Aboriginal Cultural Heritage Assessment

Orana BESS

March 2023

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Acronyms and abbreviations

ACHA	Aboriginal Cultural Heritage Assessment
ACHCRP	(NSW) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
AHIMS	Aboriginal Heritage Information Management System
Akaysha	Akaysha Energy Pty Ltd - the Proponent
AMBS	Australian Museum Business Services
AS	Artefact scatter
ASL	Above sea level
DECCW	Department of Environment, Climate Change, and Water, now part of Heritage NSW
BESS	Battery energy storage system
CCTV	closed-circuit television
CMT	Culturally modified tree – scarred or carved
DEM	Digital elevation model
Development Site	Broader area studied in specialist assessments which incorporates the Development Footprint
Development Footprint	Indicative development footprint encompassing all of the infrastructure components
DPE	Department of Planning and Environment (NSW)
EIS	Environmental Impact Statement
EKAC	Edgerton Kwiembal Aboriginal Corporation
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
FGS	Fine-grained siliceous
Heritage Act	Heritage Act 1977 (NSW)
Heritage NSW	Part of the NSW Department of Premier and Cabinet, formerly part of OEH (NSW)
IF	Isolated find

kV	kilovolt
LALC	Local Aboriginal Land Council
LGA	Local Government Area
LEP	Local Environmental Plan
MVA	Megavolt-amperes
MW	Megawatt
MWh	Megawatt-hour
NGH	NGH Pty Ltd
NPW Act	National Parks and Wildlife Act 1974 (NSW)
O & M	Operations and Maintenance
OEH	Former Office of Environment and Heritage NSW
Orana BESS	The Project
NSW	New South Wales
PAD	Potential archaeological deposit
PCT	Plant community types
RAPs	Registered Aboriginal parties
RMU	Ring main units
SEARs	Planning Secretary's Environmental Assessment Requirements
SSD	State Significant Development
TWAC	Tubba-Gah (maing) Wiradjuri Aboriginal Corporation
WSF	Wellington Solar Farm
WNSP	Wellington North Solar Plant
WVAC	Wellington Valley Wiradjuri Aboriginal Corporation
YGCCHS	Yurwang Gundana Consultancy Cultural Heritage Service

Executive summary

Introduction

NGH Pty Ltd (NGH) has been engaged by Akaysha Energy Pty Ltd (Akaysha) (the 'Proponent') to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for the installation of a battery energy storage system (BESS) within Lot 2 DP1226751 which is located approximately two kilometres north-east of Wellington in NSW, within the Dubbo Regional Local Government Area (LGA). The project (Orana BESS) would also include grid connection and transmission line works to the existing Transgrid substation in Lot 1 DP1226751, site access through Lot 2 DP1136578 and potentially some road intersection upgrades along Goolma Road where it intersects with the Development Site. The Development Site is the broader area surrounding the Development Footprint that is studied in specialist assessments as the entire Development Site would not be directly impacted by the Project.

The proposed Orana BESS development would include:

- The construction, operation and eventual decommissioning of a battery energy storage system (BESS) with an estimated capacity of up to 400 MW / 1600 MWh; and
- associated infrastructure, including connection to existing transmission infrastructure.

The ACHA and Archaeological Technical Report are being undertaken to investigate and examine the presence, extent and nature of any Aboriginal heritage sites within the Development Site, assess the potential impacts to Aboriginal sites within the Development Site and provide management strategies that may mitigate any impacts. The proposed BESS is a State Significant Development (SSD) project and 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-45242780). The EIS will be submitted to the Department of Planning and Environment (DPE) for assessment and determination of the project.

This assessment 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)

Aboriginal community consultation

The consultation with Aboriginal stakeholders was undertaken in accordance with clause 60 of the *National Parks and Wildlife Amendment Regulation 2019* following the consultation steps outlined in the guidelines.

The full list of consultation steps, including those groups and individuals that were contacted and a consultation log is provided in Appendix A. A copy of the draft report was provided to all the registered parties for comment.

Survey results

The survey undertaken for the Orana BESS identified no Aboriginal sites within the Development Site. The results of previous archaeological surveys within the local area show that there are sites and artefacts present across the landscape in generally low densities. The lack of sites identified within the Development Site is not unexpected given topography, shallow soils, previous disturbance and poor surface visibility. It is also likely to be reflective of the sparse and dispersed nature of stone artefacts within the Development Site.

As a result of the survey, the survey area is considered to have low archaeological potential due to the lack of permanent fresh water or other desirable resources, such as outcrops of stone material suitable for stone artefact manufacture. While Aboriginal people would have utilised the whole landscape of the Wellington region, the use of the Development Site would have likely been limited to transitory use rather than long term occupation with the focus of occupation instead on the Wambuul / Macquarie River approximately 1 to 1.5 km to the south of the Development Site or Wuuluman Creek (a third order tributary of the Wambuul / Macquarie River) approximately 400 m to 1 km to the north of the Development Site.

Potential impacts

As described in this report, no new archaeological sites were identified during the current field assessment. No previously recorded AHIMS sites are located within the Development Site with one previously recorded culturally modified tree (CMT) located to the immediate south of the southern Development Site boundary (within the heritage avoidance area in Figure 7-1). This site is approximately 150 m from any of the infrastructure components within the proposed Development Footprint.

The construction activities associated with the development of the Orana BESS will result in significant ground disturbance and any unidentified Aboriginal archaeological material within the Development Footprint would likely be totally impacted. It is however considered that there is a low potential for surface or subsurface stone artefacts to be present within the entire Development Site and therefore to be harmed by the development proposal. There are no known specific values, scientific, social or cultural, aesthetic or historic within the Development Site that would be impacted by the development proposal.

Recommendations

1. Works must not impact the CMT sites to the south of the Development Site. If works are to extend outside of the indicative Development Footprint detailed in this report in close proximity to the modified trees (AHIMS#36-4-0117, 36-4-0118, 36-4-0223, 36-4-0224 and 36-4-0225) then a “no-go zone” with a 10 m buffer within the Development Site must be established to ensure there are no inadvertent impacts to these CMTs (see area in Figure 7-1). The “no go zone” area must be delineated with a hi-visibility mesh/flagging/fencing and be in place for the duration of the construction.
2. Aboriginal heritage should be included within the Construction Environment Management Plan (CEMP) or equivalent for the Project. This must include an unexpected finds protocol for Aboriginal objects and Aboriginal heritage should also be included in any induction for the Project. Site personnel should be advised that there are registered Aboriginal heritage sites within the vicinity of the Development Site and ground disturbance is not allowed outside of the approved areas.

3. In the unlikely event that human remains are discovered during the development works, all work must cease in the immediate vicinity and the protocol provided in Appendix B must be followed. Heritage NSW and the police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal.
4. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs and may include further field survey.
5. Consultation with the RAPs for the Project should be maintained through the approvals process and post-approval construction.
6. A copy of the final ACHA should be lodged with AHIMS and provided to each of the RAPs for their records.

Akaysha Energy Pty Ltd is reminded that it is an offence under the *National Parks and Wildlife Act* to harm an Aboriginal object without a valid approval.

1. Introduction

NGH Pty Ltd (NGH) has been engaged by Akaysha Energy Pty Ltd (Akaysha) (the 'Proponent') to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for the installation of a battery energy storage system (BESS) within Lot 2 DP1226751 which is located approximately two kilometres north-east of Wellington in NSW, within the Dubbo Regional Local Government Area (LGA). The Project (Orana BESS) would also include grid connection and transmission line works to the existing Transgrid substation in Lot 1 DP1226751, site access through Lot 2 DP1136578 and potentially some road intersection upgrades along Goolma Road where it intersects with the Development Site.

The Development Site is the broader area surrounding the Development Footprint that is studied in specialist assessments and the entire Development Site would not be directly impacted by the Project. The general location of the Development Site is shown in Figure 1-1 and the Development Site and infrastructure components within the Development Footprint are shown in Figure 1-2. The Development Site is within the Parish of Nanima in the County of Bligh, NSW.

The ACHA and Archaeological Technical Report are being undertaken to investigate and examine the presence, extent and nature of any Aboriginal heritage sites within the Development Site, assess the potential impacts to Aboriginal sites within the Development Site and provide management strategies that may mitigate any impacts. The proposed BESS is a State Significant Development (SSD) project and 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-45242780). The EIS will be submitted to the Department of Planning and Environment (DPE) for assessment and determination of the Project.

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 Orana BESS is classified as a state significant development (SSD) under Part 4 of the EP&A Act. SSDs are major projects which require approval from the Minister for Planning and Environment. The archaeological assessment is to support the completion of an Environment Impact Statement (EIS) to fulfil the requirements of the Secretary of the Department of Planning and Environment (DPE).

The Secretary of the DPE Environmental Assessment Requirements (SEARs) relating to Aboriginal heritage were as follows:

- An assessment of the impact to Aboriginal cultural heritage items (cultural and archaeological) in accordance with the *Guide to Investigation, 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 test excavations (if required);
- Provide 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)* (SEARs for Orana BESS 12/07/2022).

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 Aboriginal Heritage Impact Permit (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 deal with the issuing of an AHIP, including that the permit may be subject to certain conditions. However, as the Orana BESS project is a designated State Significant Development, section 90 of the NPW Act does not apply. There is no requirement to obtain an AHIP to impact Aboriginal heritage objects. Instead, the approval pathway is through DPE. The SEARs issued for the project guide the level of assessment and provide the framework for assessing the impact to Aboriginal heritage.

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 Orana BESS project will involve ground disturbance there is potential to impact on Aboriginal heritage sites and objects, which are protected under the *NSW National Parks and Wildlife Act 1974* (NPW Act). The purpose of this report is to investigate the presence of any Aboriginal sites within the Development Site, assess the impacts to Aboriginal sites within the Development Site and provide management strategies that may mitigate any impacts.

The purpose of this ACHA and Archaeological Report are 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 A*boriginal Cultural Heritage Consultation Requirements for Proponents* (ACHCRP) (DECCW 2010a);
- Undertake a field survey of the Development Site to identify and record any Aboriginal objects within the Development Site;
- Undertake an assessment of the archaeological and cultural values of the Development Site and any Aboriginal objects therein;
- Assess the cultural and scientific significance of any archaeological material;
- Asses 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)

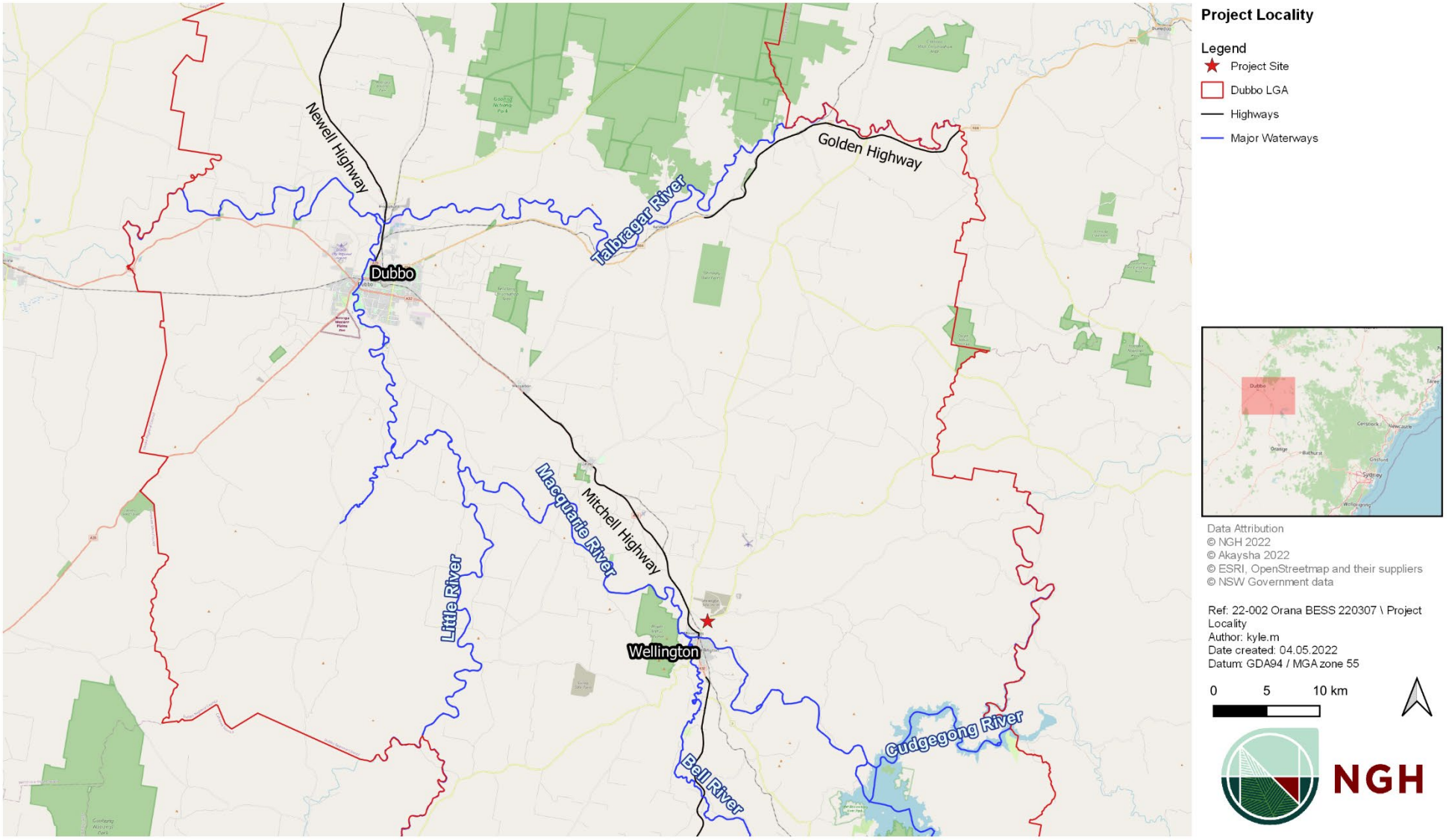

Figure 1-1 General location of Development Site.

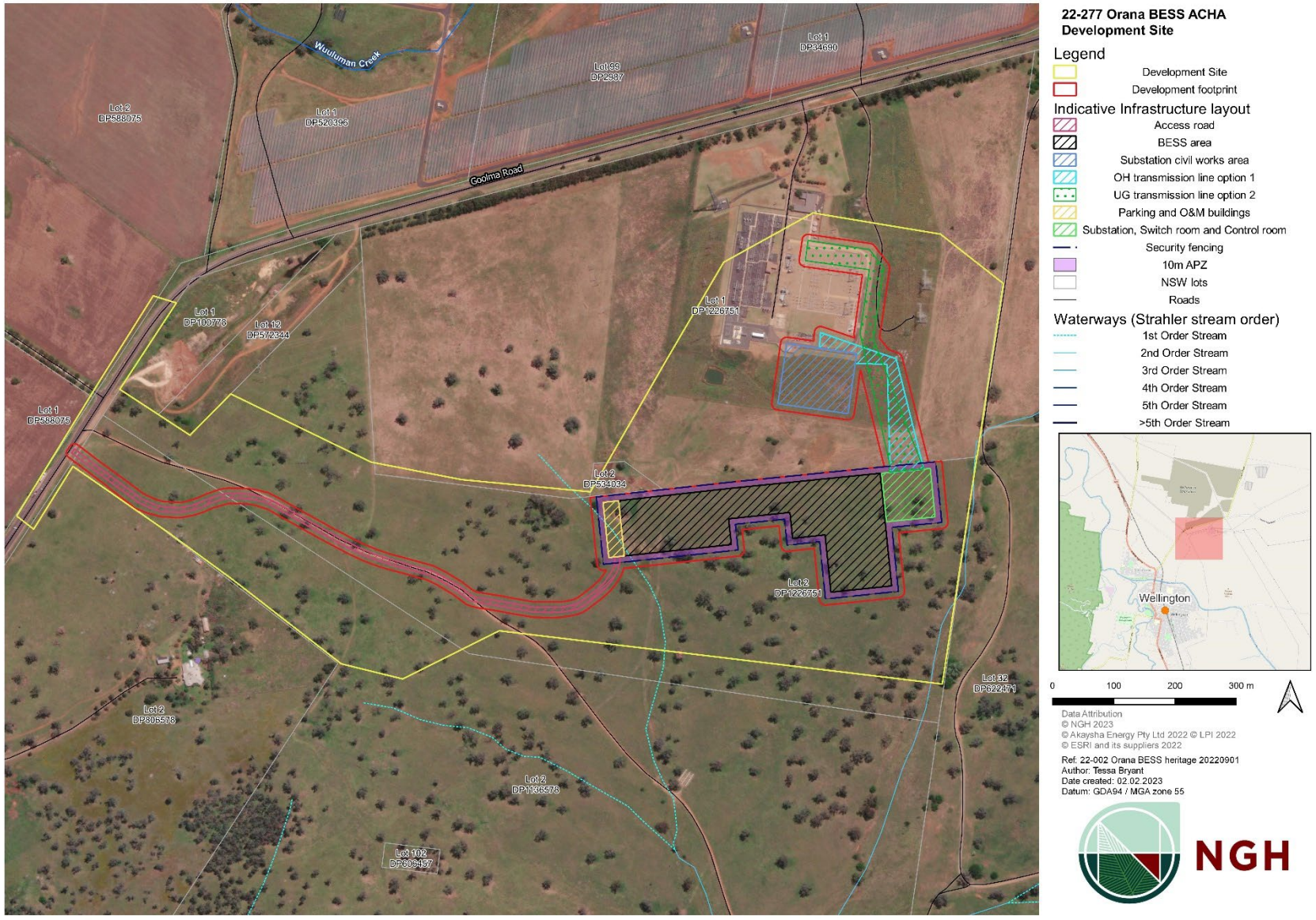

Figure 1-2 Development Site and infrastructure components.

2. Description of the area

2.1 Project location

The Development Site is located at 6945 Goolma Road, Montefiores NSW 2820, approximately 2km north-east of Wellington and is located within the Dubbo Regional Local Government Area (LGA). The Development Site encompasses parts of Lot 1 DP1226751, Lot 2 DP534034, Lot 2 DP1226751 and Lot 2 DP1136578. The Development Site also includes part of the Goolma Road corridor. The Development Footprint is primarily within Lot 2 DP1226751, with site access through Lot 2 DP1136578 and connections to the existing Transgrid substation in Lot 1 DP1226751. The Development Site covers an area of approximately 41 hectares; however, the BESS will occupy an area of approximately 14.8 hectares. The site comprises privately owned farmland, which would be leased or purchased by the proponent for the life of the Project.

The Development Site is immediately adjacent to the existing Transgrid 330kV zone substation and the Wellington Solar Farm (constructed). The approved Wellington North Solar Farm site is also located in the area and was anticipated to commence construction in July 2022. The EIS assessment for the Wellington South BESS, proposed 300m east of the Development Site, is currently on exhibition. The Development Site includes the previously approved location of the Wellington Gas-fired Power Station (MP06-0315) which was approved in 2009 but was never constructed.

2.2 Environmental context

Understanding the landscape context of the Development Site 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 Development Site.

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 landscape context assessment for the Development Site is based on several classifications that have been made at national, regional and local levels to help us better understand the archaeological modelling of the Development Site. These site location factors are based on the geology, topography, hydrology, flora and fauna and past land disturbances within and adjacent to the Development Site.

2.2.1 Geology

The landscape context of the Development Site is based on Mitchell soil landscapes interim Biogeographic Regionalisation for Australia (IBRA) data and NSW geological maps. The combination of these differing resolutions of landform data provides a comprehensive and multi scaled understanding of the landscape within the Development Site and its immediate surroundings.

The Development Site is within the NSW South Western Slopes Bioregion which is characterised by foothills and isolated ranges within the eastern section of the Lachlan Fold Belt consisting of a series of north to north westerly trending folded bodies of Cambrian to Early Carboniferous sedimentary and volcanic rocks. Granites form a dominate part of this bioregion, generally occurring as central basins surrounded by steep hills. Hilly landscapes developed on sedimentary and volcanic rocks typically form lines of hills, following the strike of more resistant rocks such as

quartzite. The valleys between these features are generally granite or softer rocks such as shale or slate.

To the west and north of the bioregion wide valleys filled with Quaternary alluvium and lakes become the dominant landform. On the western edge however, alluvial fans from the Riverine Plain have buried most of the bedrock. Gravel deposition in these fans form terraces in valleys and gravel outwash plains and are attributed to higher river discharges in the past. Notably there are several areas of fossil bearing limestone outcropping with developed karst topography.

The overall pattern of soils in these landscapes is one where shallow, stony soils are found on the tops of ridges and hills. Moving downslope, texture contrast soils are the norm with subsoils derived from the underlying weathered rock and the topsoils being a homogenised surface mantle of coarser material derived from all parts of the slope.

Archaeologically, the geology of any location is important as it informs as to whether there any potential for in-situ deposits of stone material traditionally used for the manufacture of stone tools or whether these materials would have to have been sourced from further afield or even traded with other groups of people.

The Wellington 1:100 000 Geological Map indicates that the geology underlying the Development Site consists of Ordovician and Silurian geological sequences (Scott et al 1999). The western part of the Development Site is within the Oakdale Formation (Cabonne group) which comprises basalt, basaltic andesite, latite lava and intrusions, volcaniclastic breccia, conglomerate, sandstone and siltstone, minor allochthonous limestone. The remainder of the Development Site is within Wylinga Member (Mumbil group) comprising felsic crystal-lithic sandstone and fossiliferous limestone or the Warderie Volcanic Member (Mumbil group) comprising purple andesite and trachyte, volcaniclastic sandstone and breccia and siltstone. The underlying geology of the Development Site is shown in Figure 2-1.

Basalt and volcanic stone materials are common raw materials that were used by Aboriginal people in the past to manufacture stone artefacts in the local area. Basalt, various volcanics and sandstone would have been available in the region in areas with outcrops or exposed bedrock.

2.2.2 Topography

The topography of the Development Site is generally sloping from low hills down towards drainage lines (Figure 2-2) and sits at an elevation of between 320 and 360 m above sea level (ASL). The site includes the following topographic features:

- Low hills and gentle slopes to drainage lines.
- Two unnamed tributaries of the Wambuul / Macquarie River

2.2.3 Soils

Based on the Soil Landscapes of the Dubbo 1:250 000 Sheet there are two soil landscapes within the Development Site (Murphy and Lawrie 1998). The majority of the Development Site is within the Nanima soil landscape with small areas in the northern portion of the Development Site in the Wellington substation area and on the western edge of the Development Site along Goolma Road within the Bodangora soil landscape (Figure 2-3). These are both euchrozem landscapes of red strongly structured clay soils within a lower clay content near the surface (OEH 2017).

The Bodangora soil landscape comprises undulating low hills with andesite and associated shale, tuff and limestone. Local relief is 40-100m with slopes of 3 to 10%. Drainage lines are 500-1000m

apart. There is a high erosion hazard under cultivation and low cover levels. Soils are shallow with a dark-reddish brown clay loam topsoil up to 35cm depth overlying reddish-brown light to medium clay within increasing gravel and nodules of calcium carbonate from 90cm depth in euchrozems (Murphy and Lawrie 1998:86-87).

The Nanima soil landscape comprises rolling low hills with andesite, hornfels, shale, tuff and limestone. Local relief is 80-150m with slopes of 5-20%. Drainage lines are 500-1200m apart. There is a high erosion hazard under cultivation. Soils (euchrozems) are generally friable, dark reddish-brown clay loam up to 15cm depth overlying dark reddish-brown light clay up to 50cm depth grading to dark reddish-brown heavy clay up to 120cm depth.

Both of these soil landscapes have shallow soils with underlying bedrock of materials that are potentially suitable for lithic artefact manufacture.

2.2.4 Hydrology

Two ephemeral watercourses occur within the Development Site (Figure 2-2), one unnamed first order tributary in the centre of the site running northwest to southeast and one unnamed second order tributary in the east of the site running northeast to southwest. These are both tributaries of the Wambuul/Macquarie River which is approximately 1.5km south of the Development Site. Wuuluman Creek (a third order tributary of the Wambuul/Macquarie River) is between 400m and 1km north of the Development Site.

2.2.5 Flora and fauna

Information provided herein is intended as a generalised summary of the endemic flora and fauna present within the Development Site and is not to be used as a substitute for detailed ecological studies and assessments. A preliminary biodiversity assessment carried out by NGH as part of the Scoping Report for the Orana BESS (NGH 2022) identified one plant community type (PCT) within the Development Site. This PCT was evident in two forms as detailed in Table 2-1 below.

Table 2-1 PCTs within the Orana BESS Development Site.

PCT	Description
PCT 266 White Box Grassy Woodland in the Upper Slopes Subregion of NSW South Eastern Slope Bioregion	*Woodland structure.* Overstory dominated by *Eucalyptus albens, Callitris glaucophylla*, good condition understorey, Some thistle, lots of native grasses, *Sclerolaena muricata*, *Atriplex semibaccata, Euchiton sphaericus, Austrostipa aristiglumis, A. scabra. Some Heliotrope. Carthamus lanatus, Chloris truncata, Trifolium arvense, Panicum effusum, Euchiton sphaericus*, *Arthropodium strictum, Rytidosperma spp., Wahlenbergia sp., Vittadinia cuteata, V. gracilis, Enneopogon nigricans, Boerhavia domini, Sida corrugata.* **This PCT form covers the majority of the Development Site.**
PCT 266 White Box Grassy Woodland	*Grassland structure.* Overstory absent, high exotic component in areas but generally native species of high diversity across entire vegetation zone. *Centaurea calcitrapa, Carthamus lanatus, Austrostipa scabra, A. aristiglumis, Bromus catharticus, Heliotropium sp., Hordeum leporinum, Trifolium spp., Calotis lappulacea, Oxalis perennans, Vittadinia cuneata, Lepidium africanum, Glycine spp., Atriplex semibaccata, Euchiton*

PCT	Description
	sphaericus, Sida corrugata, Boerhavia domini. **This PCT form is present in the northern portions of the Development Site.**

In the past these vegetation communities would have provided timber, bark and fibre resources. White Box trees are known within the region to be Aboriginal scarred trees. Native plant species provided food and medicine as well as supporting habitat for terrestrial and arboreal animals that were hunted by Aboriginal people.

2.2.6 Historic land use and land disturbance

There has been relatively minimal disturbance to the Development Site other than from previous pastoral activities. The Wellington region was subject to European settlement from the 1820s following the first European exploration by Oxley and Evans in July 1817 (Dunlop 2006). The Development Site was part of the Nanima Estate that was a large pastoral and agricultural property originally owned by J B Montefiore who had acquired this in the 1830's. The Development Site was within both the Stony Creek and Ironbarks Gold field (in the north) and the Macquarie River Gold field (in the south) in the late nineteenth century from approximately the 1880s to 1900 (County of Bligh, Parish of Nanima Sheet 1 Edition 1 1886 map). Historic maps also show that a council gravel pit (to the west of the Development Site) was established after 1925 on Goolma Road (County of Bligh, Parish of Nanima Sheet 1 Edition 6 1924 Map). Parish maps show the area as an Animal and Bird Sanctuary proclaimed on January 11th 1946, with a transmission line easement running through the Development Site and the Wellington substation also marked on the 1956 Parish Map (County of Bligh, Parish of Nanima Sheet 1 Edition 8 1956 map).

The area to the north of the Development Site including the Wellington substation was also largely cleared prior to the construction of the substation. Historic aerial photographs show that other than vehicle tracks there have been little changes within the Development Site with the majority of extant trees appearing in aerial imagery from the 1960s to present. The drainage line on the eastern edge of the Development Site is visible in past aerial imagery but the central one is not.

2.2.7 Landscape context

Most archaeological surveys are conducted in situations where there is topographic variation, and this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal objects. The Development Site is located within rolling low hills (320 to 360m ASL) within the South Western Slopes bioregion. There are two ephemeral drainage lines within the Development Site which are tributaries of the Wambuul / Macquarie River.

The majority of the Development Site is within the euchozerm Nanima soil landscape which generally has shallow (<20cm) reddish brown clay loam overlying reddish brown light then heavy clays. Erosion hazard under cultivation for this landscape is high.

Analysis of historic aerial imagery for the Development Site and the preliminary biodiversity inspection (NGH 2022) indicate that the majority of the Development Site is white box grassy woodland in a good condition. Old growth trees are present in the Development Site and there are known scarred trees, with high cultural value, extant south of the Development Site.

The landforms within the Development Site have been determined based on topographic identification through the inspection of contour data and Digital Elevation Modelling (DEM). Two landforms were identified within the Development Site:

- Low crests
- Gentle slopes to drainage lines.

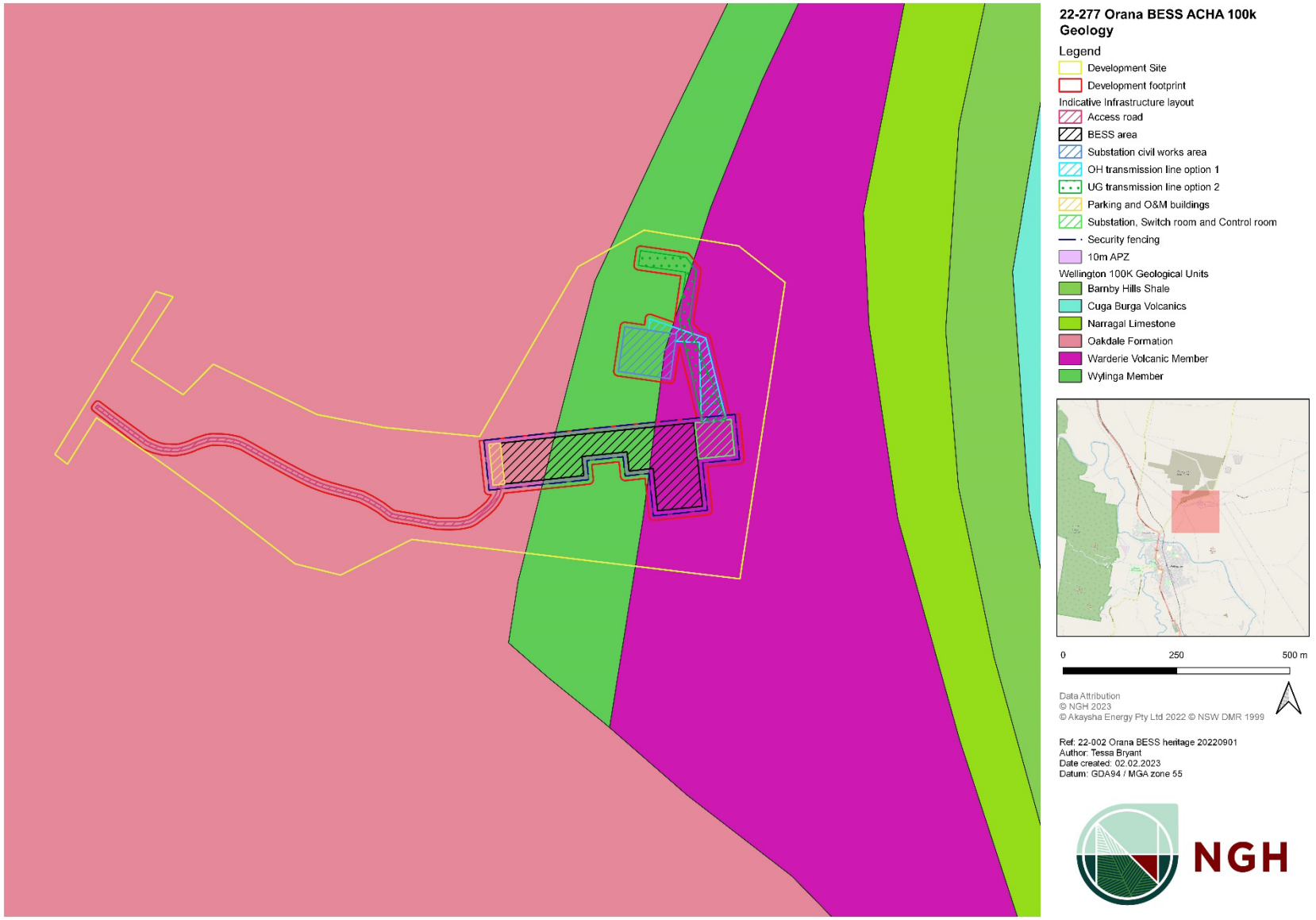

Figure 2-1 Geology of the Development Site.

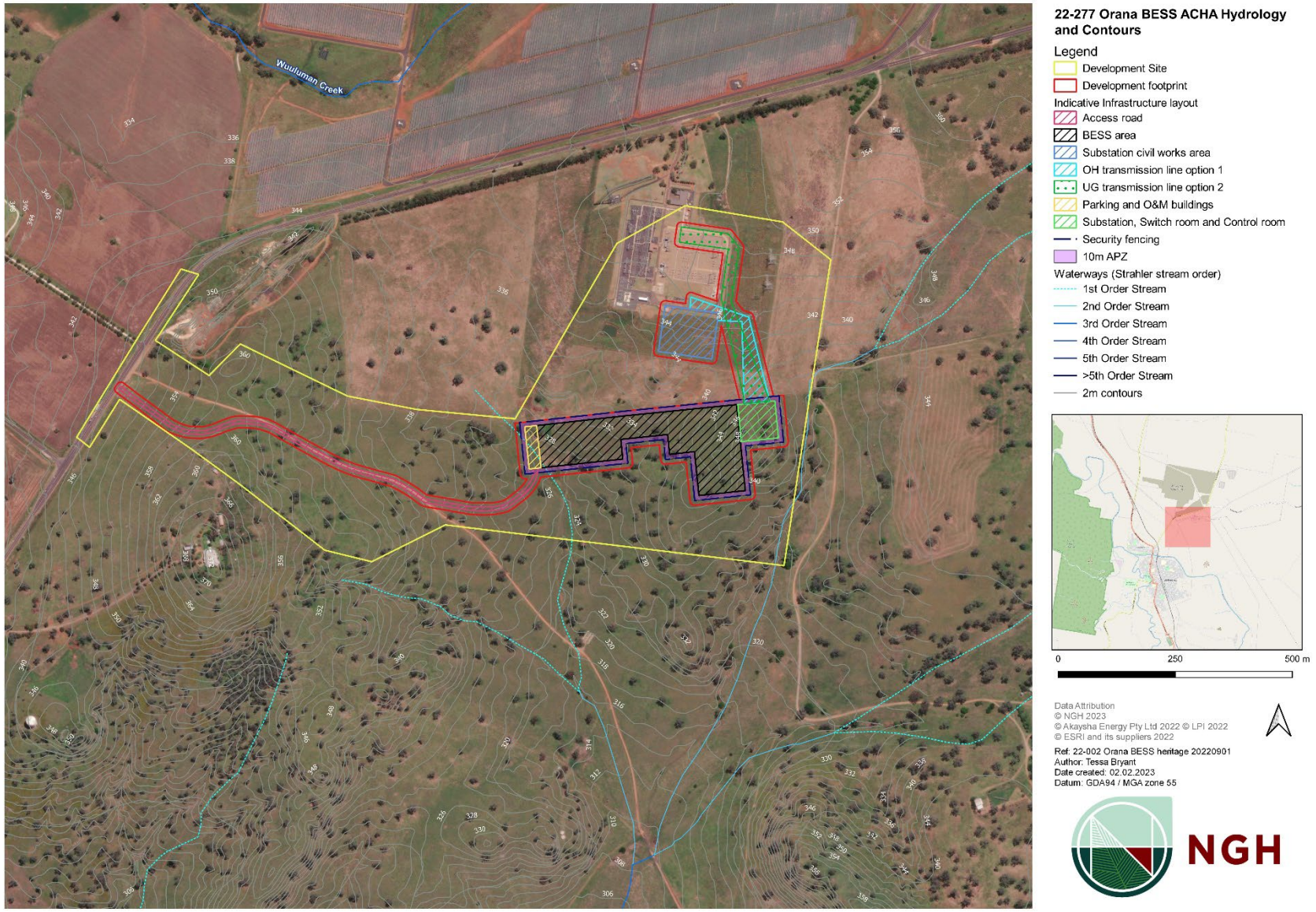

Figure 2-2 Hydrology and contours within the Development Site.

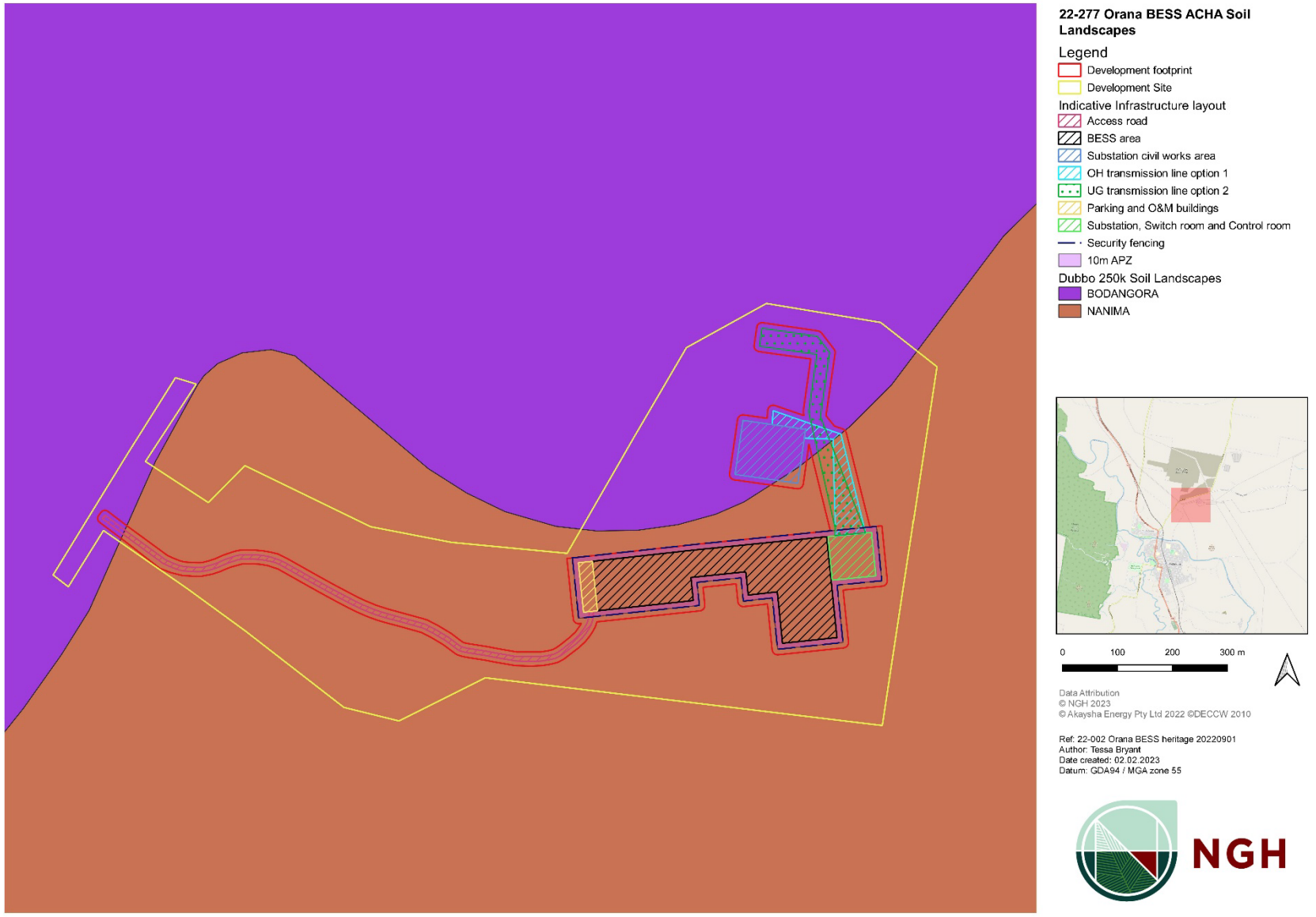

Figure 2-3 Soil landscapes within the Development Site.

2.3 Cultural context

2.3.1 Ethnographic setting

There are several ethnographic recordings of Aboriginal life in the Wellington region from the 1800s that notably focus on the prevalence of Aboriginal people around waterways in the region. It is 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 and Allen 2007).

The dispossession from traditional lands and acts of violence against the Aboriginal people caused great social upheaval meaning that access to traditional resource gathering and hunting areas, religious life, marriage links and sacred ceremonial sites was disrupted or prevented. 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, pp. 8 and 16).

Wellington is within an area identified as part of the Wiradjuri language group. This is an assemblage of many small clans and bands speaking a number of similar dialects (Tindale 1974, MacDonald 1983, Horton 1994).

The Wiradjuri language group was the largest in NSW prior to European settlement. The borders were, however, not static, they were most likely fluid, expanding and contracting over time to the movements of smaller family or clan groups. Boundaries ebbed and flowed through contact with neighbours, the seasons and periods of drought and abundance.

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.

These 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 (MacDonald 1983). 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. The archaeological legacy of these gatherings would be larger sites rather 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.

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 camped over a shorter period of time.

European settlers started arriving in the district in the 1820s. At this point the Aboriginal population was in decline, due to disease such as smallpox and influenza as well as dispossession from traditional lands and acts of violence against the Aboriginal people meant there was great social upheaval and partial disintegration of the traditional way of life. This meant that access to traditional resource gathering and hunting areas, religious life and marriage links and access to sacred ceremonial sites were disrupted or destroyed.

However, despite these disruptions, Aboriginal people continued to maintain their connections to sites and the land in the early days of European settlement. Where Aboriginal people were moved to places like missions, people could maintain at least some form of association with Country and maintain traditional stories.

Material culture, food and resources

Early settlers and others who wrote about the Wiradjuri people and customs differentiated between the origin of some groups, referring to people as the Lachlan or Murrumbidgee tribes, or the Levels tribe for those between the two major rivers (Woolrych 1890). The extent of the Wiradjuri group means that there were many different environments that were exploited for natural resources and food. Like everywhere in Australia, Wiradjuri people were adept at identifying and utilising resources either on a seasonal basis or all year round.

Terrestrial animals, such as the possum, were 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 food sources. Fish and mussels would have been prevalent from the rivers and creeks and insects were also a common food type, in particular grubs and ants and ant eggs (Fraser 1892, Pearson 1981). Birds including emus were common as a food source, often being caught in nets made from fibres of various plants such as flax, rushes and kurrajong trees. Bird hunts were also often undertaken as group activities, with emus, ducks and other birds targeted through groups of people flushing them out and driving them into pre-arranged nets (Ramson 1983).

On the 22nd of August 1817 John Oxley, the first European to explore the Wellington Valley observed an abundance of fish, emus, swans and ducks' as well as very large mussels growing among the reeds in many stretches of the river. He noted that in such country there was no fear of being in want of food (Oxley 1820, pp. 191–192).

Plant foods were equally as important and mostly consisted of roots and tubers, such as *Typha* or Cumbungi whose tubers were eaten in late summer and the shoots in early spring. Other edible plants from the Wiradjuri region include the Yam Daisy or *Murnong*, eaten in summer and autumn, the Kurrajong seeds and roots, Acacia seeds and other rushes (Gott 1982).

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.

The 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. 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. Outcropping stone sources also provide clues to their utilisation through flaking, although pebble beds may also provide sources of stone which leave no archaeological trace.

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, the result of an AHIMS 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 investigation area. A search of the AHIMS database was conducted over an area of approximately 1 km^2 centred on Lot 2 DP1226751 on 11 April 2022. The AHIMS client service ID was: 674727. There were 20 Aboriginal sites and no declared Aboriginal Places recorded in the search area. The results of the AHIMS search are summarised in Table 2-2 below. One site within the search area was mistakenly recorded in a previous survey which has been updated to not a site. Ten sites (artefact scatters and isolated finds) have been destroyed during development of Wellington Solar Farm (under development consent SSD-8573).

Table 2-2 AHIMS site types and frequency within the search area.

Site type	Number	Percentage
Isolated find	9	45%
Artefact scatter	5	25%
Restricted	3	15%
Potential Archaeological Deposit (PAD)*	2	10%
Not a site	1	5%
Total	**20**	**100%**

* Incorrectly registered as PADs should be Modified Trees.

The AHIMS sites within the search area are mapped in Figure 2-4. Please note, the not a site recording (#36-4-0201) is not mapped, and the locations of sites # 36-4-0117 and 36-4-0118 are not mapped due to the wishes of knowledge holders from the local Aboriginal community.

There are no sites previously recorded within the Development Footprint. There is one site recorded on AHIMS within the Development Site (#36-4-0117). The location for this site, a culturally modified tree (CMT) that is incorrectly recorded as a PAD on AHIMS, is immediately outside the southern boundary of the Development Site. This location difference is due to the margin of error in site recording using non- differential GPS and the point being recorded outside of the tree canopy to the north of the tree. The tree location was confirmed during the archaeological survey. AHIMS #36-4-0118, the other modified tree incorrectly recorded as a PAD, is approximately 50m south of the Development Site.

Three restricted sites are also located within the search area. NGH has been advised that these sites are also CMT (scarred trees) and have their location restricted. These sites (#36-4-0224, 36-4-0225 and 36-4-0223) are all outside of the Development Site. These trees are adjacent to and up to 100m south of the Development Site. NGH believes that two of these location restricted CMT sites are duplicate recordings of CMT #36-4-0117 and CMT #36-4-0118. These duplicate recordings were likely made due to the error in AHIMS listing sites #36-4-0117 and #36-4-0118 as PAD. Therefore, the five CMT site recordings south of the Development Site reflect three CMTs.

In addition to the CMTs there are two stone artefact sites located within 500m of the Development Site. AHIMS #36-4-0203, an isolated find (chert core), is approximately 300m north of the Development Site and #36-4-0216, also an isolated find, was recorded approximately 180m northwest of the Development Site boundary.

Overall, the main site features present within the search area are stone artefacts and scarred (modified) trees. Stone artefacts, comprising both isolated finds and artefact scatters have been recorded both on the surface and during subsurface excavation. Raw materials of stone artefacts recorded in the area include silcrete, chert, quartz, basalt, volcanic and sandstone. Stone artefact types include flakes, flaked pieces, cores, retouched flakes, manuports and grindstone fragments.

2.3.3 Additional searches

Desktop searches were undertaken on 12 April 2022 of the relevant heritage registers including the Australian Heritage Database, the NSW State Heritage Inventory (SHI) and Section 170 registers, to identify any items that are currently listed within or adjacent to the Development Site. The Australian Heritage Database includes items on the National and Commonwealth Heritage Lists while the SHI includes items on the State Heritage Register and items listed by state agencies and local government. The Dubbo Regional LGA was formed in 2016 following a merger of the Wellington Council and City of Dubbo Council.

The results of the Australian Heritage Database search indicated that:

- There are no sites on the World Heritage List within the former Wellington LGA.
- There is one site on the National Heritage List within the former Wellington LGA, being the Wellington Caves on the Mitchell Highway, which is not near the Development Site.
- There is a single site on the Commonwealth Heritage List within the former Wellington LGA (Wellington Post Office), which is not within or near the Development Site.
- There are 43 sites on the Register of the National Estate (a non-statutory archive) within the former Wellington LGA. None of the sites are located within the Development Site. Nanima Homestead is located to the immediate southwest of the Development Site.

The results of the NSW SHI database search indicated that:

- There are fifteen (15) previously recorded heritage sites listed on the State Heritage Register within the Dubbo Regional LGA. Four sites are in Wellington, but none are located within or adjacent to the Development Site.
- There are 414 previously recorded heritage sites listed on the LEP within the Dubbo Regional LGA, of which, 64 sites are in Wellington. While none are located within or the Development Site there are two adjacent Homesteads located in proximity to the Development Site (Figure 2-5):
    - Nanima Homestead (listing no. I51), the closest part of the curtilage is adjacent to the southwest of the Development Site; and
    - Keston Homestead (listing no. I50) curtilage to the north on the other side of Goolma Road adjacent to potential road upgrade area.

No other known previously recorded heritage sites are located within or adjacent to the Development Site.

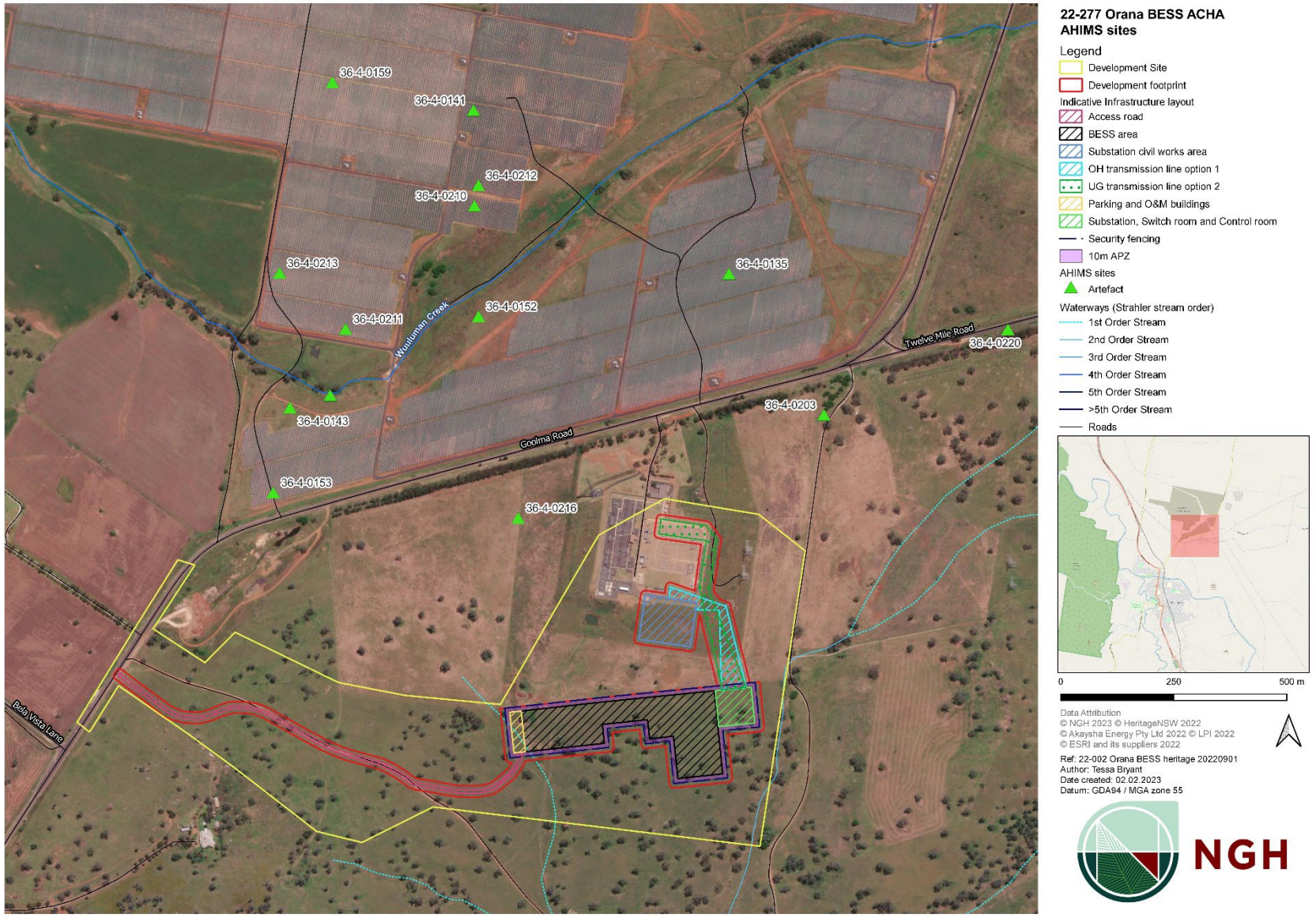

Figure 2-4 AHIMS sites within the search area.

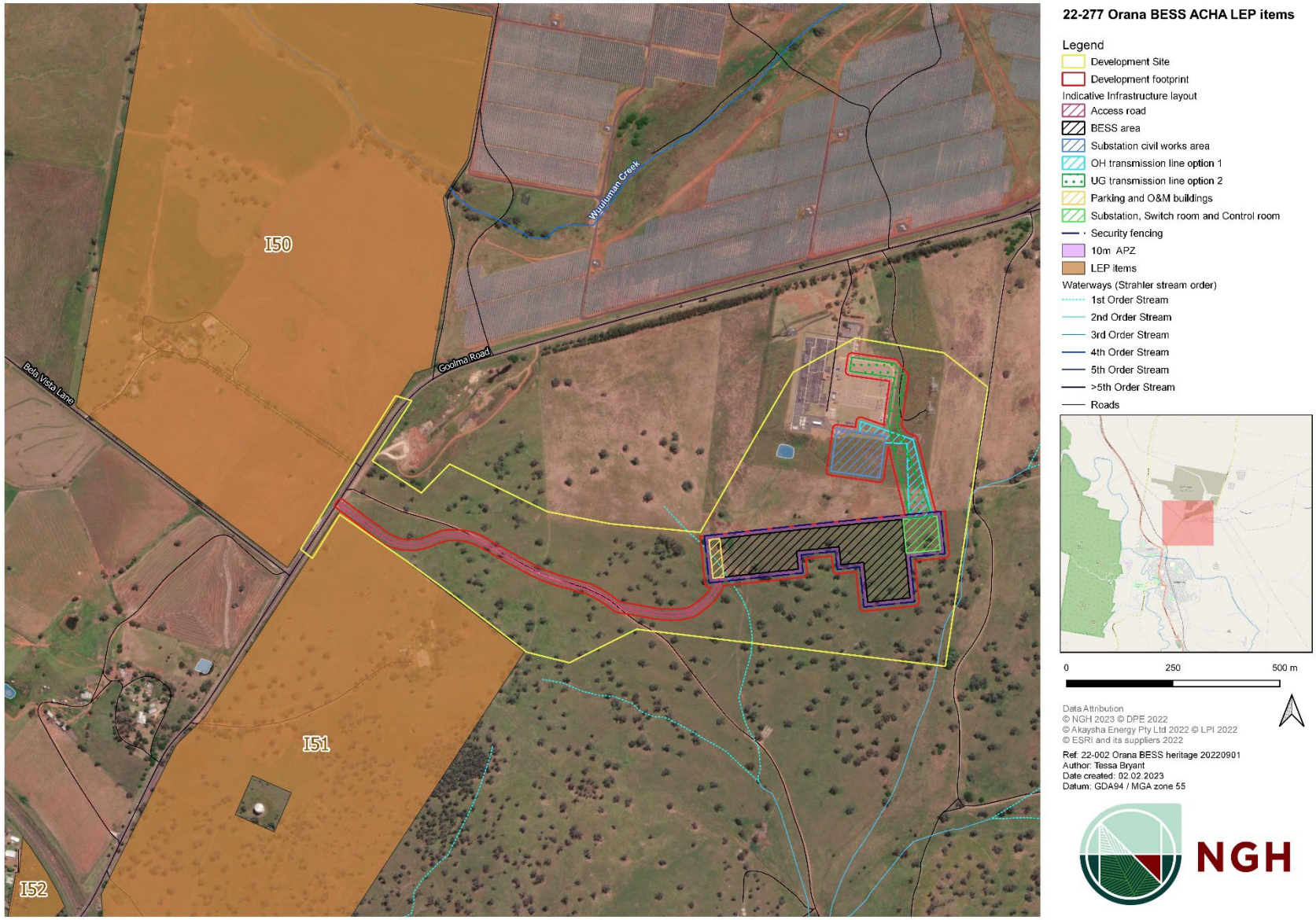

Figure 2-5 Historic heritage in proximity to the Development Site.

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 60,000 years and beyond (Mulvaney and Kamminga 1999, Hiscock 2007). While no regional synthesis of the archaeology has been completed for the Wellington area research studies have been undertaken in the Upper Macquarie River region by Pearson (1981) and Koettig (1985). The following is a summary of the findings from these studies.

Pearson (1981) analysed a series of sites which tended to be biased towards larger and more noticeable sites identified by local residents. During this study, he excavated three rockshelters (Botobolar 5, Granites 1 and Granites 2) which provided a record of regional Aboriginal occupation in the area to 5,000 years before present. Based on his findings, Pearson categorised these sites as either occupation sites or non-occupation sites (sites that are generally for a single purpose i.e. scarred trees, grinding grooves and burial sites) and built an archaeological model based on location. The model developed by Pearson is summarised below.

- Distance to water from sites varied from 10 to 500m, with larger sites found closer to a water source.
- Good soil drainage and an outlook over a water source were important to location.
- Ceremonial and stone arrangement sites were located away from campsites.
- Quarry sites were located in areas with desirable stone source qualities and reasonable access.

Koettig (1985) continued to build on the archaeological understanding of this region by conducting a comprehensive and systematic study of the Dubbo region, which although over 70 km to the west, is relevant as one of only a few wide-ranging archaeological studies in the region. Koettig investigated all topographic landform units and creek orders through sample survey to clarify locations and site types. The study arrived at the following conclusions:

- Aboriginal sites may be expected throughout all landscapes.
- Artefact scatters, scar trees and grinding grooves are the most frequently occurring site types.
- The location and size of sites were determined by various factors, predominately environmental and social factors around the proximity to water, geological formations and the availability of food resources.

Koettig (1985) suggested that larger and constantly occupied sites are likely to occur along permanent watercourses, while more sporadic occupation would have occurred along ridge tops or temporary water courses.

Purcell (2002) conducted a broad regional cultural heritage study of the Brigalow Belt South Bioregion in NSW. This bioregion extends from Dubbo north to Moree. Over the course of the study Purcell recorded 110 oral history interviews, located 1,110 Aboriginal sites, documented 60 traditionally used plant species and mapped landforms that have Aboriginal cultural heritage values. Of the 1,110 Aboriginal sites recorded during this assessment 893 existed on the AHIMS site register prior to the study.

The field survey portion of Purcell's study primarily targeted government owned land such as state forests and a landform mapping proposal was undertaken to assist with the development of a predictive model for Aboriginal site distribution across the bioregion. Water localities were noted to be the major contributing element influencing the distribution of sites among landforms with sites expected to be concentrated near water localities. The study indicated that Aboriginal sites have

been recorded more frequently on high contour and alluvial landforms. The majority of the sites recorded were within 100-400 m of water.

OzArk (2007) conducted a cultural heritage review of the Dubbo LGA that overlaid all recorded sites within the LGA on a mapped geomorphological GIS layer of landforms. The study confirmed that most Aboriginal sites are recorded within 100 m of water accompanied by a general trend of there to be fewer sites recorded further away from water. Additionally, most of the recorded sites were identified to be located on Quaternary alluvium soils that once supported the more complex ecological communities in the region. This geological unit in the region occurs near major waterways and consequently, the likelihood of associated Aboriginal objects and sites in such landforms increases.

2.3.5 Local archaeological studies

There have been several archaeological investigations undertaken in the Wellington local area including the Development Site and adjacent areas. Previous investigations in relative proximity to the Development Site are summarised below.

In 1982 Cubis surveyed the proposed electrical transmission line between Wellington and Lithgow. Cubis identified 55 Aboriginal sites consisting of stone and glass artefact scatters and quarry sites. Most sites were in close proximity to drainage lines and/or located on ridges close to gullies, streams or swamps. Cubis assessed the Central Western Region as being of archaeological significance due to the presence of both prehistoric and contact archaeological sites (AMBS 2008:24–25).

A subsequent appraisal by Bowdler (1982) of five sites in the transmission corridor originally identified by Cubis (1982) was undertaken. Bowdler (1982) established that none of the five sites were of significant future research potential and the quarries identified by Cubis (1982) were not in fact quarries. It was suggested that no further archaeological work was required for the proposal (AMBS 2008:25).

In 1985 McIntyre surveyed the proposed reconstructed route of two proposed Electricity Commission transmission lines between Wellington and Dubbo. The survey of these proposed transmission lines began at the Wellington substation and followed the line of the Mitchell Highway approximately 54 km northwest to Dubbo. A total of 27 sites were recorded generally situated within close proximity to water. McIntyre noted that the areas of high archaeological sensitivity were areas adjacent to reliable seasonal water sources and stands of mature native vegetation (AMBS 2008:25).

Lance (1985) surveyed a proposed transmission line between Wellington and Forbes. It is assumed that the transmission line began at the Wellington Substation however this is not clearly stated in the report. During the survey 16 open camp sites, 14 isolated finds and two scarred trees were identified. Lance noted that that there was a direct correlation between the location of archaeological sites and water sources in the area. Lance further concluded that in the Wellington area, quartz was the predominant raw material, while further to the south, meta-sedimentary and meta-volcanic and other volcanic materials became dominant.

In 1995 Barber undertook a survey of a proposed communications GSM Tower approximately 4 km southeast of the Development Site. A single White Box scarred tree was identified in the survey area. Barber (1995) suggested that the relative lack of archaeological material at this site was a true reflection as most camp sites would be located on the flats, closer to rivers and creeks rather than on the crest of a hill. The presence however, of the scarred tree demonstrates that ‘Aboriginal

people utilised all of the resources available to them and covered most of the country in which they lived' (Barber 1995:6).

Kelton (1999) undertook a survey of a proposed sewage treatment plant approximately 3.8 km southwest of the current Development Site. No archaeological sites were identified within the study area although a scarred tree was identified on a creek flat adjacent to the site. Kelton (1999) suggests that the presence of the scarred tree indicates that prior to European land clearing of old growth trees there would have been potential for such sites to have occurred within the study area.

AMBS (2008) recorded four Aboriginal heritage sites within the 100 km corridor of the proposed Wellington gas pipeline, power station and compressor station. The proposed location of the power station was adjacent to the southern boundary of the Wellington 330 kV substation and includes parts of the current Development Site. The proposed gas-fired power station location is shown in Plate 2-1 below. Three artefact scatters consisting of chert, silcrete and quartz and a single scarred tree were recorded within the proposed gas pipeline route. All sites were identified on low slopes and flats within proximity of a creek line or water source. The scarred tree was noted to be highly culturally significant to the local Aboriginal community. None of the sites recorded were near or within the current Development Site.

Plate 2-1 The study area of the proposed gas-fired power station from AMBS (2008:3)

OzArk (2009) surveyed nine kilometres for the proposed upgrade of the existing 11 kV electricity transmission line, proposed extensions and associated access tracks southwest of Wellington. This survey was approximately 4.2 km south of the current Development Site. Four Aboriginal sites were identified consisting of three open sites with potential archaeological deposits (PAD) and one isolated find. The open sites consisted of a range of raw material types including silcrete, chert, greywacke, hornfels and quartz. These sites were all located on elevated creek confluences or spur crests overlooking water.

Pardoe (2010) carried out the Aboriginal cultural heritage assessment for the proposed Young to Wellington Gas Pipeline Project. Eighteen (18) sites were identified consisting of 13 scarred trees and 5 open artefact scatters. Within the Wellington section of the proposed pipeline three open sites and seven scarred trees were recorded. The artefact scatters tended to be on slightly raised ground associated with a source of permanent water, just above or within a few hundred meters of

swampy ground and manufactured from locally sourced quartz and volcanic stone. Most scars were on Yellow Box trees and the location of the scarred trees is suggested to 'largely reflect retention of trees on or near watercourses, or on sections of land that were too rough to warrant clearing' (Pardoe 2010:109).

Two scarred trees were identified by Aboriginal community representatives outside of the gas pipeline alignment when showing where the proposed power station was located at the end of the Wellington section survey. These two trees are adjacent to the current Development Site and are noted within the report (Pardoe 2010:84-85) and site cards were submitted upon request of the Aboriginal community representatives (#36-4-0117 and #36-4-0118).

The Bodangora Wind Farm, approximately 16 km northeast of the Development Site was surveyed by Dibden in 2011. Two Aboriginal sites were recorded on crests, comprised of an artefact scatter and a possible quartz procurement site. Dibden noted that all the artefacts were recorded on crests with no artefacts recorded on the simple slopes.

In 2017 NGH Environmental (NGH) surveyed approximately 500 ha for the proposed Wellington Solar Farm (WSF). The Wellington Solar Farm is approximately 500 m from the current Development Site on the other side of Goolma Road. Despite variable visibility, 61 stone artefacts were found across the solar farm area that were recorded as 25 site occurrences. These archaeological features were recorded as ten artefact scatters (AS) and 15 isolated finds (IF). A single scarred tree was also recorded. Additionally, two areas of Potential Archaeological Deposit (PAD) were identified. The artefacts recorded were manufactured primarily from quartz and volcanic material with a lesser number of silcrete, sandstone, fine-grained siliceous and quartzite artefacts recorded. The presence of cores, hammer stones and flakes indicated that tool manufacture likely occurred onsite, although the presence of an edge ground axe implies some completed tools were also brought to the site. The sites were all identified on low slopes and flats within proximity of a creek line or water source, even in areas highly disturbed by farming activities. The results of the survey increased the number of sites recorded in the local area by 21.6% from 98 to 125. It was noted that there are likely to be many hundreds of such sites in the local area, and that the low number of sites recorded in AHIMS was merely an indication that few surveys had been undertaken in the area and therefore the sites are yet to be found.

Post approval subsurface testing and surface salvage was undertaken within the WSF area in 2019 (NGH 2020). Surface collection of eight AS and 11 IF sites was initially undertaken in May 2019 resulting in the salvage of 89 artefacts over a two-day period. Severe drought led to increased visibility with a further 318 surface artefacts recovered in September 2019 at the time of the subsurface testing. The recovered surface artefacts were mostly quartz, basalt and volcanic flakes, flake fragments and flaked pieces. Cores, retouched flakes (including backed artefacts), grindstone fragments, ground edge adzes and hammerstones were also recovered. Manuports and other items as requested by RAPs were also collected. Bipolar quartz and basalt cores and flakes were present in the recovered assemblage. A range of other raw materials were recovered including fine-grained siliceous (FGS), silcrete, quartzite, sandstone and hornfels.

PAD1 encompassed the area of previously recorded surface sites Wellington Solar Farm AS4 and Wellington Solar Farm AS3, in a flat area in an otherwise undulating landscape in the area of a previous natural spring (no longer evident due to impacts from farming). Four test pits were excavated (59, 60, 62 and 65) which reached a depth of 10-20 cm before encountering sterile clay. No artefacts were recovered from PAD1 (NGH 2020).

PAD2 encompassed elevated flat areas associated with Wuuluman creek line and covered five previously recorded AS sites (Wellington Solar Farm AS5 to AS9), five IF sites (Wellington Solar

Farm IF9-IF11 and IF14-15) and a possible hearth (Wellington Solar Farm HTH1). Fifty-four test pits were excavated (1-3, 5, 7-11, 12A, 12B, 13-33, 35-37-51, 53-58) and three subsurface artefacts were recovered from the upper 10cm of deposit. Test pits were excavated to sterile clay which varied in depth between 10 and 54 cm. Two artefacts were recovered from test pit 2A (Wellington Solar Farm AS13) a basalt flake and a basalt proximal flake and one artefact was recovered from test pit 35 (Wellington Solar Farm IF17) a quartz angular fragment. All recovered artefacts were reburied on site (Wellington Solar Farm Artefact Burial Site).

The soil profiles encountered in the subsurface testing at WSF consisted of a compacted red-brown silty loam with a high proportion of angular basalt gravel inclusions overlying a reddish-brown to yellow silty clay over an extremely compacted mottled reddish yellow clay with basalt and limestone inclusions (NGH 2020:16). Clay was usually reached at 10-20 cm depth. The loam deposit generally decreased in depth with distance away from the creek line. Disturbance from insects and grass roots was evident throughout the deposit and evidence of pastoral and agricultural activities such as vegetation clearance and ploughing were evident to depths of 5-15 cm.

In 2018 NGH undertook an ACHA for the Wellington North Solar Plant, located approximately 4.5km north of the current Development Site but included transmission line connections to the Wellington substation to the immediate north of the Development Site. The project area for the Wellington North Solar Plant (WNSP) encompassed approximately 837 ha, including up to 31 ha for offsite transmission line options. Despite the variable visibility encountered during the survey, there were 99 stone artefacts found across the WNSP project area that were recorded as 37 site occurrences. These archaeological features were recorded as nine artefact scatters and 28 isolated finds. Two possible scarred trees and a European survey marker tree were also recorded. NGH acknowledged that additional stone artefact occurrences within the WNSP area were possible however there was negligible potential for the presence of intact subsurface deposits with high densities of objects or cultural material within the WNSF project area.

In 2019 NGH Environmental (NGH) surveyed an additional 118.6 ha for the proposed eastern transmission line route which was unable to be previously surveyed for the WNSP. This eastern transmission line route was a connection to the Wellington substation (to the north of the present Development Site). Two isolated finds were identified in the southern part of the eastern transmission line route. These sites were:

- IF29 / Wellington Nth Additional Area IF1 / 36-4-0203, a yellow-orange chert rotated core measuring 10.6 x 9.4 x 8.9 cm
- IF30 / Wellington Nth SF Additional Area / IF2 0 36-4-0202, a brown-red tuff retouched flake measuring 6.5 x 4.5 x 1.7 cm.

An additional site was mistakenly recorded (#36-4-0201) which has been updated on AHIMS to not a site. The site #36-4-0203 is the closest previously recorded stone artefact site to the current Development Site.

EMM (2022) have undertaken an ACHA for the Wellington South Battery Energy Storage System adjacent to the eastern boundary of the Development Site, which is also proposed to connect to the existing Transgrid Wellington Substation. The ACHA, part of the EIS for this project is currently on public exhibition (November 2022). No Aboriginal sites or subsurface potential was identified within the Wellington South BESS project area.

2.3.6 Summary of archaeological context and site location model

The results of previous archaeological investigations in the Wellington region show that there are sites and artefacts present throughout the landscape. There is a dominance of artefacts either as isolated finds or in clusters as artefact scatters. These stone artefact scatters and isolated finds are most likely to be in surface expressions with very low densities of artefacts recovered from subsurface deposits in the local area. CMTs are also prevalent in the region.

There appears to be a pattern of site location that relates to the presence of potential resources for Aboriginal use. The Aboriginal site modelling for the region to date suggests that while Aboriginal sites may be expected throughout all landscapes the most archaeologically sensitive areas occur in close proximity to water.

The most likely site types to be encountered within the Orana BESS Development Site would be stone artefacts (AS and IF) and CMTs where old growth native trees, particularly Yellow Box trees remain. The results of test excavations at the neighbouring WSF site indicate that significant intact subsurface deposits containing stone artefacts are unlikely due to the shallow nature of deposits. A range of artefact types and raw materials are possible with quartz, basalt and volcanic the most commonly recorded materials of artefact from nearby surface and subsurface sites.

A detailed understanding of the Aboriginal land use of the region is lacking, as few in depth studies have been completed and no sites have been dated within the local area. Regional dates for occupation go back to 5000 years before present. It is possible however, to ascertain that proximity to water sources and raw materials 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, but the current archaeological record of that activity is currently limited.

Based on the results of the environmental context and results of previous archaeological investigations in and around the Development Site and the local Wellington area, and through extrapolation of Aboriginal heritage sites from the region, several predictive modelling statements can be made. These are outlined in Table 2-3 below.

Table 2-3 Aboriginal site prediction statements

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.	Possible to occur in low densities within the Development Site, in particular on any slightly raised areas adjacent to the drainage lines and on spur and crest landforms.
Isolated Finds	These sites consist of a single artefact and usually represent accidental discard or disposal. Can occur anywhere.	Possible to occur anywhere within the Development Site.
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material. These sites require the existence of undisturbed stratigraphy.	Based on topography and soil landscapes present within the Development Site PADs are unlikely to occur.

Site Type	Site Description	Potential
Modified Trees (carved or scarred)	Trees that have undergone cultural modification	There are known CMT adjacent to the southern boundary of the Development Site, so it is possible for other scarred trees to occur, particularly where there are remnant old growth native (Yellow Box) trees.

The AHIMS database is a record of those places that have been identified and had site cards submitted. 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. Therefore, an absence of AHIMS recorded sites within an area does not mean that sites are not present.

Within the Wellington area there have been several archaeological investigations and studies including previous studies within and adjacent to the Development Site. While these studies have informed understandings of site patterns and geomorphic context, the antiquity of most sites is not yet known. The robustness of the current understanding of the archaeological record for the Development Site and surrounds, based AHIMS survey results and previous archaeological assessments is therefore considered to be only moderate. There are likely to be sites that exist that have yet to be identified although the scale of farming and development has altered the natural landscape in some places. This activity has also disturbed the archaeological record and there are unlikely to be many places that retain *in situ* archaeological material due to the scale of agricultural and pastoral activities and development.

Within the Development Site (and Development Footprint) there are no registered Aboriginal sites (the one CMT, AHIMS #36-4-0117, is immediately adjacent to the Development Site southern boundary rather than within it). There are five registered Aboriginal sites (likely reflective of three CMTs) adjacent to the Development Site with two stone artefact sites recorded less than 300m to the north of the Development Site. Within the AHIMS search area artefact scatters and isolated finds were the most common site types with only very low densities of material recovered from any subsurface contexts.

In summary, the topography and existence of CMTs adjacent to the Development Site indicate that this area would have been part of the Wiradjuri cultural landscape. The CMTs are known to have high cultural value. Stone artefact sites – either as an artefact scatters or as isolated finds and CMTs are the mostly likely site types within the Orana BESS Development Site. Raw materials of artefacts are likely to be quartz, basalt or volcanic and have the highest potential to occur in areas adjacent to the drainage line in the east of the Development Site.

2.3.7 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 Development Site, other than the CMTs which have high cultural value to the south of the Development Site. 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 A. 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 17 August 2022. An advertisement was placed in the local newspaper, the *Wellington and District Leader* on 18 August 2022 seeking registrations of interest from Aboriginal people and organisations. A further series of letters was sent to other organisations identified by Heritage NSW in correspondence with NGH on 25 August 2022 and to other organisations identified by Dubbo LALC in correspondence with NGH on 8 September 2022. In each instance, the closing date for submission was 14 days from the date of the letter.

As a result of this process, five Aboriginal groups registered their interest in the proposal. No response was received from Wellington LALC, but they will continue to be included in the consultation as the Project is within the Wellington LALC area. Notification of Registered Aboriginal Parties (RAPs) was provided to Heritage NSW and Wellington LALC on 29 September 2022 and sent to Wellington LALC again on 28 October 2022.

These were:

- Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC);
- Thomas Dahlstrom;
- Yurwang Gundana Consultancy Cultural Heritage Services (YGCCHS);
- Edgerton Kwiembal Aboriginal Corporation (EKAC); and
- Tubba-Gah (maing) Wiradjuri Aboriginal Corporation (TWAC).

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

Stage 2. On 29 September 2022, an *Assessment Methodology* document for the Orana BESS was sent to the five RAPs listed above and the Wellington LALC. This document provided details of the background to the proposal, a summary of previous archaeological surveys, 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 Development Site 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 Development Site. It was noted that sensitive information would be treated as confidential. No response regarding cultural information specific to the Development Site was received in response to the methodology. Previous discussions with Wellington Valley Wiradjuri Aboriginal Corporation had highlighted that the scarred trees in the vicinity of the Development Site were of high cultural significance.

The survey fieldwork was organised, and three of the five RAPs were invited to provide a representative for fieldwork participation by the Proponent. The survey fieldwork was carried out on 24 November 2022 by one archaeologist from NGH and two Aboriginal RAP representatives. Three RAP representatives were due to participate in the fieldwork but due to illness on the day, only two were able to attend. The RAP representatives who participated in the fieldwork were:

- Bradley Bliss (Representing WVWAC); and
- Merekai Bell (representing YGCCHS).

Stage 4 A draft version of this *Aboriginal Cultural Heritage Assessment Report* for the proposal (this document) was forwarded to the RAPs for review and specifically invited 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.

3.1 Aboriginal community feedback

Feedback was received from WVWAC on the draft report. WVWAC agreed that no cultural sites were identified and agreed with the recommendations as set out in the draft report. No further comments were received prior to the report being finalised after the conclusion of the 28-day review period.

4. Archaeological investigation results

The predictions based on the modelling for the Development Site were that isolated artefacts and low-density artefact scatters were the most likely site features to occur, with the most archaeologically sensitive areas for the region noted to tend to occur on flat areas of elevated ground in association with water courses. CMTs are known in the local area. The topography and landscape features within the Orana BESS Development Site suggested that the area would have been part of the Wiradjuri landscape and had a possibility of providing an archaeological signature.

The survey undertaken for the Orana BESS identified no Aboriginal sites within the Development Site. This result was similar to the surveys undertaken within part of the Development Site for the approved but not constructed Wellington Gas-fired Power Station (AMBS 2008) and the Wellington South BESS (EMM 2022). The results of previous archaeological surveys within the local area show that there are sites and artefacts present across the landscape in generally low densities. The lack of sites identified within the Development Site is not unexpected given topography, shallow soils, previous disturbance and poor surface visibility. It is also likely to be reflective of the sparse and dispersed nature of stone artefacts within the Development Site.

The Development Site has been largely cleared and used for pastoral activities. The majority of the Development Site comprises slopes with low crests. Bedrock outcrops occur on crests and across slopes. One minor first order watercourse crosses through the centre of the Development Site and another first order watercourse passes mostly to the east adjacent to the Development Site. Soil, where evident, was shallow and there were not flat areas identified adjacent to the water courses with potential for intact substantial subsurface deposits. It is considered unlikely that any *in situ* subsurface deposits occur within the Development Site and therefore a subsurface testing programme was not warranted.

Based on the results of this investigation and the land use history of the Development Site, there is negligible potential for the presence of intact subsurface deposits with high densities of objects or cultural material within the Orana BESS Development Site. There are culturally significant CMTs to the south of the Development Site, however no CMTs were identified within the Development Site.

As a result of the survey, the survey area is considered to have low archaeological potential due to the lack of permanent fresh water or other desirable resources, such as outcrops of stone material suitable for stone artefact manufacture. While Aboriginal people would have utilised the whole landscape of the Wellington region, the use of the Development Site would have likely been limited to transitory use rather than long term occupation with the focus of occupation instead on the Wambuul/Macquarie River approximately 1 to 1.5 km to the south of the Development Site or Wuuluman Creek (a third order tributary of the Wambuul/Macquarie River) approximately 40 0m to 1 km to the north of the Development Site.

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 (Marquis-Kyle and Walker 1994). 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. For example, 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 places 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 of course, 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

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 the Aboriginal representatives for this proposal through the consultation process which included providing

comments on the methodology, participating in fieldwork and draft reporting process. No sites were identified within the Development Site during this assessment however the CMTs to the south of the Development Site were highlighted to have high cultural significance.

Scientific (archaeological) value

As a result of this investigation no Aboriginal sites – stone artefacts, CMTs or PADs were identified within the Development Site. Due to this lack of archaeological material identified within the Development Site the archaeological significance of the Development Site is considered to be very low to nil.

Any unexpected finds that are encountered are likely to be located within disturbed contexts and therefore may not provide any further information about Aboriginal occupation of the area other than their existence within the landscape.

Aesthetic value

There are no known aesthetic values associated with the Development Site.

Historic value

There are no known historic values associated with the Development Site.

Other values

There are no other known heritage values associated with the Development Site.

5.2.1 Statement of significance

From a scientific perspective, no surface Aboriginal archaeological material was identified within the Development Site and no areas with subsurface potential were identified. The Development Site has low to nil-scientific significance. There are no known aesthetic or historic values associated with the Development Site. There are no specific cultural values known with regards to the Development Site however, the CMTs recorded to the immediate south of the Development Site are of known high cultural significance.

6. Proposed activity

The Project involves the development of a 200 - 400MW Lithium-ion BESS. It would provide up to 8hours or 1600MWh of energy storage. The BESS would store excess energy generated during peak production periods, to be later transmitted back into the grid when required.

A BESS is a device that stores energy by accumulating energy through reversible electrochemical (lithium) reactions. The energy is stored/extracted in DC (Direct Current) and converted/inverted into AC (Alternating Current) by an accompanying bi-directional inverter sized to the storage capacity.

The Project involves the development of an estimated 400MW Lithium-ion BESS providing up to 4 hours or 1600MWh of energy storage or a 200MW BESS providing up to 8 hours or 1600MWh of energy storage, to be built in up to two stages. The BESS would store excess energy generated during peak production periods, to later be transmitted back into the grid when required. A BESS is a device that stores energy by accumulating energy through reversible electrochemical (lithium) reactions. The energy is stored/extracted in DC (Direct Current) and converted/inverted into AC (Alternating Current) by an accompanying bi-directional inverter sized to the storage capacity.

The BESS Development Footprint would occupy approximately 15.32 ha of land (see Figure 1-2), including the transmission line, access track and bushfire asset protection zones (APZ). The future development would include but not be limited to construction of the following infrastructure components:

- Battery Storage (BESS). The BESS will consist of multiple modular segment units (nominally 750kWh each) arranged in rows. Each row will consist of:
    - BESS DC segment; each container will be 1.6m wide, 2.5m deep and 3.4m high with up to 18 segments per row
    - Rows of DC segments connect to a DC collection segment of similar dimensions to the segments that is joined to the start of the row
    - Row of DC segments are connected to a single PCS with multiple inverter modules. The PCS will be 5.3m wide, 1.7m deep and 2.5m high.
    - Two PCS's are connected to each 7.3MVA medium voltage (MV) transformer with a double low-voltage windings stepping up to 33kV.
    - MV transformers are grouped via ring main units (RMU), from which 33kV cables connect to the 33kV switchroom. The main transformer structure will be circa 5m high and the isolators and oil tank extend this to 7-8m high.
    - **In total there will be circa 2,660 BESS segments, approximately 140 DC collectors and inverters, 70 MV transformers, and up to 35 RMUs**
- Site access and intersection upgrades including access route from Goolma Road including auxiliary turn treatments within the road reserve. The access road will be 8 m wide to allow vehicles to safely pass and includes an 8.5 m buffer either side for construction purposes, and for batters and drainage as required.
- Switch rooms and control room. The HV Substation will include prefabricated switch rooms with modular 33 kV switchgear and a control room. The switch rooms are nominally 20 m x 5 m and the control room 10 m x 4 m

- Operations and Maintenance (O&M) buildings. A permanent O&M facility with staff amenities and vehicle parking. The O&M facility will include a maintenance area and on-site storage for spare parts
- Fire water tanks. The installation will include one fire water tank of approximately 20,000 L for each stage of the project, with an appropriate ring main and fire hydrants in accordance with AS 2419.
- Security fencing, lighting and CCTV
- The Project's dedicated assets would be adjacent to the BESS, including transformers and switching equipment, O&M building, car parking and storage facility.
- A new transmission line would run from the Development Footprint to the existing Wellington Substation. There are two options for this:
    - Option 1: A 330kV overhead line from the BESS to the southern portion of the Wellington Substation. This option includes two 45m tall transmission poles with a 60m wide clear easement corridor.
    - Option 2: A 330kV underground line from the BESS to the northern portion of the Wellington substation. This option would include a 20m wide cable corridor.
- Works within the Transgrid substation to connect the onsite substation to the Transgrid substation via the new transmission line:
    - Up to two 330 kV/33 kV power transformers connecting the BESS to the Transgrid site (about 8 m high including insulators and gantries)
    - A 330 kV switchyard of approximately 1-2 ha.
- Temporary construction compound.

The proposed development and associated construction activities would require the use of heavy machinery and would cause significant ground disturbance. Any Aboriginal sites within the Development Footprint within the Development Site could therefore be subject to harm.

6.1 Assessment of harm

As described in this report, no new archaeological sites were identified during the current field assessment. No previously recorded AHIMS sites are located within the Development Site with one previously recorded CMT located to the immediate south of the southern Development Site boundary. This site is approximately 150 m from any of the infrastructure components within the proposed Development Footprint.

The construction activities associated with the development of the Orana BESS will result in significant ground disturbance and any unidentified Aboriginal archaeological material within the Development Footprint would likely be totally impacted. It is however considered that there is a low potential for surface or subsurface stone artefacts to be present within the entire Development Site to be harmed by the development proposal.

6.2 Consideration of ESD principles

Consideration of the principles of Ecologically Sustainable Development (ESD) and the use of the precautionary principle was undertaken when assessing the harm to the sites within the Proposal Area. The main consideration was the cumulative effect of the proposed impact to the previously recorded AHIMS sites 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 potential consequences.

No Aboriginal heritage sites were identified during this assessment and the Development Site is considered to have very low to nil archaeological significance.

The principle of inter-generational equity requires the present generation to ensure that the health 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 the proposed development as there are no sites that will be impacted within the Development Site. Therefore, there are no reasons based on ESD principles that the development should not proceed.

7. Avoiding or mitigating harm

7.1 Measures to avoid harm

There are no known Aboriginal heritage sites within the Development Site that would be harmed by the proposed development. Based on this assessment and in consideration of discussions with the Aboriginal representatives during the field survey, it is not considered necessary to prevent development at this location. Development should not impact the culturally significant CMTs to the immediate south of the Development Site.

7.2 Mitigation of harm

Mitigation of harm to cultural heritage sites generally involves some level of detailed recording to preserve the information contained within the site. Mitigation can be in the form of minimising harm, through slight changes in the development plan or through direct management measures of the artefacts. As there are no know Aboriginal heritage sites within the Development Site mitigation is not warranted.

The culturally highly significant trees (CMTs) are outside of both the Development Footprint and the Development Site and can be avoided. A 10 m buffer within the Development Site should be established to ensure that no inadvertent impacts affect the trees if works are proposed outside of the current indicative Development Footprint. This could be in the form of a hi-visibility mesh fence and should be left in place for the duration of the construction. The area to be avoided to ensure no impacts to the CMTs in the area adjoining the Development Site to the south is indicated by the orange cross-hatched area in Figure 7-1.

Aboriginal heritage should be included within the Construction Environment Management Plan (CEMP) or equivalent for the Project. This should include an unexpected find protocol and could include an onsite induction. This Plan should be developed in consultation with the RAPs for the Project. Site personnel should be advised that there are registered Aboriginal heritage sites within the vicinity of the Development Site and ground disturbance is not allowed outside of the approved areas.

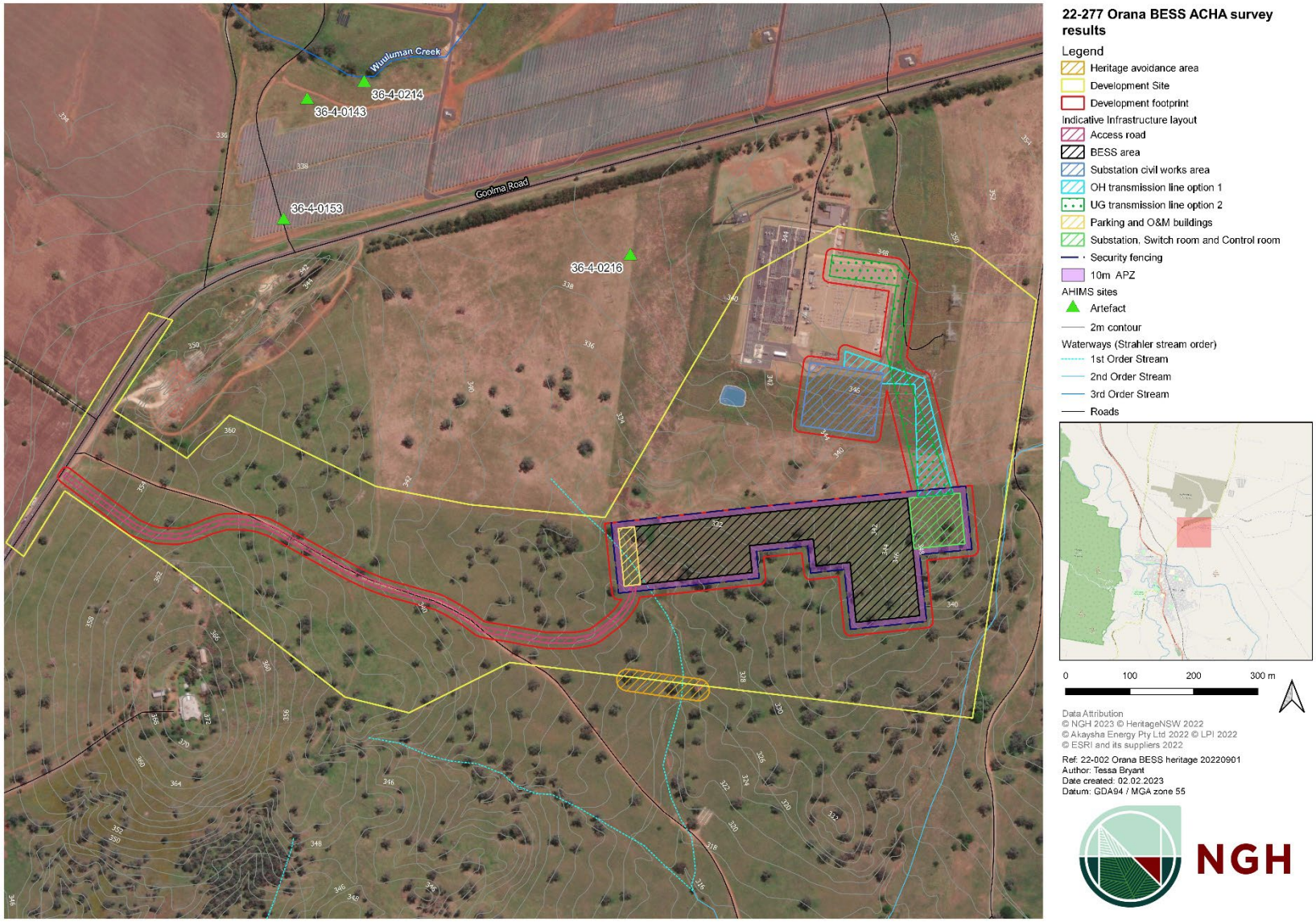

Figure 7-1 Heritage restraints – avoidance area in southern part of Development Site to ensure no impacts to adjoining scarred trees (CMTs).

8. Recommendations

The recommendations are based on the following information and considerations:

- Results of the current archaeological survey of the Development Site;
- Consideration of results from other archaeological assessments which have occurred in the Development Site;
- 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. Works must not impact the CMT sites to the south of the Development Site. If works are to extend outside of the indicative Development Footprint detailed in this report in close proximity to the modified trees (AHIMS#36-4-0117, 36-4-0118, 36-4-0223, 36-4-0224 and 36-4-0225) then a “no-go zone” with a 10 m buffer within the Development Site must be established to ensure there are no inadvertent impacts to these CMTs (see area in Figure 7-1). The “no go zone” area must be delineated with a hi-visibility mesh/flagging/fencing and be in place for the duration of the construction.
2. Aboriginal heritage should be included within the Construction Environment Management Plan (CEMP) or equivalent for the Project. This must include an unexpected finds protocol for Aboriginal objects and Aboriginal heritage should also be included in any induction for the Project. Site personnel should be advised that there are registered Aboriginal heritage sites within the vicinity of the Development Site and ground disturbance is not allowed outside of the approved areas.
3. In the unlikely event that human remains are discovered during the development works, all work must cease in the immediate vicinity and the protocol provided in Appendix B must be followed. Heritage NSW and the police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal.
4. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs and may include further field survey.
5. Consultation with the RAPs for the Project should be maintained through the approvals process and post-approval construction.
6. A copy of the final ACHA should be lodged with AHIMS and provided to each of the RAPs for their records.

Akaysha Energy Pty Ltd is reminded that it is an offence under the *National Parks and Wildlife Act* to harm an Aboriginal object without a valid approval.

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Appendix A Consultation log and documentation

Redacted – available on request to Heritage NSW

Appendix B Unexpected Finds Protocol

B.1 Unexpected Human Skeletal Remains

If any human remains or suspected human remains are discovered during any works, all activity in the 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 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 fenced off area immediately.

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 you must provide any available details of the remains and their location. Heritage NSW 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 unless authorised in writing by the appropriate consenting authority (Heritage NSW/DPE)
- 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, Heritage NSW and DPE.

B.2 Unexpected Aboriginal object

This unexpected find protocol has been developed to provide a method for managing unexpected Aboriginal heritage items identified during the construction and operation 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) and standard requirements for SSD Projects. It is noted that this is in draft form and may be required to be amended pending the issuing of the Conditions of Consent for this Project by DPE.

All Aboriginal heritage objects are protected under the NPW Act Under Part 6 of the Act, though in a State Significant Development (SSD) Development Consent 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 are encountered that were not anticipated that 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 will 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.

In the event that any unexpected Aboriginal heritage sites or objects are discovered during the Project, the following management protocols will be implemented. **Note: this process does not apply to human or suspected human remains which has been detailed above.**

In the event that Project activities identify any unexpected Aboriginal objects:

1. All works must halt in the immediate area of the heritage item to prevent any further impacts to the object(s). Personnel should notify their supervisor of the find, who will notify the project manager.
2. A suitably qualified archaeologist (or the Project Archaeologist) must be contacted to determine if the unexpected find is Aboriginal in origin or not. The visual inspection of the unexpected find should be undertaken with a minimum of one representative from the Registered Aboriginal Parties (RAP) for this Project. If no representative from the RAPs is available to participate in the inspection, the visual inspection of the unexpected object may be undertaken solely by a suitably qualified archaeologist (or the Project Archaeologist).

   If the unexpected find is determined to be Aboriginal in origin and within the approved footprint of the Project an appropriate mitigation method would be undertaken. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) and the management outcome for the site included in the information provided to AHIMS. For stone artefacts, which are considered the most likely type of unexpected find for this Project, at a minimum the collection and relocation of the object would be undertaken. If a dense assemblage of subsurface stone artefacts is identified it may be warranted to undertake a limited programme of salvage excavation. If any unexpected modified trees or archaeologically significant sites are identified additional consultation with the RAPs, Heritage NSW and DPE may be required which would be determined on a case by case matter in consideration of archaeological best practice and consultation with the appropriate consent authority.

Appendix C Archaeological technical report

Archaeological Technical Report

Orana BESS

Dubbo Regional LGA, Wellington, NSW

March 2023

Project Number: 22-277

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Acronyms and abbreviations

ACHA	Aboriginal Cultural Heritage Assessment
ACHCRP	(NSW) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
AHIMS	Aboriginal Heritage Information Management System
Akaysha	Akaysha Energy Pty Ltd - the Proponent
AMBS	Australian Museum Business Services
AS	Artefact scatter
ASL	Above sea level
DECCW	Department of Environment, Climate Change, and Water, now part of Heritage NSW
BESS	Battery energy storage system
CCTV	closed-circuit television
CMT	Culturally modified tree – scarred or carved
DEM	Digital elevation model
Development Site	Broader area studied in specialist assessments which incorporates the Development Footprint
Development Footprint	Indicative development footprint encompassing all of the infrastructure components
DPE	Department of Planning and Environment (NSW)
EIS	Environmental Impact Statement
EKAC	Edgerton Kwiembal Aboriginal Corporation
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
FGS	Fine-grained siliceous
Heritage Act	Heritage Act 1977 (NSW)
Heritage NSW	Part of the NSW Department of Premier and Cabinet, formerly part of OEH (NSW)
IF	Isolated find

kV	kilovolt
LALC	Local Aboriginal Land Council
LGA	Local Government Area
LEP	Local Environmental Plan
MVA	Megavolt-amperes
MW	Megawatt
MWh	Megawatt-hour
NGH	NGH Pty Ltd
NPW Act	National Parks and Wildlife Act 1974 (NSW)
O & M	Operations and Maintenance
OEH	Former Office of Environment and Heritage NSW
Orana BESS	The Project
NSW	New South Wales
PAD	Potential archaeological deposit
PCT	Plant community types
RAPs	Registered Aboriginal parties
RMU	Ring main units
SEARs	Planning Secretary's Environmental Assessment Requirements
SSD	State Significant Development
TWAC	Tubba-Gah (maing) Wiradjuri Aboriginal Corporation
WSF	Wellington Solar Farm
WNSP	Wellington North Solar Plant
WVAC	Wellington Valley Wiradjuri Aboriginal Corporation
YGCCHS	Yurwang Gundana Consultancy Cultural Heritage Service

Executive summary

Introduction

NGH Pty Ltd (NGH) has been engaged by Akaysha Energy Pty Ltd (Akaysha) (the 'Proponent') to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for the installation of a battery energy storage system (BESS) within Lot 2 DP1226751 which is located approximately two kilometres north-east of Wellington in NSW, within the Dubbo Regional Local Government Area (LGA). The project (Orana BESS) would also include grid connection and transmission line works to the existing Transgrid substation in Lot 1 DP1226751, site access through Lot 2 DP1136578 and potentially some road intersection upgrades along Goolma Road where it intersects with the Development Site. The Development Site is the broader area surrounding the Development Footprint that is studied in specialist assessments however the entire Development Site would not be directly impacted by the Project.

The proposed Orana BESS development would include:

- The construction and operation of a battery energy storage system (BESS) with an estimated capacity of up to 400 MW / 1600 MWh; and
- associated infrastructure, including connection to existing transmission infrastructure.

The ACHA and Archaeological Technical Report are being undertaken to investigate and examine the presence, extent and nature of any Aboriginal heritage sites within the Development Site, assess the potential impacts to Aboriginal sites from project works within the Development Site and provide management strategies that may mitigate any impacts. The proposed BESS is a State Significant Development (SSD) project and 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-45242780). The EIS will be submitted to the Department of Planning and Environment (DPE) for assessment and determination of the project.

This assessment 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)

Aboriginal Community Consultation conducted as part of this assessment is outlined in Section 3 of the ACHA.

Project proposal

The Project involves the development of an estimated 400 MW Lithium-ion BESS providing up to 8 hours or 1600 MWh. The BESS would store excess energy generated during peak production periods, to later be transmitted back into the grid when required. A BESS is a device that stores energy by accumulating energy through reversible electrochemical (lithium) reactions. The energy

is stored/extracted in DC (Direct Current) and converted/inverted into AC (Alternating Current) by an accompanying bi-directional inverter sized to the storage capacity.

The BESS Development Footprint would occupy approximately 15.32 ha of land (see Figure 1-2), including the transmission line, access track and bushfire asset protection zones (APZ). The future development would include but not be limited to construction of the following infrastructure components:

- Battery Storage (BESS).
- Site access and intersection upgrades, including access route from Goolma Road and auxiliary turn treatments within the road reserve.
- Switch rooms and control room.
- Operations and Maintenance (O&M) buildings.
- Fire water tanks.
- Security fencing, lighting and CCTV
- The Project's dedicated assets would be adjacent to the BESS, including transformers and switching equipment, O&M building, car parking and storage facility.
- A new transmission line would run from the Development Footprint to the existing Wellington Substation.
- Works within the Transgrid substation to connect the onsite substation to the Transgrid substation via the new transmission line.
- Temporary construction compound.

Survey results

A pedestrian survey of the Orana BESS Development Site was undertaken by an NGH archaeologist and two Aboriginal community representatives on 24 November 2022. No Aboriginal sites were identified within the Development Site.

The Development Site has been largely cleared and used for pastoral activities. The majority of the Development Site comprised slopes with low crests. Bedrock outcrops occur on crests and across slopes. One minor first order watercourse crosses through the centre of the Development Site and another first order watercourse passes mostly to the east adjacent to the Development Site. Soil, where evident, was shallow and there were not flat areas identified adjacent to the water courses with potential for intact substantial subsurface deposits. It is considered unlikely that any *in situ* subsurface deposits occur within the Development Site and therefore a subsurface testing programme was not warranted.

As a result of the survey, the Development Site is considered to have low archaeological potential due to the lack of permanent fresh water or other desirable resources, such as outcrops of stone material suitable for stone artefact manufacture. While Aboriginal people would have utilised the whole landscape of the Wellington region, the use of the Development Site would have likely been limited to transitory use rather than long term occupation with the focus of occupation instead on the Wambuul / Macquarie River approximately 1 to 1.5 km to the south of the Development Site or Wuuluman Creek (a third order tributary of the Wambuul / Macquarie River) approximately 400 m to 1 km to the north of the Development Site.

Potential impacts

As described in this report, no new archaeological sites were identified during the current field assessment. No previously recorded AHIMS sites are located within the Development Site with one previously recorded culturally modified tree (CMT) located to the immediate south of the southern Development Site boundary. This site is approximately 150 m from any of the infrastructure components within the proposed Development Footprint.

The construction activities associated with the development of the Orana BESS will result in significant ground disturbance and any unidentified Aboriginal archaeological material within the Development Footprint would likely be totally impacted. It is however considered that there is a low potential for surface or subsurface stone artefacts to be present within the entire Development Site and therefore to be harmed by the development proposal. There are no known specific values, scientific, social or cultural, aesthetic or historic within the Development Site that would be impacted by the development proposal.

Recommendations

It is recommended that:

1. Works must not impact the CMT sites to the south of the Development Site. If works are to extend outside of the indicative Development Footprint detailed in this report in close proximity to the modified trees (AHIMS#36-4-0117, 36-4-0118, 36-4-0223, 36-4-0224 and 36-4-0225) then a “no-go zone” with a 10 m buffer within the Development Site must be established to ensure there are no inadvertent impacts to these CMTs (see area in Figure 7-1). The “no go zone” area must be delineated with a hi-visibility mesh/flagging/fencing and be in place for the duration of the construction.
2. Aboriginal heritage should be included within the Construction Environment Management Plan (CEMP) or equivalent for the Project. This must include an unexpected finds protocol for Aboriginal objects and Aboriginal heritage should also be included in any induction for the Project. Site personnel should be advised that there are registered Aboriginal heritage sites within the vicinity of the Development Site and ground disturbance is not allowed outside of the approved areas.
3. In the unlikely event that human remains are discovered during the development works, all work must cease in the immediate vicinity and the protocol provided in Appendix B must be followed. Heritage NSW and the police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal.
4. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs and may include further field survey.
5. Consultation with the RAPs for the Project should be maintained through the approvals process and post-approval construction.
6. A copy of the final ACHA should be lodged with AHIMS and provided to each of the RAPs for their records.

Akaysha Energy Pty Ltd is reminded that it is an offence under the *National Parks and Wildlife Act* to harm an Aboriginal object without a valid approval.

1. Introduction

NGH Pty Ltd (NGH) has been engaged by Akaysha Energy Pty Ltd (Akaysha) (the 'Proponent') to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for the installation of a battery energy storage system (BESS) within Lot 2 DP1226751 which is located approximately two kilometres north-east of Wellington in NSW, within the Dubbo Regional Local Government Area (LGA). The Project (Orana BESS) would also include grid connection and transmission line works to the existing Transgrid substation in Lot 1 DP1226751, site access through Lot 2 DP1136578 and potentially some road intersection upgrades along Goolma Road where it intersects with the Development Site. The Development Site is the broader area surrounding the Development Footprint that is studied in specialist assessments and the entire Development Site would not be directly impacted by the Project. The general location of the Development Site is shown in Figure 1-1 and the Development Site and infrastructure components within the Development Footprint are shown in Figure 1-2. The Development Site includes the previously approved location of the Wellington Gas-fired Power Station (MP06-0315) which was approved in 2009 but was never constructed.

The ACHA and Archaeological Technical Report are being undertaken to investigate and examine the presence, extent and nature of any Aboriginal heritage sites within the Development Site, assess the potential impacts to Aboriginal sites within the Development Site and provide management strategies that may mitigate any impacts. The proposed BESS is a State Significant Development (SSD) project and 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-45242780). The EIS will be submitted to the Department of Planning and Environment (DPE) for assessment and determination of the Project.

1.1 Investigation contributors

The ACHA report was completed by Dr Tessa Bryant *(NGH Senior Heritage Consultant - PhD* with 8 years experience) who conducted research, GIS mapping, Aboriginal community consultation, and report preparation. Kirwan Williams (*NGH Heritage Consultant – BA* with 16 years experience) assisted in report preparation. Dr Tessa Bryant undertook the fieldwork and NGH Senior Heritage Consultant Glenn Willcox *(BA [Hons],* with nine years experience), reviewed the report for quality assurance purposes.

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

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

- Wellington Valley Wiradiuri Aboriginal Corporation (WVWAC)
- Edgerton Kwiembal Aboriginal Corporation (EKAC)
- Yurwang Gundana Consultancy Cultural Heritage Services (YGCCHS);
- Tubba-Gah (maing) Wiradjuri Aboriginal Corporation (TWAC); and
- Thomas Dahlstrom.

In line with the *Aboriginal cultural heritage consultation requirements for proponents 2010*, Akaysha chose to invite three Aboriginal groups who had registered their interest in the project to provide a representative to attend fieldwork. Three RAP representatives were due to participate in

the fieldwork but due to illness on the day one RAP representative was unable to attend. The RAP representatives who participated in the survey fieldwork were:

- Bradley Bliss (Representing WVWAC); and
- Merekai Bell (representing YGCCHS).

Further details and an outline of the consultation process is provided in Section 3 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 2010b). 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

Section 8 – Field methodology

Section 9 – Field results

Section 10 – Analysis and Discussion of results

Section 11 – Significance Assessment

Section 12 – Impact assessment

Section 13 – Management and mitigation considerations

Section 14 – Recommendations

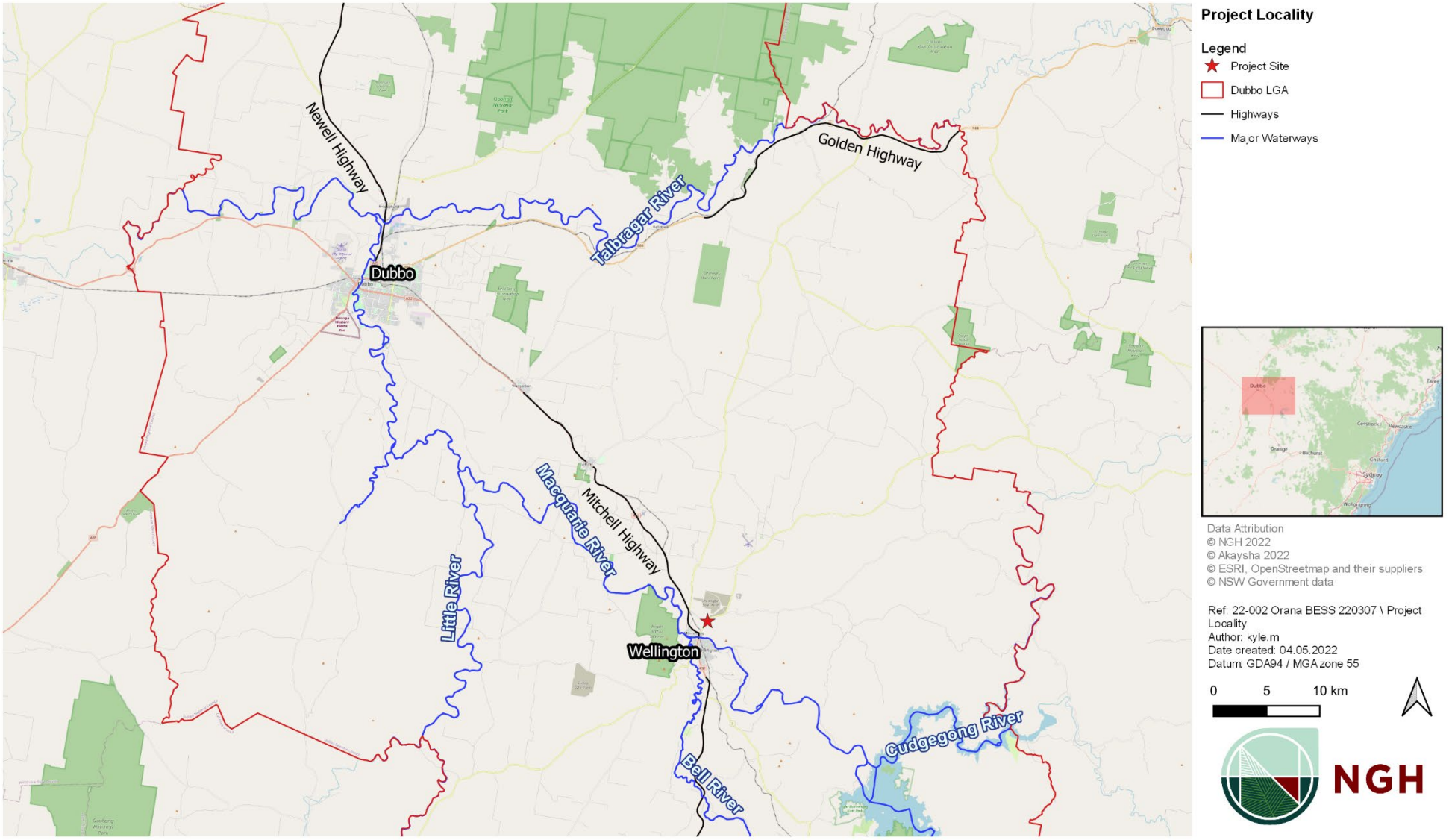

Figure 1-1 General location of the Development Site.

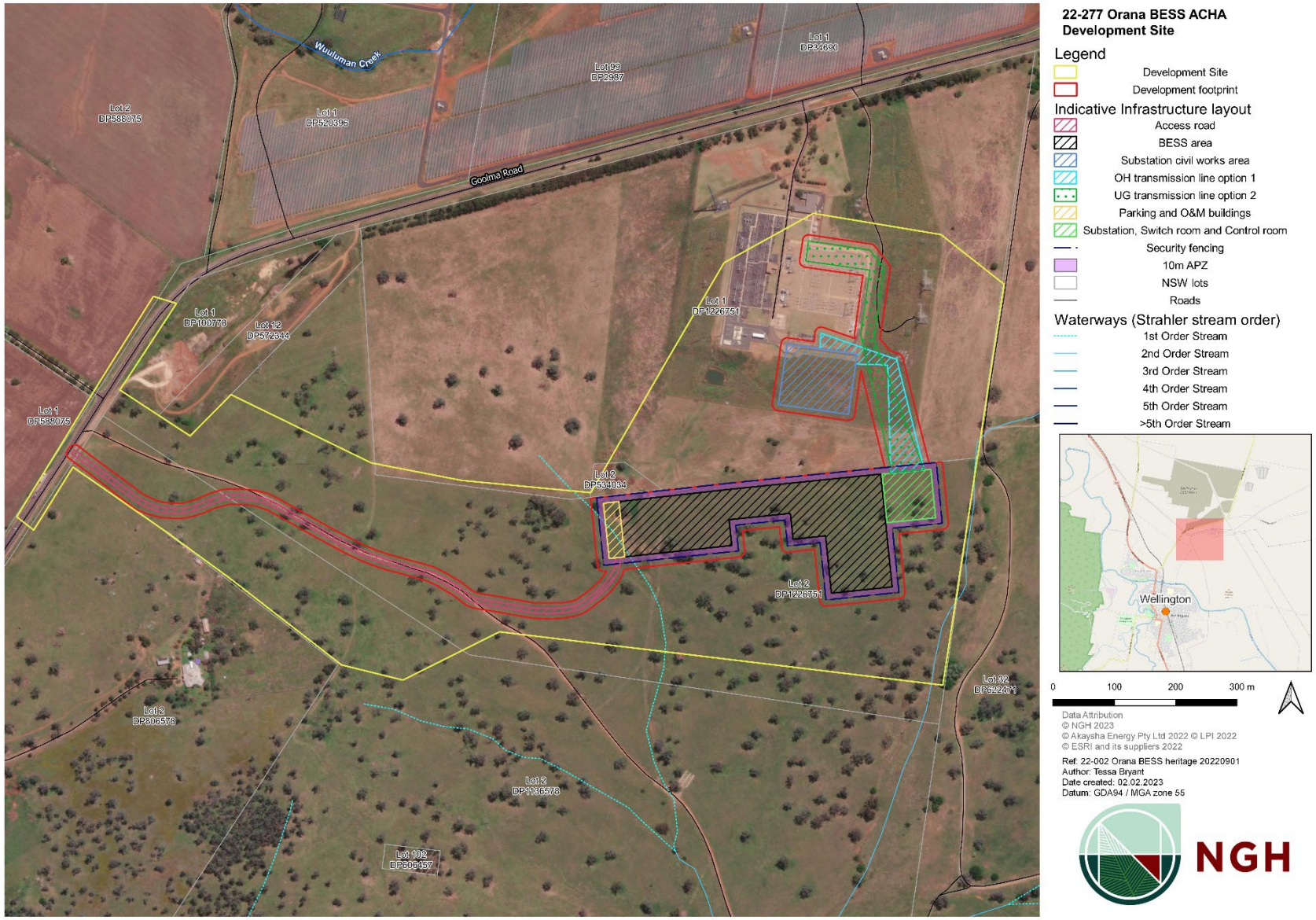

Figure 1-2 Development Site and infrastructure components within the Development Footprint.

2. Project proposal

The Development Site is located at 6945 Goolma Road, Montefiores NSW 2820, approximately 2km north-east of Wellington and is located within the Dubbo Regional Local Government Area (LGA). The Development Site encompasses parts of Lot 1 DP1226751, Lot 2 DP534034, Lot 2 DP1226751 and Lot 2 DP1136578. The Development Site also includes part of the Goolma Road corridor. The Development Footprint is primarily within Lot 2 DP1226751, with site access through Lot 2 DP1136578 and connections to the existing Transgrid substation in Lot 1 DP1226751. The Development Site covers an area of approximately 41 hectares; however, the BESS will occupy an area of approximately 14.8 hectares. The site comprises privately owned farmland, which would be leased or purchased by the proponent for the life of the Project.

The Development Site is immediately adjacent to the existing Transgrid 330kV zone substation and the Wellington Solar Farm (constructed). The approved Wellington North Solar Farm site is also located in the area and was anticipated to commence construction in July 2022. The EIS assessment for the Wellington South BESS, proposed 300m east of the Development Site, is currently on exhibition. The Development Site includes the previously approved location of the Wellington Gas-fired Power Station (MP06-0315) which was approved in 2009 but was never constructed.

The Project involves the development of a 400MW Lithium-ion BESS. It would provide up to 8hours or 1600MWh of energy storage. The BESS would store excess energy generated during peak production periods, to be later transmitted back into the grid when required.

A BESS is a device that stores energy by accumulating energy through reversible electrochemical (lithium) reactions. The energy is stored/extracted in DC (Direct Current) and converted/inverted into AC (Alternating Current) by an accompanying bi-directional inverter sized to the storage capacity.

The Project involves the development of an estimated 400 MW Lithium-ion BESS providing up to 8 hours or 1600 MWh of energy storage. The BESS would store excess energy generated during peak production periods, to later be transmitted back into the grid when required. A BESS is a device that stores energy by accumulating energy through reversible electrochemical (lithium) reactions. The energy is stored/extracted in DC (Direct Current) and converted/inverted into AC (Alternating Current) by an accompanying bi-directional inverter sized to the storage capacity.

The BESS Development Footprint would occupy approximately 15.32 ha of land (see Figure 1-2), including the transmission line, access track and bushfire asset protection zones (APZ). The future development would include but not be limited to construction of the following infrastructure components:

- Battery Storage (BESS). The BESS will consist of multiple modular segment units (nominally 750kWh each) arranged in rows. Each row will consist of:
    - BESS DC segment; each container will be 1.6m wide, 2.5m deep and 3.4m high with up to 18 segments per row
    - Rows of DC segments connect to a DC collection segment of similar dimensions to the segments that is joined to the start of the row
    - Row of DC segments are connected to a single PCS with multiple inverter modules. The PCS will be 5.3m wide, 1.7m deep and 2.5m high.
    - Two PCS's are connected to each 7.3MVA medium voltage (MV) transformer with a double low-voltage windings stepping up to 33kV.

  - MV transformers are grouped via ring main units (RMU), from which 33kV cables connect to the 33kV switchroom. The main transformer structure will be circa 5m high and the isolators and oil tank extend this to 7-8m high.
  - **In total there will be circa 2,660 BESS segments, approximately 140 DC collectors and inverters, 70 MV transformers, and up to 35 RMUs.**
- Site access and intersection upgrades including access route from Goolma Road including auxiliary turn treatments within the road reserve. The access road will be 8 m wide to allow vehicles to safely pass and includes an 8.5 m buffer either side for construction purposes, and for batters and drainage as required.
- Switch rooms and control room. The HV Substation will include prefabricated switch rooms with modular 33 kV switchgear and a control room. The switch rooms are nominally 20 m x 5 m and the control room 10 m x 4 m
- Operations and Maintenance (O&M) buildings. A permanent O&M facility with staff amenities and vehicle parking. The O&M facility will include a maintenance area and on-site storage for spare parts
- Fire water tanks. The installation will include one fire water tank of approximately 20,000 L for each stage of the project, with an appropriate ring main and fire hydrants in accordance with AS 2419.
- Security fencing, lighting and CCTV
- The Project's dedicated assets would be adjacent to the BESS, including transformers and switching equipment, O&M building, car parking and storage facility.
- A new transmission line would run from the Development Footprint to the existing Wellington Substation. There are two options for this:
  - Option 1: A 330kV overhead line from the BESS to the southern portion of the Wellington Substation. This option includes two 45m tall transmission poles with a 60m wide clear easement corridor.
  - Option 2: A 330kV underground line from the BESS to the northern portion of the Wellington substation. This option would include a 20m wide cable corridor.
- Works within the Transgrid substation to connect the onsite substation to the Transgrid substation via the new transmission line:
  - Up to two 330 kV/33 kV power transformers connecting the BESS to the Transgrid site (about 8 m high including insulators and gantries)
  - A 330 kV switchyard of approximately 1-2 ha.
- Temporary construction compound.

The proposed development and associated construction activities would require the use of heavy machinery and would cause significant ground disturbance. Any Aboriginal sites within the Development Footprint within the Development Site could therefore be subject to harm.

3. Archaeological background

3.1 Ethnographic setting

There are several ethnographic recordings of Aboriginal life in the Wellington region from the 1800s that notably focus on the prevalence of Aboriginal people around waterways in the region. It is 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 and Allen 2007).

The dispossession from traditional lands and acts of violence against the Aboriginal people caused great social upheaval meaning that access to traditional resource gathering and hunting areas, religious life, marriage links and sacred ceremonial sites was disrupted or prevented. 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 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, pp. 8 and 16).

Wellington is within an area identified as part of the Wiradjuri language group. This is an assemblage of many small clans and bands speaking a number of similar dialects (Tindale 1974, MacDonald 1983, Horton 1994).

The Wiradjuri language group was the largest in NSW prior to European settlement. The borders were, however, not static, they were most likely fluid, expanding and contracting over time to the movements of smaller family or clan groups. Boundaries ebbed and flowed through contact with neighbours, the seasons and periods of drought and abundance.

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.

These 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 (MacDonald 1983). 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. The archaeological legacy of these gatherings would be larger sites rather 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.

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 camped over a shorter period of time.

European settlers started arriving in the district in the 1820s. At this point the Aboriginal population was in decline, due to disease such as smallpox and influenza as well as dispossession from traditional lands and acts of violence against the Aboriginal people meant there was great social upheaval and partial disintegration of the traditional way of life. This meant that access to traditional resource gathering and hunting areas, religious life and marriage links and access to sacred ceremonial sites were disrupted or destroyed.

However, despite these disruptions, Aboriginal people continued to maintain their connections to sites and the land in the early days of European settlement. Where Aboriginal people were moved to places like missions, people could maintain at least some form of association with Country and maintain traditional stories.

3.1.2 Material culture, food and resources

Early settlers and others who wrote about the Wiradjuri people and customs differentiated between the origin of some groups, referring to people as the Lachlan or Murrumbidgee tribes, or the Levels tribe for those between the two major rivers (Woolrych 1890). The extent of the Wiradjuri group means that there were many different environments that were exploited for natural resources and food. Like everywhere in Australia, Wiradjuri people were adept at identifying and utilising resources either on a seasonal basis or all year round.

Terrestrial animals, such as the possum, were 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 food sources. Fish and mussels would have been prevalent from the rivers and creeks and insects were also a common food type, in particular grubs and ants and ant eggs (Fraser 1892, Pearson 1981). Birds including emus were common as a food source, often being caught in nets made from fibres of various plants such as flax, rushes and kurrajong trees. Bird hunts were also often undertaken as group activities, with emus, ducks and other birds targeted through groups of people flushing them out and driving them into pre-arranged nets (Ramson 1983).

On the 22nd of August 1817 John Oxley, the first European to explore the Wellington Valley observed an abundance of fish, emus, swans and ducks' as well as very large mussels growing among the reeds in many stretches of the river. He noted that in such country there was no fear of being in want of food (Oxley 1820, pp. 191–192).

Plant foods were equally as important and mostly consisted of roots and tubers, such as *Typha* or Cumbungi whose tubers were eaten in late summer and the shoots in early spring. Other edible plants from the Wiradjuri region include the Yam Daisy or *Murnong*, eaten in summer and autumn, the Kurrajong seeds and roots, Acacia seeds and other rushes (Gott 1982).

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.

The 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. 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. Outcropping stone sources also provide clues to their utilisation through flaking, although pebble beds may also provide sources of stone which leave no archaeological trace.

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, the result of an AHIMS 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 investigation area. A search of the AHIMS database was conducted over an area of approximately 1 km^2 centred on Lot 2 DP1226751 on 11 April 2022. The AHIMS client service ID was: 674727. There were 20 Aboriginal sites and no declared Aboriginal Places recorded in the search area. The results of the AHIMS search are summarised in Table 3-1 below. One site within the search area was mistakenly recorded in a previous survey which has been updated to not a site. Ten sites (artefact scatters and isolated finds) have been destroyed during development of Wellington Solar Farm (under development consent SSD-8573).

Table 3-1 AHIMS site types and frequency within the search area

Site type	Number	Percentage
Isolated find	9	45%
Artefact scatter	5	25%
Restricted	3	15%
Potential Archaeological Deposit (PAD)*	2	10%
Not a site	1	5%
Total	**20**	**100%**

* Incorrectly registered as PADs should be Modified Trees.

The AHIMS sites within the search area are mapped in Figure 3-1. Please note the not a site recording (#36-4-0201) is not mapped and the locations of sites # 36-4-0117 and 36-4-0118 are not mapped due to the wishes of knowledge holders from the local Aboriginal community.

There are no sites previously recorded within the Development Footprint. There is one site recorded on AHIMS within the Development Site (#36-4-0117). The location for this site, a culturally modified tree (CMT) that is incorrectly recorded as a PAD on AHIMS, is immediately outside the southern boundary of the Development Site. This location difference is due to the margin of error in site recording using non- differential GPS and the point being recorded outside of the tree canopy to the north of the tree. The tree location was confirmed during the archaeological survey. AHIMS #36-4-0118, the other modified tree incorrectly recorded as a PAD, is approximately 50m south of the Development Site.

Three restricted sites are also located within the search area. NGH has been advised that these sites are also CMT (scarred trees) and have their location restricted. These sites (AHIMS# 36-4-0224, 36-4-0225 and 36-4-0223) are all outside of the Development Site. These trees are adjacent to and up to 100m south of the Development Site. NGH believes that two of these location restricted CMT sites are duplicate recordings of CMT #36-4-0117 and CMT #36-4-0118. These duplicate recordings were likely made due to the error in AHIMS listing sites #36-4-0117 and #36-4-0118 as PAD. Therefore, the five CMT site recordings south of the Development Site reflect three CMTs.

In addition to the CMTs there are two stone artefact sites located within 500m of the Development Site. AHIMS #36-4-0203, an isolated find (chert core), is approximately 300m north of the Development Site and #36-4-0216, also an isolated find, was recorded approximately 180m northwest of the Development Site boundary.

Overall, the main site features present within the search area are stone artefacts and scarred (modified) trees. Stone artefacts, comprising both isolated finds and artefact scatters have been recorded both on the surface and during subsurface excavation. Raw materials of stone artefacts recorded in the area include silcrete, chert, quartz, basalt, volcanic and sandstone. Stone artefact types include flakes, flaked pieces, cores, retouched flakes, manuports and grindstone fragments.

3.3 Additional searches

Desktop searches were undertaken on 12 April 2022 of the relevant heritage registers including the Australian Heritage Database, the NSW State Heritage Inventory (SHI) and Section 170 registers, to identify any items that are currently listed within or adjacent to the Development Site. The Australian Heritage Database includes items on the National and Commonwealth Heritage Lists while the SHI includes items on the State Heritage Register and items listed by state agencies and local government. The Dubbo Regional LGA was formed in 2016 following a merger of the Wellington Council and City of Dubbo Council.

The results of the Australian Heritage Database search indicated that:

- There are no sites on the World Heritage List within the former Wellington LGA.
- There is one site on the National Heritage List within the former Wellington LGA, being the Wellington Caves on the Mitchell Highway, which is not near the Development Site.
- There is a single site on the Commonwealth Heritage List within the former Wellington LGA (Wellington Post Office), which is not within or near the Development Site.

- There are 43 sites on the Register of the National Estate (a non-statutory archive) within the former Wellington LGA. None of the sites are located within the Development Site. Nanima Homestead is located to the immediate southwest of the Development Site.

The results of the NSW SHI database search indicated that:

- There are fifteen (15) previously recorded heritage sites listed on the State Heritage Register within the Dubbo Regional LGA. Four sites are in Wellington, but none are located within or adjacent to the Development Site.
- There are 414 previously recorded heritage sites listed on the LEP within the Dubbo Regional LGA, of which, 64 sites are in Wellington. While none are located within or the Development Site there are two adjacent Homesteads located in proximity to the Development Site (Figure 3-2):
    - Nanima Homestead (listing no. I51), the closest part of the curtilage is adjacent to the southwest of the Development Site; and
    - Keston Homestead (listing no. I50) curtilage to the north on the other side of Goolma Road adjacent to potential road upgrade area.

No other known previously recorded heritage sites are located within or adjacent to the Development Site.

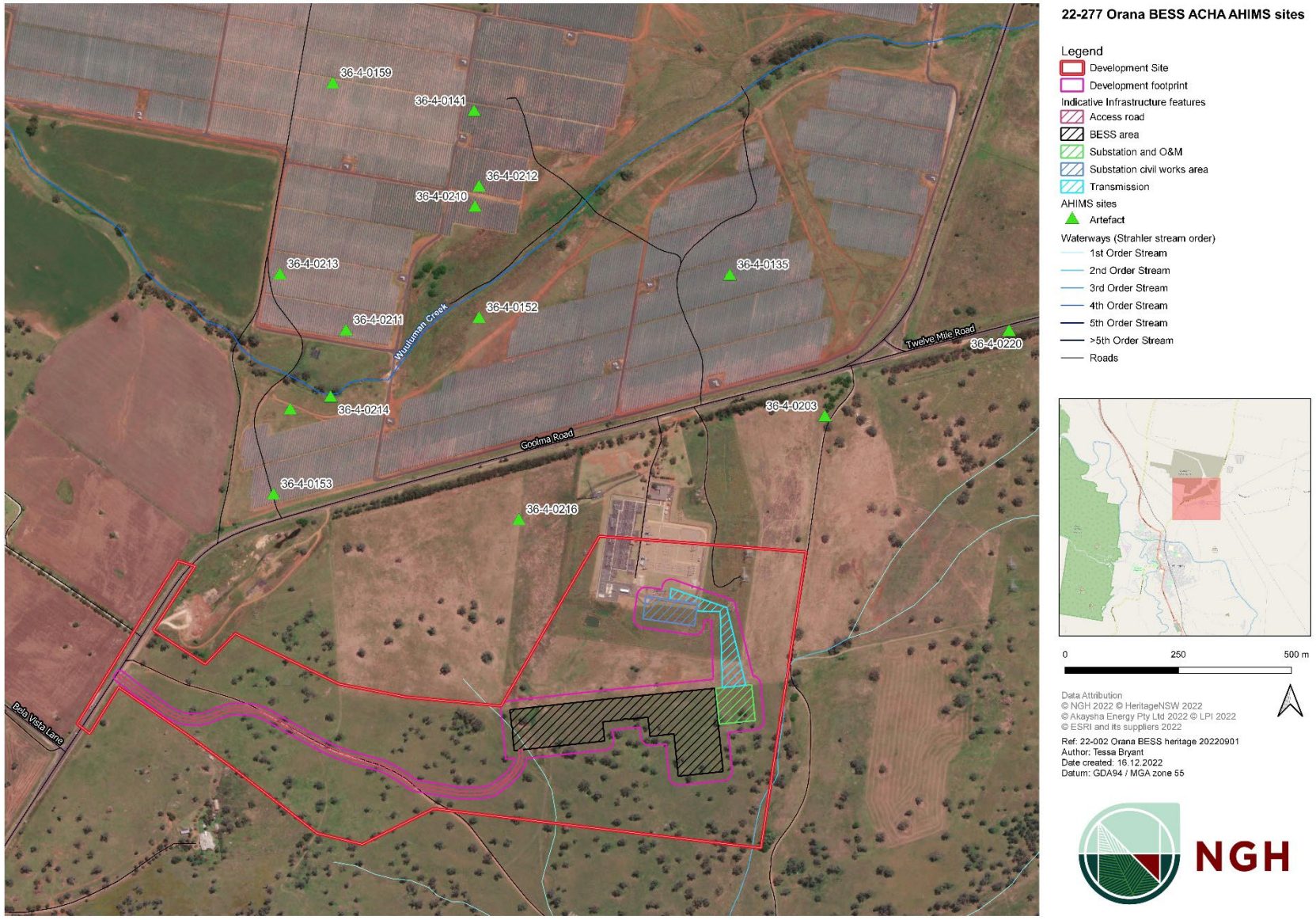

Figure 3-1 AHIMS sites within search area.

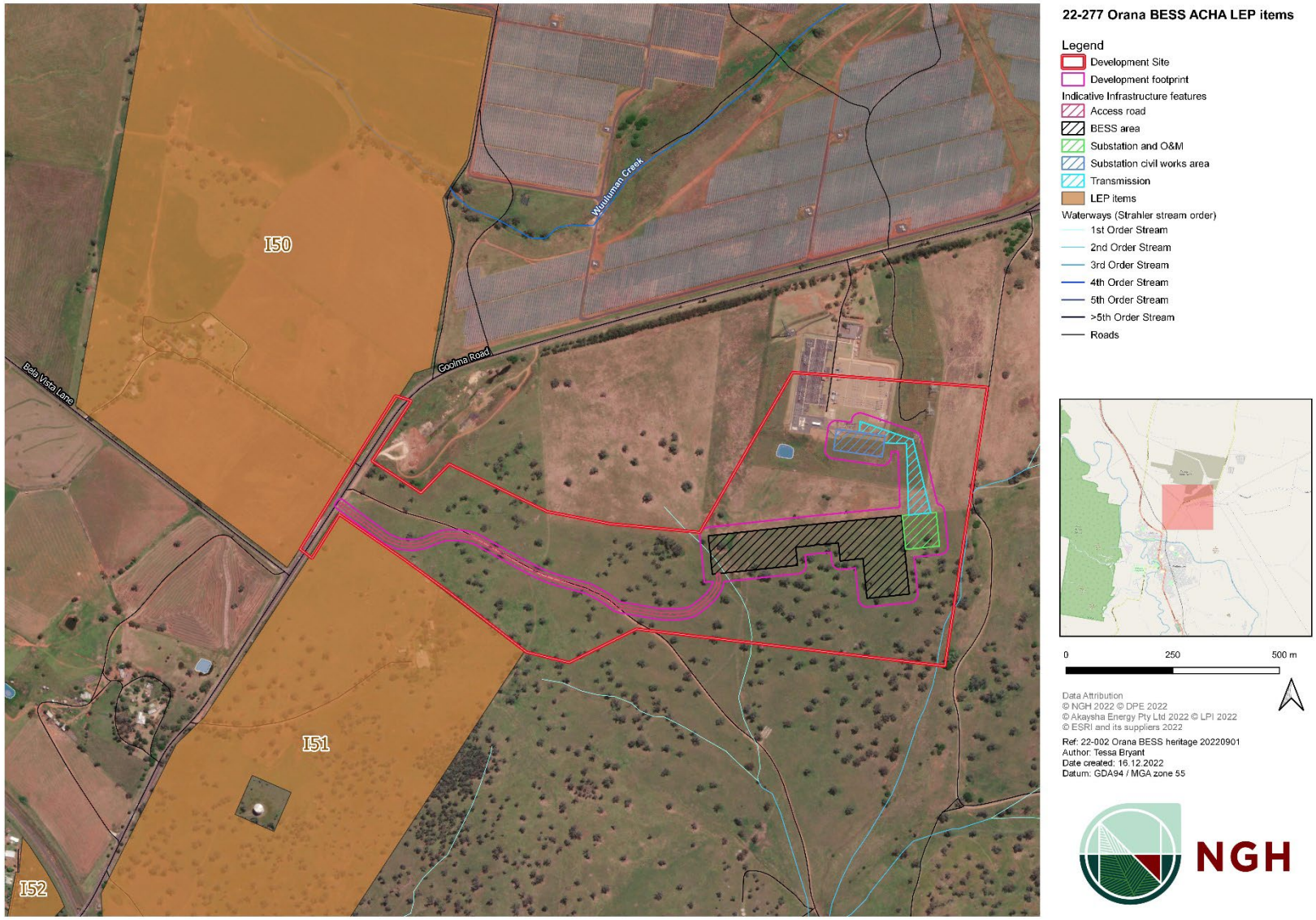

Figure 3-2 Historic heritage in proximity to the Development Site.

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 60,000 years and beyond (Mulvaney and Kamminga 1999, Hiscock 2007). While no regional synthesis of the archaeology has been completed for the Wellington area research studies have been undertaken in the Upper Macquarie River region by Pearson (1981) and Koettig (1985). The following is a summary of the findings from these studies.

Pearson (1981) analysed a series of sites which tended to be biased towards larger and more noticeable sites identified by local residents. During this study, he excavated three rockshelters (Botobolar 5, Granites 1 and Granites 2) which provided a record of regional Aboriginal occupation in the area to 5,000 years before present. Based on his findings, Pearson categorised these sites as either occupation sites or non-occupation sites (sites that are generally for a single purpose i.e. scarred trees, grinding grooves and burial sites) and built an archaeological model based on location. The model developed by Pearson is summarised below.

- Distance to water from sites varied from 10 to 500m, with larger sites found closer to a water source.
- Good soil drainage and an outlook over a water source were important to location.
- Ceremonial and stone arrangement sites were located away from campsites.
- Quarry sites were located in areas with desirable stone source qualities and reasonable access.

Koettig (1985) continued to build on the archaeological understanding of this region by conducting a comprehensive and systematic study of the Dubbo region, which although over 70 km to the west, is relevant as one of only a few wide-ranging archaeological studies in the region. Koettig investigated all topographic landform units and creek orders through sample survey to clarify locations and site types. The study arrived at the following conclusions:

- Aboriginal sites may be expected throughout all landscapes.
- Artefact scatters, scar trees and grinding grooves are the most frequently occurring site types.
- The location and size of sites were determined by various factors, predominately environmental and social factors around the proximity to water, geological formations and the availability of food resources.

Koettig (1985) suggested that larger and constantly occupied sites are likely to occur along permanent watercourses, while more sporadic occupation would have occurred along ridge tops or temporary water courses.

Purcell (2002) conducted a broad regional cultural heritage study of the Brigalow Belt South Bioregion in NSW. This bioregion extends from Dubbo north to Moree. Over the course of the study Purcell recorded 110 oral history interviews, located 1,110 Aboriginal sites, documented 60 traditionally used plant species and mapped landforms that have Aboriginal cultural heritage values. Of the 1,110 Aboriginal sites recorded during this assessment 893 existed on the AHIMS site register prior to the study.

The field survey portion of Purcell's study primarily targeted government owned land such as state forests and a landform mapping proposal was undertaken to assist with the development of a predictive model for Aboriginal site distribution across the bioregion. Water localities were noted to be the major contributing element influencing the distribution of sites among landforms with sites expected to be concentrated near water localities. The study indicated that Aboriginal sites have

been recorded more frequently on high contour and alluvial landforms. The majority of the sites recorded were within 100-400 m of water.

OzArk (2007) conducted a cultural heritage review of the Dubbo LGA that overlaid all recorded sites within the LGA on a mapped geomorphological GIS layer of landforms. The study confirmed that most Aboriginal sites are recorded within 100 m of water accompanied by a general trend of there to be fewer sites recorded further away from water. Additionally, most of the recorded sites were identified to be located on Quaternary alluvium soils that once supported the more complex ecological communities in the region. This geological unit in the region occurs near major waterways and consequently, the likelihood of associated Aboriginal objects and sites in such landforms increases.

3.5 Local archaeological studies

There have been several archaeological investigations undertaken in the Wellington local area including the Development Site and adjacent areas. Previous investigations in relative proximity to the Development Site are summarised below.

In 1982 Cubis surveyed the proposed electrical transmission line between Wellington and Lithgow. Cubis identified 55 Aboriginal sites consisting of stone and glass artefact scatters and quarry sites. Most sites were in close proximity to drainage lines and/or located on ridges close to gullies, streams or swamps. Cubis assessed the Central Western Region as being of archaeological significance due to the presence of both prehistoric and contact archaeological sites (AMBS 2008:24–25).

A subsequent appraisal by Bowdler (1982) of five sites in the transmission corridor originally identified by Cubis (1982) was undertaken. Bowdler (1982) established that none of the five sites were of significant future research potential and the quarries identified by Cubis (1982) were not in fact quarries. It was suggested that no further archaeological work was required for the proposal (AMBS 2008:25).

In 1985 McIntyre surveyed the proposed reconstructed route of two proposed Electricity Commission transmission lines between Wellington and Dubbo. The survey of these proposed transmission lines began at the Wellington substation and followed the line of the Mitchell Highway approximately 54 km northwest to Dubbo. A total of 27 sites were recorded generally situated within close proximity to water. McIntyre noted that the areas of high archaeological sensitivity were areas adjacent to reliable seasonal water sources and stands of mature native vegetation (AMBS 2008:25).

Lance (1985) surveyed a proposed transmission line between Wellington and Forbes. It is assumed that the transmission line began at the Wellington Substation however this is not clearly stated in the report. During the survey 16 open camp sites, 14 isolated finds and two scarred trees were identified. Lance noted that that there was a direct correlation between the location of archaeological sites and water sources in the area. Lance further concluded that in the Wellington area, quartz was the predominant raw material, while further to the south, meta-sedimentary and meta-volcanic and other volcanic materials became dominant.

In 1995 Barber undertook a survey of a proposed communications GSM Tower approximately 4 km southeast of the Development Site. A single White Box scarred tree was identified in the survey area. Barber (1995) suggested that the relative lack of archaeological material at this site was a true reflection as most camp sites would be located on the flats, closer to rivers and creeks rather than on the crest of a hill. The presence however, of the scarred tree demonstrates that ‘Aboriginal

people utilised all of the resources available to them and covered most of the country in which they lived' (Barber 1995:6).

Kelton (1999) undertook a survey of a proposed sewage treatment plant approximately 3.8 km southwest of the current Development Site. No archaeological sites were identified within the study area although a scarred tree was identified on a creek flat adjacent to the site. Kelton (1999) suggests that the presence of the scarred tree indicates that prior to European land clearing of old growth trees there would have been potential for such sites to have occurred within the study area.

AMBS (2008) recorded four Aboriginal heritage sites within the 100 km corridor of the proposed Wellington gas pipeline, power station and compressor station. The proposed location of the power station was adjacent to the southern boundary of the Wellington 330 kV substation and includes parts of the current Development Site. The proposed gas-fired power station location is shown in Plate 3-1 below. Three artefact scatters consisting of chert, silcrete and quartz and a single scarred tree were recorded within the proposed gas pipeline route. All sites were identified on low slopes and flats within proximity of a creek line or water source. The scarred tree was noted to be highly culturally significant to the local Aboriginal community. None of the sites recorded were near or within the current Development Site.

Plate 3-1 The study area of the proposed gas-fired power station from AMBS (2008:3)

OzArk (2009) surveyed nine kilometres for the proposed upgrade of the existing 11 kV electricity transmission line, proposed extensions and associated access tracks southwest of Wellington. This survey was approximately 4.2 km south of the current Development Site. Four Aboriginal sites were identified consisting of three open sites with potential archaeological deposits (PAD) and one isolated find. The open sites consisted of a range of raw material types including silcrete, chert, greywacke, hornfels and quartz. These sites were all located on elevated creek confluences or spur crests overlooking water.

Pardoe (2010) carried out the Aboriginal cultural heritage assessment for the proposed Young to Wellington Gas Pipeline Project. Eighteen (18) sites were identified consisting of 13 scarred trees and 5 open artefact scatters. Within the Wellington section of the proposed pipeline three open sites and seven scarred trees were recorded. The artefact scatters tended to be on slightly raised ground associated with a source of permanent water, just above or within a few hundred meters of

swampy ground and manufactured from locally sourced quartz and volcanic stone. Most scars were on Yellow Box trees and the location of the scarred trees is suggested to 'largely reflect retention of trees on or near watercourses, or on sections of land that were too rough to warrant clearing' (Pardoe 2010:109).

Two scarred trees were identified by Aboriginal community representatives outside of the gas pipeline alignment when showing where the proposed power station was located at the end of the Wellington section survey. These two trees are adjacent to the current Development Site and are noted within the report (Pardoe 2010:84-85) and site cards were submitted upon request of the Aboriginal community representatives (#36-4-0117 and #36-4-0118).

The Bodangora Wind Farm, approximately 16 km northeast of the Development Site was surveyed by Dibden in 2011. Two Aboriginal sites were recorded on crests, comprised of an artefact scatter and a possible quartz procurement site. Dibden noted that all the artefacts were recorded on crests with no artefacts recorded on the simple slopes.

In 2017 NGH Environmental (NGH) surveyed approximately 500 ha for the proposed Wellington Solar Farm (WSF). The Wellington Solar Farm is approximately 500 m from the current Development Site on the other side of Goolma Road. Despite variable visibility, 61 stone artefacts were found across the solar farm area that were recorded as 25 site occurrences. These archaeological features were recorded as ten artefact scatters (AS) and 15 isolated finds (IF). A single scarred tree was also recorded. Additionally, two areas of Potential Archaeological Deposit (PAD) were identified. The artefacts recorded were manufactured primarily from quartz and volcanic material with a lesser number of silcrete, sandstone, fine-grained siliceous and quartzite artefacts recorded. The presence of cores, hammer stones and flakes indicated that tool manufacture likely occurred onsite, although the presence of an edge ground axe implies some completed tools were also brought to the site. The sites were all identified on low slopes and flats within proximity of a creek line or water source, even in areas highly disturbed by farming activities. The results of the survey increased the number of sites recorded in the local area by 21.6% from 98 to 125. It was noted that there are likely to be many hundreds of such sites in the local area, and that the low number of sites recorded in AHIMS was merely an indication that few surveys had been undertaken in the area and therefore the sites are yet to be found.

Post approval subsurface testing and surface salvage was undertaken within the WSF area in 2019 (NGH 2020). Surface collection of eight AS and 11 IF sites was initially undertaken in May 2019 resulting in the salvage of 89 artefacts over a two-day period. Severe drought led to increased visibility with a further 318 surface artefacts recovered in September 2019 at the time of the subsurface testing. The recovered surface artefacts were mostly quartz, basalt and volcanic flakes, flake fragments and flaked pieces. Cores, retouched flakes (including backed artefacts), grindstone fragments, ground edge adzes and hammerstones were also recovered. Manuports and other items as requested by RAPs were also collected. Bipolar quartz and basalt cores and flakes were present in the recovered assemblage. A range of other raw materials were recovered including fine-grained siliceous (FGS), silcrete, quartzite, sandstone and hornfels.

PAD1 encompassed the area of previously recorded surface sites Wellington Solar Farm AS4 and Wellington Solar Farm AS3, in a flat area in an otherwise undulating landscape in the area of a previous natural spring (no longer evident due to impacts from farming). Four test pits were excavated (59, 60, 62 and 65) which reached a depth of 10-20 cm before encountering sterile clay. No artefacts were recovered from PAD1 (NGH 2020).

PAD2 encompassed elevated flat areas associated with Wuuluman creek line and covered five previously recorded AS sites (Wellington Solar Farm AS5 to AS9), five IF sites (Wellington Solar

Farm IF9-IF11 and IF14-15) and a possible hearth (Wellington Solar Farm HTH1). Fifty-four test pits were excavated (1-3, 5, 7-11, 12A, 12B, 13-33, 35-37-51, 53-58) and three subsurface artefacts were recovered from the upper 10cm of deposit. Test pits were excavated to sterile clay which varied in depth between 10 and 54 cm. Two artefacts were recovered from test pit 2A (Wellington Solar Farm AS13) a basalt flake and a basalt proximal flake and one artefact was recovered from test pit 35 (Wellington Solar Farm IF17) a quartz angular fragment. All recovered artefacts were reburied on site (Wellington Solar Farm Artefact Burial Site).

The soil profiles encountered in the subsurface testing at WSF consisted of a compacted red-brown silty loam with a high proportion of angular basalt gravel inclusions overlying a reddish-brown to yellow silty clay over an extremely compacted mottled reddish yellow clay with basalt and limestone inclusions (NGH 2020:16). Clay was usually reached at 10-20 cm depth. The loam deposit generally decreased in depth with distance away from the creek line. Disturbance from insects and grass roots was evident throughout the deposit and evidence of pastoral and agricultural activities such as vegetation clearance and ploughing were evident to depths of 5-15 cm.

In 2018 NGH undertook an ACHA for the Wellington North Solar Plant, located approximately 4.5km north of the current Development Site but included transmission line connections to the Wellington substation to the immediate north of the Development Site. The project area for the Wellington North Solar Plant (WNSP) encompassed approximately 837 ha, including up to 31 ha for offsite transmission line options. Despite the variable visibility encountered during the survey, there were 99 stone artefacts found across the WNSP project area that were recorded as 37 site occurrences. These archaeological features were recorded as nine artefact scatters and 28 isolated finds. Two possible scarred trees and a European survey marker tree were also recorded. NGH acknowledged that additional stone artefact occurrences within the WNSP area were possible however there was negligible potential for the presence of intact subsurface deposits with high densities of objects or cultural material within the WNSF project area.

In 2019 NGH Environmental (NGH) surveyed an additional 118.6 ha for the proposed eastern transmission line route which was unable to be previously surveyed for the WNSP. This eastern transmission line route was a connection to the Wellington substation (to the north of the present Development Site). Two isolated finds were identified in the southern part of the eastern transmission line route. These sites were:

- IF29 / Wellington Nth Additional Area IF1 / 36-4-0203, a yellow-orange chert rotated core measuring 10.6 x 9.4 x 8.9 cm
- IF30 / Wellington Nth SF Additional Area / IF2 0 36-4-0202, a brown-red tuff retouched flake measuring 6.5 x 4.5 x 1.7 cm.

An additional site was mistakenly recorded (#36-4-0201) which has been updated on AHIMS to not a site. The site #36-4-0203 is the closest previously recorded stone artefact site to the current Development Site.

EMM (2022) have undertaken an ACHA for the Wellington South Battery Energy Storage System adjacent to the eastern boundary of the Development Site, which is also proposed to connect to the existing Transgrid Wellington Substation. The ACHA, part of the EIS for this project is currently on public exhibition (November 2022). No Aboriginal sites or subsurface potential was identified within the Wellington South BESS project area.

3.6 Summary of archaeological context and site location model

The results of previous archaeological investigations in the Wellington region show that there are sites and artefacts present throughout the landscape. There is a dominance of artefacts either as isolated finds or in clusters as artefact scatters. These stone artefact scatters and isolated finds are most likely to be in surface expressions with very low densities of artefacts recovered from subsurface deposits in the local area. CMTs are also prevalent in the region.

There appears to be a pattern of site location that relates to the presence of potential resources for Aboriginal use. The Aboriginal site modelling for the region to date suggests that while Aboriginal sites may be expected throughout all landscapes the most archaeologically sensitive areas occur in close proximity to water.

The most likely site types to be encountered within the Orana BESS Development Site would be stone artefacts (AS and IF) and CMTs where old growth native trees, particularly Yellow Box trees remain. The results of test excavations at the neighbouring WSF site indicate that significant intact subsurface deposits containing stone artefacts are unlikely due to the shallow nature of deposits. A range of artefact types and raw materials are possible with quartz, basalt and volcanic the most commonly recorded materials of artefact from nearby surface and subsurface sites.

A detailed understanding of the Aboriginal land use of the region is lacking, as few in depth studies have been completed and no sites have been dated within the local area. Regional dates for occupation go back to 5000 years before present. It is possible however, to ascertain that proximity to water sources and raw materials 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, but the current archaeological record of that activity is currently limited.

4. Landscape context

Understanding the landscape context of the Development Site may also assist us to better understand the archaeological modelling of the area and assist to identify local resources that may have been utilised by Aboriginal people in the past. This information can then be used in predicting the nature of Aboriginal occupation across the landscapes within and adjacent to the Development Site. Factors that are typically used to inform the archaeological potential of landscapes include the presence or absence of environmental resources that would have been utilised by Aboriginal people in the past. 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 Development Site is based on several classifications that have been made at national, regional, and local levels to help us better understand the archaeological modelling of the Development Site. These site location factors are based on the geology, topography, hydrology, flora and fauna and past land disturbances within and adjacent to the Development Site.

The landscape context of the Development Site is based on a number of classifications 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 Development Site and its immediate surroundings.

4.1 Interim biogeographic regionalisation for Australia

The national IBRA system identifies the Development Site as located within the NSW South Western Slopes Bioregion and the Inland Slopes Subregion (DE&E 2016). The dominant IBRA subregion affected by the proposal is the Inland Slopes Subregion.

The NSW South Western Slopes Bioregion extends north of Cowra (including Wellington, NSW) through southern NSW into western Victoria along the lower inland slopes of the Great Dividing Range. This region is characterised by foothills and isolated ranges, 93% of which occur in NSW. The NSW portion of the bioregion occupies about 10.1 percent of the state.

The bioregion lies within the eastern section of the Lachlan Fold Belt consisting of a series of north to north westerly trending folded bodies of Cambrian to Early Carboniferous sedimentary and volcanic rocks. Granites form a dominate part of this bioregion, generally occurring as central basins surrounded by steep hills. Hilly landscapes developed on sedimentary and volcanic rocks typically form lines of hills, following the strike of more resistant rocks such as quartzite. The valleys between these features are generally granite or softer rocks such as shale or slate.

To the west and north of the bioregion wide valleys filled with Quaternary alluvium and lakes become the dominant landform. On the western edge however, alluvial fans from the Riverine Plain have buried most of the bedrock. Gravel deposition in these fans form terraces in valleys and gravel outwash plains and are attributed to higher river discharges in the past. Notably there are several areas of fossil bearing limestone outcropping with developed karst topography.

The overall pattern of soils in these landscapes is one where shallow, stony soils are found on the tops of ridges and hills. Moving downslope, texture contrast soils are the norm with subsoils derived from the underlying weathered rock and the topsoils being a homogenised surface mantle of coarser material derived from all parts of the slope.

The South Western Slopes Bioregion contains two subregions: Upper slopes and Lower Slopes. The Development Site is located in the Upper (Inland) Slopes subregion. A description of this subregion is provided in Table 4-1.

Table 4-1 Upper slope subregion of the South Western Slope Bioregion (NPWS 2003).

Subregion	Geology	Landforms	Soils
Upper Slopes	Ordovician to Devonian folded and faulted sedimentary sequences with inter-bedded volcanic rocks and large areas of intrusive granites.	Steep, hilly and undulating ranges and granite basins. Occasional basalt caps, confined river valleys with terrace remnants.	Shallow stony soils on steep slopes, texture contrast soils grading from red subsoils on upper slopes to yellow subsoils on lower slopes. Alluvial sands, loams and clays.

4.1.1 Mitchell landscapes

Further landscape mapping as part of the Mitchell landscapes system (DECC 2002) shows the Development Site is within a single landscape - the Mullion Slopes. The Mullion Slopes landscape is characterised by steep hills and strike ridges on tightly folded Ordovician andesite, conglomerate and tuff, Silurian rhyolite and shale, Devonian quartz sandstones, slate and minor limestone. The landscape has a general elevation between 500 to 830 m, with local relief 200 m. Stony uniform sand and loam in extensive rock outcrop along crests, stony red and brown texture-contrast soil on slopes, yellow harsh texture-contrast soil in valleys with some evidence of salinity. Gravel and sand in streambeds.

4.2 Geology

The Wellington 1:100 000 Geological Map indicates that the geology underlying the Development Site consists of Ordovician and Silurian geological sequences (Scott et al 1999). The western part of the Development Site is within the Oakdale Formation (Cabonne group) which comprises basalt, basaltic andesite, latite lava and intrusions, volcaniclastic breccia, conglomerate, sandstone and siltstone, minor allochthonous limestone. The remainder of the Development Site is within Wylinga Member (Mumbil group) comprising felsic crystal-lithic sandstone and fossiliferous limestone or the Warderie Volcanic Member (Mumbil group) comprising purple andesite and trachyte, volcaniclastic sandstone and breccia and siltstone. The underlying geology of the Development Site is shown in Figure 4-1.

Basalt and volcanic stone materials are common raw materials that were used by Aboriginal people in the past to manufacture stone artefacts in the local area. Basalt, various volcanics and sandstone would have been available in the region in areas with outcrops or exposed bedrock.

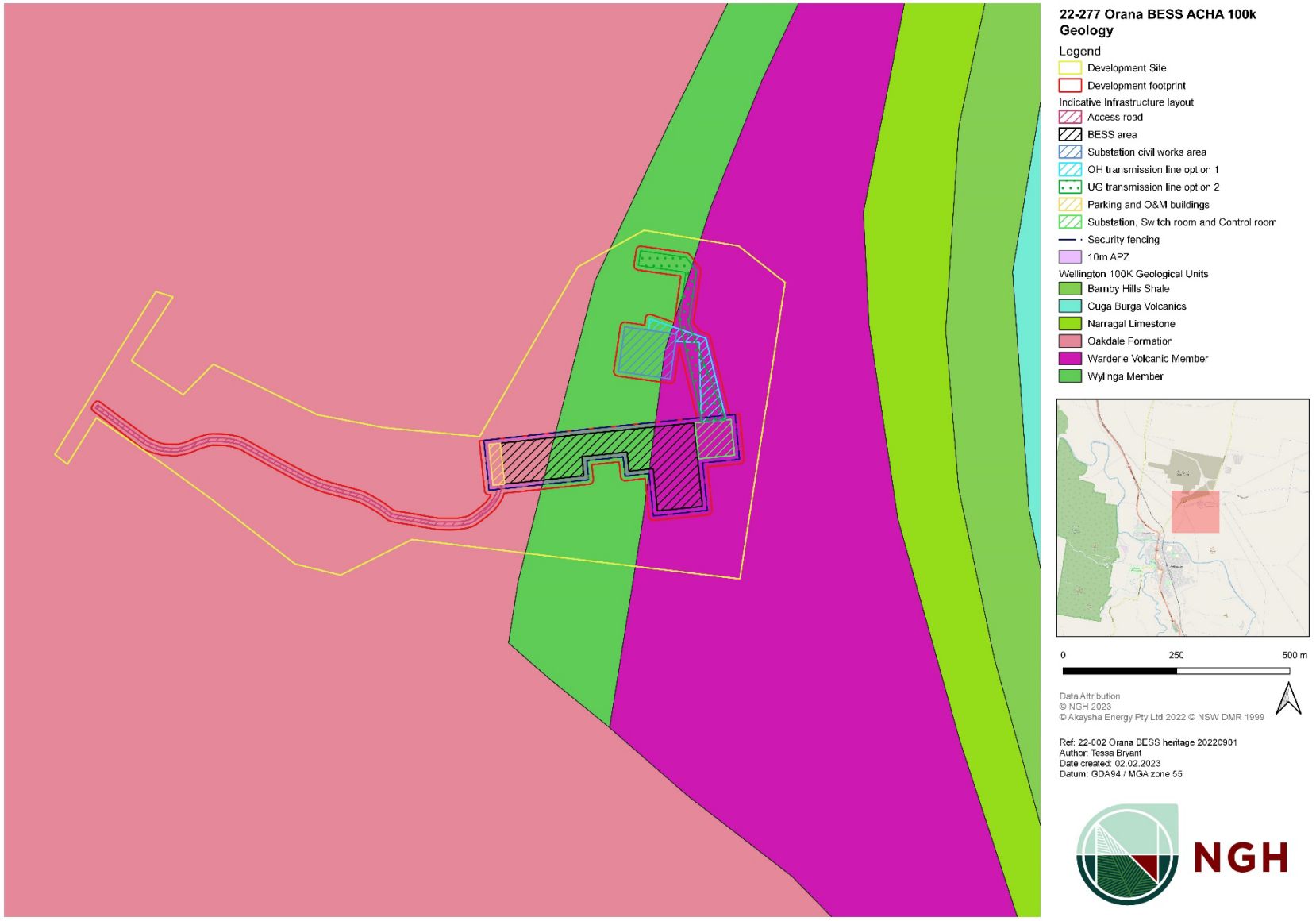

Figure 4-1 Geology of the Development Site.

4.3 Topography

The topography of the Development Site is generally sloping from low hills down towards drainage lines (Figure 4-2) and sits at an elevation of between 320 and 360 m above sea level (ASL). The site includes the following topographic features:

- Low hills and gentle slopes to drainage lines.
- Two unnamed tributaries of the Wambuul/Macquarie River

4.4 Soils

Based on the Soil Landscapes of the Dubbo 1:250 000 Sheet there are two soil landscapes within the Development Site (Murphy and Lawrie 1998). The majority of the Development Site is within the Nanima soil landscape with small areas in the northern portion of the Development Site in the Wellington substation area and on the western edge of the Development Site along Goolma Road within the Bodangora soil landscape (Figure 4-3). These are both euchrozem landscapes of red strongly structured clay soils within a lower clay content near the surface (OEH 2017).

The Bodangora soil landscape comprises undulating low hills with andesite and associated shale, tuff and limestone. Local relief is 40-100 m with slopes of 3 to 10%. Drainage lines are 500-1000 m apart. There is a high erosion hazard under cultivation and low cover levels. Soils are shallow with a dark-reddish brown clay loam topsoil up to 35 cm depth overlying reddish-brown light to medium clay within increasing gravel and nodules of calcium carbonate from 90 cm depth in euchrozems (Murphy and Lawrie 1998:86-87).

The Nanima soil landscape comprises rolling low hills with andesite, hornfels, shale, tuff and limestone. Local relief is 80-150 m with slopes of 5-20%. Drainage lines are 500-1200 m apart. There is a high erosion hazard under cultivation. Soils (euchrozems) are generally friable, dark reddish-brown clay loam up to 15 cm depth overlying dark reddish-brown light clay up to 50 cm depth grading to dark reddish-brown heavy clay up to 120 cm depth.

Both of these soil landscapes have shallow soils with underlying bedrock of materials that are potentially suitable for lithic artefact manufacture.

4.5 Hydrology

Two ephemeral watercourses occur within the Development Site (Figure 4-2), one unnamed first order tributary in the centre of the site running northwest to southeast and one unnamed second order tributary in the east of the site running northeast to southwest. These are both tributaries of the Wambuul/Macquarie River which is approximately 1.5 km south of the Development Site. Wuuluman Creek (a third order tributary of the Wambuul/Macquarie River) is between 400 m and 1 km north of the Development Site.

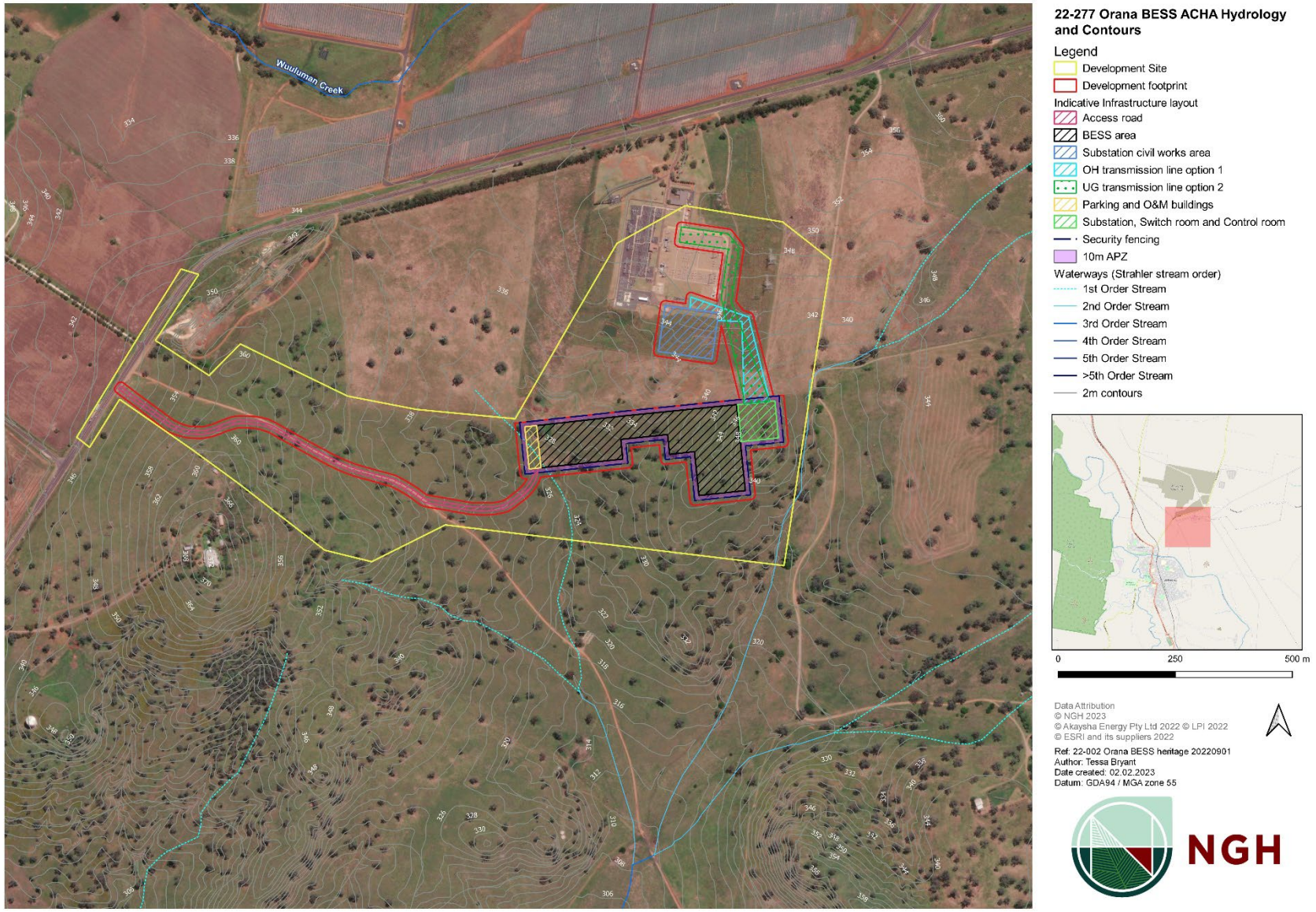

Figure 4-2 Hydrology and contours within the Development Site.

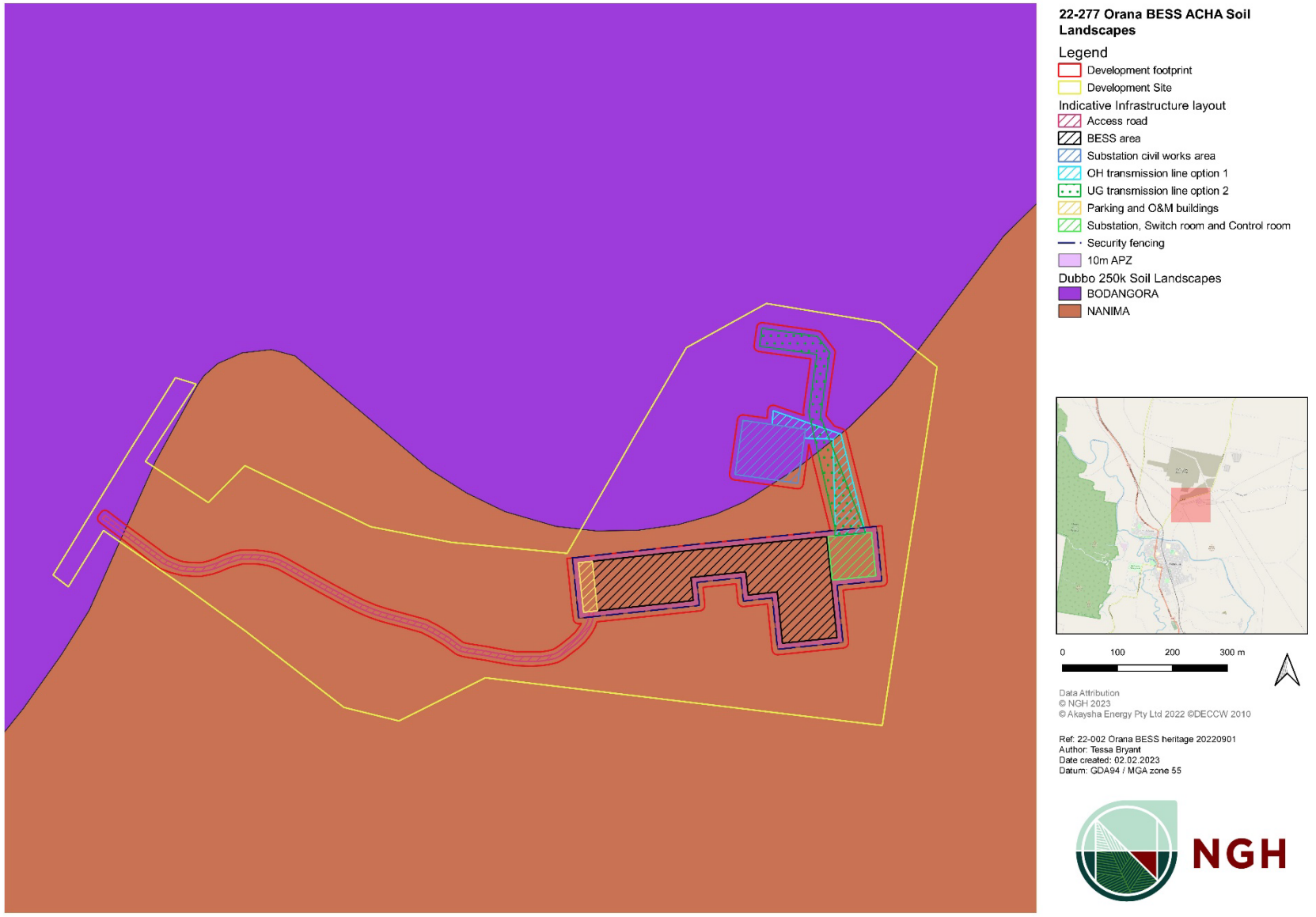

Figure 4-3 Soil landscapes within the Development Site.

4.6 Flora and fauna

Information provided herein is intended as a generalised summary of the endemic flora and fauna present within the Development Site and is not to be used as a substitute for detailed ecological studies and assessments. A preliminary biodiversity assessment carried out by NGH as part of the Scoping Report for the Orana BESS (NGH 2022) identified one plant community type (PCT) within the Development Site. This PCT was evident in two forms as outline in Table 4-2 below.

Table 4-2 PCTs within the Orana BESS Development Site.

PCT	Description
PCT 266 White Box Grassy Woodland in the Upper Slopes Subregion of NSW South Eastern Slope Bioregion	*Woodland structure.* Overstory dominated by *Eucalyptus albens, Callitris glaucophylla*, good condition understorey, Some thistle, lots of native grasses, *Sclerolaena muricata*, *Atriplex semibaccata, Euchiton sphaericus, Austrostipa aristiglumis, A. scabra. Some Heliotrope. Carthamus lanatus, Chloris truncata, Trifolium arvense, Panicum effusum, Euchiton sphaericus*, *Arthropodium strictum, Rytidosperma spp., Wahlenbergia sp., Vittadinia cuteata, V. gracilis, Enneopogon nigricans, Boerhavia domini, Sida corrugata.* **This PCT form covers the majority of the Development Site.**
PCT 266 White Box Grassy Woodland	*Grassland structure.* Overstory absent, high exotic component in areas but generally native species of high diversity across entire vegetation zone. *Centaurea calcitrapa, Carthamus lanatus, Austrostipa scabra, A. aristiglumis, Bromus catharticus, Heliotropium sp., Hordeum leporinum, Trifolium spp., Calotis lappulacea, Oxalis perennans, Vittadinia cuneata, Lepidium africanum, Glycine spp., Atriplex semibaccata, Euchiton sphaericus, Sida corrugata, Boerhavia domini.* **This PCT form is present in the northern portions of the Development Site.**

In the past these vegetation communities would have provided timber, bark and fibre resources. White Box trees are known within the region to have been culturally modified by Aboriginal people. Native plant species provided food and medicine as well as supporting habitat for terrestrial and arboreal animals that were hunted by Aboriginal people.

4.7 Historic land use and disturbance

There has been relatively minimal disturbance to the majority of the Development Site other than from previous pastoral activities. The Wellington region was subject to European settlement from the 1820s following the first European exploration by Oxley and Evans in July 1817 (Dunlop 2006). The Development Site was part of the Nanima Estate that was a large pastoral and agricultural property originally owned by J B Montefiore who had acquired this in the 1830's. The Development Site was within both the Stony Creek and Ironbarks Gold field (in the north) and the Macquarie River Gold field (in the south) in the late nineteenth century from approximately the 1880s to 1900 (County of Bligh, Parish of Nanima Sheet 1 Edition 1 1886 map). Historic maps also show that a

council gravel pit (to the west of the Development Site) was established after 1925 on Goolma Road (County of Bligh, Parish of Nanima Sheet 1 Edition 6 1924 Map). Parish maps show the area as an Animal and Bird Sanctuary proclaimed on January 11th 1946, with a transmission line easement running through the Development Site and the Wellington substation also marked on the 1956 Parish Map (County of Bligh, Parish of Nanima Sheet 1 Edition 8 1956 map).

The area to the north of the Development Site including the Wellington substation was also largely cleared prior to the construction of the substation. Historic aerial photographs show that other than vehicle tracks there have been little changes within the Development Site with the majority of extant trees appearing in aerial imagery from the 1960s to present. The drainage line on the eastern edge of the Development Site is visible in past aerial imagery but the central one is not.

4.8 Summary of contextual information

Most archaeological surveys are conducted in situations where there is topographic variation, and this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal objects. The Development Site is located within rolling low hills (320 to 360 m ASL) within the South Western Slopes bioregion. There are two ephemeral drainage lines within the Development Site which are tributaries of the Wambuul / Macquarie River.

The majority of the Development Site is within the euchozerm Nanima soil landscape which generally has shallow (<20 cm) reddish brown clay loam overlying reddish brown light then heavy clays. Erosion hazard under cultivation for this landscape is high.

Analysis of historic aerial imagery for the Development Site and the preliminary biodiversity inspection (NGH 2022) indicate that the majority of the Development Site is white box grassy woodland in a good condition. Old growth trees are present in the Development Site and there are known scarred trees, with high cultural value, extant south of the Development Site.

The landforms within the Development Site have been determined based on topographic identification through the inspection of contour data and Digital Elevation Modelling (DEM). Two landforms were identified within the Development Site:

- Low crests
- Gentle slopes to drainage lines.

5. Predictive model

Based on an understanding of the environmental context and results of previous archaeological investigations in and around the Development Site and the local Wellington area, and through extrapolation of recorded Aboriginal heritage sites from the region, several predictive modelling statements can be made. These are outlined in Table 5-1 below.

Table 5-1 Aboriginal site prediction statements

Site Type	Site Description	Potential within Development Site
Artefact scatters	Artefact scatter sites can range from high-density concentrations through to sites containing two artefacts. The size and density of these sites usually correlates with proximity to sources of fresh water.	Possible to occur in low densities within the Development Site, in particular on any slightly raised areas adjacent to the drainage lines and on spur and crest landforms.
Isolated Finds	These sites consist of a single artefact and usually represent accidental discard or disposal. Can occur anywhere.	Possible to occur anywhere within the Development Site.
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material. These sites require the existence of undisturbed stratigraphy.	Based on topography and soil landscapes present within the Development Site PADs are unlikely to occur.
Culturally Modified Trees (carved or scarred)	Trees that have undergone cultural modification.	There are known CMT adjacent to the southern boundary of the Development Site, so it is possible for other scarred trees to occur, particularly where there are remnant old growth native (Yellow Box) trees.

As noted above (Section 3.2), the result of an AHIMS register search is not conclusive evidence of the presence or absence of Aboriginal heritage sites within the search area. Therefore, an absence of AHIMS recorded sites within a search area does not mean conclusively that Aboriginal cultural material is not present.

Within the Wellington area there have been several archaeological investigations and studies including previous studies within and adjacent to the Development Site. While these studies have informed understandings of site patterns and geomorphic context, the antiquity of most sites is not yet known. The robustness of the current understanding of the archaeological record for the Development Site and surrounds, based AHIMS survey results and previous archaeological assessments is therefore considered to be only moderate. There are likely to be sites that exist that have yet to be identified although the scale of farming and development has altered the natural landscape in some places. This activity has also disturbed the archaeological record and there are

unlikely to be many places that retain *in situ* archaeological material due to the scale of agricultural and pastoral activities and development.

Within the Development Site (and Development Footprint) there are no registered Aboriginal sites (the one CMT, AHIMS #36-4-0117, is immediately adjacent to the Development Site southern boundary rather than within it). There are five registered Aboriginal sites (likely reflective of three CMTs) adjacent to the Development Site with two stone artefact sites recorded less than 300m to the north of the Development Site. Within the AHIMS search area artefact scatters and isolated finds were the most common site types with only very low densities of material recovered from any subsurface contexts.

In summary, the topography and existence of CMTs adjacent to the Development Site indicate that this area would have been part of the Wiradjuri cultural landscape. The CMTs are known to have high cultural value. Stone artefact sites – either as an artefact scatters or as isolated finds and CMTs are the mostly likely site types within the Orana BESS Development Site. Raw materials of artefacts are likely to be quartz, basalt or volcanic and have the highest potential to occur in areas adjacent to the drainage line in the east of the Development Site.

Regarding the limitations of the information available, archaeologists rely on Aboriginal parties to divulge information about places with cultural or spiritual significance (intangible values) in situations where non-archaeological sites may be threatened by development. The CMTs to the south of the Development Site are known to have high cultural value and there is potential for other places and values to exist within the Development Site however to date none have been identified.

6. Investigation strategy and methodology

6.1 Survey strategy

The survey strategy was to cover as much of the ground surface as possible within the Development Site in a systematic way focusing on the proposed Development Footprint and areas of with ground surface visibility to identify Aboriginal heritage objects. The survey aimed to provide enough surface coverage to be confident of assessing the proposed development areas for the presence of Aboriginal objects.

The Development Site was surveyed on foot in transects with spacing of 10-30 m between survey participants. Areas within the Development Footprint as well as areas with good ground surface visibility and old growth trees were the focus. The survey team consisted of three people (two representatives from the Aboriginal community and one archaeologist) which allowed for 30-100m wide tracts of the Development Site to be surveyed with each transect.

Ground surface visibility was generally poor across the Development Site largely constrained by the knee to waist high grasses and weeds present with the occasional ground surface exposures present that were identified and inspected. Bedrock outcrops were evident on crests and upper slopes, this material was not of a type suitable for the manufacture of stone artefacts. Visibility was the best on the dirt track through the centre of the Development Site. Areas adjacent to the central watercourse were boggy following rain. The average ground surface visibility across the entire Development Site was 5-10%. Any mature trees among remnant vegetation within the Development Site were also inspected for any evidence of Aboriginal scarring or modification.

NGH believes that the survey strategy was comprehensive and the most effective way to identify the presence of Aboriginal heritage objects within the Development Site. Discussions were held in the field during and after the survey between the archaeologists and Aboriginal community representatives to ensure all were satisfied and agreed with the spacing and methodology.

7. Archaeological results

7.1 Survey coverage

The survey fieldwork, as assessed in this report, was undertaken by the team over a single day on 24 November 2022. The team consisted of NGH Archaeologist Dr Tessa Bryant, with Bradley Bliss of Wellington Valley Wiradjuri Aboriginal Corporation and Merekai Bell of Yurwang Gundana Consultancy Cultural Heritage Services. During the survey, notes were made about visibility, photographs were taken, and any possible Aboriginal objects or features identified were inspected, assessed, and recorded if deemed to be Aboriginal in origin.

The Development Site was surveyed on foot in transects with spacing of 10-30 m between survey participants. Areas within the Development Footprint as well as areas with good ground surface visibility and old growth trees were the focus. The survey team consisted of three people (two representatives from the Aboriginal community and one archaeologist) which allowed for 30-100m wide tracts of the Development Site to be surveyed with each transect.

Ground surface visibility was generally poor across the Development Site largely constrained by the knee to waist high grasses and weeds present with the occasional ground surface exposures present that were identified and inspected. Bedrock outcrops were evident on crests and upper slopes, this material was not of a type suitable for the manufacture of stone artefacts. Visibility was the best on the dirt track through the centre of the Development Site. Areas adjacent to the central watercourse were boggy following rain. The average ground surface visibility across the entire Development Site was 5-10%. Any mature trees among remnant vegetation within the Development Site were also inspected for any evidence of Aboriginal scarring or modification.

The Development Site comprised mostly cleared land that is currently used for grazing. Survey transects were undertaken by foot and traversed the Development Site with a focus on the proposed Development Footprint and areas with increased ground surface visibility.

There was thick weeds and grasses across the majority of the Development Site as a result of recent rain which impeded the survey however there were a number of exposures present across the Development Site and across both landforms. The best visibility was on vehicle tracks (see Plate 7-1 and Plate 7-2). There were some areas of bedrock outcropping on both the crests and slopes across the Development Site (see Plate 7-3, Plate 7-4, Plate 7-5). The bedrock material was considered unsuitable for artefact manufacture.

There were some ground surface exposures around some of the bedrock outcrops where topsoil was evident to be thin, larger exposures such as one near a gate into the adjoining land to the south of the Wellington Substation (Plate 7-6). No artefacts were present within any of the ground surface exposures and the stone materials present were not suitable for stone artefact manufacture. There was also evidence of disturbance and modification in a bank to the south of the Wellington Substation (see Plate 7-9), and boggy areas adjacent to the first order watercourses that had been churned up by cattle. The mapped first order tributaries were in the same approximate location as mapped and there was not suitable flat land adjacent to these identified during the survey with potential for subsurface archaeological deposits. The tributary in the east of the Development Site that was considered prior to the survey to have the most potential for a PAD comprised a relatively steep slope within the Development Site and was not considered to be an area with potential for substantial intact subsurface deposits.

The Wellington substation was not accessible for the survey and the survey to the immediate south of the substation was limited to a pre-existing vehicle track and its immediate surrounds due to the extremely thick vegetation.

The trees within the Development Site were inspected for evidence of modification. The previously recorded CMT were confirmed to be outside of the southern boundary of the Development Site. No CMT were identified within the Development Site.

Table 7-1 below shows the calculations of effective coverage for the survey. The ground surface visibility was generally poor (see Plate 7-7 and Plate 7-8) with an estimated average visibility of 5% on the low crests and 10% on the slopes. Approximately 6km of transects were walked across the Development Site during this survey and given the poor ground surface visibility the survey effectively examined approximately 5% of the Development Site.

It is considered by NGH that the survey of the Proposal Area during this investigation had sufficient survey coverage. It was discussed with the Aboriginal community representatives that were present for the survey at the beginning of the survey what the planned methodology would be and the representatives agreed with the survey effort during discussions at the end of the survey.

Plate 7-1 View southeast along dirt vehicle track near property entrance.

Plate 7-2 Exposure in vehicle track with low visibility off track.

Plate 7-3 Bedrock exposure on low crest.

Plate 7-4 Bedrock exposure on upper slope.

Plate 7-5 Bedrock exposure on mid slope.

Plate 7-6 Ground surface exposure near gate to adjoining property to the north.

Plate 7-7 View north towards Wellington substation in area of proposed BESS.

Plate 7-8 Visibility within area south of Wellington substation view east.

Plate 7-9 View north of manufactured bank to the south of the wellington substation.

Plate 7-10 view of general vegetation cover within the Development Site

Table 7-1 Table of effective survey coverage for the Orana BESS Development Site

Landform	Number of Survey Transects	Exposure type	Survey Unit Area ha	Surveyed area (length m x width m)	Visibility (average %)	Effective coverage (area x visibility) m^2	Survey unit surveyed (ha)	Percentage of survey unit effectively surveyed	Survey result
Low crest	1	Small eroded areas, bedrock exposures	0.55 ha	60m x 90m = 5400m^2	5%	270	0.027	4.9%	Very little ground surface visibility, areas with bedrock exposed at surface on crests. **No stone artefacts or areas of PAD identified.**
Slopes	4	Small eroded areas, bedrock exposures, graded tracks	59.2	100 x 860 = 86, 000 80 x 1725 = 138, 000 30 x 1270 = 38, 100 20 x 2050 = 41, 000 Total = 303, 101 m^2	10%	30,310	3.031	5.1%	Low ground surface visibility, areas with bedrock and small surface exposures particularly near fence lines, boggy ground near watercourses. No CMTs within the Development Site – confirmed AHIMS sites 36-4-0117 and 36-4-0118 are outside of the southern boundary of the development site. Ground surface visibility worst adjacent to substation where there was evidence of prior earthworks in the form of a bank. **No stone artefacts or areas of PAD were identified**.

7.2 Survey results

No new Aboriginal sites were identified during the survey. Although ground surface visibility was poor there were exposures across the Development Site that indicated a generally shallow topsoil, with bedrock outcropping across both low crests and slopes. The majority of the Development Site area consisted of sloping ground with no elevated flat areas adjacent to the first order tributaries that had higher potential to contain Aboriginal archaeological deposits. Based on the topography, generally shallow soils and the known archaeology from the local area there is a low potential for subsurface Aboriginal archaeological deposits.

7.2.1 Previously recorded AHIMS sites in the Development Site

There are no previously recorded AHIMS sites within the Development Footprint. The two CMTs incorrectly recorded on AHIMS as PADs, sites #36-4-0117 and #36-4-0118 were also confirmed to be to the south of the southern boundary of the Development Site. The mapped location of site #36-4-0117 is within the development site but due to the extent of the tree canopy and errors in GPS location the site inspection confirmed that this tree is outside of the Development Site boundary. The three location restricted sites - all CMT (#36-4-0224, 36-4-0225 and 36-4-0223) were also confirmed to be outside the Development Site.

8. Analysis and discussion

The predictions based on the modelling for the Development Site were that isolated artefacts and low-density artefact scatters were the most likely site features to occur, with the most archaeologically sensitive areas for the region noted to tend to occur on flat areas of elevated ground in association with water courses. CMTs are known in the local area. The topography and landscape features within the Orana BESS Development Site suggested that the area would have been part of the Wiradjuri cultural landscape and had a possibility of providing an archaeological signature.

The survey undertaken for the Orana BESS identified no Aboriginal sites within the Development Site. This result was similar to the surveys undertaken within part of the Development Site for the approved but not constructed Wellington Gas-fired Power Station (AMBS 2008) and the Wellington South BESS (EMM 2022). The results of previous archaeological surveys within the local area show that there are sites and artefacts present across the landscape in generally low densities. The lack of sites identified within the Development Site is not unexpected given topography, shallow soils, previous disturbance and poor surface visibility. It is also likely to be reflective of the sparse and dispersed nature of stone artefacts if present within the Development Site.

The Development Site has been largely cleared and used for pastoral activities. The majority of the Development Site comprises slopes with low crests. Bedrock outcrops occur on crests and across slopes. One minor first order watercourse crosses through the centre of the Development Site and another first order watercourse passes mostly to the east adjacent to the Development Site. Soil, where evident, was shallow and there were not flat areas identified adjacent to the water courses with potential for intact substantial subsurface deposits. It is considered unlikely that any *in situ* subsurface deposits occur within the Development Site and therefore a subsurface testing programme was not warranted.

Based on the results of this investigation and the land use history of the Development Site, there is negligible potential for the presence of intact subsurface deposits with high densities of objects or cultural material within the Orana BESS Development Site. There are culturally significant CMTs to the south of the Development Site, however no CMTs were identified within the Development Site.

The Development Site is considered to have low archaeological potential due to the lack of permanent fresh water or other desirable resources, such as outcrops of stone material suitable for stone artefact manufacture. While Aboriginal people would have utilised the whole landscape of the Wellington region, the use of the Development Site would have likely been limited to transitory use rather than long term occupation with the focus of occupation instead on the Wambuul / Macquarie River approximately 1 to 1.5 km to the south of the Development Site or Wuuluman Creek (a third order tributary of the Wambuul/Macquarie River) approximately 400 m to 1 km to the north of the Development Site.

9. Cultural heritage values and Statement of Significance

9.1 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.

9.2 Significance assessment

9.2.1 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 the Aboriginal representatives for this proposal through the consultation process which included providing

comments on the methodology, participating in fieldwork and draft reporting process. No sites were identified within the Development Site during this assessment however the CMTs to the south of the Development Site were highlighted to have high cultural significance.

9.2.2 Scientific (archaeological) value

As a result of this investigation no Aboriginal sites – stone artefacts, CMTs or PADs were identified within the Development Site. Due to this lack of archaeological material identified within the Development Site the archaeological significance of the Development Site is considered to be very low to nil.

Any unexpected finds that are encountered are likely to be located within disturbed contexts and therefore may not provide any further information about Aboriginal occupation of the area other than their existence within the landscape.

9.2.3 Aesthetic value

There are no known aesthetic values associated with the Development Site.

9.2.4 Historic value

There are no known historic values associated with the Development Site.

9.2.5 Other values

There are no other known heritage values associated with the Development Site.

9.3 Statement of Significance

From a scientific perspective, no surface Aboriginal archaeological material was identified within the Development Site and no areas with subsurface potential were identified. The Development Site has very low to nil-scientific significance. There are no known aesthetic or historic values associated with the Development Site. There are no specific cultural values known with regards to the Development Site however, the CMTs recorded to the immediate south of the Development Site are of known high cultural significance.

10. Impact assessment

10.1 Proposed development activity

As noted above in Section 2 of this report, the proposed works are for the development of an estimated 400MW Lithium-ion BESS. The BESS Development Footprint would occupy approximately 15.32ha of land (see Figure 1-2, including the transmission line, access track and bushfire asset protection zones (APZ). The future development would include but not be limited to construction of the following infrastructure components:

- Battery Storage (BESS)
- Site access and intersection upgrades including access route from Goolma Road including auxiliary turn treatments within the road reserve. The access road will be 8m wide to allow vehicles to safely pass and includes an 8.5m buffer either side for construction purposes, and for batters and drainage as required.
- Switch rooms and control room.
- Operations and Maintenance (O&M) buildings.
- Fire water tanks.
- Security fencing, lighting and CCTV
- A new transmission line would run from the Development Footprint to the existing Wellington Substation.
- Works within the Transgrid substation to connect the onsite substation to the Transgrid substation via the new transmission line:
- Temporary construction compound.

The proposed development and associated construction activities would require the use of heavy machinery and would cause significant ground disturbance. Any Aboriginal heritage objects that are within this footprint would therefore likely be impacted.

10.2 Assessment of harm

As described in this report, no new archaeological sites were identified during the current field assessment. No previously recorded AHIMS sites are located within the Development Site with one previously recorded CMT located to the immediate south of the southern Development Site boundary (within the heritage avoidance area in Figure 11-1). This site is approximately 150 m from any of the infrastructure components within the proposed Development Footprint.

The construction activities associated with the development of the Orana BESS will result in significant ground disturbance and any unidentified Aboriginal archaeological material within the Development Footprint would likely be totally impacted. It is however considered that there is a low potential for surface or subsurface stone artefacts to be present within the entire Development Site to be harmed by the development proposal.

10.3 Impacts to values

There are no known specific values, scientific, social or cultural, aesthetic or historic within the Development Site that would be impacted by the development proposal.

11. Management and mitigation measures

11.1 Consideration of harm

There are no known Aboriginal heritage sites within the Development Site that would be harmed by the proposed development. Based on this assessment and in consideration of discussions with the Aboriginal representatives during the field survey, it is not considered necessary to prevent development at this location. Development should not impact the culturally significant CMTs to the immediate south of the Development Site.

11.2 Mitigation of harm

Mitigation of harm to cultural heritage sites generally involves some level of detailed recording to preserve the information contained within the site. Mitigation can be in the form of minimising harm, through slight changes in the development plan or through direct management measures of the artefacts. As there are no know Aboriginal heritage sites within the Development Site mitigation is not warranted.

The culturally highly significant trees (CMTs) are outside of both the Development Footprint and the Development Site and can be avoided. A 10 m buffer should be established within the Development Site to ensure that no inadvertent impacts affect the trees if works are proposed outside of the current indicative Development Footprint. This could be in the form of a hi-visibility mesh fence and should be left in place for the duration of the construction. The area to be avoided to ensure no impacts to the CMTs in the area adjoining the Development Site to the south is indicated by the orange cross-hatched area in Figure 11-1.

Aboriginal heritage should be included within the Construction Environment Management Plan (CEMP) or equivalent for the Project. This should include an unexpected find protocol and could include an onsite induction. This Plan should be developed in consultation with the RAPs for the Project. Site personnel should be advised that there are registered Aboriginal heritage sites within the vicinity of the Development Site and ground disturbance is not allowed outside of the approved areas.

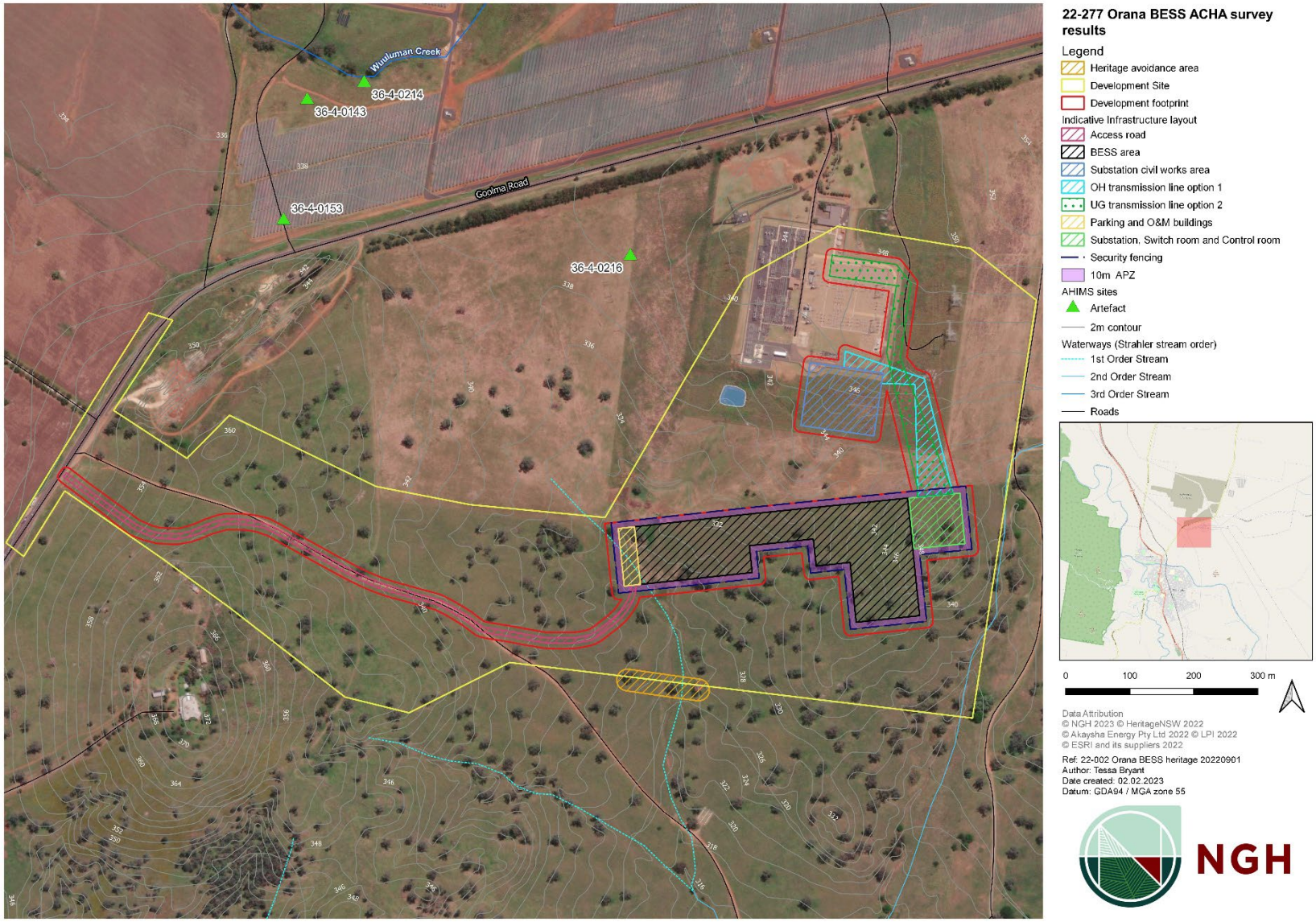

Figure 11-1 Heritage restraints – avoidance area in southern part of Development Site to ensure no impacts to adjoining CMT.

12. Recommendations

The recommendations are based on the following information and considerations:

- Results of the current archaeological survey of the Development Site;
- Consideration of results from other archaeological assessments which have occurred in the Development Site;
- 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. Works must not impact the CMT sites to the south of the Development Site. If works are to extend outside of the indicative Development Footprint detailed in this report in close proximity to the modified trees (AHIMS#36-4-0117, 36-4-0118, 36-4-0223, 36-4-0224 and 36-4-0225) then a “no-go zone” with a 10 m buffer within the Development Site should be established to ensure there are no inadvertent impacts to these CMTs (see area in Figure 11-1). The “no go zone” fence should be hi-visibility mesh and be in place for the duration of the construction.
2. Aboriginal heritage should be included within the Construction Environment Management Plan (CEMP) or equivalent for the Project. This should include an unexpected find protocol and could include an onsite induction and be developed in consultation with the RAPs for the Project. Site personnel should be advised that there are registered Aboriginal heritage sites within the vicinity of the Development Site and ground disturbance is not allowed outside of the approved areas.
3. In the unlikely event that human remains are discovered during the development works, all work must cease in the immediate vicinity and follow the protocol provided in Appendix B. Heritage NSW and the police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal.
4. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs and may include further field survey.
5. Consultation with the RAPs for the Project should be maintained through the approvals process and post-approval construction.
6. A copy of the final ACHA should be lodged with AHIMS and provided to each of the RAPs for their records.

Akaysha Energy Pty Ltd is reminded that it is an offence under the *National Parks and Wildlife Act* to harm an Aboriginal object without a valid approval.

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Appendix A Previously recorded AHIMS site cards

Redacted – available on request to Heritage NSW

Appendix B Unexpected Finds Protocol

B.1 Unexpected Human Skeletal Remains

If any human remains or suspected human remains are discovered during any works, all activity in the 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 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 fenced off area immediately.

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 you must provide any available details of the remains and their location. Heritage NSW 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 unless authorised in writing by the appropriate consenting authority (Heritage NSW/DPE)
- 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, Heritage NSW and DPE.

B.2 Unexpected Aboriginal object

This unexpected find protocol has been developed to provide a method for managing unexpected Aboriginal heritage items identified during the construction and operation 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) and standard requirements for SSD Projects. It is noted that this is in draft form and may be required to be amended pending the issuing of the Conditions of Consent for this Project by DPE.

All Aboriginal heritage objects are protected under the NPW Act Under Part 6 of the Act, though in a State Significant Development (SSD) Development Consent 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 are encountered that were not anticipated that 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 will 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.

In the event that any unexpected Aboriginal heritage sites or objects are discovered during the Project, the following management protocols will be implemented. **Note: this process does not apply to human or suspected human remains which has been detailed above.**

In the event that Project activities identify any unexpected Aboriginal objects:

1. All works must halt in the immediate area of the heritage item to prevent any further impacts to the object(s). Personnel should notify their supervisor of the find, who will notify the project manager.
2. A suitably qualified archaeologist (or the Project Archaeologist) must be contacted to determine if the unexpected find is Aboriginal in origin or not. The visual inspection of the unexpected find should be undertaken with a minimum of one representative from the Registered Aboriginal Parties (RAP) for this Project. If no representative from the RAPs is available to participate in the inspection, the visual inspection of the unexpected object may be undertaken solely by a suitably qualified archaeologist (or the Project Archaeologist).

   If the unexpected find is determined to be Aboriginal in origin and within the approved footprint of the Project an appropriate mitigation method would be undertaken. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) and the management outcome for the site included in the information provided to AHIMS. For stone artefacts, which are considered the most likely type of unexpected find for this Project, at a minimum the collection and relocation of the object would be undertaken. If a dense assemblage of subsurface stone artefacts is identified it may be warranted to undertake a limited programme of salvage excavation. If any unexpected modified trees or archaeologically significant sites are identified additional consultation with the RAPs, Heritage NSW and DPE may be required which would be determined on a case by case matter in consideration of archaeological best practice and consultation with the appropriate consent authority.