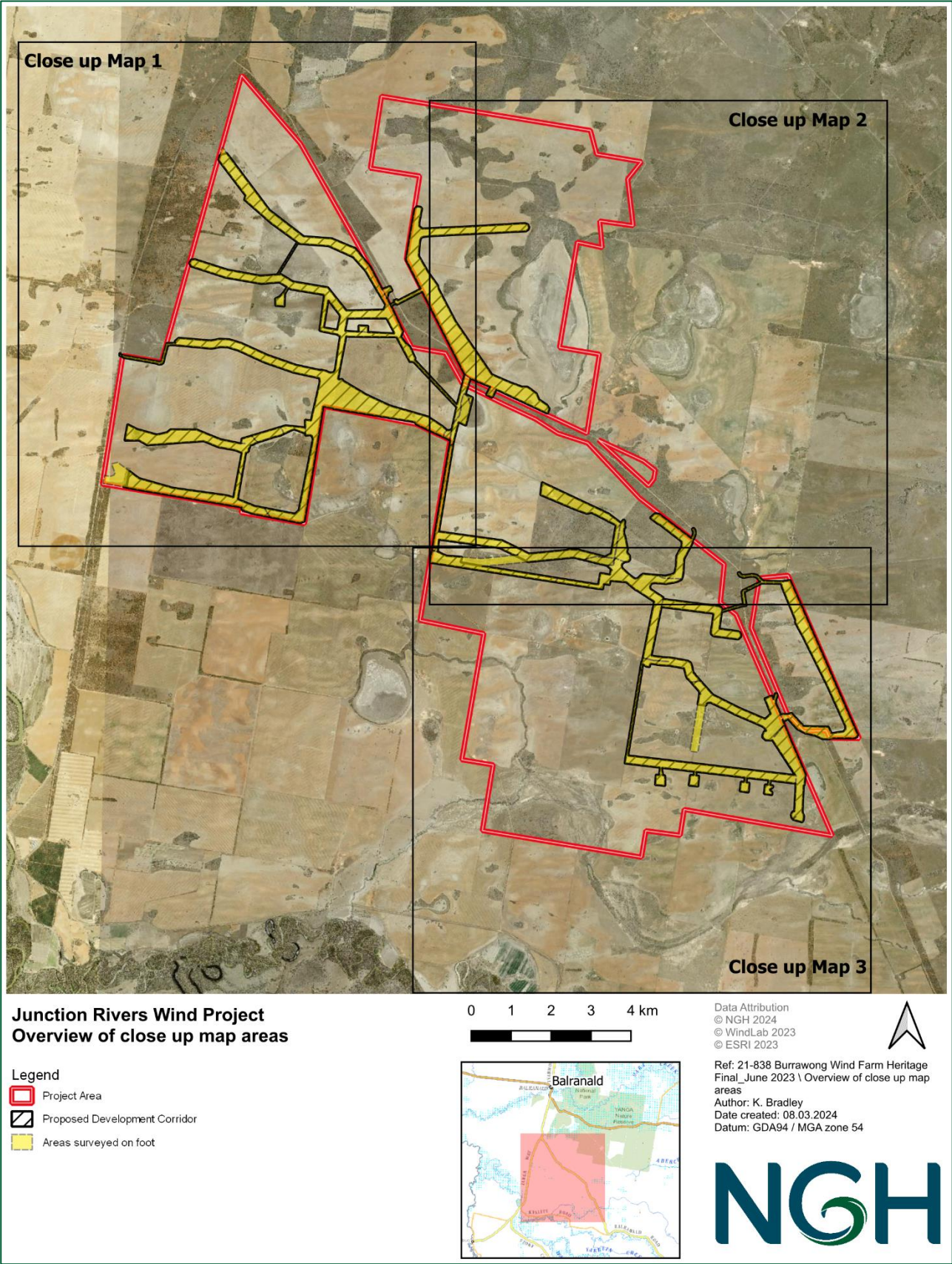


Figure 4-2 Overview of close up maps in this report

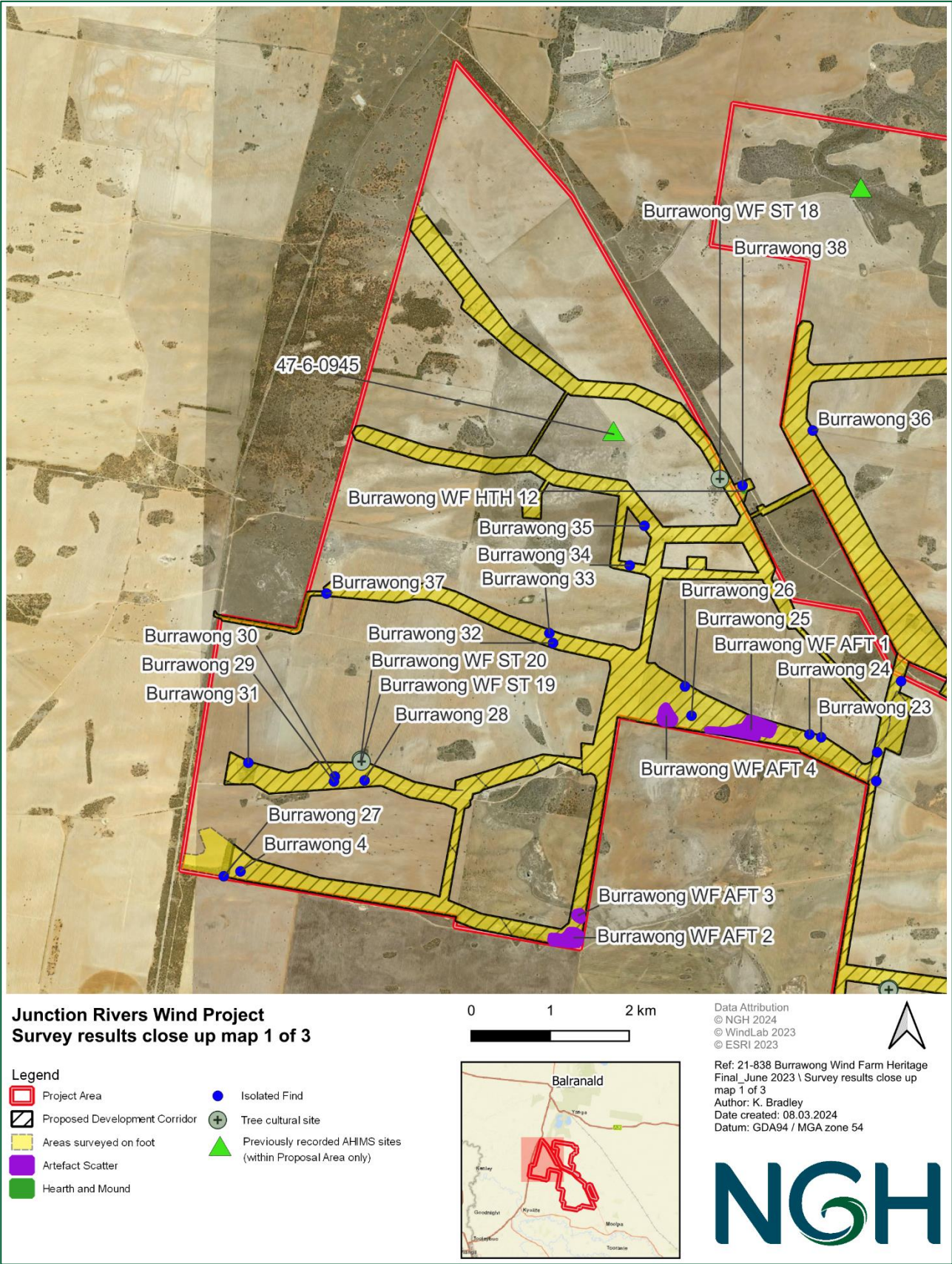


Figure 4-3 Survey Results close up Map 1.

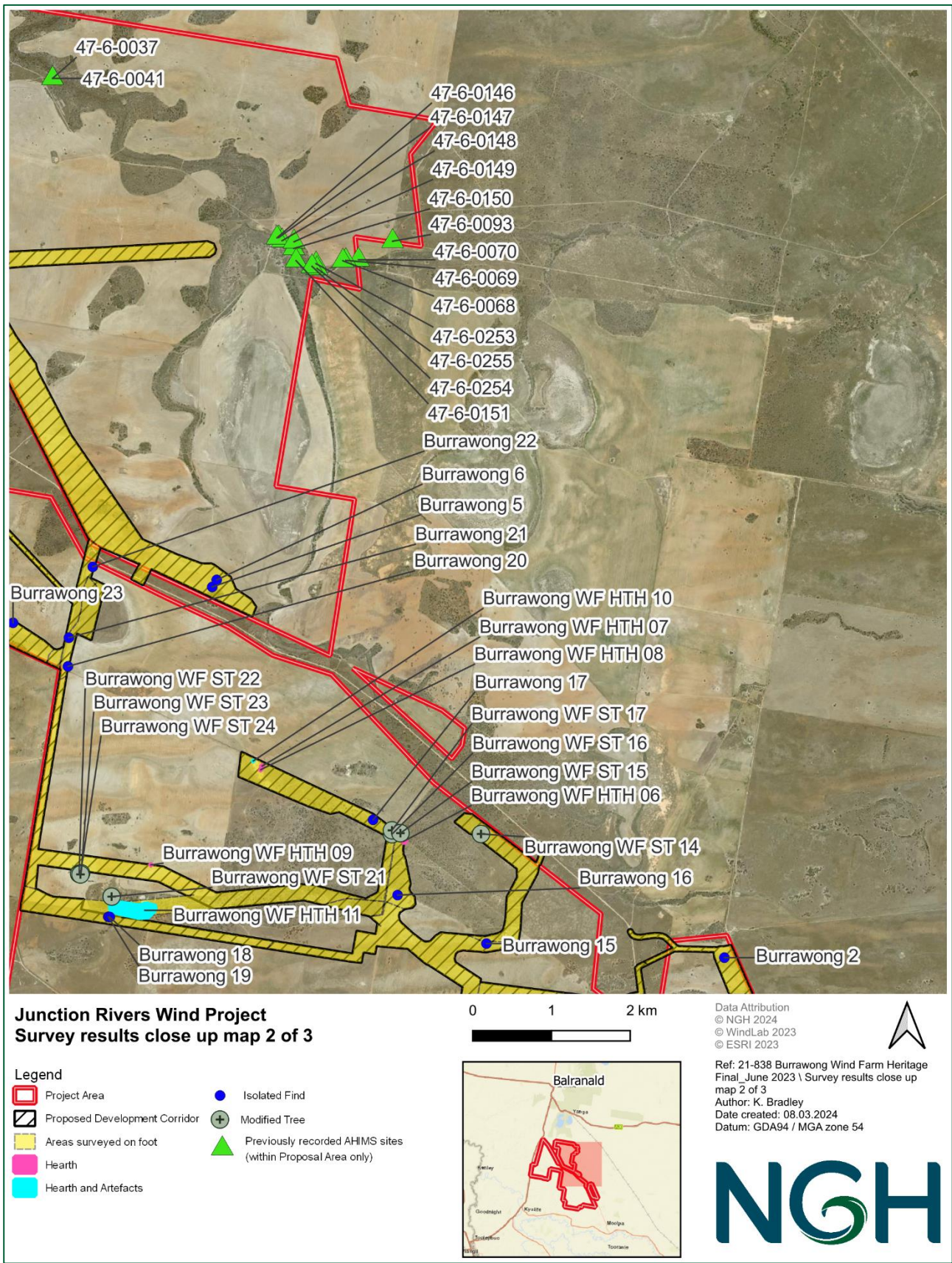


Figure 4-4 Survey Results close up Map 2

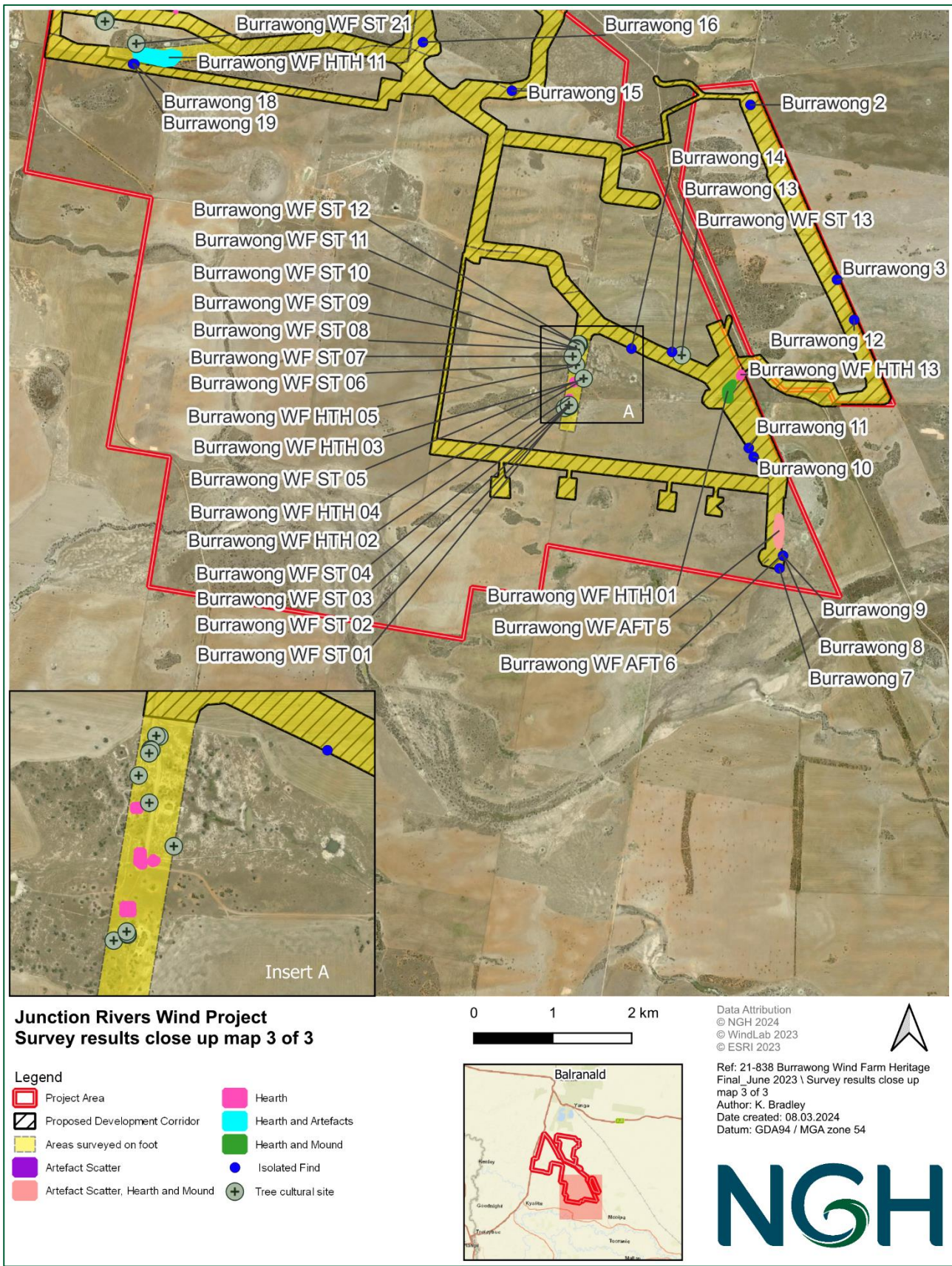


Figure 4-5 Survey Results close up Map 3

5. Cultural heritage values and statement of significance

5.1 Assessment criteria

The assessment of the significance of Aboriginal archaeological sites is currently undertaken largely with reference to criteria outlined in the ICOMOS Burra Charter (Australian ICOMOS 2013). Criteria used for assessment are:

- **Social or Cultural Value:** In the context of an Aboriginal heritage assessment, this value refers to the significance placed on a site or place by the local Aboriginal community – either in a contemporary or traditional setting.
- **Scientific Value:** Scientific value is the term employed to describe the potential of a site or place to answer research questions. In making an assessment of scientific value issues such as representativeness, rarity and integrity are addressed. All archaeological places possess a degree of scientific value in that they contribute to understanding the distribution of evidence of past activities of people in the landscape. In the case of flaked stone artefact scatters, larger sites or those with more complex assemblages are more likely to be able to address questions about past economy and technology, giving them greater significance than smaller, less complex sites. Sites with stratified and potentially in situ sub-surface deposits, such as those found within rock shelters or depositional open environments, could address questions about the sequence and timing of past Aboriginal activity, and will be more significant than disturbed or deflated sites. Groups or complexes of sites that can be related to each other spatially or through time are generally of higher value than single sites.
- **Aesthetic Value:** Aesthetic values include those related to sensory perception and are not commonly identified as a principal value contributing to management priorities for Aboriginal archaeological sites, except for art sites.
- **Historic Value:** Historic value refers to a site or place's ability to contribute information on an important historic event, phase or person.
- **Other Values:** The Burra Charter makes allowance for the incorporation of other values into an assessment where such values are not covered by those listed above. Such values might include Educational Value.

All sites or places have some degree of value, but some have more than others. In addition, where a site is deemed to be significant, it may be so on different levels or contexts ranging from local to regional to national, or in very rare cases, international. Further, sites may either be assessed individually, or where they occur in association with other sites the value of the complex should be considered.

5.2 Significance assessment

5.2.1 Social or cultural value

While the true cultural and social value of Aboriginal sites can only be determined by local Aboriginal people, as a general concept, all sites hold cultural value to the local Aboriginal community. An opportunity to identify cultural and social value was provided to all the registered Aboriginal stakeholders for this proposal through the draft reporting process.

Feedback about the cultural value of the sites while in the field with the representatives was that all sites and Aboriginal objects hold cultural value to the Aboriginal community and should where possible be avoided by any impacts. It was also clear from the conversations held in the field that the community view the stone artefacts as important and would like to see the surface artefacts that are unable to be avoided by the

development collected before any construction works occurs. It was noted during the conversations that there was importance placed on collecting the artefacts and placing them in a safe location to avoid future disturbance. Mounds and tree cultural sites were also noted to be particular site types that should be avoided by the proposed development.

Overall, the cultural value of each of the sites recorded is deemed to be high by the Aboriginal community.

No further feedback on the cultural value of the Aboriginal sites or the Project Area in general was provided by the RAPs during the review of the draft ACHA.

5.2.2 Scientific (archaeological) value

The research potential of the majority of the sites located during this assessment is generally considered to be low. While the presence of the sites can be used to assist in the development of site modelling for the local landscape, their scientific value for further research is generally limited. However, there are some sites and Aboriginal objects recorded during this assessment which are considered to have some potential for further research.

Grindstone fragments can be inspected microscopically and undergo residue analysis to determine what plants and/or other materials were being processed. Given this, the grindstone fragments recorded at the sites Burrawong 10, Burrawong 12, Burrawong 31 and Burrawong 34 which were noted to have evidence of residues and silica present may be suitable for further research. However, it should be noted that these four grindstone fragments were all recorded as isolated finds which have low integrity and lack contextual information and comparative archaeological material which to some degree lowers the research potential of these items. Stone artefacts which are commonly associated with food processing (seed grinding) activities were also recorded at Burrawong 2, Burrawong 15, Burrawong 35 and Burrawong WF AFT 01. These objects also have some potential for further research however, as mentioned above, the low integrity and lack contextual information and comparative archaeological material at these sites lowers the research potential of these items. The majority of these stone objects are also noted to be recorded in ploughed agricultural paddocks so any residues may also be contaminated to some degree by the modern and historic cropping of the area.

Generally hearths and mounds are a common site type in the region that has the potential to be directly dated. If subsurface deposits of hearth features and mounds are intact and undisturbed it is possible that cultural charcoal and/or shell has been preserved. If the integrity of this material is sound it can be used as a means for dating these sites through carbon dating (C14) and/or optical stimulated luminescence (OSL) techniques. Given this the mound features within the sites Burrawong WF AFT 05, Burrawong WF HTH 01, and Burrawong WF HTH 12 and hearth feature at Burrawong WF HTH 03 and Burrawong WF HTH 11 are considered to have moderate research potential due to the possibility of undisturbed deposits and cultural charcoal to be present at these specific archaeological features at these sites. While the presence of the other individual hearth features recorded during this assessment can be used to assist in the development of site modelling for the region, it is considered that all other hearth features recorded during this assessment (beyond those noted above) have low research potential due to their generally deflated and disturbed nature.

The ground edge axe which was recorded within the site Burrawong WF AFT 04 was noted to be a relatively uncommon artefact type in the region and therefore the individual scientific value of this object is considered to be low to moderate. This object was also noted to have high conservation value by the Aboriginal community representatives as an uncommon artefact type in the local area.

The sites Burrawong WF AFT 01, Burrawong WF AFT 02, Burrawong WF AFT 04 and Burrawong WF AFT 05, Burrawong WF HTH 01 and Burrawong WF HTH 11 are noted to have low to moderate archaeological value due to the density and range of cultural material recorded at these six sites. Retouched artefacts, food processing objects and hammerstones were also noted to be recorded at Burrawong WF AFT 01 and Burrawong WF AFT 04. The presence of hammerstones suggests local lithic manufacture and the presence of grindstone fragments is strongly indicative of onsite food processing.

While the other stone artefacts recorded during this assessment are intrinsically interesting in terms of their base technical information, their current lack of temporal context and the absence of information about local resources makes further conclusions about land use difficult. Their scientific value for further research is also limited due to the disturbed nature of the landscape and the subsequent movement of objects by clearing and ploughing activities. Given this, the presence of the other artefacts beyond those associated with the site noted above are considered to have low research potential. However, they can be used to assist in the development of site modelling including the distribution of raw material and artefact types across the local landscape.

The tree cultural sites recorded during this assessment hold cultural value to the Aboriginal community. The fact that the surrounding landscape has been cleared and modified means that as a representative example of this site type the trees have high value despite the site type being common for the local area. The survival of trees is subject to natural factors such as death, decay, and bushfires, as well as man-made threats such as land clearing, which means their long-term survival prospects are diminished. This leads to the conclusion that the remaining tree cultural sites in the landscape have high value given the cultural value to the community. Therefore, the tree cultural sites in the Project Area, regardless of the ambiguity of origin, are assessed overall as having high conservation value.

The findings of this project have increased the number of sites listed in the AHIMS database for the area. In terms of representativeness and rarity we would argue that there are likely to be many hundreds of such sites in the surrounding area as the relatively low number of sites in AHIMS in the local area is merely an indication that few surveys have been undertaken in the local area.

5.2.3 Aesthetic value

There are no aesthetic values associated with the archaeological sites *per se*, apart from the presence of Aboriginal objects and sites in the landscape. However, the modified and heavily disturbed nature of the Project Area through farming practices detracts from this aesthetic setting to some degree.

5.2.4 Historic value

There are no known historic sites identified or links to known important historic events, phases or persons. No further information has been provided to date by the Aboriginal community to suggest the area is historically important in terms of persons, events, phases or activities.

5.2.5 Other values

There are no other known heritage values associated with the Project Area. The area may have some educational value (not related to archaeological research) through educational material provided to the public about the Aboriginal occupation and use of the area, although the archaeological material is primarily within private property and there is little for the public to see.

5.3 Statement of Significance

A summary of cultural heritage values and corresponding significance assessment for the sites with known Aboriginal objects recorded during this assessment within the Project Area is provided below.

Table 5-1. Summary of significance

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong WF ST 01	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 02	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 03	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 04	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 05	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 06	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 07	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 08	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 09	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 10	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 11	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 12	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 13	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 14	Tree cultural site	High	NA	High	N/A	N/A	High	NA

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong WF ST 15	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 16	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 17	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 18	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 19	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 20	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 21	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 22	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 23	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 24	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong 2	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 3	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 4	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 5	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 6	Isolated Find	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong 7	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 8	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 9	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 10	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 11	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 12	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 13	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 14	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 15	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 16	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 17	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 18	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 19	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 20	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 21	Isolated Find	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong 22	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 23	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 24	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 25	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 26	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 27	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 28	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 29	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 30	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 31	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 32	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 33	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 34	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 35	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 36	Isolated Find	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong 37	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 38	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF AFT 01	Artefact Scatter	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 02	Artefact Scatter	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 03	Artefact Scatter	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF AFT 04	Artefact Scatter	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 05	Artefact Scatter, Hearth and oven mound	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 06	Artefact Scatter	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 01	Hearth and oven mound	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 02	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 03	Hearth	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 04	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 05	Hearth	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong WF HTH 06	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 07	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 08	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 09	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 10	Hearth and Artefact	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 11	Hearth and Artefact	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 12	Hearth and oven mound	High	Low to Moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 13	Hearth	High	Low	Low	N/A	N/A	Low	Common

6. Proposed activity

The Project is located within the SW-REZ which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap.

Windlab proposes to develop the Project to provide a reliable and affordable source of energy for the people of NSW and contribute to reducing greenhouse gas emissions associated with energy generation. The Project would involve the construction, operation and eventual decommissioning or repowering of a wind farm with up to 96 Wind Turbine Generators (WTG) and associated ancillary infrastructure, with a generating capacity of up to approximately 750 megawatts (MW) and would connect to the existing 220 kilovolt (kV) transmission line that traverses the site and/or the proposed Project EnergyConnect transmission line.

The key components of the Project include:

- up to 96 (3 blade) WTGs with a total height (tip height) of approximately 300 m;
- electrical connections between the proposed WTGs and substations/switching stations consisting of a combination of underground cables and overhead powerlines;
- substations/switching stations and transmission connections to connect to the existing 220 kV transmission line and/or the proposed Project EnergyConnect transmission line;
- up to four Battery Energy Storage System (BESS) facilities (to a total of 200 MW with a 4 hour delivery capacity), or up to four STATcom facilities;
- other associated infrastructure including access roads and tracks, operation and maintenance buildings and construction facilities;
- temporary on-site concrete batching plants and rock crushing facilities during the construction phases; and
- targeted road network upgrades to facilitate delivery of WTG components to the site as required.

The Project specific design components are noted in Table 6-1.

Table 6-1 Project design specification

Component	Approximate Dimensions	Quantity
Wind Turbine Generator (WTG)		Up to 96
Blade length	Maximum of 100m	
Hub height	Maximum of 200m	
Uppermost blade tip	Maximum of 300m	
Lowermost blade tip	Minimum of 49m	
Hardstand	Maximum of 100 x 115 m	
Crane laydown	Maximum of 30 x 240 m	

Component	Approximate Dimensions	Quantity
Ancillary Infrastructure – Electrical		
Battery Energy Storage System (BESS) (up to 200MW/800MWh)	Maximum of 3.2 hectares	Up to 2*
Main substation (33/220kV and/or 33/330kV)	Maximum of 5.0 hectares	Up to 2*
Switching station	Maximum of 1.275 hectares	Up to 2*
Underground and/or overhead cables (33kV)	5m trench	approx. 78 km (total length of trenches), approx. 148 km (total length of cable)
Overhead transmission line (220kV and/or 330kV)	80m easement	approx. 17.2 km
Ancillary Infrastructure – Other		
Internal access tracks and drainage	Width ranging from 5.5-10m	approx. 91 km
O&M facility including carpark	Maximum 2.5 hectares	Up to 2*
Meteorological masts (power performance masts)	Maximum height of 200m	Up to 7
Site Access Points		Up to 8 locations
Temporary Facilities		
Construction compound	Maximum of 2.25 hectares	1 main and up to 4 satellite
Concrete batching plants	Maximum of 3.0 hectares	Up to 4
Laydown areas	Maximum of 2.28 hectares	Up to 5
Temporary meteorological masts	Maximum height of 150m	Up to 2

* 1 per stage, if constructed in stages

As is typical of projects of this scale, the construction of the wind farm may be staged. The decision to construct the wind farm in stages will depend on a number of factors, including but not limited to:

- Access arrangements for the South-West Renewable Energy Zone
- Availability of offtake and other energy market considerations
- Financing arrangements and other commercial considerations

If the project is constructed in stages, Stage 1 may see the construction of up to 30 WTGs and required ancillary infrastructure and Stage 2 may see the construction of the remaining WTGs and required ancillary infrastructure. The construction period would be approximately four years.

The final configuration for Stage 1 will depend on the WTG model selected and the outcome of detailed grid studies. The possible Stage 1 works are detailed in Table 6-2.

Table 6-2 Stage 1 project design specification- if constructed in stages

Component	Quantity	Location
Wind turbine generator (WTG)	Up to 30	subset of WTG 1-30
Battery Energy Storage (BESS)	Up to 1	1
Main substation	1	1
Switching station	1	1
O&M facility including carpark	1	1
Meteorological masts	Up to 2	1, 2
Temporary Facilities	1	1
Concrete batching plants	1	1
Laydown areas	1	1
Construction compound	1	1
Temporary meteorological masts	Up to 2	1, 2
Site access points	2	2, 3

In order to facilitate refinement of the layout during the detailed design process, an allowance for micro-siting of WTGs by up to 100 m radius from the locations identified in the EIS is sought. Other project infrastructure components, including substations, switchyard, maintenance building, temporary facilities, cabling and access tracks, may also be micro-sited within the disturbance corridor to ensure that micro-siting does not result in greater impacts than those assessed in the EIS for this project and complies with all conditions imposed on any development consent granted for the project.

The development activity will therefore involve disturbance of the ground during the construction of the wind farm and thereafter through its operation and ongoing use, including maintenance activities for the wind farm and its associated infrastructure and access tracks.

6.1 Assessment of harm

It should be noted that significant design changes have occurred throughout the development of the design for this Project. Initial changes occurred early in the design process in consultation with NGH archaeologists prior to any fieldwork being undertaken for this Project to ensure the previously recorded AHIMS sites and landforms of very high archaeological sensitivity (i.e. lunettes and source bordering dunes) were avoided where possible. Specifically, these initial early development design changes prior to fieldwork included:

- Removal of initially proposed WTG and other infrastructure adjacent to Condouple Lake;
- The removal and/or adjustment of initially proposed locations for WTG within the northwest portion of the Project Area to avoid landforms of high archaeological sensitivity;

- Removal of initially proposed WTG and other infrastructure in the central portion of the Project Area to avoid landforms of high archaeological sensitivity;
- Removal of infrastructure in the southern portion of the Project Area to avoid landforms of high archaeological sensitivity.

Feedback and communications with the archaeologists during the fieldwork for this Project were also taken into consideration by the designers to ensure the avoidance of any archaeologically sensitive landforms (source bordering areas around black box swamp depressions and undisturbed raised red sandy areas) and site types with high conservation value (tree cultural sites and mounds) which were identified during the fieldwork and/or requested if possible to be avoided by the RAPs who participated in the fieldwork. A summary of the early design changes which occurred after the fieldwork was completed is provided below.

- Proposed development area redesigned to ensure the avoidance of all tree cultural sites and mound features due to the high cultural and/or archaeological conservation value they hold;
- The proposed development footprint was redesigned to avoid as many of the hearth features/site as possible;
- Several heritage exclusion zones were established to ensure the avoidance areas with a density of Aboriginal sites and/or specific site types. The proposed development was redesigned to facilitate the heritage exclusion zones;
- The two large heritage exclusion zones were entirely removed from the proposed development footprint to ensure the avoidance of landforms of high archaeological sensitivity and areas which had a density of sites recorded;
- No further infrastructure was added to the southern portion of the Project Area despite the inclusion of heritage exclusion zones and the removal of proposed development areas;
- Underground cabling in the southern portion of the Project Area was moved west to avoid hearths and tree cultural sites;
- The overhead transmission line was relocated within the southwest portion of the Project Area to avoid landforms of high archaeological sensitivity; and
- The proposed development footprint was reduced, where possible, to avoid any impacts to recorded sites.

An overview of the land initially proposed to be impacted by this development, compared to the area assessed in this report is shown in Figure 6-1 includes all the early design changes noted above which occurred prior to and post the completion of the fieldwork for this assessment to ensure minimal impacts, where possible, on Aboriginal heritage. As summarised above, significant effort was undertaken following the completion of the surveys for this Project to ensure the design and micro-siting for the infrastructure components where possible can avoid recorded Aboriginal sites through the placement of heritage exclusion zones. The heritage exclusion zones for this Project are shown in Figure 6-2.

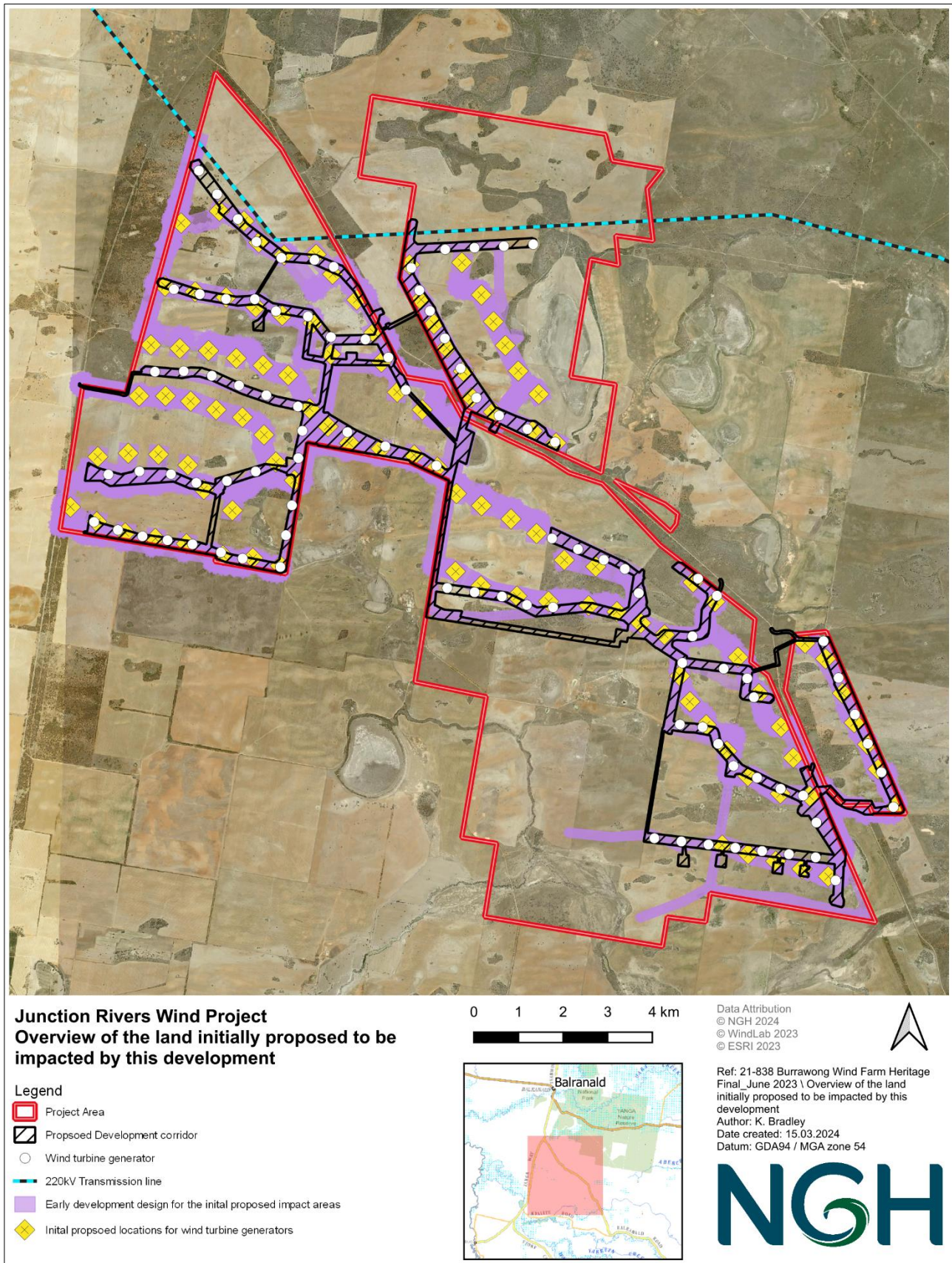


Figure 6-1 Overview of the land initially proposed to be impacted by this development, compared to the area assessed in this report.

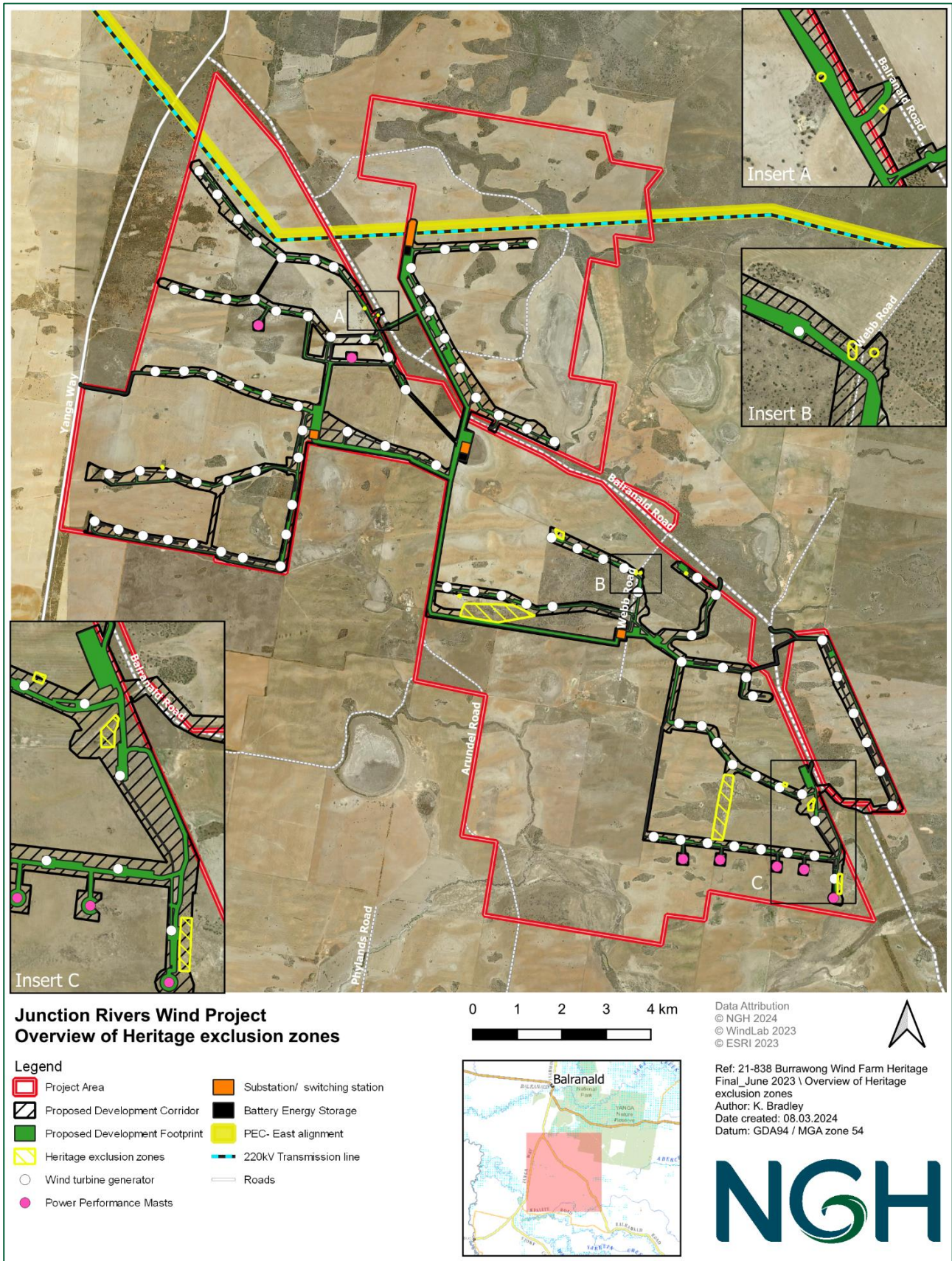


Figure 6-2 Overview of Heritage exclusion zones

To facilitate refinement of the layout during the detailed design process, an allowance for micro-siting of WTGs within a 100m radius from the locations identified in the EIS and this assessment is sought by the Proponent. This micro-siting approach is a common occurrence on wind farm projects. Other project infrastructure components, including substations, switchyard, maintenance building, temporary facilities, cabling, and access tracks, may also be micro-sited within the assessed area of the proposed development corridor to ensure that the final design of this Project does not result in greater impacts to Aboriginal Heritage than those assessed.

Where possible the micro-siting of Project infrastructure components has avoided sites, with heritage exclusion zones implemented within the development corridor to ensure Aboriginal sites, where possible, are able to be avoided by any impact or harm. An overview of the heritage exclusion zones is also shown in Figure 6-2 with close up maps of the proposed development corridor o Aboriginal heritage sites provided in to Figure 6-3 to Figure 6-5.

Beyond the heritage exclusion zones and in consideration of the nature of the proposed works (which require some flexibility in terms of micro-siting for the final design and during the construction planning phases for this Project) NGH has applied a precautionary principle during the assessment of harm. Therefore, it is presumed that within the development corridor, in any areas outside the mapped heritage exclusion zones, that complete impact to sites may occur when assessing impact to Aboriginal cultural heritage for this Project. Based on this approach Table 6-3 below provides a summary of sites assessed to be impacted and avoided by the proposed development of the Junction Rivers Wind Project.

Table 6-3. Summary of sites to be impacted and avoided by the proposed development.

Sites impacted	Sites avoided
Burrawong WF AFT 01 to Burrawong WF AFT 04	Burrawong WF ST 01 to Burrawong WF ST 24
Burrawong WF AFT 06	Burrawong WF AFT 05
Burrawong WF HTH 06	Burrawong WF HTH 01 to Burrawong WF HTH 05
Burrawong WF HTH 09	Burrawong WF HTH 07 to Burrawong WF HTH 08
Burrawong WF HTH 13	Burrawong WF HTH 10 to Burrawong WF HTH 12
Burrawong 02 to Burrawong 38	15 Previously recorded AHIMS sites within the Project Area (AHIMS# 47-6-0037, #47-6-0041, #47-6-0093, #47-6-0945, #47-6-0253, #47-6-0147, #47-6-0148, #47-6-0150, #47-6-0255, #47-6-0151, #47-6-0254, #47-6-0146, #47-6-0069, #47-6-0149 and #47-6-0068).

Table 6-4 details the degree of harm and the consequence of that harm upon the heritage value of each site type resulting from the proposed development works. The proposed level of disturbance for the construction of the wind farm will therefore impact some of the stone artefacts and hearth features recorded during the field survey within areas of the development corridor which are outside the heritage exclusion zones. Furthermore, although the pedestrian survey undertaken for this Project covered the entire proposed development corridor, it is possible that unrecorded Aboriginal heritage objects may be identified during construction, operation and maintenance works. However, this is considered likely to only occur as isolated stone artefacts and/or scattered heat retainers. Given these proposed impacts, the assessment of harm overall for the Project is assessed as low.

Figure 6-3 to Figure 6-5 show the location of the heritage exclusion zones and sites to be impacted by the proposed development corridor for this Project.

Table 6-4. Summary of the degree of harm and the consequence of that harm upon each site type recorded within the Survey Area.

Site Type	Type of Harm	Degree of Harm	Consequence of harm	No. of Sites	% of site type
Isolated Finds	Direct	Complete	Total loss of value	37	100
Artefact Scatters	Direct	Complete	Total loss of value	5	100
Hearths	Direct	Complete	Total loss of value	3	33.3
	Nil	Nil	No loss of value	6	66.7
Artefact Scatter, Hearth and Mound	Nil	Nil	No loss of value	1	100
Hearth and Mound	Nil	Nil	No loss of value	2	100
Hearth and Artefact	Nil	Nil	No loss of value	2	100
Tree cultural site	Nil	Nil	No loss of value	24	100
Previously recorded AHIMS sites within the Project Area	Nil	Nil	No loss of value	15	100

6.2 Impacts to values

The values potentially impacted by this proposed wind farm development are any social and cultural values attributed to the sites and Aboriginal objects by the local Aboriginal community. The extent to which the loss of the sites or parts of the sites would impact on the community is only something the Aboriginal community can articulate.

Beyond the response from the Bangerang Aboriginal Corporation on the draft ACHA that if any of the stone artefacts recorded are going to be impacted by the development they need to be attempted to be collected and moved to an area which will not be impacted no further feedback on the cultural value of the Aboriginal sites was provided by the RAPs during the review of the draft ACHA.

The impact to scientific values for this development are summarised in Section 5.2.2 and Table 5-1. A total of 37 isolated finds, five artefact scatters and three hearth sites are within the proposed development corridor (outside the heritage exclusion areas) which are proposed to be impacted by the development (based on the precautionary principle used during the assessment of harm for this Project). Any removal of Aboriginal cultural heritage objects would obviously reduce the scientific value they may have.

While all of the isolated finds and artefact scatter sites recorded during this assessment are rated as having total loss of scientific value it is argued here that there are likely to be a number of similar sites in the local area and therefore the impact to the overall local archaeological record is low, especially in consideration that all these sites are within disturbed contexts and located within paddocks that have been highly disturbed through intensive dryland cropping activities (including ploughing, sowing etc) that have been undertaken for a number of generations. It is further reiterated that the development has been significantly redesigned to

avoid landforms and areas within the Project Area which had high archaeological sensitivity to ensure impacts to the scientific value of the region were minimised where possible.

Furthermore, the existing disturbed context of the sites which are proposed for impact is noted to reduce the possible research value that some of the stone artefacts at these sites may have. The information obtained during the present assessment can also be used to further the development of Aboriginal site modelling in the region, which has largely now been realised by the recording of these sites.

The intrinsic values of the stone artefacts and heat retainers themselves may also be affected by the development. Any removal of the artefacts and heat retainers, or their breakage would reduce the generally low scientific value they retain.

Impacts from development activity will be avoided for all tree cultural sites and sites with mounds identified. Four isolated finds, seven hearth sites and the two artefact and hearth sites will also be avoided by the development. Given this, it is noted that a representative sample of stone artefacts and hearth sites will be avoided by the development, and it may further be possible during the micro-siting to avoid impacts to some sites assessed to be impacted in this report.

No other values have been identified that would be affected by the development proposal.

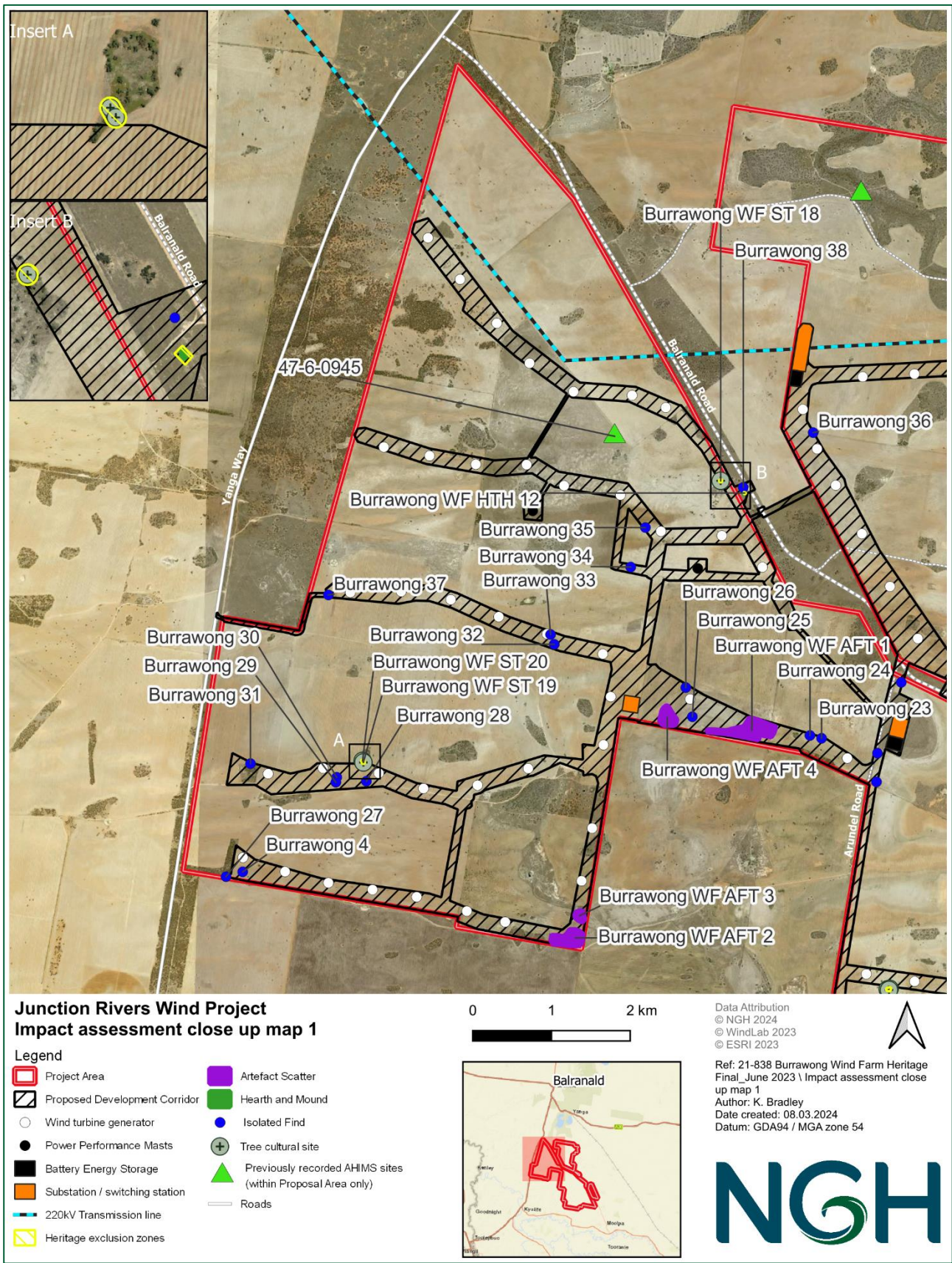


Figure 6-3 Proposed development corridor and impacts to known Aboriginal sites Map 1.

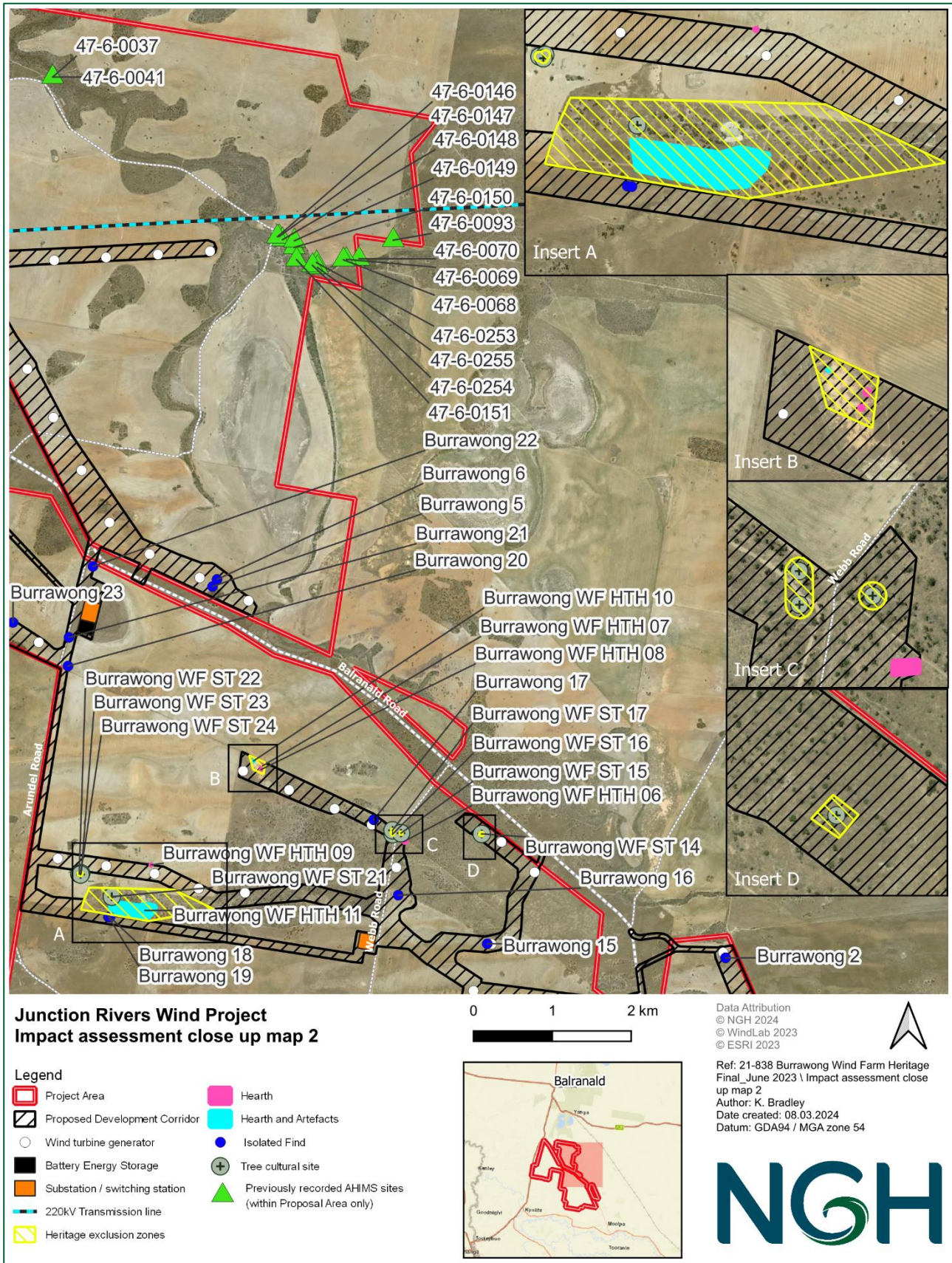


Figure 6-4 Proposed development corridor and impacts to known Aboriginal sites Map 2

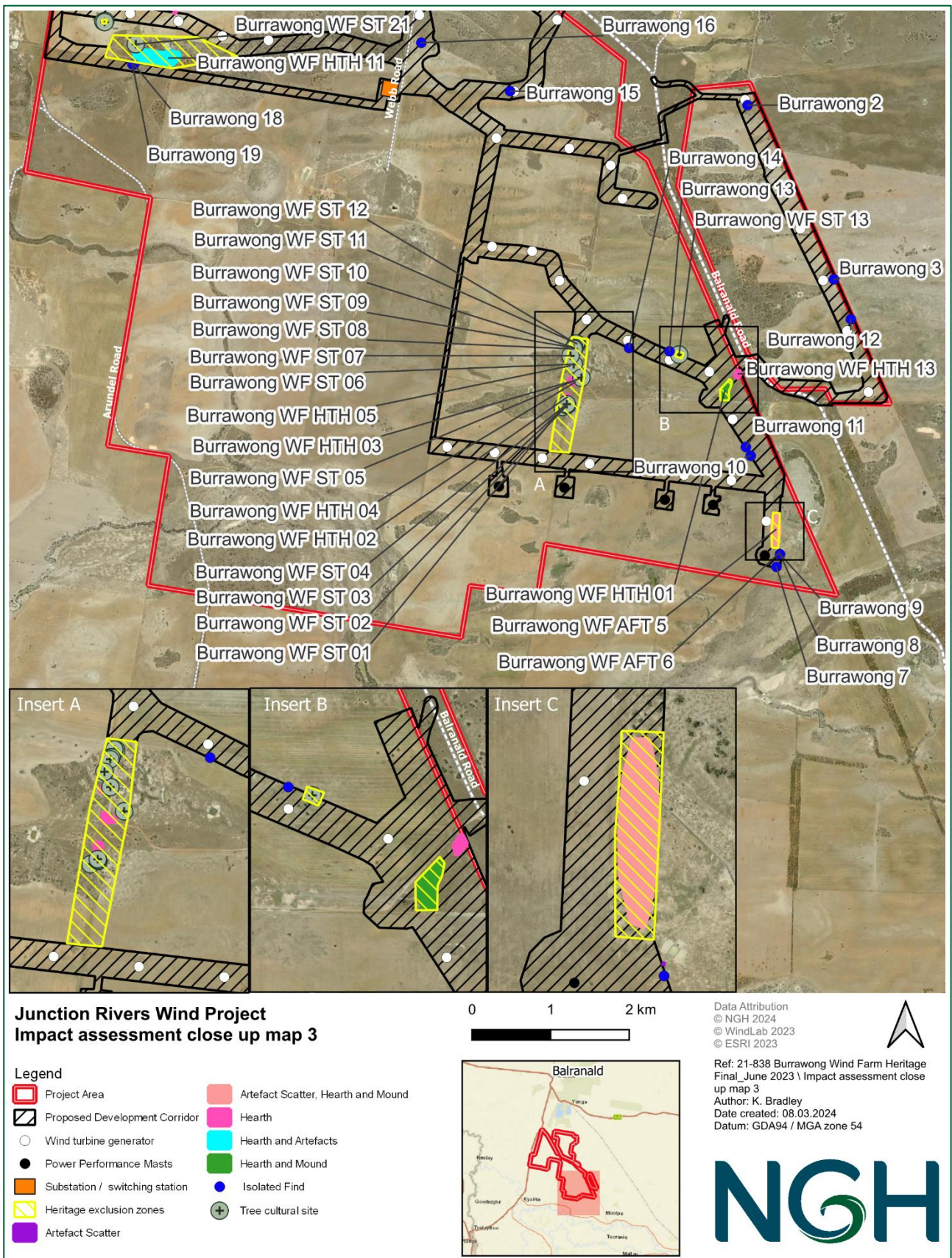


Figure 6-5 Proposed development corridor and impacts to known Aboriginal sites Map 3.

Table 6-5. Identified risk to known archaeological and cultural sites within the Project Area.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
NA	Burrawong WF ST 01	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 02	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 03	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 04	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 05	Tree cultural site	Good -tree dead but standing <i>in situ</i>	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 06	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 07	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 08	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 09	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 10	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
NA	Burrawong WF ST 11	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 12	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 13	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 14	Tree cultural site	Moderate- tree dead lying down	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 15	Tree cultural site	Moderate- tree dead lying down	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 16	Tree cultural site	Good -tree dead but standing <i>in situ</i>	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 17	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 18	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 19	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 20	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
NA	Burrawong WF ST 21	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 22	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 23	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 24	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
47-6-1159	Burrawong 2	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1161	Burrawong 3	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1160	Burrawong 4	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1173	Burrawong 5	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1140	Burrawong 6	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1141	Burrawong 7	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1142	Burrawong 8	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1143	Burrawong 9	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1139	Burrawong 10	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1138	Burrawong 11	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1164	Burrawong 12	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1163	Burrawong 13	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1162	Burrawong 14	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1144	Burrawong 15	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1151	Burrawong 16	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1158	Burrawong 17	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1157	Burrawong 18	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1156	Burrawong 19	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1155	Burrawong 20	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1154	Burrawong 21	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1153	Burrawong 22	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1152	Burrawong 23	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1150	Burrawong 24	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1149	Burrawong 25	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1148	Burrawong 26	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1147	Burrawong 27	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1146	Burrawong 28	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1145	Burrawong 29	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1184	Burrawong 30	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1183	Burrawong 31	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1182	Burrawong 32	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1181	Burrawong 33	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1180	Burrawong 34	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1179	Burrawong 35	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1178	Burrawong 36	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1177	Burrawong 37	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1176	Burrawong 38	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1188	Burrawong WF AFT 01	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1175	Burrawong WF AFT 02	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1174	Burrawong WF AFT 03	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1172	Burrawong WF AFT 04	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1192	Burrawong WF AFT 05	Artefact Scatter, Hearth and oven mound	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1170	Burrawong WF AFT 06	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of this report.
47-6-1191	Burrawong WF HTH 01	Hearth and oven mound	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1171	Burrawong WF HTH 02	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1169	Burrawong WF HTH 03	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1190	Burrawong WF HTH 04	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1168	Burrawong WF HTH 05	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1167	Burrawong WF HTH 06	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	Unmitigated impacts to this site.
47-6-1189	Burrawong WF HTH 07	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1166	Burrawong WF HTH 08	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1165	Burrawong WF HTH 09	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	Unmitigated impacts to this site.
47-6-1193	Burrawong WF HTH 10	Hearth and Artefact	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1187	Burrawong WF HTH 11	Hearth and Artefact	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1186	Burrawong WF HTH 12	Hearth and oven mound	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1185	Burrawong WF HTH 13	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	Unmitigated impacts to this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-0037	Condoulpe	Burial	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0041	Condoulpe Creek	Burial	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0093	North Dusty Lake-8	Artefact	Listed as partially destroyed site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0945	Burrawong 1	Artefact	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0253	Condoulpe Lake 24	Hearth	Listed as partially destroyed site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-0147	Condoulpe 19	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0148	Condoulpe 20	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0150	Condoulpe 22	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0255	Condoulpe Lake 26	Modified Tree	Not a site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0151	Condoulpe 23	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-0254	Condoulpe Lake 25	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0146	Condoulpe 18	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0069	Condoulpe 2	Modified Tree (Carved or Scarred)	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0149	Condoulpe 21	Modified Tree (Carved or Scarred)	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0068	Condoulpe 1	Modified Tree (Carved or Scarred)	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50 m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.

6.3 Consideration of ESD principles

Consideration of the principles of Ecologically Sustainable Development (ESD) and the use of the precautionary principle is required to be undertaken when assessing the harm to Aboriginal sites and determining the potential for mitigating impacts to any sites that will be impacted by a development. The main consideration is the cumulative effect of the proposed impacts to the site/s and the wider archaeological record. The precautionary principle in relation to Aboriginal heritage implies that development proposals should be carefully evaluated to identify possible impacts and assess the risk of potential consequences.

In broad terms, the archaeological material located during this investigation is similar to what has been found previously within the region, comprising isolated finds, artefact scatters, hearths and tree cultural sites.

While there have been archaeological investigations for other projects in the region, there is no clear regional synthesis of the nature, number, extent and content for archaeological sites within the Murray River Council LGA. Nevertheless, given the size of the geographical area, it is almost certain that there would be similar site types present within the region. The result of this Aboriginal heritage assessment supports a proposed model of site location and site distribution, whereby objects and sites could be expected to occur in proximity to water sources, in slightly raised red sandy soils and in source boarding areas adjacent and within black box depressions, even in areas highly disturbed by farming activities. The results of this Aboriginal heritage assessment therefore suggest that more sites could be expected to occur in the region than was previously envisaged.

The implications for the ESD principles are that more sites, particularly sites with stone artefacts and clay heat retainers, are likely to be present in the region than previously thought. This reduces the individual representative value of these particular sites within the Project Area as they are also likely to be represented elsewhere. It must be recognised that large parts of the region have been heavily cleared, farmed and developed through the construction and maintenance of roads and residential structures and therefore other sites are also likely to have been disturbed. The conclusion that similar sites exist in the region reduces the representative values of the sites within the Project Area. It should also be noted that not all sites recorded during the survey fall within the proposed development corridor and that the sites outside the development corridor will not be impacted by the proposed wind farm development. Additionally, a number of heritage exclusion zones have been identified within the proposed development corridor which will be area excluded from harm for this Project to ensure the heritage values of the sites within these areas are not harmed. Furthermore, it is noted that a micro-siting approach will be implemented for this Project, which is a common occurrence on wind farm projects, to ensure that where possible post development approval as part of the final designs that infrastructure can where possible avoid additional impacts to assessed heritage sites.

As noted above, the archaeological values of the sites within the development corridor (outside the heritage exclusion zones), when considering the scientific, representative and rarity values, was deemed to be generally low. In terms of representativeness and rarity the previous relatively low number of overall sites in the local area on AHIMS was merely an indication that few surveys have been undertaken in the immediate area and therefore they are yet to be found. It is believed therefore, that the proposed impacts to the stone artefacts and clay heat retainers sites through the development of this particular wind farm proposal would not adversely affect the broader archaeological record for the local area or the region.

The principle of inter-generational equity requires the present generation to ensure that the sites and diversity of the archaeological record is maintained or enhanced for the benefit of future generations. We believe that the diversity of the archaeological record is not compromised by development of this

particular wind farm proposal, given the avoidance of a number of the stone artefact sites, hearth features, all sites recorded with mound features and tree cultural sites and the removal of any development works with the heritage exclusion area of the development corridor. It must also be considered that redesign has occurred throughout the development of this Project to ensure that, where possible, undisturbed archaeologically sensitive landforms were avoided by this proposed development.

We estimate that while the current development proposal will impact a number of the newly recorded sites with stone artefacts and clay heat retainers, the overall cumulative impact on the archaeological record for the region is likely to be minimal, in consideration of the disturbance which has occurred through farming practises to these sites prior to their identification as part of this assessment and assuming that a similar density of artefact and hearth sites remain across the wider region. Therefore, it is argued that the cumulative impacts of the proposal on the archaeological record are not enough to reject outright the development proposal for the Junction Rivers Wind Project.

7. Avoiding or mitigating harm

7.1 Measures to avoid harm

Avoiding harm to all the Aboriginal sites is technically possible through avoidance. However, the scattered nature of the archaeological sites across the Project Area and within the development corridor would pose serious design and viability constraints on the proposed development of this wind farm. However, it must be noted that significant design changes have occurred throughout the development of the design for this Project. These design changes have occurred in consultation with NGH archaeologists prior to any fieldwork being undertaken for this Project to ensure the previously recorded AHIMS sites and landforms of very high archaeological sensitivity (i.e. lunettes and source bordering dunes) were avoided where possible. Feedback and communications with the archaeologist during the fieldwork for this Project were also taken into consideration by the designers to ensure the avoidance of any archaeological sensitivity landforms (source bordering dunes, areas around black box swamp depressions and undisturbed raised red sandy areas) and site types with high conservation value (tree cultural sites and mounds) were able to be avoided.

Significant effort has also been undertaken following the completion of the surveys for this Project to ensure the design and micro-siting for the infrastructure components where possible is able to avoid recorded Aboriginal sites through the placement of heritage exclusion zones as shown Figure 6-2. A number of heritage exclusion zones have been implemented within the development corridor to ensure Aboriginal sites, where possible, are able to be avoided by any impact or harm. The heritage exclusion zones are also shown in Figure 6-3 to Figure 6-5 which include all of the recorded tree cultural sites (Burrawong WF ST 01 to Burrawong WF ST 24) and sites with cooking mounds (Burrawong WF AFT 05, Burrawong WF HTH 01 and Burrawong WF HTH 12) which have been avoided by the proposed development works.

A summary of the sites to be avoided by these proposed works is listed in Table 7-1 and shown in Figure 7-1 to Figure 7-3.

As the redesign measures undertaken to date for this Project to avoid harm to Aboriginal heritage is summarised in Section 6.1 and shown in Figure 6-1 it is not duplicated in this section.

7.2 Mitigation of harm

Mitigation of harm to Aboriginal sites generally involves some level of detailed recording to preserve the information contained within the site or setting aside areas as representative samples of the relevant landform to preserve a portion of the sites. Mitigation can be in the form of minimising harm, through changes in the development plan or through direct management measures of the Aboriginal objects. There are a range of management strategies that may be implemented as mitigation based on the proposed or potential harm to archaeologically sensitive landforms, Aboriginal sites and objects.

Mitigation of harm has been incorporated into this project design in the following ways:

- significant redesign of the proposed development corridor.
- avoidance of landforms of high archaeological sensitivity (ie lunettes, paleochannels, source bordering dunes, areas around black box swamp depressions and undisturbed raised red sandy areas) within the Project Area.
- the avoidance of the tree cultural sites and mound features which had high cultural value.
- inclusion of heritage exclusion areas to ensure avoidance of sites where possible in the development corridor.

The creation of heritage exclusion areas (see Figure 6-2) within the development corridor and its immediate adjacent areas has been implemented as part of this Project to ensure the avoidance of site types with high conservation value and to ensure a representative sample of Aboriginal sites in the development corridor are avoided where possible. These heritage exclusion areas should be shown on all construction maps for this Project and if during construction works any ground disturbance activity is proposed within 50m of these areas high visibility temporary fencing should be in place prior to any construction works commencing to ensure there are no inadvertent impacts to these areas. Given the size of some of these heritage exclusion zones it is acceptable that only the portion of the heritage exclusion zones in proximity to works is demarcated.

Given the avoidance of a large number of sites and the creation of heritage exclusion areas and in consideration of the significant redesign of the proposed development corridor undertaken by the Proponent, it is argued that further mitigation in the form of additional alteration to the development corridor is not feasible or warranted in this instance. However, the recorded stone artefact sites within the development corridor that will be impacted by works for the Project which are outside the heritage exclusion areas are noted to be conducive to surface collection salvage as a mitigation strategy.

The surface collection salvage of the stone artefacts to be impacted by the development was also requested by the Aboriginal representatives during the fieldwork programme and review of the draft ACHA. It is recommended that a reasonable attempt to collect the recorded surface stone artefacts at the sites that will be impacted by the proposed development is undertaken by an archaeologist with representatives of the registered Aboriginal parties (as selected by the Proponent) following the development consent. Given this, a reasonable and feasible attempt, through the visual inspection of the site by an archaeologist with an Aboriginal community representative, to collect the surface stone artefacts in the development corridor at the sites Burrawong WF AFT 01 to Burrawong WF AFT 04, Burrawong WF AFT 06 and Burrawong 02 to Burrawong 38 should occur once development consent of this SSD project is issued. Due to ongoing farming practises in the wider area and the potential for delays in the commencement of construction, the ability to undertake the immediate surface collection salvage within the development corridor (outside the heritage exclusion areas) should be facilitated in any conditions of consent issued for this Project. The surface collection salvage would be undertaken in line with the methodology provided in Appendix D of this report.

It is acknowledged that changes in the ground surface visibility and standard taphonomic and other environmental factors may impede the relocation of all the recorded stone artefacts noted in this report. This is a typical and accepted archaeological phenomenon and therefore salvage surface collection should focus on visible artefacts within each site, which is an acceptable outcome. A list of the sites to be subject to surface collection as a mitigation measure once development consent of this SSD project is issued is provided in Table 7-3 and shown in Figure 7-1 to Figure 7-3.

The stone artefacts collected should be moved to a safe area within the Project Area that will not be subject to any ground disturbance work, which may be within the boundary of a heritage exclusion area, although the location must be outside the boundary of any sites not approved for impacts. Several proposed locations for the relocation of any collected material is shown in Figure 7-4. It must be noted that two of the proposed relocation areas are also within the heritage exclusion zones, outside the boundary of recorded sites, to ensure they would not be subject to any future impacts. If required the items recovered may be temporarily stored at an NGH office.

The surface collection should be undertaken through the following process which also detailed in the surface collection methodology provided in Appendix D of this report.

- Walk across the recorded site area (within the approved development corridor), use 'pin' flags to identify and mark artefacts.
- Photograph site area.

- If considered necessary, construct a collection grid of 2 m x 2 m or 5 m x 5 m or similar as appropriate to the size of the site, only larger sites or sites with higher densities of artefacts will have this strategy.
- As an alternative, GPS plot artefacts if required, this is suitable for smaller sites (~<20).
- Collect artefacts. At each collection site the artefacts will be recorded, bagged and labelled in accordance with their collection position, that is either individual number and/or their collection grid.
- Recording of stone artefacts will be conducted in line with standard archaeological practice to include raw material, type, dimensions and any other characteristics considered relevant and in accordance with the Code of Practice. Photos of particularly rare items only or those asked to be photographed by the Aboriginal representatives onsite would be taken.
- The salvaged Aboriginal objects may be temporarily stored in a locked cabinet at an office of the Project Archaeologist for analysis and recording until the long-term management and relocation of the salvaged objects can occur.
- An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage.

Unmitigated impacts are proposed for the hearth sites Burrawong WF HTH 06, Burrawong WF HTH 09 and Burrawong WF HTH 13 as the condition of these hearth features was noted to be poor and the cultural material at these sites to consist of very disturbed clay heat retainers with no further potential research value noted. Unmitigated impacts may only occur at these sites once development consent of this SSD project is issued. A list of the sites to be subject to unmitigated harm is provided in Table 7-2 and shown in Figure 7-1 to Figure 7-3.

As a mitigation measure the Proponent should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal stone artefacts and objects during the construction of the Junction Rivers Wind Project and for the management of known sites within and in proximity to the development corridor which will be avoided. The CHMP should include at a minimum the following items:

- An unexpected finds procedure to manage any objects suspected to be Aboriginal in origin during the construction, maintenance, operational and decommissioning works. The unexpected finds procedure must also include a procedure to manage suspected human remains (provided in Appendix C of this report).
- Include requirements for heritage to be included as part of the site inductions and note that all employees, contractors and utility staff working on site will receive Aboriginal Cultural Heritage Awareness Training in the form of an induction before they begin work on site.
- Include the requirements for the delineation, signage and monitoring of sites and the heritage exclusion zones which will be avoided by works.
- Include a ground disturbance protocol.

Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.

In consideration of the future mitigation of harm of within the development footprint and Project Area the CHMP should also consider the requirement that an new extensive search of the AHIMS is required to be completed over the Project Area prior to construction works commencing and again prior to decommissioning or repowering works for the project commencing. These AHIMS searches are recommended to ensure no new Aboriginal sites in close proximity to the approved development footprint have been recorded since the completion of this assessment which may need to be shown on mapping and/or appropriately demarcated prior to any staged works or decommissioning commencing. In the event that any new Aboriginal sites are recorded within the approved

development footprint for the Project follow SSD approval of this Project they would be subject to the Unexpected Finds Procedure as noted in the CHMP.

Given the significant effort undertaken to avoid the tree cultural sites within the Project Area further mitigation in the event that the future natural deterioration of these trees occurs is not determined to be warranted unless the natural deterioration of any of these trees may impact the assets of the Project. If assets of the Project were to be impacted by the future natural deterioration of these trees, then further consultation regarding their management would be required to be undertaken with the RAPs as these sites were determined to have cultural value to the Aboriginal community. A modification may be required to the approvals in the future to facilitate the safe removal of the tree in a manner which will not impact the Project assets.

Table 7-1. List of sites to be avoided by any harm.

Site name	AHIMS#	Site Type	Site name	AHIMS#	Site Type
Burrawong WF ST 01	NA	Tree cultural site	Burrawong WF HTH 01	47-6-1191	Hearth and oven mound
Burrawong WF ST 02	NA	Tree cultural site	Burrawong WF HTH 02	47-6-1171	Hearth
Burrawong WF ST 03	NA	Tree cultural site	Burrawong WF HTH 03	47-6-1169	Hearth
Burrawong WF ST 04	NA	Tree cultural site	Burrawong WF HTH 04	47-6-1190	Hearth
Burrawong WF ST 05	NA	Tree cultural site	Burrawong WF HTH 05	47-6-1168	Hearth
Burrawong WF ST 06	NA	Tree cultural site	Burrawong WF HTH 07	47-6-1189	Hearth
Burrawong WF ST 07	NA	Tree cultural site	Burrawong WF HTH 08	47-6-1166	Hearth
Burrawong WF ST 08	NA	Tree cultural site	Burrawong WF HTH 10	47-6-1193	Hearth and Artefact
Burrawong WF ST 09	NA	Tree cultural site	Burrawong WF HTH 11	47-6-1187	Hearth and Artefact
Burrawong WF ST 10	NA	Tree cultural site	Burrawong WF HTH 12	47-6-1186	Hearth and oven mound
Burrawong WF ST 11	NA	Tree cultural site	Condoulpe	47-6-0037	Burial
Burrawong WF ST 12	NA	Tree cultural site	Condoulpe Creek	47-6-0041	Burial
Burrawong WF ST 13	NA	Tree cultural site	North Dusty Lake-8	47-6-0093	Artefact

Site name	AHIMS#	Site Type	Site name	AHIMS#	Site Type
Burrawong WF ST 14	NA	Tree cultural site	Burrawong 1	47-6-0945	Artefact
Burrawong WF ST 15	NA	Tree cultural site	Condoulpe Lake 24	47-6-0253	Hearth
Burrawong WF ST 16	NA	Tree cultural site	Condoulpe 19	47-6-0147	Modified Tree
Burrawong WF ST 17	NA	Tree cultural site	Condoulpe 20	47-6-0148	Modified Tree
Burrawong WF ST 18	NA	Tree cultural site	Condoulpe 22	47-6-0150	Modified Tree
Burrawong WF ST 19	NA	Tree cultural site	Condoulpe Lake 26	47-6-0255	Modified Tree
Burrawong WF ST 20	NA	Tree cultural site	Condoulpe 23	47-6-0151	Modified Tree
Burrawong WF ST 21	NA	Tree cultural site	Condoulpe Lake 25	47-6-0254	Modified Tree
Burrawong WF ST 22	NA	Tree cultural site	Condoulpe 18	47-6-0146	Modified Tree
Burrawong WF ST 23	NA	Tree cultural site	Condoulpe 2	47-6-0069	Modified Tree
Burrawong WF ST 24	NA	Tree cultural site	Condoulpe 21	47-6-0149	Modified Tree
Burrawong WF AFT 05	47-6-1192	Artefact Scatter, Hearth and oven mound	Condoulpe 1	47-6-0068	Modified Tree

Table 7-2. List of sites to be subject to unmitigated harm.

Site name	AHIMS#	Site Type
Burrawong WF HTH 06	47-6-1167	Hearth
Burrawong WF HTH 09	47-6-1165	Hearth
Burrawong WF HTH 13	47-6-1185	Hearth

Table 7-3. List of sites to be subject to mitigation via surface collection.

Site name	AHIMS#	Site Type	Site name	AHIMS#	Site Type
Burrawong 2	47-6-1159	Isolated Find	Burrawong 23	47-6-1152	Isolated Find
Burrawong 3	47-6-1161	Isolated Find	Burrawong 24	47-6-1150	Isolated Find
Burrawong 4	47-6-1160	Isolated Find	Burrawong 25	47-6-1149	Isolated Find
Burrawong 5	47-6-1173	Isolated Find	Burrawong 26	47-6-1148	Isolated Find
Burrawong 6	47-6-1140	Isolated Find	Burrawong 27	47-6-1147	Isolated Find
Burrawong 7	47-6-1141	Isolated Find	Burrawong 28	47-6-1146	Isolated Find
Burrawong 8	47-6-1142	Isolated Find	Burrawong 29	47-6-1145	Isolated Find
Burrawong 9	47-6-1143	Isolated Find	Burrawong 30	47-6-1184	Isolated Find
Burrawong 10	47-6-1139	Isolated Find	Burrawong 31	47-6-1183	Isolated Find
Burrawong 11	47-6-1138	Isolated Find	Burrawong 32	47-6-1182	Isolated Find
Burrawong 12	47-6-1164	Isolated Find	Burrawong 33	47-6-1181	Isolated Find
Burrawong 13	47-6-1163	Isolated Find	Burrawong 34	47-6-1180	Isolated Find
Burrawong 14	47-6-1162	Isolated Find	Burrawong 35	47-6-1179	Isolated Find
Burrawong 15	47-6-1144	Isolated Find	Burrawong 36	47-6-1178	Isolated Find
Burrawong 16	47-6-1151	Isolated Find	Burrawong 37	47-6-1177	Isolated Find
Burrawong 17	47-6-1158	Isolated Find	Burrawong 38	47-6-1176	Isolated Find
Burrawong 18	47-6-1157	Isolated Find	Burrawong WF AFT 01	47-6-1188	Artefact Scatter
Burrawong 19	47-6-1156	Isolated Find	Burrawong WF AFT 02	47-6-1175	Artefact Scatter
Burrawong 20	47-6-1155	Isolated Find	Burrawong WF AFT 03	47-6-1174	Artefact Scatter
Burrawong 21	47-6-1154	Isolated Find	Burrawong WF AFT 04	47-6-1172	Artefact Scatter
Burrawong 22	47-6-1153	Isolated Find	Burrawong WF AFT 06	47-6-1170	Artefact Scatter

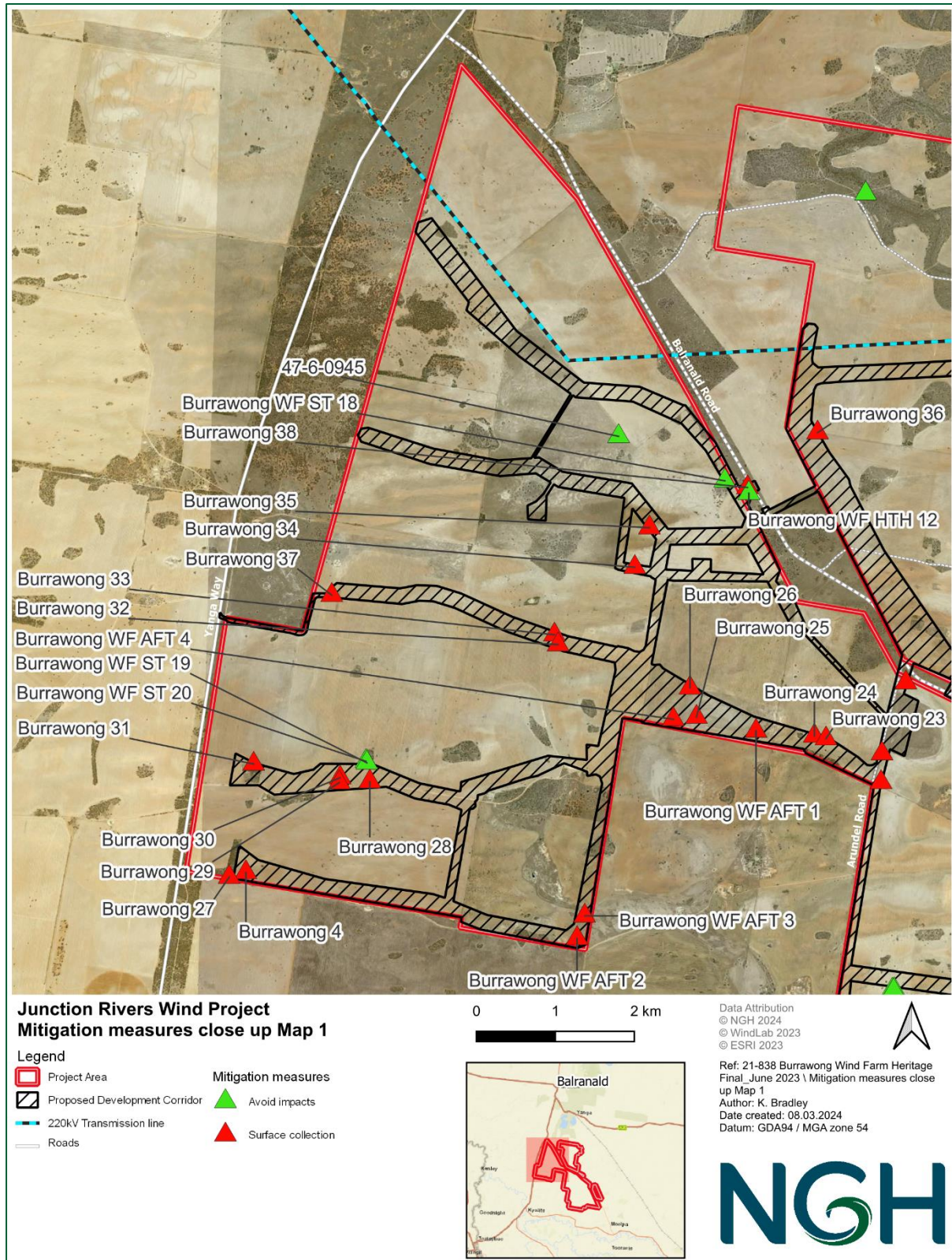


Figure 7-1 Mitigation measures close up map 1.

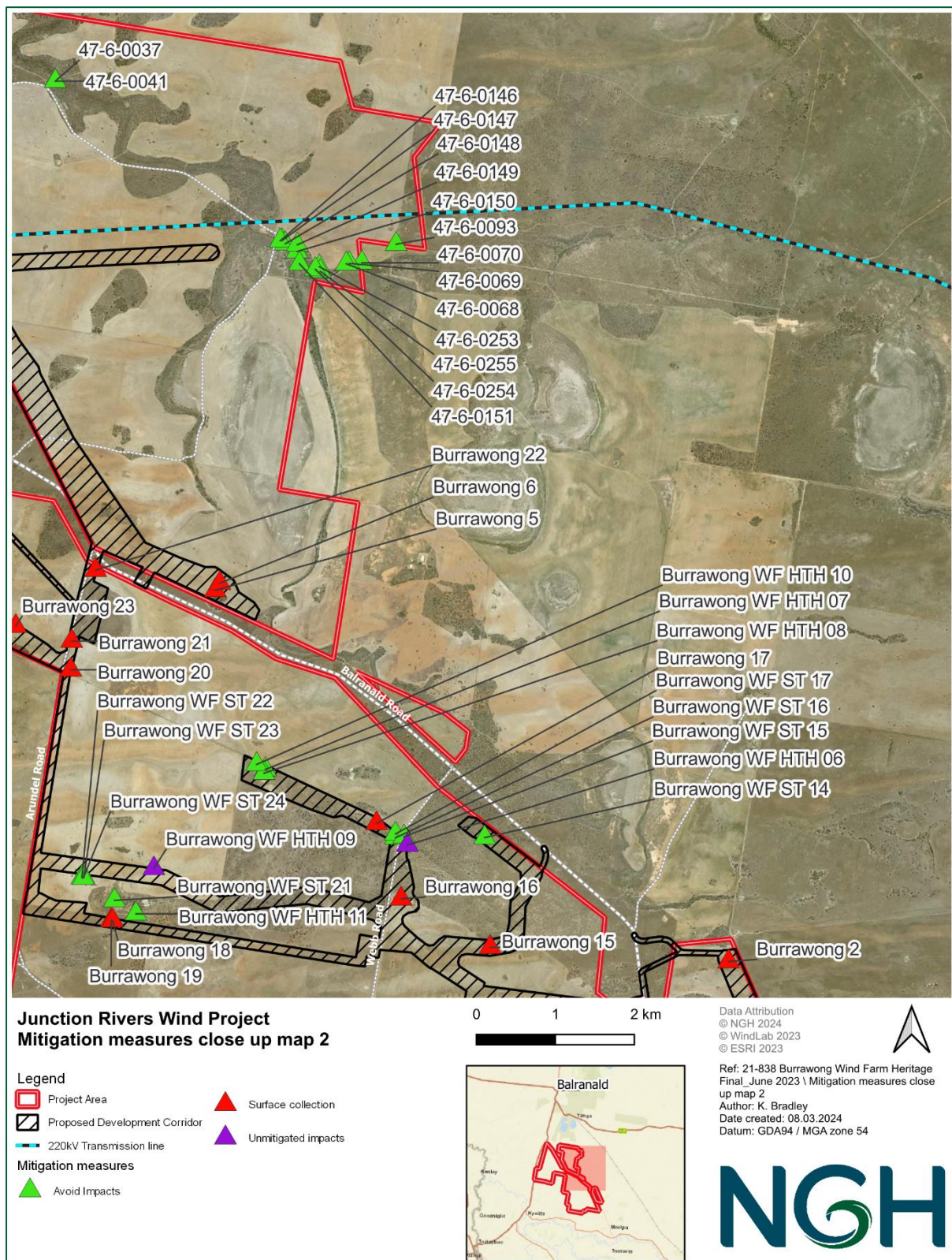


Figure 7-2 Mitigation measures close up map 2.

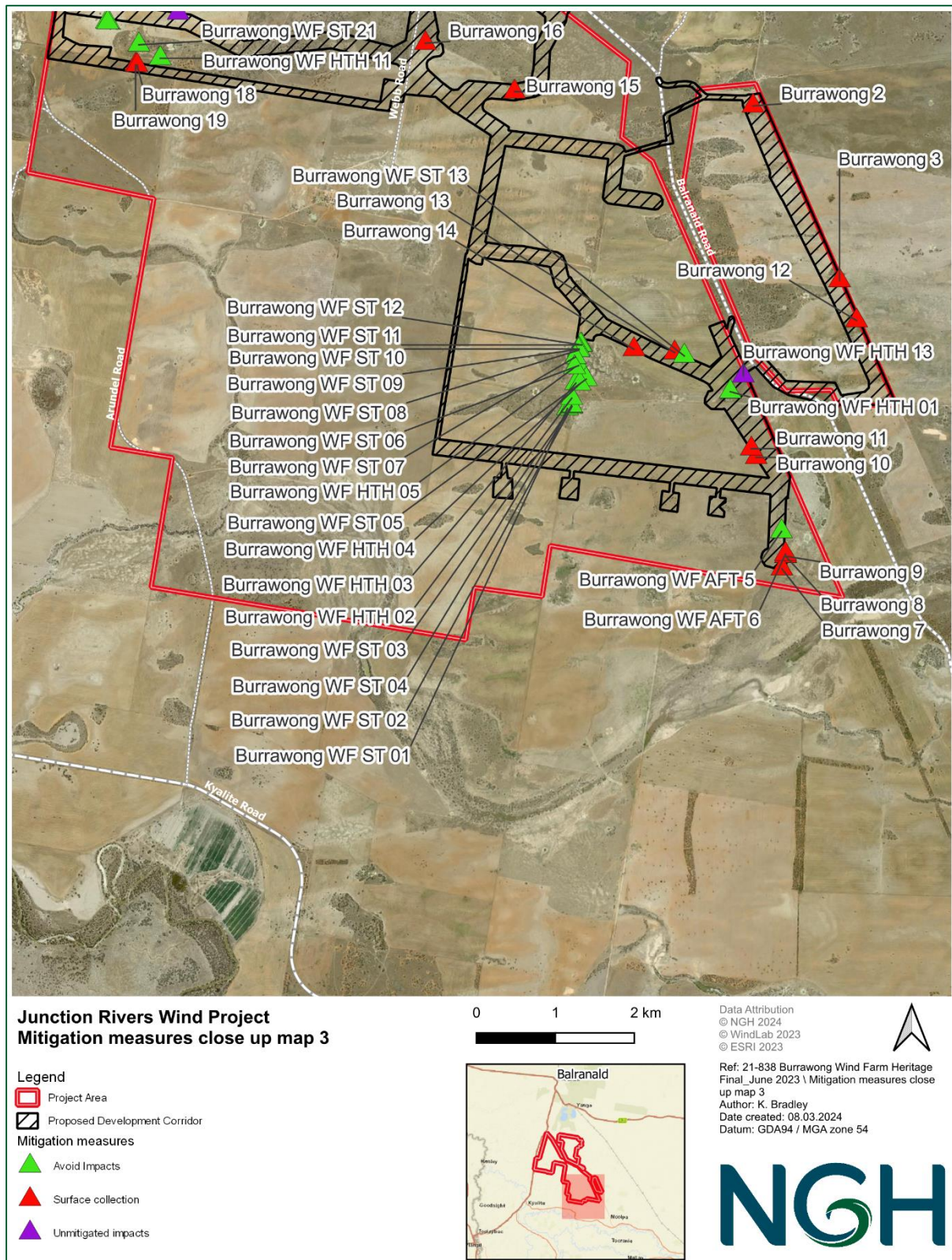


Figure 7-3 Mitigation measures close up map 3.

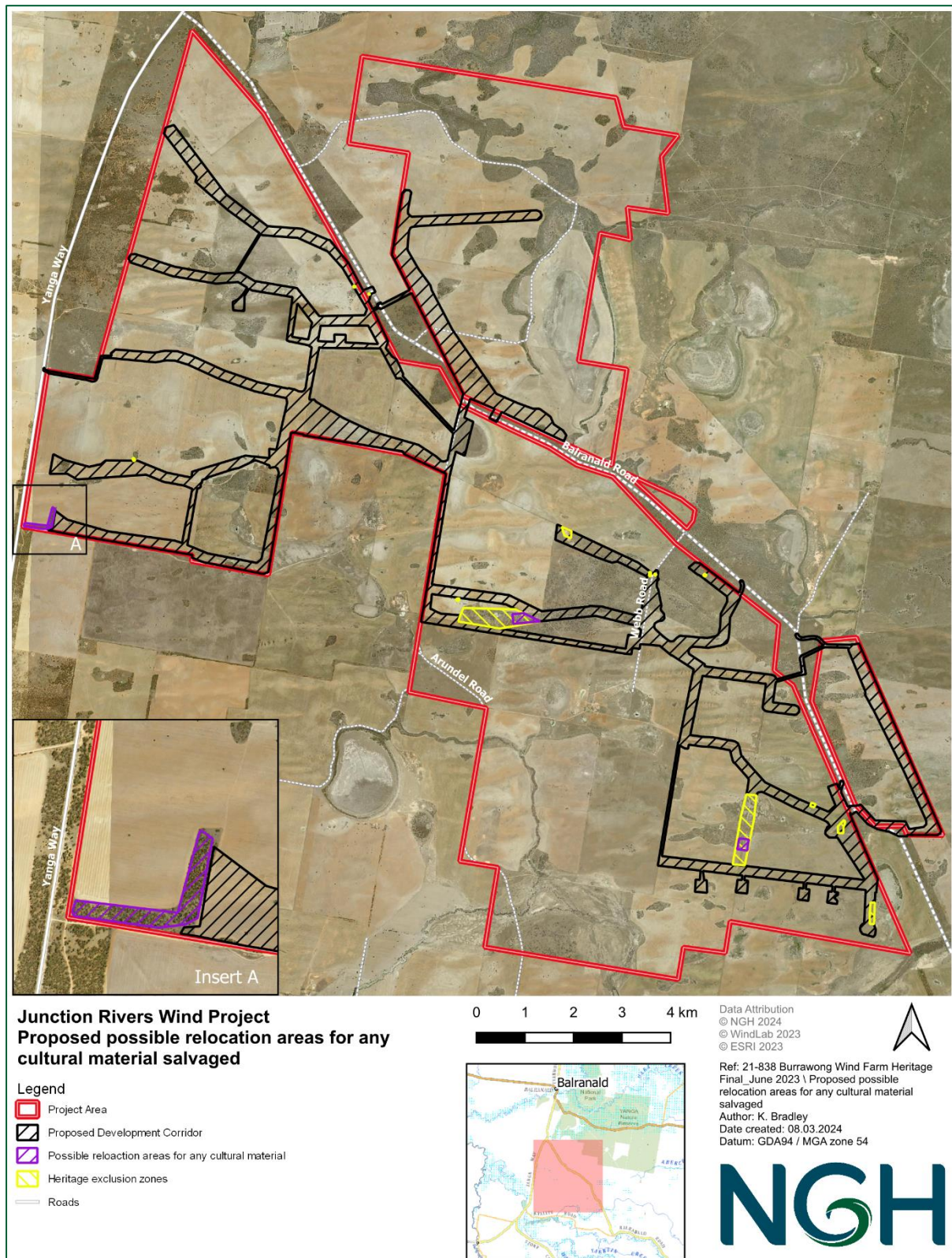


Figure 7-4 Proposed possible relocation areas for any cultural material salvaged.

8. Recommendations

The recommendations are based on the following information and considerations:

- Results of the current archaeological survey of the Project Area;
- Consideration of results from other regional archaeological studies;
- Results of consultation with the registered Aboriginal parties;
- The assessed significance of the sites;
- Appraisal of the proposed development; and
- Legislative context for the development proposal.

It is recommended that:

1. The development must avoid all the heritage exclusion zones which are mapped within the Project Area. These heritage exclusion areas should be shown on all construction maps for this Project and if during construction works any ground disturbance activity is proposed within 50 m of any of these heritage exclusion zones then high visibility temporary fencing must be in place along the boundary of the heritage exclusion zone in proximity to the works prior to any ground disturbance and/or construction works commencing nearby to ensure there are no inadvertent impacts to these areas. Given the size of some of these heritage exclusion zones it is acceptable that only the portion of the heritage exclusion zones in proximity to works is demarcated.
2. The development must avoid the 24 tree cultural sites recorded during this assessment as Burrawong WF ST 01 to Burrawong WF ST 24. A minimum 20 m buffer must be in place from the trunk of each tree to prevent any inadvertent impacts to the canopy and/or root system of each recorded cultural site.
3. The development must avoid the 15 previously registered AHIMS sites within the Project Area which are outside the proposed development corridor for this Project. The AHIMS sites to be avoided are: 47-6-0037, 47-6-0041, 47-6-0093, 47-6-0945, 47-6-0253, 47-6-0147, 47-6-0148, 47-6-0150, 47-6-0255, 47-6-0151, 47-6-0254, 47-6-0146, 47-6-0069, 47-6-0149 and 47-6-0068. No works or access tracks are proposed to be implemented during the Project within proximity (within 50 m) to any of these previously registered AHIMS sites within the Project Area, hence no demarcation of these sites is required as part of the Junction Rivers Wind Project.
4. If complete avoidance to any of the isolated finds and artefact scatters recorded within the proposed development corridor is not possible, a reasonable and feasible attempt, through the visual inspection of the site by an archaeologist with an Aboriginal community representative (as selected by the Proponent), must occur in an attempt to collect the surface stone artefacts within the development corridor at each of these recorded locations. This must occur prior to construction, following the development consent which is issued for State Significance Developments.
5. Due to ongoing farming practises in the wider Project Area and the potential for delays in the commencement of construction, the ability to undertake the surface collection salvage within the development corridor (outside the heritage exclusion areas) should be facilitated in any conditions of consent issued for this Project. This should occur following the approval of a Cultural Heritage Management Plan for the Project and in accordance with the development consent. The surface collection salvage would be undertaken in line with the methodology provided in Appendix D of the ACHA report.
6. A surface collection salvage programme must be attempted at each site with stone artefacts recorded that is approved for impacts prior to the proposed construction works commencing for each stage of works proposed within the development corridor for the Junction Rivers Wind Project. The surface collection programme may be staged, if required, to conform to the proposed staged approach of construction works.
7. The collection and relocation of the surface artefacts and any collected cultural material should be undertaken by an archaeologist with a representative/s of the registered Aboriginal parties, as selected by the Proponent, and be consistent with Requirement 26 of the *Code of Practice for Archaeological*

Investigation of Aboriginal Objects in New South Wales and/or the wishes of the Registered Aboriginal Parties.

8. All objects salvaged must have their long term relocation details submitted to the AHIMS database. An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works as approved in the development consent for this State Significant Development.
9. A minimum 5 m buffer should be observed around all stone artefact and hearth sites that are being avoided by the proposed development. If during any works for the Junction Rivers Wind Project, any ground disturbance activity is proposed within 50 m of any recorded valid in situ known Aboriginal sites then high visibility temporary fencing must be in place to demarcate a minimum 5 m buffer around the boundary of the site prior to any works commencing within proximity (within 50 m) of the site.
10. Unmitigated impacts can occur to the hearth sites Burrawong WF HTH 06, Burrawong WF HTH 09, Burrawong WF HTH 13 if they cannot be avoided by works.
11. All works for the Junction Rivers Wind Project must stay within the area assessed for the development corridor and impact areas as detailed in this report to ensure there are no inadvertent impacts to Aboriginal objects.
12. For any proposed future impacts to the Aboriginal sites being avoided and outside the development corridor, as assessed in this report, further assessment and consideration of impacts on Aboriginal Heritage as determined by an archaeologist should occur. Additional Aboriginal consultation and further assessment which may include survey and/or subsurface testing may be required.
13. Further archaeological assessment would be required if the proposal activity and development corridor extends beyond the area assessed in this report. This would include consultation with the registered Aboriginal parties and may involve further field survey.
14. The Proponent should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal artefacts and objects during the construction of the Junction Rivers Wind Project and for the management of known sites within and in proximity to the development corridor which will be avoided. The Plan should include the unexpected finds procedure to manage any objects suspected to be Aboriginal in origin during the construction, maintenance, operation and decommissioning works and include requirements for heritage to be included as part of the site inductions and the monitoring of sites which will be avoided. Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.
15. In the event that suspected human remains are discovered during the construction of the Junction Rivers Wind Project, all work must cease in the immediate vicinity. The appropriate heritage team within Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were ancestral Aboriginal remains or not. If the remains are deemed to be ancestral Aboriginal in origin Heritage NSW would be sought to advise the Proponent on the appropriate actions required. An unexpected find protocol for suspected human remains must be included in the CHMP for the Project.
16. Prior to any development consent being issued for this Project, the drafted conditions which relate to Aboriginal heritage should be reviewed by a qualified archaeologist to ensure all sites assessed for impacts and avoidance and the management recommendations, as noted in this report, are clearly included and listed in any conditions of consent.

All Aboriginal objects and places in NSW are protected under the *National Parks and Wildlife Act*. It is an offence to disturb an Aboriginal object or site without appropriate consent.

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Appendix A Archaeological report

Prepared for Windlab Developments Australia

Archaeological Technical Report

Junction Rivers Wind Project

Murray Valley LGA, Kyalite, NSW

April 2024

Project Number: 21-838

Document verification and authorship

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Acronyms and abbreviations

ACHA	Aboriginal Cultural Heritage Assessment
ACHCRP	Aboriginal Cultural Heritage Consultation Requirements for Proponents
AFT	Artefact scatter
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ATR	Archaeological Technical Report
BESS	Battery Energy Storage System
CHMP	Cultural Heritage Management Plan
Development corridor	Area of proposed works and ground disturbance for the Junction Rivers Wind Project.
DEM	Digital Elevation Modelling
DPHI	Department of Planning, Housing and Infrastructure (NSW)
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
HHIA	Historical Heritage Impact Assessment
HTH	<i>Hearth</i>
IBRA	Interim Biogeographic Regionalisation for Australia
ICOMOS	International Council on Monuments and Sites
km	kilometres
LALC	Local Aboriginal Land Council
LGA	Local Government Area
m	metres
NGH	NGH Pty Ltd
NOHC	Navin Officer Heritage Consultants Pty Ltd
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>

NSW	New South Wales
OzArk	OzArk Environmental & Heritage Management Pty Ltd
PAD	Potential Archaeological Deposit
Proponent	Windlab Developments Pty Ltd
Project Area	The wider boundary of all affected lots where the proposed Project may be located within the land which is being assessed for the Junction Rivers Wind Project, this includes the proposed development corridor.
PEC-East	Project Energy Connect Eastern Section
RAP	Registered Aboriginal Party
SEARs	Planning Secretary's Environmental Assessment Requirements
SHI	State Heritage Inventory
SSD	State Significant Development
ST	Tree cultural site
SW-REZ	South-West Renewable Energy Zone
The Project	Junction Rivers Wind Project
Windlab	Windlab Developments Pty Ltd
WTG	Wind Turbine Generators

Note: This Project was initially named the Burrawong Wind Farm. In October 2023 the name of this Project was changed to the Junction Rivers Wind Project at the request of the Proponent following consultation with the community, landholders and local First Nation groups. The new Aboriginal sites recorded during this assessment and detailed in this report were registered on AHIMS before this project name change, thus the Aboriginal sites recorded in this Project Area by NGH and referred to in this report refer to “Burrawong” as part of the site names. The AHIMS site names are unable to be changed after they have been registered thus the continuation of the naming convention “Burrawong” for the Aboriginal sites detailed in this report

Executive summary

Introduction

NGH Pty Ltd (NGH) has been engaged by Windlab Developments Pty Ltd (the Proponent) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to address potential impacts by the proposed Junction Rivers Wind Project (the Project) on Aboriginal cultural heritage. The Project is located between Yanga and Kyalite in the Murray River Council Local Government Area (LGA), in New South Wales (NSW).

The Project would involve the construction, operation and eventual decommissioning or repowering of a wind farm with up to 96 Wind Turbine Generators (WTG) and associated ancillary infrastructure, with a generating capacity of up to approximately 750 megawatts (MW) and would connect to the existing 220 kilovolt (kV) transmission line that traverses the site and/or the proposed Project EnergyConnect transmission line. For assessment purposes, a Project 'Development Corridor' has been established consisting of a buffer around the conceptual layout for the Project. The development corridor represents a worst-case assessment scenario and allows for refinement of Project infrastructure, such as micro-siting of WTGs, during the detailed design phase.

The proposed Junction Rivers Wind Project is a State Significant Development (SSD) and the ACHA, of which this archaeological technical assessment forms part of, will be used as part of the Environmental Impact Statement (EIS) for the Project (SSD-30448824). The proposed work for the wind farm includes a number of activities that will require ground disturbance that has the potential to impact on Aboriginal heritage sites and objects which are protected under the *NSW National Parks and Wildlife Act 1974* (NPW Act).

Throughout the assessment, the following codes and guides were followed in relation to Aboriginal heritage assessment:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011)
- *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (DECCW NSW 2010a)
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRP) (DECCW NSW 2010b).

The Junction Rivers Wind Project is an SSD project that represents an important contribution to renewable energy generation in NSW and is subject to approval by the NSW Minister for Planning and Public Spaces.

Desktop assessment and survey results

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database revealed 15 previously recorded Aboriginal sites located within the Project Area, these being two burials, two sites with stone artefacts (1 or more), one hearth and 10 modified trees. Upon further assessment, it was determined that all these 15 previously recorded Aboriginal sites were located outside the proposed development corridor and will not be impacted by the proposed development.

As part of the assessment of the Project Area, the entirety of the proposed development corridor was surveyed on foot by NGH archaeologists with representatives from the RAPs as part of the fieldwork undertaken for the Project. During the surveys completed for this assessment, the following additional archaeological features and cultural sites were recorded, stone artefacts, hearths, oven mounds and tree cultural sites.

A summary of the Aboriginal and cultural sites recorded during the field survey for this Project are provided in the table below. The new tree cultural sites were recorded by NGH with the naming convention Burrawong WF ST 01 to Burrawong WF ST 24, while the isolated stone artefact sites were recorded with the naming convention Burrawong 2 to Burrawong 38. The sites with artefact scatters, hearth and mound

features were recorded with the naming conventions Burrawong WF AFT 01 to Burrawong WF AFT 06 and Burrawong WF HTH 01 to Burrawong WF HTH 13.

Site Type	Number	%
Isolated finds	37	46.25
Tree cultural site	24	30
Hearths	9	11.25
Artefact scatter	5	6.25
Hearth and mound	2	2.5
Hearth and Artefact	2	2.5
Artefact Scatter, Hearth and mound	1	1.25
Total	80	100

Based on the site types, archaeological features and cultural sites recorded during this assessment, it is likely that the area as a whole was used intermittently over long periods of time for camping while water remained in the landscape, as indicated by the presence of hearths, mounds and stone artefacts. Sites that consist of both hearths/mounds and stone artefacts indicate that camping, cooking and tool manufacturing activities were undertaken in these areas. Additionally, several Aboriginal sites identified in this assessment have a number of hearth features with associated artefacts and/or mounds. This suggests that some sites were repeatedly revisited and reused over time or were the focus of occupation for a relatively large group of people at one time.

It should also be noted that the results of this investigation have substantially increased the number of sites and archaeological features recorded in the local area and it's likely that similar numbers of these sites may occur in areas outside the land surveyed for this project in the local area.

Potential impacts

It should be noted that significant design changes have occurred throughout the development for this wind farm. Significant effort has also been undertaken both before, during and following the completion of the surveys for this Project to ensure the design and micro-siting for the infrastructure components, where possible, is able to avoid recorded Aboriginal sites through the placement of heritage exclusion zones.

To facilitate refinement of the layout during the detailed design process, an allowance for micro-siting of infrastructure within the development corridor as assessed in this report is sought by the Proponent to ensure that the final design of this project does not result in greater impacts to Aboriginal heritage than those assessed in this report. This micro-siting approach is a common occurrence on wind farm projects; therefore, a precautionary principle has been applied during the assessment of harm which assumes that within the development corridor (excluding the mapped heritage exclusion zones) that complete impact to sites may occur. Based on this approach the tables below provide a summary of sites assessed to be impacted and avoided by the proposed development.

Sites impacted	Sites avoided
Burrawong WF AFT 01 to Burrawong WF AFT 04	Burrawong WF ST 01 to Burrawong WF ST 24
Burrawong WF AFT 06	Burrawong WF AFT 05
Burrawong WF HTH 06	Burrawong WF HTH 01 to Burrawong WF HTH 05
Burrawong WF HTH 09	Burrawong WF HTH 07 to Burrawong WF HTH 08
Burrawong WF HTH 13	Burrawong WF HTH 10 to Burrawong WF HTH 12
Burrawong 02 to Burrawong 38	15 Previously recorded AHIMS sites within the Project Area (AHIMS# 47-6-0037, #47-6-0041, #47-6-0093, #47-6-0945, #47-6-0253, #47-6-0147, #47-6-0148, #47-6-0150, #47-6-0255, #47-6-0151, #47-6-0254, #47-6-0146, #47-6-0069, #47-6-0149 and #47-6-0068).

Meanwhile, the table below provides a summary of the degree of harm and the consequence of that harm upon the heritage value of each site type recorded during this assessment within the Project Area.

Site Type	Type of Harm	Degree of Harm	Consequence of harm	No. of Sites	% of site type
Isolated Finds	Direct	Complete	Total loss of value	37	100
Artefact Scatters	Direct	Complete	Total loss of value	5	100
Hearths	Direct	Complete	Total loss of value	3	33.3
	Nil	Nil	No loss of value	6	66.7
Artefact Scatter, Hearth and Mound	Nil	Nil	No loss of value	1	100
Hearth and Mound	Nil	Nil	No loss of value	2	100
Hearth and Artefact	Nil	Nil	No loss of value	2	100
Tree cultural site	Nil	Nil	No loss of value	24	100
Previously recorded AHIMS sites within the Project Area	Nil	Nil	No loss of value	15	100

Recommendations

It is recommended that:

1. The development must avoid all the heritage exclusion zones which are mapped within the Project Area. These heritage exclusion areas should be shown on all construction maps for this Project and if during construction works any ground disturbance activity is proposed within 50 m of any of these heritage exclusion zones then high visibility temporary fencing must be in place along the boundary of the

heritage exclusion zone in proximity to the works prior to any ground disturbance and/or construction works commencing nearby to ensure there are no inadvertent impacts to these areas. Given the size of some of these heritage exclusion zones it is acceptable that only the portion of the heritage exclusion zones in proximity to works is demarcated.

2. The development must avoid the 24 tree cultural sites recorded during this assessment as Burrawong WF ST 01 to Burrawong WF ST 24. A minimum 20 m buffer must be in place from the trunk of each tree to prevent any inadvertent impacts to the canopy and/or root system of each recorded cultural site.
3. The development must avoid the 15 previously registered AHIMS sites within the Project Area which are outside the proposed development corridor for this Project. The AHIMS sites to be avoided are: 47-6-0037, 47-6-0041, 47-6-0093, 47-6-0945, 47-6-0253, 47-6-0147, 47-6-0148, 47-6-0150, 47-6-0255, 47-6-0151, 47-6-0254, 47-6-0146, 47-6-0069, 47-6-0149 and 47-6-0068. No works or access tracks are proposed to be implemented during the Project within proximity (within 50 m) to any of these previously registered AHIMS sites within the Project Area, hence no demarcation of these sites is required as part of the Junction Rivers Wind Project.
4. If complete avoidance to any of the isolated finds and artefact scatters recorded within the proposed development corridor is not possible, a reasonable and feasible attempt, through the visual inspection of the site by an archaeologist with an Aboriginal community representative (as selected by the Proponent), must occur in an attempt to collect the surface stone artefacts within the development corridor at each of these recorded locations. This must occur prior to construction, following the development consent which is issued for State Significance Developments.
5. Due to ongoing farming practises in the wider Project Area and the potential for delays in the commencement of construction, the ability to undertake the surface collection salvage within the development corridor (outside the heritage exclusion areas) should be facilitated in any conditions of consent issued for this Project. This should occur following the approval of a Cultural Heritage Management Plan for the Project and in accordance with the development consent. The surface collection salvage would be undertaken in line with the methodology provided in Appendix D of the ACHA report.
6. A surface collection salvage programme must be attempted at each site with stone artefacts recorded that is approved for impacts prior to the proposed construction works commencing for each stage of works proposed within the development corridor for the Junction Rivers Wind Project. The surface collection programme may be staged, if required, to conform to the proposed staged approach of construction works.
7. The collection and relocation of the surface artefacts and any collected cultural material should be undertaken by an archaeologist with a representative/s of the registered Aboriginal parties, as selected by the Proponent, and be consistent with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* and/or the wishes of the Registered Aboriginal Parties.
8. All objects salvaged must have their long term relocation details submitted to the AHIMS database. An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works as approved in the development consent for this State Significant Development.
9. A minimum 5 m buffer should be observed around all stone artefact and hearth sites that are being avoided by the proposed development. If during any works for the Junction Rivers Wind Project, any ground disturbance activity is proposed within 50 m of any recorded valid in situ known Aboriginal sites then high visibility temporary fencing must be in place to demarcate a minimum 5 m buffer around the boundary of the site prior to any works commencing within proximity (within 50 m) of the site.
10. Unmitigated impacts can occur to the hearth sites Burrawong WF HTH 06, Burrawong WF HTH 09, Burrawong WF HTH 13 if they cannot be avoided by works.
11. All works for the Junction Rivers Wind Project must stay within the area assessed for the development corridor and impact areas as detailed in this report to ensure there are no inadvertent impacts to Aboriginal objects.

12. For any proposed future impacts to the Aboriginal sites being avoided and outside the development corridor, as assessed in this report, further assessment and consideration of impacts on Aboriginal Heritage as determined by an archaeologist should occur. Additional Aboriginal consultation and further assessment which may include survey and/or subsurface testing may be required.
13. Further archaeological assessment would be required if the proposal activity and development corridor extends beyond the area assessed in this report. This would include consultation with the registered Aboriginal parties and may involve further field survey.
14. The Proponent should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal artefacts and objects during the construction of the Junction Rivers Wind Project and for the management of known sites within and in proximity to the development corridor which will be avoided. The Plan should include the unexpected finds procedure to manage any objects suspected to be Aboriginal in origin during the construction, maintenance, operation and decommissioning works and include requirements for heritage to be included as part of the site inductions and the monitoring of sites which will be avoided. Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.
15. In the event that suspected human remains are discovered during the construction of the Junction Rivers Wind Project, all work must cease in the immediate vicinity. The appropriate heritage team within Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were ancestral Aboriginal remains or not. If the remains are deemed to be ancestral Aboriginal in origin Heritage NSW would be sought to advise the Proponent on the appropriate actions required. An unexpected find protocol for suspected human remains must be included in the CHMP for the Project.
16. Prior to any development consent being issued for this Project, the drafted conditions which relate to Aboriginal heritage should be reviewed by a qualified archaeologist to ensure all sites assessed for impacts and avoidance and the management recommendations, as noted in this report, are clearly included and listed in any conditions of consent.

All Aboriginal objects and places in NSW are protected under the *National Parks and Wildlife Act*. It is an offence to disturb an Aboriginal object or site without appropriate consent.

1. Introduction

NGH Pty Ltd (NGH) has been engaged by Windlab Developments Pty Ltd (Windlab) [the Proponent] to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to address potential impacts by the proposed Junction Rivers Wind Project (the Project) on Aboriginal cultural heritage within a number of lots along Balranald Road (the Project Area) between Yanga and Kyalite in New South Wales (NSW).

The Project is located approximately 15 kilometres (km) south of Balranald, 140 km west of Hay and 20 km northeast of the NSW and Victorian border within the southern section of the Murray-Darling Basin. The Project is within the Murray River Council Local Government Area (LGA), and immediately east of Balranald Shire LGA. The Project is located within the South-West Renewable Energy Zone (SW-REZ), which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap. The Project will have a generating capacity of approximately 750 megawatts (MW) and would connect to the existing 220 kilovolt (kV) transmission line that traverses the site and/or the proposed Project EnergyConnect transmission line. For assessment purposes, a Project 'Development Corridor' has been established consisting of a buffer around the conceptual layout for the Project. The development corridor represents a worst-case assessment scenario and allows for refinement of Project infrastructure, such as micro-siting of WTGs, during the detailed design phase.

The ACHA and Archaeological Technical Report (ATR) are being undertaken to investigate and examine the presence, extent and nature of any Aboriginal heritage sites within the proposed development corridor of the Project Area, assess the potential impacts to Aboriginal sites within the development corridor of the Project Area and provide management strategies that may mitigate any impacts. This ATR documents the detailed findings from the field survey conducted as part of the ACHA for the Project.

The proposed Junction Rivers Wind Project is a State Significant Development (SSD) project as defined under *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) and will require development consent under Part 4 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). The ACHA will be used to form part of the Environmental Impact Statement (EIS) as required by the Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project (SSD-30448824). The EIS will be submitted to the Department of Planning, Housing and Infrastructure (DPHI) for assessment and determination. The proposed work for the wind farm includes a number of activities that will require ground disturbance that has the potential to impact on Aboriginal heritage sites and objects which are protected under the *NSW National Parks and Wildlife Act 1974* (NPW Act).

The SEARs for the Project also identified Aboriginal heritage as a specific issue to be addressed in the EIS including:

- *an assessment of the impact to Aboriginal cultural heritage items (archaeological and cultural) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), including results of archaeological tests (if required).*
- *evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010).*

(Supplementary SEARS 19/12/2023- SSD-30448824).

Throughout the assessment therefore, to ensure compliance with the SEARs and Aboriginal heritage assessment undertaken in NSW, the following codes and guides were followed in relation to this Aboriginal heritage assessment:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011)*

- *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (DECCW NSW 2010a)
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRP) (DECCW NSW 2010b).

The Junction Rivers Wind Project is an SSD project that represents an important contribution to renewable energy generation in NSW and is subject to approval by the NSW Minister for Planning and Public Spaces. Under Section 4.41 (1) (d) of the EP&A Act an Aboriginal Heritage Impact Permit (AHIP) is not required for the Junction Rivers Wind Project as the project is an SSD.

1.1 Investigation contributors

The ACHA report was completed by Kirsten Bradley (NGH Principal Heritage Consultant - BA Hons Archaeology with 15 years experience), Dr Tessa Bryant (NGH Senior Heritage Consultant – PhD with 8 years experience) and Dr Rhiannon Stammers (NGH Senior Heritage Consultant - PhD - Archaeology and BA Hons Archaeology with 8 years experience) who conducted research, GIS mapping and report preparation. Matthew Barber (NGH General Manager- Heritage BA-Hons, MAACAI with over 30 years experience) and Glenn Willcox (NGH Senior Heritage Consultant - BA Hons with 15 years experience), reviewed the report for quality assurance purposes.

NGH archaeologists Dr Rhiannon Stammers, Tom Knight, Layne Holloway, Kirwan Williams, Jorge Fuenzalida Miralles, Dr Tessa Bryant and Gabriella McLay undertook the fieldwork survey for this Project.

Aboriginal consultation was undertaken by Dr Rhiannon Stammers and Kirsten Bradley from NGH and Windlab Developments Australia.

Consultation with the Aboriginal community was undertaken following the process outlined in the *Aboriginal cultural heritage consultation requirements for proponents 2010*.

The Registered Aboriginal Parties (RAPs) for this project were:

- Balranald Local Aboriginal Land Council (LALC)
- Bangerang Aboriginal Corporation
- John Jackson
- Pappin Family Aboriginal Corporation
- Wakool Indigenous Corporation
- Yarkuwa Indigenous Knowledge Centre

In line with the Aboriginal cultural heritage consultation requirements for proponents 2010, the Proponent chose to invite four of the Aboriginal groups who had registered their interest in the project to attend fieldwork. Aboriginal representatives from the four RAP groups listed below participated in the fieldwork undertaken for the assessment.

- Balranald LALC
- Bangerang Aboriginal Corporation
- Pappin Family Aboriginal Corporation
- Wakool Indigenous Corporation

The initial survey fieldwork for this Project was undertaken by a team of two NGH archaeologists and two Aboriginal community representatives over 28 days between the 7th of March 2022 and the 13th of April 2022. Additional survey was also undertaken by a team of two NGH archaeologists and two Aboriginal community representatives over five days between the 17th of April 2023 and the 21st of April 2023 to ensure the entirety of the proposed development corridor was surveyed on foot following some minor design modifications.

Further details and an outline of the consultation process is provided in Section 2 of the ACHA.

1.2 Report structure

This report is structured in accordance with the outline provided under Requirement 11 in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). The report includes the following components:

- Section 1 – Background context for the project and study objectives
- Section 2 – Details of the project proposal
- Section 3 – Details of previous archaeological studies and site models
- Section 4 – Landscape context
- Section 5 – Summary of contextual information
- Section 6 – Site prediction model
- Section 7 – Details of sampling strategy and field methodology
- Section 8 – Field results
- Section 9 – Analysis and Discussion of results
- Section 10 – Significance Assessment
- Section 11 – Impact assessment
- Section 12 – Management and mitigation considerations
- Section 13 – Recommendations

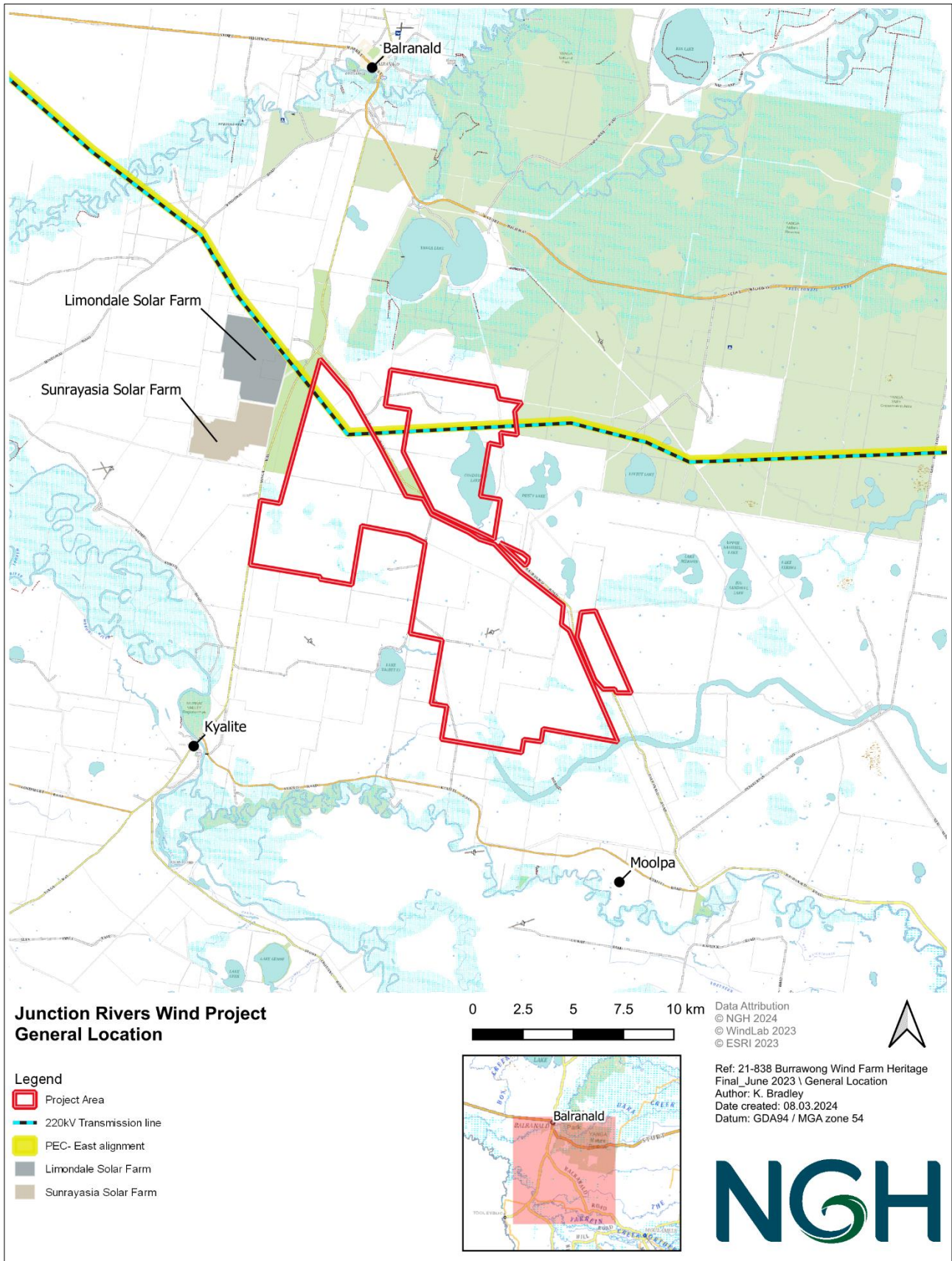


Figure 1-1 General location of the Project Area

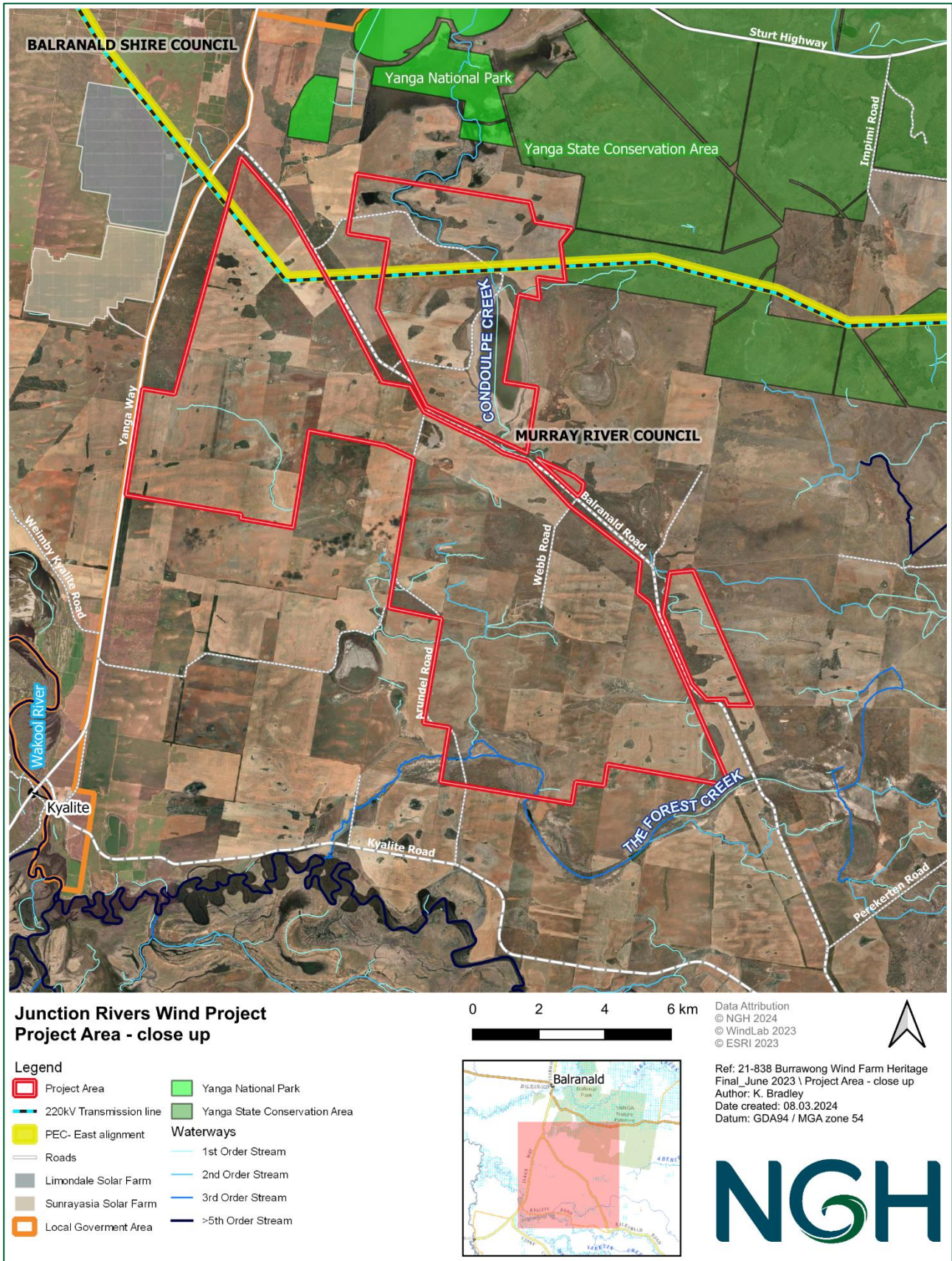


Figure 1-2 Project Area

2. Project proposal

The Project is located approximately 15 km south of Balranald, 140 km west of Hay and 20 km northeast of the NSW and Victorian border within the southern section of the Murray-Darling Basin. The Project is within the Murray River Council LGA and immediately east of Balranald Shire LGA. The Project Area is within the parishes of Burrawang, Condoulpe, Salisbury and Turora in the county of Wakool, and partially within the parish of Wombah in the county of Caira, NSW.

The Project Area includes the Lot/DP listed in

Table 2-1 and the Project Area is shown in Figure 1-1 and Figure 1-2. All proposed infrastructure would be located within a development corridor within the Project Area as shown in Figure 2-1.

Table 2-1 Freehold and crown land lot within the Project Area

Freehold land Plan Number	Lot Number
16335	10, 14
134424	1, 2, 3
720256	47
725897	84
751243	7, 10, 11, 13, 44
756520	2, 16, 19, 20, 21, 22, 23, 24, 26, 27, 35, 36, 38, 39, 42, 43, 48, 49, 50, 53, 54, 55, 57, 58, 59
756528	20, 21, 22, 23, 24, 28, 29, 30, 51, 58, 60, 62, 63, 64, 65, 67, 68, 69, 71, 72, 75, 80
756588	2, 4, 5, 6, 7, 10, 13
876082	482
1140351	2
Crown Land Plan Number	Lot Number
1158277	7308
1158277	7306
1159244	7300
1159244	7301
725898	86
725897	83

The Project is located within the SW-REZ which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap. Windlab proposes to develop the Project to provide a reliable and affordable source of energy for the people of NSW and contribute to reducing greenhouse gas emissions associated with energy generation. The Project would involve the construction, operation and eventual decommissioning or repowering of a wind farm with up to 96 Wind Turbine Generators (WTG) and associated ancillary infrastructure, with a generating

capacity of up to approximately 750 megawatts (MW) and would connect to the existing 220 kilovolt (kV) transmission line that traverses the site and/or the proposed Project EnergyConnect transmission line.

The key components of the Project include:

- up to 96 (3 blade) WTGs with a total height (tip height) of approximately 300 m;
- electrical connections between the proposed WTGs and substations/switching stations consisting of a combination of underground cables and overhead powerlines;
- substations/switching stations and transmission connections to connect to the existing 220 kV transmission line and/or the proposed Project EnergyConnect transmission line;
- up to four Battery Energy Storage System (BESS) facilities (to a total of 200 MW with a 4 hour delivery capacity), or up to four STATcom facilities;
- other associated infrastructure including access roads and tracks, operation and maintenance buildings and construction facilities;
- temporary on-site concrete batching plants and rock crushing facilities during the construction phases; and
- targeted road network upgrades to facilitate delivery of WTG components to the site as required.

As is typical of projects of this scale, the construction of the wind farm may be staged. The decision to construct the wind farm in stages will depend on a number of factors, including but not limited to:

- Access arrangements for the South-West Renewable Energy Zone
- Availability of offtake and other energy market considerations
- Financing arrangements and other commercial considerations

The Project may be constructed in two stages. Stage 1 may see the construction of up to 30 WTGs and required ancillary infrastructure and Stage 2 may see the construction of the remaining WTGs and required ancillary infrastructure. The construction period would be approximately four years.

The Project specific design components are noted in Table 2-2. The final configuration for Stage 1 will depend on the WTG model selected and the outcome of detailed grid studies. The possible Stage 1 works are detailed in Table 2-3.

Table 2-2 Project design specification

Component	Approximate Dimensions	Quantity
Wind Turbine Generator (WTG)		Up to 96
Blade length	Maximum of 100m	
Hub height	Maximum of 200m	
Uppermost blade tip	Maximum of 300m	
Lowermost blade tip	Minimum of 49m	
Hardstand	Maximum of 100 x 115 m	
Crane laydown	Maximum of 30 x 240 m	
Ancillary Infrastructure – Electrical		
Battery Energy Storage System (BESS) (up to 200MW/800MWh)	Maximum of 3.2 hectares	Up to 2*
Main substation	Maximum of 5.0 hectares	Up to 2*

Component	Approximate Dimensions	Quantity
(33/220kV and/or 33/330kV)		
Switching station	Maximum of 1.275 hectares	Up to 2*
Underground and/or overhead cables (220kV and/or 330kV)	5m trench	approx.78 km (total length of trenches), approx. 148 km (total length of cable)
Overhead transmission line (330kV)	80m easement	approx. 17.2 km
Ancillary Infrastructure – Other		
Internal access tracks and drainage	Width ranging from 5.5-10m	approx. 91 km
O&M facility including carpark	Maximum 2.5 hectares	Up to 2*
Meteorological masts (power performance masts)	Maximum height of 200m	Up to 7
Site Access Points		Up to 8 locations
Temporary Facilities		
Construction compound	Maximum of 2.25 hectares	1 main and up to 4 satellite
Concrete batching plants	Maximum of 3.0 hectares	Up to 4
Laydown areas	Maximum of 2.28 hectares	Up to 5
Temporary meteorological masts	Maximum height of 150m	Up to 2

* 1 per stage, if constructed in stages

Table 2-3 Stage 1 project design specification- if constructed in stages

Component	Quantity	Location
Wind turbine generator (WTG)	up to 30	subset of WTG 1-30
Battery Energy Storage (BESS)	Up to 1	1
Main substation	1	1
Switching station	1	1
O&M facility including carpark	1	1
Meteorological masts	Up to 2	1, 2
Temporary Facilities	1	1
Concrete batching plants	1	1
Laydown areas	1	1
Construction compound	1	1
Temporary meteorological masts	Up to 2	1, 2
Site access points	2	2, 3

In order to facilitate refinement of the layout during the detailed design process, an allowance for micro-siting of WTGs by up to 100 m radius from the locations identified in the EIS is sought. Other project infrastructure components, including substations, switchyard, maintenance building, temporary facilities, cabling and access tracks, may also be micro-sited within the development corridor to ensure that micro-siting does not result in greater impacts than those assessed in the EIS for this project and complies with all conditions imposed on any development consent granted for the project.

The development activity will therefore involve disturbance of the ground during the construction of the wind farm and thereafter through its operation and ongoing use, including maintenance activities for the wind farm and its associated infrastructure and access tracks.

ACHA Appendix A

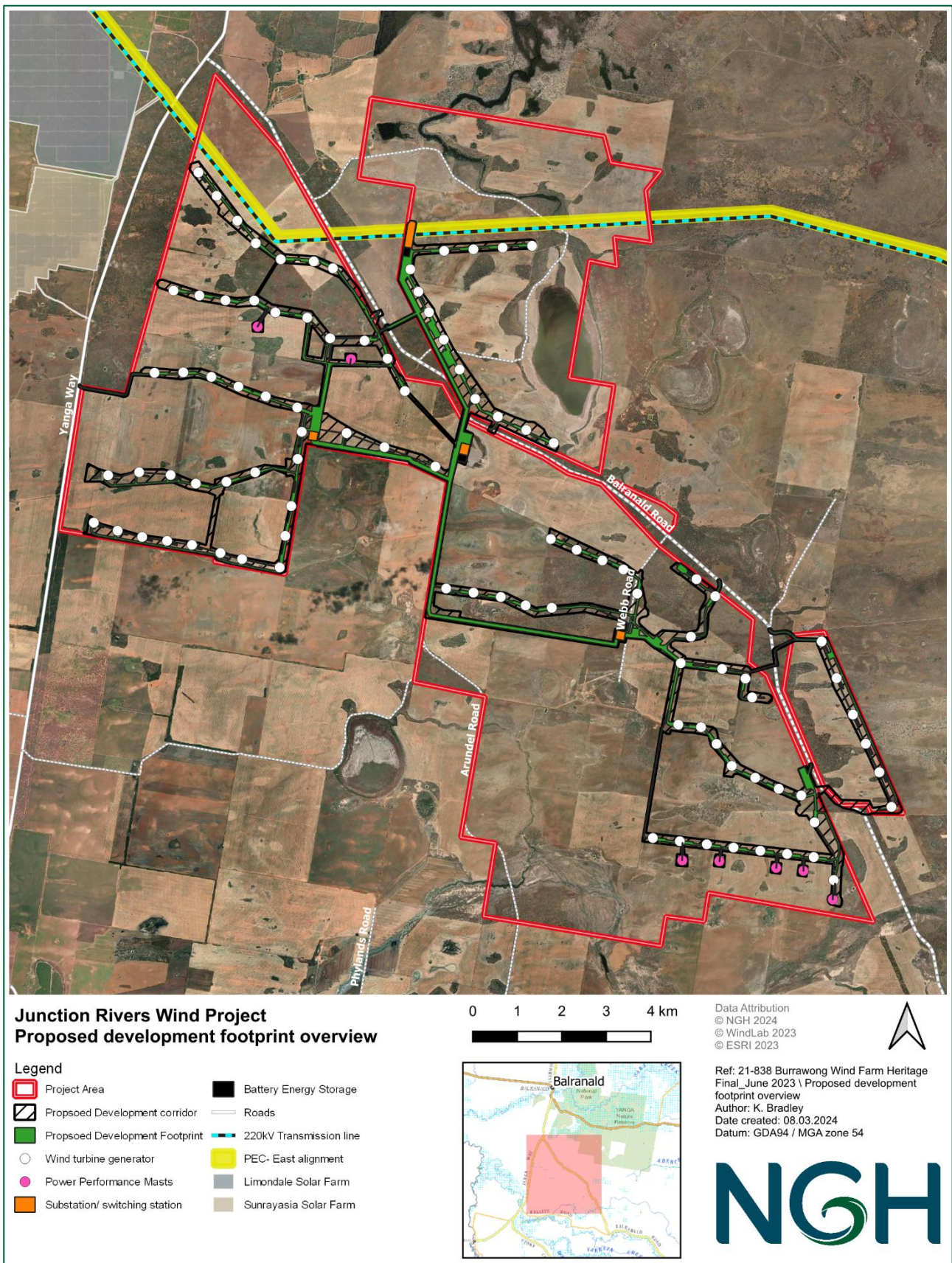


Figure 2-1 Proposed development corridor overview

3. Previous archaeological work

3.1 Ethnographic setting

There are several ethnographic recordings of Aboriginal life in the region from the 1800s that notably focus on the prevalence of Aboriginal people around waterways. It is however important to consider that the Aboriginal people alive at the time of such observations were survivors of serious epidemics of infectious disease such as smallpox, brought by Europeans, that greatly affected the population sizes and distribution of people within the landscape. Consequently, European records may not necessarily reflect pre-contact population distributions and traditional ways of life (Dowling 1997; Littleton & Allen 2007).

The dispossession from traditional lands and acts of violence against the Aboriginal people also caused great social upheaval meaning that access to traditional resource gathering and hunting areas, religious life, marriage links and sacred ceremonial sites were disrupted or destroyed. Despite this, Aboriginal people continued to maintain their connections to sites and the landscape in a variety of ways. The Aboriginal people of the region continue to have a strong connection to their land.

3.1.1 Tribal boundaries

Cultural areas are difficult to define and “must encompass an area in which the inhabitants have cultural ties, that is, closely related ways of life as reflected in shared meanings, social practices and interactions” (Egloff et al. 2005:8). Depending on the culture defining criteria chosen - i.e. which cultural traits and the temporal context (historical or contemporary) - the definition of the spatial boundary may vary. In Australia, Aboriginal “marriage networks, ceremonial interaction and language have been central to the constitution of regional cultural groupings” with the distribution of language speakers being the main determinate of groupings larger than a foraging band (Egloff et al. 2005:8 & 16).

The Balranald area is identified as within the Muthi Muthi language group (Tindale 1974). As with a number of Aboriginal groups in the lower reaches of the Murrumbidgee, Lachlan and Darling River, the groups were known by their repeated word for ‘no’. It should be noted however that Tindale’s tribal boundaries were partially the product of a European system of determining landownership, a system that did not reflect Aboriginal social constructs or their relationship with country. Tindale’s maps imply that the language groups identified, and their defined borders/boundaries should be considered as territorial units. It is important to remember that the boundaries between all the language groups mapped by Tindale are suggestive only and would most likely have changed through time due to changing availability and distribution of edible and raw material resources. Today not all Aboriginal groups agree with the mapped boundaries presented in Tindale and other publications. Borders were most likely not static but fluid, expanding and contracting over time with the movements of smaller family or clan groups. These boundaries ebbed and flowed through contact with neighbours, the seasons and periods of drought and abundance. The close proximity to each other also meant that people likely spoke multiple languages and dialects (Howitt 1904; Tindale 1974; MacDonald 1983; Horton 1994).

The Muthi Muthi language group has also been grouped into a broad language group identified as the Kulin family that also comprises of the Watthi Watthi, Wemba Wemba and Nari Nari languages (Tindale 1974, Horton 1994). Studies of various ethnographic resources in the region by Martin (2006) suggest that the Mutthi Mutthi group was likely to have originally been comprised of two groups with similar languages, the Mutthi Mutthi, located near the junction of the Murray and Murrumbidgee, and the Wathi Wathi, located around present day Balranald (Martin 2006:151). Martin (2006) noted that it is highly likely that these groups combined at some point in recent history to form one group which is today known as the Mutthi Mutthi people. More broadly the Mutthi Mutthi language group is associated with the Kulin language group of western Victoria.

There are numerous variations to the spelling of the Muthi Muthi group which include: Madi Madi, Muti Muti, Mutti Mutti, Mardi, Maadi, Muttee, Muttu Muttu and Murdi (Wakool Indigenous Corporation 2016a).

The Muthi Muthi people occupied the area around Balranald and their country extends to include sections of the Murray and Murrumbidgee Rivers. These rivers were reliable and abundant resources that sustained some the densest populations of Aboriginal people in Australia with the area from Echuca to the Murray Darling junction occupied by a number of Aboriginal clans with relatively small territories that included a portion of the river and back country. The close proximity to each other also meant that people likely spoke multiple languages and dialects and the ethnographic records show that people travelled extensively.

The Project Area is located within what today is regarded as Muthi Muthi Country of the Muthi Muthi language group.

3.1.2 Social structure and Colonisation

It was the small family group that was at the core of Aboriginal society and the basis for their hunting and gathering life. The immediate family camped, sourced food, made shelter and performed daily rituals together. The archaeological manifestations of these activities are likely to be small campsites, characterised by small artefact scatters and hearths across the landscape. Places that were visited more frequently would develop into larger site complexes with higher numbers of artefacts and possibly more diverse archaeological evidence.

The small family units were part of a larger band which comprised a number of families. They moved within an area defined by their particular religious sites. Such groups might come together on special occasions such as pre-ordained times for ceremonies, rituals or simply if their paths happened to cross. They may also have joined together at particular times of the year and at certain places where resources were known to be abundant. Trade between groups was incorporated into such gatherings, as well as important ceremonies, marriage arrangements, and sharing of news. The archaeological legacy of these gatherings would be larger sites than small family camps. They may include large hearth or oven complexes, contain a number of grinding implements and a larger range of stone tools and raw materials. The regular flooding of the region would also have influenced the distribution of resources and campsites at certain times of the year.

Identification and differentiation of such sites are difficult in the field. A family group and their antecedents and descendants occupying a particular campsite repeatedly over a long period of time may leave a similar pattern of archaeological signatures as a large group who camped in an area over a shorter period.

The first account of European exploration into the Balranald areas was by Charles Sturt in 1829-30 as he explored the Lower Murrumbidgee and Murray Rivers (Sturt 1833). Sturt was followed by Mitchell who passed through the area in 1836. European settlers started arriving in the district from 1848 with the township of Balranald gazetted on the 4th of April 1851. The Burke and Wills expedition also crossed the Murrumbidgee River at Balranald in 1860. (Wakool Indigenous Corporation 2016a).

There were three missions or Aboriginal reserves in the Balranald area that operated from 1892 until 1964 (Niche 2012:33). In the 1880's the local police noted that there were 98 "full-bloods" and 8 "half-caste" Aboriginal people in the Balranald district that were employed on stations such as Yanga, Canally and Paika (Feldtmann 1976).

3.1.3 Material culture, food and resources

Like everywhere in Australia, the Muthi Muthi people were adept at identifying and utilising resources either on a seasonal basis or all year round. Terrestrial animals such as the possum was noted by many early observers as a prime food source and the skins were made into fine cloaks that evidently were very warm (Evans 1815, Oxley 1820, Mitchell 1839). Kangaroos were also eaten and their skins made into cloaks as well. A range of reptiles and other mammals were also food sources. Fish, crayfish and mussels would have been prevalent from the rivers and creeks. Insects were also a common food type; in particular grubs, ants

and ant eggs (Pearson 1981, Fraser 1892). Birds including emus and their eggs were common as a food source. Water birds would have been a significant food resource that was also likely to be influenced by the seasonal flooding. Plant foods were equally as important and mostly consisted of roots and tubers, leaves, seeds and fruit. Wood was used to make boomerangs, spears, digging sticks, bark for canoes and shelters, fibre to produce string, and stone to make axes, grinding stones, and spear points. Animals were utilised not only for food, but also for the manufacture of materials.

In an archaeological context, few of these items would survive, particularly in an open site context. Anything made from bark and timber and animal skins would decay quickly in an open environment. However, other items, in particular those made of stone would survive where they were made, placed or dropped. Shell material may also survive in an archaeological context. Sources of raw materials, such as the extraction of wood or bark would leave scars on the trees that are archaeologically visible, although few trees of sufficient age survive in the modern context. There are no outcropping stone sources within the local area and therefore stone had to be brought in for use, most likely traded from source areas such as the Willandra Lakes and elsewhere.

Furthermore, some of the early settlers and pastoralists, surveyors, explorers, administrators and others observed traditional Aboriginal activities, including ceremonies, burial practices and general way of living, and recorded these in letters, journals and books. These early records of Aboriginal lifestyle and society within the region assist in understanding parts of the traditional Aboriginal way of life, albeit already heavily disrupted at the time of the observations and through the eyes of largely ignorant and uninformed observers.

Mitchell (1839) recorded what is likely to be the earliest description of heat retainers such as those found in Aboriginal mounds and hearths along the Murrumbidgee River. Mitchell described the heaps of stones used in cooking as an artificial feature in the landscape that he had not observed in other places. The mounds of burnt clay or ashes distinguished the areas frequently used by the local Aboriginal people for cooking.

The common process of natives in dressing their provisions is to lay the food between layers of heated stones; but here, where there are no stones, the calcined clay seems to answer the same purpose, and becomes better or harder the more it is used. Hence the accumulation of heaps resembling small hills. Some of them were so very ancient as to be surrounded by circles of lofty trees; others, long abandoned, were half worn away by the river which, in the course of ages, had so far changed its bed that the burnt ashes reached out to mid-channel; others, now very remote from the river, had large trees growing out of them (Mitchell 1838, Vol. 2 Ch. 3.4)

Mitchell also observed the way Aboriginal people of the Murrumbidgee and Murray buried the dead noting that a small thatched hut was erected over a burial. The huts were enclosed by two or three low ridges of dirt in the shape of an ellipse with pointed ends (Mitchell 1839). These early observations also note that some weapons and tools were carried, some made from wood such as spears, spear throwers, clubs, shields, boomerangs, digging sticks, bark vessels and canoes. Other materials were observed in use such as stone axes, shell and stone scrapers and bone needles.

3.2 AHIMS search

The Aboriginal Heritage Information Management System (AHIMS) provides a database of previously recorded Aboriginal heritage sites in NSW. A search provides basic information about any sites previously identified within a search area. However, a register search is not conclusive evidence of the presence or absence of Aboriginal heritage sites, as it requires that an area has been inspected and details of any sites located have been provided to add to the register. As a starting point, the search will indicate whether any sites are known within or adjacent to the Project Area. While the initial search of the AHIMS database was conducted on the 24th January 2021 (AHIMS Client Service ID was: 653918) it is noted that the results of an extensive AHIMS search are only considered valid for a 12 month period. Consequently, an updated extensive search of the AHIMS database was conducted on the 10th May 2023 for the following area which was also centred on the Project Area- Easting, Northings from : 723310.0 -753310.0, - Easting, Northings to :

6123209.0 - 6153209.0. The AHIMS Client Service ID was: 780380. There were 117 Aboriginal sites and no declared Aboriginal Places in the search area results. The results of the AHIMS search are shown below in Table 3-1 and Figure 3-1. There are 15 registered AHIMS sites currently recorded within the Project Area, these are detailed in Table 3-2. None of these 15 registered AHIMS sites are within the and/or in close proximity (within 400 m) to the proposed development corridor for this project as shown in Figure 3-2.

There is a dominance of scarred trees recorded in the AHIMS search area and the Project Area, especially where there are remnant stands of native trees. Scarred trees provide a tangible link to the past and provide evidence of Aboriginal subsistence activities through the deliberate removal of bark or wood. It is however considered likely that the dominance of scarred trees recorded in the area is related to lack of surveys in the area and the more conspicuous nature of scarred trees when compared to small artefact scatters, isolated stone artefacts and hearths. It is also possible that the high number of modified tree in the AHIMS search area is reflective of the debate which continues in the local area about Rabbiters Trees' and Leaghur Trees (culturally sacred trees) as noted above in Section 4.4.

Table 3-1 AHIMS Registered Sites

Site Type	Number
Modified Tree (Carved or Scarred)	53
Hearth	15
Earth Mound	8
Artefact (1 or more)	5
Hearth & Potential Archaeological Deposit (PAD)	5
Artefact & Hearth	4
Burial	4
Earth Mound & Shell	4
Artefact, Hearth, PAD & Shell	3
Earth Mound & Hearth	2
Hearth, Shell & Potential Archaeological Deposit (PAD)	2
Hearth & Shell	2
Shell	2
Artefact, Earth Mound & Hearth	1
Artefact, Earth Mound, PAD & Shell	1
Artefact, Earth Mound & Shell	1
Artefact, Hearth & Shell	1
Artefact & PAD	1
Artefact & Earth Mound	1
Artefact, Earth Mound, Habitation Structure & PAD	1
Burial, Artefact, Hearth & Shell	1
Total	117

Table 3-2 Registered AHIMS sites within the Project Area

Site Number	Site Name	Site Type	Site Status on AHIMS	Distance to the proposed development corridor (m)
47-6-0037	Condoulpe	Burial	Valid	1,780
47-6-0041	Condoulpe Creek	Burial	Valid	1,780
47-6-0093	North Dusty Lake-8	Artefact	Partially Destroyed	2,245
47-6-0945	Burrawong 1	Artefact	Valid	450
47-6-0253	Condoulpe Lake 24	Hearth	Partially Destroyed	1,285
47-6-0147	Condoulpe 19	Modified Tree (Carved or Scarred)	Valid	810
47-6-0148	Condoulpe 20	Modified Tree (Carved or Scarred)	Valid	845
47-6-0150	Condoulpe 22	Modified Tree (Carved or Scarred)	Valid	990
47-6-0255	Condoulpe Lake 26	Modified Tree (Carved or Scarred)	Not a site	1,305
47-6-0151	Condoulpe 23	Modified Tree (Carved or Scarred)	Valid	1,025
47-6-0254	Condoulpe Lake 25	Modified Tree (Carved or Scarred)	Valid	1,240
47-6-0146	Condoulpe 18	Modified Tree (Carved or Scarred)	Valid	790
47-6-0069	Condoulpe 2	Modified Tree (Carved or Scarred)	Valid	1,655
47-6-0149	Condoulpe 21	Modified Tree (Carved or Scarred)	Valid	995
47-6-0068	Condoulpe 1	Modified Tree (Carved or Scarred)	Valid	1,620

An additional AHIMS search (AHIMS Client Service ID was 871337) over the Project Area was undertaken on 8th March 2024 in order to ensure the validity of the AHIMS search results. No additional sites were recorded within the search area, which covered the entirety of the Project Area, beyond those recorded by NGH as part of this assessment.

3.3 Additional searches

Other heritage register searches were also undertaken to identify any items or places in proximity to the Project Area, with a focus on the Project Area and surrounding landscape. The following resources were used as part of this assessment:

- The *NSW State Heritage Inventory* (SHI), includes items on the State Heritage Register and items listed by state agencies and local Government, to identify any items currently listed within or adjacent to the proposal site.
- The *Australian Heritage Database*, includes items on the National and Commonwealth Heritage Lists, to identify any items that are currently listed within or adjacent to the proposal site.

The results of the NSW SHI database search indicated there are no previously recorded Aboriginal Places listed under the *National Parks and Wildlife Act* within the vicinity of the Project Area.

The results of the NSW SHI database search indicated there are no previously recorded heritage sites listed under the *NSW Heritage Act* within the vicinity of the Project Area.

The results of the Australian Heritage Database search indicated there are no listed items within the vicinity of the Project Area.

No other known previously recorded heritage sites are located within or adjacent to the Project Area.

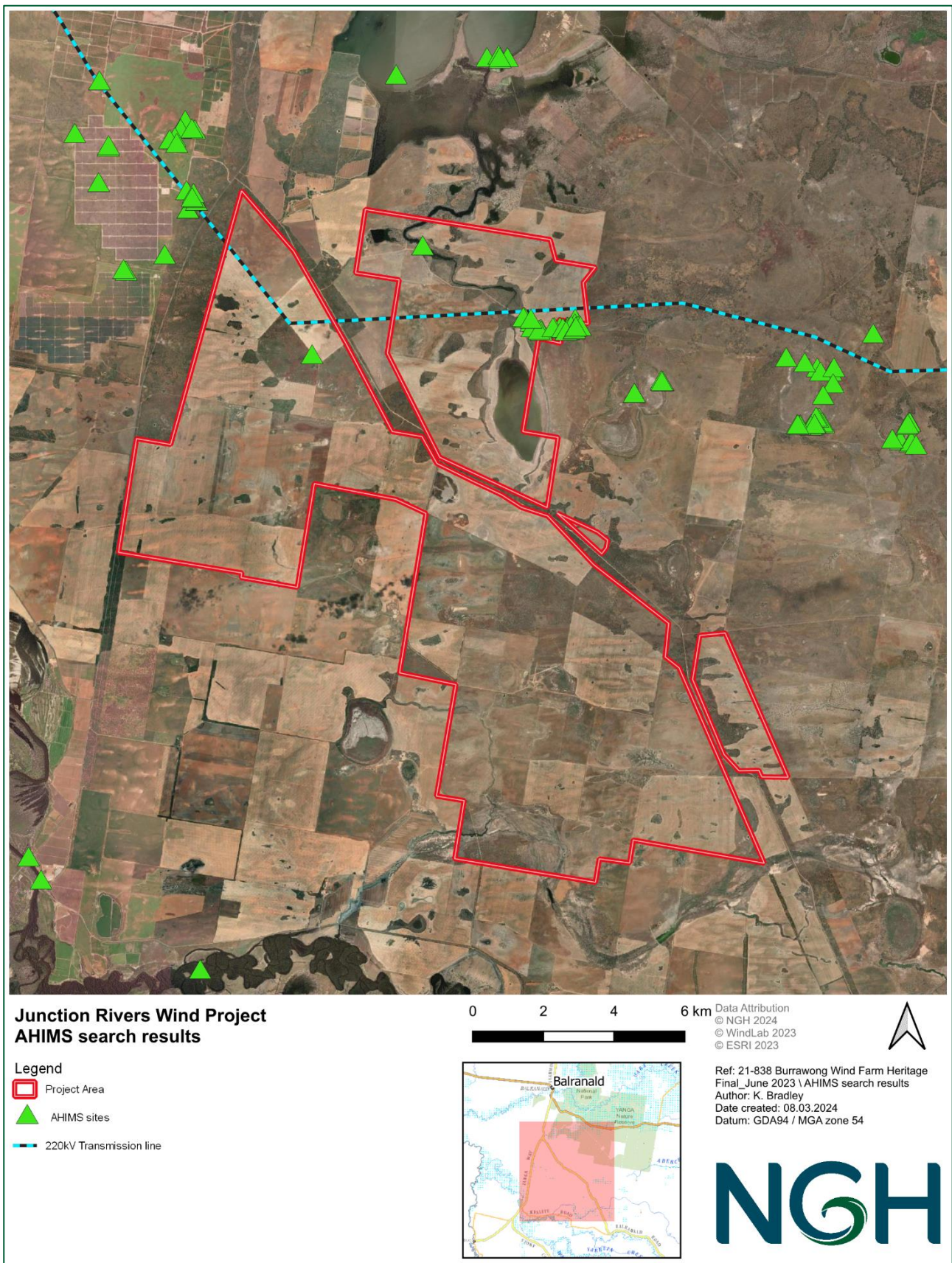


Figure 3-1 AHIMS sites surrounding the Project Area

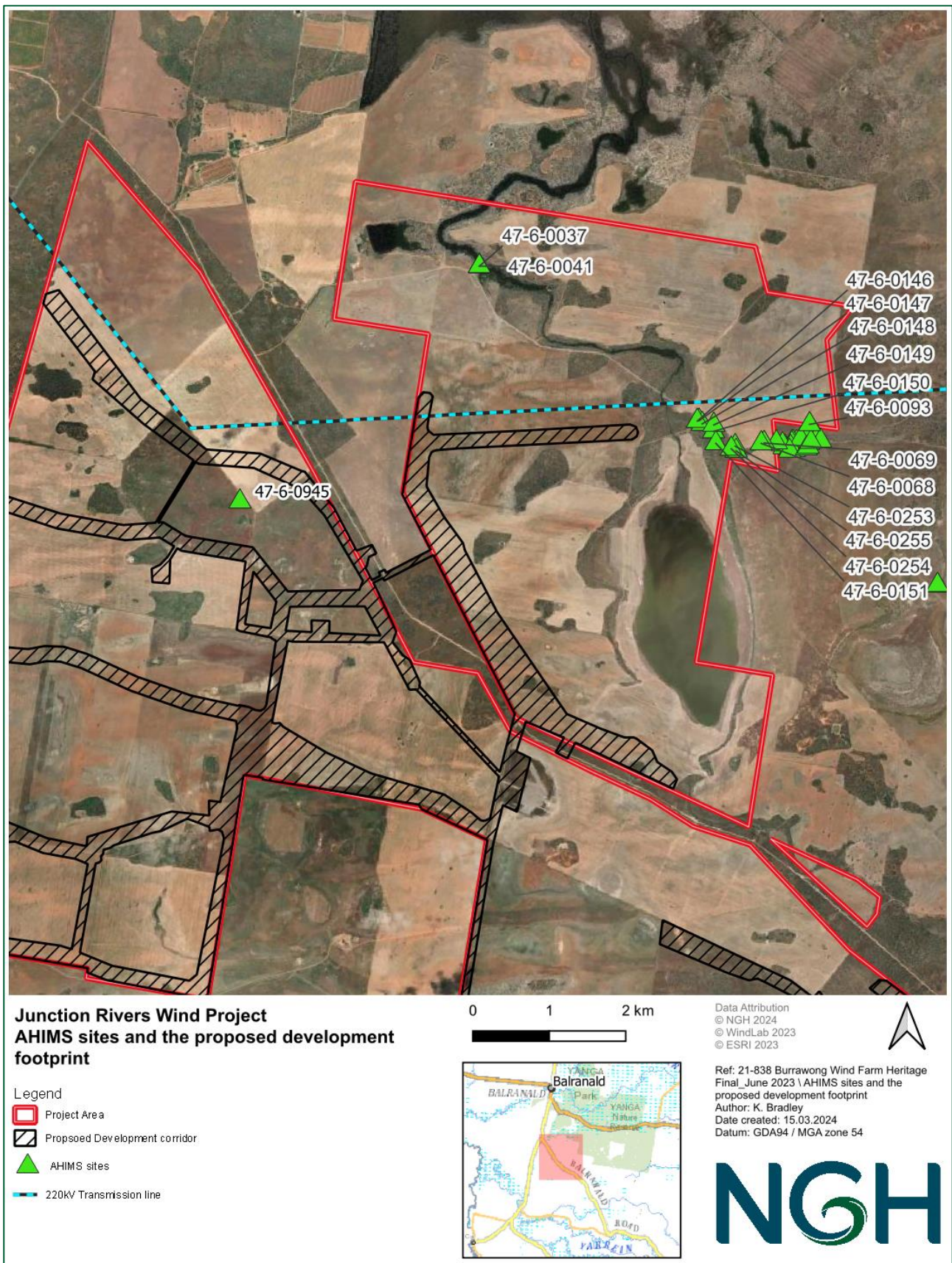


Figure 3-2 AHIMS sites within the Project Area, showing the development corridor

3.4 Regional archaeological record

Aboriginal people have occupied what we now know as the Australian continent for at least 40,000 years and perhaps 65,000 years and beyond. There have been no dated excavations in the Balranald area, although the archaeological evidence from Lake Mungo, 100 km to the north-west provides ample evidence of Aboriginal occupation dating back 40,000 years (Mulvaney & Kamminga 1999; Hiscock 2007).

Within the broader region, several studies have been undertaken that have resulted in a range of Aboriginal sites being recorded that show that the riverine landforms and lunette lake systems in the Murray Basin are rich in Aboriginal cultural material. The major relevant studies are summarised below.

The Willandra Lakes World Heritage Area is a series of dry lake basins within a dune system, approximately 100 km north-west of the current assessment area. Lake Mungo is part of the Willandra Lakes World Heritage Area that has been subject to ongoing archaeological research since the discovery of one of the world's oldest cremated human remains, Mungo Woman (Mungo I), in the late 60's (Turney 2011). The 1974 discovery of a Pleistocene burial surrounded by ochre stained sands referred to as Mungo Man (Mungo III) (Bowler and Thorne 1976) further established the Willandra Lakes area as an important area that adds to the understanding of the early Aboriginal occupation in Australia. These burials are dated to 42,000 years BP and are the oldest known human remains in Australia and some of the earliest remains of modern humans outside of Africa (Turney 2011). Studies undertaken in the Willandra Lakes area indicates that most burials occur within sand dunes created from paleo-channels near permanent and ephemeral water sources.

Furthermore, a series of 123 fossilised footprints, known as the Garnpang footprint trackway, were recorded that were impressed into hardened sediment dated to 23,000±1000 BP and 19,200±1000 BP (Webb et al 2006). A number of stone artefacts, human and faunal remains, shell middens, quarries, clay and stone heat retainers and hearths have been recorded across the Willandra Lakes World Heritage Area (Turney 2011). Turney's (2011) analysis of three stone artefact assemblages along the Lake Mungo lunette noted that silcrete was the most common lithology utilised for the manufacture of stone tools with lesser amounts of quartzite, quartz and sandstone. Turney also noted the presence of a soil carbonate or calcrete nodules that occur more frequently on lunettes to have been used as heat retainers in some of the recorded hearths.

During the 1970's and 80's archaeological research in the Murray Valley region between the Edwards and Murray Rivers focused on burials and mounds. Simmons (1980) identified 75 mounds, 17 scarred trees and a range of other site types including isolated artefacts, hearths, shell middens and burials. Mounds were the most common site type that generally consisted of abundant clay nodules in association with burnt fragments of shell or bone, while the scarred trees in the area were generally all mature River Red Gums. The sites identified by Simmons were all located in close proximity and/or associated with the floodplains, anabranches and lake systems of the Murray Valley and clearly showed the importance of aquatic resources to the local Aboriginal populations in the region.

Sample surveys undertaken by Pardoe and Martin (2001) within the Murrumbidgee Province covered an area of approximately 30,000 square kilometres, extending from Balranald to Narrandera and Booligal to Jerilderie. Using an analysis of landforms and identifying gaps in the archaeological knowledge based on the sites recorded in the AHIMS database, they found that there was a bias in the distribution of sites along major waterways and some landforms such as lunettes, but there were also large gaps where no sites had been recorded. Pardoe and Martin surveyed 61 sample areas or quadrants from 22 Stations or locations across their project area. This resulted in 347 new sites being recorded. The major site types (over 90%) were scarred trees (26.2%), mounds (24.2%), open sites (14.4%), ovens (12.4%), burials (7.8%) and hearths (6.1%). Pardoe and Martin analysed their results in order to develop a predictive model for site distribution across the Murrumbidgee Province. They found that mounds varied in size, from 4 m-140 m in diameter and height also varied from 2 cm to 2 m. Mounds were most commonly found along floodplain creeks within River Red Gum and Black Box vegetation communities. They found that as well as being situated along the major rivers, they were also located on the plains to the north and south of the Murrumbidgee, such as around the edge of depressions such as lakes and swamps and also on palaeochannel features. Mounds were often

characterised as being situated on elevated ground such as lunettes, levees and dunes where silty sandy soil was prevalent (Pardoe and Martin 2001:82-87). Burials occurred mostly as individuals within mounds but there were six locations where more than one burial was recorded. Most of the burials were observed as highly fragmented bone disturbed by rabbit activity. Scarred trees were found to be quite variable in the size of the scar with the largest scars being on River Red Gums. Scars were classified into three groups, ceremonial- which were associated with a known burial, extraction- used in extracting food such as honey or grubs, and functional- all other types. The latter varied in size from 0.18 m to 3.6 m in length and width from 0.09 m to 0.55 m with an average width of 0.38 m.

Pardoe and Martin (2001) developed a predictive model of site distribution based on their results and an analysis of variables through the use of GIS mapping. They examined proximity to water and found that no sites were more than 12 km from a major river channel (in this case the Murrumbidgee River, and the Yanco, Box and Mirool Creeks). They also found that 75% of sites were within 3.3 km of such water courses. An assessment of proximity to minor stream was made difficult by the presence of irrigation channels in their GIS layer but nevertheless, they also found that the average distance from a minor stream was 1.8 km and 75% of sites recorded were within 2.2 km (Pardoe and Martin 2001:106).

Martin's PhD thesis (2006) examined the spatial, temporal and socio-cultural relationships of mounds in order to establish a model of human behaviour that could explain the linking of environment, spatial and temporal patterns and cultural change in the archaeology of the Hay Plain. She undertook excavations of two mound complexes, one at the Tchelery property, and one at Ravensworth property about 60 km and 70 km northeast of the current assessment area respectively. The Tchelery mounds were situated northwest of Dry Lake on grey cracking clays. Martin dated the mound to 4,010±170 BP (Martin 2006:119) and the Ravensworth 3 mound was dated to between 4,100±70 BP and 3,860±60 BP (Martin 2006:96). Martin concluded that mound building commenced in the region about 4,300 years ago but there was an increase in mound building after 2,000 BP and that there was a deliberate focus on wetland plants such as *Typha* and *Triglochin* that were baked and steamed in the mounds, along with animal foods.

Martin (2010) also conducted a detailed archaeological survey and modelling project for the Rivers Environmental Restoration Program (RERP). This project area was also focused on the Lowbidgee and concentrated on areas downstream (west) of Maude, areas to the east and west of Oxley on the Lower Lachlan floodplain, the Great Cumbungi Swamp and the western side of the Murrumbidgee north of Balranald. The project utilised GIS modelling to identify areas of archaeological potential and gaps in the archaeological record and targeted field survey to these locations. They recorded 1,306 archaeological features at 1,186 locations with the major site types being mounds (41%), scarred trees (21.7%), hearths (12.7%), artefacts (11.5%), shell middens (5.4%) and burials (4%). The conclusions for the project were that in broad terms there appeared to be a difference in the distribution of sites across the riverine plain. Martin identified that mounds and burials were concentrated on the lower western side of the plain while ovens and artefact scatters were more common on the higher eastern side of the plain. Martin thought the difference was related to the character of the hydrological regimes, because mounds were related to the ecological diversity of the dependable wetlands as food sources. She found that mounds were situated on the higher sand bodies and paleochannels present in the western part of the plain (Martin 2010:78). The RERP survey found burials to be in similar landforms to those identified by Bonhomme, namely lunettes, source bordering dunes, river levees and prior stream levees as well as sand bodies within the clay floodplain.

Several archaeological investigations have also been conducted across the region as part of development applications which been summarised below to provide further information to inform an indication of site modelling for the Project Area being assessed in this report.

Edmonds (1997) identified four Aboriginal sites during the survey for Binbinette Station, approximately 40 km south-east of the current assessment area, including a scarred tree, a midden with an associated scarred tree and two extensive campsites. The two campsites had stone artefact assemblages dominated by quartzite flakes and *in situ* hearths with burnt clay heat retainers on severely scalded soils. It was estimated that both campsites contained over 1,000 artefacts. The soil around the hearths with clay heat retainers was

noted as being eroded up to 15 cm in depth which created a series of mounded hummocks and clay pans. These clay pans fill up with water after rain and provide a temporary water source. Edmonds suggested that these temporary water sources may have made the area an attractive camping place during winter rains as Aboriginal groups ventured further away from the rivers during autumn and winter months to hunt on the plains. Edmonds concluded from this survey that landforms associated with a water source (including temporary clay pans) were the most archaeologically sensitive and that plains have low archaeological sensitivity.

In 2003, Edmonds surveyed the proposed Balranald Levee on behalf of the Balranald Shire Council. The project area was situated on the Condoulpe and Riverland land systems and ran for approximately 3.4 km along the Murrumbidgee River. The predictive model suggested that culturally modified trees, middens and camps sites were the most likely site types to be identified with the high riverbanks and the margins between the Condoulpe and Riverland land systems the most archaeologically sensitive landscapes in the study area. A total of 12 sites were recorded, including 10 modified trees and two shell middens.

Kamminga (2010) examined potential Aboriginal artefacts from three surface sites and an isolated find within Yanga National Park and three collections held by the National Parks and Wildlife Service (NPWS) housed at Yanga Homestead. Two of the stone artefact scatters, Waugorah Road and Lintot Lake, were confirmed to be Aboriginal in origin and comprised of 12 and 54 artefacts respectively. Kamminga noted that the raw material types identified within the Yanga assemblages were mostly quartzite, with lesser numbers of silcrete, quartz, sandstone.

Landskape conducted a preliminary cultural heritage assessment of the Atlas-Campaspe Mine area which is located approximately 100 km northwest of the current assessment area and developed a predictive site model based on the desktop research for the distribution of archaeological sites in the area over various landscapes (as cited in Niche 2012:34). It was predicted that stone artefacts and hearths would be the most common site types in the area which would likely be located near relict lake basins or clay pans that may intermittently hold water. The likelihood of encountering scarred trees, shell middens and burials was assessed as low as these site types are generally found near more permanent water sources. Burials were most likely to occur in bordering dunes and lunettes adjacent to rivers and lakes. Landskape noted that silcrete stone sources have previously been recorded in the Willandra Lakes Region and that silcrete outcrops may occur in areas such as dry lakebeds (as cited in Niche 2012:38).

In 2012 Niche undertook field survey for the Atlas-Campaspe Mine projects using the Landskape predictive model noted above. The field survey included inspection of the proposed mine approximately 90 km north of Balranald and the proposed Ivanhoe Rail Facility. No sites were previously recorded in the project area despite the close proximity to the Mungo National Park and Willandra Lakes Region World Heritage Area. The survey of the proposed development corridor identified 78 Aboriginal sites within the Atlas-Campaspe Mine area and 22 Aboriginal sites within the Ivanhoe Rail Facility. A number of areas of high and moderate Aboriginal heritage value were also identified, consequently the development corridor was modified to allow the conservation of some areas. Niche identified a number of isolated finds, artefact scatters, hearths and a modified tree. The majority of stone artefacts were retouched tools manufactured from silcrete which is common in the area. Fewer chert, sandstone and quartzite artefacts were also recorded. The sites recorded in the Atlas-Campaspe Mine area were all generally located on the margins of ephemeral depressions. A raised dune on the eastern edge of a lake depression near the proposed works footprint was also noted to have archaeological potential. The proposed transport route surveyed had the highest number of sites and it was suggested that this density of sites was reflective of the close proximity to more permanent water sources in the area. Niche concluded that the sandplain and dune fields assessed contained few traces of past land use by Aboriginal people while the playas and relict lake areas contained an abundance of Aboriginal objects.

Niche (2015) undertook survey for the Balranald Mineral Sands Project for Iluka Resources Limited for the proposed development of a mineral sands mine 12 km north-west of Balranald between 2012 and 2014. A total of 548 sites were identified over the course of the project. A database of sites for the project was

created that is referred to as the Balranald Project Aboriginal Heritage Database. Analysis of site distribution and density was used to classify areas as having high, moderate or low archaeological risk to assist in the management of the mine. Niche predicted that stone artefacts and hearths were the most likely site type to occur in the project area while middens, modified trees and burials were less likely to occur. Niche also predicted that mounds were unlikely to occur in the project area. During the field survey an emphasis was placed on visually inspecting alluvial plains, playas and basins while sand plains, sand dunes and areas with reduced archaeological visibility had less of an emphasis placed on them. While 11 land systems were identified and surveyed within the Balranald Mineral Sands Project, very few Aboriginal sites were located in the Condoulpe landform, which is the main land system within the current Project Area.

The artefact density per hectare of surveyed land system by Niche for the Balranald Mineral Sands Project is shown below in Table 3-3. Stone artefact occurrences as isolated finds and clusters were the most common site types identified. A breakdown of the site types recorded by Niche is shown in Table 3-4. Niche noted that there was a strong correlation between the location of sites and dunes, rises, lunettes and exposures associated with depressions or a decrease in elevation in the landscape. The majority of sites (approximately 52%) contained between one to 10 stone artefacts with only eight of the recorded sites containing over 200 artefacts. Silcrete artefacts were dominant and accounted for 93.5% of the recorded assemblage. The bulk of the stone artefacts recorded were complete flakes, broken flakes and angular fragments. Retouched flakes or tools formed 7.9% of the assemblage with a number of tool types identified including burins, burrens, piecers and assorted scrapers. Niche (2015) concluded that within the project area sites fell into either short term occupation or single activity sites or specific long term seasonal nodal sites.

Table 3-3 Artefact density per ha of surveyed land system in the Balranald Project Aboriginal Heritage Database (Niche 2015:103).

Land System	All recorded/ estimated artefacts in the Balranald Project Aboriginal Heritage Database (ha)	Surveyed land system (ha)	Artefacts per hectare of land system surveyed
	Artefact count	Transect ha	Artefact/ha
Arumpo	2	16.7	0.1
Bulgamura	4	7.9	0.5
Condoulpe	31	606	0.1
Gulthul	661	667.6	1
Hatfield	1619	347.5	4.7
Marma	4299	605.6	7.1
Perekertin	82	36.2	2.3
Rata	2777	1037.6	2.7
Riverland	1	19.3	0.1
Wilkurra	28	13.8	2
Youhl	884	198.4	4.5
Total	10388	3556.2	

Table 3-4 Summary of Aboriginal Site Types within the Balranald Project Aboriginal Heritage Database (Niche 2015:91).

Site Type	Sites in Balranald Aboriginal Heritage Database	
	Number	%
Artefact scatter (more than 1)	230	41.97
Isolated Artefact	246	44.89
Artefact scatter and Hearth	42	7.66
Hearth	22	4.01
Hearth and Isolated Artefact	5	0.91
Artefacts, Hearth, Culturally Modified Tree, Shell and PAD	1	0.18
Artefacts, Mound, Mound Scatter, Hearth, Hearth Scatter and PAD	1	0.18
Culturally Modified Tree	1	0.18
Total	548	100.00

NGH (2017) were contracted by GHD on behalf of Murrumbidgee Irrigation Ltd to prepare an ACHA for the proposed Gunbar Water Pipeline Project approximately 130 km north-east of the current assessment area, that would supply water to the Wah Wah Stock and Domestic district between Griffith and Hay, NSW. The assessment area comprised a 20 m wide pipeline corridor of approximately 296 km in length, largely within the road reserves of the area. The Project Area was also within the Murrumbidgee Scalded Plains, the Murrumbidgee Channel and Floodplains, the Lachlan Depression Plains, the Lachlan Channels and Floodplains, and the Lachlan Lakes, Swamps, and Lunettes Mitchell landscapes (DECCW 2002). A total of 93 Aboriginal sites were identified during the survey which included a pedestrian survey of the entire alignment. The site types are shown in Table 3-5 below. NGH concluded that the area had been used intermittently over a period for camping, evident in the distribution of stone artefacts and hearths. They also believed that there was a high potential for similar features to occur within unsurveyed parts of the landscape in the region, with the distribution likely to be focussed on resources such as water and sites therefore found on features such as lunettes, paleochannels, around depressions and waterways.

Table 3-5 Number of different site types identified during the surveys of the Gunbar Water Pipeline (NGH Environmental 2017:17).

Site Types	Number	% of Total Features
Artefact Scatters	54	58
Isolated Finds	33	35.5
Hearths*	6	6.5

* Hearths found in association with a scatter of artefacts were recorded as artefact scatters with hearth features.

Barber (2015) undertook an archaeological survey for the purpose of identifying and recording Aboriginal sites and cultural values of the Nimmie-Caira area, an area of 867 km² between Maude and Balranald and approximately 17 km north-east of the current assessment area. The purpose of the study was to identify sites to assist the future land and water management of the area. Furthermore, it was designed to engage the local Aboriginal communities to enhance and share their knowledge by providing opportunities for involvement in the surveys and recording of archaeological features. Due to the sensitivity of the wetland landscape that made up most of the area, the survey served two purposes. Firstly, it would examine a range of environments and undertake survey to obtain an understanding of likely archaeological resources of the area, to develop site models and clarify the distribution of archaeological features in the landscape. Using both soil mapping, vegetation mapping and sample survey blocks, areas of high, medium, and low archaeological potential were identified. The second aim of the study was to ensure that the area had enough data in relation to the location and type of Aboriginal heritage sites so that the area could be managed effectively in the future. Barber (2015) used GIS to examine environmental data and aerial photography to select a range of survey sample areas for pedestrian survey. A total of 68 separate survey sample areas were examined over a period of 30 days; the total ground coverage of these surveys was 31.68 km², 3.65% of the 867 km² of the Project Area. However, despite being such a small percentage of the total area, the surveys recorded 469 Aboriginal heritage features as shown in Table 3-6 below. Barber also noted that another 39 recordings were made where the archaeologists did not consider the features to be Aboriginal in origin but where the Aboriginal community considered them to be Aboriginal heritage sites; these features were simply called 'Cultural locations'.

Table 3-6 Breakdown of feature types found within the Nimmie-Caira area (Barber 2015).

Feature Type	Number	Percentage of Total Features
Artefact occurrences*	83	17.67
Burial	40	8.53
Hearth	84	17.91
Mound	103	21.96
Modified tree (including ring trees)	46	9.81
Isolated Finds#	113	24.09

* Includes artefacts grouped within 50m of other feature types, eg. Mounds

Includes either isolated or small clusters of artefacts situated more than 50m from another feature

Barber (2015) also made mention that the 40 burials were all found within a mound or a sand body that was elevated above the floodplain, which itself was usually close to other archaeological evidence; none of these burials were intact. Furthermore, Barber had expected the mounds to be the most common feature recorded during the survey, they occurred more frequently in association with waters, especially the Uara, Nimmie and Pollen waterways. They most often occurred on the banks of creeks or on elevated sand bodies and lunettes on the edge of the relict lakes in the area. Their size also varied greatly, from only 2 m in length to nearly 160 m. The hearths were an archaeological feature that contained clay heat retainers but without association to a mound. Some of these features were loosely related while isolated clusters spread across several metres. Both the more spread-out features and the discreet and confined clusters were recorded as hearths. The 46 modified trees that were recorded included four Ring trees. Eleven of the modified trees were identified as River Red Gums (*E. camaldulensis*), while 35 were Black Box (*E. largiflorens*). A total of 46 scars were recorded including six possible rings on the four Ring trees. Only nine of these trees were recorded as dead along with four as dying, the remainder were alive (although two were 'lying down' and one had partially fallen). There were 504 stone artefacts recorded in 193 locations and were most often found in association with mounds. The erosion of these mounds had provided a good opportunity to find stone artefacts, Barber noted that the mounds likely contained more artefacts buried within. Some artefacts were also found in

isolated locations far removed from other archaeological features. This could be the result of travel or could potentially represent the very temporary use of that location.

The Nimmie Caira surveys also identified that sites could remain in the landscape, even after intensive agricultural activities. For example, stone artefacts and other material such as burnt clay were recorded within irrigation bays and on channel banks. It was also found that erosion, often because of rabbit infestation, caused significant impacts to mounds, but that cultural material was still identifiable in a landscape context. The land use by Aboriginal people clearly showed widespread activity across multiple soil and vegetation units but higher ground, associated with elevated palaeochannels, lunettes, sand dunes and plains were clearly preferred. While lower lying areas such as lignum and Nitre Goosefoot wetland vegetation did contain some cultural material, it was generally in lower frequency and in smaller site areas (Barber 2015). Further survey at Nimmie Caira by NGH in 2019 recorded an additional 62 mound sites along Uara Creek. The purpose of the survey was obtaining baseline data to assist the Nari Nari Tribal Council in managing heritage locations within Nimmie Caira. The report also provided options for the longer-term management of sites (NGH 2019).

Wakool Indigenous Corporation (2016a) undertook a due diligence archaeological investigation for the proposed Balranald Floating Pontoon on the northern bank of the Murrumbidgee River, near the Balranald Road Bridge, for the Balranald Shire Council. No Aboriginal sites or objects were recorded during the survey.

Wakool Indigenous Corporation (2016b) also undertook a due diligence archaeological investigation for the proposed Kyalite floating Pontoon on the northern bank of the Wakool River, near the Kyalite Road Bridge, for the Balranald Shire Council. The proposed works area covered an area approximately 20 x 30 metres along a steep slope subject to inundation during flood events. Although no Aboriginal sites or objects were recorded during the survey a known shell midden (AHIMS #is 47-8-0004) was located approximately 10 m south of the project area. The close proximity of AHIMS #is 47-8-0004 suggested the possible presence of subsurface material and it was recommended that an AHIP be granted prior to works commencing.

3.5 Local archaeological studies

There have been two surveys conducted to the west of the Project Area, both for solar farms (NGH Environmental 2016, (2017a & 2017b), a survey and test excavation programme undertaken as part of the Project EnergyConnect Eastern section assessment which includes part of the Project Area and two due diligence assessments conducted within the Project Area – one for proposed met masts (NGH 2021) and one for Geotechnical Investigations (NGH 2022). These are described in detail below and show in Figure 3-3 and Figure 3-4.

NGH Environmental (2016) surveyed 800 ha for the proposed Sunraysia Solar Farm near Balranald approximately 1.5 km west of the current assessment area. The survey recorded three sites comprising two clusters of burnt clay recorded as ovens and a site complex of seven stone artefacts and three hearths. They noted that the absence of scarred trees, which is another common site type in the area, was not surprising as the Project Areas had been cleared of native vegetation for cropping purposes and that most scarred trees occurred near permanent water sources, of which there were none. The nature of the archaeological material within this landscape suggested that Aboriginal use of the landscape was intermittent. These results of this assessment indicated that while sites can occur throughout the landscape, even in areas of highly disturbed farming activities, there is a dominance of Aboriginal cultural material recorded within the Perekertin landscape system and in relatively undisturbed landscapes in the area. The Perekertin landscape is characterised as a transitional area on the riverine plain. This project now has SSD approval.

Biosis (2017a & 2017b) undertook an ACHA for the Limondale Sun Farm in Balranald approximately 1 km west of the current assessment area. There were five previously recorded AHIMS sites within the site boundary. The survey of the study area located a further 11 Aboriginal sites, including artefacts scatters, hearths, earth mounds and a scarred tree. Two of the Aboriginal sites also had historical objects indicating

that they are post-contact sites. The Aboriginal sites recorded within the assessment area were predominantly identified on red sandy rises in disturbed (ploughed and trackways) contexts within the Murrumbidge Scalded Plain landscape. The identification of only one site within the Mallee Cliff soil landscape was expected given that this landscape was noted to have the least archaeological potential. Biosis noted that the location of sites within the study area seems to bear little correlation with their relationship to modern water sources as there was no drainage or creek lines in the study area and none of the sites were located in close proximity to water. The generally poor condition of sites within the study area was noted to be the result of the historic agricultural disturbance and land use history of the area. All stone artefacts identified during the survey were silcrete, which is a common material for the area. This project now has SSD approval.

Navin Officer Heritage Consultants Pty Ltd (NOHC) undertook an ACHA (NOHC 2022) for the Project EnergyConnect Eastern Section (PEC-East) in NSW from the Buronga substation to Wagga Wagga substation. The PEC-East survey included a section of alignment within the Junction Rivers Wind Project area. The PEC-East project recorded 105 Aboriginal sites within the heritage survey area with an additional 11 sites previously recorded as well as identifying 45 areas of PAD. Isolated finds were the most common site type recorded across the PEC-East project followed by artefact scatters, modified trees, hearths with few mounds, middens and sites with multiple features. Sites were most commonly recorded on alluvial plains and flat plains and were identified near or across high order perennial watercourses. Three areas of PAD were identified in proximity or within the Junction Rivers Wind Project area. PEC-E-PAD05 (Figure 3-3) is within the Junction Rivers Wind Project area. Test excavation within this PAD recovered no stone artefacts or cultural material and this area was subsequently found to not be a PAD and NOHC argued that Condolup Creek was not a focus of past Aboriginal land use (NOHC 2022:129). The other two PADs one to the west and one to the east of the Junction Rivers Wind Project area similarly had no stone artefacts or cultural material recovered and were found to not be PAD.

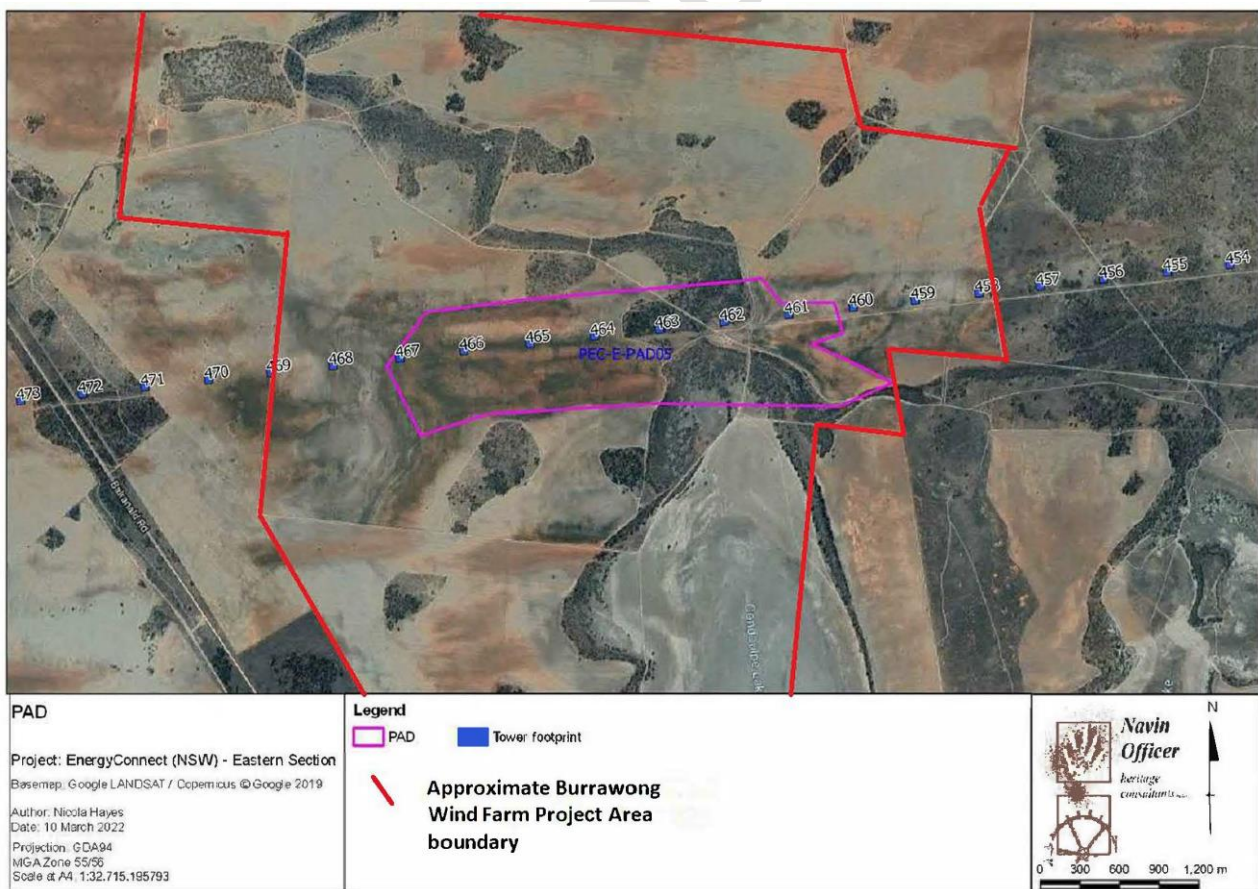


Figure 3-3 PEC-E-PAD05 location from NOHC 2022:32 with approximate boundary of the Junction Rivers Wind Project area marked in red.

NGH Pty Ltd (2021) undertook a due diligence assessment for two proposed met mast locations on behalf of Windlab within the boundary of the Junction Rivers Wind Project area (Location 1 [Lat: -34.8139, Lon: 143.5613], Location 2 [Lat: -34.8772, Lon: 143.6451]). The two met mast locations inspected were found to be highly disturbed, predominantly from extensive agricultural cultivation. However, a single silcrete stone artefact was identified on the upper slope of a sandy rise. The due diligence assessment refers to this site as Burrawong 1. Harm was avoided to the place through redesign of the met mast location and the installation of a no-go zone around this site to ensure no inadvertent harm.

NGH Pty Ltd (2022) undertook a due diligence assessment for 15 test pit and eight bore hole locations for geotechnical investigations for the proposed Junction Rivers Wind Project. The survey for the due diligence was undertaken at the same time as the survey undertaken for this ACHA in March 2022. Visibility was approximately 99% across the proposed locations for the geotechnical investigations. These areas were found to be highly disturbed, predominantly from extensive agricultural cultivation. Despite the high levels of disturbance, two stone artefact scatters (Burrawong AFT 1 and Burrawong AFT 2) and five isolated stone artefacts (Burrawong 2, Burrawong 3, Burrawong 4, Burrawong 5, Burrawong 6) were identified. Secondary locations were proposed for geotechnical investigations to avoid harm to the identified sites.

3.6 Summary of archaeological context and site location model

The AHIMS database is a record of those places that have been identified and had site cards submitted to AHIMS. It is not a comprehensive list of all places in NSW as site identification relies on an area being surveyed and on the submission of site forms to AHIMS. There are likely to be many areas within NSW that have yet to be surveyed and therefore have no sites recorded. However, this does not mean that sites are not present. While a number of in-depth studies have been completed in the wider region, a comprehensive and detailed understanding of Aboriginal land use of the region is still somewhat lacking. It is possible however, to ascertain that proximity to resources, particularly food and water sources was a key factor in the location of Aboriginal sites. It is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape.

The Project Area is generally accepted to be located within Muthi Muthi Country. The Muthi Muthi people have well established links to the land of which the Project Area falls within. Their cultural connection and occupation of the land has been well documented by the presence of Aboriginal objects in the area.

Based on previous studies undertaken in the region, a general idea of Aboriginal land use of the area can be suggested. It is possible to ascertain that proximity to water sources and raw materials were key factors in the location of Aboriginal sites. The results of previous archaeological surveys in the region show that there are sites and Aboriginal objects present throughout the region, even in areas highly disturbed by farming practises. The surveys undertaken in the region give a clear picture as to the most common site types, those being stone artefacts, hearths, mounds, burials, and modified/scarred trees. Due to the landscape and soil type in the area it is very likely that the pattern of site distribution will continue within the Project Area. The presence and durability of stone artefacts in these areas also suggests a similar frequency may occur within the Project Area being assessed in this report.

The results of the surveys in the landscape immediately adjacent to and within Balranald suggest that the region has archaeological sensitive due to its proximity to major regional (and seasonal) waterways along with other landscape features including ancient paleochannels and relict lake features including lunettes and red sandy dunes and raised micro topographic features. As such, it is likely that the Project Area would have been occupied by past Aboriginal people throughout different times of the year. In particular, elevated areas within a markedly flat landscape are known to contain clusters of cultural material. Paleochannel and lunette features and areas on the margins of wetlands and drainage depressions, including where stands of trees are present, indicate less disturbed areas, and are also known to contain sites. Characterised by siliceous sands and red-brown earths, these areas generally contain the largest concentrations of known and registered AHIMS sites across the Project Areas and its surrounding landscape.

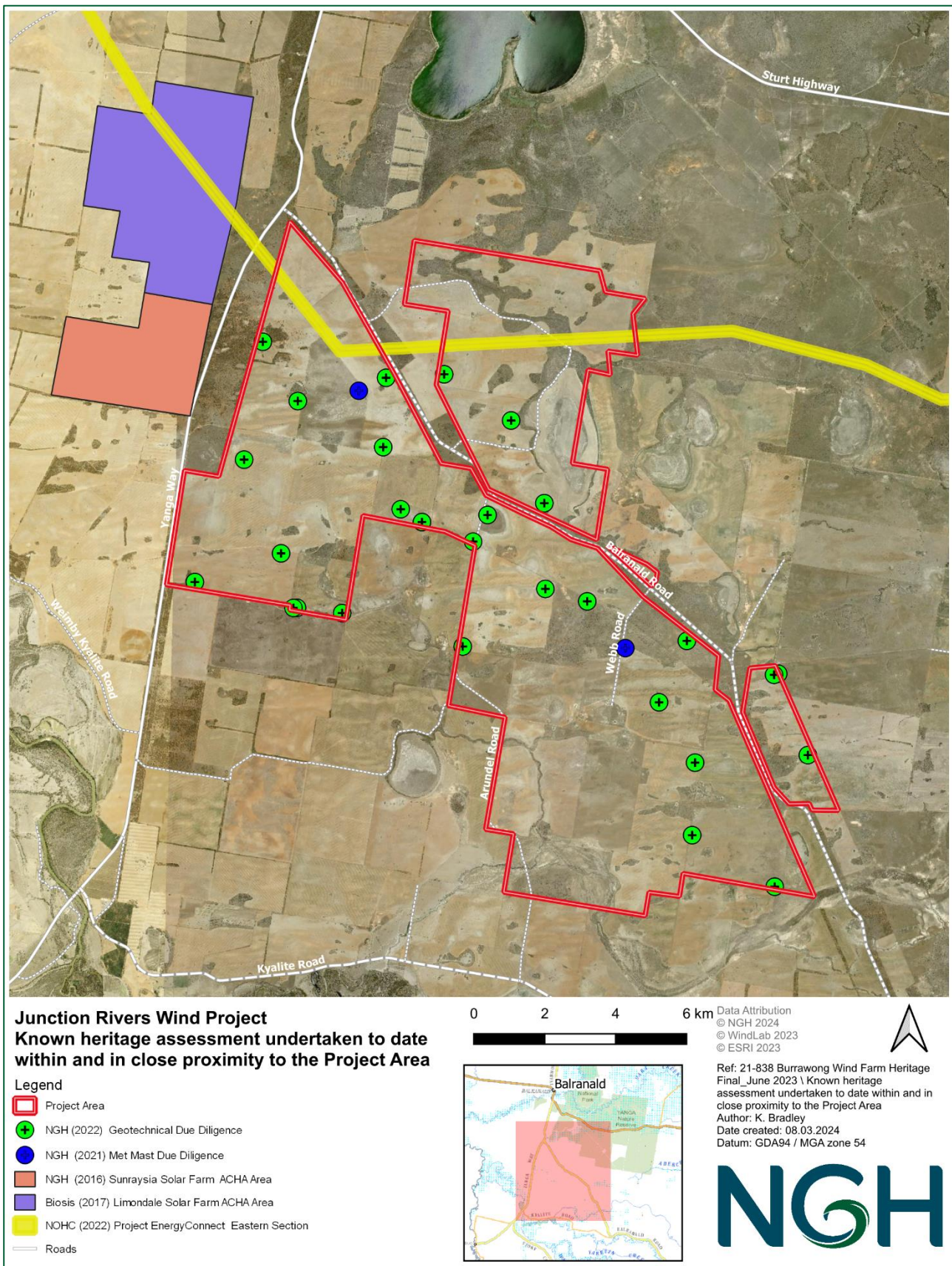


Figure 3-4 Known heritage assessment undertaken to date within and in close proximity to the Project Area.

4. Landscape context

Understanding the landscape context of the Project Area may assist us to better understand the archaeological modelling of the area and assist in identifying local resources which may have been used by Aboriginal people in the past. This information can then potentially be used to predict the nature of Aboriginal occupation across the landscapes within the Project Area.

Factors that are typically used to inform the archaeological potential of landscapes include the presence or absence of resources that would have been used by Aboriginal people including water, animal and plant foods, stone and other resources. The environmental context is equally important in terms of the taphonomic process, erosion or other factors that may influence the detectability of Aboriginal heritage sites.

The landscape context assessment for the Project Area is based on a number of classifications that have been made at national, regional and local levels to help us better understand the archaeological modelling of the area based on the geology, topography, hydrology, flora and fauna and past land disturbances within and adjacent to the Project Area.

4.1 Geology, Topography and Soils

The landscape context assessment is based on several classifications that have been made at national and regional level for Australia that include the National Interim Biogeographic Regionalisation for Australia (IBRA) system, Mitchell landscapes, NSW soil landscapes and geological maps. The combination of these differing resolutions of landform data provides a comprehensive and multi scaled understanding of the landscape within the Project Area and its immediate surroundings.

The national IBRA system identifies that the majority of the Project Area as located within the South Olary Plain Subregion of the Murray Darling Depression Bioregion and a small section in the northeast corner of the Project Area within the Murrumbidgee Subregion of the Riverina Bioregion. The description of the geology, topography and soils within these IBRA subregions is provided in Table 4-1.

Table 4-1 IBRA Subregion descriptions (DE&E 2016).

Unit	Geology	Characteristic Landforms	Dominant Soils
South Olary Plain	Quaternary aeolian sands and lake sediments	Dunefields, sandplains, dry lakes and groundwater basins.	Deep siliceous and calcareous red to yellow sands, sandy earths, brown texture contrast soils on dunes and sandplains. Saline, gypseous and calcareous clays on lake beds, missed sands and pelleted clays in lunettes
Murrumbidgee	Quaternary alluvial sediments, clay and sand with source bordering dunes and lakes.	Soils are red brown earths, grey and brown clays and deep siliceous sands on dunes.	Red brown earths, grey and brown clays and deep siliceous sands on dunes.

The NSW 1:1500K simplified surface geology shows the Project Area mostly comprises of Quaternary Woorinen Formation (Qdw) which consists of poorly consolidated red-brown sands. However, a small area in the north-eastern corner of the Project Area (which is outside the proposed development corridor) has Quaternary lacustrine deposits (Ql) and Cainozoic sand dunes. The lacustrine deposits form when lakes are filled with sediment during wet period and after the water evaporates, mud, silt and sand are left in the now

dry lakebed. A small portion in the south of the Project Area consists of Cainozoic Shepparton Formation which has poorly consolidated clay, silt, sand and gravels.

Review of the Australian Soil classification (ASC) mapping within the Project Area shows that the soils within the Project Area consist primarily of grey-brown and red Calcareous soils (ASC order Calcarosols).

Further landscape mapping as part of the Mitchell landscapes system (DECC 2002) notes that the majority of the Project Area is located within the Murrumbidgee Depression Plains. Three other landscapes are also present in small areas within the Project Area which include the Murrumbidgee Lakes, Swamps and Lunettes, Mallee Cliffs Sandplains, and Murrumbidgee Scalded Plains. These landscapes are described below in Table 4-2 and shown in Figure 4-1.

Table 4-2 Description of the Mitchell Landscape relevant to the Project Area (DECC 2002)

Mitchell Landscape	Characteristic Landforms	Typical Soils
Murrumbidgee Depression Plains	Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters	Grey to brown clays and clay loams with linear patterns of sandy prior streams.
Murrumbidgee Lakes, Swamps and Lunettes	Large active freshwater lakes and swamps frequently flooded by the river, often nestled within larger relic Quaternary lake features.	Beaches, sand and clay pellet lunettes and sand hills on the eastern margins. Lake beds and associated channels of grey cracking clay, beaches of brown to white sands, lunettes of deep cemented yellow to white sands, with or without interbedded strata of pelleted clay. Relief of lakes and channels to 8 m, lunettes to 15 m.
Murrumbidgee Scalded Plains	Quaternary alluvial plains with extensive scalding interpreted as relic floodplains or terraces.	Grey, brown and red cracking clays, red brown texture-contrast soils with scalds. Levees traces evident, relief generally
Mallee Cliffs Sandplains	Extensive, slightly undulating sandplain of Quaternary aeolian sands with east-west trending dunes, often with blowouts, partly scalded broad swales and small depressions, relief 6 to 10 m	Solonized brown soils, calcareous loamy sand, and texture-contrast soils on the plain, red and brown sands on dunes, non-cracking grey or brown clays in depressions.

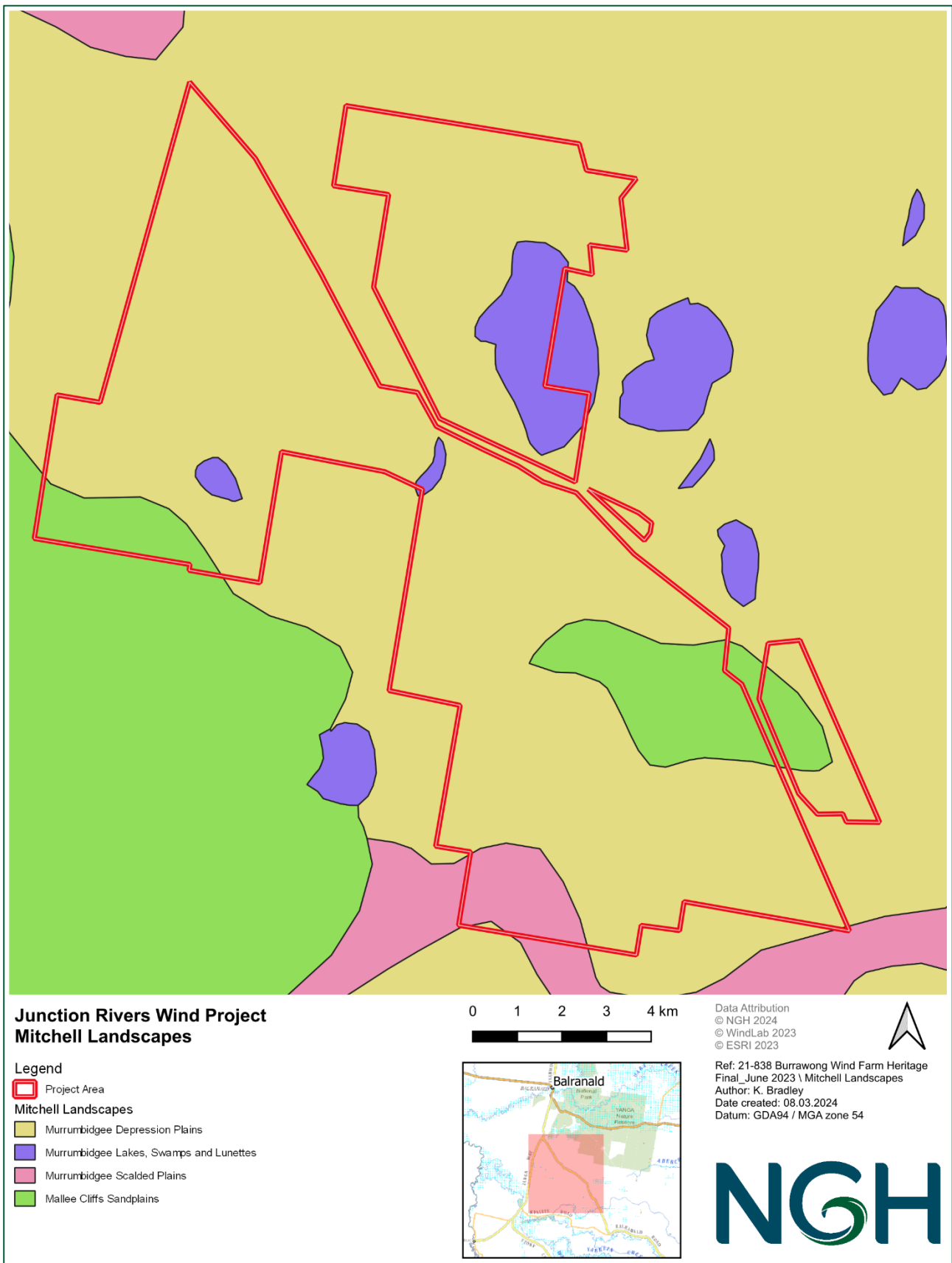


Figure 4-1 Mitchell Landscapes relevant to the Project Area.

In earlier work on the NSW landscape, parts of western NSW were also divided into land systems (Walker 1991) with this mapping extending across the Project Area. Based on land system mapping compiled in “Land Systems of Western New South Wales” (Walker 1991) the Project Area is mostly within the Condoupe land system which is characterised as a sandplain between dunefields on the Riverine Plain near Balranald. Other notable elements of this system include the aeolian east-west dunes with relief to 5 m. There are small areas of the Murrumbidgee, Marma and Victoria land systems within the Project Area as described below in Table 4-3 and show in Figure 4-2.

Table 4-3 Description of the land systems in western NSW relevant to the Project Area (Walker 1991)

Land system name	Description	Soil and Vegetation	Landform and geomorphology	Summary
Condoupe (Cd)	Sandplains and dunefields with mallee	Mallee. Plain and flats of predominantly solonized brown soils and areas of red earths; dunes of deep brownish sands; drainage basins of grey cracking clays; generally dense to scattered belah and mallee; areas of dense edible chenopods; drainage basins of dense black box, nitre goosefoot and dillon bush; variable speargrass, annual saltbushes and forbs.	Sandplain of Quaternary aeolian material with large areas of east-west trending dunes; relief to 5m; open flats, terminal drainage basins, locally depressed to 2m.	Sandplain between dunefields and the Riverine Plain near Balranald
Murrumbidgee (Mc)	Floodplains with black box and/or river red gum	Southern Riverine Woodlands. Plains with grey cracking and non-cracking clays; lunettes and rises of deep brownish sands; backplains of scalded yellow texture-contrast soils; moderate to dense black box, lignum, old man saltbush and nitre goosefoot; rises, lunettes and backplains with clumped mallee, white cypress pine, prickly wattle and scattered shrubs; abundant forbs and grasses.	Alluvial plains. Floodplain of grey fine-textured Quaternary alluvium with small rises, relief to 3 m; backplains, scalded levees and swamps. Riverside lunettes of deep sands; relief to 10 m. Irregularly inundated by flooding.	Higher terraces of the Murrumbidgee Murray, lower Lachlan and Wakool Rivers.
Marma (Mh)	Scalded plains	Saltbush Plains. Levees of red and yellow texture-contrast soils and grey cracking clays; sandplains and lunettes of solonized brown soils and red texture-contrast soils; floodplains of grey cracking clays; scattered to dense bluebushes, bladder saltbush and old man saltbush; canegrass in swamps; abundant forbs, copperburrs arid annual saltbushes.	Alluvial plains. Severely scalded levees, with associated swamps, pans and lunettes; relief to 5m; associated floodplain of fine-textured Quaternary alluvium and aeolian sandplains.	Ill-defined scalded drainage tracts associated with the Riverine Plain.

Land system name	Description	Soil and Vegetation	Landform and geomorphology	Summary
Victoria (Vc)	Lakebeds and swamps	Southern Riverine Woodlands. Lakebeds, margins and channels of grey cracking clays and brownish sands; lunettes of deep, cemented sands; scattered to dense black box, lignum and nitre goosefoot along margins and channels; sparse prickly wattle and bluebushes on lunettes; copperburrs, forbs and annual grasses.	Playas and Basins. Large active freshwater and saline lakes to 15 km in diameter, depressed to 10 m; crescentic lunettes to 20 km long, relief to 20 m, small interconnecting channels and adjoining alluvial plains of Quaternary alluvium, sometimes saline, and aeolian sand.	Active lakes associated with the Murrumbidgee and Murray Rivers.

Given this mapping it is clear that there is very little topographic variation within the Project Area although there are east-west orientated dunes within close proximity to the Project Area and from aerial imagery, it appears that the Project Area may contain this landform. The relative height difference between the crest and swales varies but is approximately 5 m. The dunes surrounding the Project Area do not; however, comprise a consistent and regular dune sequence but rather an irregular and variable array of dunes, some running almost continuously across the region as micro topographic features while others fade into low swales at their eastern or western extremities.

In general, the soil profiles within the Project Area are expected to be predominantly made up of silty or cracking clays as described above, these soils tend to have low potential for subsurface archaeological deposits. However, any red sandy deposits and lunette features have high potential for Aboriginal objects. Other archaeological assessments in the region have also noted that very few Aboriginal sites were located in the Condoulpe landform which is the main land system within the Project Area and the development corridor.

4.2 Hydrology

The Project Area broadly lies between the Edward River in the south (which at its closest point to the Project Area is 3.5 km south) and the Murrumbidgee River in the north (which at its closest point to the Project Area is 13.5 km north). Within the north-eastern portion of the Project Area is Condoulpe Lake and the associated Condoulpe Creek. To the north is Lake Yanga and several other small lakes that surround the Project Area including Lake Talbetts. Forest Creek also intersects a small portion of the southern area of the Project Area. The hydrology of the Project Area and its immediate surrounding area is shown in Figure 4-3.

All the natural creeks and bodies of water in this area are ephemeral. However, in pre-European times, the region would have been subject to seasonal flooding. The Murrumbidgee River would flood and through a distributary system of anastomosing channels, including Forest Creek, water would spread out across the plain. Channels would have assisted in the distribution of the floodwaters into a myriad of seasonal wetlands and lakes. The water eventually made its way west and south, passing through what is now Yanga National Park and re-entering the Murrumbidgee River near Balranald as well as emptying into the Edwards River.

These creeks and bodies of water would have acted as vital waterways in the past and be a reliable and predicted event used to harness certain resources such as fish, water birds and plants.

4.3 Flora and fauna

The information provided herein is intended as a generalised summary of the endemic flora and fauna present within the Project Area and is not to be used as a substitute for detailed ecological and biodiversity studies.

As previously mentioned, the Project Area covers two different IBRA subregions. The plant communities within these subregions are summarised below (Table 4-4). These species would have provided a wide variety of resources for the manufacturing of wooden implements, medicine and food, as well as habitats for animals that were also used for food. If mature native trees remain, there is a possibility that scarred trees may be present as Yellow Box are known to have been favoured species for the extraction of bark for use as canoes, shields, and containers by Aboriginal people. The vegetation communities pre European settlement would have also provides numerous habitat types for fauna. Canopy trees provide foraging and nesting/resting habitat for birds and arboreal fauna. The mid-storey provides foraging and nesting habitat for smaller birds, as well as refuge for small-medium sized mammals and reptiles. Ground cover plants, logs and fallen leaves also provide shelter and foraging habitat for terrestrial fauna.

The majority of the Project Area today is cleared and cropped farmland containing exotic species of grass and commercial crops.

Table 4-4 IBRA subregion vegetation types (DE&E 2016).

Bioregion subregion	Vegetation types
South Olary Plains	Diverse mallee on sands with; pointed mallee, congoo mallee, red mallee, lerp mallee, slender-leaf mallee, yorrell, white cypress pine, mallee cypress pine, belah, rosewood, with porcupine grass and shrubs. Belah, rosewood, black bluebush, pearl bluebush, old man saltbush, on sandplains and heavier soils. Black box fringing depressions, halophytes on salinas, and chenopod shrublands on lunettes. lunettes, sometimes with white cypress pine.
Murrumbidgee	River red gum and river cooba on channels, Black box, lignum and old man salt bush on floodplains, Myall and old man saltbush with other saltbush and grasses formerly widespread on backplains. White cypress pine on dunes.

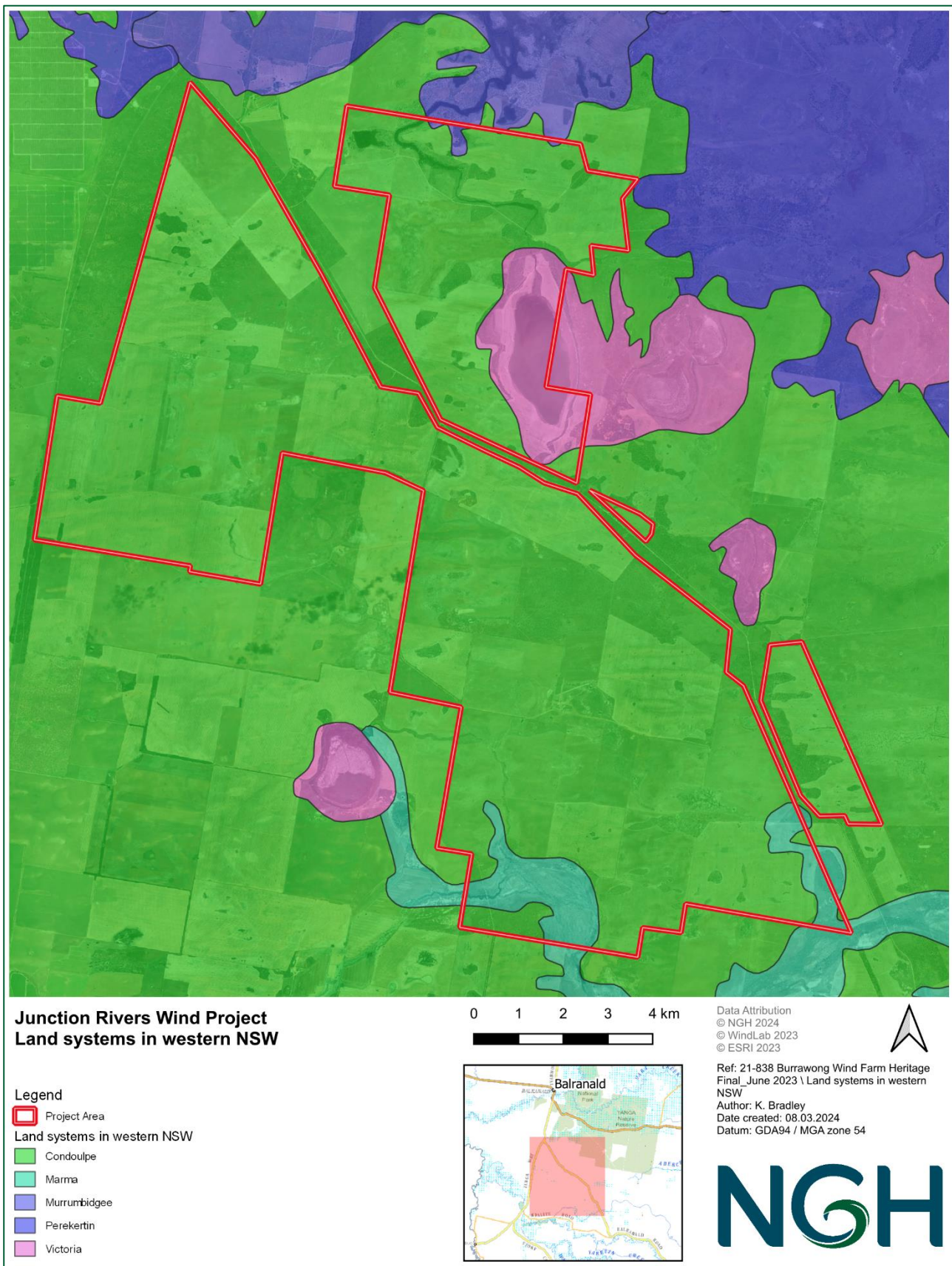


Figure 4-2 Land systems in western NSW relevant to the Project Area.

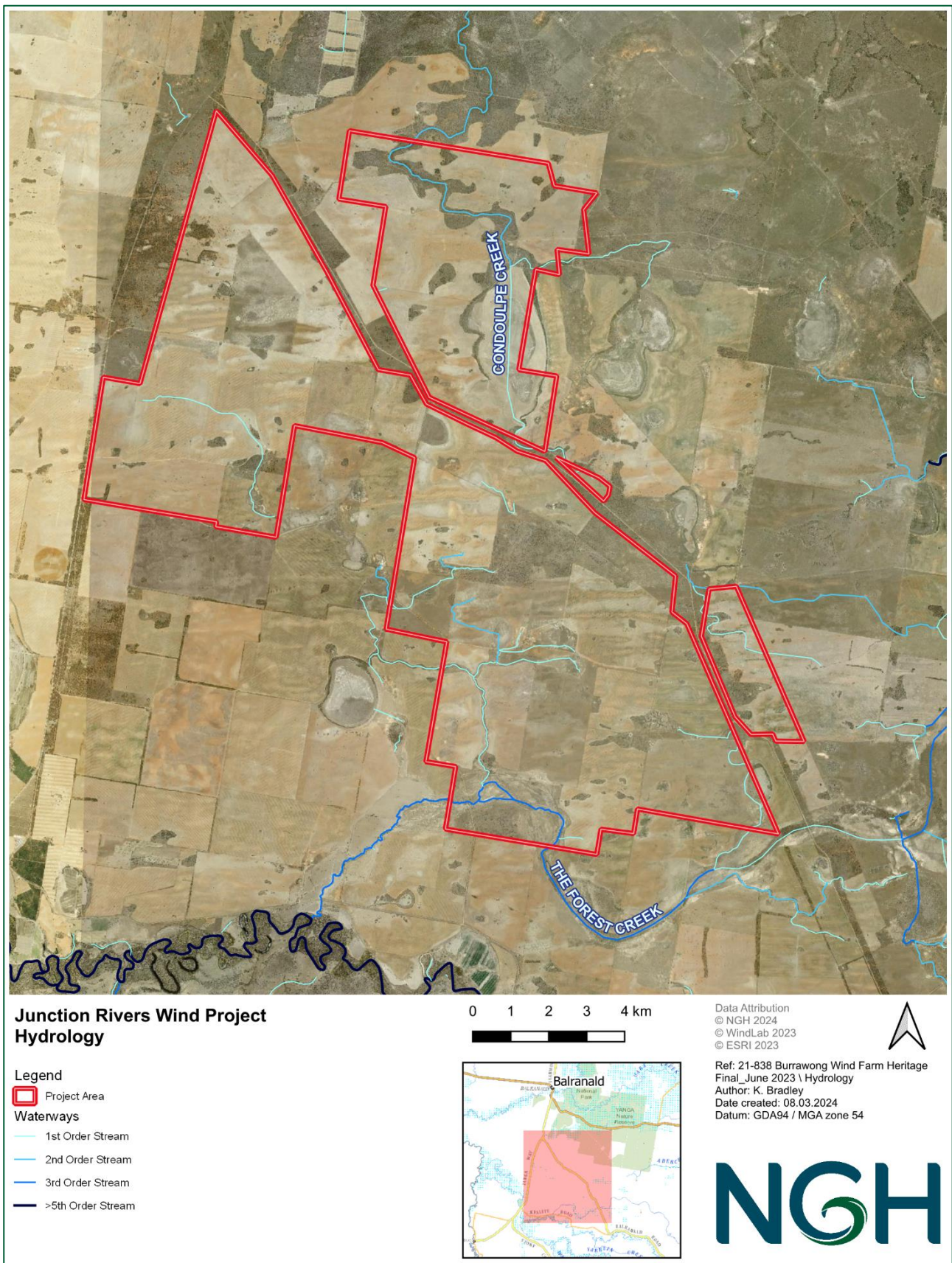


Figure 4-3 Hydrology in the Project Area.

4.4 Historic land use and disturbance

The following section is a brief overview of the historical land use of the Project Area. A comprehensive history of the historic use of the Project Area is available in the Historical Heritage Impact Assessment (HHIA) report prepared by Umwelt (2024).

The Project Area is within the parishes of Burrawang, Condoulpe, Salisbury and Turora in the county of Wakool, and partially within the parish of Wombah in the county of Caira, NSW as show in

Figure 4-4. The corresponding parish maps over the Project Area are provided in Plate 4-1 to Plate 4-5 which show that the Project Area initially formed part of the Yanga holding, before being subdivided into a number of smaller holdings.

The Project Area has been diagonally crossed by the Balranald Road and the area generally has a history of intensive agricultural and pastoral use. The majority of the area has been utilised for grazing and crop production since European settlement in the mid 1800's.

From the beginning of the 20th Century, wells and tanks were constructed throughout the area to provide better infrastructure for the stock and allow for an increase in capacity. The region was designated as part of the soldier settler scheme and was surveyed for subdivision in April 1924. By 1964 the region and its various farms were reintegrated into the Yanga Estate.

Homestead ruins were noted as being present within the Project Area (see Plate 4-6). Information regarding these ruins have been further addressed and detailed in Umwelt's HHIA.

The area is also noted to have historically had a very high rabbit populations with rabbit trappers actively employed in the area. In an attempt to control the rabbit numbers in the area the rabbiters are noted to scar and mark trees as part of one of the poisoning techniques historically used. The rabbiters would cut the bark from the Box trees then sprinkle strychnine over the sap on the bark before it was then placed on the ground about 3 meters apart to poison the rabbits (Kelly 2007). This method of cutting the tree would leave very distinctive marks on the trees which are referred to as "Rabbiters Trees" (see Plate 4-7). However, there is still ongoing debate in regard to the origins of these markings on trees in the area as the members of the local Aboriginal community also identified these as Leaghur Trees, sacred women's sites colloquially known as 'Rabbiters Trees', which are believed to be related to sacred activities of the Muthi Muthi people (Wakool Indigenous Corporation 2016b).

"During the drought periods rabbits were noted to eat the bark from Box trees to get the sap and trappers have been noted to create a cut on the bark an poison the rabbit population on Yanga in the early years was in plague proportion and when in drought time the rabbits were eating of the bark from the Box trees on the creek lines to get the sap out to eat. And the old trappers who seemed to be fighting a losing battle with the rabbits decided to cut of the bark from the Box trees to feed the rabbits with sap. When they carried out the cutting of bark form the trees they used steel axes that left a very distinctive mark in the heartwood of the tree. After cutting the bark off they would then sprinkle strychnine over the sap on the bark and it was then placed on the ground about 3 metres apart to poison the rabbits." (Kelly 2007:2)

An account of Yanga in 1912, by traveller and author Walter Kilroy Harris, who visited many stations along the Murray and Murrumbidgee, notes the number of rabbiters being employed at on the Yanga run:

"Manager Briggs, whom we found hard at work in his little office, told us that even at that moment, in addition to the permanent eighty men, and the almost equally permanent one hundred rabbiters he had a small army of contractors at work completing a job of sinking twenty-one bores in various parts of his run." (NSW and the Office of Environment and Heritage 2013:58)

The current land use of the Project Area, according to eSpade, is a mixture between dryland cropping, irrigated cropping, irrigated pasture, grazing, and modified pasture. Combined with the historic use of the region for seasonal grazing, it is likely that the area has had low to moderate surface disturbance in grazed areas and moderate surface disturbances in areas which have been ploughed for agricultural crop production.

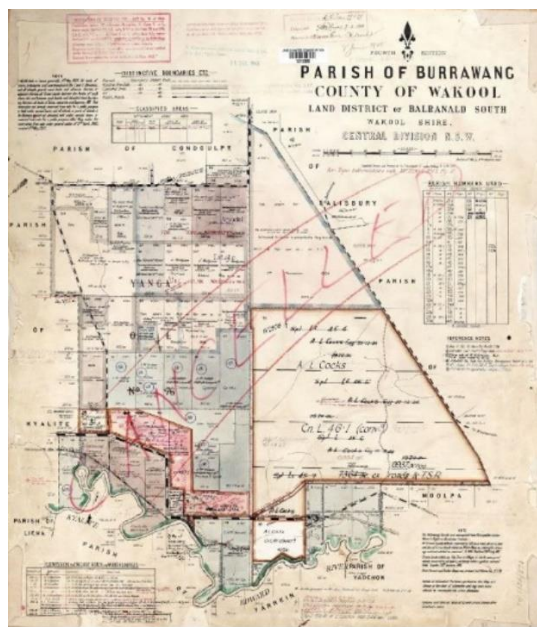


Plate 4-1 Parish of Burrawang map dated 1928.

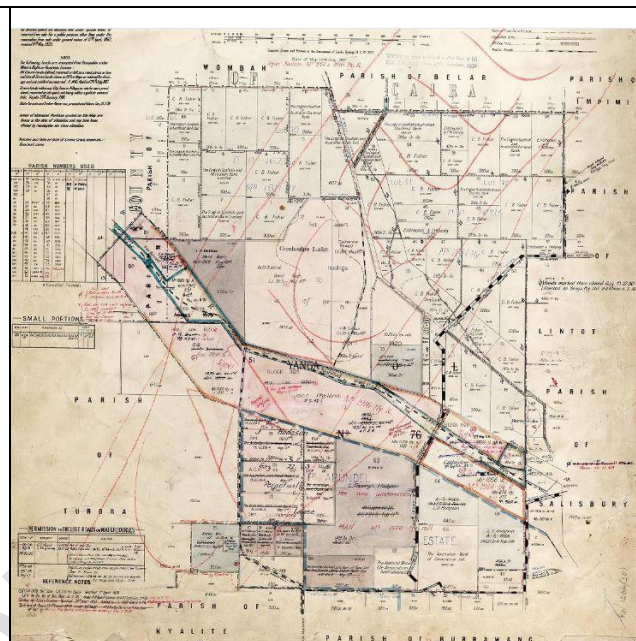


Plate 4-2 Parish of Condoulpe map dated 1928.

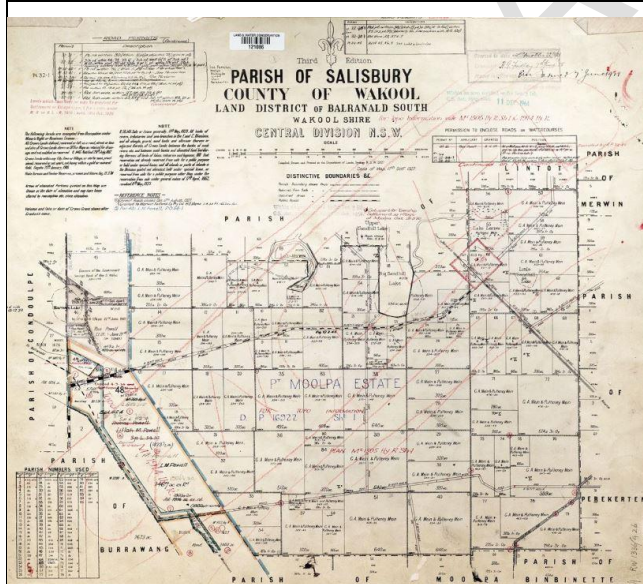


Plate 4-3 Parish of Salisbury map dated 1928.

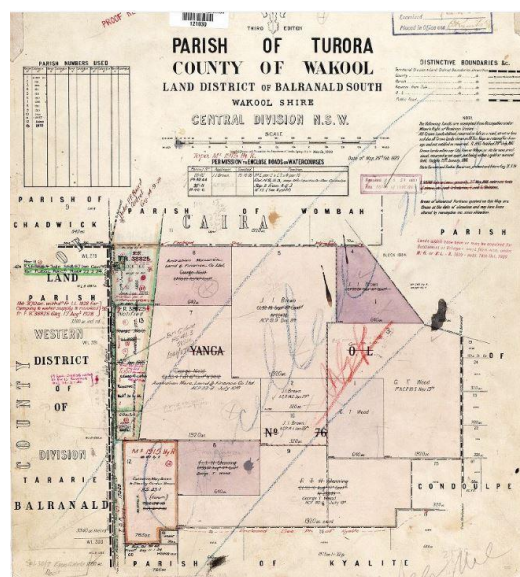


Plate 4-4 Parish of Turora map dated 1920.

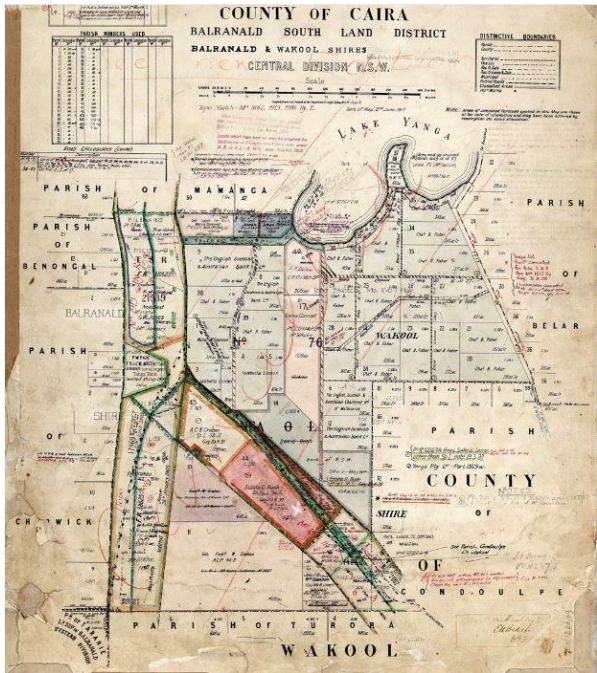


Plate 4-5 Parish of Turora map dated 1920.



Plate 4-6 Lynwood homestead remains located in the Project Area (see Umwelt 2024 for further details of the historical assessment for this Project).



Plate 4-7 Example of a rabbit sapping tree, historical Rabbiters Trees (image from Kelly 2017).

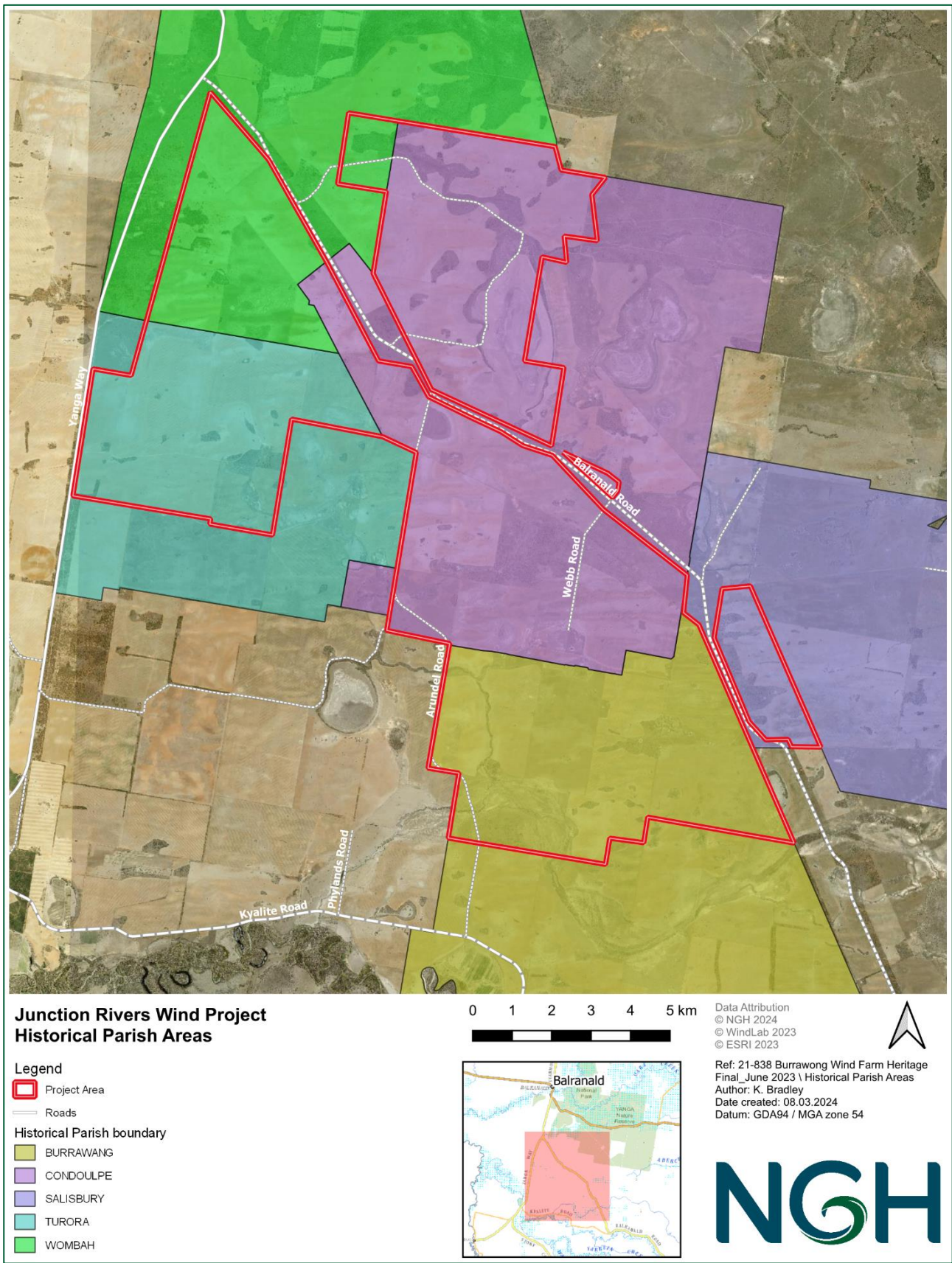


Figure 4-4 Historical Parishes within the Project Area.

5. Summary of contextual information

Most archaeological surveys are conducted in areas with topographic variation, and this can lead to differences in assessments of archaeological potential and site modelling for the location of Aboriginal objects. Previous studies in the region have identified that sites are generally noted to be associated with slightly raised red sandy area and areas adjacent to water. Paleochannel and lunette features and areas on the margins of wetlands and drainage depressions, including where stands of trees are present are also known to contain sites. Additionally, any old growth mature native trees within the Project Area have the potential to have been culturally modified. It is considered that the Project Area as a whole would have provided resources, shelter, water and food for Aboriginal people.

Previous studies in the Balranald area suggest that the region as a whole has archaeological sensitivity due to its proximity to major regional (and seasonal) waterways along with other landscape features including ancient paleochannels and relict lake features, including lunettes and red sandy dunes. In particular, slightly elevated raised areas which are considered micro topographic features within a markedly flat landscape are known to contain clusters of cultural material.

While there have been archaeological investigations within and in close proximity to the Project Area the information relating to site patterns, their age and geomorphic context is little understood. The robustness of the AHIMS survey results are considered to be only moderate for the present investigation as few surveys have been undertaken within and adjacent to the Project Area.

The Project Area is noted to be situated on relatively flat ground with very little topographic variation. Prior to European land modifications, this area as a whole would have provided resources, shelter, water and food from terrestrial and fluvial environments for Aboriginal people.

The landforms within the Project Area have been determined based on topographic identification during the fieldwork for this project and in consideration of contour data, Digital Elevation Modelling (DEM), the Mitchell landscapes and the mapping for the Land Systems of Western NSW. Given the very little topographic variation within the Project Area it has been determined that the Mitchell landscape mapping most accurately reflects the landforms and vegetation within the Project Area. While the Land Systems of Western NSW mapping (see Figure 4-2) could also be used over the Project Area and is considered to be an accurate representation of the landforms, the Mitchell landscape data has an additional landform which allows for slight further refinement of the landforms and archaeological sensitivity in the wider Project Area.

These Mitchell landscapes are listed below and shown in Figure 4-1.

- Murrumbidgee Depression Plains
- Murrumbidgee Lakes, Swamps and Lunettes
- Murrumbidgee Scalded Plains
- Mallee Cliffs Sandplains

The division of the landforms by the Mitchell landscapes is also in line with the adjacent study undertaken for the Limondale Sun Farm which may allow for the comparison of data between these two adjacent studies.

6. Predictive model

Several archaeological surveys have been undertaken in the region and the adjacent ACHA studies undertaken for the Limondale Sun Farm and Sunraysia Solar Farm near Balranald were both conducted within similar landforms and provide reliable data to build a predictive model for the Project Area. In particular, elevated red sandy areas within a markedly flat landscape are considered to likely contain Aboriginal sites. Paleochannels, relict lake and lunette features and areas on the margins of wetlands and black box drainage depressions, including where stands of trees are present are also known to contain sites. Additionally, any old growth mature native trees within the Project Area have the potential to have been culturally modified. These landforms represent the most archaeologically sensitive areas with the highest potential for previously unrecorded Aboriginal heritage sites to occur within the Project Area.

It is considered that while the Project Area as a whole would have provided resources, shelter, water and food for Aboriginal people any slightly elevated red sandy raised areas (which are considered micro topographic features within a markedly flat landscape) in proximity to water sources have a high potential to contain cultural material. It is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape, but the current archaeological record of that activity is limited.

In association with the predictive modelling and known sites within the region, the site types most likely to occur within the Project Area are Aboriginal stone artefacts (in low to moderate densities and/or as isolated finds), scarred trees (within woodland communities on the edges of a depression), earth mounds, hearths, PADs and ancestral burials (in particular within lunettes). As the Project Area has been subject to clearing for grazing and agricultural activities, the chances of scarred trees surviving in the area are greatly reduced. However, there is the potential for the implements used in the scarring of trees (to extract bark and wood used for various purposes) to remain within the vicinity. A lack of stone outcrops throughout the region also suggests that any stone artefacts identified would be the product of trading stone resources and their utilisation.

Given that the landscape context is a plain and there have been a moderate degree of historic disturbance including mass vegetation clearance in recent times it is assessed that whilst there is a moderate to high potential for Aboriginal cultural heritage to occur within the Project Area, there is a relatively low potential for it to be in its primary context.

Based on the results of the previous archaeological investigations in the general area, and through extrapolation of sites from the area, it is possible to provide the following model of site location in relation to the Project Area which is provided in Table 6-1 below.

Table 6-1 Aboriginal Site Prediction Statements

Site Type	Site Description	Potential
Isolated Finds	These sites consist of a single artefact and can occur anywhere. As Aboriginal people traversed the entire landscape for thousands of years, such finds can occur anywhere and indicate the presence of isolated activity, dropped or discarded artefacts from hunting or gathering expeditions or the ephemeral presence of short-term camps.	High potential to occur within the Project Area. This feature is likely to occur.

Site Type	Site Description	Potential
Artefact scatters	Artefact scatter sites can range from high-density concentrations through to sites containing two artefacts. The size of these sites usually correlates with proximity to sources of fresh water. Representing camp sites or flaking and maintenance activity can occur across the landscape, usually in association with some form of resource or landscape. Water bodies, such as rivers, ephemeral creeks or clay pans can also be a focus of Aboriginal occupation.	High potential to occur within the Project Area in low to moderate densities. This feature is likely to occur.
Modified trees	Trees that have undergone cultural modification. These require the presence of mature native trees and are likely to be concentrated along major waterways and around swamps or depression areas.	Potential to occur within areas where there are remnant mature native trees, isolated paddock trees, and dead or fallen mature trees. There are patches of remnant vegetation within and adjacent to the Project Area. This feature is therefore possible to occur.
Hearths/Ovens	Are identified by burnt clay used for heat retainers. Some are recorded in the district in association with resource locations. However, they could occur either independently or in association with other Aboriginal cultural features such as artefact scatters. Hearths are generally considered to be limited, one-off use or reused but few times and are smaller concentrations. Ovens are considered to represent larger features, often extending over a larger area and can include other material such as bone.	Similar sites have been recorded within region however they tend to be adjacent to major water sources. It is likely that hearth sites are present within Project Area however oven sites are less likely.
Mounds	Are accumulations of heat retainer ovens that have built up over time. They are typically round or oval in shape and range in length from just a few metres to over 100 m and range in height from 0.1 m to 2 m. They are identified by the presence of baked clay heat retainers, which have usually been brought to the location from a nearby source of natural clay such as a lakebed, swamp or drainage line.	Mounds are generally found in proximity to wetland areas such as lakes, swamps and creeks, often elevated above these areas by being situated on sandy rises, lunettes, source bordering dunes and paleochannels. Mounds are likely to contain a range of other archaeological features such as bone, shell, stone artefacts and burials. This feature has been recorded in the region and may possibly occur within the Project Area.

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Site Type	Site Description	Potential
Burials	Ancestral Aboriginal burials are generally found in elevated sandy contexts or in association with rivers and major creeks.	The Project Area is characterised by low dunes and therefore such sites may occur as burial sites have been recorded nearby.
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material	PADs have potential to occur in areas that are likely to have reasonable subsurface deposits in archeologically sensitivity landforms. This feature may occur within the Project Area.
Shell Middens	Are the agglomeration of shell material disposed of after consumption. Such places are found along the edges of significant waterways, swamps and billabongs.	Similar sites have been recorded within region it is possible that this site type will be identified within the Project Area.

In summary, the Project Area forms part of the overall landscape in which Aboriginal People lived and given that sites have previously been recorded within landscapes that are present within the Project Area, there is potential for Aboriginal objects to be present, despite the existing level of disturbance. As Aboriginal people have lived in the region for thousands of years, there is potential for archaeological evidence to occur throughout the area; this is most likely to be in the form of stone artefacts, heat retainers and modified trees.

With regard to the limitations of the information available, archaeologists rely on Aboriginal parties to divulge information about places with cultural or spiritual significance in situations where non archaeological sites may be threatened by development. To date, we have not been told of any such places within the Junction Rivers Wind Project area. There is always the potential for such places to exist but insofar as the current proposal is concerned, no such places or values have been identified.

7. Investigation strategy and methodology

7.1 Fieldwork Aims

The objectives of the fieldwork were to:

- Comply with current NSW legislation and heritage guidelines;
- Undertake survey to identify any archaeological material; and
- To record all Aboriginal cultural heritage objects and places within the development corridor.

Broadly, the aims of the fieldwork were to:

- Identify the presence or absence of Aboriginal cultural material within the development corridor;
- Assess the likely extent and nature of any such cultural material, and.
- Undertake a basic analysis of any cultural material recovered or identified.

7.2 Survey strategy

Where possible the proposed development corridor was redesigned to avoid areas of high archaeological sensitivity prior to fieldwork being undertaken for this Project. NGH archaeologists completed the field survey for this project with the participation of members of the Aboriginal Community (RAPs) on foot, targeting the proposed development corridor within the Project Area. The entirety of the proposed development corridor within the Project Area was surveyed on foot as part of the fieldwork undertaken for this Project. The initial survey for this Project was undertaken by the team of two NGH archaeologists and two Aboriginal community representatives over 28 days between the 7th of March 2022 and the 13th of April 2022. Additional survey was also undertaken by a team of two NGH archaeologists and two Aboriginal community representatives over five additional days between the 17th of April 2023 and the 21st of April 2023 to ensure the entirety of the proposed development corridor as assessed in this report was surveyed on foot following some minor design modifications.

The survey strategy was to cover as much of the ground surface proposed to be impacted within the Project Area as possible. Consequently, the survey strategy was devised to walk a series of transects across the proposed development corridor and its associated works areas to achieve maximum coverage. Because the proposed development corridor within the Project Area was generally situated across disturbed agricultural land the survey team were spaced evenly across the proposed impact corridor at 20-30 m intervals to ensure appropriate coverage of any areas proposed for impacts. The linear nature of the development corridor made this an ideal survey strategy allowing for maximum survey coverage and the opportunity for the field team to identify any heritage objects within the corridors of the proposed development corridor. Any exposures or areas of higher visibility within the development corridor were also targeted during the survey. Any mature trees within and/or in proximity to the development area and proposed impact areas were also inspected for any evidence of Aboriginal scarring (c.f. Long 2005).

We believe that the survey strategy was comprehensive and the most effective way to identify the presence of Aboriginal heritage sites within the proposed development corridor. Discussions were held in the field during each day between the archaeologists and Aboriginal community representatives to ensure all were satisfied and agreed with the spacing and methodology. During the survey notes were made about visibility, photographs were taken, and any possible Aboriginal objects or features identified were inspected, assessed, and recorded where deemed to be Aboriginal in origin.

8. Archaeological results

8.1 Survey coverage

The survey was undertaken to encompass all of the proposed development corridor within the Project Area. The proposed development corridor underwent a number of changes during and after the archaeological survey with areas removed from the proposed development corridor to ensure that where possible there was minimal impact on the recorded Aboriginal sites and site types which had high archaeological conservation value. The Mitchell landscapes across the development corridor within the Project Area were used to differentiate the survey units inspected. Three Mitchell landscape units were identified within the development corridor. This included the Mallee Cliffs Sandplains, Murrumbidgee Depression Plains and Murrumbidgee Lakes, Swamps and Lunettes. The development corridor within the Project Area comprised primarily cleared land which has been subject to previous disturbance through ploughing with some fields actively under cultivation at the time of survey and some fallow.

Survey transects were undertaken by foot across the entirety of the proposed development corridor and any initially proposed impact area, primarily in March and April 2022, with an additional week survey undertaken in April 2023. Visibility differed between the surveys undertaken for this Project based on rainfall and use of the area in terms of its farming activities (grazing or under crop cultivation) but overall, the ground surface visibility was very good. The ground surface visibility was overall approximately 85% across the development corridor, with the best visibility occurring in ploughed areas, in blowouts and on existing vehicle tracks.

The Murrumbidgee Depression Plains was the largest survey unit and had a variety of ground surface visibility (see Plate 8-1 to Plate 8-6) which was overall very high. The average visibility was 90% for both the Murrumbidgee Depression Plains and Murrumbidgee Lakes, Swamps and Lunettes (see Plate 8-9 and Plate 8-10) survey units and was 80% for the Mallee Cliffs Sandplains (see Plate 8-7 and Plate 8-8) survey unit. The survey coverage is detailed in Table 8-1 and areas subject to survey shown in Figure 8-1. Allowing for an effective view width of 5m for each of the survey participants and given the variability in ground surface visibility across the development corridors the survey effectively examined 33.2% of the development corridors which were assessed. It is considered by NGH that the survey of the development corridors within the Project Area during this investigation had sufficient survey coverage.



Plate 8-1 Example of ground surface visibility within ploughed paddock in Murrumbidgee Depression Plains survey unit



Plate 8-2 Example of ground surface visibility within ploughed paddock in Murrumbidgee Depression Plains survey unit



Plate 8-3 Example of ground surface visibility within ploughed paddock in Murrumbidgee Depression Plains survey unit



Plate 8-4 Example of ground surface visibility in Murrumbidgee Depression Plains survey unit



Plate 8-5 Example of ground surface visibility in Murrumbidgee Depression Plains survey unit during additional survey in April 2023 in southwest of Project Area



Plate 8-6 Example of ground surface visibility in Murrumbidgee Depression Plains survey unit during additional survey in April 2023 in southeast of Project Area



Plate 8-7 Example of ground surface visibility in Mallee Cliffs Sandplain survey unit



Plate 8-8 Example of ground surface visibility in Mallee Cliffs Sandplain survey unit near Balranald Road.



Plate 8-9 Example of ground surface visibility within Murrumbidgee Lakes, Swamps and Lunettes survey unit



Plate 8-10 Example of ground surface visibility within Murrumbidgee Lakes, Swamps and Lunettes survey unit

Table 8-1 Table of effective survey coverage for the Junction Rivers Wind Project development corridor

Landform	Number of Survey Transects	Exposure type	Survey Unit Area within the development corridor (hectare)	Surveyed area (length m x width m)	Surveyed Area m ²	Visibility (average %)	Effective coverage (area x visibility) m ²	Survey unit surveyed (ha)	Percentage of survey unit effectively surveyed within the development corridor
Murrumbidgee Depression Plains	178	Bare ground, vehicle tracks, ground surface exposures	1,801.1	330,614 x 20	6,612,278	90	5,951,051	595.1	33
Murrumbidgee Lakes, Swamps and Lunettes	6	Bare ground, vehicle tracks, ground surface exposures	14.6	4,527 x 20	90,540	90	81,486	8.1	55.5
Mallee Cliffs Sandplains	34	Bare ground, vehicle tracks, ground surface exposures	208.9	65,153 x 20	1,303,054	80	1,042,443	104.2	49.8
Total	218	Bare ground, vehicle tracks, ground surface exposures	2,024.6	400,294 x 20	8,005,880	84	6,724,939	672.49	33.2%

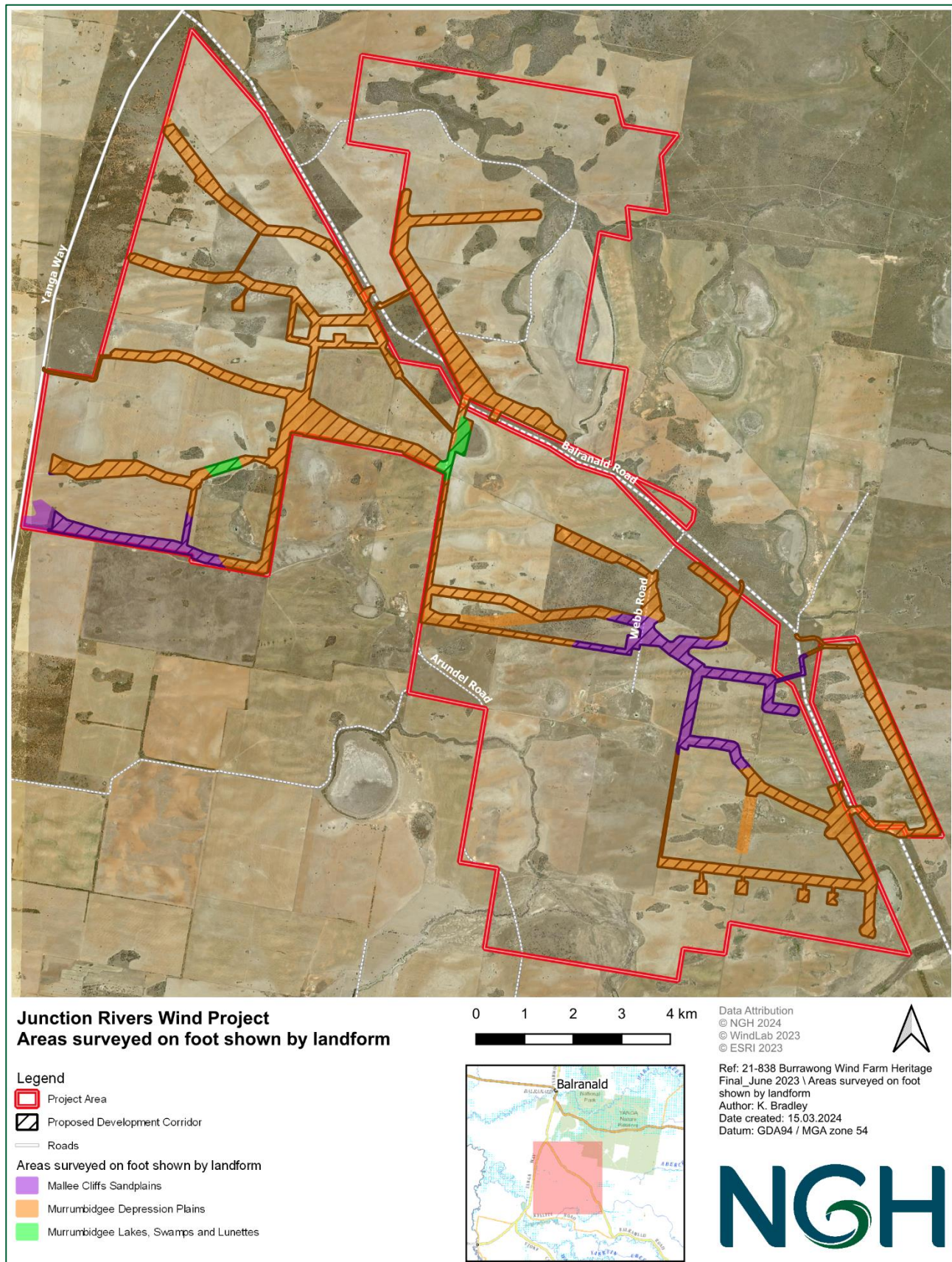


Figure 8-1 Areas surveyed on foot shown by landform.

8.2 Survey results

8.2.1 Previously recorded AHIMS sites in the Project Area

The previously recorded AHIMS sites within the Project Area which are noted in Table 8-2 are largely in the north-eastern section of the Project Area along Condoulpe Creek. All of the previously recorded AHIMS sites within the Project Area are located outside development corridor (as previously shown in Figure 3-2) and no impacts are proposed for works associated with the Junction Rivers Wind Project. Given this, none of the previously recorded AHIMS sites within the Project Area were visually inspected during the surveys undertaken for this assessment.

Table 8-2 Registered AHIMS sites within the Project Area and comments.

Site Number	Site Name	Site Type	Site Status on AHIMS	Distance to the proposed development corridor (m)	Comments for this assessment
47-6-0037	Condoulpe	Burial	Valid	1,780	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0041	Condoulpe Creek	Burial	Valid	1,780	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0093	North Dusty Lake-8	Artefact	Partially Destroyed	2,245	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0945	Burrawong 1	Artefact	Valid	450	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0253	Condoulpe Lake 24	Hearth	Partially Destroyed	1,285	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0147	Condoulpe 19	Modified Tree	Valid	810	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0148	Condoulpe 20	Modified Tree	Valid	845	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0150	Condoulpe 22	Modified Tree	Valid	990	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.

Site Number	Site Name	Site Type	Site Status on AHIMS	Distance to the proposed development corridor (m)	Comments for this assessment
47-6-0255	Condoulpe Lake 26	Modified Tree	Not a site	1,305	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0151	Condoulpe 23	Modified Tree	Valid	1,025	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0254	Condoulpe Lake 25	Modified Tree	Valid	1,240	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0146	Condoulpe 18	Modified Tree	Valid	790	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0069	Condoulpe 2	Modified Tree (Carved or Scarred)	Valid	1,655	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0149	Condoulpe 21	Modified Tree (Carved or Scarred)	Valid	995	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.
47-6-0068	Condoulpe 1	Modified Tree (Carved or Scarred)	Valid	1,620	Not inspected during this assessment as site is located outside development corridor and no impacts are proposed.

8.2.2 Summary of Newly recorded sites

During the survey the following site types and archaeological features were recorded: stone artefacts, hearths, oven mounds and tree cultural sites. It should be noted that where hearths were found in association with high frequencies of artefacts, the naming convention was for the site to be recorded as an artefact scatter (AFT). Where hearths were found in isolation or with a low density of stone artefacts in association, the naming convention was for the sites to be recorded as hearths (HTH).

A summary of the Aboriginal site types/features recorded during the field survey are provided in Table 8-3 and Table 8-4 and their locations shown in Figure 8-2. The site descriptions are provided in Appendix A and the archaeological data recorded at these sites is provided in Appendix B, Appendix C and Appendix D of this report. Maps of the survey results are shown in Figure 8-2 to Figure 8-6.

Table 8-3 Summary of site types

Site Type	Number	%
Isolated finds	37	46.25
Tree cultural sites	24	30
Hearths	9	11.25
Artefact scatter	5	6.25
Hearth and mound	2	2.5
Hearth and Artefact	2	2.5
Artefact Scatter, Hearth and mound	1	1.25
Total	80	100

Table 8-4 Summary of all Aboriginal objects recorded during the surveys for this assessment.

AHIMS Site ID	Name	Type	Brief Site Description
NA	Burrawong WF ST 01	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 02	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 03	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 04	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 05	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 06	Tree cultural site	1 community identified cultural tree with 1 scar

AHIMS Site ID	Name	Type	Brief Site Description
NA	Burrawong WF ST 07	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 08	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 09	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 10	Tree cultural site	1 community identified cultural tree with 2 scars
NA	Burrawong WF ST 11	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 12	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 13	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 14	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 15	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 16	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 17	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 18	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 19	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 20	Tree cultural site	1 community identified cultural tree with 1 scar

AHIMS Site ID	Name	Type	Brief Site Description
NA	Burrawong WF ST 21	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 22	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 23	Tree cultural site	1 community identified cultural tree with 1 scar
NA	Burrawong WF ST 24	Tree cultural site	1 community identified cultural tree with 1 scar
47-6-1159	Burrawong 2	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1161	Burrawong 3	Isolated Stone Artefact Find	1 x Flake
47-6-1160	Burrawong 4	Isolated Stone Artefact Find	1 x Proximal Fragment
47-6-1173	Burrawong 5	Isolated Stone Artefact Find	1 x Flake
47-6-1140	Burrawong 6	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1141	Burrawong 7	Isolated Stone Artefact Find	1 x Distal flake
47-6-1142	Burrawong 8	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1143	Burrawong 9	Isolated Stone Artefact Find	1 x Flake
47-6-1139	Burrawong 10	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1138	Burrawong 11	Isolated Stone Artefact Find	1 x Flaked Piece

AHIMS Site ID	Name	Type	Brief Site Description
47-6-1164	Burrawong 12	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1163	Burrawong 13	Isolated Stone Artefact Find	1 x Proximal Fragment
47-6-1162	Burrawong 14	Isolated Stone Artefact Find	1 x Hammerstone
47-6-1144	Burrawong 15	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1151	Burrawong 16	Isolated Stone Artefact Find	1 x Flake
47-6-1158	Burrawong 17	Isolated Stone Artefact Find	1 x Flake
47-6-1157	Burrawong 18	Isolated Stone Artefact Find	1 x Flake
47-6-1156	Burrawong 19	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1155	Burrawong 20	Isolated Stone Artefact Find	1 x Flake
47-6-1154	Burrawong 21	Isolated Stone Artefact Find	1 x Flake
47-6-1153	Burrawong 22	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1152	Burrawong 23	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1150	Burrawong 24	Isolated Stone Artefact Find	1 x Flake
47-6-1149	Burrawong 25	Isolated Stone Artefact Find	1 x Distal Fragment

AHIMS Site ID	Name	Type	Brief Site Description
47-6-1148	Burrawong 26	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1147	Burrawong 27	Isolated Stone Artefact Find	1 x Manuport
47-6-1146	Burrawong 28	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1145	Burrawong 29	Isolated Stone Artefact Find	1 x Flake
47-6-1184	Burrawong 30	Isolated Stone Artefact Find	1 x Distal Fragment
47-6-1183	Burrawong 31	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1182	Burrawong 32	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1181	Burrawong 33	Isolated Stone Artefact Find	1 x Flaked Piece
47-6-1180	Burrawong 34	Isolated Stone Artefact Find	1 x Grindstone fragment
47-6-1179	Burrawong 35	Isolated Stone Artefact Find	1 x Muller
47-6-1178	Burrawong 36	Isolated Stone Artefact Find	1 x Flake
47-6-1177	Burrawong 37	Isolated Stone Artefact Find	1 x Core
47-6-1176	Burrawong 38	Isolated Stone Artefact Find	1 x Flake
47-6-1188	Burrawong WF AFT 01	Artefact Scatter	Low to moderate density of stone artefacts recorded (50+ artefacts present).

AHIMS Site ID	Name	Type	Brief Site Description
47-6-1175	Burrawong WF AFT 02	Artefact Scatter	Low to moderate density of stone artefacts recorded (50+ artefacts present).
47-6-1174	Burrawong WF AFT 03	Artefact Scatter	Low density of stone artefacts recorded (4 artefacts).
47-6-1172	Burrawong WF AFT 04	Artefact Scatter	Low to moderate density of stone artefacts recorded (29 artefacts present).
47-6-1192	Burrawong WF AFT 05	Artefact Scatter, Hearth and mound	Low to moderate density of stone artefacts recorded (37 artefacts present) with 5 hearth features and an oven mound feature.
47-6-1170	Burrawong WF AFT 06	Artefact Scatter	Low density of stone artefacts recorded (2 artefacts).
47-6-1191	Burrawong WF HTH 01	Hearth and mound	7 hearth features and 1 oven mound feature.
47-6-1171	Burrawong WF HTH 02	Hearth	1 x hearth feature
47-6-1169	Burrawong WF HTH 03	Hearth	2 x hearth feature
47-6-1190	Burrawong WF HTH 04	Hearth	1 x hearth feature
47-6-1168	Burrawong WF HTH 05	Hearth	1 x hearth feature
47-6-1167	Burrawong WF HTH 06	Hearth	2 x hearth feature
47-6-1189	Burrawong WF HTH 07	Hearth	2 x hearth feature
47-6-1166	Burrawong WF HTH 08	Hearth	1 x hearth feature

AHIMS Site ID	Name	Type	Brief Site Description
47-6-1165	Burrawong WF HTH 09	Hearth	1 x hearth feature
47-6-1193	Burrawong WF HTH 10	Hearth and Artefact	1 x hearth feature and 1 x stone artefact
47-6-1187	Burrawong WF HTH 11	Hearth and Artefact	7 x hearth features and 4 x stone artefacts
47-6-1186	Burrawong WF HTH 12	Hearth and mound	1 x hearth feature and 1 x oven mound feature
47-6-1185	Burrawong WF HTH 13	Hearth	2 x hearth feature

Summary of tree cultural sites recorded.

A total of 24 trees were identified by the Aboriginal community representatives as cultural sites. Some of these trees had obvious horizontal axe cut marks within a scar which were requested by the RAPs onsite to be recorded to have scarring and/or modification which is possible to be Aboriginal in origin. It has however been noted by the NGH archaeologists that the scarring and modification of these trees may be representative of 'rabbiting trees' (see Section 2.2.5) and therefore the modification is unlikely to be Aboriginal in origin. In consideration of this, the trees which were recorded with obvious horizontal axe cut marks within a scar are not considered to be an Aboriginal object under the NPW Act. A number of the other trees with scarring were also requested to be recorded by the RAPs. The scarring on these other trees was determined not to conform with the standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005) and therefore these trees are not considered likely to be an Aboriginal object under the NPW Act by NGH archaeologists. Regardless of the assessment of these trees by NGH archaeologists the Aboriginal community representatives onsite view these 24 trees (which were recorded as the individual sites Burrawong WF ST 01 to Burrawong WF ST 24) as cultural sites. As the previous assessment of similar trees with obvious horizontal axe cut marks within a scar in Yanga National Park was unable to unequivocally determine the origin of horizontal axe cut marks on similar trees, the engagement of an arborist was determined not be warranted by NGH in this instance as the community identify these tree as cultural sites.

The scars recorded at the request of the Aboriginal community representatives were on both living and dead trees with generally only a single scar recorded on each tree. The majority of the trees recorded were Black Box trees associated with depressions and areas of remnant vegetation. Black Box trees have historically also been noted to generally be the tree used for 'rabbiting trees'. While a number of the tree cultural sites recorded are located in stands and groupings of trees it was determined that it was appropriate for each individual tree to be recorded as a separate site as part of this assessment to ensure the GPS location of each tree was recorded. This is due to the high conservation value of these trees as a site type to the Aboriginal community. Despite a number of the tree cultural sites occurring in stands there was occasion where a cultural tree was also recorded as isolated occurrences, however this may also be reflective of the survey methodology which was only to inspect the proposed development corridor and not all vegetated areas within the Project Area.

Example of these cultural tree sites is provided below in Plate 8-11 and Plate 8-12.

Given the ambiguity of the origins of the scaring and/or modification recorded on the tree cultural sites recorded during this assessment, no site cards are proposed to be submitted to AHIMS by NGH for these locations as they have been determined to not meet the definition of an Aboriginal object under the NPW Act. Despite this, these trees are all being avoided by the proposed development given their cultural significance to the Aboriginal community.

	
Plate 8-11 Burrawong WF ST 10 with metal axe marks - possible rabbiting tree.	Plate 8-12 Close up of metal axe marks on Burrawong WF ST 10.

Summary of the isolated stone artefacts recorded.

A total of 37 stone artefacts were recorded within the Project Area as surface isolated finds which were labelled subsequently as Burrawong 02 to Burrawong 38. These surface isolated find stone artefacts included flakes (n=13), flaked pieces (n=7), grindstone fragments (n=6), distal fragments (n= 5), proximal fragments (n=2) and a core (n=1), hammerstone (n=1), manuport (n=1) and muller (n=1). These artefacts were primarily manufactured from silcrete (n=19) which is a common raw material for the region. Other raw materials recorded included quartz (n=5), quartzite (n= 5), sandstone (n=5), fine-grained silicious (n=2) and chert (n=1). The sandstone artefacts were generally attributed to the occurrence of grindstone fragments within the survey area. It was noted that of the objects commonly associated with food processing (seed grinding) activities (grindstone fragments and mullers), that the grindstone fragments recorded as the sites Burrawong 10, Burrawong 12, Burrawong 31 and Burrawong 34 had evidence of residues and silica present. These artefacts may be suitable for further research in the form of residue analysis however the disturbed contexts of these finds may detract from their research potential.

Summary of the artefact scatter sites recorded.

A total of six surface artefact scatter (AFT) sites were recorded which ranged from two surface stone artefacts to 50+ stone artefacts. The sites were named Burrawong WF AFT 01 to Burrawong WF AFT 06 which were generally located on a raised red sandy landform. Of these artefact scatter sites only one also contained hearth features and one contained an oven mound feature. The majority of stone artefacts recorded were flaked including complete flakes, broken flakes, debitage and cores. Grinding stones were present, but generally only as fragments. Further analysis of the stone artefacts is provided below in Section 9.

Summary of the hearth, oven and mound sites recorded.

The sites described as hearths (HTH) are the remains of ground ovens with heat retainers. The hearths were present as clustered heat retainers (in some cases still buried), and frequently as dispersed heat retainers resting on the ground surface (a scatter of ex situ heat retainers). In some instances mounds were identified as hearth cooking areas which were likely subject to repeated use and which were slightly built up from the surrounding landscape. The hearth sites were recorded as Burrawong WF HTH 01 to Burrawong WF HTH 13. A total of 31 hearth features and three oven mound features were recorded during the survey. They ranged from single use discrete location (20 cm in length x 30 cm in width) to dispersed heat retainers scattered across large open areas (20 m in length x 20 m in width). The mound features were recorded the accumulation of cooking hearths and were generally recorded in association with other hearth features within the sites. Of the 13 hearth sites recorded, only two were also associated low densities of surface stone artefacts.

	
Plate 8-13 Sample of stone artefacts from Burrawong WF AFT 1.	Plate 8-14 Burrawong WF HTH 03 with range pole at cluster of clay heat retainers.

8.2.3 Consideration of Potential Archaeological Deposits (PAD)

The following factors have been considered to inform the predictive modelling developed to assess the likelihood of *in situ* subsurface Aboriginal objects to be present within the proposed Junction Rivers Wind Project development corridor;

- The visual inspection of the proposed development corridor and impact areas;
- Survey results from the visual inspection;
- An assessment of contour and DEM data;
- Land use history and degree of disturbance;
- Archaeological modelling;
- An assessment of landforms present; and
- Comments from the RAPs who participated in the visual inspection fieldwork.

It was concluded that there was negligible potential for the presence of intact subsurface deposits with high densities of cultural material within the proposed development corridor for the Junction Rivers Wind Project as assessed in this report. The initial proposed development corridor for this Project has been significantly redesigned prior, during and after the completion of the fieldwork to avoid any lunette features and slightly raised/basal slope landforms surrounding current or prior black box swamps which may have subsurface potential.

The current development corridor (as assessed in this report) is largely confined to landscapes which generally have deflated surfaces and areas considered to have negligible potential for intact subsurface deposits with high densities of cultural material. As such it was determined by the NGH archaeologists who undertook this survey that the development corridor as mapped in this report contains few landforms, sites or features that warrant subsurface investigation. The exceptions to this are the mounds and hearth features which were recorded at the sites Burrawong WF AFT 05, Burrawong WF HTH 01, Burrawong WF HTH 03, Burrawong WF HTH 11, and Burrawong WF HTH 12 which were noted to be in situ and likely to have some potential for subsurface material and deposit. These five sites are considered to have some further research value and thus higher archaeological conservation value however, it must be noted that they have been excluded from the development corridor and/or captured in heritage exclusion zones to ensure no harm will occur to these sites. Consequently, no subsurface test excavation was determined to be warranted within the proposed development corridor.

ACHA Appendix A

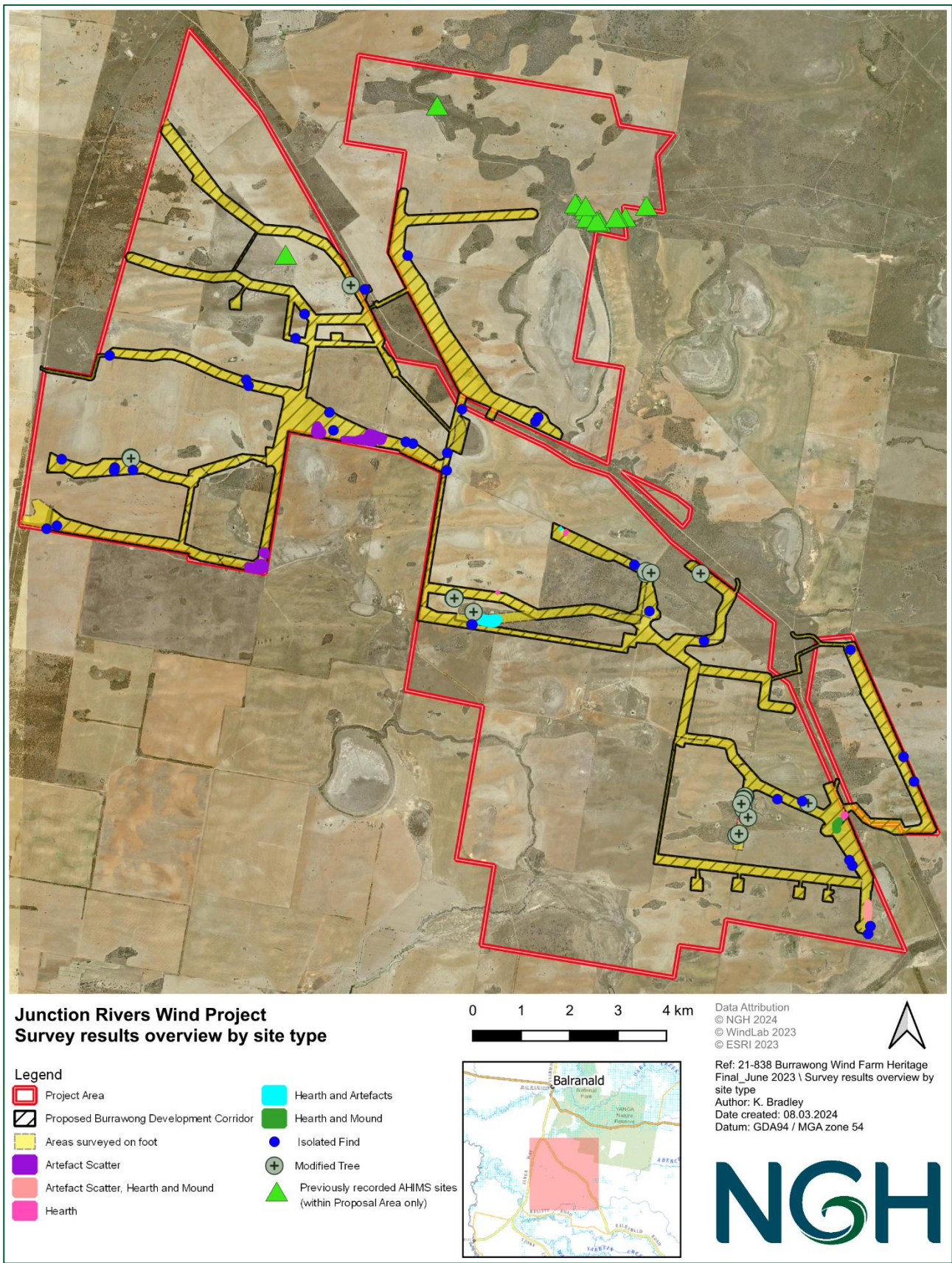


Figure 8-2 Location of the sites recorded during the survey.

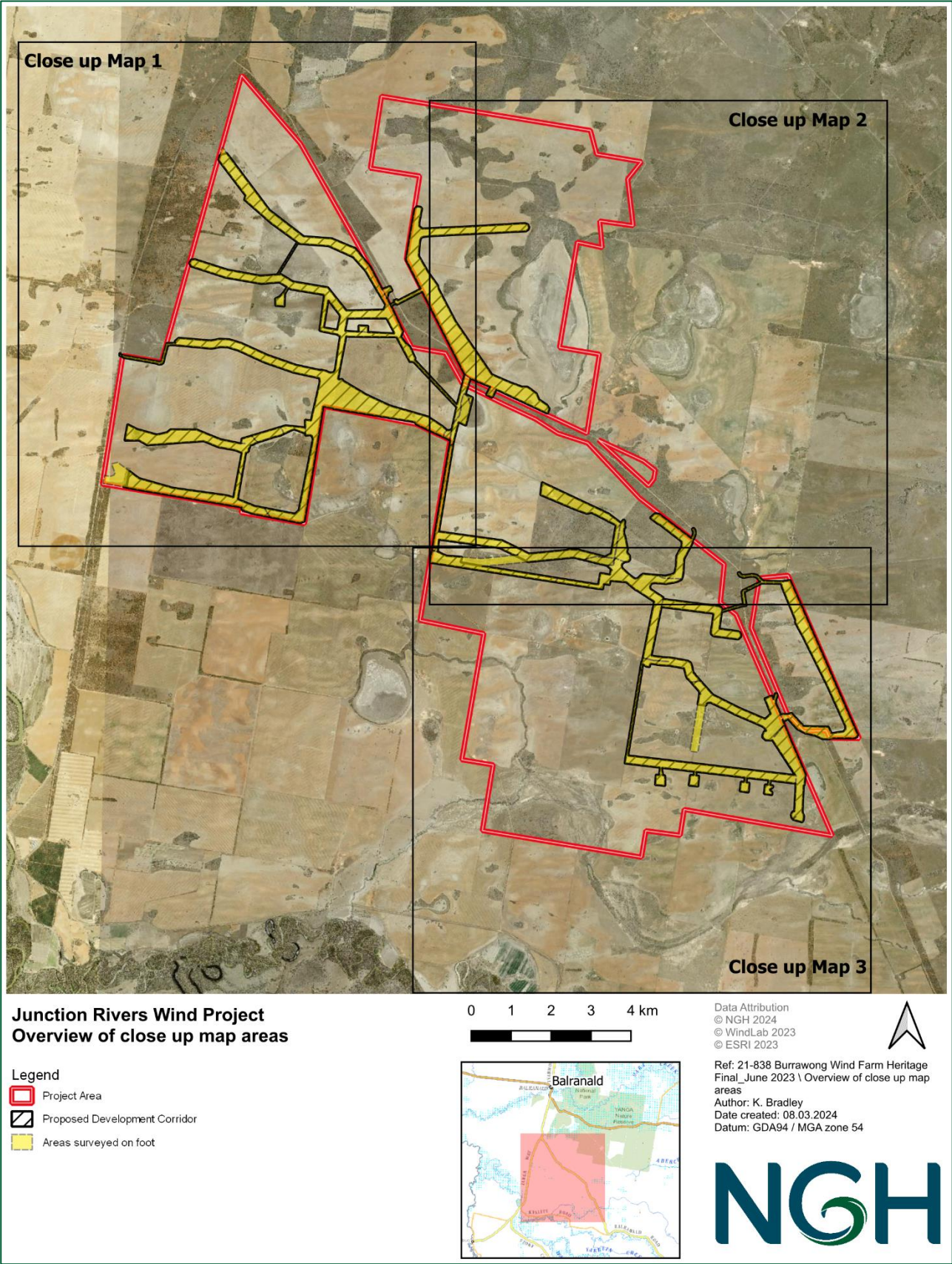


Figure 8-3 Overview of close up maps in this report

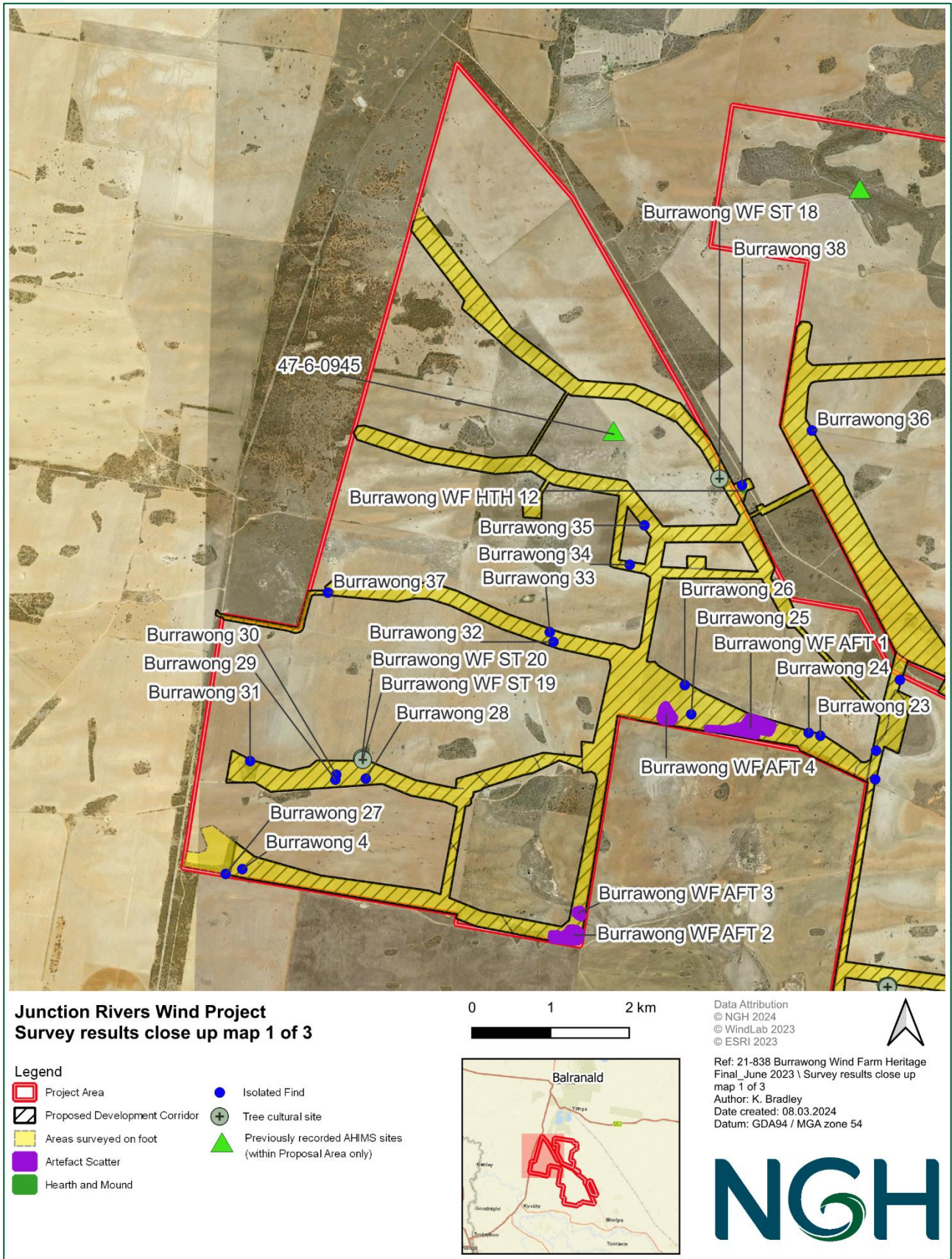


Figure 8-4 Survey Results close up Map 1.

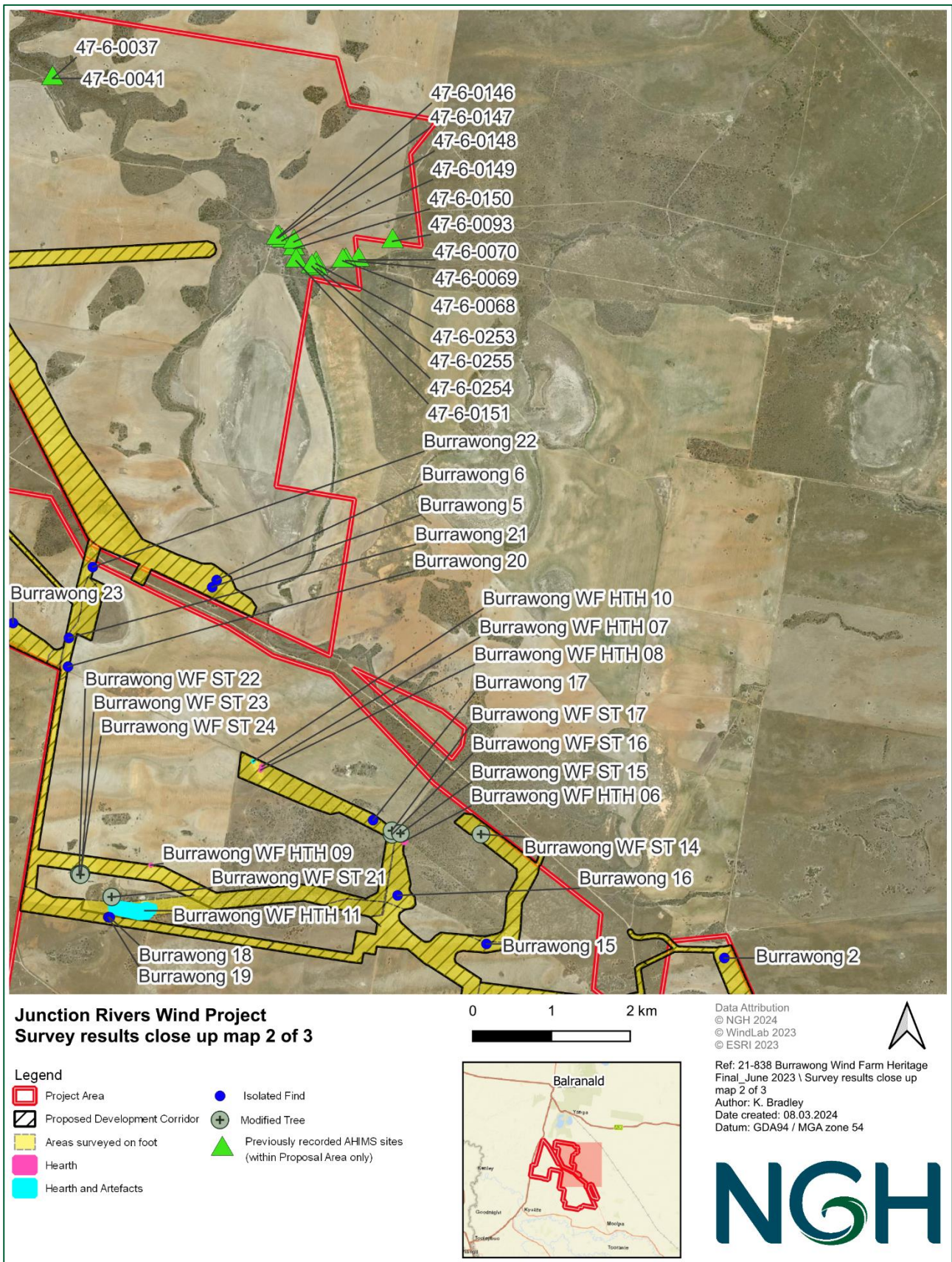


Figure 8-5 Survey Results close up Map 2

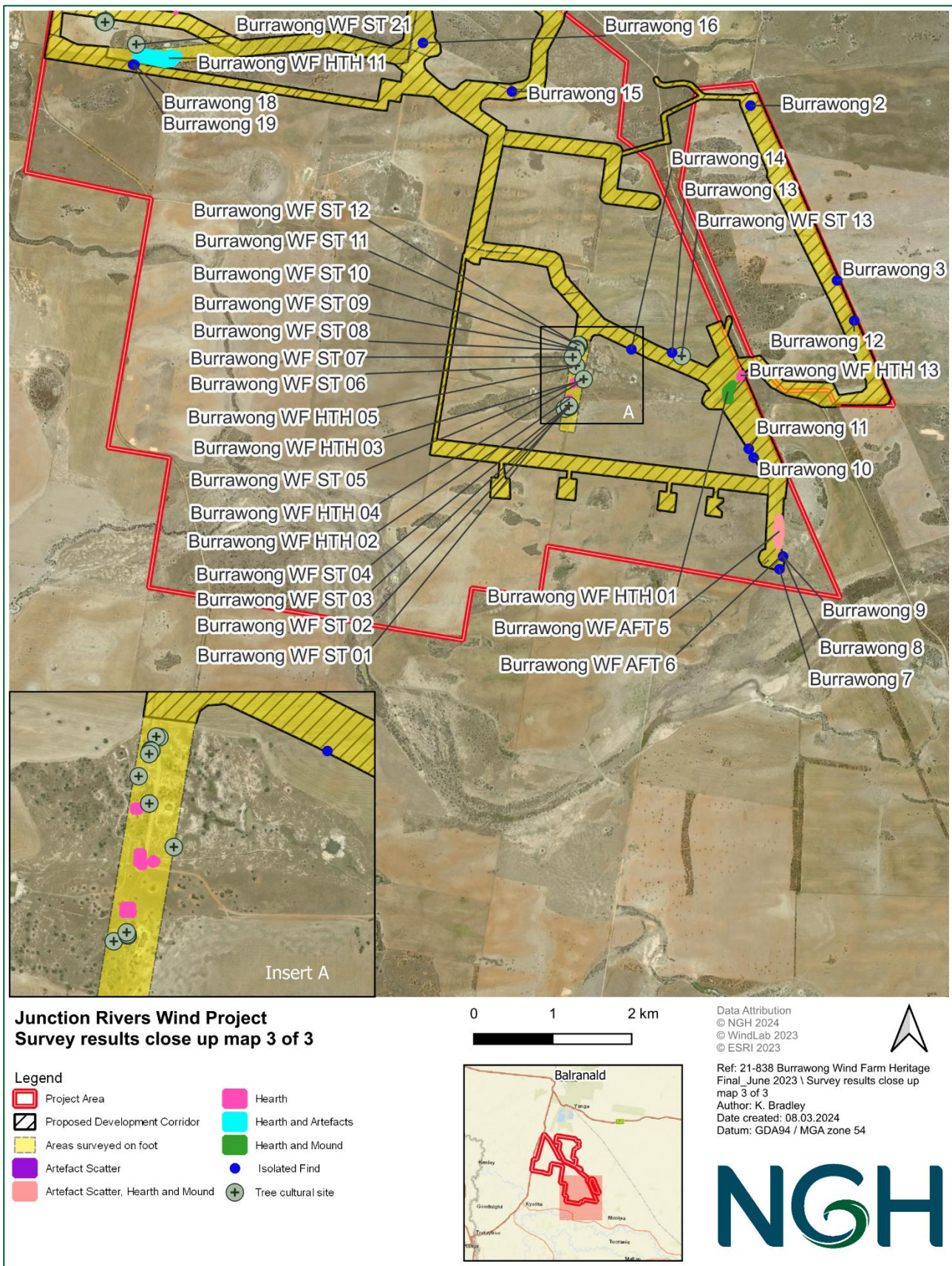


Figure 8-6 Survey Results close up Map 3.

9. Analysis and discussion

A total of 170 stone artefacts were recorded within the Project Area. Where possible all stone artefacts identified were recorded, although in some instances the high number of artefacts and time constraints meant only basic information was noted. The majority of stone artefacts identified during the survey were flaked pieces (n=48; 28.2%) and flakes (n=47; 27.6%) followed by lesser number of distal fragments (n=24; 14.1%), cores (n=12; 7.0%), proximal fragments (n=10; 5.9%), grindstone fragments (n=9; 5.3%), medial fragments (n=8; 4.7%), hammerstones (n=3; 1.7%), manuports (n=3; 1.7%), blades (n=3; 1.7%) and an axe (n=1), a muller (n=1) and a pestle (n=1). The majority of the cores recorded were noted to be multiple platform cores. The relatively low number of cores and generally small artefact sizes recorded (a total of 108 artefacts recorded are in the size range of <10 mm to <30 mm) may be representative of the high intensity working of raw materials brought into the area, most likely due to the absence of local stone sources.

Most of the stone artefacts recorded were manufactured from silcrete (n=85; 50%) which is a common material for the area followed by quartz (n=31; 18.2%) and quartzite (n=20; 11.8%) artefacts with a lesser number of sandstone (n=15; 8.8%), fine-grained silicious material (n=12; 7.0%), volcanic material (n=5; 2.9%) with only a single chert (n=1) and single granite (n=1) object recorded. No outcropping of rock was observed within the project area suggesting that raw material is likely to have been transported to site. There are some artefacts and manuports that exhibit a smooth pebble cortex suggesting that this raw material was likely sourced from exposed conglomerates or riverbeds in the region, however the relative infrequency of cortex on artefacts suggests that raw material may have been brought to site in an already reduced state.

The number of sandstone artefacts recorded within the Project Area are attributed to the relatively common occurrence of grindstones fragments. In addition to artefact manufacture, food processing (seed grinding) activities may have taken place as indicated by the relatively high number of grindstone fragments and presence of a pestle and a muller. It was noted that the grindstone fragments, objects commonly associated with food processing (seed grinding) activities, which were recorded at sites Burrawong 10, Burrawong 12, Burrawong 31 and Burrawong 34 had evidence of residues and silica present which may be suitable for further research in the form of residue analysis.

The large number of hearth features as well as the presence of four earth mounds suggests that this area in general was likely used quite extensively by Aboriginal groups in the past. Looking at the spatial distribution of these features and the landforms within the Project Area its quite clear that the hearth and earth mound features tend to be focused along the outer boundaries of black box swamps and depression areas (ie Burrawong WF AFT 5, Burrawong WF HTH 01, Burrawong WF HTH 11) which in the past would have been desirable locations for camping. Furthermore, the majority of the sites with stone artefacts are located in slightly elevated areas of red gravely sands rather than in the low lying grey cracking clays of the flood plains.

The tree cultural sites recorded were generally noted to be located in association with Black Box depressions and areas of remnant vegetation. While some of the tree cultural sites recorded had obvious horizontal axe cut marks on a scar face and it has been suggested by the NGH archaeologists that these are representative of 'rabbiting tree' (see section 4.4) and therefore the modification is unlikely to be Aboriginal in origin. Some of the Aboriginal community however disagree with this assessment and note that this modification is cultural and cultural value is associated with these trees. The scarring on the other trees recorded as tree cultural sites was determined not to conform with the standard scarring morphology accepted for Aboriginal modification (cf. Long 2005), however they have been noted to have cultural value. The Aboriginal community representatives who participated in the survey for this Project noted that they view Burrawong WF ST 01 to Burrawong WF ST 24 as cultural sites and requested they be avoided by the proposed development of the area by the Project.

The predictions based on the modelling for the region were that stone artefacts, hearths and modified trees (where old growth vegetation remains) were the most likely manifestation of Aboriginal occupation of the area within the proposed development corridor of this Project. Archaeologically sensitive landforms

recognised in the region tend to occur in strong association with the presence of potential resources for Aboriginal use. Landforms directly associated with water and/or elevated ground (ie slightly raised red sandy areas, lunettes and basal slopes boarding black box depressions) appear to have the greatest potential for identification of Aboriginal cultural material. The survey results have confirmed this prediction with stone artefacts, hearth features, mounds and tree cultural sites recorded within the surveyed area. Furthermore, these results indicate that Aboriginal sites can occur throughout the landscape, even in areas highly disturbed by farming activities.

Based on the site types and archaeological features recorded during this assessment, it is likely that the area as a whole was used intermittently over long periods of time for camping while water remained in the landscape, as indicated by the presence of hearths, mounds and stone artefacts. Sites that consist of both hearths/mounds and stone artefacts indicate that camping, cooking and tool manufacturing activities were undertaken in these areas. Additionally, sites such as Burrawong WF AFT 5, Burrawong WF HTH 01 and Burrawong WF HTH 11 which have a number of hearth features with associated artefacts and/or mounds suggest that sites were repeatedly revisited and reused over time or were the focus of occupation for a relatively large group of people.

It is most likely that the Aboriginal cultural material recorded within the Project Area reflects the use of the area by small family groups on multiple occasions as they moved through the landscape exploiting the increased range of available resources associated with the prolonged presence of water after annual flooding. The spatial analysis of the sites recorded clearly shows that sites with multiples features and/or a density of cultural material recorded (ie Burrawong WF AFT 01, Burrawong WF AFT 02, Burrawong WF AFT 04, Burrawong WF AFT 05, Burrawong WF HTH 01 and Burrawong WF HTH 11) tend to be focused along the outer boundaries of black box swamps, depression areas and paleochannels, thus confirming the modelling of the area and that access to resources, in particular water, were favourable locations utilised for camping.

Based on this assumption, there is every chance that there are similar stone artefacts, hearths, oven and tree cultural sites across similar landscapes in the Balranald region and that these site types could be more prevalent in the landscape than previously envisaged. It should also be noted that the results of this investigation have substantially increased the number of sites and archaeological features recorded in the area and it's likely that similar numbers of these sites may occur in areas outside the land surveyed for this project in the local area. The implications for this relate to significance assessments and the related appraisal of site representativeness.

10. Cultural heritage values and Statement of Significance

10.1 Assessment criteria

The assessment of the significance of Aboriginal archaeological sites is currently undertaken largely with reference to criteria outlined in the ICOMOS Burra Charter (Australian ICOMOS 2013). Criteria used for assessment are:

- **Social or Cultural Value:** In the context of an Aboriginal heritage assessment, this value refers to the significance placed on a site or place by the local Aboriginal community – either in a contemporary or traditional setting.
- **Scientific Value:** Scientific value is the term employed to describe the potential of a site or place to answer research questions. In making an assessment of scientific value issues such as representativeness, rarity and integrity are addressed. All archaeological places possess a degree of scientific value in that they contribute to understanding the distribution of evidence of past activities of people in the landscape. In the case of flaked stone artefact scatters, larger sites or those with more complex assemblages are more likely to be able to address questions about past economy and technology, giving them greater significance than smaller, less complex sites. Sites with stratified and potentially in situ sub-surface deposits, such as those found within rock shelters or depositional open environments, could address questions about the sequence and timing of past Aboriginal activity, and will be more significant than disturbed or deflated sites. Groups or complexes of sites that can be related to each other spatially or through time are generally of higher value than single sites.
- **Aesthetic Value:** Aesthetic values include those related to sensory perception and are not commonly identified as a principal value contributing to management priorities for Aboriginal archaeological sites, except for art sites.
- **Historic Value:** Historic value refers to a site or place's ability to contribute information on an important historic event, phase or person.
- **Other Values:** The Burra Charter makes allowance for the incorporation of other values into an assessment where such values are not covered by those listed above. Such values might include Educational Value.

All sites or places have some degree of value, but some have more than others. In addition, where a site is deemed to be significant, it may be so on different levels or contexts ranging from local to regional to national, or in very rare cases, international. Further, sites may either be assessed individually, or where they occur in association with other sites the value of the complex should be considered.

10.2 Significance assessment

10.2.1 Social or cultural value

While the true cultural and social value of Aboriginal sites can only be determined by local Aboriginal people, as a general concept, all sites hold cultural value to the local Aboriginal community. An opportunity to identify cultural and social value was provided to all the registered Aboriginal stakeholders for this proposal through the draft reporting process.

Feedback about the cultural value of the sites while in the field with the representatives was that all sites and Aboriginal objects hold cultural value to the Aboriginal community and should where possible be avoided by any impacts. It was also clear from the conversations held in the field that the community view the stone artefacts as important and would like to see the surface artefacts that are unable to be avoided by the

development collected before any construction works occurs. It was noted during the conversations that there was importance placed on collecting the artefacts and placing them in a safe location to avoid future disturbance. Mounds and tree cultural sites were also noted to be particular site types that should be avoided by the proposed development.

Overall, the cultural value of each of the sites recorded is deemed to be high by the Aboriginal community.

No further feedback on the cultural value of the Aboriginal sites or the Project Area in general was provided by the RAPs during the review of the draft ACHA.

10.2.2 Scientific (archaeological) value

The research potential of the majority of the sites located during this assessment is generally considered to be low. While the presence of the sites can be used to assist in the development of site modelling for the local landscape, their scientific value for further research is generally limited. However, there are some sites and Aboriginal objects recorded during this assessment which are considered to have some potential for further research.

Grindstone fragments can be inspected microscopically and undergo residue analysis to determine what plants and/or other materials were being processed. Given this, the grindstone fragments recorded at the sites Burrawong 10, Burrawong 12, Burrawong 31 and Burrawong 34 which were noted to have evidence of residues and silica present may be suitable for further research. However, it should be noted that these four grindstone fragments were all recorded as isolated finds which have low integrity and lack contextual information and comparative archaeological material which to some degree lowers the research potential of these items. Stone artefacts which are commonly associated with food processing (seed grinding) activities were also recorded at Burrawong 2, Burrawong 15, Burrawong 35 and Burrawong WF AFT 01. These objects also have some potential for further research however, as mentioned above, the low integrity and lack contextual information and comparative archaeological material at these sites lowers the research potential of these items. The majority of these objects are also noted to be recorded in ploughed agricultural paddocks so any residues may also be contaminated to some degree by the modern and historic cropping of the area.

Generally hearths and mounds are a common site type in the region that has the potential to be directly dated. If subsurface deposits of hearth features and mounds are intact and undisturbed it is possible that cultural charcoal and/or shell has been preserved. If the integrity of this material is sound it can be used as a means for dating these sites through carbon dating (C14) and/or optical stimulated luminescence (OSL) techniques. Given this the mound features within the sites Burrawong WF AFT 05, Burrawong WF HTH 01, and Burrawong WF HTH 12 and hearth feature at Burrawong WF HTH 03 and Burrawong WF HTH 11 are considered to have moderate research potential due to the possibility of undisturbed deposits and cultural charcoal to be present at these specific archaeological features at these sites. While the presence of the other individual hearth features recorded during this assessment can be used to assist in the development of site modelling for the region, it is considered that all other hearth features recorded during this assessment (beyond those noted above) have low research potential due to their generally deflated and disturbed nature.

The ground edge axe which was recorded within the site Burrawong WF AFT 04 was noted to be a relatively uncommon artefact type in the region and therefore the individual scientific value of this object is considered to be low to moderate. This object was also noted to have high conservation value by the Aboriginal community representatives as an uncommon artefact type in the local area.

The sites Burrawong WF AFT 01, Burrawong WF AFT 02, Burrawong WF AFT 04 and Burrawong WF AFT 05, Burrawong WF HTH 01 and Burrawong WF HTH 11 are noted to have low to moderate archaeological value due to the density and range of cultural material recorded at these six sites. Retouched artefacts, food processing objects and hammerstones were also noted to be recorded at Burrawong WF AFT 01 and Burrawong WF AFT 04. The presence of hammerstones suggests local lithic manufacture and the presence of grindstone fragments is strongly indicative of onsite food processing.

While the other stone artefacts recorded during this assessment are intrinsically interesting in terms of their base technical information, their current lack of temporal context and the absence of information about local resources makes further conclusions about land use difficult. Their scientific value for further research is also limited due to the disturbed nature of the landscape and the subsequent movement of objects by clearing and ploughing activities. Given this, the presence of the other artefacts beyond those associated with the site noted above are considered to have low research potential. However, they can be used to assist in the development of site modelling including the distribution of raw material and artefact types across the local landscape.

The tree cultural sites recorded during this assessment hold cultural value to the Aboriginal community. The fact that the surrounding landscape has been cleared and modified means that as a representative example of this site type the trees have high value despite the site type being common for the local area. The survival of trees is subject to natural factors such as death, decay, and bushfires, as well as man-made threats such as land clearing, which means their long-term survival prospects are diminished. This leads to the conclusion that the remaining tree cultural sites in the landscape have high value given the cultural value to the community. Therefore, the tree cultural sites in the Project Area, regardless of the ambiguity of origin, are assessed overall as having high conservation value.

The findings of this Project have increased the number of sites listed in the AHIMS database for the area. In terms of representativeness and rarity we would argue that there are likely to be many hundreds of such sites in the surrounding area as the relatively low number of sites in AHIMS in the local area is merely an indication that few surveys have been undertaken in the local area.

10.2.3 Aesthetic value

There are no aesthetic values associated with the archaeological sites *per se*, apart from the presence of Aboriginal objects and sites in the landscape. However, the modified and heavily disturbed nature of the Project Area through farming practices detracts from this aesthetic setting to some degree.

10.2.4 Historic value

There are no known historic sites identified or links to known important historic events, phases or persons. No further information has been provided to date by the Aboriginal community to suggest the area is historically important in terms of persons, events, phases or activities.

10.2.5 Other values

There are no other known heritage values associated with the Project Area. The area may have some educational value (not related to archaeological research) through educational material provided to the public about the Aboriginal occupation and use of the area, although the archaeological material is primarily within private property and there is little for the public to see.

10.3 Statement of Significance

A summary of cultural heritage values and corresponding significance assessment for the sites with known Aboriginal objects recorded during this assessment within the Project Area is provided below.

Table 10-1. Summary of significance

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong WF ST 01	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 02	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 03	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 04	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 05	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 06	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 07	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 08	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 09	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 10	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 11	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 12	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 13	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 14	Tree cultural site	High	NA	High	N/A	N/A	High	NA

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong WF ST 15	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 16	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 17	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 18	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 19	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 20	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 21	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 22	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 23	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong WF ST 24	Tree cultural site	High	NA	High	N/A	N/A	High	NA
Burrawong 2	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 3	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 4	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 5	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 6	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 7	Isolated Find	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong 8	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 9	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 10	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 11	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 12	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 13	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 14	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 15	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 16	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 17	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 18	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 19	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 20	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 21	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 22	Isolated Find	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong 23	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 24	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 25	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 26	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 27	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 28	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 29	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 30	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 31	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 32	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 33	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 34	Isolated Find	High	Low to Moderate	Low	N/A	N/A	Low to Moderate	Common
Burrawong 35	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 36	Isolated Find	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong 37	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong 38	Isolated Find	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF AFT 01	Artefact Scatter	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 02	Artefact Scatter	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 03	Artefact Scatter	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF AFT 04	Artefact Scatter	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 05	Artefact Scatter, Hearth and oven mound	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF AFT 06	Artefact Scatter	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 01	Hearth and oven mound	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 02	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 03	Hearth	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 04	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 05	Hearth	High	Low	Low	N/A	N/A	Low	Common

Site Name	Site type	Cultural Value	Scientific Value	Aesthetic Value	Historic Value	Other Value	Overall Value	Rarity
Burrawong WF HTH 06	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 07	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 08	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 09	Hearth	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 10	Hearth and Artefact	High	Low	Low	N/A	N/A	Low	Common
Burrawong WF HTH 11	Hearth and Artefact	High	Low to moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 12	Hearth and oven mound	High	Low to Moderate	Low	N/A	N/A	Low to moderate	Common
Burrawong WF HTH 13	Hearth	High	Low	Low	N/A	N/A	Low	Common

11. Impact assessment

11.1 Proposed development activity

The Project is located within the SW-REZ which the NSW Government has identified as a target area for renewable energy development in its Transmission Infrastructure Strategy and Electricity Infrastructure Roadmap. Windlab proposes to develop the Project to provide a reliable and affordable source of energy for the people of NSW and contribute to reducing greenhouse gas emissions associated with energy generation.

The Project would involve the construction, operation and eventual decommissioning or repowering of a wind farm with up to 96 WTG and associated ancillary infrastructure, with a generating capacity of up to approximately 750MW and would connect to the existing 220 kV transmission line that traverses the site and/or the proposed Project EnergyConnect transmission line. The Project would also include up to four locations for a BESS of up to approximately 250MW / 800MWh. The Project specific design components are detailed in Section 2 of this report (see Table 2-2) and it is noted that all works would be within the development corridor as assessed in this report. The works involve a range of activities including vegetation clearing, earthworks, construction activities, trenching, concrete works and the establishment of site access and construction compounds.

As is typical of projects of this scale, the construction of the wind farm may be staged. If the project is constructed in stages, Stage 1 may see the construction of up to 30 WTGs and required ancillary infrastructure and Stage 2 may see the construction of the remaining WTGs and required ancillary infrastructure. The final configuration for Stage 1 will depend on the WTG model selected and the outcome of detailed grid studies. The construction period would be approximately four years.

The development activity will therefore involve disturbance of the ground during the construction of the wind farm and thereafter through its operation and ongoing use, including maintenance activities for the wind farm and its associated infrastructure and access tracks.

11.2 Assessment of harm

It should be noted that significant design changes have occurred throughout the development of the design for this Project. These initial changes occurred early in the design process in consultation with NGH archaeologists prior to any fieldwork being undertaken for this Project to ensure the previously recorded AHIMS sites and landforms of very high archaeologically sensitivity (i.e. lunettes and source bordering dunes) were avoided where possible. Specifically, these initial early development design changes prior to fieldwork included:

- Removal of initially proposed WTG and other infrastructure adjacent to Condoupe Lake;
- The removal and/or adjustment of initially proposed locations for WTG within the northwest portion of the Project Area to avoid landforms of high archaeologically sensitivity;
- Removal of initially proposed WTG and other infrastructure in the central portion of the Project Area to avoid landforms of high archaeologically sensitivity;
- Removal of infrastructure in the southern portion of the Project Area to avoid landforms of high archaeologically sensitivity.

Feedback and communications with the archaeologists during the fieldwork for this Project were also taken into consideration by the designers to ensure the avoidance of any archaeologically sensitive landforms (source bordering areas around black box swamp depressions and undisturbed raised red sandy areas) and site types with high conservation value (tree cultural sites and mounds) which were

identified during the fieldwork and/or requested if possible to be avoided by the RAPs who participated in the fieldwork. A summary of the early design changes which occurred after the fieldwork was completed is provided below.

- Proposed development area redesigned to ensure the avoidance of all tree cultural sites and mound features due to the high cultural and/or archaeological conservation value they hold;
- The proposed development footprint was redesigned to avoid as many of the hearth features/site as possible;
- Several heritage exclusion zones were established to ensure the avoidance areas with a density of Aboriginal sites and/or specific site types. The proposed development was redesigned to facilitate the heritage exclusion zones;
- The two large heritage exclusion zones were entirely removed from the proposed development footprint to ensure the avoidance of landforms of high archaeological sensitivity and areas which had a density of sites recorded;
- No further infrastructure was added to the southern portion of the Project Area despite the inclusion of heritage exclusion zones and the removal of proposed development areas;
- Underground cabling in the southern portion of the Project Area was moved west to avoid hearths and tree cultural sites;
- The overhead transmission line was relocated within the southwest portion of the Project Area to avoid landforms of high archaeological sensitivity; and
- The proposed development footprint was reduced, where possible, to avoid any impacts to recorded sites.

An overview of the land initially proposed to be impacted by this development, compared to the area assessed in this report is shown in Figure 11-1. This includes all the early design changes noted above which occurred prior to and post the completion of the fieldwork for this assessment to ensure minimal impacts on Aboriginal heritage. As summarised above significant effort was undertaken following the completion of the surveys for this Project to ensure the design and micro-siting for the infrastructure components where possible can avoid recorded Aboriginal sites through the placement of heritage exclusion zones. The heritage exclusion zones for this Project are shown in Figure 11-2.

To facilitate refinement of the layout during the detailed design process, an allowance for micro-siting of WTGs within a 100 m radius from the locations identified in the EIS and this assessment is sought by the Proponent. This micro-siting approach is a common occurrence on wind farm projects. Other project infrastructure components, including substations, switchyard, maintenance building, temporary facilities, cabling, and access tracks, may also be micro-sited within the assessed area of the proposed development corridor to ensure that the final design of this Project does not result in greater impacts to Aboriginal Heritage than those assessed.

Where possible the micro-siting of Project infrastructure components has avoided sites, with heritage exclusion zones implemented within the development corridor to ensure Aboriginal sites, where possible, are able to be avoided by any impact or harm. An overview of the heritage exclusion zones is also shown in Figure 11-2 with close up maps provided in to Figure 11-3 to Figure 11-5.

Beyond the heritage exclusion zones and in consideration of the nature of the proposed works (which require some flexibility in terms of micro-siting for the final design and during the construction planning phases for this Project) NGH has applied a precautionary principle during the assessment of harm. Therefore, it is presumed that within the development corridor, in any areas outside the mapped heritage exclusion zones, that complete impact to sites may occur when assessing impact to Aboriginal cultural heritage for this

Project. Based on this approach Table 11-1 below provides a summary of sites assessed to be impacted and avoided by the proposed development of the Junction Rivers Wind Project.

Table 11-1. Summary of sites to be impacted and avoided by the proposed development.

Sites impacted	Sites avoided
Burrawong WF AFT 01 to Burrawong WF AFT 04	Burrawong WF ST 01 to Burrawong WF ST 24
Burrawong WF AFT 06	Burrawong WF AFT 05
Burrawong WF HTH 06	Burrawong WF HTH 01 to Burrawong WF HTH 05
Burrawong WF HTH 09	Burrawong WF HTH 07 to Burrawong WF HTH 08
Burrawong WF HTH 13	Burrawong WF HTH 10 to Burrawong WF HTH 12
Burrawong 02 to Burrawong 38	15 Previously recorded AHIMS sites within the Project Area (AHIMS# 47-6-0037, #47-6-0041, #47-6-0093, #47-6-0945, #47-6-0253, #47-6-0147, #47-6-0148, #47-6-0150, #47-6-0255, #47-6-0151, #47-6-0254, #47-6-0146, #47-6-0069, #47-6-0149 and #47-6-0068).

Table 11-2 details the degree of harm and the consequence of that harm upon the heritage value of each site type resulting from the proposed development works. The proposed level of disturbance for the construction of the wind farm will therefore impact some of the stone artefacts and hearth features recorded during the field survey within areas of the development corridor which are outside the heritage exclusion zones. Furthermore, although the pedestrian survey undertaken for this Project covered the entire proposed development corridor, it is possible that unrecorded Aboriginal heritage objects may be identified during construction, operation and maintenance works. However, this is considered likely to only occur as isolated stone artefacts and/or scattered hearth retainers. Given these proposed impacts, the assessment of harm overall for the Project is assessed as low.

Table 11-2. Summary of the degree of harm and the consequence of that harm upon each site type recorded within the Survey Area.

Site Type	Type of Harm	Degree of Harm	Consequence of harm	No. of Sites	% of site type
Isolated Finds	Direct	Complete	Total loss of value	37	100
Artefact Scatters	Direct	Complete	Total loss of value	5	100
Hearths	Direct	Complete	Total loss of value	3	33.3
	Nil	Nil	No loss of value	6	66.7
Artefact Scatter, Hearth and Mound	Nil	Nil	No loss of value	1	100
Hearth and Mound	Nil	Nil	No loss of value	3	100
Hearth and Artefact	Nil	Nil	No loss of value	2	100

Site Type	Type of Harm	Degree of Harm	Consequence of harm	No. of Sites	% of site type
Tree cultural sites	Nil	Nil	No loss of value	24	100
Previously recorded AHIMS sites within the Project Area	Nil	Nil	No loss of value	15	100

11.3 Impacts to values

The values potentially impacted by this proposed wind farm development are any social and cultural values attributed to the sites and Aboriginal objects by the local Aboriginal community. The extent to which the loss of the sites or parts of the sites would impact on the community is only something the Aboriginal community can articulate.

Beyond the response from the Bangerang Aboriginal Corporation on the draft ACHA that if any of the stone artefacts recorded are going to be impacted by the development they need to be attempted to be collected and moved to an area which will not be impacted no further feedback on the cultural value of the Aboriginal sites was provided by the RAPs during the review of the draft ACHA.

The impact to scientific values for this development are summarised in Section 10.2.2 and Table 10-1. A total of 33 isolated finds, five artefact scatters and three hearth sites are within the proposed development corridor (outside the heritage exclusion areas) which are proposed to be impacted by the development (based on the precautionary principle used during the assessment of harm for this Project). Any removal of Aboriginal cultural heritage objects would obviously reduce the scientific value they may have.

While all of the isolated finds and artefact scatter sites recorded during this assessment are rated as having total loss of scientific value it is argued here that there are likely to be a number of similar sites in the local area and therefore the impact to the overall local archaeological record is low, especially in consideration that all these sites are within disturbed contexts and located within paddocks that have been highly disturbed through intensive dryland cropping activities (including ploughing, sowing etc) that have been undertaken for decades. It is further reiterated that the development has been significantly redesigned to avoid landforms and areas within the Project Area which had high archaeological sensitivity to ensure impacts to the scientific value of the region were minimised where possible.

Furthermore, the existing disturbed context of the sites which are proposed for impact is noted to reduce the possible research value that some of the stone artefacts at these sites may have. The information obtained during the present assessment can also be used to further the development of Aboriginal site modelling in the region, which has largely now been realised by the recording of these sites.

The intrinsic values of the stone artefacts and heat retainers themselves may also be affected by the development. Any removal of the artefacts and heat retainers, or their breakage would reduce the generally low scientific value they retain.

Impacts from development activity will be avoided for all tree cultural sites and mounds identified. Four isolated finds, seven hearth sites and the two artefact and hearth sites will also be avoided by the development. Given this, it is noted that a representative sample of stone artefacts and hearth sites will be avoided by the development, and it may further be possible during the micro-siting to avoid impacts to some sites assessed to be impacted in this report.

Figure 11-3 to Figure 11-5 show the location of the heritage exclusion zones and sites to be impacted by the proposed development corridor for this Project. No other values have been identified that would be affected by the development proposal.

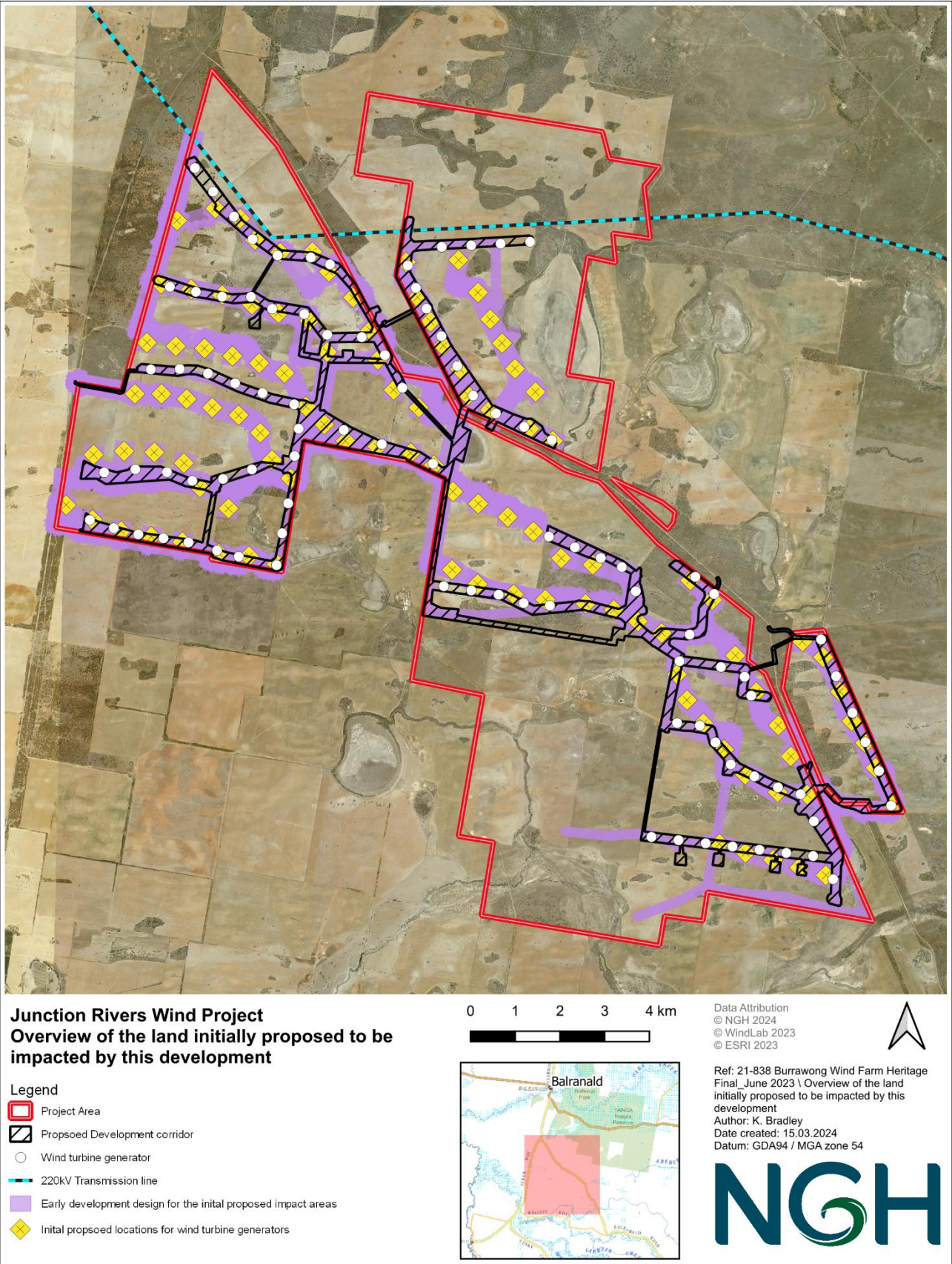


Figure 11-1 Overview of the land initially proposed to be impacted by this development, compared to the area assessed in this report.

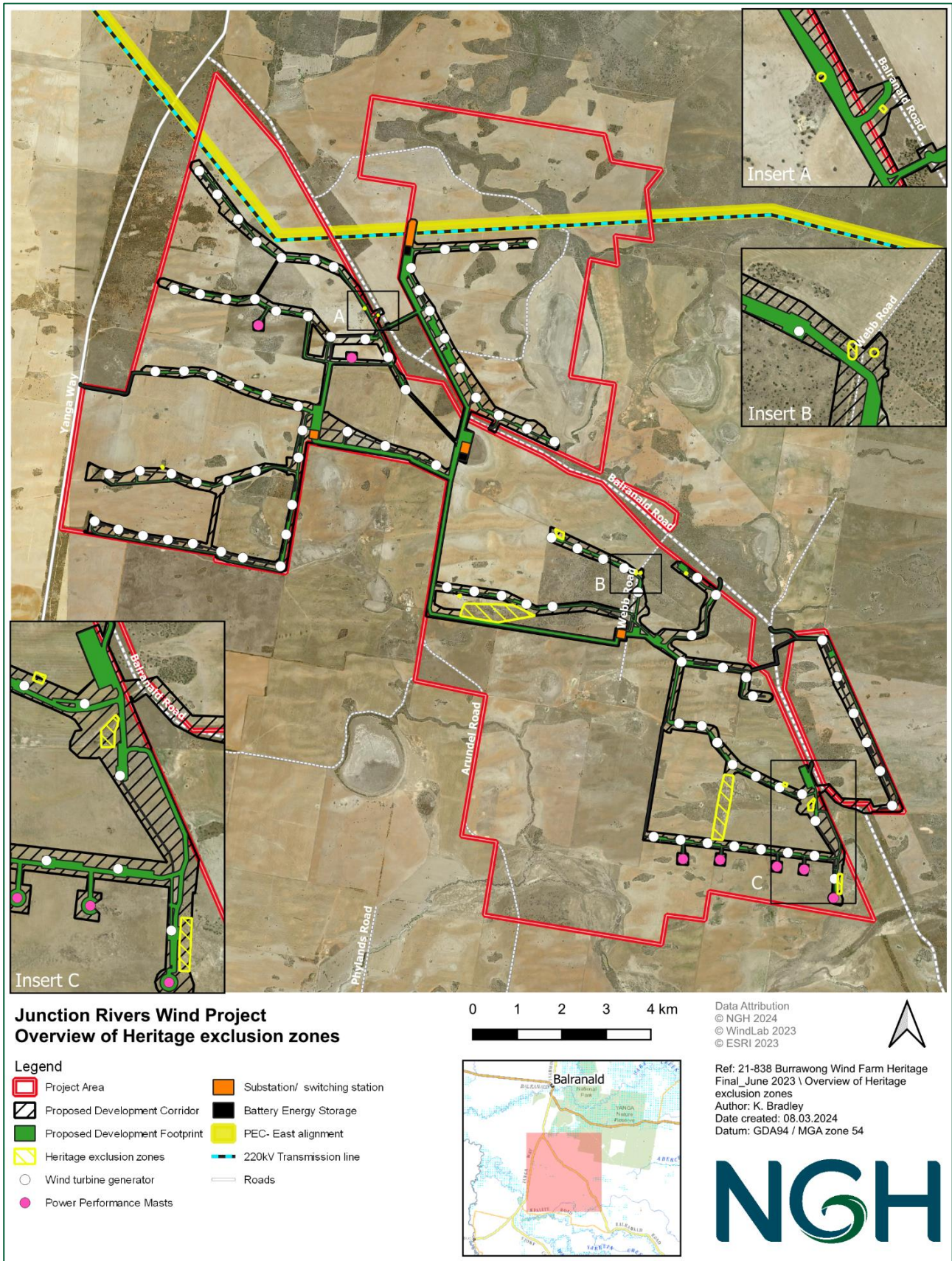


Figure 11-2 Overview of Heritage exclusion zones

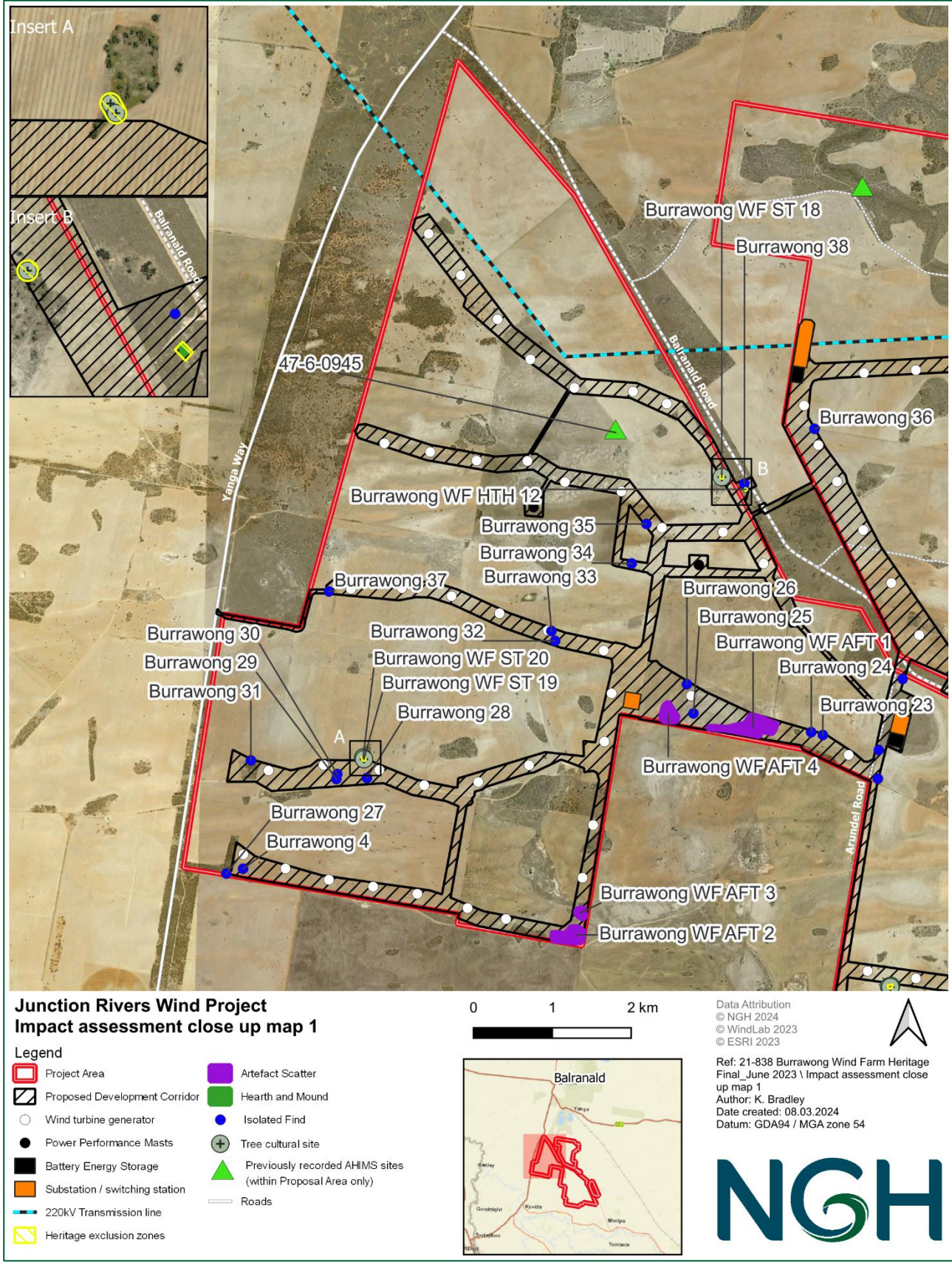


Figure 11-3 Proposed development corridor and impacts to known Aboriginal sites Map 1.

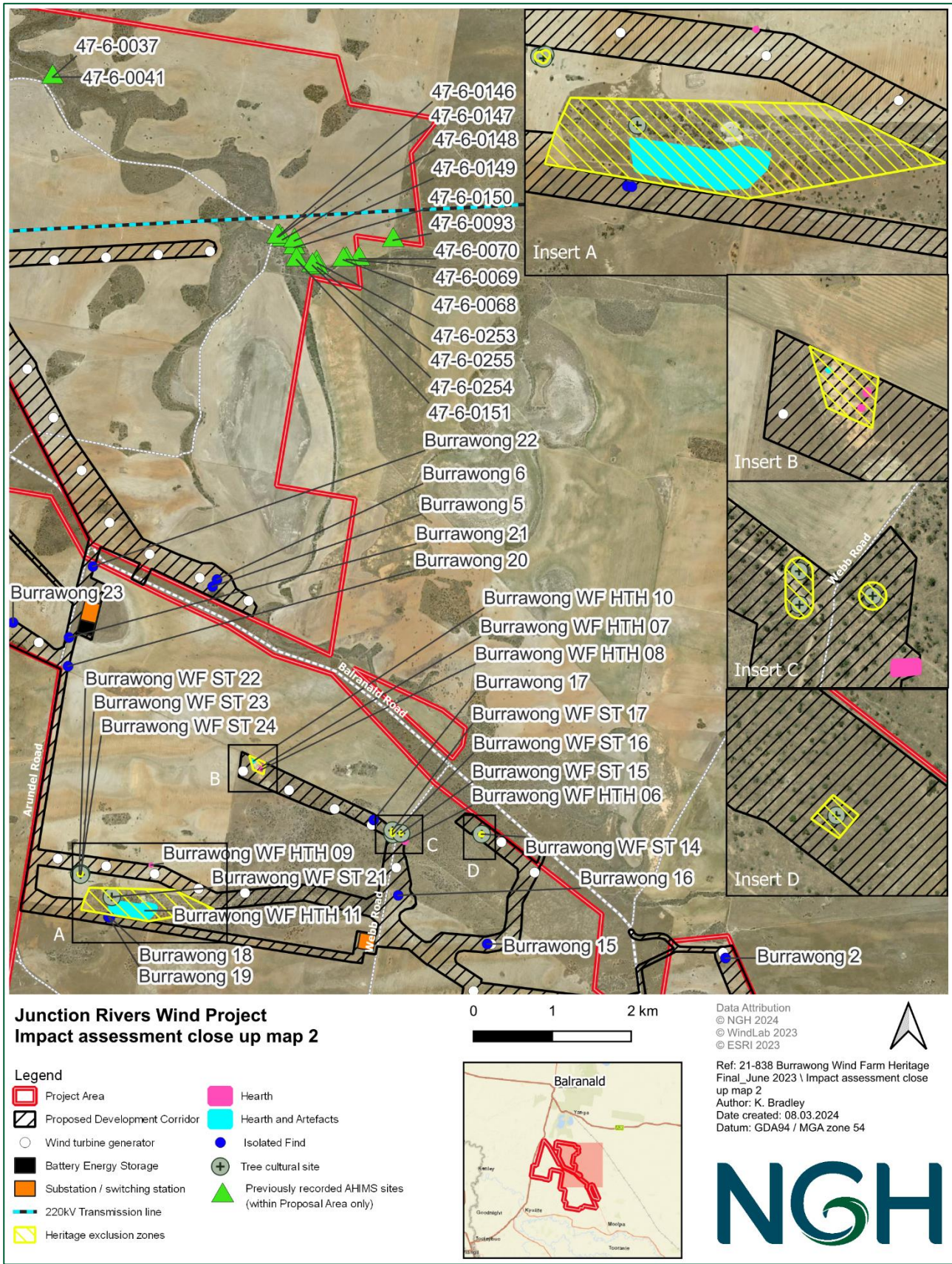


Figure 11-4 Proposed development corridor and impacts to known Aboriginal sites Map 2

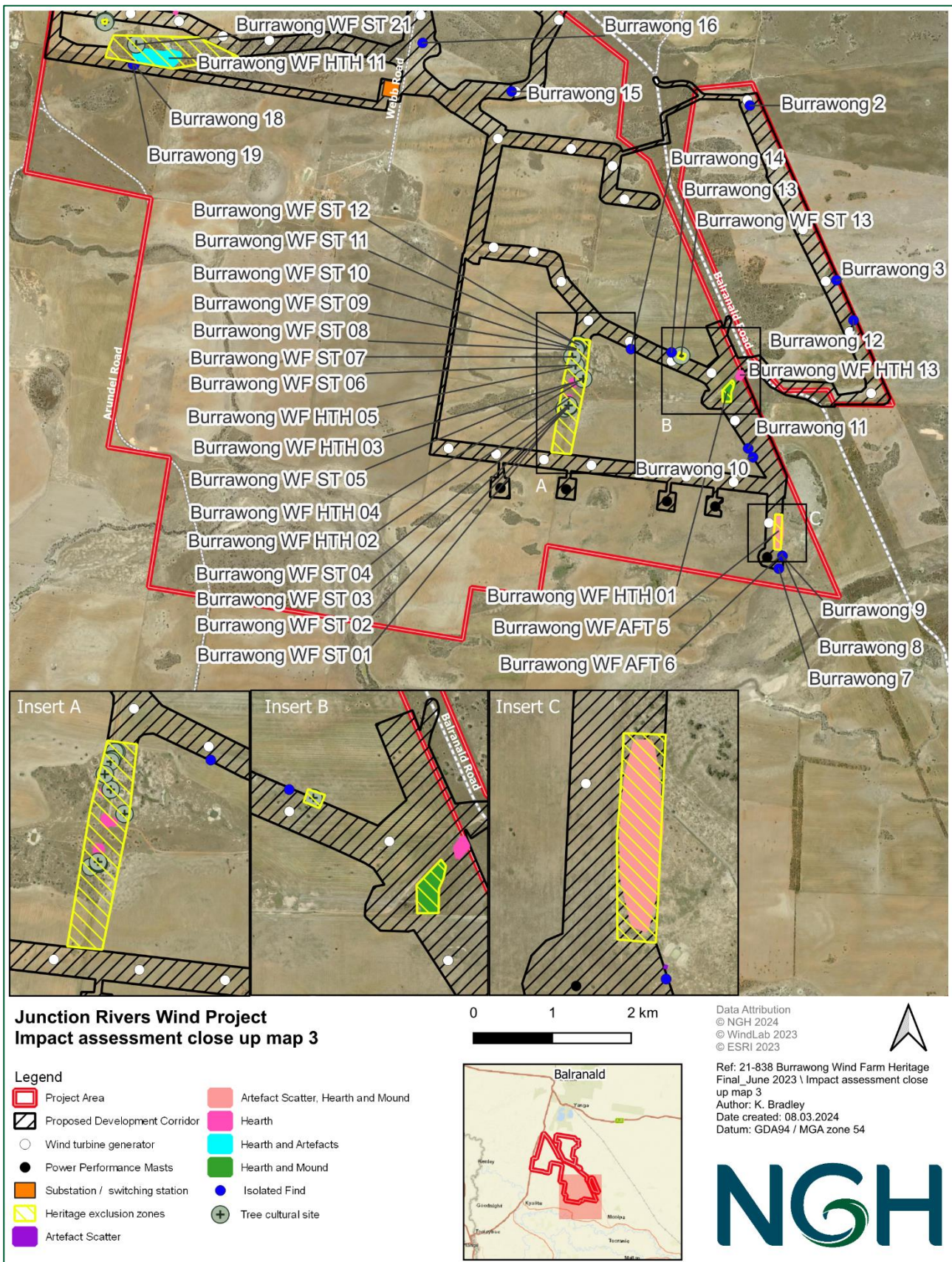


Figure 11-5 Proposed development corridor and impacts to known Aboriginal sites Map 3.

Table 11-3. Identified risk to known archaeological and sites within the Project Area.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
NA	Burrawong WF ST 01	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 02	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 03	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 04	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 05	Tree cultural site	Good -tree dead but standing <i>in situ</i>	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 06	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 07	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 08	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 09	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 10	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
NA	Burrawong WF ST 11	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 12	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 13	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 14	Tree cultural site	Moderate- tree dead lying down	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 15	Tree cultural site	Moderate- tree dead lying down	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 16	Tree cultural site	Good -tree dead but standing <i>in situ</i>	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 17	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 18	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 19	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 20	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
NA	Burrawong WF ST 21	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 22	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 23	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
NA	Burrawong WF ST 24	Tree cultural site	Good- <i>in situ</i> living tree	NA	Will not be harmed	None	No loss of value	Site to be avoided by proposed development. Ensure avoidance with a minimum 20 m buffer around this tree location.
47-6-1159	Burrawong 2	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1161	Burrawong 3	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1160	Burrawong 4	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1173	Burrawong 5	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1140	Burrawong 6	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1141	Burrawong 7	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1142	Burrawong 8	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1143	Burrawong 9	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1139	Burrawong 10	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1138	Burrawong 11	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1164	Burrawong 12	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1163	Burrawong 13	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1162	Burrawong 14	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1144	Burrawong 15	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1151	Burrawong 16	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1158	Burrawong 17	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1157	Burrawong 18	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1156	Burrawong 19	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1155	Burrawong 20	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1154	Burrawong 21	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1153	Burrawong 22	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1152	Burrawong 23	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1150	Burrawong 24	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1149	Burrawong 25	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1148	Burrawong 26	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1147	Burrawong 27	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1146	Burrawong 28	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1145	Burrawong 29	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1184	Burrawong 30	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1183	Burrawong 31	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1182	Burrawong 32	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1181	Burrawong 33	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1180	Burrawong 34	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1179	Burrawong 35	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1178	Burrawong 36	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1177	Burrawong 37	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1176	Burrawong 38	Isolated Find	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface object within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1188	Burrawong WF AFT 01	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1175	Burrawong WF AFT 02	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1174	Burrawong WF AFT 03	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1172	Burrawong WF AFT 04	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.
47-6-1192	Burrawong WF AFT 05	Artefact Scatter, Hearth and oven mound	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1170	Burrawong WF AFT 06	Artefact Scatter	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	A reasonable attempt to collect the surface objects within the approved development corridor at this site must occur following approval of this SSD Project in line with the surface collection methodology provided in Appendix D of the ACHA for this Project.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1191	Burrawong WF HTH 01	Hearth and oven mound	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1171	Burrawong WF HTH 02	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1169	Burrawong WF HTH 03	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1190	Burrawong WF HTH 04	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1168	Burrawong WF HTH 05	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1167	Burrawong WF HTH 06	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	Unmitigated impacts to this site

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1189	Burrawong WF HTH 07	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1166	Burrawong WF HTH 08	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1165	Burrawong WF HTH 09	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	Unmitigated impacts to this site.
47-6-1193	Burrawong WF HTH 10	Hearth and Artefact	Poor – 100+ year history of agricultural and pastoral use.	Low	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1187	Burrawong WF HTH 11	Hearth and Artefact	Poor – 100+ year history of agricultural and pastoral use.	Low to moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.
47-6-1186	Burrawong WF HTH 12	Hearth and oven mound	Poor – 100+ year history of agricultural and pastoral use.	Low to Moderate	Will not be harmed	None	No loss of value	No impacts to occur. This site will be avoided by the proposed development by the implementation of a heritage exclusion zone around this site. The heritage exclusion zone must incorporate the 5 m buffer around this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-1185	Burrawong WF HTH 13	Hearth	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Whole	Total loss of value	Unmitigated impacts to this site.
47-6-0037	Condoulpe	Burial	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0041	Condoulpe Creek	Burial	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0093	North Dusty Lake-8	Artefact	Listed as partially destroyed site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0945	Burrawong 1	Artefact	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-0253	Condoulpe Lake 24	Hearth	Listed as partially destroyed site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0147	Condoulpe 19	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0148	Condoulpe 20	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0150	Condoulpe 22	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0255	Condoulpe Lake 26	Modified Tree	Not a site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-0151	Condoulpe 23	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0254	Condoulpe Lake 25	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0146	Condoulpe 18	Modified Tree	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0069	Condoulpe 2	Modified Tree (Carved or Scarred)	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.
47-6-0149	Condoulpe 21	Modified Tree (Carved or Scarred)	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.

AHIMS #	Site name	Site Type	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
47-6-0068	Condoulpe 1	Modified Tree (Carved or Scarred)	Listed as a valid site on AHIMS	Not assessed in this report	Nil	Nil	No loss of value	Site is outside the proposed development corridor. Ensure avoidance with a minimum 50m buffer around site. No delineation of this is required unless any future development works for the Project are proposed within 50m of this site.

12. Management and mitigation measures

12.1 Consideration of harm

Avoiding harm to all the Aboriginal sites is technically possible through avoidance. However, the scattered nature of the archaeological sites across the Project Area and within the development corridor would pose serious design and viability constraints on the proposed development of this wind farm. Additional measures to redesign the development corridor are not considered to be necessary in this instance based on the already significant design modifications, inclusion of heritage exclusion zones and in consideration of the micro-siting of infrastructure within the proposed development corridor. The design changes undertaken to date for this Project have already ensured where possible the avoidance of landforms of high archaeologically sensitivity (ie lunettes, paleochannels, source bordering dunes, areas around black box swamp depressions and undisturbed raised red sandy areas) and site types with high conservation value (i.e. tree cultural sites and mounds). As the redesign measures undertaken to date for this Project to avoid harm were possible to Aboriginal heritage is summarised in Section 11.2 and shown in Figure 11-1 it is not duplicated in this section.

Based on the assessment of the Aboriginal sites and in consideration of discussions with the Aboriginal representatives during the field survey it is not considered necessary to prevent all development, or for total avoidance of all the stone artefact and hearth sites identified within the development corridor. The stone artefact sites (Burrawong WF AFT 01 to Burrawong WF AFT 04, Burrawong WF AFT 06, Burrawong WF 02 to Burrawong WF 38) and three hearth sites (Burrawong WF HTH 06, Burrawong WF HTH 09 and Burrawong WF HTH 13) proposed to be impacted by the Junction Rivers Wind Project have been shown to be in highly disturbed contexts with little remaining scientific value.

The most likely cause of harm to these sites will be through the initial ground disturbance works such as vegetation clearance, creating access tracks & hard stand areas, crane boom work areas and the installation of cabling for the turbines. The archaeological material identified in the survey within the development corridor, which is outside the heritage exclusion areas, is not of sufficient archaeological value to reject the development proposal, especially considering the avoidance of archaeological sensitive landforms and areas within the wider Project Area and inclusion of heritage exclusion areas to ensure avoidance of sites where possible within the development corridor for this Project.

12.2 Mitigation of harm

Mitigation of harm to Aboriginal sites generally involves some level of detailed recording to preserve the information contained within the site or setting aside areas as representative samples of the relevant landform to preserve a portion of the sites. Mitigation can be in the form of minimising harm, through changes in the development plan or through direct management measures of the Aboriginal objects. There are a range of management strategies that may be implemented as mitigation based on the proposed or potential harm to archaeologically sensitive landforms, Aboriginal sites and objects.

Mitigation of harm has been incorporated into this project design in the following ways:

- significant redesign of the proposed development corridor.
- avoidance of landforms of high archaeologically sensitivity (ie lunettes, paleochannels, source bordering dunes, areas around black box swamp depressions and undisturbed raised red sandy areas) within the Project Area.
- the avoidance of the tree cultural sites and mound features which had high cultural value.

- inclusion of heritage exclusion areas to ensure avoidance of sites where possible in the development corridor.

The creation of heritage exclusion areas (see Figure 11-2) within the development corridor and its immediate adjacent areas has been implemented as part of this Project to ensure the avoidance of site types with high conservation value and to ensure a representative sample of Aboriginal sites in the development corridor are avoided where possible. A summary of the sites to be avoided by these proposed works is listed in Table 12-1 and shown in Figure 12-1 to Figure 12-3. These heritage exclusion areas should be shown on all construction maps for this Project and if during construction works any ground disturbance activity is proposed within 50m of these areas high visibility temporary fencing should be in place prior to any construction works commencing to ensure there are no inadvertent impacts to these areas. Given the size of some of these heritage exclusion zones it is acceptable that only the portion of the heritage exclusion zones in proximity to works is demarcated.

Given the avoidance of a large number of sites and the creation of heritage exclusion areas and in consideration of the significant redesign of the proposed development corridor undertaken by the Proponent it is argued that further mitigation in the form of additional alteration to the development corridor is not feasible or warranted in this instance. However, the recorded stone artefact sites within the development corridor that will be impacted by works for the Project which are outside the heritage exclusion areas are noted to be conducive to surface collection salvage as a mitigation strategy.

The surface collection salvage of the stone artefacts to be impacted by the development was also requested by the Aboriginal representatives during the fieldwork programme. It is recommended that a reasonable attempt to collect the recorded surface stone artefacts at the sites that will be impacted by the proposed development is undertaken by an archaeologist with representatives of the registered Aboriginal parties (as selected by the Proponent) following the development consent. Given this, a reasonable and feasible attempt, through the visual inspection of the site by an archaeologist with an Aboriginal community representative, to collect the surface stone artefacts in the development corridor at the sites Burrawong WF AFT 01 to Burrawong WF AFT 04, Burrawong WF AFT 06, Burrawong 02 to Burrawong 38 should occur once development consent of this SSD project is issued. Due to ongoing farming practises and the potential for delays in the commencement of construction, the ability to undertake the immediate surface collection salvage within the development corridor (outside the heritage exclusion areas) should be facilitated in any conditions of consent issued for this Project. The surface collection salvage would be undertaken in line with the methodology provided in Appendix D of the ACHA for this Project.

It is acknowledged that changes in the ground surface visibility and standard taphonomic and other environmental factors may impede the relocation of all the recorded stone artefacts noted in this report. This is a typical and accepted archaeological phenomenon and therefore salvage surface collection should focus on visible artefacts within each site, which is an acceptable outcome. A list of the sites to be subject to surface collection as a mitigation measure once development consent of this SSD project is issued is provided in Table 12-3 and shown in Figure 12-1 to Figure 12-3.

The stone artefacts collected should be moved to a safe area within the Project Area that will not be subject to any ground disturbance work, which may be within the boundary of a heritage exclusion area, although the location must be outside the boundary of any sites not approved for impacts. Several proposed locations for the relocation of any collected material is shown in Figure 12-4. It must be noted that two of the proposed relocation areas are also within the heritage exclusion zones, outside the boundary of recorded sites, to ensure they would not be subject to any future impacts. If required the items recovered may be temporarily stored at an NGH office.

The surface collection should be undertaken through the following process which is also detailed in the surface collection methodology provided in Appendix D of the ACHA for this Project.

- Walk across the recorded site area (within the approved development corridor), use 'pin' flags to identify and mark artefacts.
- Photograph site area.
- If considered necessary, construct a collection grid of 2 m x 2 m or 5 m x 5 m or similar as appropriate to the size of the site, only larger sites or sites with higher densities of artefacts will have this strategy.
- As an alternative, GPS plot artefacts if required, this is suitable for smaller sites (~<20).
- Collect artefacts. At each collection site the artefacts will be recorded, bagged and labelled in accordance with their collection position, that is either individual number and/or their collection grid.
- Recording of stone artefacts will be conducted in line with standard archaeological practice to include raw material, type, dimensions and any other characteristics considered relevant and in accordance with the Code of Practice. Photos of particularly rare items only or those asked to be photographed by the Aboriginal representatives onsite would be taken.
- The salvaged Aboriginal objects may be temporarily stored in a locked cabinet at an office of the Project Archaeologist for analysis and recording until the long-term management and relocation of the salvaged objects can occur.
- An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage.

Unmitigated impacts are proposed for the hearth sites Burrawong WF HTH 06, Burrawong WF HTH 09, and Burrawong WF HTH 13 as the condition of these hearth features was noted to be poor and the cultural material at these sites to consist of very disturbed clay heat retainers with no further potential research value noted. Unmitigated impacts may only occur at these sites once development consent of this SSD project is issued. A list of the sites to be subject to unmitigated harm is provided in Table 12-2 and shown in Figure 12-1 to Figure 12-3.

As a mitigation measure the Proponent should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal stone artefacts and objects during the construction of the Junction Rivers Wind Project and for the management of known sites within and in proximity to the development corridor which will be avoided. The CHMP should include at a minimum the following items:

- An unexpected finds procedure to manage any objects suspected to be Aboriginal in origin during the construction, maintenance, operational and decommissioning works. The unexpected finds procedure must also include a procedure to manage suspected human remains (provided in Appendix C of the ACHA).
- Include requirements for heritage to be included as part of the site inductions and note that all employees, contractors and utility staff working on site will receive Aboriginal Cultural Heritage Awareness Training in the form of an induction before they begin work on site.
- Include the requirements for the delineation, signage and monitoring of sites and the heritage exclusion zones which will be avoided by works.
- Include a ground disturbance protocol.
- Include a methodology for surface collection.

Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.

In consideration of the future mitigation of harm of within the development footprint and Project Area the CHMP should also consider the requirement that a new extensive search of the AHIMS is required to be completed over the Project Area prior to construction works commencing and again prior to

decommissioning or repowering works for the project commencing. These AHIMS searches are recommended to ensure no new Aboriginal sites in close proximity to the approved development footprint have been recorded since the completion of this assessment which may need to be shown on mapping and/or appropriately demarcated prior to any staged works or decommissioning commencing. In the event that any new Aboriginal sites are recorded within the approved development footprint for the Project follow SSD approval of this Project they would be subject to the Unexpected Finds Procedure as noted in the CHMP.

Given the significant effort undertaken to avoid the tree cultural sites within the Project Area further mitigation in the event that the future natural deterioration of these trees occurs is not determined to be warranted unless the natural deterioration of any of these trees may impact the assets of the Project. If assets of the Project were to be impacted by the future natural deterioration of these trees, then further consultation regarding their management would be required to be undertaken with the RAPs as these sites were determined to have cultural value to the Aboriginal community. A modification may be required to the approvals in the future to facilitate the safe removal of the tree in a manner which will not impact the Project assets.

Table 12-1. List of sites to be avoided by any harm (includes previously recorded AHIMS sites in the Project Area also).

Site name	AHIMS#	Site Type	Site name	AHIMS#	Site Type
Burrawong WF ST 01	NA	Tree cultural site	Burrawong WF HTH 01	47-6-1191	Hearth and oven mound
Burrawong WF ST 02	NA	Tree cultural site	Burrawong WF HTH 02	47-6-1171	Hearth
Burrawong WF ST 03	NA	Tree cultural site	Burrawong WF HTH 03	47-6-1169	Hearth
Burrawong WF ST 04	NA	Tree cultural site	Burrawong WF HTH 04	47-6-1190	Hearth
Burrawong WF ST 05	NA	Tree cultural site	Burrawong WF HTH 05	47-6-1168	Hearth
Burrawong WF ST 06	NA	Tree cultural site	Burrawong WF HTH 07	47-6-1189	Hearth
Burrawong WF ST 07	NA	Tree cultural site	Burrawong WF HTH 08	47-6-1166	Hearth
Burrawong WF ST 08	NA	Tree cultural site	Burrawong WF HTH 10	47-6-1193	Hearth and Artefact
Burrawong WF ST 09	NA	Tree cultural site	Burrawong WF HTH 11	47-6-1187	Hearth and Artefact
Burrawong WF ST 10	NA	Tree cultural site	Burrawong WF HTH 12	47-6-1186	Hearth and oven mound

Site name	AHIMS#	Site Type	Site name	AHIMS#	Site Type
Burrawong WF ST 11	NA	Tree cultural site	Condoulpe	47-6-0037	Burial
Burrawong WF ST 12	NA	Tree cultural site	Condoulpe Creek	47-6-0041	Burial
Burrawong WF ST 13	NA	Tree cultural site	North Dusty Lake-8	47-6-0093	Artefact
Burrawong WF ST 14	NA	Tree cultural site	Burrawong 1	47-6-0945	Artefact
Burrawong WF ST 15	NA	Tree cultural site	Condoulpe Lake 24	47-6-0253	Hearth
Burrawong WF ST 16	NA	Tree cultural site	Condoulpe 19	47-6-0147	Modified Tree
Burrawong WF ST 17	NA	Tree cultural site	Condoulpe 20	47-6-0148	Modified Tree
Burrawong WF ST 18	NA	Tree cultural site	Condoulpe 22	47-6-0150	Modified Tree
Burrawong WF ST 19	NA	Tree cultural site	Condoulpe Lake 26	47-6-0255	Modified Tree
Burrawong WF ST 20	NA	Tree cultural site	Condoulpe 23	47-6-0151	Modified Tree
Burrawong WF ST 21	NA	Tree cultural site	Condoulpe Lake 25	47-6-0254	Modified Tree
Burrawong WF ST 22	NA	Tree cultural site	Condoulpe 18	47-6-0146	Modified Tree
Burrawong WF ST 23	NA	Tree cultural site	Condoulpe 2	47-6-0069	Modified Tree
Burrawong WF ST 24	NA	Tree cultural site	Condoulpe 21	47-6-0149	Modified Tree
Burrawong WF AFT 05	47-6-1192	Artefact Scatter, Hearth and oven mound	Condoulpe 1	47-6-0068	Modified Tree

Table 12-2. List of sites to be subject to unmitigated harm.

Site name	AHIMS#	Site Type
Burrawong WF HTH 06	47-6-1167	Hearth
Burrawong WF HTH 09	47-6-1165	Hearth
Burrawong WF HTH 13	47-6-1185	Hearth

Table 12-3. List of sites to be subject to mitigation via surface collection prior to any development impacts.

Site name	AHIMS#	Site Type	Site name	AHIMS#	Site Type
Burrawong 2	47-6-1159	Isolated Find	Burrawong 23	47-6-1152	Isolated Find
Burrawong 3	47-6-1161	Isolated Find	Burrawong 24	47-6-1150	Isolated Find
Burrawong 4	47-6-1160	Isolated Find	Burrawong 25	47-6-1149	Isolated Find
Burrawong 5	47-6-1173	Isolated Find	Burrawong 26	47-6-1148	Isolated Find
Burrawong 6	47-6-1140	Isolated Find	Burrawong 27	47-6-1147	Isolated Find
Burrawong 7	47-6-1141	Isolated Find	Burrawong 28	47-6-1146	Isolated Find
Burrawong 8	47-6-1142	Isolated Find	Burrawong 29	47-6-1145	Isolated Find
Burrawong 9	47-6-1143	Isolated Find	Burrawong 30	47-6-1184	Isolated Find
Burrawong 10	47-6-1139	Isolated Find	Burrawong 31	47-6-1183	Isolated Find
Burrawong 11	47-6-1138	Isolated Find	Burrawong 32	47-6-1182	Isolated Find
Burrawong 12	47-6-1164	Isolated Find	Burrawong 33	47-6-1181	Isolated Find
Burrawong 13	47-6-1163	Isolated Find	Burrawong 34	47-6-1180	Isolated Find
Burrawong 14	47-6-1162	Isolated Find	Burrawong 35	47-6-1179	Isolated Find
Burrawong 15	47-6-1144	Isolated Find	Burrawong 36	47-6-1178	Isolated Find
Burrawong 16	47-6-1151	Isolated Find	Burrawong 37	47-6-1177	Isolated Find
Burrawong 17	47-6-1158	Isolated Find	Burrawong 38	47-6-1176	Isolated Find
Burrawong 18	47-6-1157	Isolated Find	Burrawong WF AFT 01	47-6-1188	Artefact Scatter

Site name	AHIMS#	Site Type	Site name	AHIMS#	Site Type
Burrawong 19	47-6-1156	Isolated Find	Burrawong WF AFT 02	47-6-1175	Artefact Scatter
Burrawong 20	47-6-1155	Isolated Find	Burrawong WF AFT 03	47-6-1174	Artefact Scatter
Burrawong 21	47-6-1154	Isolated Find	Burrawong WF AFT 04	47-6-1172	Artefact Scatter
Burrawong 22	47-6-1153	Isolated Find	Burrawong WF AFT 06	47-6-1170	Artefact Scatter

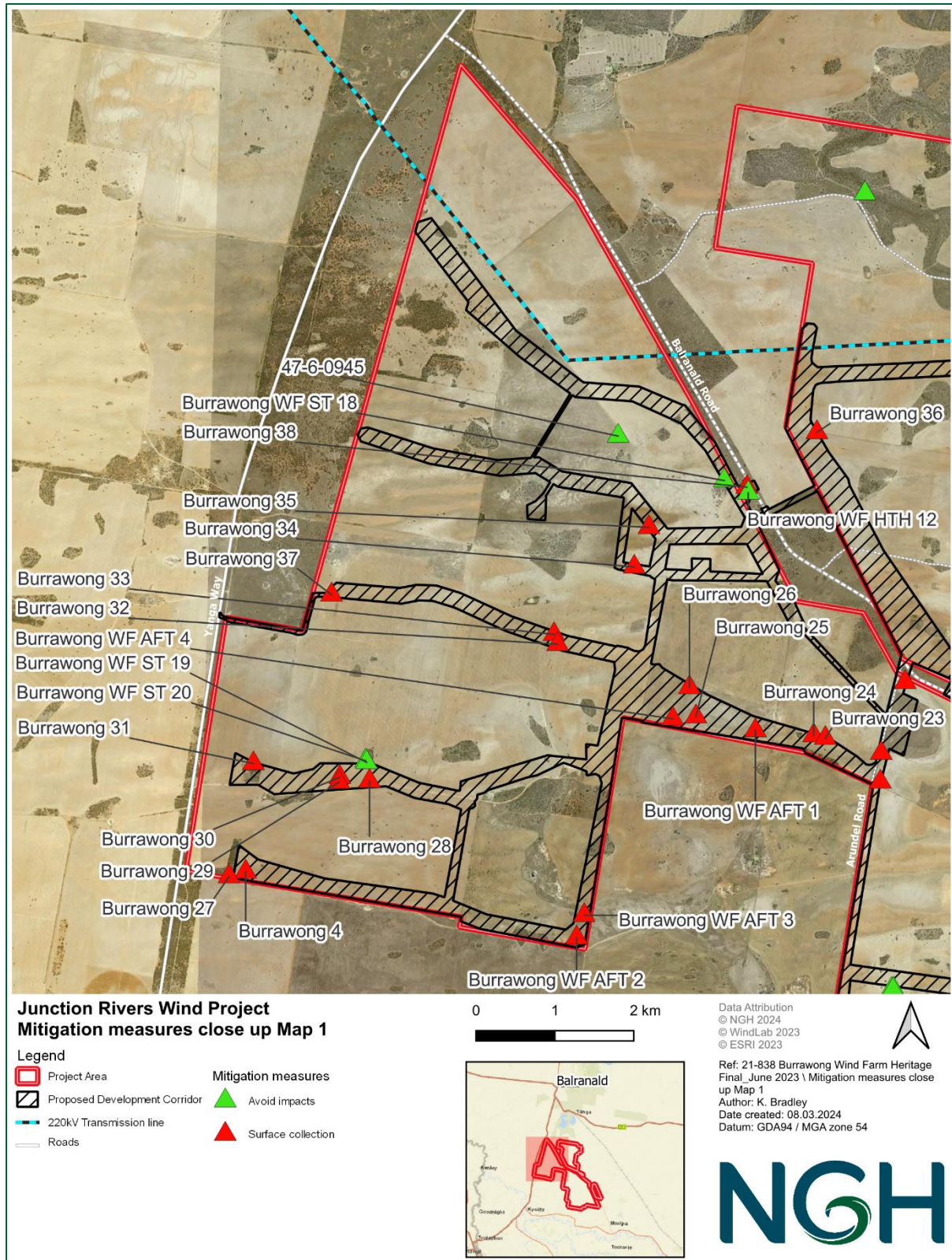
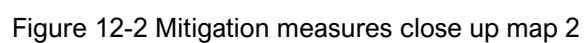


Figure 12-1 Mitigation measures close up map 1



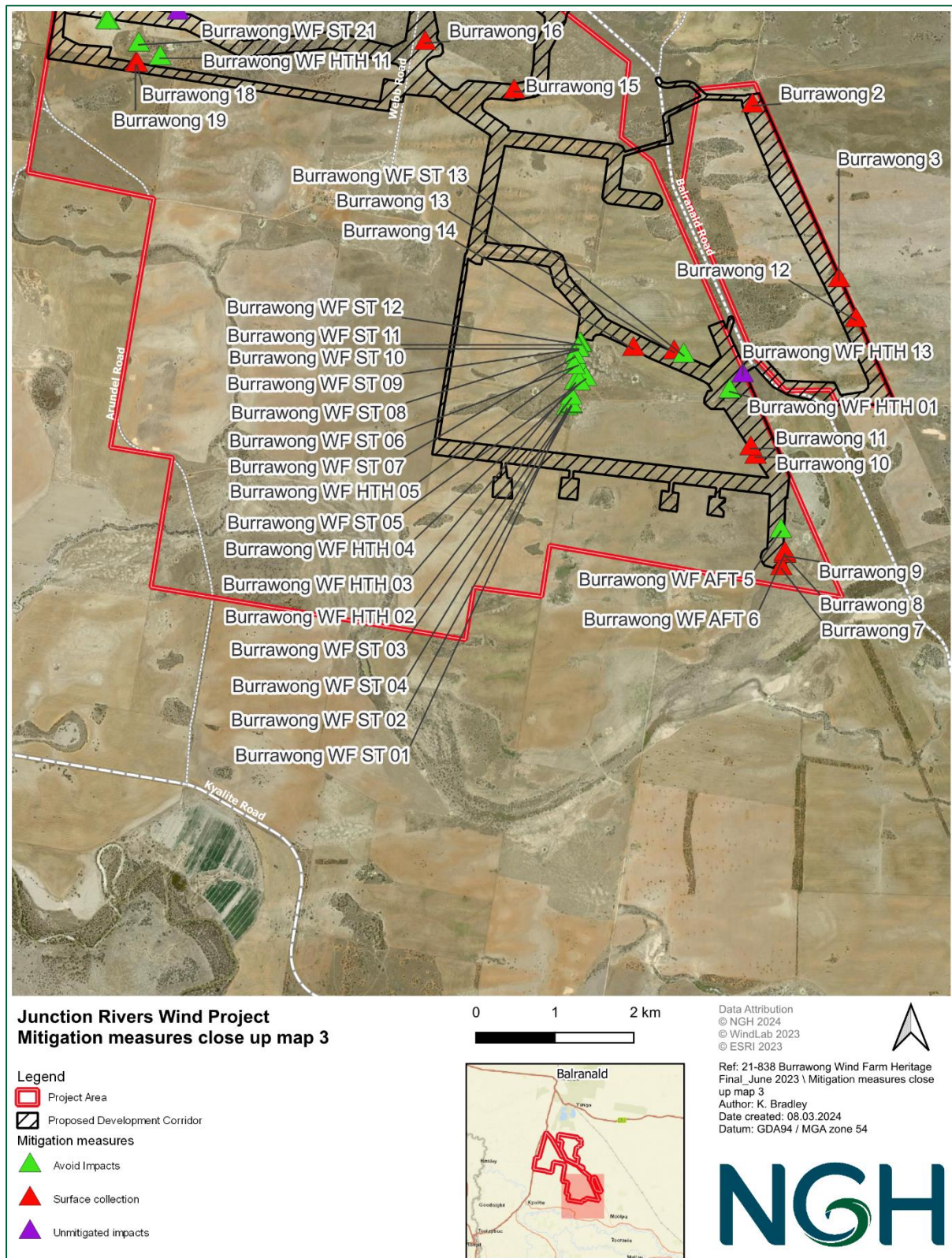


Figure 12-3 Mitigation measures close up map 3

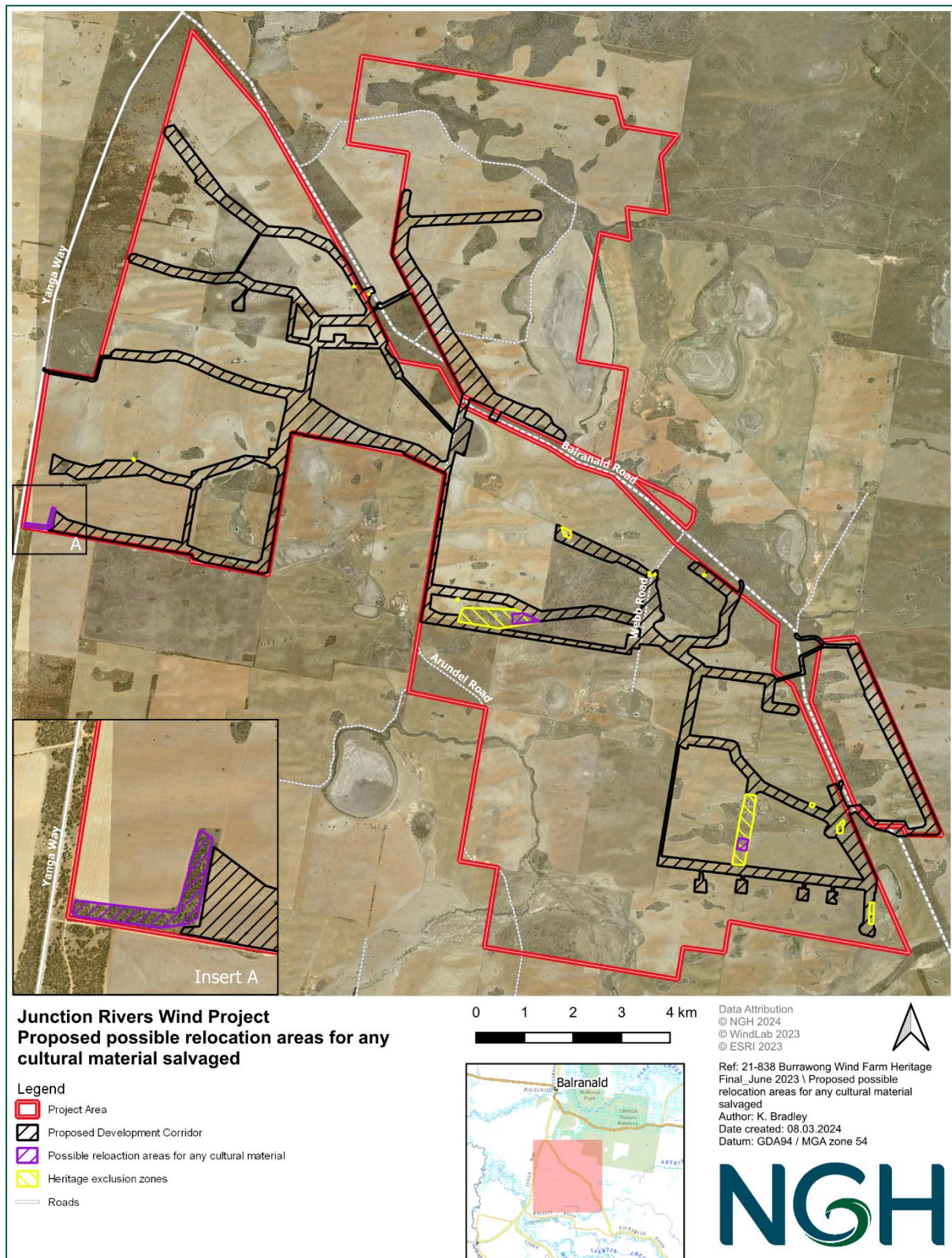


Figure 12-4 Proposed possible relocation areas for any cultural material salvaged.

13. Recommendations

The recommendations are based on the following information and considerations:

- Results of the current archaeological survey of the Project Area;
- Consideration of results from other regional archaeological studies;
- Results of consultation with the registered Aboriginal parties;
- The assessed significance of the sites;
- Appraisal of the proposed development; and
- Legislative context for the development proposal.

It is recommended that:

1. The development must avoid all the heritage exclusion zones which are mapped within the Project Area. These heritage exclusion areas should be shown on all construction maps for this Project and if during construction works any ground disturbance activity is proposed within 50 m of any of these heritage exclusion zones then high visibility temporary fencing must be in place along the boundary of the heritage exclusion zone in proximity to the works prior to any ground disturbance and/or construction works commencing nearby to ensure there are no inadvertent impacts to these areas. Given the size of some of these heritage exclusion zones it is acceptable that only the portion of the heritage exclusion zones in proximity to works is demarcated.
2. The development must avoid the 24 tree cultural sites recorded during this assessment as Burrawong WF ST 01 to Burrawong WF ST 24. A minimum 20 m buffer must be in place from the trunk of each tree to prevent any inadvertent impacts to the canopy and/or root system of each recorded cultural site.
3. The development must avoid the 15 previously registered AHIMS sites within the Project Area which are outside the proposed development corridor for this Project. The AHIMS sites to be avoided are: 47-6-0037, 47-6-0041, 47-6-0093, 47-6-0945, 47-6-0253, 47-6-0147, 47-6-0148, 47-6-0150, 47-6-0255, 47-6-0151, 47-6-0254, 47-6-0146, 47-6-0069, 47-6-0149 and 47-6-0068. No works or access tracks are proposed to be implemented during the Project within proximity (within 50 m) to any of these previously registered AHIMS sites within the Project Area, hence no demarcation of these sites is required as part of the Junction Rivers Wind Project.
4. If complete avoidance to any of the isolated finds and artefact scatters recorded within the proposed development corridor is not possible, a reasonable and feasible attempt, through the visual inspection of the site by an archaeologist with an Aboriginal community representative (as selected by the Proponent), must occur in an attempt to collect the surface stone artefacts within the development corridor at each of these recorded locations. This must occur prior to construction, following the development consent which is issued for State Significance Developments.
5. Due to ongoing farming practises in the wider Project Area and the potential for delays in the commencement of construction, the ability to undertake the surface collection salvage within the development corridor (outside the heritage exclusion areas) should be facilitated in any conditions of consent issued for this Project. This should occur following the approval of a Cultural Heritage Management Plan for the Project and in accordance with the development consent. The surface collection salvage would be undertaken in line with the methodology provided in Appendix D of the ACHA report.
6. A surface collection salvage programme must be attempted at each site with stone artefacts recorded that is approved for impacts prior to the proposed construction works commencing for each stage of works proposed within the development corridor for the Junction Rivers Wind Project. The surface collection programme may be staged, if required, to conform to the proposed staged approach of construction works.
7. The collection and relocation of the surface artefacts and any collected cultural material should be undertaken by an archaeologist with a representative/s of the registered Aboriginal parties, as selected

by the Proponent, and be consistent with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* and/or the wishes of the Registered Aboriginal Parties.

8. All objects salvaged must have their long term relocation details submitted to the AHIMS database. An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works as approved in the development consent for this State Significant Development.
9. A minimum 5 m buffer should be observed around all stone artefact and hearth sites that are being avoided by the proposed development. If during any works for the Junction Rivers Wind Project, any ground disturbance activity is proposed within 50 m of any recorded valid in situ known Aboriginal sites then high visibility temporary fencing must be in place to demarcate a minimum 5 m buffer around the boundary of the site prior to any works commencing within proximity (within 50 m) of the site.
10. Unmitigated impacts can occur to the hearth sites Burrawong WF HTH 06, Burrawong WF HTH 09, Burrawong WF HTH 13 if they cannot be avoided by works.
11. All works for the Junction Rivers Wind Project must stay within the area assessed for the development corridor and impact areas as detailed in this report to ensure there are no inadvertent impacts to Aboriginal objects.
12. For any proposed future impacts to the Aboriginal sites being avoided and outside the development corridor, as assessed in this report, further assessment and consideration of impacts on Aboriginal Heritage as determined by an archaeologist should occur. Additional Aboriginal consultation and further assessment which may include survey and/or subsurface testing may be required.
13. Further archaeological assessment would be required if the proposal activity and development corridor extends beyond the area assessed in this report. This would include consultation with the registered Aboriginal parties and may involve further field survey.
14. The Proponent should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal artefacts and objects during the construction of the Junction Rivers Wind Project and for the management of known sites within and in proximity to the development corridor which will be avoided. The Plan should include the unexpected finds procedure to manage any objects suspected to be Aboriginal in origin during the construction, maintenance, operation and decommissioning works and include requirements for heritage to be included as part of the site inductions and the monitoring of sites which will be avoided. Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.
15. In the event that suspected human remains are discovered during the construction of the Junction Rivers Wind Project, all work must cease in the immediate vicinity. The appropriate heritage team within Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were ancestral Aboriginal remains or not. If the remains are deemed to be ancestral Aboriginal in origin Heritage NSW would be sought to advise the Proponent on the appropriate actions required. An unexpected find protocol for suspected human remains must be included in the CHMP for the Project.
16. Prior to any development consent being issued for this Project, the drafted conditions which relate to Aboriginal heritage should be reviewed by a qualified archaeologist to ensure all sites assessed for impacts and avoidance and the management recommendations, as noted in this report, are clearly included and listed in any conditions of consent.

All Aboriginal objects and places in NSW are protected under the *National Parks and Wildlife Act*. It is an offence to disturb an Aboriginal object or site without appropriate consent.

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Appendix A Site descriptions

ACHA Appendix A

A.1 Artefact Scatters and Hearths

AHIMS#	Site ID	Description	Photos
47-6-1188	Burrawong WF AFT 1	This artefact scatter was initially recorded as 15 stone artefacts comprising silcrete, quartz and fine-grain siliceous (FGS) materials in forms such as a hammerstone, flakes, blades, and flake fragments. This site is located on the basal to flat portion of a grey clay slope overlooking a dry soak. This site was recorded as part of the site inspection for the geotechnical investigation due diligence (NGH 2022) in the proposed location for Bore Hole 3. A number of additional artefacts were identified during the ACHA survey, and the area of the site expanded to encompass a total of 54 stone artefacts within an area of approximately 800 m (east/west) by 250 m (north/south). These artefacts were primarily silcrete flakes and flake fragments. Other raw materials include quartz, quartzite, FGS, sandstone and volcanic with artefact forms in addition to the flakes and flake fragments including cores, flaked pieces, grindstone and grindstone fragments, hammerstone, manuport, pestle and retouched artefacts.	 Sample of stone artefacts from AFT 1  View east across site AFT 1

AHIMS#	Site ID	Description	Photos
47-6-1175	Burrawong WF AFT 2	This artefact scatter was recorded as part of the site inspection for geotechnical investigation due diligence (NGH, 2022) in the proposed location of TP05. The site is located on the basal slope of a red sandy rise overlooking an ephemeral soak. Several artefact types were identified, including several burnt clay balls, and stone tools comprising of silcrete, chert, and quartzite. The site recorded a total of 50+ artefacts.	 Silcrete artefact from AFT 2  View south across site AFT 2

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1174	Burrawong WF AFT 3	This low-density artefact scatter is located on the basal slope of a red sandy rise overlooking an ephemeral soak and situated approximately 122 m north of AFT 2. The site consists of a total of four stone artefact including a silcrete core, a silcrete flake, a volcanic flake and a silcrete flaked piece.	 Grey silcrete flake from AFT 3

AHIMS#	Site ID	Description	Photos
47-6-1172	Burrawong WF AFT 4	This artefact scatter is located on the basal to flat portion of a grey clay slope overlooking a dry soak, situated 400m west of AFT 1. Several artefact types were identified, including predominantly silcrete and fine grain silicious material with a small amount of quartz also present. Artefact types included, flakes, cores, retouched flakes, hammerstone, manuport and an axe. Typologies were silcrete, quartzite, FGS, quartz and volcanic. A total of 29 stone artefacts were recorded over an area of approximately 200 m (east/west) by 250 m (north/south)	 axe from AFT 4.  axe from AFT 4.  View across site AFT 4

AHIMS#	Site ID	Description	Photos
47-6-1192	Burrawong WF AFT 5	This site consists of an artefact scatter, with five hearth features and a mound feature across an areas of approximately 80 m (east/west) by 370 m (north/south). A total of 37 stone artefacts were recorded which included flakes, broken flakes, cores and flaked pieces. A total of 5 hearth features with burnt clay were in the north and centre portion of the sit. The hearth ranged from small localised features measuring 20 cm x 30 cm to large hearths with scatter clay heat retainers over an 12 m by 11 m area. The hearth features were generally in exposures around clay pans and found in association with stone artefacts. A single oven mound was recorded in the southern portion of the site which is approximately 13 m in length and 8.6 m wide which was partially intact in the centre but noted to be eroding around the edges This mound feature was noted to be associated with cooking activities and stone artefacts.	 View across site AFT 5  Silcrete flake from AFT 5

AHIMS#	Site ID	Description	Photos
47-6-1170	Burrawong WF AFT 6	This very low density artefact scatter is located 80m southeast of AFT 5. This site constitutes of two artefacts, one quartz flake and one fine grained silicious broken flake.	 Quartz flake from AFT 6
47-6-1191	Burrawong WF HTH 01	This hearth and mound site is located across an area approximately 100 m (east/west) by 230 m (north/south). A total of five hearth features were recorded which included small isolated hearths with in situ clay heat retainers to scattered and dispersed heat retainers over a 10 m x 15 m area. A single oven mound was recorded at this site which was noted to be used for cooking which was 4.1m in length by 4.7m wide.	

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1171	Burrawong WF HTH 02	A single small hearth feature was recorded with clay heat retainers in the gateway of a vehicle track. Heat retainers in an area of 0.48 m by 0.5 m.	
47-6-1169	Burrawong WF HTH 03	Two small localised hearth features were recorded adjacent to a track on a slight rise within grey clays. One of these hearth features was noted to be in situ and possible to be suitable for testing.	

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1190	Burrawong WF HTH 04	A single small hearth feature was recorded with clay heat retainers adjacent to a soak which has been subject to erosion.	
47-6-1168	Burrawong WF HTH 05	A single small hearth feature was recorded with clay heat retainers which has been subject to erosion and stock damage.	

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1167	Burrawong WF HTH 06	Two small localised hearth features were recorded within an area approximately 25 m (east/west) by 10 m (north/south). Both were noted to have subject to erosion.	
47-6-1189	Burrawong WF HTH 07	Two small localised hearth features were recorded within an area approximately 10 m (east/west) by 10 m (north/south). Both were noted to be eroding from a blow out with one of these features noted to still have an in situ section in the wall.	

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1166	Burrawong WF HTH 08	A single hearth feature approximately 2 m by 1.5 m in area was recorded with clay heat retainers.	

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1165	Burrawong HTH 09	WFH A single hearth feature with a small in situ area of burnt clay was recorded within a scatter of clay heat retainers across an area of 10 m by 5 m.	

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1193	Burrawong WF HTH 10	A single hearth feature was recorded with clay heat retainers in the wall of a blow out in proximity to a single silcrete blade. Clay heat retainers spread across an area of 1m by 0.8 m.	

AHIMS#	Site ID	Description	Photos
47-6-1187	Burrawong WF HTH 11	This hearth and low density artefact scatter is located across an area approximately 550 m (east/west) by 140 m (north/south). A total of seven hearth features were recorded which were generally small, localised hearths with in situ clay heat retainers with surrounding dispersed heat retainers. The artefacts recorded in included two distal silcrete fragments, a silcrete flake and a quartzite flake.	 

<u>AHIMS#</u>	<u>Site ID</u>	<u>Description</u>	<u>Photos</u>
47-6-1186	Burrawong WF HTH 12	This hearth and mound site is located across an area approximately 5 m (east/west) by 150 m (north/south) and included scattered clay heat and a single oven mound which was noted to be used for cooking.	
47-6-1185	Burrawong WF HTH 13	Two small localised hearth features were recorded within an area approximately 60m (east/west) by 30m (north/south).	

A.2 Tree cultural site

Site Name	Description	Photo
Burrawong WF ST 01	Alive and standing Black Box tree with a single oval shaped scar. Good condition despite insect and termite damage. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	
Burrawong WF ST 02	Alive Standing Black Box tree with single rectangular scar. Recent metallic axe marks noted. Weathered and in poor condition. Recorded as cultural site at the request of Aboriginal community representatives onsite. Tree possible to be representative of 'rabbiting tree'.	

Site Name	Description	Photo
Burrawong WF ST 03	Alive standing Black Box tree with a single scar. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	
Burrawong WF ST 04	Alive standing Black Box tree with a single rectangular scar. Very old axe mark on remnant original surface of scar. Original bark panel has since fallen off. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005). Tree possible to be representative of 'rabbiting tree'.	

Site Name	Description	Photo
Burrawong WF ST 05	Dead standing Eucalypt tree with a single rectangular scar. In poor condition with evidence of rot across surface. Likely dead for a long time. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	
Burrawong WF ST 06	Alive standing Black Box tree with a single scar. Poor condition with evidence of rot. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	

Site Name	Description	Photo
Burrawong WF ST 07	Alive standing Black box tree with a single rectangular scar. Evidence of insect trauma. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	
Burrawong WF ST 08	Alive standing Black box tree with a single scar. Evidence of insect trauma. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	

Site Name	Description	Photo
Burrawong WF ST 09	Alive standing Black Box tree with two scars. One scar has horizontal marking from axe. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005). Tree possible to be representative of 'rabbiting tree'.	

Site Name	Description	Photo
Burrawong WF ST 10	Alive standing Black Box with two scars. Metal axe mark present. Recorded as cultural site at the request of Aboriginal community representatives onsite. Tree possible to be representative of 'rabbiting tree'.	

Site Name	Description	Photo
Burrawong WF ST 11	Alive standing Black Box with a single scar. Metal axe mark present. Recorded as cultural site at the request of Aboriginal community representatives onsite. Tree possible to be representative of 'rabbiting tree'.	

Site Name	Description	Photo
Burrawong WF ST 12	Alive standing Black Box with a single scar. Metal axe mark present. Three parallel lines at base of tree. Recorded as cultural site at the request of Aboriginal community representatives onsite. Tree possible to be representative of 'rabbiting tree'.	
Burrawong WF ST 13	Alive standing Black Box with an oval scar. Recorded as cultural site at the request of Aboriginal community representatives onsite.	
Burrawong WF ST 14	Dead fallen Eucalypt tree with one ringbark scar and one cultural scar. Weathered but in good condition. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	

Site Name	Description	Photo
Burrawong WF ST 15	Dead fallen Eucalypt tree with one cultural scar. Weathered but in good condition. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	
Burrawong WF ST 16	Dead standing eucalypt with one scar. Good condition but some damage from stock. Recorded as cultural site at the request of Aboriginal community representatives onsite.	
Burrawong WF ST 17	Alive standing eucalypt with one cultural scar and metal axe marks. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	

Site Name	Description	Photo
Burrawong WF ST 18	One alive standing Black Box with single oval scar. Some insect and termite damage present. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	
Burrawong WF ST 19	One alive standing Black Box with single oval scar. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	

Site Name	Description	Photo
Burrawong WF ST 20	One alive standing Black Box with single oval scar. Recorded as cultural site at the request of Aboriginal community representatives onsite. Tree possible to be representative of 'rabbiting tree'.	

Site Name	Description	Photo
Burrawong WF ST 21	One standing alive Black Box with a single scar. Steel axe marks, 16 lines. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005). Tree possible to be representative of 'rabbiting tree'.	

Site Name	Description	Photo
Burrawong WF ST 22	One standing dead Black Box with a single scar. Significant regrowth. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	

Site Name	Description	Photo
Burrawong WF ST 23	One standing Black Box with a single oval scar. The scar is facing south with 11 evenly space steel axe strikes. Recorded as cultural site at the request of Aboriginal community representatives onsite. Tree possible to be representative of 'rabbiting tree'.	 

Site Name	Description	Photo
Burrawong WF ST 24	Standing Black Box with single south facing scar. In stand of Black Box trees. Recorded as cultural site at the request of Aboriginal community representatives onsite. Scar does not conform with standard scarring morphology accepted for Aboriginal modification in NSW (cf. Long 2005).	 

A.3 Isolated Finds

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1159	Burrawong 2	Grindstone fragment	Granite	 
47-6-1161	Burrawong 3	Flake	Silcrete	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1160	Burrawong 4	Proximal Fragment	Silcrete	
47-6-1173	Burrawong 5	Flake	Silcrete	 

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1140	Burrawong 6	Flaked Piece	Quartz	
47-6-1141	Burrawong 7	Flake	Quartz	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1142	Burrawong 8	Flaked Piece	Fine-grained silicious	
47-6-1143	Burrawong 9	Flake	Silcrete	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1139	Burrawong 10	Grindstone fragment	Silcrete	 Location of Burrawong 10

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1138	Burrawong 11	Flaked Piece	Silcrete	
47-6-1164	Burrawong 12	Grindstone fragment	Sandstone	
47-6-1163	Burrawong 13	Proximal Fragment	Quartzite	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1162	Burrawong 14	Hammer stone	Silcrete	
47-6-1144	Burrawong 15	Grindstone fragment	Silcrete	
47-6-1151	Burrawong 16	Flake	Silcrete	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1158	Burrawong 17	Flake	Quartz	
47-6-1157	Burrawong 18	Flake	Quartzite	
47-6-1156	Burrawong 19	Distal Fragment	Silcrete	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1155	Burrawong 20	Flake	Quartzite	 
47-6-1154	Burrawong 21	Flake	Sandstone	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1153	Burrawong 22	Flaked Piece	Quartzite	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1152	Burrawong 23	Flaked Piece	Silcrete	
47-6-1150	Burrawong 24	Flake	Silcrete	
47-6-1149	Burrawong 25	Distal Fragment	Silcrete	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1148	Burrawong 26	Distal Fragment	Quartz	
47-6-1147	Burrawong 27	Manuport	Silcrete	
47-6-1146	Burrawong 28	Distal Fragment	Chert	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1145	Burrawong 29	Flake	Silcrete	
47-6-1184	Burrawong 30	Distal Fragment	Quartz	
47-6-1183	Burrawong 31	Grindstone fragment	Sandstone	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1182	Burrawong 32	Flaked Piece	Silcrete	
47-6-1181	Burrawong 33	Flaked Piece	Silcrete	
47-6-1180	Burrawong 34	Grindstone fragment	Sandstone	

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1179	Burrawong 35	Muller	Quartzite	
47-6-1178	Burrawong 36	Flake	Silcrete	
47-6-1177	Burrawong 37	core	Silcrete	 

AHIMS #	Site Name	Type	Lithology	Photo
47-6-1176	Burrawong 38	Flake	Fine-grained silicious	

Appendix B Surface Stone Artefact Data

ARCHAEOLOGICAL APPENDIX

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong 2	Grindstone fragment	Granite	<80mm							Primary	Pitting along margin. Plough damage
Burrawong 3	Flake	Silcrete	<20mm	19	16	3	Crushed	Shattered	Feather	Tertiary	
Burrawong 4	Proximal Fragment	Silcrete	<10mm	9	8	3	Flake scar	Broad		Tertiary	
Burrawong 5	Flake	Silcrete	<20mm	14	11	3	Flake scar	Broad	Feather	Tertiary	
Burrawong 6	Flaked Piece	Quartz	<30mm							Tertiary	on red sandy rise overlooking soak
Burrawong 7	Flake	Quartz	<30mm	22	22	6	Flake scar	Broad	Feather	Tertiary	
Burrawong 8	Flaked Piece	Fine-grained silicious	<30mm							Tertiary	
Burrawong 9	Flake	Silcrete	<30mm	24	23	6	Indeterminate	Focal	Feather	Tertiary	Found in claypan
Burrawong 10	Grindstone fragment	Silcrete	<50mm	45	17	18				Primary	Located within a ploughed paddock. Fragmented burnt clay sparsely dispersed along the lower slope of same dune landform. Upper grindstones frag. Possible muller. Smooth cortex edge with slight silica skin visible
Burrawong 11	Flaked Piece	Silcrete	<30mm							Tertiary	Located 350 m approx. NE of power line. Burnt clay frags heavily distributed by ploughing found in same lower slope of dune landform.
Burrawong 12	Grindstone fragment	Sandstone	<80mm	73	38	22				Primary	Visible residue on grinding platform, Grindstone dish or plate fragment. The fragment seems to be a broken piece of the outer edge of the dish
Burrawong 13	Proximal Fragment	Quartzite	<40mm	23	34	14	Flake scar	Broad		Secondary	
Burrawong 14	Hammer stone	Silcrete	<40mm	39	30	31				Primary	utilised as hammerstone, pitting on margins and surfaces
Burrawong 15	Grindstone fragment	Silcrete	<80mm	79	35	62				Primary	Highly polished on one side pitting on other
Burrawong 16	Flake	Silcrete	<10mm	10	9	4	Flake scar	Focal	Feather	Tertiary	
Burrawong 17	Flake	Quartz	<20mm	9	15	5	Flake scar	Broad	Hinge	Tertiary	Near road
Burrawong 18	Flake	Quartzite	<20mm	13	14	5	Flake scar	Broad	Feather	Tertiary	on red sand overlooking soak
Burrawong 19	Distal Fragment	Silcrete	<20mm	10	8	3			Feather	Tertiary	On red sandy rise overlooking soak

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong 20	Flake	Quartzite	<40mm	42	12	4	Cortex	Focal	Step	Secondary	
Burrawong 21	Flake	Sandstone	<30mm	23	19	19	Flake scar	Broad	Feather	Tertiary	Located on blow out of vehicle track along fence line.
Burrawong 22	Flaked Piece	Quartzite	<40mm							Tertiary	In ploughed paddock. Site located approx. 40 m of powerline and 60 m east of Arundel Road
Burrawong 23	Flaked Piece	Silcrete	<40mm							Tertiary	
Burrawong 24	Flake	Silcrete	<40mm	22	25	7	Cortex	Broad	Hinge	Primary	100% cortical surface
Burrawong 25	Distal Fragment	Silcrete	<30mm	20	29	6			Feather	Tertiary	
Burrawong 26	Distal Fragment	Quartz	<20mm	15	11	4			Plunge	Tertiary	
Burrawong 27	Manuport	Silcrete	<40mm	33	30	20				Primary	Two instances of pitting along margins. Silcrete pebble
Burrawong 28	Distal Fragment	Chert	<20mm	10	13	6			Feather	Tertiary	
Burrawong 29	Flake	Silcrete	<50mm	45	38	18	Flake scar	Focal	Bipolar	Primary	90% distal cortex. Red sand rise
Burrawong 30	Distal Fragment	Quartz	<20mm	12	18	4			Feather	Tertiary	
Burrawong 31	Grindstone fragment	Sandstone	>100m m	104	84	49				Primary	Grindstone which RAP suggests maybe used for crushing pigments
Burrawong 32	Flaked Piece	Silcrete	<30mm							Tertiary	
Burrawong 33	Flaked Piece	Silcrete	<40mm							Tertiary	
Burrawong 34	Grindstone fragment	Sandstone		74	51	28				Primary	Some possible plough marks on top. Silica polish on one side with Rejuvenation pecking. Partial polished with plough damage on the other side. Milling on one margin.
Burrawong 35	Muller	Quartzite	<80mm	80	60	55				Primary	River shaped pebble with polished ground cortex surface. Four break surfaces.
Burrawong 36	Flake	Silcrete	<20mm	7	10	2	Flake scar	Broad	Hinge	Tertiary	
Burrawong 37	core	Silcrete	<50mm	44	35	8				Tertiary	Four negative scars, platform trimming
Burrawong 38	Flake	Fine-grained silicious	<40mm	31	22	23	Flake scar	Focal	feather	Secondary	Cortex q2 and 3 less than 25%, in small erosion scald 2 x 1 m
Burrawong AFT 1	Blade	Silcrete	<30mm	28	10	6	Flake scar	Broad	Feather	Tertiary	

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong AFT 1	Blade	Silcrete	<30mm	19	7	6	Flake scar	Broad	Feather	Tertiary	
Burrawong AFT 1	Core	Silcrete	<40mm	35	27	24				Secondary	1 negative flake scar, 1 platform
Burrawong AFT 1	Core	Silcrete	<50mm	47	34	38				Secondary	Multi directional core. 3 negative flake scars
Burrawong AFT 1	Core	Silcrete	<50mm	47	32	28				Secondary	Multi directional core. 1 complete flake scar. Some cortex
Burrawong AFT 1	Core	Silcrete	<70mm	67	52	39				Secondary	Multi directional core. 4 complete flake scars
Burrawong AFT 1	Core	Fine-grained silicious	<70mm	61	41	58				Secondary	Multi directional core. 1 complete flake scar
Burrawong AFT 1	Distal Fragment	Silcrete	<30mm	25	22	4			Hinge	Tertiary	
Burrawong AFT 1	Distal Fragment	Silcrete	<30mm	22	16	7			Hinge	Tertiary	
Burrawong AFT 1	Distal Fragment	Fine-grained silicious	<50mm	22	43	9			Feather	Primary	
Burrawong AFT 1	Distal Fragment	Silcrete	<40mm	32	27	10			Feather	Tertiary	
Burrawong AFT 1	Distal Fragment	Quartzite	<30mm	19	24	4			Feather	Primary	
Burrawong AFT 1	Distal Fragment	Silcrete	<40mm	39	18	8			Feather	Tertiary	2 notches of retouch on left lateral margin
Burrawong AFT 1	Distal Fragment	Silcrete	<30mm	23	15	5			Feather	Tertiary	
Burrawong AFT 1	Distal Fragment	Silcrete	<20mm	18	17	2			Feather	Tertiary	
Burrawong AFT 1	Distal Fragment	Silcrete	<20mm	9	19	3			Feather	Tertiary	Distal end of blade. Backing evident along right margin
Burrawong AFT 1	Distal Fragment	Quartzite	<20mm	18	12	5			Hinge	Tertiary	
Burrawong AFT 1	Flake	Silcrete	<30mm	21	21	9	Flake scar	Bipolar	Feather	Tertiary	Retouch along distal and left lateral margin
Burrawong AFT 1	Flake	Quartz	<30mm	25	13	11	Crushed	Shattered	Plunge	Tertiary	

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong AFT 1	Flake	Silcrete	<30mm	27	17	5	Flake scar	Broad	Plunge	Secondary	
Burrawong AFT 1	Flake	Silcrete	<30mm	28	21	6	Flake scar	Broad	Feather	Tertiary	
Burrawong AFT 1	Flake	Silcrete	<40mm	32	28	11	Cortex	Broad	Hinge	Secondary	
Burrawong AFT 1	Flake	Silcrete	<50mm	47	38	9	Flake scar	Focal	Plunge	Secondary	
Burrawong AFT 1	Flake	Fine-grained silicious	<40mm	23	29	7	Flake scar	Focal	Hinge	Tertiary	
Burrawong AFT 1	Flake	Quartz	<10mm	9	6	2	Flake scar	Broad	Feather	Tertiary	
Burrawong AFT 1	Flake	Quartz	<10mm	19	15	4	Crushed	Shattered	Feather	Tertiary	
Burrawong AFT 1	Flake	Silcrete	<40mm	23	24	7	Flake scar	Broad	Feather	Tertiary	
Burrawong AFT 1	Flaked Piece	Silcrete	<20mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Quartz	<20mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Quartz	<20mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Quartz	<30mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Silcrete	<40mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Silcrete	<40mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Silcrete	<40mm							Secondary	
Burrawong AFT 1	Flaked Piece	Silcrete	<30mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Silcrete	<30mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Silcrete	<40mm							Primary	

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong AFT 1	Flaked Piece	Silcrete	<40mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Quartzite	<30mm							Tertiary	
Burrawong AFT 1	Flaked Piece	Silcrete	<80mm							Secondary	
Burrawong AFT 1	Flaked Piece	Quartzite	<30mm							Tertiary	
Burrawong AFT 1	Grindstone fragment	Silcrete	<60mm	53	23	24				Primary	
Burrawong AFT 1	Grindstone	Silcrete	<70mm	67	52	37				Secondary	2 worked edges, heavy plough damages
Burrawong AFT 1	Grindstone	Sandstone	<90mm	81	55	48				Primary	1 grinding surface, 1 mortar/pounding surface
Burrawong AFT 1	Hammer stone	Silcrete	<80mm	75	43	50				Secondary	Significant plough damage. Some pitting
Burrawong AFT 1	Manuport	Quartzite	<100m m	99	48	22				Primary	Heavy plough damage. Potential grindstone but unable to determine recorded as manuport
Burrawong AFT 1	Medial Fragment	Silcrete	<30mm	17	29	7				Tertiary	
Burrawong AFT 1	Pestle	Volcanic	<70mm	68	62	48				Primary	
Burrawong AFT 1	Proximal Fragment	Quartz	<20mm	12	16	5	Flake scar	Broad		Tertiary	
Burrawong AFT 1	Proximal Fragment	Silcrete	<30mm	26	23	7	Crushed	Focal		Tertiary	
Burrawong AFT 1	Proximal Fragment	Silcrete	<30mm	23	17	5	Flake scar	Broad		Tertiary	
Burrawong AFT 1	Proximal Fragment	Silcrete	<20mm	11	10	4	Flake scar	Focal		Tertiary	
Burrawong AFT 1	Proximal Fragment	Silcrete	<20mm	13	15	3	Flake scar	Focal		Tertiary	
Burrawong AFT 1	Proximal Fragment	Fine-grained silicious	<30mm	22	22	3	Crushed	Shattered		Tertiary	
Burrawong AFT 2	Core	Silcrete	<50mm	46	35	26				Primary	Multi directional core, cortex present. Longest negative flake scar 30mm

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong AFT 2	Flake	Quartz	<20mm	16	17	7	Flake scar	Focal	Hinge	Tertiary	
Burrawong AFT 3	Core	Silcrete	<40mm	38	33	32				Secondary	Multi directional core, longest negative flake scar 25mm
Burrawong AFT 3	Flake	Silcrete	<60mm	51	32	15	Flake scar	Focal	Hinge	Tertiary	Sandy rise overlooking soak
Burrawong AFT 3	Flake	Volcanic	<30mm	26	16	4	Flake scar	Focal	Plunge	Tertiary	
Burrawong AFT 3	Flaked Piece	Silcrete	<40mm							Tertiary	
Burrawong AFT 4	Axe	Volcanic	>100m m	113	49	32				Secondary	Big plough damage. Pitting on margin
Burrawong AFT 4	Core	Silcrete	<50mm	42	41	25				Primary	core fragment, 1 negative flake scar
Burrawong AFT 4	Distal Fragment	Silcrete	<30mm	27	19	7			Hinge	Tertiary	
Burrawong AFT 4	Distal Fragment	Silcrete	<20mm	17	15	6			Feather	Tertiary	
Burrawong AFT 4	Distal Fragment	Other	<40mm	33	34	6			Feather	Tertiary	Plough damage.
Burrawong AFT 4	Distal Fragment	Quartzite	<30mm	27	26	5			Hinge	Tertiary	
Burrawong AFT 4	Flake	Silcrete	<30mm	25	11	9	Flake scar	Broad	Axial	Tertiary	
Burrawong AFT 4	Flake	Silcrete	<20mm	11	14	3	Crushed	Shattered	Step	Tertiary	
Burrawong AFT 4	Flake	Silcrete	<40mm	33	33	10	Flake scar	Broad	Axial	Secondary	
Burrawong AFT 4	Flake	Quartzite	<20mm	16	15	3	Flake scar	Broad	Feather	Tertiary	
Burrawong AFT 4	Flake	Silcrete	<30mm	25	19	5	Flake scar	Focal	Feather	Tertiary	Very fine grained. Quartz inclusions
Burrawong AFT 4	Flake	Silcrete	<40mm	29	30	10	Cortex	Broad	Hinge	Secondary	
Burrawong AFT 4	Flake	Silcrete	<20mm	13	10	3	Flake scar	Broad	Step	Tertiary	
Burrawong AFT 4	Flake	Silcrete	<40mm	37	27	11	Flake scar	Broad	Feather	Secondary	

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong AFT 4	Flake	Silcrete	<30mm	28	16	5	Crushed	Shattered	Plunge	Secondary	
Burrawong AFT 4	Flake	Silcrete	<50mm	42	31	12	Flake scar	Broad		Tertiary	Retouched termination. Retouch along all margins except proximal
Burrawong AFT 4	Flake	Silcrete	<40mm	36	15	8	Flake scar	Focal	Feather	Tertiary	
Burrawong AFT 4	Flake	Silcrete	<40mm	31	30	10	Crushed	Focal	Hinge	Tertiary	
Burrawong AFT 4	Flake	Fine-grained silicious	<30mm	22	21	4	Flake scar	Focal	Plunge	Tertiary	Retouch along left margin
Burrawong AFT 4	Flaked Piece	Silcrete	<10mm							Tertiary	
Burrawong AFT 4	Flaked Piece	Silcrete	<30mm							Tertiary	
Burrawong AFT 4	Flaked Piece	Quartz	<20mm							Tertiary	
Burrawong AFT 4	Flaked Piece	Silcrete	<20mm							Tertiary	
Burrawong AFT 4	Flaked Piece	Silcrete	<60mm							Tertiary	
Burrawong AFT 4	Flaked Piece	Quartz	<40mm							Tertiary	
Burrawong AFT 4	Hammer stone	Volcanic	<60mm	59	44	34				Primary	
Burrawong AFT 4	Manuport	Silcrete	<60mm	55	50	34				Primary	
Burrawong AFT 4	Medial Fragment	Quartz	<20mm	14	18	4				Tertiary	
Burrawong AFT 4	Proximal Fragment	Fine-grained silicious	<30mm	22	12	4	Crushed	Shattered		Tertiary	
Burrawong AFT 5	Core	Sandstone	<20mm	12	11	2				Tertiary	1 negative flake scar, 1 platform
Burrawong AFT 5	Core	Quartz	<30mm	25	16	8				Secondary	Located in clay pan exposure, One negative flake scar
Burrawong AFT 5	Core	Sandstone	<60mm	52	41	19				Secondary	Located in clay pan, Ridges visible on ventral surface

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong AFT 5	Distal fragment	Sandstone	<20mm	16	18	6			Feather	Tertiary	
Burrawong AFT 5	Distal fragment	Quartz	<20mm	16	12	4			Feather	Tertiary	
Burrawong AFT 5	Distal fragment	Quartz	<10mm	8	9	1			Feather	Tertiary	Located in clay pan exposure
Burrawong AFT 5	Flake	Sandstone	<30mm	26	26	8	Cortex	Focal	Feather	Secondary	
Burrawong AFT 5	Flake	Quartzite	<20mm	16	18	9	Cortex	Broad	Feather	Secondary	
Burrawong AFT 5	Flake	Quartz	<20mm	12	9	4	Crushed	Focal	Feather	Tertiary	Use wear presenting as serrations on lateral margin
Burrawong AFT 5	Flake	Fine-grained silicious	<10mm	8	10	3	Crushed	Focal	Step	Tertiary	Located in clay pan
Burrawong AFT 5	Flake	Quartzite	<20mm	12	12	7	Flake scar	Broad	Feather	Tertiary	Located in clay pan
Burrawong AFT 5	Flaked Piece	Quartzite	<20mm							Tertiary	Located within a raised landform with several hearths in proximity
Burrawong AFT 5	Flaked Piece	Silcrete	<30mm							Tertiary	Located in claypan with hearth
Burrawong AFT 5	Flaked Piece	Quartz	<20mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Quartz	<20mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Quartz	<30mm							Secondary	
Burrawong AFT 5	Flaked Piece	Sandstone	<20mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Sandstone	<30mm							Primary	
Burrawong AFT 5	Flaked Piece	Fine-grained silicious	<30mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Quartz	<20mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Sandstone	<10mm							Tertiary	

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong AFT 5	Flaked Piece	Quartz	<10mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Quartz	<10mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Sandstone	<30mm							Tertiary	Located in clay pan
Burrawong AFT 5	Flaked Piece	Sandstone	<30mm							Tertiary	
Burrawong AFT 5	Flaked Piece	Quartzite	<20mm							Tertiary	Located in clay pan
Burrawong AFT 5	Flaked Piece	Volcanic	<30mm							Secondary	Located in clay pan
Burrawong AFT 5	Flaked Piece	Quartzite	<20mm							Tertiary	Located in earth mound
Burrawong AFT 5	Flaked Piece	Quartzite	<30mm							Secondary	Located in earth mound
Burrawong AFT 5	Flaked Piece	Quartzite	<20mm							Tertiary	Located in earth mound
Burrawong AFT 5	Medial fragment	Quartz	<20mm	10	15	4				Tertiary	
Burrawong AFT 5	Medial fragment	Quartz	<10mm	10	7	2				Tertiary	
Burrawong AFT 5	Medial fragment	Quartz		13	9	5				Tertiary	
Burrawong AFT 5	Medial fragment	Silcrete	<20mm	10	12	3				Tertiary	
Burrawong AFT 5	Medial fragment	Fine-grained silicious	<20mm	12	14	5				Tertiary	Located in clay pan
Burrawong AFT 5	Medial fragment	Sandstone	<20mm	13	12	4	Indeterminate	Focal		Tertiary	
Burrawong AFT 5	Flaked Piece	Quartz	<10mm	9	6	2				Tertiary	Located in clay pan exposure
Burrawong AFT 6	Flake	Quartz	<20mm	11	9	3	Flake scar	Broad	Feather	Tertiary	Located on sandy spoil pile 15 m SW of dam
Burrawong AFT 6	Proximal Fragment	Fine-grained silicious	<20mm	14	12	4	Indeterminate	Focal		Tertiary	

Site	Type	Raw Material	Size Class	Length mm	Width mm	Thickness mm	Platform Surface	Platform Type	Termination	Reduction stage	Notes and comments
Burrawong WF HTH 10	Blade	Silcrete	<20mm	13	10	3	Faceted	Focal	Feather	Tertiary	
Burrawong WF HTH 11	Distal Fragment	Silcrete	<40mm	33	20	8			Hinge	Secondary	In blowout
Burrawong WF HTH 11	Distal Fragment	Silcrete	<40mm	38	29	11			Hinge	Tertiary	Highly weathered
Burrawong WF HTH 11	Flake	Silcrete	<40mm	32	17	7	Flake scar	Broad	Feather	Tertiary	
Burrawong WF HTH 11	Flake	Quartzite	<30mm	18	25	6	Flake scar	Broad	Hinge	Tertiary	

Appendix C Hearth and Mound Data

ACHA Appendix A

Site name	Feature #	Length (m)	Width (m)	Evidence	Condition	Disturbance	Notes and comments
Burrawong WF AFT 5	1	0.8	1.1	Burnt Clay	Good	Erosion	In situ hearth 80 x 110 cm. Natural erosion and possible previous stock damage has spread burnt clay nodules around a 5 m area of the site. Clay heat retainers approx. 5 cm diameter. Hearth located on a slight rise within a partially intact open plain landscape
	2	2.2	2.2	Burnt Clay	Good	Erosion	Oval shape hearth located in a slight rise landform with hearth and artefact sites adjacent. Clay heat retainer are 1 to 3 cm in size. Disturbed scatter of clay heat retainers extends approx. 3 m around site
	3	0.2	0.3	Burnt Clay	Poor	Erosion	Small in situ accumulation of burnt clay (5 cm in diameter) within exposed clay pan with an isolated artefact. Smaller pieces of loose burnt clay within a 2m area of site
	4	12.1	11.2	Burnt Clay	Good	Water	Large hearth and low density artefact scatter exposed by excavation of drainage line for dam located approx. 250 SE. Hearth material exposed on both southern and northern bank of drainage ditch. The hearth horizon seems to be 3 cm below the natural ground
	5	1.6	1.8	Burnt Clay	Good	Erosion	Burnt clay exposed by clay pan erosion. Exposed and loose clay heat retainers are spread 2 m area in the clay pan
	6	13.2	8.6	Burnt Clay and mound	Poor	Stock Damage	Mound which is 5-15 cm in height and mound type is cooking. stock damage, eroded on edges and partially intact centre.

Site name	Feature #	Length (m)	Width (m)	Evidence	Condition	Disturbance	Notes and comments
Burrawong WF HTH 01	1	4.1	4.7	Burnt Clay and mound	Good	Stock Damage	Mound which is 5-15 cm in height and mound type is cooking. Water and stock damage
	2	2	1.7	Burnt Clay	Poor	Stock Damage	In Grey clays near dam old soak area
	3	1.2	1	Burnt Clay	Poor	Erosion	
	4	0.6	0.6	Burnt Clay	Poor	Stock Damage	Clay heat retainers up to 3m away
	5	10	15	Burnt Clay	Poor	Ploughed/Ripped	The disturbed scatter of burnt clay is concentrated and partially in situ within a 2- 3 m buffer around this point
	6	0.5	0.8	Burnt Clay	Good	Stock Damage	In situ burnt clay hearth located 20 m NW of dam and 20 m south of fence line. cattle tracks suggest that the site has been eroded and slight disturbed by sheep. The hearth of a small compact circle shape
Burrawong WF HTH 02	1	0.5	0.5	Burnt Clay	Good	Vehicles/Tracks	In gateway
Burrawong WF HTH 03	1	0.9	0.85	Burnt Clay	Very Good	Water	Suitable candidate for excavation if impact proposed
	2	0.4	0.85	Burnt Clay	Good	Vehicles/Tracks	
Burrawong WF HTH 04	1	0.4	0	Burnt Clay	Poor	Erosion	Slumping. On basal toe of red rise adjacent to soak

Site name	Feature #	Length (m)	Width (m)	Evidence	Condition	Disturbance	Notes and comments
Burrawong WF HTH 05	1	2	1	Burnt Clay	Good	Water	Stock damage evident.
Burrawong WF HTH 06	1	0.6	0.4	Burnt Clay	Good	Water	Clay heat retainers up to 3 m away
	2	0.4	0.2	Burnt Clay	Good	Water	
Burrawong WF HTH 07	1	0.8	1	Burnt Clay	Good	Water	In wall of blowout, eroding from section
	2	0.8	0.2	Burnt Clay	Poor	Erosion	In wall of blowout, eroding from section
Burrawong WF HTH 08	1	2	1.5	Burnt Clay	Poor	Water	
Burrawong WF HTH 09	1	10	5	Burnt Clay	Poor	Stock Damage	Small in situ location of burnt clay under a mature black box tree
Burrawong WF HTH 10	1	1	0.8	Burnt Clay	Good	Water	In wall of blow-out

Site name	Feature #	Length (m)	Width (m)	Evidence	Condition	Disturbance	Notes and comments
Burrawong WF HTH 11	1	2.5	1.2	Burnt Clay	Good	Stock Damage	In situ section approx. 0.5m x 0.5 m, dispersed clay heat retainer up to 4 m away
	2	0.6	0.8	Burnt Clay	Good	Stock Damage	Dispersed with clay heat retainers up to 4 m away
	3	0.4	0.3	Burnt Clay	Very Good	Water	Good in situ section, clay heat retainer up to 5 m away
	4	1.8	0.6	Burnt Clay	Good	Water	In blow-out near Blackwood soak
	5	0.4	0.6	Burnt Clay	Good	Stock Damage and water erosion	
	6	0.4	0.35	Burnt Clay	Good	Water	
	7	0.8	0.4	Burnt Clay	Good	Water	
Burrawong WF HTH 12	1	13	5	Burnt Clay and mound	Good	Erosion	Mound which is 0.5m in height and mound type is cooking, burnt clay scattered around edge
Burrawong WF HTH 13	1	0.6	0.4	Burnt Clay	Good	Water	
	2	0.45	0.3	Burnt Clay	Very Good	Stock Damage	

Appendix D Tree Cultural Site Data

ACHA Appendix A

Site Name	Tree Sp.	Tree Status	Tree Position	Regrowth (cm)	Tree Height (m)	Diameter (m)	No. Scars	Condition	Scar Length (m)	Scar Width (m)	Scar Depth (m)	Height above ground (m)	Scar Shape	Scar Orientation	Axe marks	Notes
Burrawong WF ST 01	Black Box	Alive	Standing	5	12	0.8	1	Good	0.35	0.15	0.07	0.73	Oval	S		
Burrawong WF ST 02	Black Box	Alive	Standing	8	18	1.22	1	Poor	0.83	0.25	0.08	0.64	Rectangle	S	Metal	Recent axe marks. branch fallen on ground under scar.
Burrawong WF ST 03	Black Box	Alive	Standing	3	12	0.61	1	Good	0.73	0.07	0.07	1.06	Other	E		
Burrawong WF ST 04	Black Box	Alive	Standing	11	14	1.05	1	Poor	2.1	0.35	0.16	0.3	Rectangle	SE		Very old Axe mark on remnant original surface. Remaining original panel has exfoliated off.
Burrawong WF ST 05	Other	Dead	Standing	6	6	0.65	1	Poor	1.02	0.11	0.09	0.8	Rectangle	SW		Has been dead for considerable time
Burrawong WF ST 06	Other	Alive	Standing	2	8	1.1	1	Good	0.55	0.08	0.11	1.1	Other	SW		Box tree. At least 2 phases of re growth. Disturbance, insect and other trauma
Burrawong WF ST 07	Black Box	Alive	Standing	5	10	1.35	1	Very Good	1.25	0.06	0.07	0.3	Rectangle	NE		
Burrawong WF ST 08	Black Box	Alive	Standing	2	13	1.5	1	Poor	0.67	0.12	0.11	0.87	Other	S		
Burrawong WF ST 09	Black Box	Alive	Standing	7	10	1	2	Poor	1.1	0.2	0.08	0.5	Rectangle	SE	Metal	Multi carving

Site Name	Tree Sp.	Tree Status	Tree Position	Regrowth (cm)	Tree Height (m)	Diameter (m)	No. Scars	Condition	Scar Length (m)	Scar Width (m)	Scar Depth (m)	Height above ground (m)	Scar Shape	Scar Orientation	Axe marks	Notes
Burrawong WF ST 10	Black Box	Alive	Standing	6	12	0.95	2	Good	1.7	0.3	0.11	0.4	Rectangle	NW	Metal	Multi carving
Burrawong WF ST 11	Black Box	Alive	Standing	10	11	1.05	1	Good	1.4	0.2	0.12	0.28	Other	N	Metal	
Burrawong WF ST 12	Black Box	Alive	Standing	10	12	1.2	1	Poor	1.06	0.27	0.12	0.9	Rectangle	SE	Metal	3 parallel lines at base scar, dead trunk 3.2m
Burrawong WF ST 13	Black Box	Alive	Standing	4	15	1.7	1	Very Good	1.54	0.23	0.1	0.4	Oval	NW		
Burrawong WF ST 14	Other	Dead	Lying Down	23	8	0.9	1	Good	0.58	0.06	0.03	1.9	Oval			Also ringbark scar below cultural scar
Burrawong WF ST 15	Other	Dead	Lying Down	3	8	0.4	1	Very Good	0.39	0.1	0.05	0.69	Oval		Unknown	She oak, looks like chainsaw mark
Burrawong WF ST 16	Other	Dead	Standing	20	1.9	1.26	1	Very Good	0.64	0.16	0.03		Oval	W		
Burrawong WF ST 17	Other	Alive	Standing	40	20	1.55	1	Very Good	0.49	0.12	0.05	1.55	Oval	N	Metal	Casuarina maybe she oak or dessert oak
Burrawong WF ST 18	Black Box	Alive	Standing	10	7	0.8	1	Good	0.54	0.16	0.09	1.26	Oval	NE	Unknown	Tree is hollow behind scar and the surface is flaking. Scar tree is located approx. 60 m SW of power pole no. 6584.

Site Name	Tree Sp.	Tree Status	Tree Position	Regrowth (cm)	Tree Height (m)	Diameter (m)	No. Scars	Condition	Scar Length (m)	Scar Width (m)	Scar Depth (m)	Height above ground (m)	Scar Shape	Scar Orientation	Axe marks	Notes
Burrawong WF ST 19	Black Box	Alive	Standing	2	5+	0.94	1	Good	0.67	0.2	0.02		Oval	N		Looks like chainsaw damage
Burrawong WF ST 20	Black Box	Alive	Standing	2.5	15	1.55	1	Very Good	0.94	0.17	0.02		Oval	N	Metal	
Burrawong WF ST 21	Black Box	Alive	Standing				1							E	Metal	16 lines of metal axe strikes, 12 m west of access track in stand of Black Box trees.
Burrawong WF ST 22	Black Box	Dead	Standing				1									Significant regrowth
Burrawong WF ST 23	Black Box	Alive	Standing				1							S	Metal	11 evenly spaced steel axe strikes
Burrawong WF ST 24	Black Box	Alive	Standing				1							S		



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Appendix B Consultation log

Wednesday December 22, 2021

The Riverine Grazier - 7

Obituary Beryl Mabon

Beryl was a warm, compassionate and vibrant woman who always went out of her way to help others – no matter what.

She had a wonderful sense of humour which endeared her to everyone she came in contact with, and it is a great testament to her nature that she formed so many long-lasting friendships over the years.

Beryl Anne Mabon was born in Hay on June 29, 1940.

She was the third daughter of Alf and Hannah Hill and a much-loved sister to June, Irene and Peter.

Beryl lived her early life at the family home in East Hay.

At school she was the youngest of her class and when she finished Intermediate, she was too young to leave school so the nuns let her help teach the new kindies for four months – starting a long association with St Mary's.

Beryl was brought up with traditional values and learnt the skills that a woman of her era should – cooking, sewing, knitting, embroidery and typing. Beryl was an extremely good typist.

One of her jobs was at a dress shop where she obtained a great flair for clothes which she showed throughout her life. She worked on the telephone exchange and at the TAB.

Like all the family, she worked in the shop (Hills Corner) and on odd occasions when Alf and Hannah went on holidays, she managed the shop. It was working in the shop that Beryl met Ernie, the story is that she was the only person that could understand his 'pommy' accent, so she had to serve him when he came into the shop.

Beryl and Ernie married on May 18, 1960 in Hay at St Fergal's Catholic Church.

Following their marriage, they moved into a flat in Macauley Street and in 1962, they moved into their house in Macauley Street across the road from the swimming pool. It was in this house that Beryl and Ernie raised their family, Lynne, Colin Vince and Andrew.

Beryl commenced work at St Mary's school as the secretary in 1972. It was more than work to Beryl. She devoted many more hours to the school than she was paid to, because she loved it and



she believed in it.

Staff and students were treated like family members and Beryl made many lifelong friends with the teachers and nuns who worked with her at St Mary's. She remained in contact with many of them.

After she retired in 2004, she continued to assist at the school and up until she got sick, was still covering the new library books for the school.

Beryl was an extremely active member of the Hay community; over the years she has been involved in many community organisations and usually held a position on the committee.

These included Shear Outback Bookshop where she worked Saturday mornings, Duncra Museum, Carers Group, Gentle Exercise Group, Heated Pool committee, Hospital Auxiliary, Convent Management committee, St Fergal's Parish Council, St Fergal's Finance Committee and St Mary's P&F.

Beryl used to visit Haydays and run trivia and joke sessions with the residents. All the sports her children participated in she would help out with fundraising and was usually on the committee as well.

Beryl and Ernie had three trips to England to visit relatives and travel around the UK. They also visited the United States on the return journey of one of their trips.

In 1991 Andrew had his accident and Beryl spent months in Adelaide with him while he was in hospital and rehab. Once he came home, Beryl continued to look after Andrew, cooking his meals doing his washing, cleaning his unit and doing anything else he needed.

The arrival of their grandchildren was a huge delight to Beryl. She loved them wholeheartedly and couldn't do enough for them.

While she was pushing one in a pram one day, someone remarked to her "oh you're babysitting

again" her reply was "No I am spending time with my grandson and I love it."

The grandkids also loved being with Grandma and they especially loved her 'lame spiders'. She loved attending anything the kids were involved in school sports, football matches, school award ceremonies and was looking forward to attending lots of weddings in the future.

Beryl was devoted to her grandchildren and was constantly checking what they were all doing, she was extremely proud of every one of them and what they had achieved in their careers.

Sadly, Ernie passed away in September 2012 and this left Beryl with time on her hands to indulge herself if she wanted. After some persuasion from her sister Irene, she decided to do some travelling.

Beryl and Irene travelled to China, Singapore, New Zealand, Canada and Alaska. They went to Queensland and to Melbourne to the Australian Open.

She and June travelled to Perth via the Indian Pacific Train had a wonderful time in and around Perth and then flew back to Sydney.

Beryl was never sick, she was fit and healthy, still mowing her own lawns and everyone expected her to be like her mother and live to be

100 plus.

Unfortunately, God had other plans for her. In a very short space of time Beryl went from feeling a bit lethargic and blaming that on her Covid vaccination, to being admitted to hospital transferred to Griffith then Sydney and then diagnosed with a very aggressive form of brain cancer.

She underwent surgery and then chemo and radiation, which she handled really well. Sadly, the treatment had little effect and Beryl was taken from her family three months after the initial diagnosis.

Beryl passed away on August 11 and is survived by her children and their partners Lynne and Ken, Colin and Vicky, Vince and Jenny and Andrew and Tukta and her grandchildren Tim, John, David, Simone, Craig, Tom, Ben and Ned.

She was very excited at the news that she was to become a great grandmother, especially that the baby would be a great granddaughter. Unfortunately, she left too soon to meet Bailey.

Not only has Beryl's family lost a loving mum, mum-in-law, grandma, great grandma, sister, cousin, but the Hay community has lost a very passionate, devoted and caring volunteer.

She will be missed by all, but her memory will live on forever.

ST MARY'S WELCOMES NEW PRIEST, FAREWELLS TEACHERS



St Mary's farewelled Veronica Tripney last week who had been teaching at the school for 27 years.

Veronica, affectionately known as Poss, is a true legend at St Mary's. She attended as a child where she was inspired to become a teacher. She then returned to Hay after completing her teacher training and worked at St Mary's. Poss is moving with her husband

Dan to Newcastle. The school also farewelled Felicity Kew who taught for two years and has taken up a position at Moama Grammar School and Shane Creece (absent in photo) who is leaving for Sacred Heart School, Broken Hill. At the same time the school welcomed new parish priest, Fr Paul Newton (story on page 3). They are pictured with St Mary's principal, Vince Campbell.

Notification for Registration of Interest for Aboriginal Stakeholders

NGH Pty Ltd has been engaged by Windlab Developments Australia (the Proponent) (GPO Box 361, Canberra City ACT 2601) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to address potential impacts of a proposed wind farm on Aboriginal cultural heritage at various land parcels along Balranald Road (the Proposal Area) within the localities of Yanga and Kyalite within the Murray River Council Local Government Area, NSW.

The proposed wind farm project will be assessed by the NSW Department of Planning, Industry and the Environment as a State Significant Development under Part 4 of the NSW Environmental Planning and Assessment Act 1979. The project will require an Environmental Impact Statement (EIS) for which an ACHA will be prepared.

In order to fulfill the requirements set out in the *Aboriginal cultural heritage consultation requirements for proponents 2010*, NGH is seeking interested Aboriginal parties who hold cultural knowledge of the assessment area to register their interest in the consultation process for the project, and to assist in the determination of the cultural significance of any Aboriginal objects or places located within the Proposal Area.

Registrations should be provided in writing to:

NGH Pty Ltd, Unit 2, 83 Hume Street (PO Box 506), Wodonga VIC 3690

Or via email to:

Dr Rhiannon Stammers (rhiannon.s@nghconsulting.com.au)

Closing date for registration is 5 JANUARY 2022.

Aboriginal parties who register an interest will be contacted to discuss the project further. Unless NGH receives notification in writing to withhold their details, Aboriginal parties who register an interest in the project are advised that their details will be provided to the Proponent, Heritage NSW and the Balranald Local Aboriginal Land Council.



Big hearts from small school community



St Mary's is proud of being 'the small school with the big heart' and reaches out to those in the community who are needy, bringing some Christmas cheer. Children and staff worked together to provide hampers of non-perishable food and other goodies to the St Vincent de Paul Christmas Appeal.

Pictured with the donations were teacher Veronica Tripney who retired after 27 years with St Mary's, and student, Samarth Patel.

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Closes Thursday, 6 January 2022

For further information contact council on 1300 087 004 or visit www.murrayriver.nsw.gov.au

PUBLIC NOTICES



Christmas / New Year 2021 Office Hours and Deadlines

OFFICE HOURS:

Closed Friday, December 24 at 12noon
re-open Wednesday, December 29 at 8.30am

Closed Friday, December 31 at 12noon
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Management and staff at The Guardian wish you all a Merry Christmas and a safe and happy New Year!

PUBLIC NOTICES

Notification for Registration of Interest for Aboriginal Stakeholders

NGH Pty Ltd has been engaged by Windlab Developments Australia (the Proponent) (GPO Box 361, Canberra City ACT 2601) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to address potential impacts of a proposed wind farm on Aboriginal cultural heritage at 68 lots along Balranald Road (the Proposal Area) within the localities of Yanga and Kyalite within the Murray River Council Local Government Area, NSW. The extent of the Proposal Area is shown in the map below.

The proposed wind farm project will be assessed by the NSW Department of Planning, Industry and the Environment as a State Significant Development under Part 4 of the NSW Environmental Planning and Assessment Act 1979. The project will require an Environmental Impact Statement (EIS) for which an ACHA will be prepared.

In order to fulfill the requirements set out in the Aboriginal cultural heritage consultation requirements for proponents 2010, NGH is seeking interested Aboriginal parties who hold cultural knowledge of the assessment area to register their interest in the consultation process for the project, and to assist in the determination of the cultural significance of any Aboriginal objects or places located within the Proposal Area.

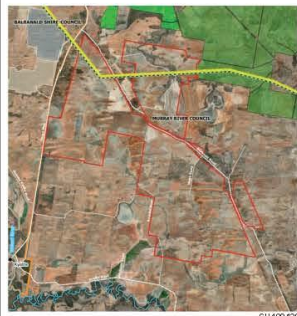
Registrations should be provided in writing to: NGH Pty Ltd, Unit 2, 83 Hume Street (PO Box 506), Wodonga VIC 3690

Or via email to:

Dr Rhiannon Stammers
(rhiannon.s@nghconsulting.com.au)

Closing date for registration is 4 January 2021.

Aboriginal parties who register an interest will be contacted to discuss the project further. Unless NGH receives notification in writing to withhold their details, Aboriginal parties who register an interest in the project are advised that their details will be provided to the Proponent, Heritage NSW and the Balranald Local Aboriginal Land Council.



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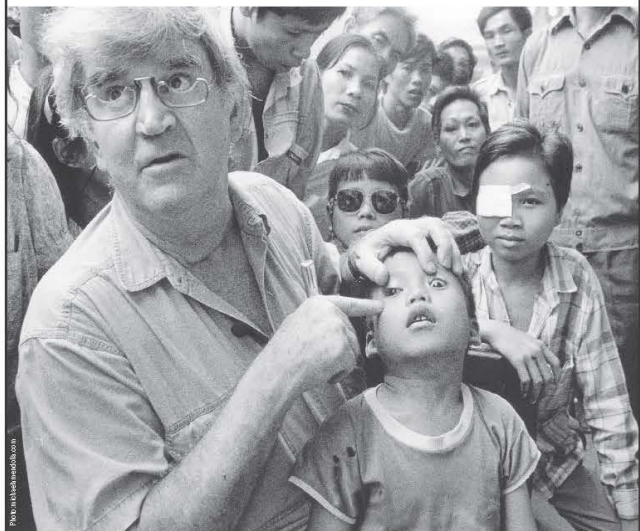
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Council invites applications for the position of Executive Manager — Engineering and is seeking to appoint an innovative, energetic and motivated professional to assist with meeting its objectives as outlined in the Community Strategic Plan.

The Council is looking for a person to work closely with the Administrator and Executive to develop long term plans, budgets and to deliver sensible on ground outcomes. Council has a positive attitude to initiate change across all areas of its workforce and to develop long term directions that support the future development of the Shire.

This position reports to the General Manager and has the responsibility to guide and manage the provision of Water, Sewer, Road Network, Assets, and Recreational areas.

It is a position that will require someone with advanced but flexible management, organisational and governance skills. The successful applicant should have an unwavering commitment to ensure the delivery of outcomes whilst ensuring high standards in project management, finance, and governance and a clear understanding of the community expectations. Council is interested in applicants who bring a diversity of experience in engineering areas and can provide flexibility to meet our location and service needs.

The position description is available on Council's website www.bairnald.nsw.gov.au.

Confidential enquiries may be directed to the A/General Manager Glenn Wilcox.

Applications close: 31st January 2022 at 12noon and should be addressed to the General Manager Bairnald Shire Council, P.O. Box 120 Bairnald NSW 2715 or Emailed: HR@bairnald.nsw.gov.au

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Correction Notice for "Notification for Registration of Interest for Aboriginal Stakeholders"

Published on page 17 in The Guardian on December 21 2021.

Error in the stated closing date for registration. The correct closing date for registration should be **4 January 2022**. Please refer to that notice for further details. Registrations should be provided in writing to:

NGH Pty Ltd, Unit 2, PO Box 506,
Wodonga VIC 3690 /

Dr Rhianon Stammers
(rhianon.s@nghconsulting.com.au)

Aboriginal parties who register an interest in the project are advised that their details will be provided to the Proponent, Heritage NSW and the Bairnald Local Aboriginal Land Council, unless they specifically request otherwise.

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5	9	7	2	3	8	1	6	4
1	7	3	8	4	6	2	9	5
6	4	9	5	7	2	8	3	1
8	2	5	9	1	3	4	7	6
9	5	8	3	6	1	7	4	2
7	3	1	4	2	9	6	5	8
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- Edith Nesbit
- Sleepwalking
- Snooker
- The New York Times
- Piano
- Two
- Harp
- Laika
- Quasimodo
- The Ghan
- Cynthia
- Nixon
14. 1991
- Scientology
16. 193
- Jane Fonda
18. Al forno
19. Jeet Kune Do
20. Lammergeier

9-LETTER WORD

boor, boring, born, boron, borrow, BORROWING, brig, bring, brio, brow, brown, giro, grin, grow, grown, iron, noir, ring, robin, robing, rowing, worn, wring, wrong

WORDFILL



The Guardian Christmas / New Year 2021 Office Hours and Deadlines

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Management and staff at The Guardian wish you all a Merry Christmas and a safe and happy New Year!

**The consultation log and its documentation for this Project has been redacted from public display.
This information is available to Heritage NSW and DPHI on request only.**

Appendix C Unexpected Finds Protocol

Introduction

This unexpected find protocol has been developed to provide a method for managing unexpected Aboriginal heritage items identified during the construction and maintenance of the Project. The unexpected find protocol has been developed to ensure the successful delivery of the Project while adhering to the NSW *National Parks and Wildlife Act 1974* (NPW Act).

All Aboriginal heritage objects are protected under the NPW Act though in a State Significant Development (SSD) Conditions of Consent (CoC) may be issued that allows for conditional harm to Aboriginal objects. However, there are some circumstances where despite undertaking appropriate heritage assessment prior to the commencement of works Aboriginal cultural heritage items or places are encountered that were not anticipated which may be of scientific and/or cultural significance.

Therefore, it is possible that unexpected heritage items may be identified during construction, operation and maintenance works. If this happens the following unexpected find protocol should be implemented to avoid breaching obligations under the NPW Act. This unexpected find protocol provides guidance as to the circumstances under which finds may occur and the actions subsequently required.

What is a Heritage Unexpected Find?

An unexpected heritage find is defined as any possible Aboriginal heritage object, that was not identified or predicted by the Project's heritage assessment and may not be covered by appropriate permits or development consent conditions. Such finds have potential to be culturally significant and may need to be assessed prior to development impact.

Unexpected heritage finds may include:

- Aboriginal stone artefacts, shell middens, modified trees, mounds, hearths, stone resources and rock art; and
- Human skeletal remains.

Aboriginal Heritage Objects

All Aboriginal objects are protected under the NPW Act.

An Aboriginal object is defined 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 the occupation of that area by persons on non-Aboriginal extraction and includes Aboriginal remains.

All Aboriginal objects are protected and it is an offence to harm or desecrate an Aboriginal object or place.

Unexpected Find Management Procedure

In the event that any unexpected Aboriginal heritage objects are unexpectedly discovered during the Project, the following management protocols will be implemented. **Note: this process does not apply to human or suspected human remains. Follow the Section referring to *Human Skeletal Remains* below if human remains or suspected human remains are encountered.**

1. Works within the immediate identified heritage location will cease and no further harm to the object will occur. Personnel should notify their supervisor of the find, who will notify the project manager.
2. Establish whether the unexpected find is located within an area covered by approved Conditions of Consent or not.
3. If the unexpected find is determined to be covered under the existing approved land of the development corridor and project approvals (as detailed in the Development Consent for the Project) undertake the following steps

- a. Establish an appropriate buffer zone of at least 20 metres to allow for the assessment and management of the find. All site personnel will be informed about the buffer zone with no further works to occur within the buffer zone. The area will be secured to avoid any further harm to the Aboriginal object/s.
 - b. A heritage specialist or the project archaeologist will be engaged to assess the Aboriginal object encountered and undertake appropriate salvage via surface collection of the material/item in line with the mitigation methods and approval requirements of the CoC and/or HMP for the Project. An AHIMS site card will be completed on the discovery of the newly identified Aboriginal objects / Aboriginal heritage items. Should the object(s) / heritage items be salvaged under the Conditions of Consent, an Aboriginal Site Impact Recording Form (ASIRF) must be completed and submitted to AHIMS.
 - c. Following appropriate salvage of the unexpected find works may continue at this location.
 - d. Surface collection and salvage of Aboriginal heritage items would not include scarred trees. If previously unidentified scarred trees are identified, further consultation with Heritage NSW, DPHI and Aboriginal stakeholders would need to be undertaken regarding management.
4. If the unexpected find is determined to not be covered under the existing approved land and approvals of the development corridor (as detailed in the Development Consent for the Project) or due to its site types (as noted above) undertake the following steps.
 - a. All works at this location must cease.
 - b. An appropriate buffer zone of at least 20 metres to allow for the assessment and management of the find must be established. All site personnel will be informed about the buffer zone with no further works to occur until notified. A temporary exclusion area would be established around this buffer zone.
 - c. A heritage specialist or the Project Archaeologist will be engaged to assess the Aboriginal place or object encountered. Registered Aboriginal Party representatives will also be engaged (if available) to assess the cultural significance of the place or object.
 - d. The discovery of an Aboriginal object will be reported to the local office of Heritage NSW and works will not recommence at the heritage place or object until advised to do so by Heritage NSW. A site card will be completed and submitted to AHIMS for registration.
 - e. If the unexpected find can be managed in situ, works at the location will not recommence until appropriate heritage management controls have been implemented, such as protective fencing.
 - f. If the unexpected find cannot be managed in situ, works at the heritage location will not recommence until further assessment is undertaken and appropriate permits and approvals to impact Aboriginal cultural heritage are approved and issued by Heritage NSW.

Unexpected Human Skeletal Remains

If any human remains or suspected human remains are discovered during any works, all activity in the immediate area must cease immediately. The following plan describes the actions that must be taken in instances where human remains, or suspected human remains are discovered. Any such discovery at the activity area must follow these steps.

Discovery:

- If any human remains or suspected human remains are found during any activity, works in the **immediate vicinity must** cease and the Project Manager must be contacted immediately.
- The remains must be left in place and protected from harm or damage. To protect the remains until their origins can be determined high visibility markers or temporary fencing which will not cause ground disturbance must be immediately placed a minimum of 10 m around the location of the human remains or suspected human remains by site personnel. A minimum no work buffer zone radius of 50 m must be implemented around the remains by taping off the area as an environmental sensitive zone.
- All personnel should then leave the immediate vicinity of the area. The Environmental Officer is responsible to ensure that these temporary measures are implemented onsite within 24 hours of identification.

Notification:

- The NSW Police must be notified immediately. Details of the location and nature of the human remains must be provided to the relevant authorities.
- If there are reasonable grounds to believe that the remains are Aboriginal, the following must also occur;
 - a. Heritage NSW must be contacted as soon as practicable and provide any available details of the remains and their location. The Environment Line can be contacted on 131 555;
 - b. The relevant Aboriginal community groups must be notified immediately when the remains are confirmed to be Aboriginal, as advised by Heritage NSW.
 - c. The relevant Project Archaeologist may be contacted to facilitate communication between the police, Heritage NSW and Aboriginal community groups.

Process:

- If the remains are considered to be Aboriginal by the Police and Heritage NSW no work can recommence at the particular location of the find unless authorised in writing by Heritage NSW.
- Recording of Aboriginal ancestral remains must be undertaken by, or be conducted under the direct supervision of, a specialist physical anthropologist or other suitably qualified person.
- Archaeological reporting of Aboriginal ancestral remains must be undertaken by, or reviewed by, a specialist physical anthropologist or other suitably qualified person, with the intent of using respectful and appropriate language and treating the ancestral remains as the remains of Aboriginal people rather than as scientific specimens.
- If the remains are considered to be Aboriginal by the Police and Heritage NSW, an appropriate management and mitigation, or salvage strategy will be implemented following further consultation with the Aboriginal community and Heritage NSW.

Appendix D Surface collection methodology

D.1 Surface collection

Each Aboriginal site with surface stone artefacts that cannot be avoided within the approved development corridor, as listed in the Conditions of Consent for this State Significant Development (SSD) project will need to be salvaged via surface collection following the Conditions of Consent being issues and prior to any construction works commencing for the Project. Due to ongoing farming practises and the potential for delays in the commencement of construction, the ability to undertake the surface collection salvage within the development corridor (outside the heritage exclusion areas) should be facilitated in any conditions of consent issued for this Project. The collection methodology is provided hereafter.

A reasonable attempt, through the visual inspection of the Aboriginal sites by an archaeologist with an Aboriginal community representative, to collect any visible surface stone artefacts is to be undertaken. It is acknowledged that changes in the ground surface visibility and standard taphonomic and other environmental factors may impede the relocation of all the recorded stone artefacts noted in the ACHA. This is a typical and accepted archaeological phenomenon and therefore salvage surface collection would focus on visible artefacts within each site, which is an acceptable outcome.

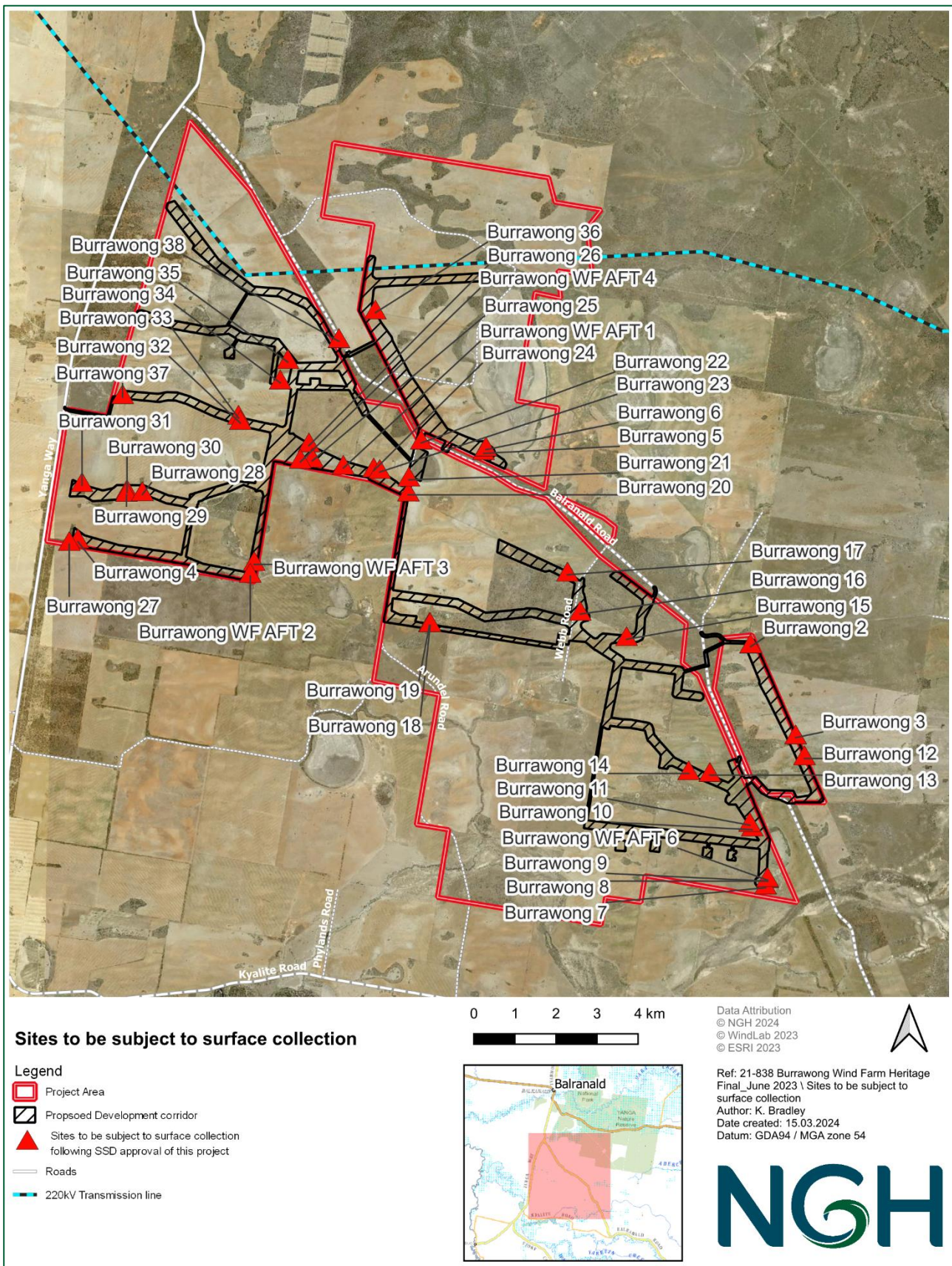
The salvage team, assumed to comprise a qualified archaeologist and representatives of the RAPs (as selected by the Proponent), would also take the opportunity to examine the immediate surrounds of the recorded sites to identify any other artefacts that may be present within the approved development corridor for this Project. The surface collection of the stone assemblage for each Aboriginal site within the approved development footprint as per the Conditions of Consent which are to be issued for an SSD Project, would be undertaken through the following process.

- A reasonable attempt, through the visual inspection of the Aboriginal site/s area, would be made to relocate the originally recorded surface stone artefacts. However, it is acknowledged that changes in the ground surface visibility and standard taphonomic and other environmental factors may impede the relocation of all the recorded stone artefacts noted in the ACHA. This is a typical and accepted archaeological phenomenon and therefore salvage collection would focus on visible artefacts within each site, which is an acceptable outcome.
- If any additional surface stone artefacts are identified within the approved development footprint these newly identified stone artefacts will be salvaged via surface collection with the sites that they are associated with.
- Walk across the Aboriginal site area (within the approved development footprint), use 'pin' flags to identify and mark artefacts or cultural material.
- Photograph the Aboriginal site area.
- If considered necessary, construct a collection grid of 2m x 2m or 5m x 5m or similar as appropriate to the size of the site, only larger sites or sites with higher densities of artefacts will have this strategy.
- As an alternative, GPS plot artefacts if required, this is suitable for smaller sites (~<20).
- Collect artefacts. At each collection site the artefacts and/or cultural material will be recorded, bagged and labelled in accordance with their collection position, that is either individual number and/or their collection grid.
- Recording of stone artefacts will be conducted in line with standard archaeological practice to include raw material, type, dimensions and any other characteristics considered relevant and in accordance with the Code of Practice. Photos of particularly rare items only or those asked to be photographed by the Aboriginal representatives onsite would be taken.
- The salvaged Aboriginal objects may be temporarily stored at an NGH office until the long-term management and relocation of the salvaged objects can occur.

- The site of the long term relocated salvaged Aboriginal objects would be noted by the submission of site cards to the Aboriginal Heritage Information Management System (AHIMS) as legally required.
- An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage.

A list of sites to be subject to mitigation via surface collection following SSD approval of this project in line with this surface collection methodology are listed below and shown in the figure provided in this methodology for easy reference.

Site name	Site Type	Site name	Site Type
Burrawong 2	Isolated Find	Burrawong 23	Isolated Find
Burrawong 3	Isolated Find	Burrawong 24	Isolated Find
Burrawong 4	Isolated Find	Burrawong 25	Isolated Find
Burrawong 5	Isolated Find	Burrawong 26	Isolated Find
Burrawong 6	Isolated Find	Burrawong 27	Isolated Find
Burrawong 7	Isolated Find	Burrawong 28	Isolated Find
Burrawong 8	Isolated Find	Burrawong 29	Isolated Find
Burrawong 9	Isolated Find	Burrawong 30	Isolated Find
Burrawong 10	Isolated Find	Burrawong 31	Isolated Find
Burrawong 11	Isolated Find	Burrawong 32	Isolated Find
Burrawong 12	Isolated Find	Burrawong 33	Isolated Find
Burrawong 13	Isolated Find	Burrawong 34	Isolated Find
Burrawong 14	Isolated Find	Burrawong 35	Isolated Find
Burrawong 15	Isolated Find	Burrawong 36	Isolated Find
Burrawong 16	Isolated Find	Burrawong 37	Isolated Find
Burrawong 17	Isolated Find	Burrawong 38	Isolated Find
Burrawong 18	Isolated Find	Burrawong WF AFT 01	Artefact Scatter
Burrawong 19	Isolated Find	Burrawong WF AFT 02	Artefact Scatter
Burrawong 20	Isolated Find	Burrawong WF AFT 03	Artefact Scatter
Burrawong 21	Isolated Find	Burrawong WF AFT 04	Artefact Scatter
Burrawong 22	Isolated Find	Burrawong WF AFT 06	Artefact Scatter



D.2 Management of recovered material and reporting

The salvaged objects may be temporarily held at secure locked cabinet at a NGH office for analysis and recording until an appropriate time as they can be arranged to be relocated and buried within the Project Area, outside the approved development corridor as part of the long term storage of this objects. The temporary storage of salvaged objects, if required, is not intended to exceed 24 months from the conclusion of the salvage surface collection programme.

The relocation site for the Aboriginal objects which will be salvaged via the salvage surface collection programme would need to be agreed to by the landowner, Project owner, Project Archaeologists and RAPs and be outside the proposed approved development footprint within the Project Area. A map of the proposed relocation areas is provided below and has been included in the ACHA to ensure there is appropriate RAP consultation. The site/s for the relocation of salvaged Aboriginal objects would be noted by the submission of site cards to the Aboriginal Heritage Information Management System (AHIMS) as legally required.

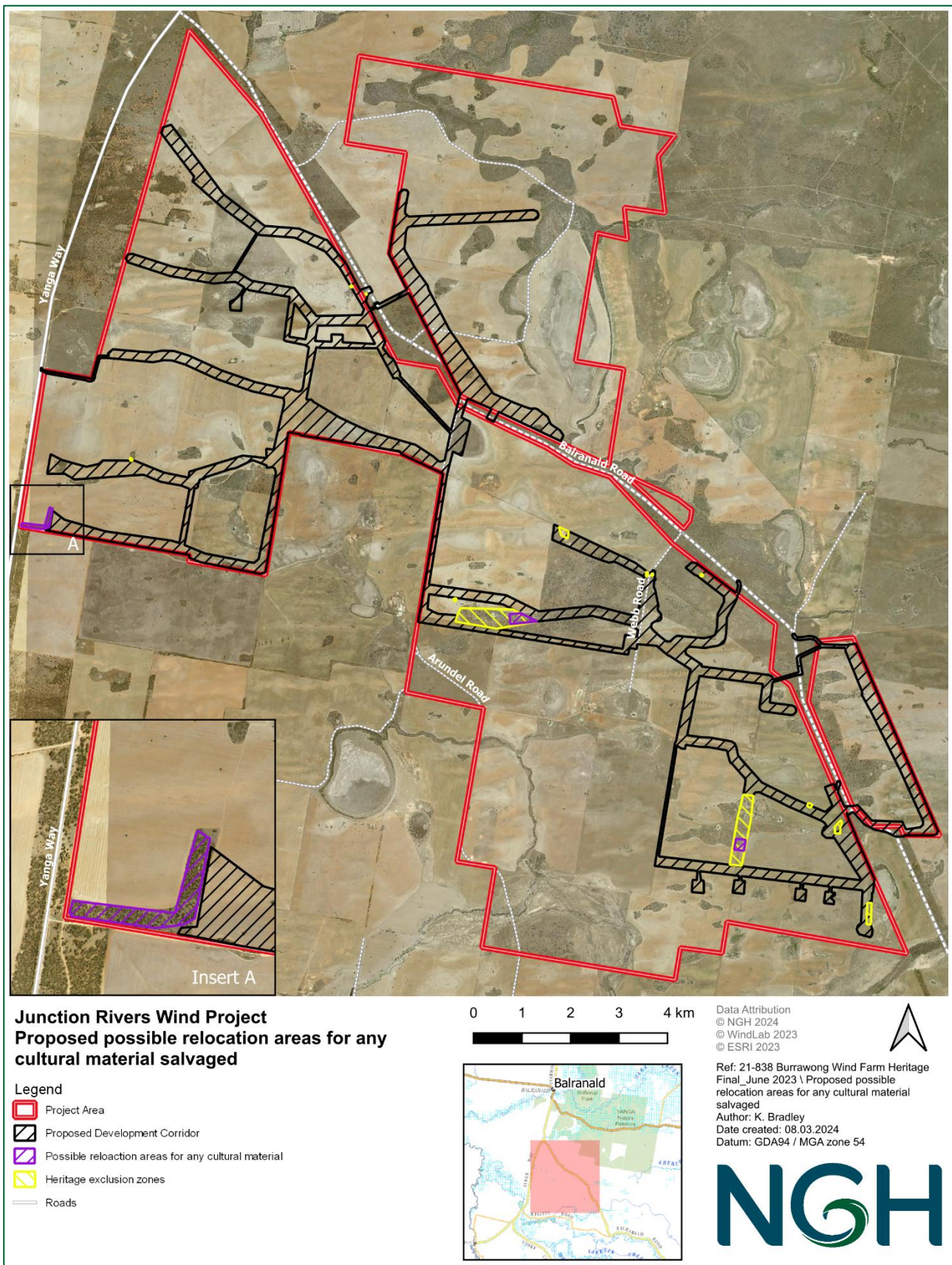
An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works. Representatives from the RAPs would be provided with the opportunity to assist the Project Archaeologist with the salvage programme and the relocation of the salvaged objects. Generally, a minimum of two representatives in total from the RAPs would be invited to participate in the salvage programme and the relocation of the Aboriginal salvaged objects. If representatives from the RAPs are not available to participate and all reasonable opportunities have been afforded, the collection and relocation of Aboriginal objects, would continue as scheduled by the Project Archaeologist.

Following the relocation of the Aboriginal objects, which have been salvaged as per the procedure in this methodology, the site location/s will also be provided to the Project owner who will inform the landowner and any other relevant parties. The recording and relocation of artefacts will be compliant with the *Code of Practice for Archaeological Investigations*.

A brief salvage report will be prepared outlining the steps taken above. The report would document the salvage programme and its results.

The salvage report would include, as applicable, the following:

- Introduction
- Purpose and objective
- Aboriginal involvement and consultation
- Surface collection salvage
 - Methodology
 - Results
 - Discussion
- Relocation and burial of salvaged objects
- Conclusions.





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Prepared for Windlab Developments Australia

Aboriginal Heritage Due Diligence Assessment

Junction Rivers Wind Project – Road Intersection Upgrades

April 2024

Project Number: 23-678

Document verification

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Acronyms and abbreviations

ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
DECCW	(Former) Department of Environment, Climate Change and Water (formerly responsible for heritage, now superseded by Heritage NSW)
DPHI	Department of Planning, Housing and Infrastructure (NSW)
Due Diligence Code	<i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales</i>
EIS	Environmental Impact Statement
Heritage NSW	Heritage NSW, within the NSW Department of Climate Change, Energy, the Environment and Water
IBRA	Interim Biogeographic Regionalisation for Australia
LALC	Local Aboriginal Land Council
LGA	Local Government Area
m	metres
NGH	NGH Pty Ltd
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NPW Regulation	National Parks and Wildlife Regulation 2019 (NSW)
NSW	New South Wales
OEH	(Former) Office of Environment and Heritage (NSW) (now Heritage NSW)
Project Area	The four proposed road intersection upgrade/ blade swept path areas within NSW being assessed in this report which includes a 10-metre buffer that was applied to the work areas. As such, the actual impact area is proposed to be smaller than the Project Area assessed.
RAP	Registered Aboriginal Party (refers to those RAPs for the Junction Rivers Wind Project Aboriginal Cultural Heritage Assessment)
SSD	State Significant Development
the Proponent	Windlab Developments Pty Ltd
Windlab	Windlab Developments Pty Ltd

Executive summary

NGH Pty Ltd (NGH) was commissioned by Windlab Developments Pty Ltd (Windlab) (the Proponent) to undertake an Aboriginal Heritage Due Diligence assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010) (Due Diligence Code) at four proposed road intersection upgrades locations/ blade swept path areas in New South Wales (NSW).

The four proposed road intersection upgrades/blade swept path areas are required to facilitate the safe haulage of materials and movement of oversized, over mass vehicles within the NSW section of the transportation route associated with the Junction Rivers Wind Project. The Junction Rivers Wind Project is a State Significant Development (SSD) (SSD-30448824) in NSW which is being assessed by the Department of Planning Housing and Infrastructure (DPHI).

The four proposed road intersection upgrade/ blade swept path areas located within NSW being assessed are listed below.

- Intersection of the Murray Valley Highway and Sturt Highway, Euston;
 - Potential hardstand required.
- Intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald;
 - Potential hardstand required.
- Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga; and
 - Potential hardstand required.
- Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.
 - Potential vegetation trimming required to accommodate the blade swept path.

Each of the four proposed road intersection upgrade/ blade swept path areas have had a 10 metre (m) buffer applied as part of the assessment of the Project Area. As such, the actual impact area is proposed to be smaller than the Project Area assessed in this report. The due diligence assessment is undertaken to evaluate whether Aboriginal objects are present, or likely to be present, within the proposed impact area, and if those objects would be harmed by the proposed activity.

Background and desktop assessment

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken over each of the four proposed work locations in January 2024. No previously recorded Aboriginal objects are present at any of the proposed work locations. Using satellite imagery, google earth street view, topographic data, the review of the archaeological context and consideration of the environmental location of each of the four proposed intersection upgrade/ blade swept path locations, it was determined by a qualified archaeologist that a visual inspection was not warranted. The desktop assessment concluded each of the proposed intersection upgrade/ blade swept path work areas was highly disturbed by the previous construction and ongoing maintenance of the existing roads. Each of the proposed four intersection upgrade/ blade swept path work areas was also noted to have been previously subject to vehicle inspection by NGH archaeologists during the previous fieldwork undertaken for the Junction Rivers Wind Project Aboriginal Cultural Heritage Assessment (ACHA) (NGH 2023). In addition, the majority of the proposed works area at the intersection of the Balranald-Moulamein Road and Arundel Road were also subject to pedestrian survey by NGH archaeologists and representatives from the Registered Aboriginal Parties (RAPs) during the fieldwork conducted for the Junction Rivers Wind Project ACHA (NGH 2023). No Aboriginal objects or areas of potential archaeological deposit were previously recorded within and/or in proximity to these proposed work areas.

While the proposed works at the intersection of Sturt Highway (corner of 49 Court Street) in the township of Balranald are within 200m of the Murrumbidgee River, with several trees present, it was determined that there is negligible potential for Aboriginal objects and/or subsurface archaeological deposits to be present at this location given the level of previous disturbance. It was also determined that none of the trees present are considered likely to have cultural modification or scarring. This was based on the generally recognised obtrusive nature of cultural scars, review of google earth street view images of this area, the previous vehicle inspection of this intersection by NGH archaeologists during the previous works for the Junction Rivers Wind Project ACHA (NGH 2023) and in consideration that these trees appear to be part of deliberate street tree planting (as evident in the 1955 aerial images of the area).

Thus, it was considered that there was negligible potential for Aboriginal objects to occur at each of the four proposed intersection upgrade work/ blade swept path locations, and a site inspection was not required.

Impact assessment conclusion

The desktop assessment was determined to sufficiently assess the potential of impacts to Aboriginal objects at the four locations of proposed intersection upgrade works/ blade swept path within NSW and no further investigation is required.

The location of the proposed four intersection upgrade work/ blade swept path areas in NSW were all determined not to be located in areas which contain known Aboriginal objects or any undisturbed archaeologically sensitive landforms. Given the levels of previous disturbance, it was concluded that there was negligible potential for Aboriginal objects to occur at each of the locations assessed within NSW, and that the proposed works can proceed with caution.

Recommendations

The proposed works at the four intersection upgrade/ blade swept path areas in NSW can proceed with caution with the following recommendations:

1. All works must be limited to the areas assessed by this document. Any activity proposed outside of the current assessment area will also be required to be subject to an Aboriginal heritage assessment.
2. When the intersection works are commenced in accordance with the approval of the Junction Rivers Wind Project (SSD-30448824) all relevant Conditions of Consent for the Project must be followed, including for the approved transportation route. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and the unexpected finds procedure for Aboriginal objects for the SSD Project must be followed.

All Aboriginal objects and places in NSW are protected under the *National Parks and Wildlife Act*. It is an offence to disturb an Aboriginal object or site without appropriate consent.

1. Introduction

NGH was commissioned by Windlab Developments Pty Ltd (Windlab) (the Proponent) to undertake an Aboriginal Heritage Due Diligence assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010) (Due Diligence Code) at four proposed road intersection upgrades/ blade swept path locations within New South Wales (NSW). Other road upgrades in Victoria and South Australia are subject to separate assessments based on the respective State legislation.

The four proposed road intersection upgrade/blade swept path areas within NSW are listed below.

- Intersection of the Murray Valley Highway and Sturt Highway, Euston
 - Potential hardstand required.
- Intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald
 - Potential hardstand required.
- Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga; and
 - Potential hardstand required.
- Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.
 - Potential vegetation trimming required to accommodate blade swept path.

The four proposed road intersection upgrade/ blade swept path locations are required to facilitate the safe haulage of material and movement of vehicles along the transportation route associated with the Junction Rivers Wind Project within NSW. The Junction Rivers Wind Project is a State Significant Development (SSD) (SSD-30448824) in NSW which is being assessed by the Department of Planning, Housing and Infrastructure (DPHI). The intersection upgrade works would involve ground surface disturbing works, as well as vegetation removal.

The Due Diligence assessment is undertaken to evaluate whether Aboriginal objects are present, or likely to be present, within the proposed impact areas in NSW, and if those objects would be harmed by the activity.

1.1 Project Area

The Project Area comprises of four separate road intersection upgrade areas/ blade swept path locations across the region of Balranald, NSW. Table 1-1 below outlines the location and potential works required at the four road intersections upgrade areas/ blade swept path locations being assessed in this report. The general location of each of these proposed work areas is shown in Figure 1-1 while a close up of each of the intersection work areas is shown in Figure 1-2. It is important to note that the Project Area being assessed in this report includes a 10 metre (m) buffer on the proposed impact area. As such, the actual impact area will be smaller than the Project Area shown in Figure 1-2.

Each of these proposed intersection upgrade areas/ blade swept path locations are primarily situated within the boundary of the existing road reserve and have been identified during the assessment of the proposed haulage transportation routes for the Junction Rivers Wind Project (SSD-30448824). The intersection upgrade works would involve ground surface disturbing works, as well as vegetation removal to ensure these intersections meet the required road safety guidelines for the movement of oversized and over mass vehicles in NSW.

Table 1-1 Four intersections upgrade areas/ blade swept path locations in NSW assessed in this report.

Suburb	Local Government Area (LGA)	Section of road	Required to facilitate vehicle procedure or movement	Potential works required
Euston	Balranald Shire Council	Murray Valley Highway onto Sturt Highway	Right hand turn	Large hardstand
Balranald	Balranald Shire Council	Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) onto Sturt Highway	Right Hand turn	Large hardstand
Yanga	Murray River Council	Yanga Way onto Balranald-Moulamein Road	Left Hand Turn	Large hardstand
Kyalite	Murray River Council	Balranald-Moulamein Road – Arundel Road	Site entrance	Vegetation trimming/removal

1.2 Project personnel

The Due Diligence assessment was carried out by qualified archaeologist Brendan Fisher of NGH. This included background research, mapping and the completion of this report. NGH Principal archaeologist Kirsten Bradley and NGH Technical Director - Heritage Matthew Barber reviewed the report for quality assurance.

1.3 Aboriginal consultation

The Due Diligence process does not formally require consultation with Aboriginal community groups. However, it is considered best practice to always consult with the relevant Local Aboriginal Land Council (LALC). The four intersection upgrade areas are within the boundaries of the Balranald LALC.

As this work forms part of the Environmental Impact Statement (EIS) being undertaken for the Junction Rivers Wind Project (SSD-30448824) a copy of this assessment was sent to each of the Registered Aboriginal Parties (RAPs) for the Junction Rivers Wind Project Aboriginal Cultural Heritage Assessment (ACHA) in April 2024. A copy of this report was provided for their records to ensure appropriate Aboriginal consultation as part of the assessment for the Junction Rivers Wind Project (SSD-30448824).

1.4 Approach and format of this report

This report has been drafted in keeping with the sequence of steps identified in the Due Diligence Code (DECCW, 2010). The Due Diligence Code outlines a five-step approach to determine if an activity is likely to cause harm to an Aboriginal object, as defined by the NSW *National Parks and Wildlife Act 1974* (NPW Act). The steps follow a logical sequence of questions, and the answer to each question determines the need for the next step in the process in order to:

- Identify whether Aboriginal objects are, or are likely to be, present in the proposed works area;
- Determine whether or not the proposed activities are likely to harm Aboriginal objects (if present) in the proposed works area; and
- Determine whether an Aboriginal Heritage Impact Permit (AHIP) application is required.

Table 1-2 Due Diligence steps

#	Due Diligence steps
Step 1.	Will the activity disturb the ground surface?
Step 2a.	Search the AHIMS database and use any other sources of information of which you are already aware.
Step 2b.	Are activities proposed in areas where landscape features indicate the presence of Aboriginal objects?
Step 3.	Can you avoid harm to the object or disturbance of the landscape feature?
Step 4.	Undertake a desktop assessment and visual inspection. Is it likely that Aboriginal objects will be impacted by the proposed works?
Step 5.	Further investigations and impact assessment.

If the proposed activities are not 'low impact activities' (a defence for which is provided under the *National Parks and Wildlife Regulation 2019*), the considerations result in a determination of whether or not:

- Further approval under the NPW Act is required, in the form of an AHIP; or
- Due Diligence obligations for the protection of Aboriginal objects are discharged by the process under the Code.

For the purposes of the Due Diligence assessment, disturbed land is defined in the Due Diligence Code. Land is disturbed if it has been the subject of a human activity that has changed the land's surface, with the changes remaining clear and observable.

The defence against prosecution offered by following the Due Diligence Code process does not apply to situations where it is known there is an Aboriginal object present. The defence does not authorise harm to Aboriginal objects.

Each section within this report follows the relevant step outlined in the Due Diligence Code (DECCW, 2010). Reference is also made, where relevant, to the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010).

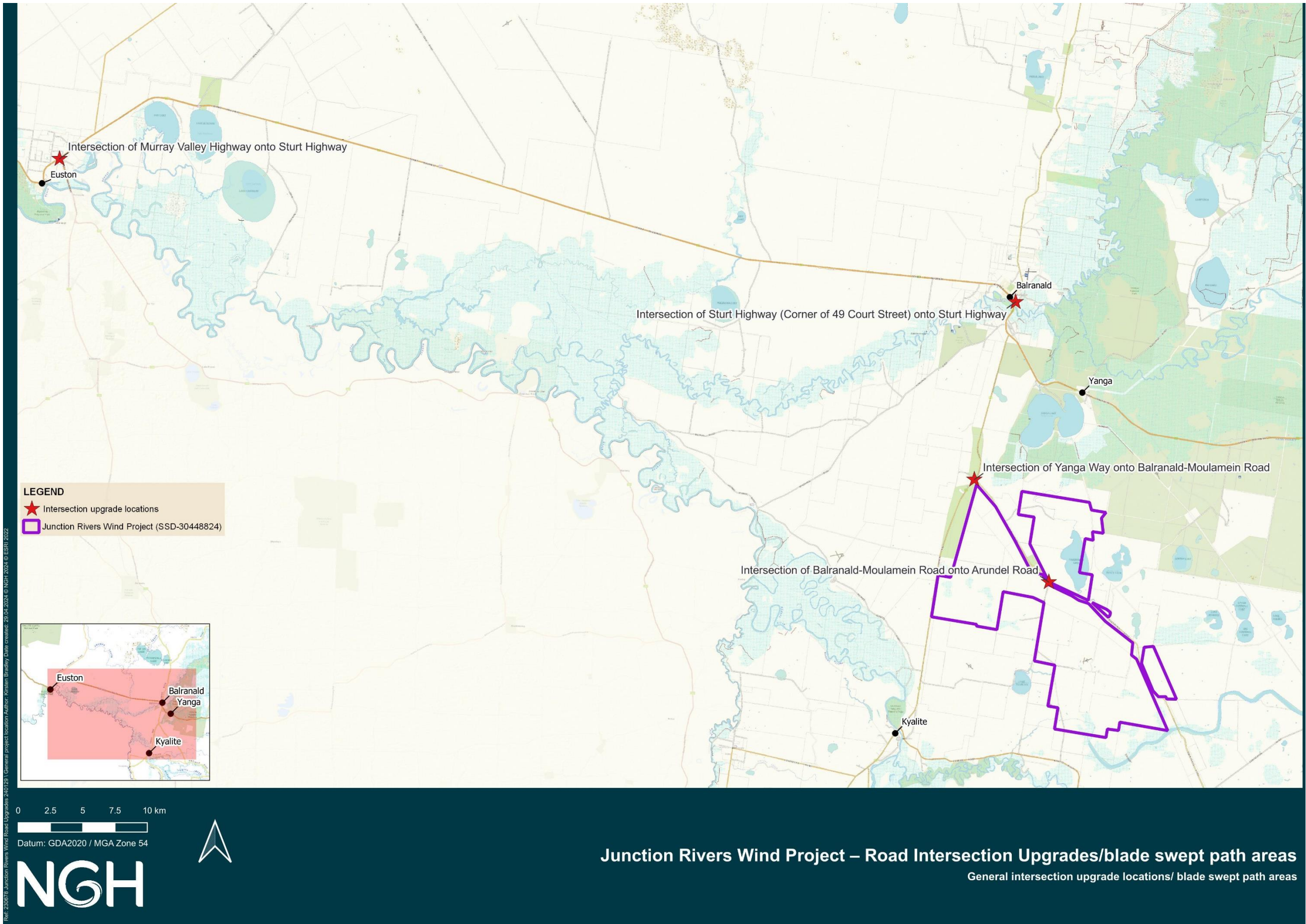


Figure 1-1 General intersection upgrade areas/ blade swept path locations.

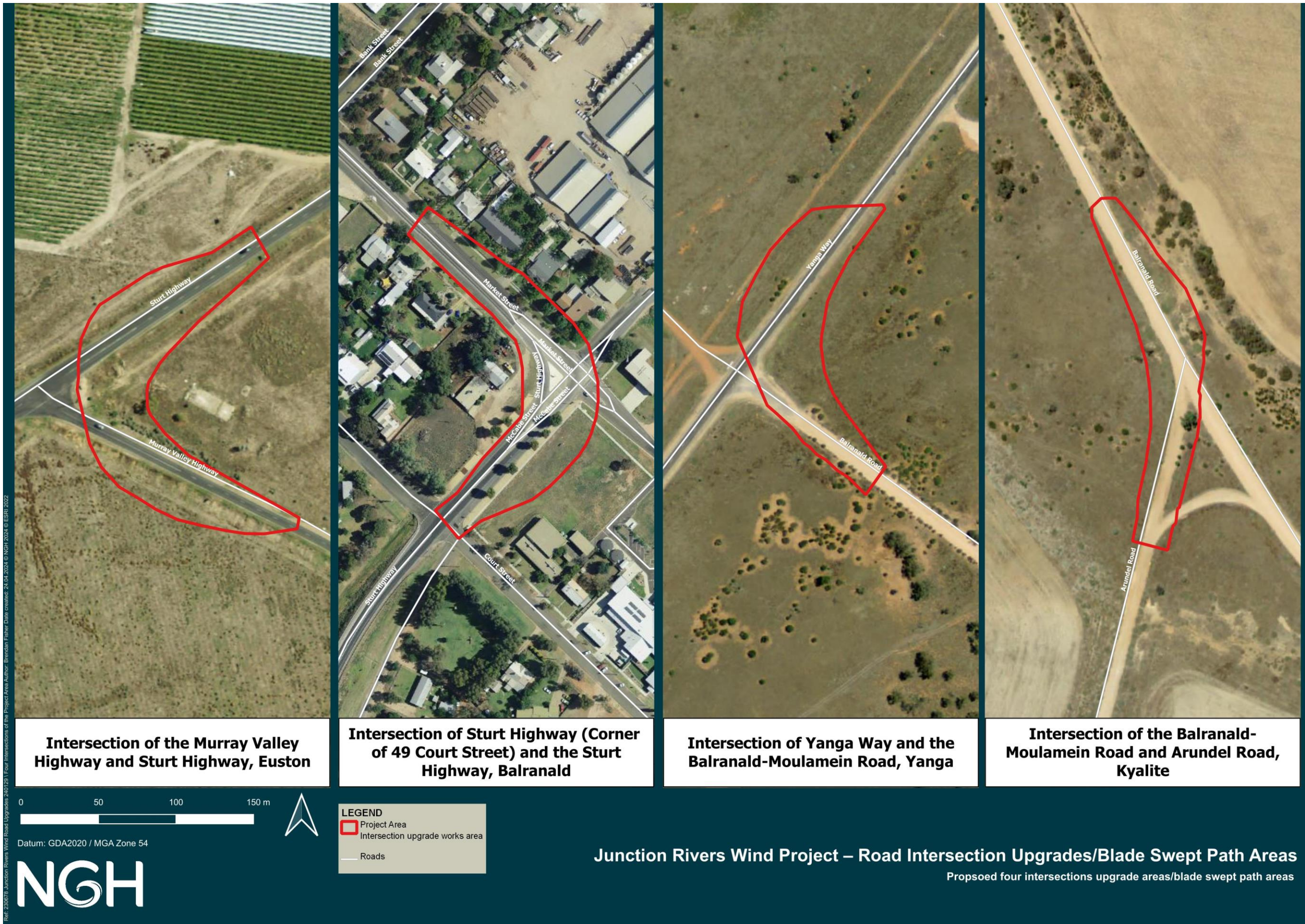


Figure 1-2 Four intersection work areas with a 10m buffer showing the Project Area subject to this assessment.

2. Legislation

In NSW, Aboriginal heritage is principally protected by two legislative acts:

- *National Parks and Wildlife Act 1974* (NSW) (NPW Act) and its subordinate legislation, the National Parks and Wildlife Regulation 2019; and
- *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act).

2.1 National Parks and Wildlife Act 1974

Part 6 of the NPW Act concerns Aboriginal objects and places and various sections describe the offences, defences and requirements to harm an Aboriginal object or place. All Aboriginal material receives blanket protection under the NPW Act. The main offences under section 86 of the NPW Act are:

- A person must not harm or desecrate an object that the person knows is an Aboriginal object.
- A person must not harm an Aboriginal object.
- For the purposes of this section, "circumstances of aggravation" are:
 - that the offence was committed in the course of carrying out a commercial activity; or
 - that the offence was the second or subsequent occasion on which the offender was convicted of an offence under this section.
- A person must not harm or desecrate an Aboriginal place.

An Aboriginal object is defined 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 the occupation of that area by persons on non-Aboriginal extraction and includes Aboriginal remains.

Section 87 sets out defences that are available to a person who is prosecuted for a particular harm offence under section 86. For example, it will be a defence in certain circumstances if the person who is being prosecuted can show that:

- the harm or desecration was authorised through an Aboriginal Heritage Impact Permit (AHIP) and conditions of the AHIP were not contravened;
- the person exercised due diligence to determine whether the act/omission constituted the offence would harm an Aboriginal object and reasonably determined no harm would occur;
- the person complied with requirements or a code of practice, as prescribed in the National Parks and Wildlife Regulation (2019); or
- was a low impact act or omission.

Section 89A of the NPW Act also requires that a person who is aware of an Aboriginal object, must notify the Director-General in a prescribed manner. In effect, this section requires the completion of AHIMS site cards for all sites located during heritage surveys.

2.2 Environmental Planning and Assessment Act 1979

The EP&A Act regulates development in NSW. It sets up a planning structure that requires developers (individuals or companies) to consider impact of the project on the environment and to promote the sustainable manage of built and cultural heritage (which includes Aboriginal cultural heritage). The EP&A Act requires that Aboriginal cultural heritage, and the possible impacts that development may have to Aboriginal heritage be considered, as part of the environmental impact assessment process under the EP&A Act. For

most projects requiring assessment under Part 4 and 5 of the EP&A Act, the NPW Act will apply and an AHIP may be required. However an AHIP under Section 90 of the NPW Act is not required for State Significant Development projects in accordance with Section 4.41 (1) (d) of the EP&A Act.

The EP&A Act also provides for the identification, protection, and management of heritage items through inclusion of these items into schedules of planning instruments, such as Local Environmental Plans (LEPs).

2.3 Balranald Local Environmental Plan 2010 and Murray River Local Environmental Plan 2011

The four intersection upgrade areas/ blade swept path locations which form the Project Area being assessed in this report are located within the Balranald and Murray River LGAs. Clause 5.10 of the Balranald and Murray River LEP requires that development consent be obtained for any proposed activity which will result in impacts to an Aboriginal object or Aboriginal Place. This includes any identified within the LEP itself, or on any other register.

Schedule 5 of the Balranald LEP 2010 and Schedule 5 of the Murray River LEP 2011 details the included environmental heritage items covered by these plans. No Aboriginal sites or places listed on Schedule 5 of either LEP are located within the Project Area being assessed.

3. Ground disturbance

Step 1. Will the activity disturb the ground surface or any culturally modified trees?

The proposed work to be undertaken for the road intersection upgrades/ blade swept path locations at four locations in NSW to facilitate the safe haulage of material and movement of oversize and overmass vehicles along the transportation route associated with the Junction Rivers Wind Project will involve, but not be limited to the following:

- The construction of large road hardstands to facilitate the required either right hand or left hand turn.
- Vegetation removal and/or trimming.
- New road alignment and markings.
- Establishment of gravel road foundations.
- Bitumen sealing.
- Drainage and erosion control.
- Temporary stockpile and laydown areas.

These activities require significant ground disturbance, the use of heavy machinery and laydown areas. Any Aboriginal sites within the disturbance footprint could therefore be subject to harm. As the activities will include ground disturbance, the next step in the due diligence process will be completed.

4. Register search and landscape assessment

Step 2a. Search the AHIMS Database and other information sources

A search of relevant heritage registers for Aboriginal sites and places provides an indication of the presence of previously recorded sites. A register search is not conclusive, however, as it requires that an area has been subject to archaeological survey, and information about any sites identified has been submitted for registration. However, as a starting point, the search will indicate whether any sites are known within or adjacent to the assessment area and provide oversight regarding the site types most commonly recorded within the locality. The Aboriginal Heritage Information Management System (AHIMS) provides a database of previously recorded Aboriginal heritage sites in NSW. A search provides basic information about any sites previously identified within a search area. The results of the search are valid for 12 months for the purposes of a due diligence level assessment.

An extensive search of the AHIMS database was undertaken over each of the four intersections areas on the 19th and 29th of January 2024. The details of these four searches are below:

Project Area	Client Service ID	Zone 54 Eastings and Northings	Aboriginal objects	Aboriginal places
Intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald	856227	Eastings: 733307 – 737307 Northings: 6161542 – 6165542 (4x4 km)	21	2
Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite	856291	Eastings: 735885 – 739885 Northings: 6139862 – 6143862 (4x4 km)	9	0
Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga;	858228	Eastings: 730137 – 734137 Northings: 6147817 – 6151817 (4x4 km)	14	0
Intersection of the Murray Valley Highway and Sturt Highway, Euston	858202	Eastings: 659300 – 663300 Northings: 6172607 – 6176607 (4x4 km)	2	0

There was a total of 46 Aboriginal sites and two declared Aboriginal Places recorded across the four extensive search areas. Table 4-1 below shows the breakdown of site types recorded across the four extensive AHIMS searches completed as part of this assessment while Figure 4-1 and Figure 4-2 show the location of the AHIMS sites in relation to the Project Area. None of the Aboriginal sites or places are located within and/or adjacent to any of the four work areas however, two sites occur within ~200m of the Sturt Highway intersection in the township of Balranald and a single site occurs within ~200m of the Balranald-Moulamein Road and Arundel Road works. These sites are summarised Table 4-2 below and shown in Figure 4-1 and Figure 4-2.

Aboriginal places are declared places that have special significance to Aboriginal people. The two Aboriginal places noted in the AHIMS extensive search of the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway in the township of Balranald are listed below. Neither of these

places will be impacted by the proposed works, with both of these Aboriginal places located over 600m east of the proposed works within the township of Balranald.

- Dippo Ceremonial Ground, Gazette Date:10/19/2001.
- The Island (Poonyea), Gazette Date: 04/08/2022.

Table 4-1 Breakdown of previously recorded Aboriginal sites in the region

Site type	Number
Modified tree	16
Artefact (1 or more)	9
Hearth	5
Hearth and Potential Archaeological Deposit (PAD)	4
Earth mound	3
Earth mound and artefact	3
Burial	2
Shell	2
Artefact (1 or more) and hearth	1
Ceremony and dreaming and burial	1
Total	46

Table 4-2 Sites within ~200m of the intersection work areas

AHIMS	Site name	Site type	Distance to project (m)	Site status on AHIMS
47-6-0058	Yanga Creek Mound 1	Earth mound	35m north of the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald works. No site card or report is associated with this site, and it is believed that the GPS location is inaccurate given the site refers to a location at Yanga Creek. The nearest point of Yanga Creek to the intersection works area is approximately 1,200m to the south-east. NGH contacted AHIMS to determine if there is any additional information on this site and it was confirmed by AHIMS that there was no site card or report linked to this site. A map of the GPS location of the site on the AHIMS database was provided by AHIMS site assessment officer on 26 January 2024 which confirmed that the GPS location is outside the proposed works area.	Valid

AHIMS	Site name	Site type	Distance to project (m)	Site status on AHIMS
47-6-0015	Police Paddock Scarred Tree	Scarred tree	170 m east of the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald works	Valid
47-6-1153	Burrawong 22	Isolated Find	175 m south east of the intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite works.	Valid

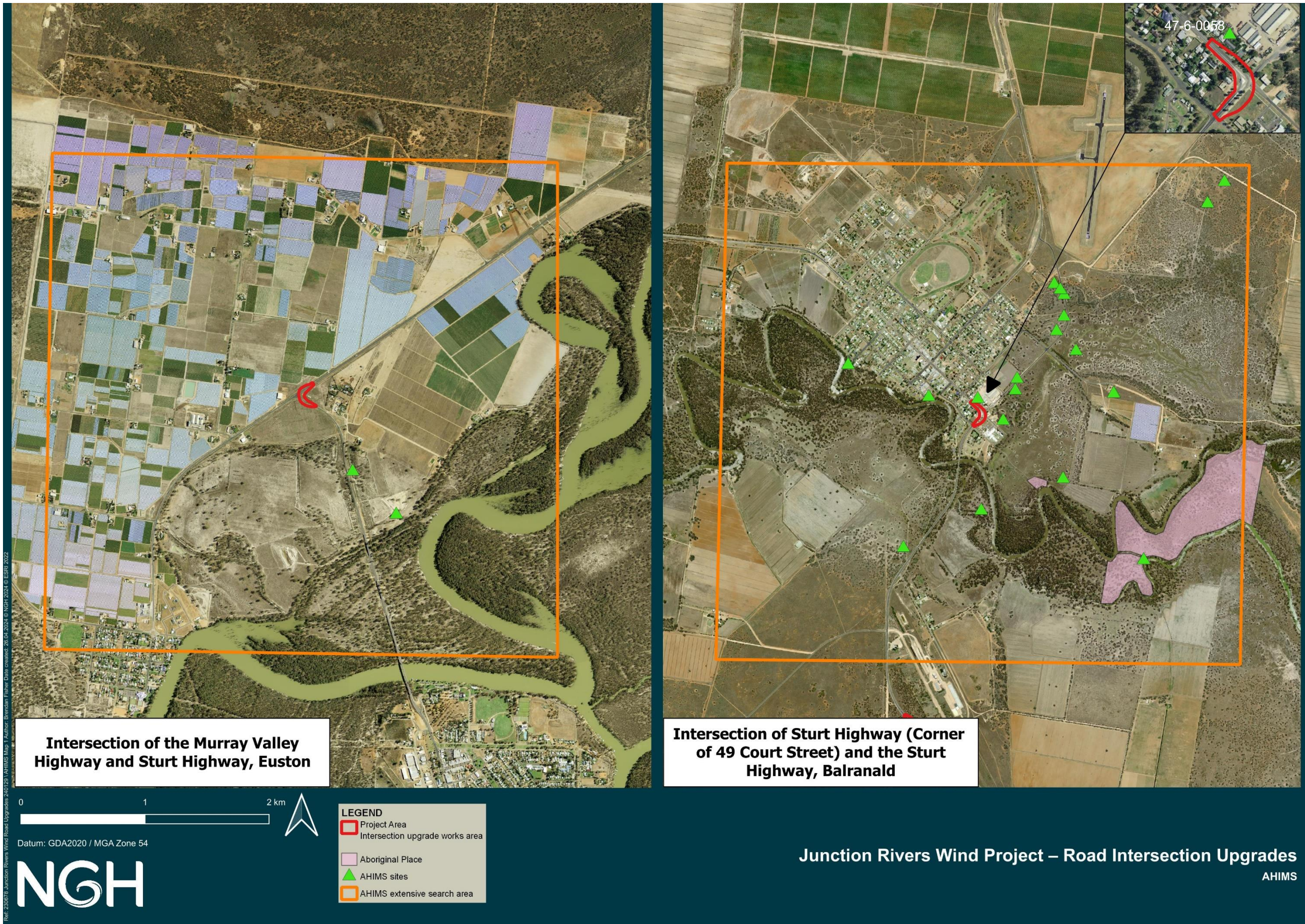


Figure 4-1 AHIMS sites surrounding the Project Area- Map 1 of 2



Figure 4-2 AHIMS sites surrounding the Project Area- Map 2 of 2

4.1 Archaeological context

4.1.1 Regional context

Aboriginal people have occupied what we now know as the Australian continent for at least 40,000 years and perhaps 65,000 years and beyond (Clarkson et al 2017). There have been no dated excavations in the Balranald area, although the archaeological evidence from Lake Mungo, 100 km to the north-west of Balranald and 90km north-east of Euston, provides ample evidence of Aboriginal occupation dating back 40,000 years (Mulvaney & Kamminga 1999; Hiscock 2007).

Within the broader region, several studies have been undertaken that have resulted in a range of Aboriginal sites being recorded that show that the riverine landforms and lunette lake systems in the Murray Basin are rich in Aboriginal cultural material. The major relevant studies are summarised below.

The Willandra Lakes World Heritage Area is a series of dry lake basins within a dune system, approximately 100 km north-west of Balranald. Lake Mungo is part of the Willandra Lakes World Heritage Area that has been subject to ongoing archaeological research since the discovery of one of the world's oldest cremated human remains, Mungo Woman (Mungo I), in the late 60's (Tumney 2011). The 1974 discovery of a Pleistocene burial surrounded by ochre stained sands referred to as Mungo Man (Mungo III) (Bowler and Thorne 1976) further established the Willandra Lakes area as an important area that adds to the understanding of the early Aboriginal occupation in Australia. These burials are dated to 42,000 years BP and are the oldest known human remains in Australia and some of the earliest remains of modern humans outside of Africa (Tumney 2011). Studies undertaken in the Willandra Lakes area indicates that most burials occur within sand dunes created from paleo-channels near permanent and ephemeral water sources.

Furthermore, a series of 123 fossilised footprints, known as the Garnpang footprint trackway, were recorded that were impressed into hardened sediment dated to 23,000+1000 BP and 19,200+1000 BP (Webb et al 2006). A number of stone artefacts, human and faunal remains, shell middens, quarries, clay and stone heat retainers and hearths have been recorded across the Willandra Lakes World Heritage Area (Tumney 2011). Tumney's (2011) analysis of three stone artefact assemblages along the Lake Mungo lunette noted that silcrete was the most common lithology utilised for the manufacture of stone tools with lesser amounts of quartzite, quartz and sandstone. Tumney also noted the presence of a soil carbonate or calcrete nodules that occur more frequently on lunettes to have been used as heat retainers in some of the recorded hearths.

During the 1970's and 80's archaeological research in the Murray Valley region between the Edwards and Murray Rivers focused on burials and mounds. Simmons (1980) identified 75 mounds, 17 scarred trees and a range of other site types including isolated artefacts, hearths, shell middens and burials. Mounds were the most common site type that generally consisted of abundant clay nodules in association with burnt fragments of shell or bone, while the scarred trees in the area were generally all mature River Red Gums. The sites identified by Simmons were all located in close proximity and/or associated with the floodplains, anabranches and lake systems of the Murray Valley and clearly showed the importance of aquatic resources to the local Aboriginal populations in the region.

Sample surveys undertaken by Pardoe and Martin (2001) within the Murrumbidgee Province covered an area of approximately 30,000 square kilometres, extending from Balranald to Narrandera and Booligal to Jerilderie. Using an analysis of landforms and identifying gaps in the archaeological knowledge based on the sites recorded in the AHIMS database, they found that there was a bias in the distribution of sites along major waterways and some landforms such as lunettes, but there were also large gaps where no sites had been recorded. Pardoe and Martin surveyed 61 sample areas or quadrants from 22 Stations or locations across their project area. This resulted in 347 new sites being recorded. The major site types (over 90%) were scarred trees (26.2%), mounds (24.2%), open sites (14.4%), ovens (12.4%), burials (7.8%) and hearths (6.1%). Pardoe and Martin analysed their results in order to develop a predictive model for site distribution across the Murrumbidgee Province. They found that mounds varied in size, from 4 m-140 m in diameter and

height also varied from 2 cm to 2 m. Mounds were most commonly found along floodplain creeks within River Red Gum and Black Box vegetation communities. They found that as well as being situated along the major rivers, they were also located on the plains to the north and south of the Murrumbidgee, such as around the edge of depressions such as lakes and swamps and also on palaeochannel features. Mounds were often characterised as being situated on elevated ground such as lunettes, levees and dunes where silty sandy soil was prevalent (Pardoe and Martin 2001:82-87). Burials occurred mostly as individuals within mounds but there were six locations where more than one burial was recorded. Most of the burials were observed as highly fragmented bone disturbed by rabbit activity. Scarred trees were found to be quite variable in the size of the scar with the largest scars being on River Red Gums. Scars were classified into three groups, ceremonial- which were associated with a known burial, extraction- used in extracting food such as honey or grubs, and functional- all other types. The latter varied in size from 0.18 m to 3.6 m in length and width from 0.09 m to 0.55 m with an average width of 0.38 m.

Pardoe and Martin (2001) developed a predictive model of site distribution based on their results and an analysis of variables through the use of GIS mapping. They examined proximity to water and found that no sites were more than 12 km from a major river channel (in this case the Murrumbidgee River, and the Yanco, Box and Mirool Creeks). They also found that 75% of sites were within 3.3 km of such water courses. An assessment of proximity to minor stream was made difficult by the presence of irrigation channels in their GIS layer but nevertheless, they also found that the average distance from a minor stream was 1.8 km and 75% of sites recorded were within 2.2 km (Pardoe and Martin 2001:106).

Martin's PhD thesis (2006) examined the spatial, temporal and socio-cultural relationships of mounds in order to establish a model of human behaviour that could explain the linking of environment, spatial and temporal patterns and cultural change in the archaeology of the Hay Plain. She undertook excavations of two mound complexes, one at the Tchelery property, and one at Ravensworth property about 60 km and 70 km northeast of the current assessment area respectively. The Tchelery mounds were situated northwest of Dry Lake on grey cracking clays. Martin dated the mound to 4,010±170 BP (Martin 2006:119) and the Ravensworth 3 mound was dated to between 4,100±70 BP and 3,860±60 BP (Martin 2006:96). Martin concluded that mound building commenced in the region about 4,300 years ago but there was an increase in mound building after 2,000 BP and that there was a deliberate focus on wetland plants such as *Typha* and *Triglochin* that were baked and steamed in the mounds, along with animal foods.

Martin (2010) also conducted a detailed archaeological survey and modelling project for the Rivers Environmental Restoration Program (RERP). This project area was also focused on the Lowbidgee and concentrated on areas downstream (west) of Maude, areas to the east and west of Oxley on the Lower Lachlan floodplain, the Great Cumbungi Swamp and the western side of the Murrumbidgee north of Balranald. The project utilised GIS modelling to identify areas of archaeological potential and gaps in the archaeological record and targeted field survey to these locations. They recorded 1,306 archaeological features at 1,186 locations with the major site types being mounds (41%), scarred trees (21.7%), hearths (12.7%), artefacts (11.5%), shell middens (5.4%) and burials (4%). The conclusions for the project were that in broad terms there appeared to be a difference in the distribution of sites across the riverine plain. Martin identified that mounds and burials were concentrated on the lower western side of the plain while ovens and artefact scatters were more common on the higher eastern side of the plain. Martin thought the difference was related to the character of the hydrological regimes, because mounds were related to the ecological diversity of the dependable wetlands as food sources. She found that mounds were situated on the higher sand bodies and paleochannels present in the western part of the plain (Martin 2010:78). The RERP survey found burials to be in similar landforms to those identified by Bonhomme, namely lunettes, source bordering dunes, river levees and prior stream levees as well as sand bodies within the clay floodplain.

Several archaeological investigations have also been conducted across the region as part of development applications which been summarised below to provide further information to inform an indication of site modelling for the areas being assessed in this report.

Edmonds (1997) identified four Aboriginal sites during the survey for Binbinette Station, approximately 40 km south-east of the current assessment area, including a scarred tree, a midden with an associated scarred tree and two extensive campsites. The two campsites had stone artefact assemblages dominated by quartzite flakes and *in situ* hearths with burnt clay heat retainers on severely scalded soils. It was estimated that both campsites contained over 1,000 artefacts. The soil around the hearths with clay heat retainers was noted as being eroded up to 15 cm in depth which created a series of mounded hummocks and clay pans. These clay pans fill up with water after rain and provide a temporary water source. Edmonds suggested that these temporary water sources may have made the area an attractive camping place during winter rains as Aboriginal groups ventured further away from the rivers during autumn and winter months to hunt on the plains. Edmonds concluded from this survey that landforms associated with a water source (including temporary clay pans) were the most archaeologically sensitive and that plains have low archaeological sensitivity.

Kamminga (2010) examined potential Aboriginal artefacts from three surface sites and an isolated find within Yanga National Park and three collections held by the National Parks and Wildlife Service (NPWS) housed at Yanga Homestead. Two of the stone artefact scatters, Waugorah Road and Lintot Lake, were confirmed to be Aboriginal in origin and comprised of 12 and 54 artefacts respectively. Kamminga noted that the raw material types identified within the Yanga assemblages were mostly quartzite, with lesser numbers of silcrete, quartz, sandstone.

Landscape conducted a preliminary cultural heritage assessment of the Atlas-Campaspe Mine area which is located approximately 100 km northwest of the current assessment area and developed a predictive site model based on the desktop research for the distribution of archaeological sites in the area over various landscapes (as cited in Niche 2012:34). It was predicted that stone artefacts and hearths would be the most common site types in the area which would likely be located near relict lake basins or clay pans that may intermittently hold water. The likelihood of encountering scarred trees, shell middens and burials was assessed as low as these site types are generally found near more permanent water sources. Burials were most likely to occur in bordering dunes and lunettes adjacent to rivers and lakes. Landscape noted that silcrete stone sources have previously been recorded in the Willandra Lakes Region and that silcrete outcrops may occur in areas such as dry lakebeds (as cited in Niche 2012:38).

In 2012 Niche undertook field survey for the Atlas-Campaspe Mine projects using the Landscape predictive model noted above. The field survey included inspection of the proposed mine approximately 90 km north of Balranald and the proposed Ivanhoe Rail Facility. No sites were previously recorded in the project area despite the close proximity to the Mungo National Park and Willandra Lakes Region World Heritage Area. The survey of the proposed development corridor identified 78 Aboriginal sites within the Atlas-Campaspe Mine area and 22 Aboriginal sites within the Ivanhoe Rail Facility. A number of areas of high and moderate Aboriginal heritage value were also identified, consequently the development corridor was modified to allow the conservation of some areas. Niche identified a number of isolated finds, artefact scatters, hearths and a modified tree. The majority of stone artefacts were retouched tools manufactured from silcrete which is common in the area. Fewer chert, sandstone and quartzite artefacts were also recorded. The sites recorded in the Atlas-Campaspe Mine area were all generally located on the margins of ephemeral depressions. A raised dune on the eastern edge of a lake depression near the proposed works footprint was also noted to have archaeological potential. The proposed transport route surveyed had the highest number of sites and it was suggested that this density of sites was reflective of the close proximity to more permanent water sources in the area. Niche concluded that the sandplain and dune fields assessed contained few traces of past land use by Aboriginal people while the playas and relict lake areas contained an abundance of Aboriginal objects.

Niche (2015) undertook survey for the Balranald Mineral Sands Project for Iluka Resources Limited for the proposed development of a mineral sands mine 12 km north-west of Balranald between 2012 and 2014. A total of 548 sites were identified over the course of the project. A database of sites for the project was created that is referred to as the Balranald Project Aboriginal Heritage Database. Analysis of site distribution

and density was used to classify areas as having high, moderate or low archaeological risk to assist in the management of the mine. Niche predicted that stone artefacts and hearths were the most likely site type to occur in the project area while middens, modified trees and burials were less likely to occur. Niche also predicted that mounds were unlikely to occur in the project area. During the field survey an emphasis was placed on visually inspecting alluvial plains, playas and basins while sand plains, sand dunes and areas with reduced archaeological visibility had less of an emphasis placed on them. While 11 land systems were identified and surveyed within the Balranald Mineral Sands Project, very few Aboriginal sites were located in the Condoulpe landform. Niche noted that there was a strong correlation between the location of sites and dunes, rises, lunettes and exposures associated with depressions or a decrease in elevation in the landscape. The majority of sites (approximately 52%) contained between one to 10 stone artefacts with only eight of the recorded sites containing over 200 artefacts. Silcrete artefacts were dominant and accounted for 93.5% of the recorded assemblage. The bulk of the stone artefacts recorded were complete flakes, broken flakes and angular fragments. Retouched flakes or tools formed 7.9% of the assemblage with a number of tool types identified including burins, burrens, piecers and assorted scrapers. Niche (2015) concluded that within the project area sites fell into either short term occupation or single activity sites or specific long term seasonal nodal sites.

Barber (2015) undertook an archaeological survey for the purpose of identifying and recording Aboriginal sites and cultural values of the Nimmie-Caira area, an area of 867 sq. km between Maude and Balranald. The purpose of the study was to identify sites to assist the future land and water management of the area. Furthermore, it was designed to engage the local Aboriginal communities to enhance and share their knowledge by providing opportunities for involvement in the surveys and recording of archaeological features. Due to the sensitivity of the wetland landscape that made up most of the area, the survey served two purposes. Firstly, it would examine a range of environments and undertake survey to obtain an understanding of likely archaeological resources of the area, to develop site models and clarify the distribution of archaeological features in the landscape. Using both soil mapping, vegetation mapping and sample survey blocks, areas of high, medium, and low archaeological potential were identified. The second aim of the study was to ensure that the area had enough data in relation to the location and type of Aboriginal heritage sites so that the area could be managed effectively in the future. Barber (2015) used GIS to examine environmental data and aerial photography to select a range of survey sample areas for pedestrian survey. A total of 68 separate survey sample areas were examined over a period of 30 days; the total ground coverage of these surveys was 31.68 km², 3.65% of the 867 km² of the Proposal Area. However, despite being such a small percentage of the total area, the surveys recorded 469 Aboriginal heritage features as shown in Table 4-3 below. Barber also noted that another 39 recordings were made where the archaeologists did not consider the features to be Aboriginal in origin but where the Aboriginal community considered them to be Aboriginal heritage sites; these features were simply called 'Cultural locations'.

Table 4-3 Breakdown of feature types found within the Nimmie-Caira area (Barber 2015).

Feature Type	Number	Percentage of Total Features
Artefact occurrences*	83	17.67
Burial	40	8.53
Hearth	84	17.91
Mound	103	21.96
Modified tree (including ring trees)	46	9.81
Isolated Finds [#]	113	24.09

* Includes artefacts grouped within 50m of other feature types, eg. Mounds

Includes either isolated or small clusters of artefacts situated more than 50m from another feature

Barber (2015) also made mention that the 40 burials were all found within a mound or a sand body that was elevated above the floodplain, which itself was usually close to other archaeological evidence; none of these burials were intact. Furthermore, Barber had expected the mounds to be the most common feature recorded during the survey, they occurred more frequently in association with waters, especially the Uara, Nimmie and Pollen waterways. They most often occurred on the banks of creeks or on elevated sand bodies and lunettes on the edge of the relict lakes in the area. Their size also varied greatly, from only 2 m in length to nearly 160 m. The hearths were an archaeological feature that contained clay heat retainers but without association to a mound. Some of these features were loosely related while isolated clusters spread across several metres. Both the more spread-out features and the discreet and confined clusters were recorded as hearths. The 46 modified trees that were recorded included four Ring trees. Eleven of the modified trees were identified as River Red Gums (*E. camaldulensis*), while 35 were Black Box (*E. largiflorens*). A total of 46 scars were recorded including six possible rings on the four Ring trees. Only nine of these trees were recorded as dead along with four as dying, the remainder were alive (although two were ‘lying down’ and one had partially fallen). There were 504 stone artefacts recorded in 193 locations and were most often found in association with mounds. The erosion of these mounds had provided a good opportunity to find stone artefacts, Barber noted that the mounds likely contained more artefacts buried within. Some artefacts were also found in isolated locations far removed from other archaeological features. This could be the result of travel or could potentially represent the very temporary use of that location.

The Nimmie Caira surveys also identified that sites could remain in the landscape, even after intensive agricultural activities. For example, stone artefacts and other material such as burnt clay were recorded within irrigation bays and on channel banks. It was also found that erosion, often because of rabbit infestation, caused significant impacts to mounds, but that cultural material was still identifiable in a landscape context. The land use by Aboriginal people clearly showed widespread activity across multiple soil and vegetation units but higher ground, associated with elevated palaeochannels, lunettes, sand dunes and plains were clearly preferred. While lower lying areas such as lignum and Nitre Goosefoot wetland vegetation did contain some cultural material, it was generally in lower frequency and in smaller site areas (Barber 2015). Further survey at Nimmie Caira by NGH in 2019 recorded an additional 62 mound sites along Uara Creek. The purpose of the survey was obtaining baseline data to assist the Nari Nari Tribal Council in managing heritage locations within Nimmie Caira. The report also provided options for the longer-term management of sites (NGH 2019).

4.1.2 Local context

There have been several assessments conducted in proximity to the proposed work areas which are described in detail below. Where possible the studies undertaken in proximity to the intersection of Yanga Way onto Balranald -Moulamein Road and at near the intersection of Balranald -Moulamein Road onto Arundel Road are shown in Figure 4-3.

In 2003, Edmonds surveyed the proposed Balranald Levee on behalf of the Balranald Shire Council. The project area for that project was situated on the Condoulpe and Riverland land systems and ran for approximately 3.4 km along the Murrumbidgee River. The predictive model suggested that culturally modified trees, middens and camps sites were the most likely site types to be identified with the high riverbanks and the margins between the Condoulpe and Riverland land systems the most archaeologically sensitive landscapes in the study area. A total of 12 sites were recorded, including 10 modified trees and two shell middens.

Wakool Indigenous Corporation (2016a) undertook a due diligence archaeological investigation for the proposed Balranald Floating Pontoon on the northern bank of the Murrumbidgee River, near the Balranald Road Bridge, for the Balranald Shire Council. No Aboriginal sites or objects were recorded during the survey.

Wakool Indigenous Corporation (2016b) also undertook a due diligence archaeological investigation for the proposed Kyalite floating Pontoon on the northern bank of the Wakool River, near the Kyalite Road Bridge, for the Balranald Shire Council. The proposed works area covered an area approximately 20 x 30 metres along a steep slope subject to inundation during flood events. Although no Aboriginal sites or objects were recorded during the survey a known shell midden (AHIMS #is 47-8-0004) was located approximately 10 m south of the project area. The close proximity of AHIMS #is 47-8-0004 suggested the possible presence of subsurface material and it was recommended that an AHIP be granted prior to works commencing.

NGH Environmental (2016) surveyed 800 ha for the proposed Sunraysia Solar Farm near Balranald approximately 1.5 km west of the Balranald Road and Arundel Road intersection of the current assessment as shown in Figure 4-3. The survey recorded three sites comprising two clusters of burnt clay recorded as ovens and a site complex of seven stone artefacts and three hearths. They noted that the absence of scarred trees, which is another common site type in the area, was not surprising as the Proposal Areas had been cleared of native vegetation for cropping purposes and that most scarred trees occurred near permanent water sources, of which there were none. The nature of the archaeological material within this landscape suggested that Aboriginal use of the landscape was intermittent. The results of this assessment indicated that while sites can occur throughout the landscape, even in areas of highly disturbed farming activities, there is a dominance of Aboriginal cultural material recorded within the Perekertin landscape system and in relatively undisturbed landscapes in the area. The Perekertin landscape is characterised as a transitional area on the riverine plain. This project now has SSD approval.

Biosis (2017a & 2017b) undertook an ACHA for the Limondale Sun Farm in Balranald approximately 1 km west of the Balranald Road and Arundel Road intersection of the current assessment area as shown in Figure 4-3. There were five previously recorded AHIMS sites within the site boundary. The survey of the study area located a further 11 Aboriginal sites, including artefacts scatters, hearths, earth mounds and a scarred tree. Two of the Aboriginal sites also had historical objects indicating that they are post-contact sites. The Aboriginal sites recorded within the assessment area were predominantly identified on red sandy rises in disturbed (ploughed and trackways) contexts within the Murrumbidge Scalded Plain landscape. The identification of only one site within the Mallee Cliff soil landscape was expected given that this landscape was noted to have the least archaeological potential. Biosis noted that the location of sites within the study area seems to bear little correlation with their relationship to modern water sources as there was no drainage or creek lines in the study area and none of the sites were located in close proximity to water. The generally poor condition of sites within the study area was noted to be the result of the historic agricultural disturbance and land use history of the area. All stone artefacts identified during the survey were silcrete, which is a common material for the area. This project now has SSD approval.

Navin Officer Heritage Consultants Pty Ltd (NOHC) undertook an ACHA (NOHC 2022) for the Project EnergyConnect Eastern Section (PEC-East) in NSW from the Buronga substation to Wagga Wagga substation. The PEC-East project recorded 105 Aboriginal sites within the heritage survey area with an additional 11 sites previously recorded as well as identifying 45 areas of PAD. Isolated finds were the most common site type recorded across the PEC-East project followed by artefact scatters, modified trees, hearths with few mounds, middens and sites with multiple features. Sites were most commonly recorded on alluvial plains and flat plains and were identified near or across high order perennial watercourses. Three areas of PAD were identified in proximity or within the Junction Rivers Wind Project Area. PEC-E-PAD05 is within the northern portion of the Junction Rivers Wind Project Area. Test excavation within this PAD recovered no stone artefacts or cultural material and this area was subsequently found to not be a PAD and NOHC argued that Condolupe Creek was not a focus of past Aboriginal land use (NOHC 2022:129). The other two PADs one to the west and one to the east of the Junction Rivers Wind Project Area similarly had no stone artefacts or cultural material recovered and were found to not be PAD. None of the previously recorded PADs were within and/or directly adjacent to any of the four intersection upgrade areas being assessed in this report. The portion of the PEC-East project alignment near the Junction Rivers Wind Project is shown in Figure 4-3.

NGH Pty Ltd (2021) undertook a due diligence assessment for two proposed met mast locations on behalf of Windlab within the boundary of the Junction Rivers Wind Project Area (Location 1 [Lat: -34.8139, Lon: 143.5613], Location 2 [Lat: -34.8772, Lon: 143.6451]). The two met mast locations (see Figure 4-3) inspected were found to be highly disturbed, predominantly from extensive agricultural cultivation. However, a single silcrete stone artefact was identified on the upper slope of a sandy rise. The due diligence assessment refers to this site as Burrawong 1. Harm was avoided to the place through redesign of the met mast location and the installation of a no-go zone around this site to ensure no inadvertent harm.

NGH Pty Ltd (2022) undertook a due diligence assessment for 15 test pit and eight bore hole locations for geotechnical investigations for the proposed Junction Rivers Wind Project (see Figure 4-3). The survey for the due diligence was undertaken at the same time as the survey undertaken for this ACHA in March 2022. Visibility was approximately 99% across the proposed locations for the geotechnical investigations. These areas were found to be highly disturbed, predominantly from extensive agricultural cultivation. Despite the high levels of disturbance, two stone artefact scatters (Burrawong AFT 1 and Burrawong AFT 2) and five isolated stone artefacts (Burrawong 2, Burrawong 3, Burrawong 4, Burrawong 5, Burrawong 6) were identified. Secondary locations were proposed for geotechnical investigations to avoid harm to the identified sites.

NGH Pty Ltd (2023) completed an ACHA for the Junction Rivers Wind Project, which includes a portion of the works areas at the intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite as shown in Figure 4-3. This assessment was also adjacent to the proposed works at the intersection of Yanga Way and the Balranald-Moulamein Road, Yanga. During the survey undertaken for the Junction Rivers Wind Project ACHA the following archaeological features and cultural sites were recorded by NGH: stone artefacts, hearths, oven mounds and tree cultural sites. A summary of the Aboriginal site types and cultural sites recorded during the field survey are provided in the table below. Most of the stone artefacts recorded during the Junction Rivers Wind Project ACHA were manufactured from silcrete which is a common material for the area followed by quartz and quartzite artefacts with a lesser number of sandstone, fine-grained silicious material, volcanic material, chert and granite. The majority of stone artefacts identified during the survey were flaked pieces and flakes followed by lesser number of broken flakes, cores, grindstone fragments, hammerstones, manuports, blades, and an axe, a muller and a pestle.

Table 4-4: Site types recorded during NGH (2023) survey for the Junction Rivers Wind Project ACHA.

Site Type	Number	%
Isolated finds	37	46.25
Tree cultural site	24	30
Hearths	9	11.25
Artefact scatter	5	6.25
Hearth and mound	2	2.5
Hearth and Artefact	2	2.5
Artefact Scatter, Hearth and mound	1	1.25
Total	80	100

Based on the site types, archaeological features and cultural sites recorded during the assessment, it was noted by NGH (2023) that it is likely that the area as a whole was used intermittently over long periods of time for camping while water remained in the landscape, as indicated by the presence of hearths, mounds and

stone artefacts. Sites that consist of both hearths/mounds and stone artefacts indicate that camping, cooking and tool manufacturing activities were undertaken in these areas. Looking at the spatial distribution of these features and the landforms within the Proposal Area it was noted by NGH that the hearth and earth mound features tend to be focused along the outer boundaries of black box swamps and depression areas which in the past would have been desirable locations for camping. Furthermore, the majority of the sites with stone artefacts are located in slightly elevated areas of red gravely sands rather than in the low lying grey cracking clays of the flood plains. The tree cultural sites recorded were generally noted to be located in association with Black Box depressions and areas of remnant vegetation. It was noted by NGH (2023) that the Aboriginal cultural material recorded within the Junction Rivers Wind Project ACHA Proposal Area is reflective of the use of the area by small family groups on multiple occasions as they moved through the landscape exploiting the increased range of available resources associated with the prolonged presence of water after annual flooding. The spatial analysis of the sites recorded clearly shows that sites with multiples features and/or a density of cultural material recorded tended to be focused along the outer boundaries of black box swamps, depression areas and paleochannels, thus confirming the modelling of the area and that access to resources, in particular water, were favourable locations utilised for camping.

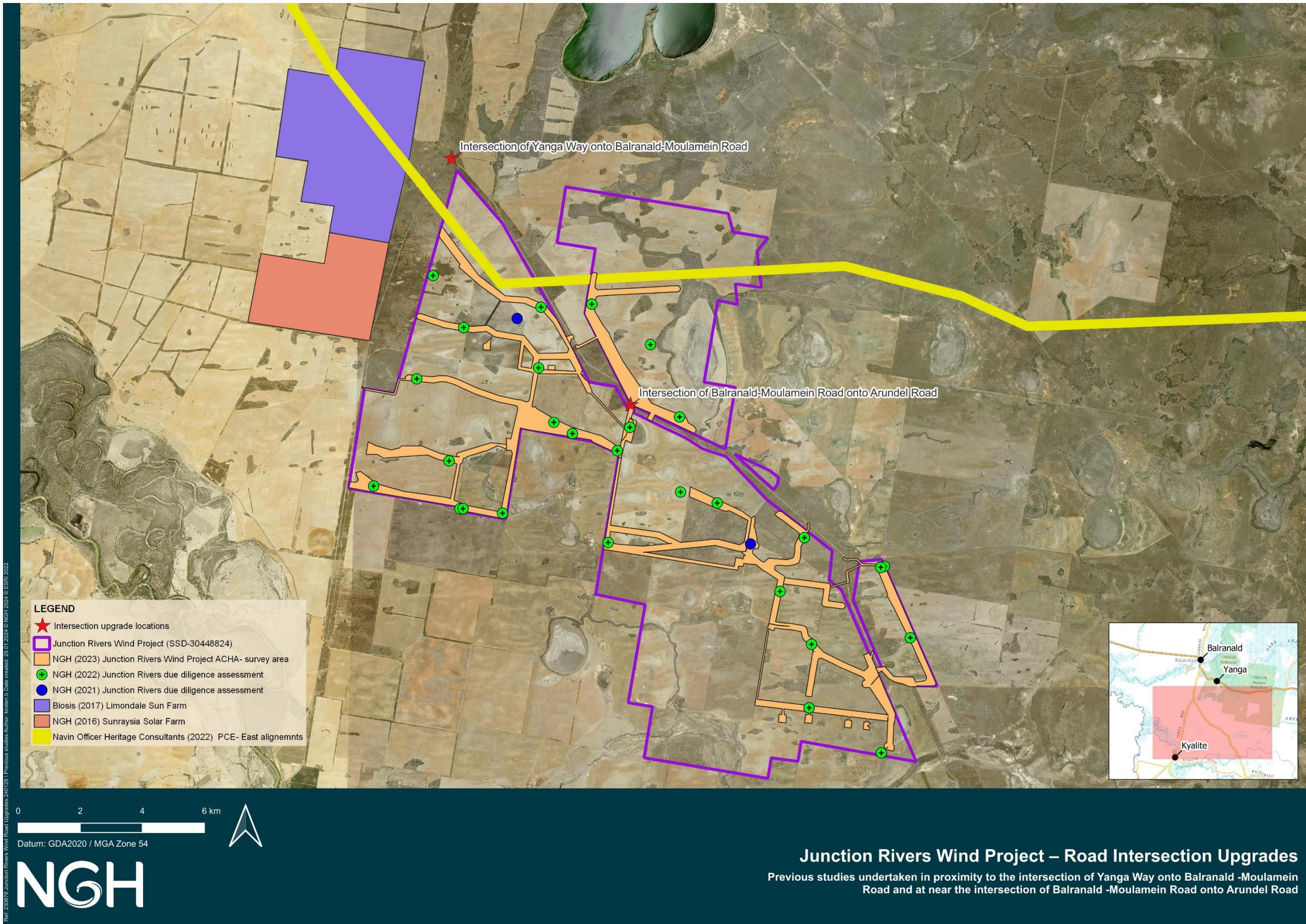


Figure 4-3 Previous studies undertaken in proximity to the intersection of Yanga Way onto Balranald -Moulamein Road and at near the intersection of Balranald -Moulamein Road onto Arundel Road.

4.2 Landscape assessment

Step 2b. Are there landscape features present likely to contain Aboriginal objects?

The Due Diligence Code outlines a range of general landscape features that are more likely to contain Aboriginal objects. These include land that is:

- Within 200m of water;
- Located within a sand dune system;
- Located on a ridge top, ridge line or headland;
- Located within 200m below or above a cliff face; or
- Within 20m of a cave, rock shelter or cave mouth.

It is also necessary to consider whether any sensitive landscape features present have been disturbed or modified which would reduce the potential for Aboriginal objects to occur.

4.2.1 Geology, soils and topography

Understanding the geological character, soils and topography of the local area can assist with understanding what, if any, raw stone materials may have been available for the manufacture and maintenance of stone tools or for use as shelter, if subsurface deposits of archaeological material are likely to occur and identify landforms which may have been a focus of Aboriginal occupation.

The National Interim Biogeographic Regionalisation for Australia (IBRA) system identifies all four proposed work areas as located within the South Olary Plain Subregion of the Murray Darling Depression Bioregion which is described below in Table 4-5.

Table 4-5 IBRA Subregion descriptions (DE&E 2016).

Unit	Geology	Landforms	Typical Soils	Vegetation
South Olary Plain	Quaternary aeolian sands and lake sediments	Dunefields, sandplains, dry lakes and groundwater basins.	Deep siliceous and calcareous red to yellow sands, sandy earths, brown texture contrast soils on dunes and sandplains. Saline, gypseous and calcareous clays on lake beds, mixed sands and pelleted clays in lunettes.	Diverse mallee on sands with; pointed mallee, congoo mallee, red mallee, lerp mallee, slender-leaf mallee, yorrell, white cypress pine, mallee cypress pine, belah, rosewood, with porcupine grass and diverse shrubs. Belah, rosewood, black bluebush, pearl bluebush, old man saltbush, on sandplains and heavier soils. Black box fringing depressions, halophytes on salinas, and chenopod shrublands on lunettes, sometimes with white cypress pine

The NSW 1:1500K simplified surface geology shows all four proposed work areas comprises of Quaternary Woorinen Formation (Qdw) which consists of poorly consolidated red-brown sands. Further landscape mapping as part of the Mitchell landscapes system (DECC 2002) notes that the four work areas are located within the Murrumbidgee Depression Plains, Murray Channels and Floodplains and the Murrumbidgee Channels and Floodplains as detailed in Table 4-6.

Table 4-6 Description of the Mitchell Landscape relevant to the proposed work areas

Proposed work areas	Soil landscape	Description
Intersection of the Murray Valley Highway and Sturt Highway, Euston	Murray Channels and Floodplains	Active channels and seasonally inundated floodplains of the Murray streams in Quaternary alluvium. Grey silty clays to brown clays or red-brown texture contrast soils.
Intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald	Murrumbidgee Channels and Floodplains	Quaternary alluvium on seasonally inundated floodplains that consist of grey and brown clays with some areas of low sandy rises.
Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga; Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.	Murrumbidgee Depression Plains	Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters. Grey to brown clays and clay loams with linear patterns of sandy prior streams.

In earlier work on the NSW landscape, parts of western NSW were also divided into land systems (Walker 1991) with this mapping extending across the four proposed work areas. Based on land system mapping compiled in “Land Systems of Western New South Wales” (Walker 1991) the proposed work areas are within either the Condoupe land system which is characterised as a sandplain between dunefields on the Riverine Plain near Balranald or on the Murrumbidgee land system which is characterised as alluvial floodplains. Both these land systems are described in Table 4-7.

Table 4-7 Description of the land systems in western NSW relevant to the Project Area (Walker 1991)

Proposed work area	Land system name	Description	Soil and Vegetation	Landform and geomorphology	Summary
Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.	Condoupe (Cd)	Sandplains and dunefields with mallee	Mallee. Plain and flats of predominantly solonized brown soils and areas of red earths; dunes of deep brownish sands; drainage basins of grey cracking clays; generally dense to scattered belah and mallee; areas of dense edible chenopods; drainage basins of dense black box, nitre goosefoot and dillon bush; variable speargrass, annual saltbushes and forbs.	Sandplain of Quaternary aeolian material with large areas of east-west trending dunes; relief to 5m; open flats, terminal drainage basins, locally depressed to 2m.	Sandplain between dunefields and the Riverine Plain near Balranald
Intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald					

Proposed work area	Land system name	Description	Soil and Vegetation	Landform and geomorphology	Summary
Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga;	Murrumbidgee (Mc)	Floodplains with black box and/or river red gum	Southern Riverine Woodlands. Plains with grey cracking and non-cracking clays; lunettes and rises of deep brownish sands; backplains of scalded yellow texture-contrast soils; moderate to dense black box, lignum, old man saltbush and nitre goosefoot; rises, lunettes and backplains with clumped mallee, white cypress pine, prickly wattle and scattered shrubs; abundant forbs and grasses.	Alluvial plains. Floodplain of grey fine-textured Quaternary alluvium with small rises, relief to 3 m; backplains, scalded levees and swamps. Riverside lunettes of deep sands; relief to 10 m. Irregularly inundated by flooding.	Higher terraces of the Murrumbidgee Murray, lower Lachlan and Wakool Rivers.
Intersection of the Murray Valley Highway and Sturt Highway, Euston					

Given the geological, soil and topographic data noted in this section, it is clear that there is very little topographic variation within each of the four road intersection upgrade areas with all four intersection areas primarily located on flat floodplain landforms with negligible variation in height. Although there could be microtopographic features on these floodplains that have archaeological potential, the level of disturbance already present within the Project Area from the existing roads, tends to diminishes any potential these areas may have once held.

In general, the soil profiles within the four work areas are expected to be predominantly made up of silty or cracking clays, these soils tend to have low potential for subsurface archaeological deposits. However, any red sandy deposits have high potential for Aboriginal objects. Other archaeological assessments in the region have also noted that very few Aboriginal sites were located in the Condoulpe landform which is the main land system at two of the work areas (the intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite and the intersection of Sturt Highway to the corner of 49 Court Street, Balranald Hospital Lot in the township of Balranald). None of the four intersection work areas have natural stone outcrops suitable for the manufacture or maintenance of tools, and past archaeological surveys suggest that stone was traded throughout the region.

4.2.2 Hydrology

The two major water sources located near the four intersections of the Project Area are the Murrumbidgee and Murray Rivers. Lake Yanga and several other small lakes, including Condoulpe Lake and Lake Talbetts and channels, including Forest Creek, are also situated near portions of the Project Area.

All the natural streams and bodies of water in this area are non-perennial. However, in pre-European times, the region would have been subject to seasonal flooding. The Murrumbidgee River would flood and through a distributary system of anastomosing channels, including Forest Creek, water would spread out across the plain. Channels would have assisted in the distribution of the floodwaters into a myriad of seasonal wetlands and lakes. The water eventually made its way west and south, passing through what is now Yanga National

Park and re-entering the Murrumbidgee River near Balranald as well as emptying into the Edwards River. The Murrumbidgee River then flows into the Murray River. The town of Euston sits on the Murray River.

These creeks and rivers would have acted as vital waterways in the past and be a reliable and predicted event used to harness certain resources such as fish, water birds and plants. Dry soaks are also known in the region to have provided water sources into the dryer months acting as refugia for animals and people.

Out of the four proposed work areas only the proposed works at the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald is located within 200m of a watercourse, the Murrumbidgee River. The distance of each of the proposed work areas to the nearest watercourse is provided in Table 4-8 below.

Table 4-8 Nearest hydrology to the proposed work areas

Proposed Works area	Distance to water	Name of nearest water source
Intersection of the Murray Valley Highway and Sturt Highway, Euston	1.3 km south-east	Murray River
Intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) and the Sturt Highway, Balranald	170m west	Murrumbidgee River.
Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga; and	800m south-west	Unnamed first order watercourse following into a man-made dam.
Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.	1.6km north-east	Condoulpe Lake

4.2.3 Flora and fauna resources

The information provided herein is intended as a generalised summary of the endemic flora and fauna and is not to be used as a substitute for detailed ecological and biodiversity studies.

Much of the proposed four work areas have been cleared during the construction and maintenance of the roads. The remaining vegetation is represented by the landscapes in Land systems of Western NSW (Walker 1991) as described in Table 4-7. These species would have provided a wide variety of resources for the manufacturing of wooden implements, medicine and food, as well as habitats for animals that were also used for food. If mature native trees remain, there is a possibility that scarred trees may be present as eucalyptus, Yellow Box and Black Box trees are known to have been favoured species for the extraction of bark for use as canoes, shields, and containers by Aboriginal people. The native vegetation communities pre European settlement would have also provides numerous habitat types for fauna. Canopy trees provide foraging and nesting/resting habitat for birds and arboreal fauna. The mid-storey provides foraging and nesting habitat for smaller birds, as well as refuge for small-medium sized mammals and reptiles. Ground cover plants, logs and fallen leaves also provide shelter and foraging habitat for terrestrial fauna. The Murrumbidgee and Murray Rivers would also have provided sufficient subsistence in the form of various species of fish, birds, reptiles, and mammals.

Review of satellite imagery and google earth street view identified that no mature native trees suitable for bark extraction are present within any of the three proposed intersection upgrade work areas noted below.

- Intersection of the Murray Valley Highway and Sturt Highway, Euston
- Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga; and
- Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.

However, several mature nature eucalyptus trees are present within the proposed works area at the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald.

4.2.4 Historic land use

Each of the four road intersection upgrade areas has primarily been used as public roads with associated infrastructure for over the last 50 years. Historic aerial imagery of each intersection shows that each area has been used as roads since at least the 1950's as shown in Plate 4-1 to Plate 4-6.



Plate 4-1 Historical aerial image of the intersection of Sturt Highway (Corner of 49 Court Street) in the township of Balranald dated 1955.



Plate 4-2 Historical aerial image of the intersection of Sturt Highway (Corner of 49 Court Street) in the township of Balranald dated 1997.



Plate 4-3 Historical aerial image of the intersection of Yanga Way and the Balranald-Moulamein Road, Yanga dated 1991.



Plate 4-4 Historical aerial image of the intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite dated 1961.



Plate 4-5 Historical aerial image of the intersection of the Murray Valley Highway and Sturt Highway, Euston dated 1973.



Plate 4-6 Historical aerial image of the intersection of the Murray Valley Highway and Sturt Highway, Euston dated 1993.

Further review of the parish maps over each intersection upgrade area also shows that the intersections and roads have been present for at least 100 years, with the 1873 Parish map of Balranald clearly showing what is now the intersection of the Sturt Highway (corner of 49 Court Street) in the township of Balranald, existing originally as the intersections of Court Street and Market Street with McCabe Street (see Plate 4-7 with the works area in Balranald circled in red). The parish maps over each of the intersection upgrade areas is shown in Plate 4-7 to Plate 4-10.

Due to this historic disturbance and land use the intersections along the Sturt Highway, Balranald Road, Arundel Road, and the Murray Valley Highway which form the Project Area, have been noted to have been subject to a number of disturbances associated with the construction and maintenance of these roads over a long period of time which may have destroyed or displaced any previous sites or Aboriginal objects which may have once been at these locations.

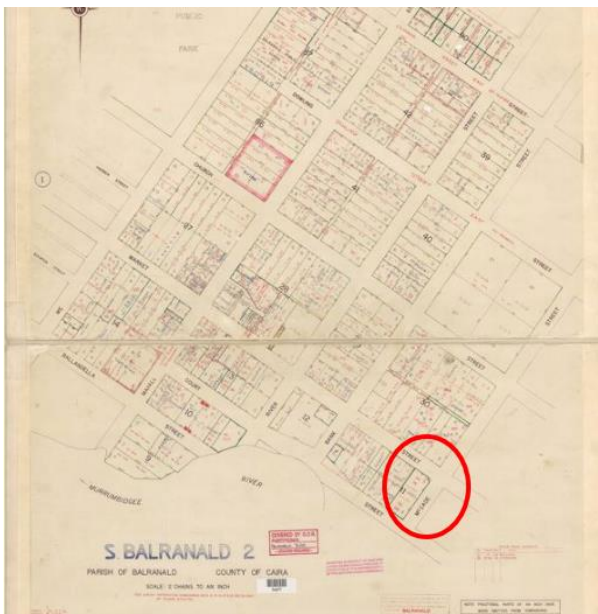


Plate 4-7 Parish of Balranald map dated 1873 with the intersection of the Sturt Highway (corner of 49 Court Street) in the township of Balranald circled in red.

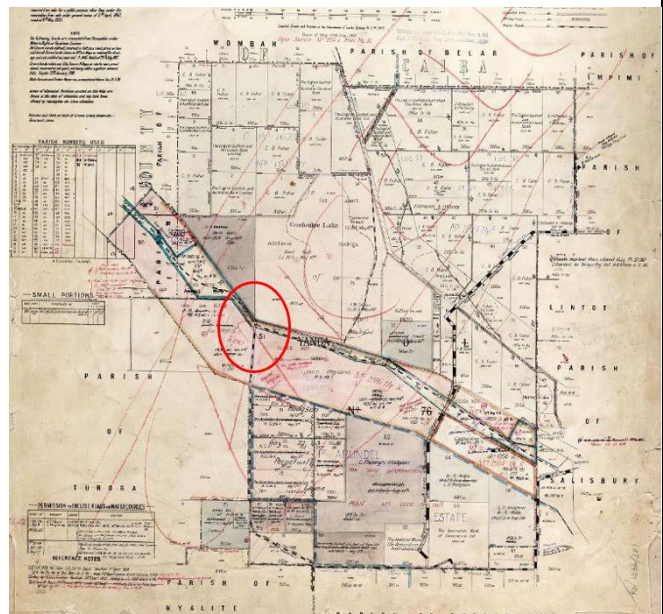


Plate 4-8 Parish of Condoulpe map dated 1928 with the intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite circled in red.

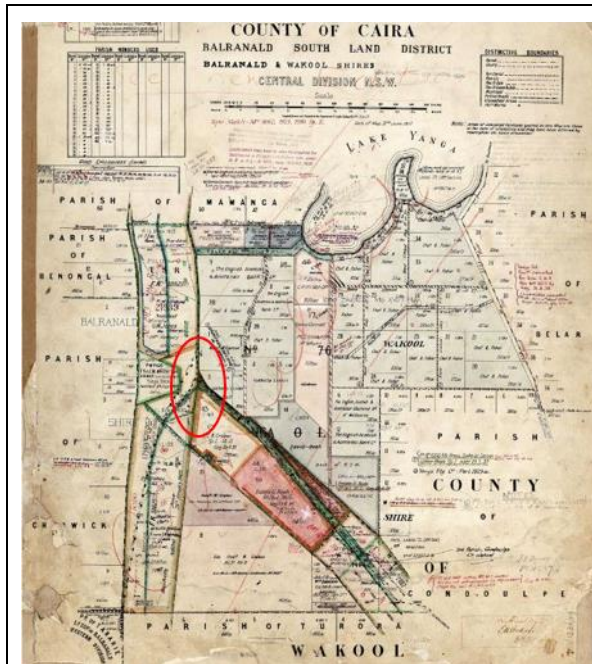


Plate 4-9 Parish of Wombah map dated 1920 showing the intersection of Yanga Way and the Balranald-Moulamein Road, Yanga circled in red.

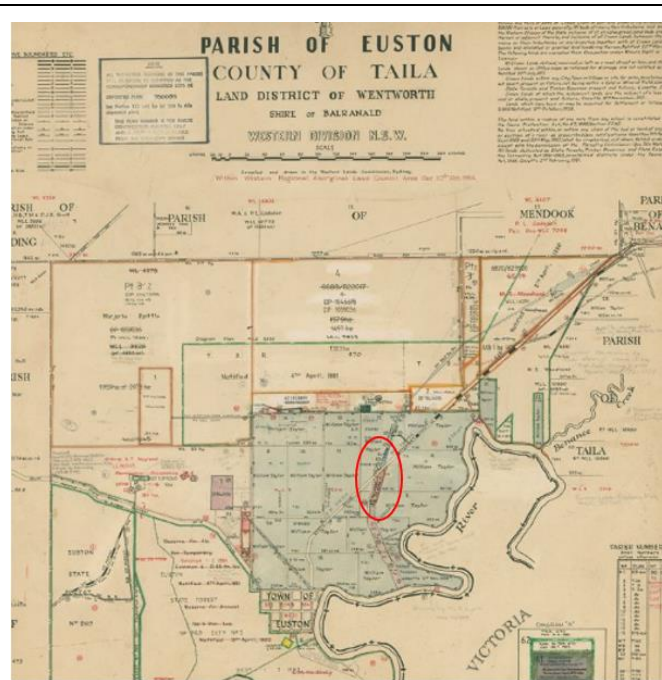


Plate 4-10 Parish of Euston map dated 1984 showing the intersection of the Murray Valley Highway and Sturt Highway circled in red.

4.3 Aboriginal site prediction

Based upon the initial desktop assessment, using satellite imagery, google earth street view, topographic data and previous archaeological studies, it appears that there is low potential for Aboriginal objects to occur within any of the four intersection road upgrade areas given the historic use and disturbances of each area during the initial construction and subsequent ongoing maintenance of these roads and their associated infrastructure and table drains.

Regardless, a number of site types have been recorded in the wider region which include modified trees, artefacts scatters, isolated stone artefacts, hearths, mounds and burials. In particular across the Balranald region, elevated red sandy areas within a markedly flat landscape are considered to likely contain Aboriginal sites. Paleochannels, relict lake and lunette features and areas on the margins of wetlands and black box drainage depressions, including where stands of trees are present are also known to contain sites. Additionally, any old growth mature native trees have the potential to have been culturally modified. It is considered that while as a whole the wider Balranald region would have provided resources, shelter, water and food for Aboriginal people any slightly elevated red sandy raised areas (which are considered micro topographic features within a markedly flat landscape) in proximity to water sources have a higher potential to contain cultural material. It is also however reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape, but the current archaeological record of that activity is limited.

Considering the predictive modelling and known sites within the region, the site types most likely to occur within the four intersection road upgrade areas are Aboriginal stone artefacts (in low densities and/or as isolated finds) and scarred trees (on mature native tree). However, consideration of the past land use and the disturbance of each of the proposed work areas must be considered when assessing the potential for such sites to remain. An outline of predicted Aboriginal objects within the four activity areas assessed in this report is provided in Table 4-9 below.

Table 4-9 Aboriginal site prediction statements

Site type	Site description	Potential
Modified trees	Trees that have undergone cultural modification. These require the presence of mature native trees and are likely to be concentrated along major waterways and around swamps or depression areas.	Potential to occur within areas where there are remnant mature native trees, and dead or fallen mature trees. While there are patches of remnant vegetation within and adjacent to the intersection upgrade areas this tends to be young or new vegetation. However, several mature native trees are present within the proposed works at the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald. However, this feature is unlikely to occur at the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald as and these trees appear to be part of deliberate street tree planting (as evident in the 1955 aerial images of the area).
Isolated artefacts	These sites consist of a single artefact and can occur anywhere. As Aboriginal people traversed the entire landscape for thousands of years, such finds can occur anywhere and indicate the presence of isolated activity, dropped or discarded artefacts from hunting or gathering expeditions or the ephemeral presence of short-term camps.	Low potential to occur due to the significant ground disturbance which has occurred during the construction and maintenance of the existing roads. Given the disturbance of all four proposed work areas any isolated finds would likely be displaced and not located in their original context.
Stone artefacts scatters	Artefact scatter sites can range from high-density concentrations through to sites containing two artefacts. The size of these sites usually correlates with proximity to sources of fresh water. Representing camp sites or flaking and maintenance activity can occur across the landscape, usually in association with some form of resource or landscape. Water bodies, such as rivers, ephemeral creeks or clay pans can also be a focus of Aboriginal occupation.	Low potential to occur due to significant ground disturbance which has occurred during the construction and maintenance of the existing roads. Given the disturbance of all four proposed work areas any remnant low density scatters would likely be displaced and not located in their original context.
Hearths/Ovens	Are identified by burnt clay used for heat retainers. Some are recorded in the district in association with resource locations. However, they could occur either independently or in association with other Aboriginal cultural features such as artefact scatters. Hearths are generally considered to be limited, one-off use or reused but few times and are smaller concentrations. Ovens are considered to represent larger features, often extending over a larger area and can include other material such as bone.	Similar sites have been recorded within region however they tend to be adjacent to major water sources. Given that only the proposed works at the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald is located near a major water source and in consideration of the existing disturbances of the areas this site type if considered unlikely to occur.

Site type	Site description	Potential
Mounds	Are accumulations of heat retainer ovens that have built up over time. They are typically round or oval in shape and range in length from just a few metres to over 100 m and range in height from 0.1 m to 2 m. They are identified by the presence of baked clay heat retainers, which have usually been brought to the location from a nearby source of natural clay such as a lakebed, swamp or drainage line.	Mounds are generally found in proximity to wetland areas such as lakes, swamps and creeks, often elevated above these areas by being situated on sandy rises, lunettes, source bordering dunes and paleochannels. Mounds are likely to contain a range of other archaeological features such as bone, shell, stone artefacts and burials. This feature has been recorded in the region however given the existing distance of the areas during the construction and maintenance of the existing roads such site are unlikely to occur.
Burial	Ancestral Aboriginal burials are generally found in elevated sandy contexts or in association with rivers and major creeks.	Very unlikely to occur due to historic disturbances as well as the absence of sand dune landforms within any of the four proposed work areas.
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material	PADs have potential to occur in areas that are likely to have reasonable subsurface deposits in archeologically sensitivity landforms. This feature has been recorded in the region however given the existing distance of the areas during the construction and maintenance of the existing roads such site are unlikely to occur.

5. Impact avoidance

Step 3. Can any AHIMS listed objects, or landscape features be avoided?

No previously recorded Aboriginal objects are present within and/or in close proximity to any of the proposed four work locations. All four work locations were noted to be subject to historical disturbance through the construction and maintenance of the existing roads (being both sealed and unsealed).

There are no archaeologically sensitive landforms as defined by the Due Diligence Code within any of the following three proposed work areas:

- Intersection of the Murray Valley Highway and Sturt Highway, Euston
- Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga; and
- Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.

Furthermore, review of satellite imagery and google earth street view identified that no mature native trees suitable for bark extraction are present within any of the three proposed intersection upgrade work areas/ blade swept path locations noted above.

The proposed works at the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald however cannot avoid the proximity to the Murrumbidgee River, which is noted to be a sensitive landscape feature as these works are within 200m of water. Several mature native trees are present within the proposed works area at the intersection of Sturt Highway (Corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald, but these trees appear to be part of deliberate street tree planting, evident in the 1955 aerial photo (see Plate 4-1). The proposed works will occur within the existing road reserve and a small portion of adjacent private property, but are within an area of high disturbance that follow existing road networks. For the construction to be in accordance with NSW road safety requirements, the proposed works are unable to avoid possible impacts to these trees. Given this, the next step, a desktop assessment, is required.

6. Desktop assessment

Step 4. Does the desktop assessment confirm that there are likely to be Aboriginal objects present or below the ground surface?

The assessment process is primarily a desktop exercise, using available information such as the AHIMS search results and relevant archaeological reports to develop or refine a model of Aboriginal site prediction based on the type of activity proposed and the level of disturbance of the area. A visual inspection is also required where landscape features are present that may contain Aboriginal objects that cannot be avoided by the activity.

The desktop assessment was determined by NGH archaeologist Brendan Fisher to sufficiently assesses the potential for impacts to Aboriginal objects at the four locations of proposed intersection upgrade works/ blade swept path areas with no visual inspection warranted. The desktop assessment of each of the four locations was undertaken using satellite imagery, google earth street view, topographic data, and the review of the archaeological context and the environmental location.

The desktop assessment concluded that each of the proposed four intersection upgrade work areas/ blade swept path areas was highly disturbed by the previous construction and ongoing maintenance of the roads and associated table drains. Plate 6-1 to Plate 6-8 show the images of each works area which has been sourced from google earth street view. Each of the proposed four intersection upgrade work areas was also noted to have been subject to vehicle inspection by NGH archaeologists during the previous fieldwork undertaken for the Junction Rivers Wind Project ACHA (NGH 2023).

Furthermore, the review of current and historical satellite imagery and google earth street view identified that no mature native trees suitable for bark extraction are present within any of the three proposed intersection upgrade work areas that are noted below.

- Intersection of the Murray Valley Highway and Sturt Highway, Euston
- Intersection of Yanga Way and the Balranald-Moulamein Road, Yanga; and
- Intersection of the Balranald-Moulamein Road and Arundel Road, Kyalite.

The majority of the proposed works area at the intersection of the Balranald-Moulamein Road and Arundel Road adjacent to the location of the Junction Rivers Wind Project (SSD-30448824) was also noted to have previously been subject to pedestrian survey by NGH archaeologists and RAPs during the fieldwork conducted for the Junction Rivers Wind Project ACHA (NGH 2023), with no Aboriginal objects or areas of potential archaeological deposit recorded within and/or in proximity to this proposed intersection upgrade work area/ blade swept path areas.

While the proposed works at the intersection of Sturt Highway (corner of 49 Court Street, Balranald Hospital Lot) in the township of Balranald are within 200m of the Murrumbidgee River, with several mature nature trees present it was determined based on current and historical satellite imagery, google earth street view, review of underground and overhead service locations and the previous knowledge and vehicle survey of this intersection by NGH archaeologists that there is negligible potential for Aboriginal objects and/or subsurface archaeological deposits to be present given the level of disturbance it has previously been subject to, with underground services also noted within the road reserve and adjacent private property. While mature native trees are present along either side of the road within the southern portion of the intersection of Sturt Highway (corner of 49 Court Street, Balranald Hospital Lot) it was determined that none had cultural modification or scarring. This was based on the generally recognised obtrusive nature of cultural scars, the absence of such site types on AHIMS within the work area, review of google earth street view images, the previous vehicle inspection of this intersection by NGH archaeologists during the works for the Junction Rivers Wind Project ACHA (NGH 2023) and in consideration that these trees appear to be part of deliberate street tree planting (as evident in the 1955 aerial images of the area). Given this, the desktop assessment concluded that there was negligible potential for Aboriginal objects to occur at each of the four proposed intersection road upgrade work areas and that the proposed works can proceed with caution.



Plate 6-1 View northwest along Balranald road at the intersection of Arundel Road (from Google Earth Street view).



Plate 6-2 View southeast along Balranald road towards the intersection of Arundel Road (from Google Earth Street view).



Plate 6-3 View south along Yanga Way towards the intersection with the Balranald-Moulamein Road (from Google Earth Street view).



Plate 6-4 View west along Balranald-Moulamein Road at its intersection with Yanga Way (from Google Earth Street view).



Plate 6-5 View south of the Sturt Highway towards the intersection with the Murray Valley Highway (from Google Earth Street view).



Plate 6-6 View west along the Murray Valley Highway towards the intersection with the Sturt Highway (from Google Earth Street view).



Plate 6-7 View north from the southern boundary of the intersection of Sturt Highway (corner of 49 Court Street) in the township of Balranald (from Google Earth Street view).



Plate 6-8 View east at the northern intersection of Sturt Highway towards the Balranald Hospital Lot in the township of Balranald (from Google Earth Street view).

7. Further assessment

Step 5. Is further investigation or impact assessment required?

The Due Diligence Code states that if, after the desktop research and visual inspection (if required) is completed, it is evident that harm will occur to Aboriginal objects or heritage places then further and more detailed assessment is required. However, if the research and inspection conclude that the proposed activity is unlikely to harm Aboriginal objects then the activity can proceed with caution.

The desktop assessment was determined to sufficiently assesses the potential of impacts to Aboriginal objects at the four locations of proposed intersection upgrade works/ blade swept path locations and no further investigation is required. The location of the proposed four intersection upgrade work areas/ blade swept path locations were all determined not to be located in areas which contains known Aboriginal objects or any archaeologically sensitive landforms. Given the previous disturbance, it was concluded that there was negligible potential for Aboriginal objects to occur at each of the locations and that the proposed works can proceed with caution.

8. Recommendations

The following recommendations are based on a number of considerations including:

- Background Aboriginal heritage research into the area;
- Assessment of Landscape ;
- Land use and disturbance assessment;
- Consideration of the impact of the proposed works; and
- Legislative context for the development proposal.

The proposed works at the four intersection upgrade/ blade swept path areas in NSW can proceed with caution with the following recommendations:

1. All works must be limited to the areas assessed by this document. Any activity proposed outside of the current assessment area will also be required to be subject to an Aboriginal heritage assessment.
2. When the intersection works are commenced in accordance with the approval of the Junction Rivers Wind Project (SSD-30448824) all relevant Conditions of Consent for the Project must be followed, including for the approved transportation route. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and the unexpected finds procedure for Aboriginal objects for the SSD Project must be followed.

All Aboriginal objects and places in NSW are protected under the *National Parks and Wildlife Act*. It is an offence to disturb an Aboriginal object or site without appropriate consent.

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