Office of Environment & Heritage


# Aboriginal Cultural Heritage Assessment Report Cover Sheet

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| **Date of Report** | 17 January 2019 |

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# Aboriginal Cultural Heritage Assessment

## YANCO SOLAR FARM ACHA

JANUARY 2019

## Document Verification

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# EXECUTIVE SUMMARY

## INTRODUCTION

NGH Environmental has been contracted by ib vogt GmbH (ib vogt) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR). This document will be incorporated into a wider Environmental Impact Statement (EIS) for a proposed commercial scale solar farm located at Yanco in the Leeton Local Government Area (LGA).

The area of investigation covers 204 hectares (ha) encompassing Lots 142 and 145 – 152 DP 751745 and Lot 6650 DP 1197165 (proposal area), located 2.4 km south west of the town of Leeton, NSW. The proposed transmission line would connect to an existing TransGrid substation adjacent to the proposal area, located 1 km to the south-east.

The solar farm proposal would involve ground disturbance that has the potential to impact on Aboriginal heritage sites and objects which are protected under the NSW *National Parks and Wildlife Act 1974* (NPW Act). The purpose of the Aboriginal Cultural Heritage Assessment (ACHA) is therefore to investigate the presence of any Aboriginal sites and to assess the impacts and management strategies that may mitigate any impact.

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

> Include an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development, including adequate consultation with the local Aboriginal community (SEARS for Yanco Solar Farm 30/08/18).

This ACHA Report was prepared in line with the following:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011);
- *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2010a), and
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (ACHCRP) (OEH 2010b) produced by the NSW Office of Environment and Heritage (OEH)

## PROJECT PROPOSAL

The Yanco Solar Farm proposal area is 204 ha and the land is currently being utilised as an orange orchard and vineyard. The Yanco Solar Farm proposal would comprise the installation of a solar farm with a capacity of approximately 72 MW (DC) The power generated will be fed into the National Electricity Market (NEM) at the transmission level from the adjacent Yanco Substation.

The proposal would consist of the following components:

- Single axis tracker photovoltaic solar panels;
- Electrical cables and conduits;
- Inverter/transformer units;
- Battery storage units;
- Control room and switchgear to connect the solar farm to a new underground powerline, including synchronous condenser, other associated structures, lightening protection masts, control and protection equipment;

- Communications tower (20m high), adjacent to the control room;
- Site office, vehicle parking areas, access tracks and perimeter fencing;
- Operations and maintenance buildings with associated car parking;
- Vegetative screening;
- An overhead or underground 33kv electrical transmission line to connect the proposal to the Yanco substation;
- Widening access routes along Research Road and Toorak Road and intersection upgrades at Toorak Road and Canal Street, Irrigation Way and Canal Street, Toorak Road and Research Road and all associated access points and channel crossings into the proposed solar farm;
- Internal access tracks; and
- Lighting, CCTV system, security fencing.

## ABORIGINAL CONSULTATION

The consultation with Aboriginal stakeholders was undertaken for the proposed solar farm in accordance with clause *80C of the National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* following the consultation steps outlined in the (ACHCRP) guide provided by OEH.

The full list of consultation steps, including those groups and individuals that were contacted are provided in a consultation log in Appendix A.

As a result of this process a single group, the Leeton & District Local Aboriginal Lands Council (Leeton LALC), contacted the consultant to register their interest in the proposal. No other party registered their interest.

The fieldwork was organised, and the sole registered party was asked to participate in the fieldwork.

A copy of the draft report was provided to the registered party for comment. No comments were received.

## ARCHAEOLOGICAL CONTEXT

The assessment included a review of relevant information relating to the landscapes within the proposal area. Included in this was a search of the OEH AHIMS database. No Aboriginal sites have previously been recorded within the proposal area. The closest sites are three scarred trees located approximately 1 km to the north of the proposal boundary. There is a dominance of scarred trees in the wider region especially where there are remnant stands of native trees.

The results of previous archaeological surveys in the Yanco region demonstrate that there is a strong, complex and varied pattern of human use and movement through the landscape. This behaviour is recorded as a range of artefact and site types distributed and concentrated in specific landforms across the region. There does appears however to be a strong association between the presence of potential resources for Aboriginal use and the presence of archaeological sites. Areas directly associated with water and or elevated ground appear to have the greatest potential for identification of Aboriginal cultural material.

Based on the previous archaeological investigations and knowledge of Wiradjuri cultural practices and traditional activities the proposal area has a possibility of containing archaeological sites, given that Aboriginal people have lived in the region for tens of thousands of years. This would most likely be in the form of stone artefacts and scarred trees.

## SURVEY RESULTS

The survey strategy was to cover as much of the ground surface as possible within the proposal area. Survey transects were undertaken on foot to achieve maximum coverage. Over the course of the field survey approximately 25 km of transects were walked by each participant. Allowing for an effective view width of 5 m for each person, this equates to a total surface area examined of 52 ha. However, allowing for the visibility restrictions, the effective survey coverage was reduced.

A subsequent survey was completed for the relocated transmission line, south of Houghton Road. Moderate to high degrees of disturbance and low ground visibility were encountered along the 1.2 km length of the road reserve and channel bank. Despite this one isolated find (YSF_IF_001) was identified in an exposure on the channel bank.

Overall, it is considered that the surface survey of the Yanco Solar Farm proposal area had sufficient and effective survey coverage. The results identified in this report are considered a true reflection of the nature of the Aboriginal archaeological record present within the proposal area.

Given that the majority of the proposal area has been levelled and subject to extensive modification the lack of newly identified Aboriginal sites was not unexpected. The absence of Aboriginal scarred trees in the proposal area was expected and corresponds directly with the lack of remnant old growth trees within and adjacent to the immediate proposal area.

Based on the land use history of the proposal area, and an appraisal of the results from the field survey it was concluded that there was negligible potential for the presence of intact subsurface deposits with high densities of objects or cultural material within the Yanco Solar Farm proposal area.

Based on discussions with ib vogt during the production of this assessment, it was determined that the location of the proposed transmission line would be the original northern route between Houghton's Road and the canal to the north (*per Comms.* Jenny Walsh 20/12/18).

## POTENTIAL IMPACTS

Only one new Aboriginal heritage site, isolated find (YSF_IF_001) was identified across the proposed Yanco Solar farm project area and this site will be avoided by utilising the northern transmission line route. No areas of archaeological potential were identified during the survey of the proposal area. Therefore, the potential impacts to archaeological material are nil.

## RECOMMENDATIONS

It is recommended that:

1. Avoidance of isolated artefact (YSF_IF_001) be achieved by utilising the proposed northern transmission line route (Figure 9).
2. If the route is altered to the southern transmission line option in the future, then this site should be salvaged and reburied outside of the impact corridor in consultation with the Leeton & District LALC.
3. NGH Environmental does not believe it is warranted to undertake monitoring for ground disturbance associated with the proposed Yanco Solar Farm, based on the results of the surveys and level of previous disturbance across the site.
4. ib vogt should prepare an Unexpected Finds Protocol (UFP) to deal with construction activity and the inadvertent discovery of Aboriginal objects. An example UFP has been provided in Appendix D in case of finds.

5. In the unlikely event that human remains are discovered during the construction, all work must cease in the immediate vicinity. OEH, the local police and the registered Aboriginal parties should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal.
6. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the registered Aboriginal party and may include further field survey.

# 1 INTRODUCTION

ib vogt GmbH (ib vogt) proposes to develop a solar farm at Yanco, approximately 2.4km south west of the township of Leeton, NSW in the Leeton Local Government Area (LGA) (see Figures 1 -2). The proposal area covers 204 hectares (ha) encompassing Lots 142 and 145 – 152 DP 751745 and Lot 6650 DP 1197165. The proposal involves the construction of a ground-mounted photovoltaic solar array generating approximately 72 MW (DC) of renewable energy. The proposed transmission lines would connect to an existing TransGrid substation adjacent to the proposal area, located 1 km to the south-east.

NGH Environmental has been contracted by ib vogt GmbH (ib vogt) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) to investigate and examine the presence, extent and nature of any Aboriginal heritage sites within the proposal area as part of an Environmental Impact Statement (EIS)

The solar farm proposal would involve ground disturbance that has the potential to impact on Aboriginal heritage sites and objects which are protected under the NSW *National Parks and Wildlife Act 1974* (NPW Act). The purpose of the Aboriginal Cultural Heritage Assessment (ACHA) is therefore to investigate the presence of any Aboriginal sites and to assess the impacts and provide management strategies that may mitigate any impact.

## 1.1 DEVELOMENT CONTEXT

The development of renewable energy projects is one of the most effective ways to achieve the commitments of Australia and a large number of other nations under the Paris Agreement to reduce greenhouse gas emissions. The Yanco Solar Farm would provide the following benefits:

- Reduction in greenhouse gas emissions from energy generation (when compared with fossil fuel generating sources).
- Provision of embedded electricity generation to supply into the Australian grid close to a main consumption centre.
- Provision of social and economic benefits through the provision of direct employment opportunities.

The establishment of a solar farm would therefore have both local, National and International benefits.

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 solar farm is classified as “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 EIS has been prepared in accordance with 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:

> Include an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development, including adequate consultation with the local Aboriginal community (SEARS for Yanco Solar Farm 30/08/18).

## 1.2 PROJECT PROPOSAL

The Yanco Solar Farm assessment area is 204 ha and the land is currently being utilised as an orange orchard and vineyard. The Yanco Solar Farm proposal would comprise the installation of a solar farm with a capacity

of approximately 72 MW (DC) The power generated will be fed into the National Electricity Market (NEM) at the transmission level from the adjacent Yanco Substation.

The proposal would consist of the following components:

- Single axis tracker photovoltaic solar panels;
- Electrical cables and conduits;
- Inverter/transformer units;
- Battery storage units;
- Control room and switchgear to connect the solar farm to a new underground powerline, including synchronous condenser, other associated structures, lightening protection masts, control and protection equipment;
- Communications tower (20m high), adjacent to the control room;
- Site office, vehicle parking areas, access tracks and perimeter fencing;
- Operations and maintenance buildings with associated car parking;
- Vegetative screening;
- An overhead or underground 33kv electrical transmission line to connect the proposal to the Yanco substation;
- Widening access routes along Research Road and Toorak Road and intersection upgrades at Toorak Road and Canal Street, Irrigation Way and Canal Street, Toorak Road and Research Road and all associated access points and channel crossings into the proposed solar farm;
- Internal access tracks; and
- Lighting, CCTV system, security fencing.

The proposed development footprint is shown below in Figures 1 and 2. This includes all land likely to be directly impacted by the construction, operation and decommissioning of the proposal, including auxiliary construction facilities (site compound, laydown, stockpiling etc.), access and all considered options. It is important to note that the development footprint is indicative only and will be refined as part of the EIS process.

The proposal is expected to operate for around 30 years. The construction phase of the proposal is expected to take approximately 10 months. After the initial operating period, the solar farm would either be decommissioned, removing all above ground infrastructure and returning the site to its existing land capability, or upgraded with new PV equipment.

## 1.3 PROJECT PERSONNEL

The initial field work for this assessment was undertake by NGH Environmental archaeologists Amy Ziesing, Kirsten Bradley and Brett Chalmers. Amy Ziesing completed the research, Aboriginal community consultation, GIS mapping and report preparation. Kirsten Bradley and Mathew Barber reviewed the report.

The subsequent transmission survey to the south of Houghton Road was completed by Amy Ziesing and the Leeton & District LALC.

Consultation with the Aboriginal community followed the process outlined in OEH's *Aboriginal cultural heritage consultation requirements for proponents 2010* (Section 2). A single group, the Leeton & District Local Aboriginal Lands Council (Leeton LALC), registered their interest in the proposal.

Two representatives from the Leeton LALC participated in the fieldwork. The representatives were:

- Courtney Davy
- David Watts

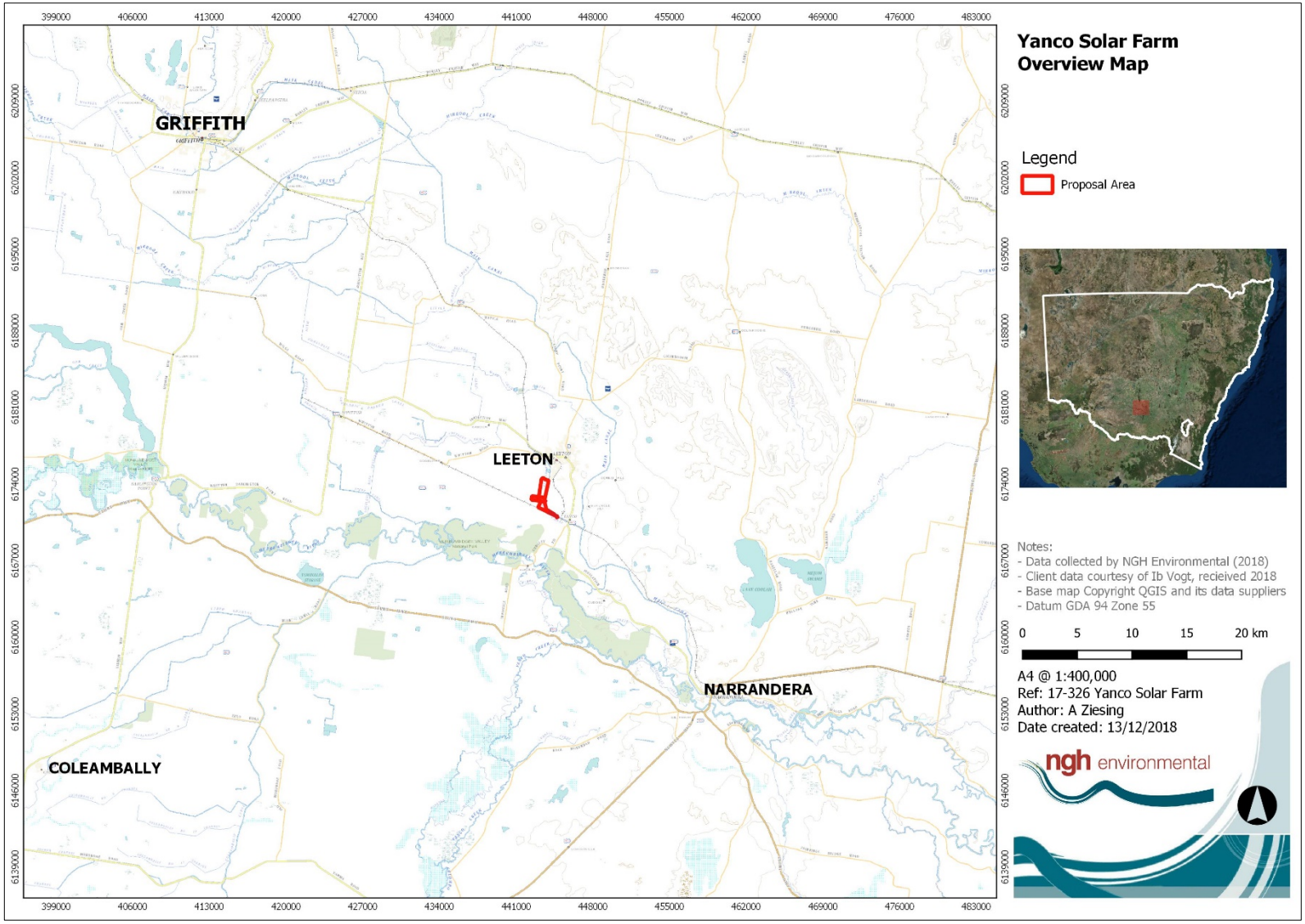


Figure 1. General project area.

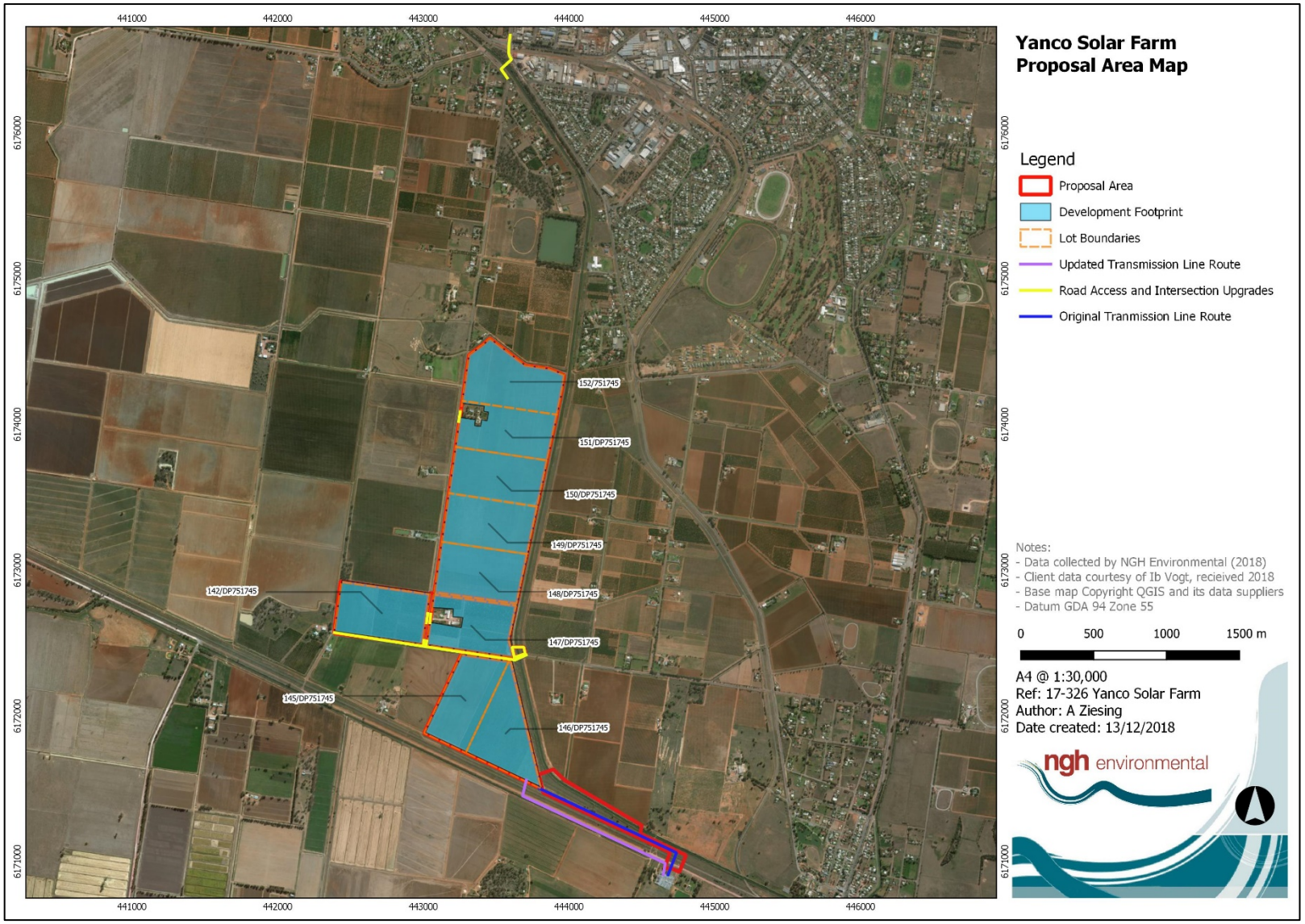


Figure 2. Proposed site layout.

## 1.4 REPORT FORMAT

For the purposes of this assessment, we have prepared the report in line with the following:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011);
- *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2010a), and
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (ACHCRP) (OEH 2010b) produced by the NSW OEH.

The purpose of this ACHA report is therefore to provide an assessment of the Aboriginal cultural values associated with the proposal area and to assess the cultural and scientific significance of any Aboriginal heritage sites. This conforms to the intention of the SEARs.

The objectives of the assessment were to:

- Conduct Aboriginal consultation as specified in clause 80c of the *National Parks and Wildlife Regulation 2009*, using the consultation process outlined in the ACHCRP*;*
- Undertake an assessment of the archaeological and cultural values of the proposal area and any Aboriginal sites therein;
- Assess the cultural and scientific significance of any archaeological material, and
- Provide management recommendations for any objects found.

# 2 ABORIGINAL CONSULTATION PROCESS

The consultation with Aboriginal stakeholders was undertaken in accordance with clause *80C of the National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* following the consultation steps outlined in the ACHCRP guide provided by OEH. 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 that were contacted is provided in a consultation log 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 the Leeton LALC and various statutory authorities including OEH, as identified under the ACHCRP. An advertisement was placed in the local newspapers, the *Leeton Irrigator* on 13 July 2018 seeking registrations of interest from Aboriginal people and organisations. A further series of letters was sent to other organisations identified by OEH in correspondence to NGH Environmental. In each instance, the closing date for submission was 14 days from receipt of the letter.

As a result of this process, a single Aboriginal group the Leeton LALC registered their interest in the proposal. No other party registered their interest.

**Stage 2**. On the 13th of September 2018, an Assessment Methodology document was sent to the Leeton LALC as the only registered party for the project. This document provided details of the background to the proposal, a summary of previous archaeological surveys and the proposed heritage assessment methodology to be employed. The document invited comments and sought any information regarding known Aboriginal cultural significance values associated with the proposal area and/or any Aboriginal objects contained therein. A minimum of 28 days was allowed for a response to the document. No comments were received on the methodology from the Leeton LALC however they 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 proposal area. It was noted that sensitive information would be treated as confidential. No response regarding cultural information was received in response to the methodology.

The fieldwork was organised, and the Leeton LALC were asked to participate. The fieldwork was carried out on the 22nd and 23rd of October 2018 by three archaeologists from NGH Environmental with two local Aboriginal representatives from the Leeton LALC.

Representatives who participated in the fieldwork were:

- David Watts (22 -23 October 2018) ; and
- Courtney Davy (22 -23 October 2018).

**Stage 4.** After the initial fieldwork, ib vogt relocated the proposed transmission line route to the southern side of Houghton Road, resulting in additional survey requirements. This additional area was provided to the Leeton LALC as an addendum email, utilising the same methods outlined in Stage 2.

**Stage 5.** The subsequent fieldwork was organised, and the registered party were asked to participate in fieldwork. Two members from the Leeton LALC participated in the fieldwork on the 11th of December 2018.

**Stage 6.** In December 2018 a draft version of this *Aboriginal Cultural Heritage Assessment Report* (this document) was forwarded to the Leeton LALC inviting comment on the results, the significance assessment and the recommendations. A minimum of 28 days was allowed for responses to the document. No comments were received on the draft report.

**Stage 7.** This ACHA report was finalised in January 2019.

## 2.1 ABORIGINAL COMMUNITY FEEDBACK

During the subsequent transmission line survey, it was requested by the representatives of the Leeton LALC that they be present to monitor any ground disturbance works associated with the Yanco Solar Farm. This included the demolition of orchards and vineyards across the site.

Community consultation occurred throughout the project. The draft report was provided to each of the Registered Aboriginal Parties (RAPs) and feedback was sought on the recommendations, the assessment and any other issues that may have been important.

No comments, recommendations or issues were received on the draft report during the 28 day review period.

# 3 BACKGROUND INFORMATION

## 3.1 REVIEW OF LANDSCAPE CONTEXT

### *3.1.1 Geology, Topography and Climate*

The landscape context assessment is based on a number of classifications that have been made at national and regional level for Australia. The national Interim Biogeographic Regionalisation for Australia (IBRA) system identifies the proposal area as located within the Riverine Plain or Riverina Bioregion of south eastern Australia (DE&E 2016). The Riverina Bioregion forms part of the Murray-Darling basin, which spreads over 1 million square kilometres in area and comprising 14% of Australia, extending from central southern Queensland through much of central New South Wales and into South Australia and northern Victoria.

The Riverina Bioregion (hereafter referred to as the Riverina) covers about 90,000 km$^2$, extending from just near Ivanhoe in the north to Shepparton in Victoria and from Balranald in the west to Narrandera in the east. The town of Hay is roughly the centre point of the Riverina.

The base geology of the region comprises vast undulating plains with flood deposits of Quaternary alluvium clays and silts with sand which border dune and lake systems.

The Murrumbidgee Scalded Plains Mitchell Landscape covers the entire proposal area (DECC 2002). The Cocoparra Ranges and Footslopes and the Murrumbidgee Channels and Floodplains are located within 2 km of the proposal area. These Mitchell Landscape descriptions are provided in Table 1 below and shown in Figure 3.

Table 1 Description of the Mitchell Landscape relevant to the proposal (DECCW 2002)

| Mitchell Landscape |
|---|
| **Murrumbidgee Scalded Plains** |
| Quaternary alluvial plains with extensive scalding shown as relic floodplains or terraces. Levees, lunettes and swamps are also present in this landscape. Relief is less than 1 m, but up to 5 m on pans, swamps and lunette formations. Grey, brown and red cracking clays to red-brown soils with scalds.<br>Low shrublands and grasslands of bladder saltbush (*Atriplex vesicaria)* and other annual saltbushes *(Atriplex sp.),* multiple burrs *(Sclerolaena sp.),* cottonbush *(Maireana aphylla),* bush minuria *(Minuria cunninghamii)* white-top grass *(Austrodanthonia caespitosa),* windmill grass *(Chloris truncate)* and hill wallaby grass *(Austrodanthonia eriantha).* |
| **Cocoparra Ranges and Footslopes** |
| This landscape is comprised of the Cocoparra and the Naradhan land systems. Steep crested ranges, ridges, hills and associated footslopes of Quaternary colluvium with outcrops of upper Devonian sandstone, conglomerate and siltstones. Cliff faces to boulder hill slopes range in relief from 30 to 260 m. Extensive rock outcrop, shallow sandy lithosols with acid, neutral and calcareous red earths on slopes and deep sandy alluvium in creek lines.<br>The ranges comprise scattered white cypress pine (*Callitris glaucophylla*), currawang (*Acacia doratoxylon*), Dwyer's mallee gum (*Eucalyptus dwyeri*) and red ironbark (*Eucalyptus sideroxylon*), locally dense broombush (*Melaleuca uncinata*), hill tea-tree (*Leptospermum divaricatum*), urn heath (*Melichrus urceolatus*), wedge-leaf hopbush (*Dodonaea viscosa*), punty bush (*Senna eremophila*), cough bush (*Cassinia laevis*), sugarwood (*Myoporum platycarpum*), grey box (*Eucalyptus micropcarpa*), wilga (*Geojera parviflora*), and Deane's wattle |

| **Mitchell Landscape** |
|---|
| (*Acacia deanei*), rock fern (*Cheilanthes sieberi*). Understorey of ranges consists of wire grass (Aristida sp.), mulga grass (*Thyridolepis mitchelliana*), short grasses and forbs.<br><br>On the lower slopes bimble box (*Eucalyptus populnea*), white cypress pine (*Callitris glaucophylla*), mallees (*Eucalyptus sp.*), yarran (*Acacia homalophylla*), wilga (*Geojera parviflora*), emu bush (*Eremophila longifolia*) and various acacias (*Acacia sp*.) with grasses and forbs. |
| **Murrumbidgee channel and floodplains** |
| Quaternary alluvium on seasonally inundated floodplains, active and inactive channels, billabongs, levees and swamps of the Murrumbidgee River and its effluent streams. Relief to 10 m. Includes scalded alluvial flats, broad elevated floodplains and associated relict channels; isolated sandy rises, relief to 5 m. Grey and brown clay with occasional areas of low sandy rise.<br><br>Open forest of river red gum (*Eucalyptus camaldulensis*), river cooba (*Acacia stenophylla*), cooba (*Acacia salicina*), lignum (*Muehlenbeckia cunninghamii*), nitre goosefoot (*Chenopodium nitrariaceum*) with numerous grasses along the channels and floodplain. Black box (*Eucalyptus largiflorens*) woodland with lignum, nitre goosefoot, thorny saltbush (*Rhagodia spinescens*), old man saltbush (*Atriplex nummularia*) and annual saltbushes (*Atriplex sp*.) on more distal floodplains and back plains. Cumbungi (*Typha orientalis*), common reed (*Phragmites australis*) and nardoo (*Marsilea drummondii*) in flooded depressions. |

The proposal area is devoid of naturally occurring bedrock outcrops which might have provided a source of stone material for Aboriginal people. However, outcroppings of sandstone and conglomerate materials are to likely occur in the Cocoparra Ranges and Footslopes landscapes which are located 2 km to the north east of the proposal area.

There is no topographic or discernible variation in the elevation within the land for the proposed solar farm as the majority has been subjected to extensive levelling. It is possible laser levelling may have been used in the past when the land was used to grown rice.

Within the proposal area, the soils are typically a brown or reddish-brown cracking clay with some silt content and very little natural gravels. The soil profile would be expected to be deep with little variation for metres in the heavily aggrading landscape.

While no natural creek lines are evident in the proposal area it is possible and considered likely that the Gogeldrie Branch Canal which boarders the eastern boundary was constructed along a previous creek line that was modified into an irrigation canal. Any natural hydrology of the proposal area has been largely been replaced by irrigation, drainage channels and dams. The proposal area contains six farm dams.

Guises Creek is located approximately 1.8 km to the south and flows into the Murrumbidgee River. The Murrumbidgee River is located approximately 4.3 km south and is a dominant feature within the Riverine landscape. The River is also a key factor in the formation of the landforms in the area. Over many millennia through the Pleistocene, the river systems migrated across the plain forming a complex series of channels, levees, source bordering dunes, lunettes and lakes. Some of these features are visible today, along with more recent Holocene features such as cut off meanders or billabongs, swamps, distributary creeks and anastomosing channels, which altogether form a highly complex landscape of interwoven land units.

The proposed solar farm area has been heavily modified for agricultural production. This has included:

- Extensive clearing of native vegetation;
- Wide spread earth moving to flatten the paddocks (possible laser levelling);
- Construction of Gogeldrie Branch Channel;

- Construction and maintenance of roads and other minor access tracks;
- Construction and maintenance of table drains and irrigation channels;
- Construction for infrastructure such as buried communication cables and overhead powerlines; and
- Ploughing/grading along fence lines for fire breaks.

### *3.1.2 Vegetation*

As stated above, the proposal area is mostly devoid of natural vegetation as the result of clearing. The land is currently used to produce orange orchards and a vineyard and has lost almost all native tree cover and understorey. Introduced species are widespread across the proposal area; however, patches of Yellow Box and River Red Gum woodland surround the area. A patch of planted Eucalypts trees surrounds a house block in the northern part of the proposal area and a windbreak of planted Casuarina species occur along the north-western boundary.

An area of Riverine Plain Grassland occurs along the road side of Houghton Road. Species present within this vegetation community include Curly Windmill Grass (*Enteropogon ramosus*), Speargrass (*Austrostipa spp.*), Red Grass (*Bothriochloa macra*), Wallaby Grass (*Rytidosperma* spp.) and Fuzzweed (*Vittadinia* spp.).

Irrigation channels and dams within the proposal area lack native vegetation and are surrounded by exotic vegetation such as Barley Grass (*Hordeum leporinum*), Prickly Lettuce (*Lactuca serriola*), Mallow (*Malva parviflora*) and Phalaris (*Phalaris aquatica*).

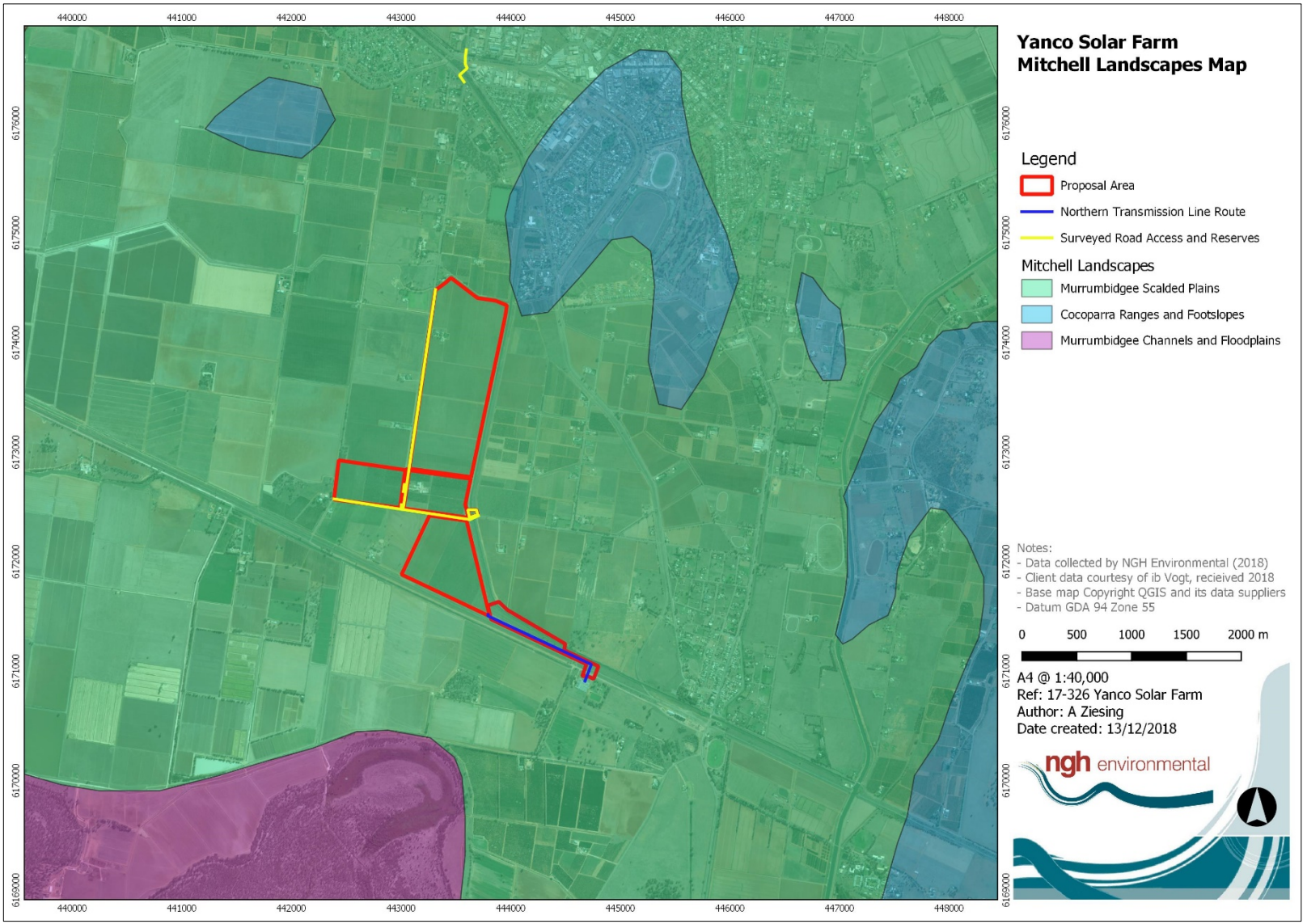


Figure 3. Location of Mitchell landscapes.

### *3.1.3 Historic Land Use*

The township of Yanco, located 5 km south of Leeton, arose when the railway line was extended from Narrandera to Hay in 1881. The railway station was built to service the home of Sir Samuel McCaughey, who is known as 'the father of irrigation.' His farm in North Yanco utilised over 16,000 ha for irrigation with 320 km of channels constructed with steam driven pumps used to create the flow from the river. He began these endeavours in 1899 and by 1906 he had convinced the government of the need for an irrigation scheme over the Riverina region which is known as the Murrumbidgee Irrigation Scheme. The Murrumbidgee Irrigation Scheme was approved by the NSW Government in 1906 and the region saw increased population growth as local towns flourished in support of the Scheme.

The Murrumbidgee Irrigation Area was officially recognised in 1912, with the establishment of dams and weirs to redirect water from the Murrumbidgee River for irrigation purposes. The establishment of the irrigation scheme led to development of the wider region through construction of channels, either by constructing new ones with banks and levees or channelising existing creek lines. The scale of the development required extensive earthworks. It is not known when the proposal area was first cleared and developed but it is assumed it would have been around the time the Murrumbidgee Irrigation Scheme was commenced. The area would have most likely been used as pastoral and/or agricultural farm land prior to the construction of the irrigation system.

The location of the proposed Yanco Solar Farm is within land currently utilised for orange orchards and a vineyard. These practises use drip irrigation systems with water from the Gogeldrie Branch Canal, bordering the eastern boundary of the proposal area. The proposal area has been modified for orcharding and vineyard production for at least 25 years and the land has been intensively used for farming. It is noted that the land was previously intensively irrigated for rice production which is renowned in the Leeton area.

Given the history of the agricultural development of the proposed Yanco Solar Farm area the land has been subject to considerable impacts from farming for many decades. Overall, the proposal area would be categorised as highly disturbed through continual modification for farming and irrigation activities over many decades.

### *3.1.4 Landscape Context*

Most archaeological surveys are conducted in a situation where there is topographic variation, this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal archaeological sites. As already noted, the proposal area contains no topographic variation which has been furthermore reduced by paddock levelling for cultivation.

There are no differences in the soil types or discernible micro features across the proposal area. The only difference observed within the landscape was the difference in crops which is clearly dived into the orange orchard and the vineyard. Given the lack of topographic or soil variation no areas are identified to have high archaeological potential however stone artefacts as isolated occurrences or low-density scatters may occur across the proposal area. All remnant old growth trees have been removed from the proposal area.

## 3.2 REVIEW OF ABORIGINAL ARCHAEOLOGICAL CONTEXT

### *3.2.1 Ethnohistoric Setting*

There are several ethnographic recordings of Aboriginal life in the Murrumbidgee region from the 1800s that notably focus on the prevalence of Aboriginal people around waterways in the region. It is however important to consider that the Aboriginal people alive at the time of such observations were survivors of serious epidemics of infectious disease such as smallpox, bought 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 were disrupted or destroyed. Despite this Aboriginal people continued to maintain their connections to sites and the landscape in a variety of ways. The Aboriginal people of the region continue to have a strong connection to their land.

**Tribal boundaries**

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, p. 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. 8–16).

The Yanco and Leeton area is within an area identified as part of the Wiradjuri language group (Howitt 1904, Tindale 1974, MacDonald 1983, Horton 1994). This is an assemblage of many small clans and bands speaking several similar dialects (Howitt 1996, Tindale 1974, MacDonald 1983, Horton 1994). The Wiradjuri language group was the largest in NSW prior to European settlement. Wiradjuri people believe that "*Wiradjuri was created and come from the Wiradjuri creator. The origins of Wiradjuri…came from Wiradjuri country…from the beginning. We were always here*" (Yalmambirra 2013).

The Wiradjuri borders however were not static, they were most likely fluid, expanding and contracting over time to the movements of smaller family or clan groups. These boundaries ebbed and flowed through contact with neighbours, the seasons and periods of drought and abundance.

**Social structures**

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 several 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 several 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.

**Material culture**

Accounts of the material culture of Aboriginal people in the Murray Darling Depression have been detailed extensively by Oxley (1820), Bennet (1834) and later Beveridge (1883) and include descriptions of tools kits, weapons and clothing.

Bennet (1834) detailed the manufacture of possum and kangaroo skin coats using mussel shell scrapers to render the skin pliable. Kangaroo tail sinew made into thread and bone awls were used to stitch the skins into cloaks, many of which had ornamental patterns scratched onto the inner side. The kangaroo sinew was also recorded as used to create head ornaments in the form of hair nets stained with ochre or pipeclay for both men and women (Bennet 1834). Both Oxley (1820) and Bennet (1834) observed that both sexes had the *septum naris* perforated in which a bone, straw or stick was worn. The adult men were also missing an upper incisor attributed to a marker of initiation (Oxley 1820, Bennet 1834) .

A range of tools and weaponry were recorded including spear throwers, parrying shields, broad shields, clubs, shovels, axes and varieties of throwing sticks (Oxley 1820, Bennet 1834, White 1986) as well as trapping nets made from plant fibre cord (Beveridge 1883).

Digging sticks were used by women to collect vegetable foods and 'grub shovels' or small wooden spades were described by Eyre (1845) as being used to dig up grubs, ants and Mallee roots. Skin bags and bark troughs were used to carry water and baskets were made from grasses, rushes and netting (Beveridge 01889, Lawrence 1967). Beverage (1883) describes a wooden trough placed over coals for cooking and 'flints, mussel shells, kangaroo bones and split reeds were used in cutting and skinning foods' (Lawrence 1967, p. 86). Grindstones and pestles were used to pound roots and mill seed and along the Darling River the deliberate cultivation and harvesting of wild millets was recorded (Mitchell 1839, Allen 1974). The bark off trees was also cut and used to carry babies (Creamer 1985, p.4).

In an archaeological context, few of these items would survive, particularly in an open site context. Anything made from bark, timber or animal skins would decay quickly in an open environment. However, other items, 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.

**Food and Resources**

There are several ethnographic recordings of Aboriginal life in the Murrumbidgee region from the 1800s. Most notably, the observations of Beveridge (1883) focused on the prevalence of Aboriginal people around water ways in the region. 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 Wiradjuri people were known as the people of the three rivers: the Wambool (Macquarie River), the Kalari (Lachlan River) and the Murrumbidjeri (Murrumbidgee River).

The Fivebough and Tuckerbil Wetlands, which are located approximately5 km north east of the proposal area, have always been an integral food resource for the Wiradjuri people (Creamer 1985). The abundance of natural edible plant and animal species present year-round meant that it became a gathering, hunting and fishing place that contributed greatly to the diet of the local tribes. Sustainable practices were employed to ensure that only enough food for the next meal was collected and breeding stocks were left untouched. Many native species still thrive here including ruby saltbush (*Enchylaena tomentosa*), old man saltbush (*Atriplex nummularia*), spiny saltbush (*Rhagodia spinescens*) and Hills Indigo (*Indigofera australis*). 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, Aboriginal people were adept at identifying and utilising resources either on a seasonal basis or all year round.

Historic accounts of Aboriginal people in the Riverine Plains of south eastern Australia reflect a group of people reliant on a range of both aquatic and terrestrial food resources. During certain seasons, fish, shellfish and waterfowl provided a significant part of the flesh diet and corresponds to periods where relatively small areas of land could support large groups of people. In other seasons populations living along the rivers were greatly reduced and the focus on and acquisition of aquatic resources changed. It is during these periods that terrestrial resources became more important and food gathering activities diversified.

During the annual flooding of the rivers, swamps and river flats were inundated and billabongs filled. Under these conditions the netting and trapping of fish by large groups of people became prevalent. The base of a large fibre net would be weighted down with clay heat retainers and at the top of the net reed bundles would be attached as floats. One man would hold one end of the net on the shore while the other would wade into the lagoon gradually dropping the net, once he reached the shore, forming a semi-circle. The two people would start pulling the net back, moving towards one another, hauling the catch of fish towards them. Such activities were recorded to have produced very large volumes of fish (Sturt 1833, p. 92, Beveridge 1883, pp. 28–30). Within major billabongs log traps were also constructed to trap fish within a smaller area, for easier access and often associated with large gatherings of people (Gilmore 1934). Additionally, women were recorded catching crayfish, where two women would trawl a fine gauged net along the lagoon bottom.

The trapping of ducks and other waterfowl in lagoons using large nets has also been observed and Beveridge suggests that over a season hundreds of birds are caught in this manner (Beveridge 1883). Additionally huge numbers of waterbird eggs during breeding season were collected using canoes (Beveridge 1883, p. 18).

Beveridge (1883) observed canoes being manufactured from a single sheet of Red Gum bark that was propped and moulded into the desired shape and left to season in the sun for ten to fifteen days (Beveridge 1883, pp. 24–25). He details pronged fish spears that doubled as a means to pole and paddle the canoes, used to harpoon fish in areas of reedy shallow water (Beveridge 1883, Kabaila 1999). Lawrence (1967) suggests that these spears were probably only used when the reed beds were filled with water and consequently not as important during the remainder of the year.

As the flood waters began to subside, the number of people the land could support began to decline. People began to fish in the broader reaches of the rivers using short, stout spears (Lawrence 1967, p. 76) and women would create weirs made of wooden stakes to trap larger fish in pools as the waters receded (Beveridge 1883, p. 30). Other types of fish traps across rivers have been recorded such as the bridging of a watercourse with a tree trunk with interwoven brush or saplings forming a net beneath the tree preventing larger fish from moving on. As the river flow dwindled and the fish became concentrated in smaller and smaller pools, fish-poisoning could be effectively employed (Lawrence 1967, p. 76).

Collection of river mussels using the toes was recorded by (Sturt 1833) and Balme suggested that mussels were the most common item in the remains of open midden sites along the Darling River and associated lakes in western NSW.

The range of methods employed to exploit aquatic resources were not a matter of random choice, but instead formed part of an annual cycle of fluctuations in river level and flow (Lawrence 1967).

A range of reptiles, other mammals and insects were also a common food type, in particular grubs and ants and ant eggs (Fraser 1892, Pearson 1981). 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 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).

### *3.2.2 AHIMS Search*

The Aboriginal Heritage Information Management System (AHIMS) is maintained by OEH and provides a database of previously recorded Aboriginal heritage sites. A search provides basic information about any sites previously identified within a search area. However, a register search is not conclusive evidence of the presence or absence of Aboriginal heritage sites, as it requires that an area has been inspected and details of any sites located have been provided to OEH 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 approximately 5 km x 5 km centred on the proposal area extent, on the 2nd of August 2018. The AHIMS Client Service Number was: 361544. An additional search of the AHIMS database was undertaken on the 13 December 2018 to provide a better understanding of the site type modelling in the area. The search was conducted over an area approximately 30 km x 30 km centred on the proposal area. The AHIMS Client Service Number was: 388779. The search area ranged from (Lat, Long) – 34.8091 , 146.1435 to (Lat , Long) - 34.3753 , 146.6039 . There were an additional 106 Aboriginal sites and one declared Aboriginal Place recorded in the search area. Figures 4 and 5 shows the locations of the AHIMS sites in relation to the proposal area and Table 2 shows a breakdown the of the site types.

Table 2 Breakdown of previously recorded sites with 30km of the proposal area.

| Site Type | Number |
|---|---|
| Artefact (1 or more) | 49 |
| Modified Tree (Carved or Scarred) | 49 |
| Massacre | 1 |
| Stone Quarry | 2 |
| Aboriginal Resource and Gathering | 2 |
| Earth Mound/PAD | 1 |
| Earth Mound, Hearth (oven) | 2 |
| Artefact Scatter, Stone Quarry | 1 |
| Shell Midden | 1 |
| Restricted Site | 1 |
| **TOTAL** | **112** |

None of the registered AHIMS sites are located within the proposal area. The closest sites are three scarred trees located approximately 1 km to the north. There is a dominance of scarred trees in the wider area especially where remnant stands of native trees exist.

One of these scarred tree sites (AHIMS# 49-6-001) is listed as destroyed. Email correspondence with OEH confirmed that the Restricted Site (AHIMS# 49-6-0036) does not fall within the proposed Yanco Solar Farm area, but is closer to Narrandera (*per email* OEH, Eva Day 14/12/18).

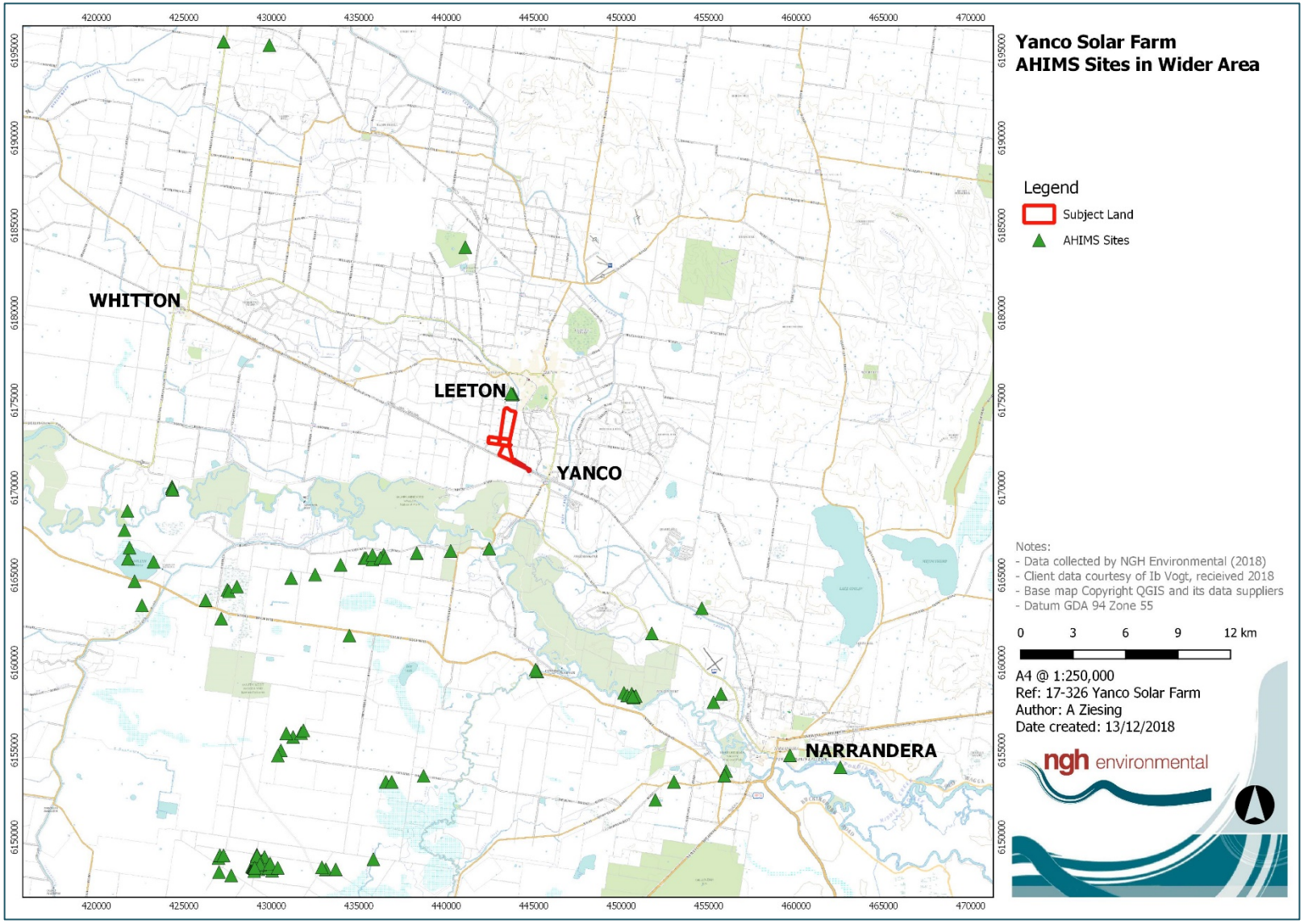


Figure 4 AHIMS Sites within a 30 km radius of the proposed Yanco Solar Farm.

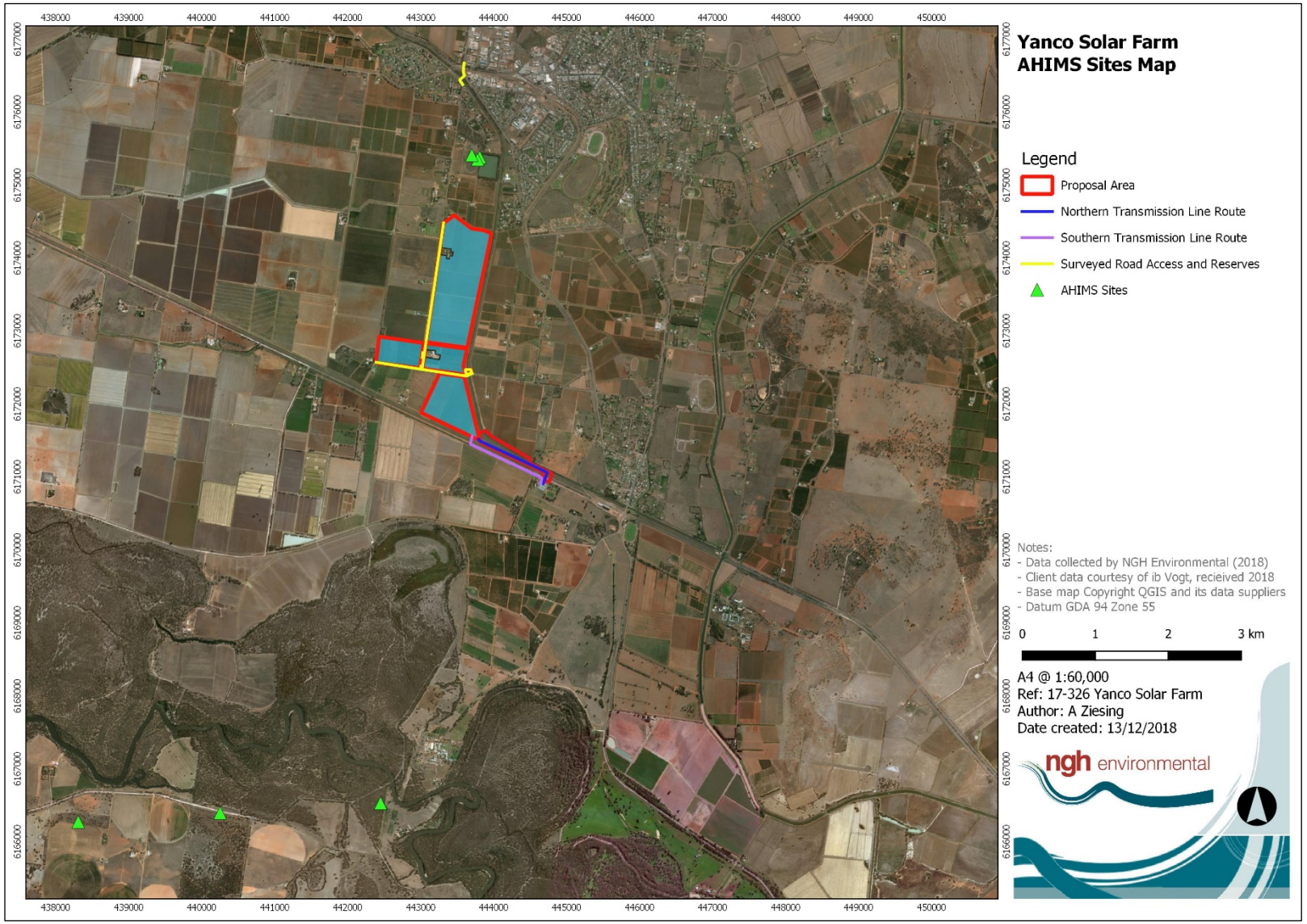


Figure 5. AHIMS Sites recorded within 5km of the Yanco Solar Farm, in the wider Leeton area.

### *3.2.3 Historic Heritage*

#### Australian Heritage Database

A search of the Australian Heritage Database was completed on 13 December 2018. The following were found near the proposal area:

Table 3 Australian Heritage Database Search Results.

| Scheme | Heritage Item | Status | Impact |
|---|---|---|---|
| **Yanco Solar Farm** | Dry Lagoon Area, Narrandera | Indicative Place | None |
| | Indigenous Place, Leeton | Registered | None |

#### State and local heritage

Searches of the State Heritage Register were completed on 13 December 2018, which found 12 items of identified state significance was located near the proposal area.

Table 4 NSW State Heritage and S.170 NSW State Agency Heritage Registers Database Search Results.

| Scheme | Heritage Item | Status | Impact |
|---|---|---|---|
| **Yanco Solar Farm** | Yanco Weir and site | Registered (#00969) – State Heritage Register | None |
| | Yanco Police Station and Official Residence | Registered – s.170 NSW State agency heritage register | None |
| | Gogeldrie Weir | Registered – s.170 NSW State agency heritage register | None |
| | Driveway Palm Trees | Registered – s.170 NSW State agency heritage register | None |
| | Gaol and Solitary Confinement Cell | Registered – s.170 NSW State agency heritage register | None |
| | Olive Trees | Registered – s.170 NSW State agency heritage register | None |
| | Rice Seed Germplasm Collection | Registered – s.170 NSW State agency heritage register | None |
| | Takasuka Monument | Registered – s.170 NSW State agency heritage register | None |
| | Yanco Agricultural Institute | Registered – s.170 NSW State agency heritage register | None |
| | Yanco Old Weir | Registered – s.170 NSW State agency heritage register | None |

A search of the Leeton Local Environmental Plan 2014 was completed on 13 December 2018, which found 21 items of identified local significance within the proposal area.

Table 5 Local Environmental Plan Listings

| Scheme | Heritage Item | Status | Impact |
|---|---|---|---|
| **Yanco Solar Farm** | Yanco Public Hall | Registered - Local | None |
| | Blue Gate Dam and Cudgel Escape, McCaughey Irrigation Works | Registered - Local | None |
| | Yanco Powerhouse Museum | Registered - Local | None |
| | Yanco Water Tower | Registered - Local | None |
| | Yanco Public School | Registered - Local | None |

| | | | |
|---|---|---|---|
| | Palm Tree row | Registered - Local | None |
| | Tatsuka Monument | Registered - Local | None |
| | Yanco Agricultural Institute, gaol and solitary confinement cell | Registered - Local | None |
| | Yanco Agricultural Institute, main buildings | Registered - Local | None |
| | Yanco Agricultural Institute, olive trees | Registered - Local | None |
| | Yanco Agricultural Institute, Rice seed germplasm collection | Registered - Local | None |
| | Water trough | Registered - Local | None |
| | Hotel Yanco | Registered - Local | None |
| | Yanco School of Arts (former) | Registered - Local | None |
| | Yanco Post Office (former) | Registered - Local | None |
| | St Mary's Anglican Church (former) | Registered - Local | None |
| | Yanco Police Station and lock up (former) | Registered - Local | None |
| | Catholic Convent | Registered - Local | None |
| | St Patrick's Catholic Church | Registered - Local | None |
| | Yanco Agricultural High School (former Samuel McCaughey's Homestead) | Registered - Local | None |
| | Yanco Conservation Area | Registered - Local | None |

None of these items of historic heritage significance will be impacted by proposed Yanco Solar Farm. The closest site is over 750 m east from the proposal area.

All these historic heritage places are shown in Figure 6 below.

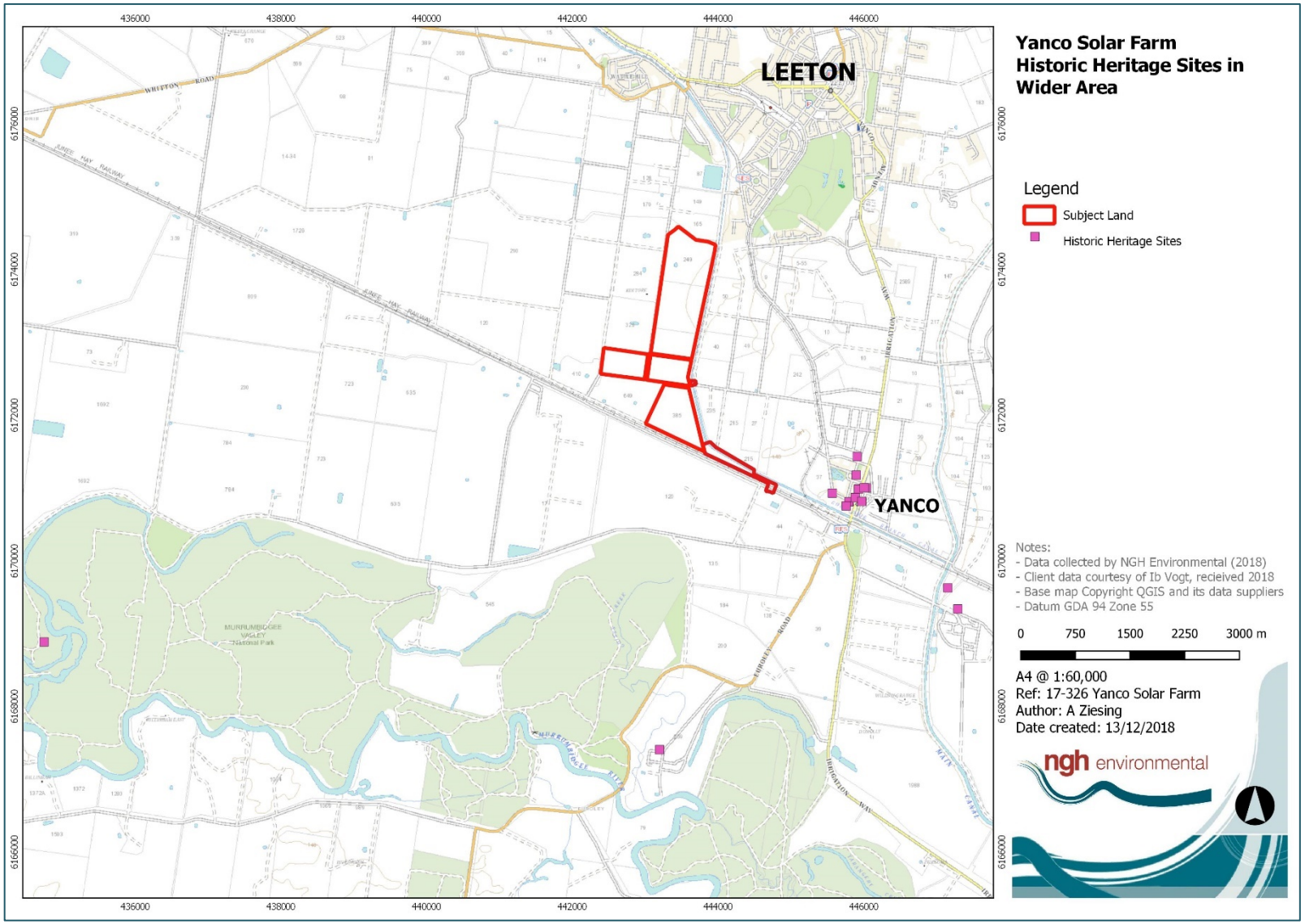


Figure 6 Historic Heritage Sites within the wider Yanco Area.

### *3.2.4 Archaeological Setting*

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). Archaeological evidence from Lake Mungo, 160 km to the west of the proposal area provides ample evidence of Aboriginal occupation dating back 40,000 years (Bowler et al. 2003). No regional synthesis of the archaeology has been completed for the Yanco area however some archaeological investigations have been conducted relatively close to the study area. A summary of those surveys is provided below.

In 1977 McIntyre conducted an archaeological survey of the Tombullen Swamp, approximately 33 km south west of the proposal area. The swamp is an abandoned meander channel of the Murrumbidgee River near the entrance to the Tubbo Homestead. Source-bordering dunes area situated to the north and south west of the swamp. 18 archaeological sites were located, including 15 scarred trees and three artefact sites. Most of the tree sites were suspected of being used as bark canoes, with three of possible Aboriginal origin. The artefact sites contained low density finds of flakeable or ground material. Ground surface visibility was low surrounding the swamp, which prevented the identification of further sites of Aboriginal cultural heritage. No large artefact scatters, hearths or shell middens were identified. Areas of archaeological potential for burials were noted in the sand hills and a stop works procedure recommended for any works in this area.

In 1978 Kelly and Morris surveyed the Aboriginal sites at the Warrangesda Aboriginal Mission at Darlington Point approximately 53 km west of the proposal area. The report details the history of the Mission and discusses the two burial sites and access to these areas. Detailed accounts of the construction of the buildings by Aboriginal people living on the Mission is also provided. There are also registered sites cards for scarred trees in the area (AHIMS # 49-5-46 and 49-5-21).

In 1982 Gollan carried out a survey for the proposed 132 Kv transmission line from Darlington Point to Griffith. The survey route is approximately 19 km west of the proposal area. This survey identified artefact scatters, a stone quarry and scarred trees . Several scarred River Red Gum trees were recorded on the southern bank of the Murrumbidgee River and an artefact scatter was recorded that extended across both sides of Mirrool Creek. This survey identified an Aboriginal stone quarry on Whitton Road, where stone material was extracted for flaking. Gollan identified that the stone source as the pebbles from the pebbly sandstone and conglomerate beds, over a 40 m x 50 m area. Although the location was heavily disturbed from recent quarrying and machine extraction, Gollan (1982) found numerous cores, flakes and hammerstones confirming the Aboriginal use of the outcrop. Raw materials recorded included quartz, quartzite, chert, greenstone and basalt. The site also exhibited signs of excavation or quarrying to obtain better materials (Gollan 1982).

In 1982 Thompson undertook a survey from Darlington Point to Yanco for a proposed transmission line. The route from Darlington Point passed though mainly grazing country, away from the Murrumbidgee River before crossing over the river near Euroley Bridge and continuing through farmed land to the substation in Yanco. During the survey Thompson recorded several Aboriginal sites. The most common site type recorded was scarred trees, with scars present on several different tree species. Larger scars, attributed to extraction for possible canoes, were located away from the river, and were noted to most likely be extracted during flooding events when the water was higher. Several smaller scars were also identified on Black Box trees. The survey also identified several potential oven sites however they were unable to unequivocally determined to be Aboriginal in origin. One surface camp site was identified, and four isolated stone artefacts were also recorded. As stone is not a naturally occurring resource in the area, it was concluded by Thompson that these tools would have been brought to the area from outside resource areas.

In 1983 Witter completed an archaeological survey of the Yanco to Darlington Point Transmission Line for NPWS and ELCOM. The purpose of this report was to inspect the effect of development on the previously recorded sites (Thompson 1982) and to survey a 10 km deviation of the proposed route. All previously recorded sites were assessed including possible oven mounds, 32 scarred trees, grindstone and axe fragments and three historic sites. Four additional Aboriginal sites were identified, including two occupation sites and two scarred trees. The artefact and hearth sites were in plains, one in a ploughed field and the other in an exposure, within 100 m of a Black Box flood channel.

In 1985 Creamer completed a report on the cultural significance of the Koonadan – Tuckerbil Area to the Aboriginal people of the Leeton District. The investigations were conducted over a two-year period with members of the Leeton Aboriginal community, including three prominent Elders and younger individuals. It details the location, past uses of the area by Aboriginal people and the associated significance of the area, including historic links to the nearby Warangesda mission. The site contains skeletal remains within the sand hill, open campsites, hearths, scarred trees, Burbung grounds and resource places. Unfortunately, the scarred trees and Burbung (ceremonial) grounds have been removed through land clearance and cropping. The report also provides an overview of management procedures and future recommendations. These including the gazettal of portion 302 as an Aboriginal Place in 1983, which ceased sand mining in the area and saw the erection of fencing, signage and valuation of the land. Monitoring of the sites for erosion by the Leeton LALC is an ongoing procedure. Creamer subsequently recommends that management plans for Koonadan and neighbouring Tuckerbil Swamp are produced to provide regulatory protection of both sites.

In 1985 McIntyre carried out a survey for a 167 km transmission line between Darlington Point and Deniliquin. A total of 27 Aboriginal archaeological sites were recorded with one associated with historic features. The site types recorded were primarily scarred trees with artefact scatters, hearths and mounds also recorded. Artefacts were manufactured from silcrete, quartz, basalt, siltstone, chert and siliceous rock. All scarred trees recorded during the survey were Grey Box trees. McIntyre noted that most of the sites recorded were clustered around existing water courses. It was suggested that such areas were favoured by Aboriginal people as they provided several resources such as food, water and shade.

Work undertaken by Edmonds (Edmonds 1990, 1992, 1995, 1996) in the Benerembah Irrigation District (BID), a 44,000 hectare area 70 km west of the proposal area has established a model of site location for the region. The 1990 and 1992 surveys carried out by Edmonds within the BID recorded 13 scarred trees, 3 artefact scatters, 4 hearths, 2 of which were in association with artefacts and an open campsite (Edmonds 1996, p. 11). Edmonds differentiates a campsite from an artefact scatter by the presence of hearths and implements such as grindstones (Edmonds 1995, 1996). Six physiographic land units were identified in the BID, which were representative of the broader riverine plains. They included Prior Stream Formations, Elevated Lands, Alluvial Plains, Linear Depressions, Alluvial Floodplain and Occluded Depressions. It was concluded that two of these landforms were archaeologically sensitive, linear depressions and prior stream formations (Edmonds 1996, p. 11).

In 1993 Holmes completed a report on the conservation works of Warangesda Aboriginal Mission in Darlington Point, approximately 53 km west of the proposed solar farm area. While the theme of this report focuses on the historic heritage component, it has been included in this summary for its association with many of the Aboriginal community members of the Leeton area. The conservation of the site also included the preservation of artefact scatters, mounds and small hollows with adequate fencing. The Mission operated from 1879-1924 with food resources being subsidised by traditional fishing and hunting throughout the local region.

In 1995 Hamm carried out a survey for a 117 km optical fibre cable to link telephone exchange networks from Darlington Point, Coleambally, Finley and Jerilderie, between 50-150 km west of the proposed solar farm. A

total of 20 sites were recorded during the survey with three scarred trees located between Darlington Point and Coleambally and 17 scarred trees recorded between Finley and Jerilderie. All scars were on Yellow Box trees.

In 1997 Australian Archaeological Survey Consultants (AASC) assessed several unused gravel pits at Hull's Quarry located between Wagga Wagga and Narrandera that were identified for further extraction approximately 72 km south east of the current assessment area. The study area was 5 km north of Old Man Creek and 5 km south of the Murrumbidgee River. No sites were recorded, and it was noted that this may be due the distance from a reliable water source. It was also suggested that the absence of sites may be the result of prior disturbances in the area.

In 1998 Central West Archaeological and Heritage Services (CWAHS) surveyed the 40 km proposed optic fibre cable route between Morundah and Dundure that followed the Newell Highway (CWAHS 1998a). This survey route is approximately 54 km north of the current assessment area. A total of five sites were recorded during the survey. The sites were three mounds, a scarred tree and a mound/open campsite with an artefact scatter. The mounds were all located near watercourses (Yanco Creek). Five additional areas of potential archaeological sensitivity were also identified at sandhill and/or dune deposits along the proposed route for a total of 2.6 km. It was recommended that due to the sensitivity of these landforms that works should be monitored in these locations by a LALC representative or an archaeologist. It was noted that the potential for sites over most of the survey was low given that presence of black soils and the generally high level of surface disturbance.

In 1998 CWAHS (1998b) also surveyed the 22 km proposed optic fibre cable route between Narrandera and Euroley (CWS 1998b). No sites were recorded during the survey however two archaeologically sensitive sand hills were located along the Sturt Highway approximately 9.5 km and 16 km west of Narrandera. It was recommended that due to the sensitivity of the sand hill landforms that works should be monitored in these locations by a LALC representative or an archaeologist. It was noted that the potential for sites over most of the survey area was low.

In 1999 CWAHS surveyed the proposed widening of the Colombo Creek Bridge and the Colombo Creek Floodway Channel Bridge approximately 57 km south west of the current proposal area. A single quartz flake and an associated area of potential archaeological deposit (PAD) were recorded. It was noted that the PAD was a raised dune above the floodplain that had potential for burials and artefacts. It was recommended that works should be monitored and that the widening of the bridges and the approached occur on the western side of the road to avoid the archaeologically sensitive area.

In 2000 Barber completed subsurface investigations at Lake Wyangan in Griffith for the Local Aboriginal Land Council, approximately 72 km north west of the proposed solar farm. Surface artefacts were identified at four locations, including a lunette formation on the eastern side of Lake Wyangan (Area A). The ridge running north to south through the property was also identified as being archaeologically sensitive despite no surface artefact being identified (Area B). The sensitivity of the ridgeline pertained to its elevated nature and proximity to a creek line. 70 test pits were predicted for Area A and a further 40 test pits for Area B; however, this number was reduced during the fieldwork as some of the digging was undertaken with a mini excavator, resulting in the same volume of soil material being removed but over less surface area (Area A=12, Area B=13). A total of 35 artefacts, including one flaked glass artefact, were identified across Area A, with most of the finds coming from the top spit (0-10cm), but small numbers still occurring at 40-70cm depth. The lower depth find suggests that these sites may reflect very old Aboriginal archaeological material. The artefacts were spread across the lunette formation, with concentrations in the north, central and southern portions, but some test pits contained no artefactual material. Area B also contained artefacts, but within very low numbers, suggesting the area was not preferred for camping by Aboriginal people.

In 2001 Edmonds undertook a survey of the area surrounding the Euroley Bridge over the Murrumbidgee River on the Yanco-Sturt Highway Local Road, 3 km south of Yanco. The proposed works featured the replacement of the old Dare truss timber and iron bridge with a concrete two lane bridge. A single Aboriginal site, a scarred tree, was recorded during the survey. The scarred tree was located on the southern bank of the Murrumbidgee River 19 metres east of the abutment of the original dare truss bridge. Edmonds noted that the lack of other identified sites within the project area was the result of the lack of archaeologically sensitive landforms in the area.

In 2009 OzArk completed an Aboriginal heritage assessment of the proposed water saving works at Coonancoocabil Lagoon near Yanco which is located approximately 9 km west of the proposal area. No Aboriginal sites or areas of potential subsurface deposit were recorded during this study.

In 2011 OzArk completed an Aboriginal heritage assessment for the McWilliams Hanwood Proposed Winery Expansion Project. This area is located approximately 56 km north west of the proposed solar farm and 4.8 km south of Griffith. Three Aboriginal sites were identified, including two isolated finds (1x silcrete flake, 1x silcrete core) and one artefact scatter (3x broken silcrete flakes), all in highly disturbed contexts. The former had been subject to extensive ploughing and the latter was found in a graded table drain of John Condon Road which was proposed as the area for installation of a water pipeline trench. The likelihood of locating occupation sites was deemed to be low, due to the distance of the survey site from permanent or ephemeral water sources. The identified finds were not expected and suggest that the area may have formed occupation centred around shallow depressions that retained water after inundation (OzArk 2011, p.24).

In 2015 OzArk completed an ACHA for the Euroley Poultry Production Complex 30 km west of Narrandera and approximately 14 km south west of the proposed Yanco Solar Farm. Two scarred trees and one hearth were identified during the survey, but no areas of potential subsurface deposit were found. The scarred trees (EPPC-ST1 and EPPC-ST2) were identified on Black Box species situated on a farm access track in predominantly cleared land 6-7km south of the Sturt Highway. The hearth site (EPPC-H1) consisted of fired clay and was located around 40m to the north west of an ephemeral floodway in an exposure on the edge of a cleared, ploughed paddock. The hearth was relatively intact and had not been damaged by the ploughing. No artefacts were associated with this site (OzArk 2015, p. 21). Overall, it was determined that the survey area only retained marginal potential for the identification of Aboriginal sites and no potential for subsurface archaeological material.

In 2016 NGH Environmental (2016a) conducted an assessment of the proposed Coleambally Solar Farm, approximately 71 km south west of the current assessment area. Despite the variable visibility encountered during the survey, no Aboriginal cultural material or objects were recorded. However, three European survey or blaze marker trees were identified. Given that much of the project area has been laser levelled and subject to extensive modification from laser levelling the lack of Aboriginal sites was not unexpected. Unfortunately, due to the extensive modifications of the drainage patterns, the construction of channels and continual cultivation of the project area the pre-European landscape of the area was unable established.

In 2016 NGH Environmental assessed the proposed Griffith Solar Farm, approximately 63 km north west of the current assessment area. Pedestrian survey was undertaken, and eleven artefacts were recorded however, they concluded that the potential for the presence of subsurface archaeological deposits would be low due to the sites land use history. NGH suggested that the models of site location in the Griffith area should be amended to reflect the fact that artefact scatters or campsites can occur at least 600m away from water sources within the broader floodplain environment, despite intensive agricultural practices (NGH Environmental 2016b, p. 20).

In 2016 OzArk conducted a Due Diligence Assessment of The Ranch Farm 4 and 5, approximately 89 km north west of the current proposal area. Desktop and pedestrian survey were undertaken however, no Aboriginal

sites or landforms were identified (OzArk 2016). The lack of Aboriginal heritage sites or objects within these three project areas was attributed to high levels of European disturbance, relatively long distances from water sources and lack of landforms identified to have high archaeological potential.

In 2018 Australian Cultural Heritage Management (ACHM) surveyed an area of approximately 600 ha for the proposed Sandigo Solar Farm, approximately 22 km south west of Narrandera, NSW. Six archaeological sites were located including two grindstones and four artefact scatters.

In 2017 and 2018 NGH Environmental conducted an Aboriginal Cultural Heritage Assessment of the proposed Avonlie Solar Farm, approximately 42 km south east of the current assessment area. Pedestrian survey was undertaken over 570 ha of land, and four artefact scatters, a scarred tree and 64 isolated artefacts were recorded however, they concluded that the potential for the presence of subsurface archaeological deposits would be low due to the sites land use history. An addendum to this assessment is underway, including an additional survey area for the powerlines. Two isolated artefacts and no areas of subsurface archaeological potential were identified during this fieldwork. The high number of grinding stones recorded suggested that this area was utilised for food processing. The dominant raw material type was quartz with lesser numbers of silcrete, sandstone, volcanic and quartzite material.

In 2018 OzArk conducted a survey of the proposed Yarrabee Solar Farm near Narrandera, approximately 26 km south east of the current proposal area. A total of 25 Aboriginal sites were identified, including nine isolated finds, 13 artefact scatters, one earthen mound and two scarred trees. The earthen mound and a dune landform within the proposal area were identified as having high archaeological potential.

There have also been several archaeological surveys conducted in the wider Murrumbidgee Province that contribute to an understanding of the nature of Aboriginal occupation.

In 1997 Bonhomme inspected several sites recorded on the NPWS Site register within the wider Riverine Plain as part of an examination of sand mining. From this research, it was suggested that burials within sand bodies are extremely common within the Riverine Plain however, burial location in sand bodies is highly variable across the plain. There is a strong correlation between burial sites and water sources, though this study could not determine whether this reflected Aboriginal occupation patterns or was due to the naturally close relationship between sand bodies and water sources on the Riverine Plain.

Sample surveys undertaken by Pardoe and Martin in 2001 within the Murrumbidgee Province covered an area of approximately 30,000 square kilometres, extending from Balranald to Narrandera and Booligal to Jerilderie. Using an analysis of landforms and identifying gaps in the archaeological knowledge based on the sites recorded in the AHIMS database, they found that there was a bias in the distribution of sites along major waterways and some landforms such as lunettes but there were also large gaps where no sites had been recorded. Pardoe and Martin surveyed 61 sample areas or quadrants from 22 Stations or locations across their project area. This resulted in 347 new sites being recorded. The major site types were scarred trees (26.2%), mounds (24.2%), open sites (14.4%), ovens (12.4%), burials (7.8%) and hearths (6.1%) as shown in Table 6.

Pardoe and Martin analysed their results to develop a predictive model for site distribution across the Murrumbidgee Province. They found that mounds varied in size, from 4 m-140 m in diameter and height also varied from 2 cm to 2 m. Mounds were most commonly found along floodplain creeks within River Red Gum and Black Box vegetation communities. They found that as well as being situated along the major rivers, they were also located on the plains to the north and south of the Murrumbidgee, such as around the edge of depressions such as lakes and swamps and on palaeochannel features. Mounds were often characterised as being situated on elevated ground such as lunettes, levees and dunes where silty sandy soil was prevalent (Pardoe and Martin 2001, pp. 82–87).

Table 6. Sites recorded in Murrumbidgee Province survey (Pardoe and Martin 2001: Table 5.4)

| Site Type | Number | % |
|---|---|---|
| **Modified trees** | 91 | 26.2 |
| **Mound** | 84 | 24.2 |
| **Open Site** | 50 | 14.4 |
| **Oven** | 43 | 12.4 |
| **Burial** | 27 | 7.8 |
| **Hearth** | 21 | 6.1 |
| **Midden** | 9 | 2.6 |
| **Isolated artefact** | 6 | 1.7 |
| **Dinner camp** | 5 | 1.4 |
| **Shell midden** | 3 | 0.9 |
| **Historic** | 3 | 0.9 |
| **Soak** | 1 | 0.3 |
| **Myth** | 1 | 0.3 |
| **Historic burial** | 1 | 0.3 |
| **Bora ring** | 1 | 0.3 |
| **Artefact scatter** | 1 | 0.3 |
| **Total** | 347 | 100.0 |

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

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

The conclusion regarding Aboriginal site modelling for the region to date suggests that the most archaeologically sensitive areas occur in association with major water sources, including anabranches and ephemeral and relict lake systems and relatively intact tracts of riverine red gum forest along the floodplains of the major active rivers and creeks, and Black Box fringed depressions. The archaeological sensitivity of source bordering dunes and lunettes to water sources, prior streams and sand bodies, including scalded environments is also noted.

### *3.2.5 Summary of Aboriginal land use*

Previous archaeological surveys and excavations within the region demonstrate that there is a strong, complex and varied pattern of human use and movement through the landscape. This behaviour is recorded as a range of artefact and site types distributed and concentrated in specific landforms. Unsurprisingly there appears to be a strong association between the presence of potential resources for Aboriginal use and the presence of archaeological sites. Areas directly associated with water and or elevated ground appear to have the greatest potential for identification of Aboriginal cultural material. There are exceptions to this however and it is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader relatively low-lying floodplain areas.

The identification of scarred trees where remnant old growth trees remain provides direct evidence of Aboriginal subsistence strategies. Scarred trees have been consistently identified on Black or Grey Box and River Red Gum within depressions, on riverbanks, lagoon margins and creek lines. The dominance of modified trees in the region can be attributed to more conspicuous nature of scarred trees as opposed to other artefacts, particularly when levels of visibility are low or significant land disturbance has occurred.

Mounds and hearths have been recorded in large numbers throughout the region most often located on elevated areas associated with creek banks, sand bodies, lunettes, river levees, lagoons, floodplain margins and minor distributaries.

The close association between mound sites and elevated areas associated with water has been noted. Excavation of several mounded sites demonstrates the long term and repetitive use of these areas, particularly following seasonal flooding (Klaver 1998). It is important to note that after occupation many mounded sites were used as Aboriginal burial sites.

Isolated artefacts and artefact scatters are routinely identified in association with the above site types and landforms. It is important to note however, that these sites have also been identified within the broader floodplain environment at least 600 m away from a water source.

Based on the previous archaeological investigations in the Yanco region and knowledge of Wiradjuri cultural practices and traditional activities the Yanco Solar Farm proposal area has a possibility of containing archaeological sites, given that Aboriginal people have lived in the region for tens of thousands of years. This would most likely be in the form of stone artefacts and scarred trees in areas of remnant vegetation.

### *3.2.6 Archaeological Site Location Model*

Based on the results of the previous archaeological investigations in the general Yanco area, and through the extrapolation of sites from other areas of the Murrumbidgee plain, it is possible to provide the following model of site location in relation to the proposed Yanco Solar Farm.

**Stone artefact scatters** – representing camp sites artefact scatters can occur across the landscape, usually in association with some form of resource or landscape. Water bodies, such as rivers, ephemeral creeks or clay pans can also be a focus of Aboriginal occupation. These features are not present in the Yanco Solar Farm

proposal area but have been recorded in previous surveys in the Yanco region. These features are therefore possible to occur within the proposal area.

**Hearths/Ovens** – are identified by burnt clay used for heat retainers. Mounds are recorded in the region in association with resource locations. However, they could occur either independently or in association with other Aboriginal cultural features such as artefact scatters. Hearths are generally considered to be limited, one-off use or reused but few times and are smaller concentrations. Ovens are considered to represent larger features, often extending over a larger area and can include other material such as bone. This feature is unlikely to occur within the proposal area.

**Mounds-** are accumulations of heat retainer ovens that have built up over time. They are typically round or oval and range in length from just a few metres to over 100 m and range in height from 0.1 m to 2 m. They are identified by the presence of baked clay heat retainers, which have usually been brought to the location from a nearby source of natural clay such as a lake bed, swamp or drainage line. Mounds are generally found in proximity to wetland areas such as lakes, swamps and creeks, often elevated above these areas by being situated on sandy rises, lunettes, source bordering dunes and palaeochannels. Mounds are likely to contain a range of other archaeological features such as bone, shell, stone artefacts and burials. This feature has not been recorded in the Yanco or wider Leeton region. It is unlikely that this feature will occur within the proposal area.

**Burials** – are generally found within mound sites, in elevated sandy contexts or in association with rivers and major creeks. These features are not present within the Yanco Solar Farm proposal area; however, previous burial sites have also been recorded in the wider Leeton region. The lack of elevated sandy areas within the proposal area suggests that this feature is unlikely to occur within the proposal area.

**Scarred Trees** – these require the presence of old growth trees and are likely to be concentrated along major waterways and around swamp areas. There are no mature trees remaining in the proposal area and this feature is therefore unlikely to occur.

**Stone resources** – are areas where people used natural stone resources as a source material for flaking. This requires geologically suitable material outcropping to be accessible. The proposal area contains no natural outcropping stone of suitable material.

**Shell Middens** – are the agglomeration of shell material disposed of after consumption. Such places are found along the edges of significant waterways, swamps and billabongs. The proposal area contains no significant waterways, swamps and billabongs and this feature is therefore unlikely to occur.

**Isolated Artefacts** – are present across the entire landscape, in varying densities. As Aboriginal people traversed the entire landscape for thousands of years, such finds can occur anywhere and indicate the presence of isolated activity, dropped or discarded artefacts from hunting or gathering expeditions or the ephemeral presence of short-term camps.

In summary, the lack of topographic or landscape features and the highly modified and disturbed context of the proposal area means that there are few loci that could contain *in situ* archaeological traces. Nonetheless, given that Aboriginal people have lived in the region for tens of thousands of years, there is some potential for archaeological evidence to occur. This is most likely to be in the form of stone artefacts.

# 4 ARCHAEOLOGICAL INVESTIGATION RESULTS

## 4.1 SURVEY STRATEGY

The survey strategy was to cover as much of the ground surface as possible within the proposal area. Although the actual ground impact from the construction method for the proposed solar farm is likely to be low, the placement of solar arrays across the landscape has the potential to cover any cultural heritage sites.

The strategy therefore was to walk a series of transects across the proposed solar farm landscape to achieve maximum coverage. Because the proposed solar farm area was arranged in plantings of north-south and/or east-west orange trees and vineyards in evenly spaced rows, transects were spaced evenly between the rows of plantings with the survey team spread apart at 15 to 25 m intervals, walking in parallel lines. The evenly spaced nature of the orange trees and vineyards made this an ideal survey strategy. The team were able to walk in parallel lines, at a similar pace, allowing for maximum survey coverage and maximum opportunity to identify any heritage features.

The survey team consisted of between three and five people which allowed for approximately 45-125 m wide tract of the proposal area to be surveyed with each transect depending on the number of survey participants and the spacing of individuals. At the end of each transect, the team would reposition along a new transect line at the same spacing and walk back on the same compass bearing between the orange trees and vineyards. Two people surveyed the proposed transmission line, the widening access routes along Research Road and Toorak Road and intersection upgrades at Toorak Road and Canal Street, Irrigation Way and Canal Street, Toorak Road and Research Road and all associated access points and channel crossings into the proposed solar farm.

While no mature trees remained within the proposed solar panel area the remaining trees along the transmission line route and the Gogeldrie Branch Canal south of Research Road were inspected for Aboriginal modification (cf. Long 2005).

We believe that the survey strategy was comprehensive and the most effective way to identify the presence of Aboriginal heritage sites. Discussions were held in the field between the archaeologists and Aboriginal community representatives to ensure all were satisfied and agreed with the spacing, coverage and methodology.

The proposal area was divided into three sections as listed below and shown in Figure 7.

- Orange orchards;
- Vineyard; and
- Disturbed areas including ploughed paddocks, transmission lines and roads.

The initial survey was undertaken on the 22nd and 23rd of October 2018 by three archaeologists from NGH Environmental with two representatives from the Aboriginal community.

After the initial survey the area for the proposed transmission line was altered to the southern side of Houghton Road, making it necessary to undertake subsequent fieldwork on 11th December 2018. The same survey method was continued from the initial survey.

Notes were made about visibility, photos taken, and any possible Aboriginal features identified were inspected.

## 4.2 SURVEY COVERAGE

The survey was impeded by poor visibility in the orange orchard however the visibility in the vineyard was quite high, particularly in the field which had recently had the vineyard crop cleared and the paddock ploughed.

The visibility in the orange orchard ranged from less than 5% to 25% with an averaged visibility of 5%. The visibility in the vineyard ranged from 10% to 100% in the recently cleared and ploughed flied, with an average of 40%. Bare ground along vehicle tracks were inspected and all contributed to the effectiveness of the visibility and the survey coverage. The visibility of the disturbed areas along proposed transmission line, road widening, and intersection upgrade areas ranged from less than 5% to 40% with an averaged visibility of 15%.

Table 7 below shows the calculations of effective survey coverage and Plates 1-8 show examples of the transects landforms and visibility for the Yanco Solar Farm area.

Over the course of the field survey, approximately 25 km of transects were walked across the proposal area by each participant. Allowing for an effective view width of 5m each person, this equates to a total surface area examined of 52 ha. However, allowing for the visibility restrictions, the effective survey coverage for the orange orchards is reduced to 1.2 ha, or 1.8% and the effective survey coverage for the vineyard reduced to 9.6 ha, or 8%.

Overall, it is considered that the surface survey of the Yanco Solar Farm proposal area had sufficient and effective survey coverage. The results identified are considered a true reflection of the nature of the Aboriginal archaeological record present within the proposal area.

Plate 1 View north of tracks around the orange orchard.

Plate 2 View east of the orange orchards.

| | |
|---|---|
|  |  |
| Plate 3 View east of vineyards . | Plate 4 View north of tracks around the vineyard. |
|  |  |
| Plate 5 View west showing ploughed vineyard field. | Plate 6 View south east of Irrigation Way and Canal Street intersection. |
|  |  |
| Plate 7 View south east showing the intersection of Research Road and Amato Road east of the Gogeldrie Branch Canal. | Plate 8 View west of proposed transmission line route, following exiting powerlines. |

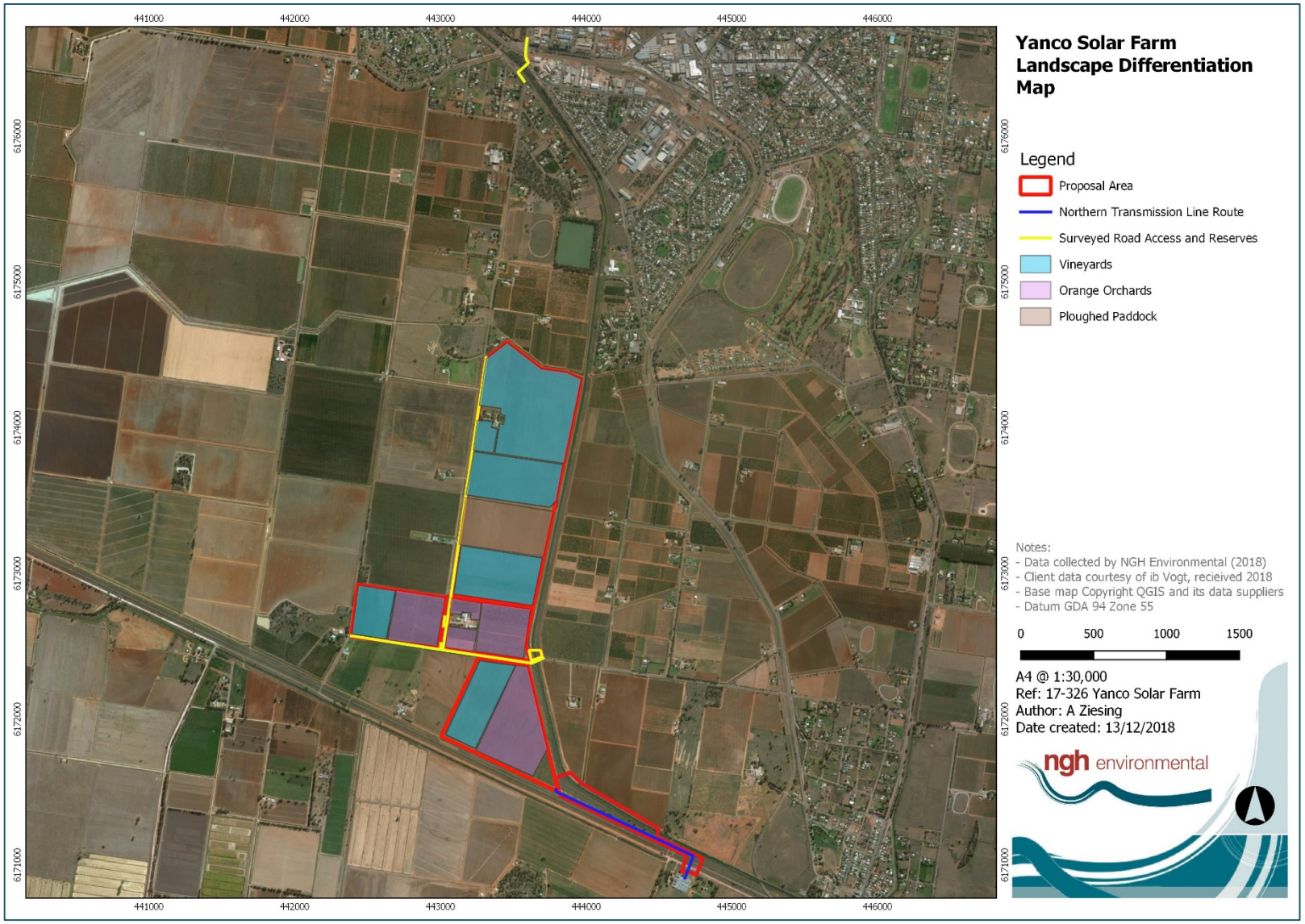


Figure 7 Landscape Differentiation across the Yanco Solar Farm proposal area.

Table 7. Transect information.

| Survey Unit | Number of Survey Transects | Exposure type | Proposal Area ha | Surveyed area (length m x width m) | Survey Area m2 | Visibility | Effective coverage (area x visibility) m2 | Proposal Area surveyed (ha) | Percentage of Proposal area effectively surveyed | Archaeological Result |
|---|---|---|---|---|---|---|---|---|---|---|
| **Orange Orchards** | 18 | Bare ground and vehicle tracks. | 66 | 3,000 x 25<br>6,500 x 25 | 237,500 | 5% | 11,875 | 1.2 | 1.8 | Nil |
| **Vineyards** | 16 | Bare ground, ploughed and cleared fields and vehicle tracks. | 120 | 6,300 x 25<br>5,500 x 15 | 240,000 | 40% | 96,000 | 9.6 | 8 | Nil |
| **Disturbed areas of ploughed paddock, transmission lines and roads** | 6 | Bare ground, and vehicle tracks | 14 | 4,000 x 10 | 40,000 | 15% | 6,000 | 0.6 | 4.3 | Nil |

## 4.3 SURVEY RESULTS

Despite the variable visibility encountered during the survey, no Aboriginal cultural material or objects were found in the initial ACHA survey (Figure 8).

During the subsequent survey for the southern transmission line route, one new isolated artefact (YSF_IF_001) was identified between the south side of Houghton Road and the channel bank. This site consists of a single fine-grained red silcrete core located in a red cracking clay exposure south of Houghton Road and 2 m north of the channel bank. The core has three negative flake scars from two platforms with a secondary reduction stage and 15% pebble cortex. The site is heavily disturbed from channel silt dumping and the ground surface visibility is low (30%) due to the low-lying vegetation and surrounding road base gravels.

### *4.3.1 Consideration of Potential for Subsurface material*

Discussions were held in the field with the representatives present to assess the potential for subsurface deposits across the proposal area. Based on the land use history, an appraisal of the landscape, soil, level of disturbance and the results from the field survey it was concluded that there was negligible potential for the presence of intact subsurface deposits with high densities of cultural material within the proposal area. It was determined by the archaeologists and representatives from the Aboriginal community present during the survey that subsurface testing was not warranted for this project.

## 4.4 DISCUSSION

The predictions based on the modelling for the proposal area was that stone artefacts were the most likely manifestation of Aboriginal occupation of the area, despite the high level of disturbance. However, the survey identified only one Aboriginal object within the proposal area, suggesting that the level of disturbance was even higher than originally assumed.

Given that most of the proposal area has been levelled and subject to extensive modification the lack of Aboriginal sites was not unexpected.

The absence of Aboriginal scarred trees in the proposal area was expected and corresponds directly with the lack of remnant old growth trees within and adjacent to the immediate proposal area. For a tree to have been a mature specimen suitable for bark extraction at the time Aboriginal people were last practicing tradition ways, the tree would have to be over 100 years old. The trees along the transmission line route and the Gogeldrie Branch Canal south of Research Road were young and did not conform to the standard scarring morphology accepted for Aboriginal modification (cf. Long 2005).

It is also possible that the Aboriginal occupation of the area focused on larger permanent sources of water and resources, such as the Murrumbidgee River and Yarangery Creek to the south of the proposal area. Unfortunately, due to the extensive modifications seen across the proposal area, the construction of channels and prolonged cultivation the pre-European landscape of the area is unable to be established and has been almost entirely disturbed.

In terms of the current proposal therefore, extrapolating from the results of this survey, it is unlikely that *in situ* stone artefacts could occur within the proposed development footprint. Based on the land use history of the proposal area, and an appraisal of the results from the field survey, there is negligible potential for the presence of intact subsurface deposits with high densities of objects or cultural material within the Yanco Solar Farm project area.

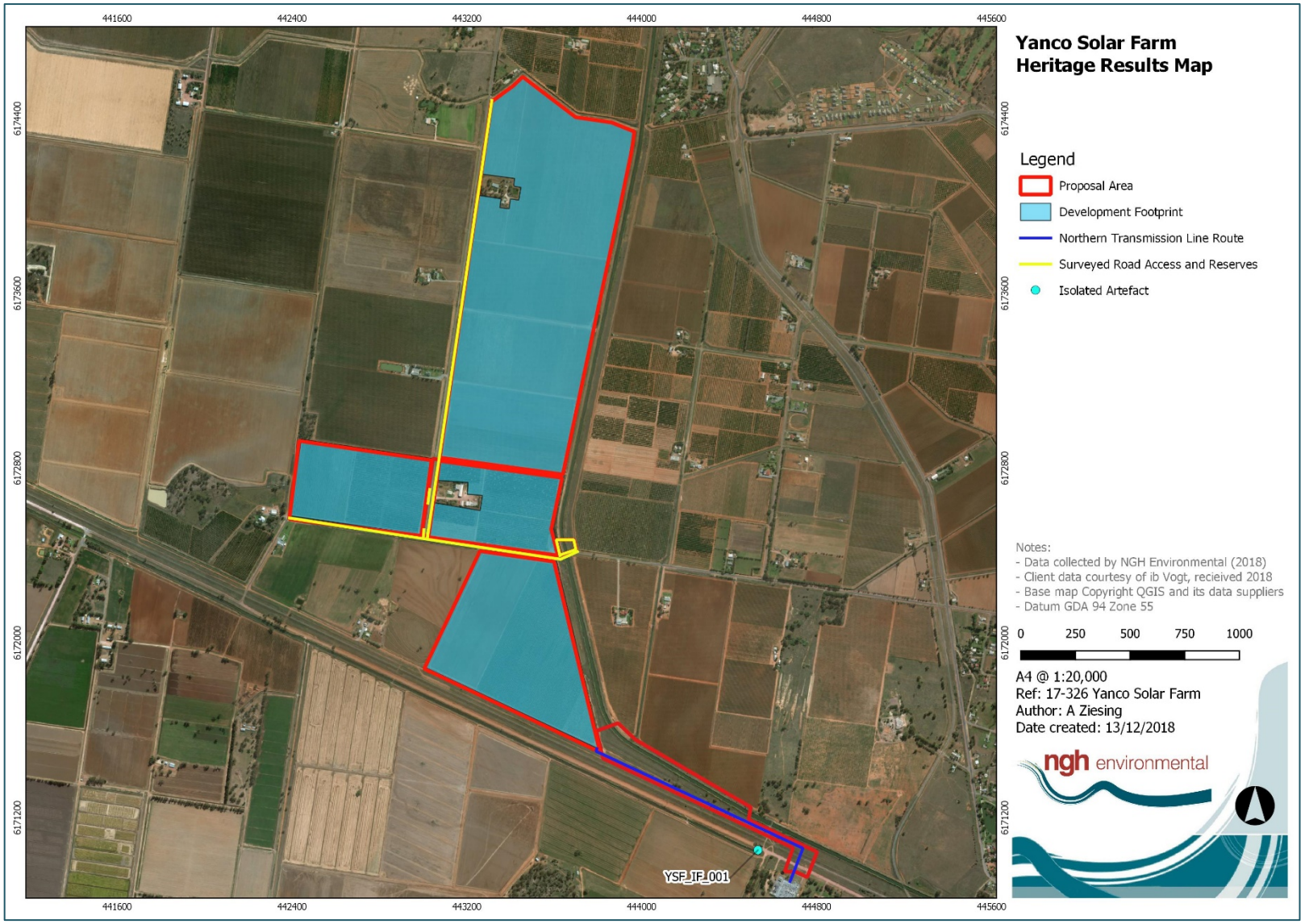


Figure 8 Heritage Results Map within the Yanco Solar Farm proposal area.

# 5 CULTURAL HERITAGE VALUES AND STATEMENT OF SIGNIFICANCE

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 assessing 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 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.

### 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.

Only one Aboriginal site was identified during the survey for the Yanco Solar Farm and no known cultural sites or places of value within the proposal area have been identified during the consultation process for this assessment.

### Scientific (archaeological) value.

The isolated find is attributed a low scientific value due to the highly disturbed nature of the channel bank and road reserve in which it was located. There is no subsurface potential at this site. The artefact itself is intrinsically interesting in terms of its base technical information however, the lack of contextual and comparative archaeological material makes detailed conclusions about Aboriginal land use unachievable. In this instance, the isolated artefact cannot be used to assist in the development of site modelling for the region and has little scientific value for further research. Isolated finds are very common throughout the wider region and have a high site representation.

### Aesthetic value

The modified and heavily disturbed landscape within the solar farm development area detracts from any aesthetic setting. There are no aesthetic values associated with the archaeological sites per se, apart from the presence of European survey marker trees in the landscape.

### Historic value

There are no know historic vales associated with the proposal site or links to known people. The site does have some historic links to the occupation of the region by Aboriginal people. The closest site of historic value is located over 750 m east of the proposal area.

### Other Values

There are no other known heritage values associated with the proposal area.

# 6 PROPOSED ACTIVITY

## 6.1 HISTORY AND LANDUSE

It has been noted above that historically the solar farm proposal area has been impacted through land use practices, levelling, clearing, ploughing and the construction of roads and irrigation canals.

The implications for this activity are that the archaeological record has been compromised in terms of the potential for scarred trees to remain within the proposal area. The scale of the earthworks for levelling, clearing and ploughing means that any stone artefacts that may have been present are now likely to have been removed or displaced.

Despite these localised impacts, Aboriginal artefacts and cultural material remain in the broader area with 112 Aboriginal sites previously recorded within a 30 km radius of the proposal area, indicating the presence of past Aboriginal people and providing indications of their use of this landscape.

## PROPOSED DEVELOPMENT ACTIVITY

As noted above in Section 1.2, the proposal involves the construction of a solar farm and includes connection to the nearby substation via a transmission line. Some access roads require widening and intersection upgraded. The development will result in disturbance of approximately 204 ha encompassing Lots 142 and 145 – 152 DP 751745 and Lot 6650 DP1197165.

Disturbances will largely be in the preparation of the ground for the solar farm. Piles would be driven or screwed into the ground to support the solar array's mounting system, which reduces the potential overall level of ground disturbance.

- Flat plate PV modules would be installed on a pile-driven steel post and framing system across the site. Each of them would be linked to an inverter and a transformer.
- Trenches would be dug for the installation of a series of underground cables linking the arrays across the proposal site.
- Some internal access tracks would also be required, and typically these would comprise of a compacted layer of gravel laid on stripped bare natural ground.
- Some ancillary facilities would also be required including parking facilities, staff amenities and offices.
- A perimeter fence and a vegetation buffer would also be constructed around the solar farm.
- A power line would be installed to connect the solar farm the existing Yanco substation.

The proposal is expected to operate for around 30 years. The construction phase of the proposal is expected to take 10 months. After the initial operating period, the solar farm would either be decommissioned, removing all above ground infrastructure and returning the site to its existing land capability, or upgraded with new PV equipment.

The development activity will therefore involve disturbance of the ground during the construction of the solar farm and transmission line to the existing substation and the extension of the substation. Once established however, there would be minimal ongoing disturbance of the ground surface. The installation of the transmission line would provide the highest degree of ground disturbance if the underground construction method is used. Discussions with ib vogt during the production of this assessment determined that the northern transmission line route was too be used for the location of the proposed line, avoiding any impact to isolated find (YSF_IF_001). Therefore, no impacts will occur as a result of the proposed Yanco Solar Farm.

The final details and timing of the proposed construction activity have yet to be finalised, but it is anticipated that construction could commence in 2019.

## 6.2 ASSESSMENT OF HARM

As described in this report, only one isolated find (YSF_IF_001) was identified within the project area. ib vogt can avoid this site by utilising the proposed northern transmission line route. Therefore, the assessment of harm for the project is nil.

## 6.3 IMPACTS TO VALUES

The values potentially impacted by the development are any social and cultural values attributed to the project area by the local Aboriginal community. As described in this report, only one isolated find (YSF_IF_001) was identified within the project area, which will be avoided by utilising the northern proposed transmission line route. Therefore, the impact to values for the project is nil.

# 7 AVOIDING OR MITIGATING HARM

## 7.1 CONSIDERATION OF ESD PRINCIPLES

The consideration of the principles of Ecologically Sustainable Development (ESD) and the use of the precautionary principle was not required to be undertaken when assessing the harm to the isolated find site and the potential for mitigating impacts on Aboriginal heritage within the Yanco Solar Farm proposal area given that only one site of low scientific value and high site representativeness was identified. As this site will be avoided by the proposed solar farm works, the ESD principles do not apply to this assessment.

We therefore argue that the overall cumulative impact on the archaeological record for the region is nil given that only one site that is common in the surrounding region with no known cultural values was identified and will be avoided.

## 7.2 CONSIDERATION OF HARM

As described in this report, only one Aboriginal archaeological site was located within the project area and no cultural values within the project area have been identified by local Aboriginal community. Given the low number of Aboriginal archaeological sites and cultural values within the proposed Yanco Solar farm project area avoidance of this site is recommended and will be achieved.

## 7.3 AVOIDING OR MITIGATING HARM

Mitigation of harm to cultural heritage sites generally involves some level of detailed recording to preserve the information contained within the site or setting aside areas as representative samples of the landform to preserve a portion of 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 artefact. This has been achieved by selecting the northern transmission line route over the southern route and avoiding impacts to any newly identified Aboriginal cultural heritage. Therefore, no further mitigation measures are required for the proposed Yanco Solar Farm.

If in the future the location is altered to the southern transmission line route, then salvage of isolated find (YSF_IF_001) is recommended in conjunction with the Leeton & District LALC to prevent impact to this site.

It is noted that the Leeton & District LALC have requested to monitor any ground disturbance as a mitigation strategy for the proposed Yanco Solar Farm (Section 2.1). NGH Environmental do not believe that monitoring is warranted, in this instance, based on the archaeological survey results and the degree of previous disturbance across the proposal area.

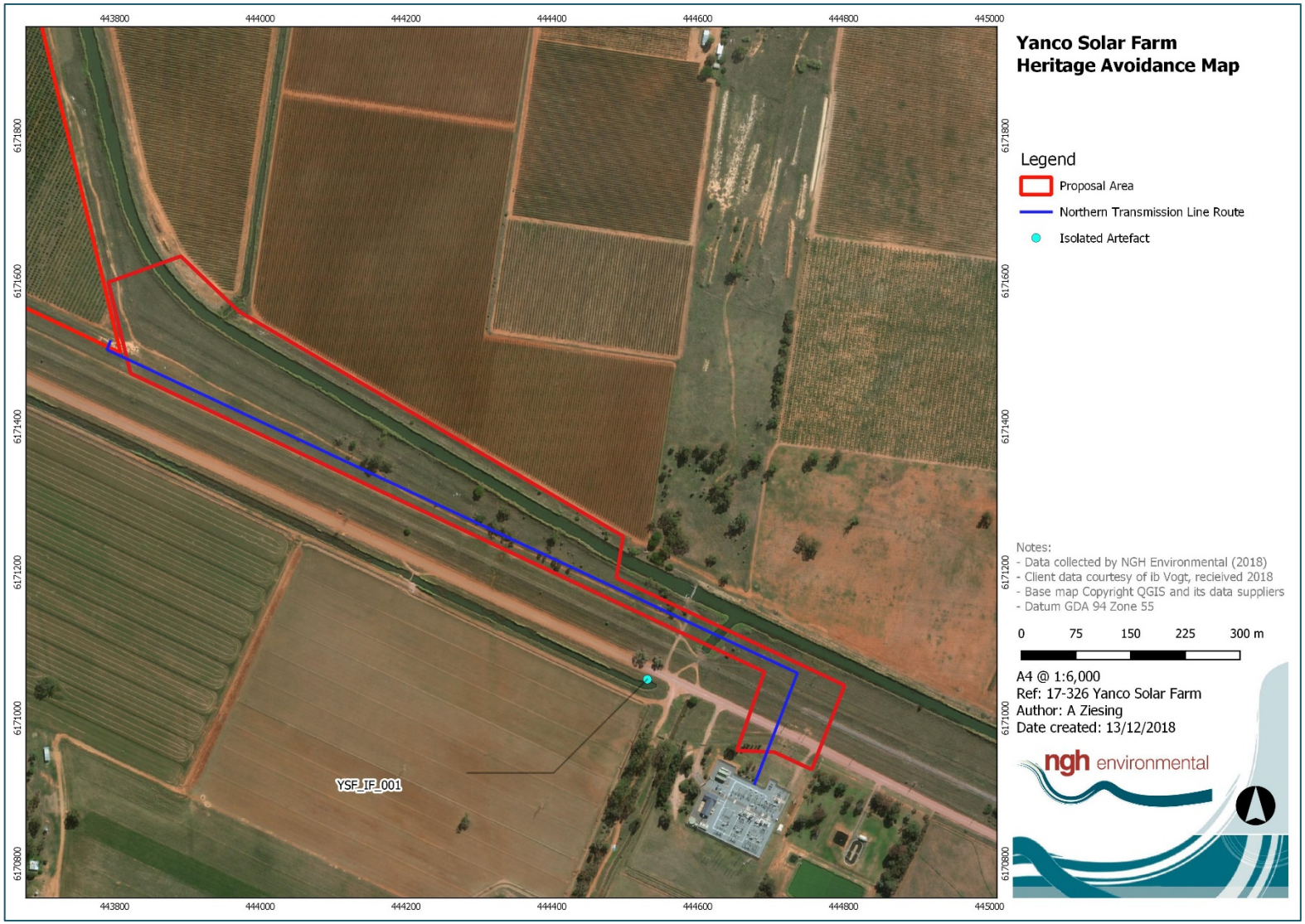


Figure 9 Avoidance map showing how isolated find (YSF_IF_001) will not be impacted.

# 8 LEGISLATIVE CONTEXT

Aboriginal heritage is primarily protected under the NPW Act 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 through 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 OEH AHIMS site cards 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. This does not apply in this instance as the development is listed as a State Significant Development (SSD) and will be determined by the Department of Planning.

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 projects. Under this Act, cultural heritage is considered to be a part of the environment. This Act requires that Aboriginal cultural heritage and the possible impacts to Aboriginal heritage that development may have are formally considered in land-use planning and development approval processes.

Proposals classified as State Significant Development or State Significant Infrastructure under the EP&A Act have a different assessment regime. As part of this process, Section 90 harm provisions under the NPW Act are not required, that is, an AHIP is not required to impact Aboriginal objects. However, the Department of Planning and Environment is required to ensure that Aboriginal heritage is considered in the

environmental impact assessment process. The Department of Planning and Environment will consult with other departments, including OEH prior to development consent being approved.

The Yanco Solar Farm proposal is a State Significant Development and will therefore be assessed via this pathway, which does not negate the need to carry out an appropriate level of Aboriginal heritage assessment or the need to conduct Aboriginal consultation in line with the requirements outlined by the OEH *Aboriginal cultural heritage consultation requirements for proponents 2010* (OEH 2010b).

# 9 RECOMMENDATIONS

The recommendations are based on the following information and considerations:

- Results of the archaeological survey;
- Consideration of results from other local 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. Avoidance of isolated artefact (YSF_IF_001) be achieved by utilising the proposed northern transmission line route (Figure 9).
2. If the route is altered to the southern transmission line option in the future, then this site should be salvaged and reburied outside of the impact corridor in consultation with the Leeton & District LALC.
3. NGH Environmental does not believe it is warranted to undertake monitoring for ground disturbance associated with the proposed Yanco Solar Farm, based on the results of the surveys and level of previous disturbance across the site.
4. ib vogt should prepare an Unexpected Finds Protocol (UFP) to deal with construction activity and the inadvertent discovery of Aboriginal objects. An example UFP has been provided in Appendix D in case of finds.
5. In the unlikely event that human remains are discovered during the construction, all work must cease in the immediate vicinity. OEH, the local police and the registered Aboriginal parties should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal.
6. Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the registered Aboriginal party and may include further field survey.

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# APPENDIX A ABORIGINAL CONSULTATION

| Organisation | Contact | Action | Date Sent | Reply Date | Replied by | Response |
|---|---|---|---|---|---|---|
| **OEH** | Andrew Fisher | Letter sent via email | 2/08/2018 | 10/08/2018 | Letter via email | Recommended contacting Leeton & District Shire LALC and Griffith LALC |
| **NTScorp** | | Letter sent via email | 2/08/2018 | N/A | No response | No response |
| **National Native Title Tribunal** | | Online search | 2/08/2018 | | | |
| **Office of Registrar** ***Aboriginal Land Rights Act*** | Jodie Rikiti | Letter sent via email | 2/08/20108 | 3/08/2018 | Letter via email | Recommended contacting Karen Davy from Leeton & District LALC |
| **Riverina Local Land Services** | Julie Heath | Letter sent via email | 2/08/2018 | 6/08/2018 | Letter via email | Recommended contacting Karen Davy from Leeton & District LALC |
| **Leeton Shire Council** | | Letter sent via email | 2/08/2018 | N/A | No response | |
| | | | | | | |
| **Leeton & District LALC** | Karen Davy | Letter sent via email | 2/08/2018 | 2/08/2018 | Email | Registered interest in the project |
| **Newspaper advertisement** | Leeton Irrigator | Advertisement sent via email | 12/07/2018 | | | |
| | | | | | | |
| **OEH list of stakeholders** | | | | | | |
| Leeton & District LALC | Karen Davy | Already contacted | 2/08/2018 | 2/08/2018 | Email | Registered interest in the project |
| Griffith LALC | Robert Carroll | Letter sent via email | 2/08/2018 | N/A | No response | No response |
| | | | | | | |
| **Methodology** | | | | | | |
| Leeton & District LALC | Karen Davy | NGH sent methodology | 13/09/2018 | N/A | No comment or response | close date 11/10/18 |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Initial Fieldwork** | | | | | | |
| Leeton & District LALC | Karen Davy | 2 representatives from 22-23 October 2018 | 27/09/18 | 15/10/2018 | Email and phone | Confirmed 15/10/18 |
| | | | | | | |
| **Addendum to Methodology sent to RAPs** | | | | | | |
| Leeton & District LALC | Karen Davy and Courtney Davy | Sent addendum to methodology to RAPs via email | 22/11/2018 | 28/11/2018 | Email | Confirmed availability for 11/12/2018 |
| | | | | | | |
| **Subsequent Fieldwork** | | | | | | |
| Leeton & District LALC | Courtney Davy and David Watts | Reminder sent to 2 representatives for 11 December 2018 (phone) | 10/12/2018 | 10/12/2018 | Phone | Confirmed they would be present at 9:00am |
| | | | | | | |
| **Draft Report** | | | | | | **Comments due 17/01/2019** |
| Leeton & District LALC | Karen Davy | Sent draft report for comment | 20/12/2018 | 11/01/2019 | Email and phone | No issues with draft report |
| | | | | | | |
| **Final Report** | Karen Davy | Sent final report via email | 17/01/2019 | | | |
| | | | | | | |

**Correspondence received from Leeton & District LALC on the 2nd of August 2018 for registration.**

**From:** L&DLALC Admin <admin@ldlalc.com.au>
**Sent:** Thursday, August 2, 2018 2:59:18 PM
**To:** Amy Ziesing
**Cc:** Karen Jamieson
**Subject:** Propose Solar Farm at Yanco

Hi Amy,

Our organisation would like to register our interest in the development as per the correspondence forwarded today by Karen Jamieson today.

## Kind regards,

**Karen Davy** | Chief Executive Officer

Leeton & District Local Aboriginal Land Council

[redacted]

**W:** www.ldlalc.com.au

**F:** http://www.facebook.com/pages/Leeton-and-District-Local-Aboriginal-Land-Council/144759648990832

***"Always Was, Always Will be Aboriginal Land"***

**Public Notice placed in the Irrigator on the 13th of July 2018.**



## Public Notices

**Notification for registration of interest for Aboriginal stakeholders**

NGH Environmental has been contracted by ib vogt GmbH to undetake an Aboriginal Cultural Heritage Assessment (ACHA) for a proposed solar farm comprising Lots 142, 145-152, 287 and 572 in DP751745, Lots 1 and 2 in DP1198789, Lot 182 in DP1198085, Lot 6650 in DP1197165 and Lot 1700 in DP1188161, approximately 5km south-east of Leeton in the Leeton Local Government Area.

The purpose of the consultation with Aboriginal people is to assist the proponent in the preparation of the ACHA and to be involved in consultation as part of possible lodgement of an Aboriginal Heritage Impact Permit application.

In order to fulfil the requirements set out in the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*, NGH Environmental is seeking interested Aboriginal parties who hold cultural knowledge of the assessment area to register their interest in the consultation process for the project and to assist in the determination of cultural significance of any Aboriginal objects or places located there.

Registrations should be provided in writing to:

**NGH Environmental Pty Ltd**

**PO Box 5464**

**WAGGA WAGGA NSW 2650**

Or via email to:

**ngh@nghenvironmental.com.au**

Closing date for registration is **27 July 2018.**

Those registering an interest will be contacted to discuss the project further. Those who do register are advised that their details will be provided to OEH and the Local Aboriginal Land Council, unless they specifically advise in writing that their details are not to be forwarded.

**EUCHRE TOURNAMENT EVERY MONDAY**

at the Leeton Men's Shed
Open to all men over 18 years
Starting Monday 30th July
$2.00 entry fee
1.00pm start and end about 3.30pm
**Contacts Garry 0499 552 922**
**Ron 0427 800 426**

**OPEN HOME**
**110 WADE AVENUE**
**Saturday 21st July 10am - 11am**
**Ph: 0427 922 461**



## Positions Vacant

Murrumbidgee Irrigation

### FIELD OPERATORS

Griffith and Leeton, NSW

We are seeking two highly motivated individuals to participate in the maintenance activities associated with MI's irrigation supply and drainage system. These full-time positions have an initial 12 month term.

The successful applicants will have: relevant industry experience; General Construction Induction certificate (White Card); and a 'HR' driver licence. Experience with mobile and heavy plant and machinery, including associated licences, would be highly desirable.

Applications should include a Murrumbidgee Irrigation application form and current resume, with a cover letter addressing ability to meet the following criteria.

- Ability to operate and maintain a range of vehicles, plant and equipment.
- Ability to assist in maintenance and construction activities according to Safe Work Method Statements and/or in accordance with verbal/written instructions.
- Ability to identify, analyse and report faults to plant and equipment.
- Experience in using technology to organise and document work activities.
- Experience in following WHS policies, procedures and regulatory requirements.

To obtain an application package, please visit www.mirrigation.com.au/Careers, or ring Karen Robertson on 02 6962 0200. For specific position enquiries, contact Simon Jackson (Civil Maintenance Facilitator) or Nev Gras (Supply Channels Program Leader) on 02 6962 0200.

Applications close: Friday 27 July 2018

Please mark your application 'CONFIDENTIAL' and forward to:

*Human Resources, Murrumbidgee Irrigation, Locked Bag 6010, GRIFFITH NSW 2680*

Or by email to:

*karen.robertson@mirrigation.com.au*

## Positions Vacant

Narrandera Shire Council

**POSITION VACANT**

**Truck Driver - HR Grade 6**
$933.59 to $1045.62/week

**Technical Officer Grade 13**
$1152.64 to $1290.96/week

**Closing Date 26 July 2018**

For further information visit **www.narrandera.nsw.gov.au** or contact Council's Human Resources Department on **02 6959 5510**

Narrandera Shire Council

**POSITION VACANT**

**Work Health Safety and Risk Officer Grade 16**
$1339.50 to $1500.24/week

**Closing Date 20 July 2018**

For further information visit **www.narrandera.nsw.gov.au** or contact Council's Human Resources Department on **02 6959 5510**

## Trade Services



## Positions Vacant

# APPENDIX B AHIMS SEARCHES

**This information has been removed for cultural reasons.**

# APPENDIX C ARCHAEOLOGICAL SITES

| AHIMS # | Site name | Site type | Location | | Description | Photos |
|---|---|---|---|---|---|---|
| **49-5-0211** | YSF_IF_001 | Isolated Find | 444530 | 6171053 | This site consists of a single fine-grained red silcrete core measuring 103 mm x 113 mm x 38 mm. Located on the edge of a raised channel bank in a red cracking clay exposure south of Houghton Road. The core has three negative flake scars from two platforms with a secondary reduction stage and 15% pebble cortex. The site is heavily disturbed from channel silt dumping and the ground surface visibility is low (30%) due to the low-lying vegetation and surrounding road base gravels. |  <br>Plate 9 Close up of red silcrete core YSF_IF_001.<br>  <br>Plate 10 View south west over location of YSF_IF_001. |

# APPENDIX D HERITAGE UNEXPECTED FINDS PROCEDURE

# Heritage Unexpected Finds Protocol

**Purpose**

This unexpected finds protocol has been developed to provide a method for managing unexpected non-Aboriginal and Aboriginal heritage items identified during the construction and maintenance of the Project. The unexpected finds 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 the *Heritage Act 1977* (Heritage Act).

Despite undertaking appropriate heritage assessment prior to the commencement of the Project, unexpected heritage items may still be identified during construction, operation and maintenance works. If this happens the following unexpected finds protocol plan should be implemented.

**What is a Heritage Unexpected Find?**

An unexpected heritage find is defined as any possible Aboriginal or non-Aboriginal heritage object or place, that was not identified or predicted by the project's heritage assessment and is not covered by appropriate permits or development consent conditions. Such finds have potential to be culturally significant and may need to be assessed prior to development impact.

Unexpected heritage finds may include:

- Aboriginal stone artefacts, shell middens, modified trees, hearths and rock art;
- Human skeletal remains; and
- Remains of historic infrastructure and relics.

**Aboriginal Heritage places or objects**

All Aboriginal objects are protected under the NSW *National Parks and Wildlife Act 1974* (NPW Act).

An Aboriginal object is defined as:

> Any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with the occupation of that area by persons on non-Aboriginal extraction and includes Aboriginal remains.

All Aboriginal objects are protected and it is an offence to harm or desecrate an Aboriginal object or place.

**Historic heritage**

The *Heritage Act 1977* protects relics which are defined as:

Any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance.

**Unexpected finds management procedure**

In the event that any unexpected Aboriginal heritage places or objects or any substantial intact historic archaeological relics of State or local significance are unexpectedly discovered during the Project, the following management protocols will be implemented:

1. Works at that identified heritage location will cease with an appropriate buffer zone of at least 20 metres to allow for the assessment and management of the find. All site personal will be informed about the buffer zone with no further works to occur within the buffer zone.
2. Heritage specialist will be engaged to assess the Aboriginal place or object encountered, Representative from the registered the Aboriginal Stakeholders for the Project may also be engaged to assess the cultural significance of the place or object;
3. The Project approvals will be reviewed to assess consistency with the approvals to impact Aboriginal heritage within the Project area
4. The discovery of an Aboriginal place or object will be reported to the local office of the Office of Environment and Heritage (OEH);
5. If the Aboriginal heritage places or objects are found to be covered under the existing approvals to impact Aboriginal heritage within the Project area, works may continue to be conducted in accordance with mitigation measures and approval requirements.
6. If the Aboriginal heritage places or objects are found to not be covered under the existing approvals to impact Aboriginal heritage within the Project area, works will not recommence at the heritage place or object until advised to do so by OEH.
7. If the heritage place or object can be managed *in situ*, works at the heritage location will not recommence until appropriate heritage management controls have been implemented, such as protective fencing.
8. For historic relics, work must cease in the affected area and the Heritage Council must be notified in writing. This is in accordance with section 146 of the *Heritage Act 1977.*
9. Depending on the nature of the discovery, additional assessment may be required prior to the recommencement of work in the area. At a minimum, any find should be recorded by an archaeologist.

**Human Skeletal Remains**

Where human skeletal remains are unexpectedly found during works for the Project the following protocol would be adopted:

1. Works at that location will cease, and an appropriate buffer zone of at least 50 metres will be established;
2. The human remains will not be moved;
3. The NSW police will be notified, and if the human remains are deemed a crime scene, the place will be managed by the police;
4. Should the human remains be deemed Aboriginal or historical by the police, OEH must be notified immediately to assess the remains; and
5. Should the human remains be deemed Aboriginal in origin all registered Aboriginal parties for the Project are to be notified in writing.

The above process functions only to appropriately identify the human remains and secure the site, from which time the management of the remains is to be determined through liaison with the NSW police, OEH and the relevant Aboriginal stakeholders.