Office of Environment & Heritage

Aboriginal Cultural Heritage Assessment Report Cover Sheet

Report Title	Aboriginal Cultural Heritage Assessment Jindera Solar Farm-Final
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Aboriginal Cultural Heritage Assessment

JINDERA SOLAR FARM

AUGUST 2019

ngh environmental

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ABBREVIATIONS

ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal heritage information management system
BAC	Bundyi Aboriginal Cultural Knowledge
BOM	Australian Bureau of Meteorology
DECCW	Refer to OEH
DP&I	(NSW) Department of Planning and Infrastructure
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
ha	Hectares
Heritage Act	*Heritage Act 1977* (NSW)
ISEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
km	Kilometres
LALC	Local Aboriginal Land Council
m	Metres
NPW Act	*National Parks And Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(NSW) Office of Environment and Heritage

EXECUTIVE SUMMARY

INTRODUCTION

Jindera Solar Farm Pty Ltd (Jindera Solar) proposes to develop a solar farm approximately 5.5 kilometres north of the township of Jindera, NSW in the Greater Hume Local Government Area (LGA). The Jindera Solar Farm proposal area comprises 404 hectare (ha) with Lot 2 DP213465; Lots 70, 90, 133-136, 138-141, 147, 148, and 153-155 DP753342; and Lots 1-3 DP1080215 with the proposed development footprint comprising of approximately 337 ha. The proposal involves the construction of a ground-mounted photovoltaic solar array with generating capacity of approximately 150 MegaWatt (MW).

The Secretary of the DPE Environmental Assessment Requirements (SEARs) were issued on the 14th of September 2018 as part of the State Significant Development (SSD) proposal. The item 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 consultation with the local Aboriginal community in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (Jindera Solar Farm 14/09/2018).

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 Jindera Solar Farm proposal would comprise the installation of a solar farm with a capacity of approximately 150 MW (DC). The power generated from the proposed Jindera Solar Farm will be fed into the National Electricity Market (NEM) at the transmission level from the nearby Jindera Substation. The proposal will consist of the following components:

- Single axis tracker PV solar panels mounted on steel frames over most of the site.
- Battery storage to store energy on site, allowing energy to be stored on site during periods of low demand and released to the network during periods of higher demand.
- Electrical conduits and transformers.
- Invertor units.
- On site substation.
- Site office, vehicle parking areas, internal access tracks and perimeter fencing.
- Overhead and underground electrical cable reticulation.
- 132 KV overhead cable run to connect the proposal to the Jindera substation.
- 40 m wide proposed transmission line easement connecting to the Jindera Substation compound.

To date TransGrid have not been able to define the scope of any works which may be required within the Jindera Substation lot. As such, the proposed transmission line easement could not be assessed however, a commitment is made to ensure Aboriginal heritage is appropriately assessed and mitigated, once the scope of work is clarified in this area. If any sites of Aboriginal cultural heritage are identified in the 40 m wide easement, they would be managed in accordance with the type and significance of the site.

ABORIGINAL CONSULTATION

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

As a result, two groups registered their interest in the proposal. These groups were:

- The Albury and District Local Aboriginal Land Council (Albury LALC); and
- Bundyi Aboriginal Cultural Knowledge (BAC)- Mark Saddler.

No other party registered their interest, including the entities and individuals recommended by OEH.

The fieldwork was organised, and both of the registered parties were asked to participate in the survey and subsurface testing fieldwork.

A copy of the draft report was provided to all the registered parties for comment.

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 results of previous archaeological surveys in the Jindera 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 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.

Based on previous archaeological investigations in the region and knowledge of Wiradjuri cultural practices and traditional activities the proposal area has a possibility of containing archaeological sites, especially given that Aboriginal people have lived in the region for tens of thousands of years. This would most likely be in the form of quartz lithic scatters, isolated artefacts and scarred trees in remnant old growth vegetation areas bordering the proposal area and/or as isolated paddock trees.

SURVEY AND SUBSURFACE TESTING RESULTS

The proposed solar farm area comprises primarily of cleared and cropped paddocks that have been subject to farming activities. Survey transects were undertaken on foot and traversed the entire proposal area. Visibility within the proposal area was variable however; as a whole it generally had visibility averaging 10% overall. The effective visibility in the paddocks ranged from 95% in exposures and in recently harvested paddocks to less than 5% in areas with a dense low grass cover. Between the survey participants, over the course of the field survey, approximately, 48 km of transects were walked across the proposal area.

Despite the variable visibility encountered during the survey, seven artefact scatters and 15 isolated finds were recorded. Four areas of potential archaeological deposit were also identified that required subsurface testing. The Aboriginal community representatives also identified three cultural trees.

The subsurface excavation of the four areas considered to have potential for *in situ* subsurface deposits was undertaken following the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. A total of 52 test pits were excavated across four areas within the proposal area during the subsurface testing program with stone artefacts recovered from 25 pits. The artefacts densities for each of the pits excavated ranged from nil to 12. From the 52 test pits, a total of 2.51 m^3 of deposit was excavated and sieved. A total of 80 subsurface artefacts were recovered during the testing program. All the subsurface artefacts recovered were manufactured from quartz which is a common lithology for the Jindera area. The density of artefacts recovered from the testing program provide an indication of the variability of artefact numbers across the landforms investigated. Observing the pattern of artefact distribution and the gaps across the testing program the proposal area is characterised by discrete low density clusters of artefacts interspersed with areas of very low or no artefactual material. The subsurface material recovered has been recorded as three additional subsurface artefact scatters.

The results of this survey and subsurface testing program support the modelling for the region that there are sites and artefacts present throughout the landscape, with high density sites generally located in elevated areas adjacent to waterways. The density of the surface and subsurface assemblage across the proposal area indicates that small groups were occupying short-term camps for short periods of time across the proposal area with a focus along water sources and elevated areas in close proximity to a water source. No direct evidence of longer-term base camps was identified within the proposal area.

POTENTIAL IMPACTS

The proposal involves the construction of a solar farm and includes connection to the nearby substation. The development will result in disturbance of approximately 337 ha. The table below provides a summary of site types to be impacted and avoided by the proposed solar farm development footprint.

Site Type	Type of Harm	Degree of Harm	Consequence of harm	No. of Sites	% of site type
Isolated Finds	Direct	Complete	Total loss of value	14	93.3
	Nil	Nil	Not Applicable	1	6.7
Artefact Scatters	Direct	Complete	Total loss of value	10	100
Cultural site	Nil	Nil	Not Applicable	3	100

A total of 24 sites with stone artefacts (Jindera Solar IF 1, Jindera Solar IF 3 to Jindera Solar IF 11, Jindera 487595, Jindera 487613, Jindera 487828, Jindera 488004, Jindera 488942, Jindera 487530, Jindera 488212/Jindera 488156, Jindera 488172, Jindera 488179, Jindera 487973 and Jindera 487666) are situated within the area of the proposed solar arrays, tracks and fencing that would be impacted by the proposed development. Only isolated stone artefact, Jindera Solar IF 2, will not be impacted by the proposed development footprint.

The impact to the sites with stone artefacts is likely to be most extensive where earthworks occur, such as the installation of cabling, which may involve the removal, breakage or displacement of artefacts. This is considered a direct impact on the sites and the Aboriginal objects by the development in its present form.

The three cultural trees (Jindera 488918, Jindera 488995 and Jindera SF Cultural Site 1) will not be impacted by the proposed development footprint however, fencing and vegetation screening is proposed to occur in close proximity to these sites.

The assessment of harm overall for the project is assessed as moderate.

While the majority of the stone artefact sites are rated as having total loss of scientific value it is argued that there are likely to be a number of similar sites in the local area and therefore the impact to the overall local archaeological record is considered to be low. The stone artefacts have little research value apart from what has already been gained from the information obtained during the present assessment. This information relates more to the presence of the artefacts and in the development of Aboriginal site modelling, which has largely now been realised by the recording. The impact to the edge-ground axe fragment (within AHIMS #55-6-0117/ Jindera 488942) is considered to have low to moderate loss of scientific value given it is more uncommon artefact type. No other values have been identified that would be affected by the development proposal.

RECOMMENDATIONS

The management recommendations are as follows:

1. The development avoids the three cultural tree sites Jindera 488918, Jindera 488995 and Jindera SF Cultural Site 1. A minimum 20 m buffer should be in place around each cultural tree to prevent any inadvertent impacts to the canopy and root system.
2. To ensure no inadvertent impacts occur to the three cultural tree sites no plantings for the vegetation screening or any form of ground disturbance during fencing actives can occur within the 20 m buffer zone. Any fencing wire installed will be a minimum of 1 m from physical contact with any part of the tree.
3. If complete avoidance of the 15 isolated find sites and 10 artefact scatters recorded within the proposal area is not possible the surface stone artefacts within the development footprint must be salvaged. The salvage of these objects must occur prior to the proposed work commencing. Until salvage has occurred a minimum 5 m buffer must be observed around all stone artefact sites.
4. The collection and relocation of the surface artefacts should be undertaken by an archaeologist with representatives of the registered Aboriginal parties and be consistent with Requirement 26 of the *Code of practice for Archaeological Investigation of Aboriginal Objects in New South Wales.* The salvage of Aboriginal objects can only occur following development consent that is issued for State Significant Developments and must occur prior to any works commencing.
5. All artefacts recovered from the subsurface testing program currently in temporary care at NGH Wagga Wagga office must be reburied in line with recommendation 4 and in an appropriate location within the proposal area that will not be subject to any ground disturbance.
6. All objects salvaged, including those recovered from the subsurface testing program, must be have their reburial location submitted to the AHIMS database. An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works.
7. A minimum 5 m buffer should be observed around all sites with stone artefact that are being avoided by the proposed development.
8. Subject to Transgrid defining the scope of any works within the Jindera Substation lot, further assessment of this area will be required. If Aboriginal cultural heritage sites are identified, they must be managed in accordance with their type and significance, which may include collection and reburial as outlined in Recommendation 3 and 6 above.
9. Jindera Solar Pty Ltd should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal artefacts during the construction of the solar farm and management of known sites and artefacts. The Plan should include the unexpected finds procedure to deal with construction activity. Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.
10. 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.
11. Further archaeological assessment would be required if the proposal activity extends beyond the area assessed in this report. This would include consultation with the registered Aboriginal parties and may include further field survey.

1 INTRODUCTION

Jindera Solar Farm Pty Ltd (Jindera Solar) proposes to develop a solar farm approximately 5.5 kilometres north of the township of Jindera, NSW in the Greater Hume Local Government Area (LGA) (see Figure 1 and 2). The Jindera Solar Farm proposal area comprises 404 hectares (ha) with Lot 2 DP213465; Lots 70, 90, 133-136, 138-141, 147, 148, and 153-155 DP753342; and Lots 1-3 DP1080215 with the proposed development footprint comprising of approximately 337 ha (Figure 3). The proposal involves the construction of a ground-mounted photovoltaic solar array with generating capacity of approximately 150 MegaWatt (MW) (DC).

NGH Environmental has been contracted by Jindera Solar to prepare an Aboriginal Cultural Heritage Assessment (ACHA) to investigate and examine the presence, extent and nature of any Aboriginal heritage for the proposed development footprint as part of an Environmental Impact Assessment (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.

Throughout the project, the following codes and guides will be followed in relation to Aboriginal heritage assessment.

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* http://www.environment.nsw.gov.au/resources/cultureheritage/20110263ACHguide.pdf
- *Code of Practice for Archaeological Investigations of Objects in NSW* http://www.environment.nsw.gov.au/resources/cultureheritage/10783FinalArchCoP.pdf
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09781ACHconsultreq.pdf

The above codes and guides are issued by the Office of Environment and Heritage (OEH) and are followed for most Aboriginal heritage assessments. The approach being undertaken by NGH Environmental will therefore be consistent with other heritage assessments undertaken in NSW.

Under the NSW Planning legislation an Aboriginal Heritage Impact Permit (AHIP) from OEH would not be required for this project because under the State Significant Development regime the Department of Planning provides the approval. However, Aboriginal heritage still needs to be considered in the EIS including conducting consultation with the Aboriginal community. The Jindera Solar Farm project is a State Significant Development (SSD) and is subject to approval by the Department of Planning. It is a requirement that Aboriginal heritage is considered in the EIS as part of SSD, including conducting consultation with the Aboriginal community. Where any project falls under the SSD regime an Aboriginal Heritage Impact Permit (AHIP), normally issued by Office and Environment and Heritage (OEH), is not required.

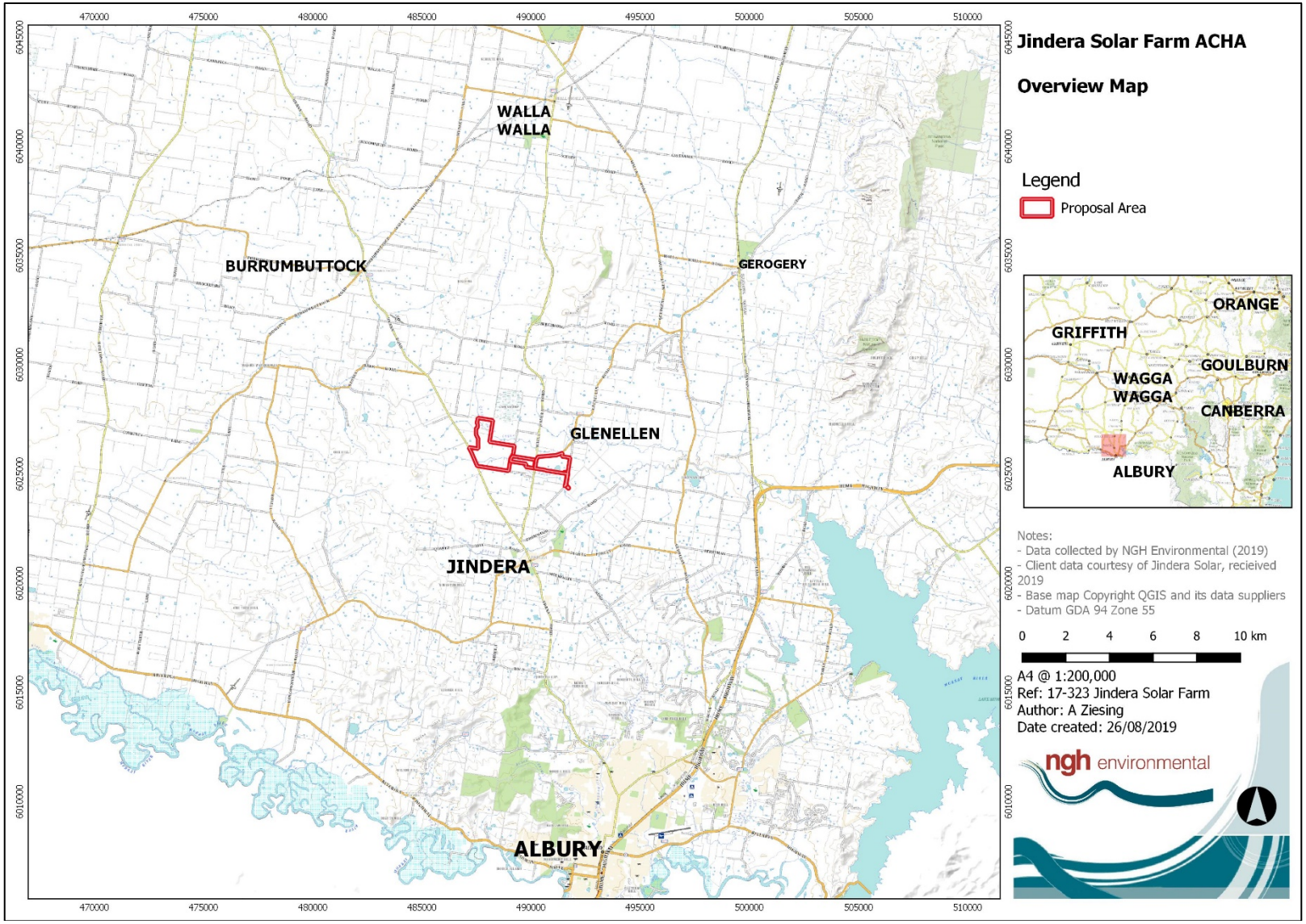


Figure 1 Overview Map.

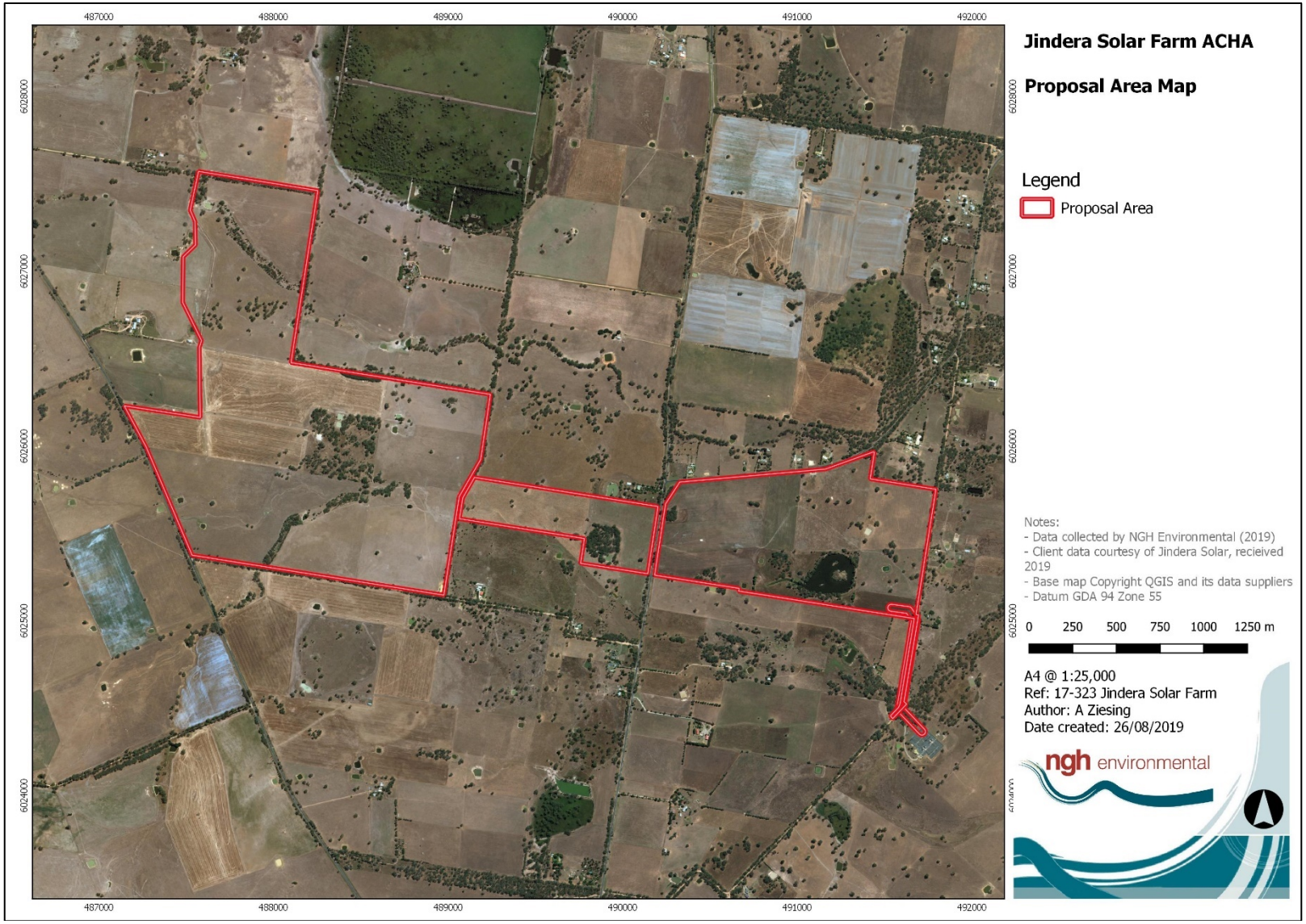


Figure 2 Proposal Area Map.

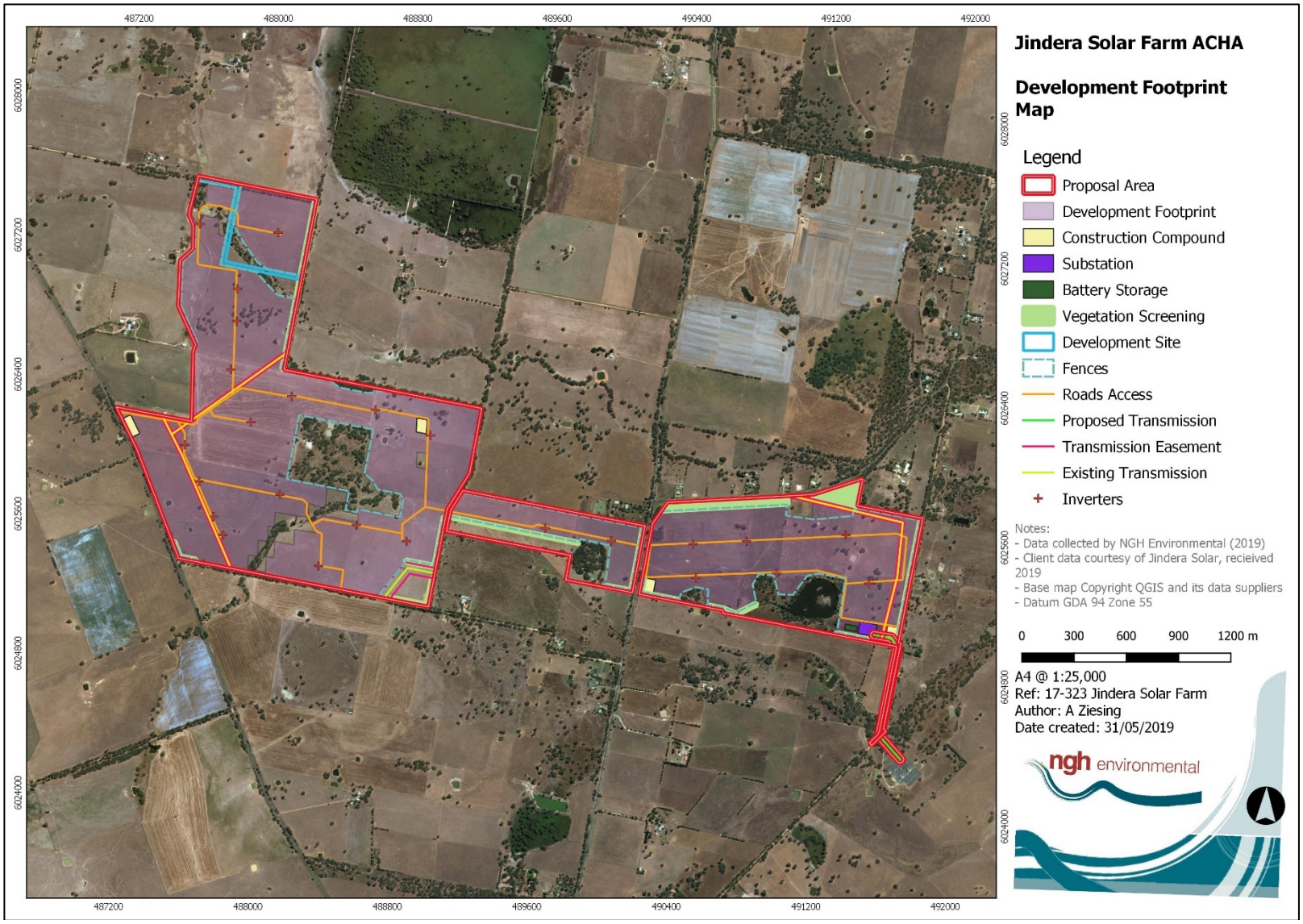


Figure 3 Proposed development footprint for Jindera Solar Farm.

1.1 DEVELOPMENT 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 Jindera 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 the Jindera 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).

A Preliminary Environmental Assessment (PEA) was submitted to the DPE and subsequently the Secretary of the DPE Environmental Assessment Requirements (SEARs) were issued on the 14th of September 2019. The specific issue of heritage in the SEARs for the project noted that the EIS must 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 in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents"* (SEARS for the Jindera Solar Farm 14/09/18).

For the purposes of this assessment only the proposal area as shown in Figure 2 was assessed.

1.2 PROJECT PROPOSAL

The Jindera Solar Farm proposal area is in Greater Hume LGA approximately 5.5 kilometres north of the township of Jindera. The Jindera Solar Farm proposal area comprises of 404 ha on Lot 2 DP213465; Lots 70, 90, 133-136, 138-141, 147, 148, and 153-155 DP753342; and Lots 1-3 DP1080215 with the proposed development footprint comprising of approximately 337 ha.

The solar farm would have a total installed capacity of up to 150 MW (DC), and would include:

- Single axis tracker PV solar panels mounted on steel frames over most of the site.
- Battery storage to store energy on site, allowing energy to be stored on site during periods of low demand and released to the network during periods of higher demand.
- Electrical conduits and transformers.
- Invertor units.
- On site substation.
- Site office, vehicle parking areas, internal access tracks and perimeter fencing.
- Overhead and underground electrical cable reticulation.
- 132 KV overhead cable run to connect the proposal to the Jindera substation.
- 40 m wide proposed transmission line easement connecting to the Jindera Substation compound.

To date TransGrid have not been able to define the scope of any required works within the Jindera Substation lot. As such, the proposed transmission line easement could not be assessed: however, a commitment is made to ensure Aboriginal heritage is appropriately assessed and mitigated, once the scope of work is clarified. If any sites of Aboriginal cultural heritage are identified in the 40 m wide easement, they would be managed in accordance with the type and significance of the site.he proposed development footprint is shown in Figure 3.

The proposed Jindera Solar Farm is expected to operate for at least 30 years. The construction phase of the proposal is expected to take 11 months and commence in late 2019. After the initial operating phase, the proposal would either be decommissioned, removing all above ground infrastructure and returning the site to its existing land capability (12 months), or upgraded with new photo voltaic equipment.

1.3 PROJECT PERSONNEL

This ACHA report was completed by archaeologist Kirsten Bradley, Brett Chalmers and Amy Ziesing of NGH Environmental, including research, Aboriginal community consultation and report preparation. Kirsten Bradley, Bronwyn Partell and Emily Dillon also participated in the survey fieldwork. Kirsten Bradley and Amy Ziesing participated in the subsurface testing fieldwork. Kirsten Bradley and Matthew Barber reviewed the report.

Consultation with the Aboriginal community was undertaken following the process outlined in OEH's *Aboriginal cultural heritage consultation requirements for proponents 2010.* Two Aboriginal groups registered their interest in the proposal.

The groups who registered interest were:

- The Albury and District Local Aboriginal Land Council (Albury LALC); and
- Bundyi Aboriginal Cultural Knowledge (BAC)- Mark Saddler.

Given there was only two Registered Aboriginal Parties for the project Jindera Solar Pty Ltd engaged both parties for fieldwork participation. This is considered best practice.

Representatives who participated in the survey fieldwork were:

- Mark Saddler (Representing BAC on the 6-8 November 2018 and 21 January 2019);
- Andom Rendell (Representing the Albury LALC 6-8 November 2018);
- Jimmy Davis (Representing the Albury LALC 7-8 November 2018);
- Jackson Edwards (Representing the Albury LALC 7 November 2018)
- Uncle Tunny (Representing the Albury LALC n the 21 January 2019); and
- Sam Kirby (Representing the Albury LALC n the 21 January 2019).

Representatives who participated in the subsurface testing fieldwork were:

- Mark Saddler (Representing BAC on the 26 February to 5 March 2019);
- Ziggy Kennedy (Representing the Albury LALC on the 25 February 2019);
- Paul Davis (Representing the Albury LALC on the 25 February and 5 March 2019); and
- Jimmy Davis (Representing the Albury LALC on the 26 February to 4 March 2019).

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

1.4 REPORT FORMAT

For the purposes of this assessment of the Jindera Solar Farm, 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 study 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 a field survey of the proposal area to identify and record any Aboriginal heritage objects and/or areas of potential significant archaeological deposits ;
- Undertake subsurface testing of any areas with potential archaeological deposits to identify the nature of archaeological material;
- 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 and a consultation log is provided in Appendix A. A summary of actions carried out in following these stages are as follows. The actions undertaking in implemented these 4 steps can be summarised as follows;

Stage 1. Letters outlining the development proposal and the need to carry out an ACHA were sent to the Albury LALC and various statutory authorities including OEH, as identified under the ACHCRP. An advertisement was placed in the local newspapers, the *Eastern Riverina Classifieds* on the 8th of August 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, two Aboriginal groups registered their interest in the proposal.

These groups were:

- The Albury and District Local Aboriginal Land Council (Albury LALC); and
- Bundyi Aboriginal Cultural Knowledge (BAC).

No other party registered their interest.

Stage 2. On the 21st of September 2018, an Assessment Methodology document for the Jindera Solar Farm survey was sent to the two registered Aboriginal parties as listed above. This document provided details of the background to the proposal, a summary of previous archaeological surveys and the proposed heritage assessment methodology for the proposal. The document invited comments regarding the proposed methodology and sought any information regarding known Aboriginal cultural significance values associated with the subject 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 registered parties however all expressed an interest in participating in fieldwork.

The field survey of the Jindera Solar Farm proposal area in November 2018 in conjunction with an assessment of contour data, archaeological modelling and consideration of the comments from the Registered Aboriginal Parties resulted in the identification of four areas considered to have potential for *in situ* subsurface deposits that required further assessment. Given this, a Subsurface Testing Methodology document for the Jindera Solar Farm was sent to the two registered Aboriginal parties on the 19th of December 2018. This document provided details of the proposed subsurface testing methodology. The document invited comments regarding the proposed methodology and sought any information regarding known Aboriginal cultural significance values associated with the subject 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 registered parties however all expressed an interest in participating in fieldwork.

Stage 3. The *Assessment Methodology* outlined in Stage 2 included a written request to the two registered Aboriginal parties to provide any information that may be relevant to the cultural heritage assessment of the study 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 initial survey fieldwork was organised, and the two registered groups were asked to participate in the fieldwork. The initial survey fieldwork was carried out in early November 2018 by two archaeologists from NGH Environmental with local Aboriginal representatives.

Representatives who participated in the November 2018 fieldwork were:

- Mark Saddler (Representing BAC on the 6-8 November 2018);
- Andom Rendell (Representing the Albury LALC 6-8 November 2018);
- Jimmy Davis (Representing the Albury LALC 7-8 November 2018); and
- Jackson Edwards (Representing the Albury LALC 7 November 2018).

Additional survey fieldwork was conducted in January 2019 following the harvesting of a crop that had previously hampered the ground survey visibility of a paddock. The two registered groups were asked to participate in the additional survey fieldwork in January 2019. The additional survey fieldwork was carried out on the 21st of January 2019 by two archaeologists from NGH Environmental with three local Aboriginal representatives.

Representatives who participated in the January 2019 fieldwork were:

- Mark Saddler (Representing BAC on the 21 January 2019);
- Uncle Tunny (Representing the Albury LALC n the 21 January 2019); and
- Sam Kirby (Representing the Albury LALC n the 21 January 2019).

The subsurface testing fieldwork was organised for February 2019 and the two registered groups were asked to participate in the fieldwork. Additional survey was also conducted during this fieldwork to cover a small area previously not surveyed. The subsurface testing and additional survey fieldwork were carried out between 25th February and the 8th March 2019 by two archaeologists from NGH Environmental with local Aboriginal representatives.

Representatives who participated in the subsurface testing fieldwork in February 2019 were:

- Mark Saddler (Representing BAC on the 26 February to 5 March 2019);
- Ziggy Kennedy (Representing the Albury LALC on the 25 February 2019);
- Paul Davis (Representing the Albury LALC on the 25 February and 5 March 2019); and
- Jimmy Davis (Representing the Albury LALC on the 26 February to 4 March 2019).

Stage 4 In April 2019 a draft version of this *Aboriginal Cultural Heritage Assessment Report* for the proposal (this document) was forwarded to the RAPs inviting comment on the results, the significance assessment and the recommendations. A minimum of 28 days was allowed for responses to the document.

2.1 ABORIGINAL COMMUNITY FEEDBACK

2.1.1 Fieldwork feedback

Aboriginal community consultation occurred throughout the project. Following the completion of the survey fieldwork in November 2018 Mark Saddler provided a report on his participation in the survey which included a list of the sites he recorded and additional comments on the proposal. The comments provided are summarised below and provided in full in Appendix C.

- The northern most paddock closest to Gum Swamp should be subject to a subsurface testing program due to the high likelihood of subsurface cultural material.
- Two paddocks within the proposal area were noted to have poor ground surface visibility due to crops and/or dense grass cover. It was requested that these paddocks are resurveyed when there is better visibility.
- All care must be taken to minimise any further damage to the recorded Aboriginal sites and the scarred trees recorded need fencing erected to stop any further damage from livestock.
- Any Aboriginal items that have been recorded and that need to be moved should be done so in the presence of an Elder or community member
- Any Aboriginal items that cannot be moved (ie scar trees) should have exclusions zones placed around them and all workers be given some cultural awareness training or education which should be conducted by local Elders or community members.
- Any items that must be moved will be returned and placed back into country by local Elders.
- That while the Solar farm is under construction that local Aboriginal people be employed to assist in the work and to also look out, care for and record any other items that may surface due to construction work.
- That the planting of native trees would enhance the area for both people and bird life, specially the planting of Bull Oak trees.

A summary of how the comments have been addressed by NGH is provided below.

The field survey of the Jindera Solar Farm proposal area in November 2018 in conjunction with an assessment of contour data, archaeological modelling and consideration of the comments from the Registered Aboriginal Parties have resulted in the identification of four areas considered to have potential for *in situ* subsurface deposits that required further assessment.

Two of the areas proposed for testing by NGH were also noted as requiring testing or additional inspection by Mark Saddler and therefore the testing program subsequently conducted and reported on with the ACHA has adequately addressed the request for the further assessment of these areas.

Additional survey was also undertaken in January 2019 following the harvest of a crop that was noted by Mark Saddler to have hindered the identification of Aboriginal objects during the initial survey. Therefore, this comment has subsequently been adequality addressed.

NGH has recommended in this report that adequate buffers are placed around all sites identified and that a salvage program be conducted with representatives of the Aboriginal community for sites with Aboriginal stone objects that will be impacted by the proposed development. Once development approval has been granted it was recommended by NGH that the artefacts within the development footprint must be salvaged with representatives of the local Aboriginal community prior to the proposed work commencing and moved to a safe area within the property that will not be subject to any ground disturbance. Given the recommendations in the report for the buffers around sites and the salvage of sites with stone artefacts with representatives of the Aboriginal community no further action in regard to these comments are required as they have been sufficiently addressed in the recommendations of the ACHA.

NGH has also recommend that a Cultural Heritage Management Plan (CHMP) be developed to address the potential for finding additional Aboriginal artefacts during the construction period and also to manage those sites that will be avoided by the work. The CHMP would outline an unexpected finds protocol to deal with construction activity. Preparation of the CHMP would be undertaken in consultation with the registered Aboriginal parties however it would be at the discretion of Jindera Solar Farm Pty Ltd who was engaged to provide cultural awareness training or education although it is noted to be best practice to engage with the local Aboriginal community for such cultural programs. The unexpected finds protocol to be developed as part of the CHMP would provide for the management of any unexpected finds and any additional Aboriginal monitoring of the construction works is deemed to be unnecessary.

The employment issue raised is not related to this archaeological assessment and the issue would be dealt with separately by Jindera Solar Farm Pty Ltd. NGH Environmental are unable to comment further on this particular matter.

In regard to the planting of native trees, particularly the planting of Bull Oak trees, this comment is not related to this archaeological assessment. NGH Environmental note that the proponent has engaged the services of a landscaper who has recommended a number of native plant species including Bull Oak *(Allocasuarina luehmannii*) as an appropriate native mid storey vegetation to be planted as part of vegetation screening for this project. This information will be incorporated into the visual impact assessment and landscape plan provided as part of the larger EIS submission.

2.1.2 Draft Report Feedback

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.

Report feedback was provided in writing via email from Mark Saddler (Bundyi Aboriginal Cultural Knowledge) on the 17th of April 2019 who did not raise any issues with the report or its recommendations. Mark Saddler noted that the report was okay and thanked NGH for caring about his mob and country. No further comments were provided. A copy of this response is provided in Appendix A.

No feedback was received from the Albury LALC.

3 BACKGROUND INFORMATION

3.1 REVIEW OF LANDSCAPE CONTEXT

3.1.1 Geology, Topography and Climate

Located within the NSW portion of the Murray-Darling Basin, north of Albury, Jindera is dominated by a sub-humid climate, characterised by hot summers with no dry season (Gibbons, 2001). The geology of the Jindera area is dominated by a basal layer of schist from the Upper Ordovician and into the Silurian, characterised by low grade metasediments and sediments of slate, phyllite, greywacke, siltstone, mudstone and shale (Willis, 1974). The proposal area is characterised by the underlying Jindera Granite, a pink to white porphyritic biotite granite that can vary from being medium to coarse grained (Willis, 1974). The topography of the region features low-gradient undulating and hilly ranges, wide valleys and isolated peaks (Goldsmith, Barker & Johnston, 1985). Within the immediate proposal area, the landscape bears flat to gently undulating gradients with two low hills located in the western portion of the proposal area. .

Throughout the region, early to middle Palaeozoic Bedrock form local highlands, overlain with extensive areas of colluvium. Areas of unconsolidated Quaternary riverine sediments occur along the banks of tributaries which increase in density with proximity to the Murray River catchment (Spennemann, 1998). The bedrock in the region comprises mainly of Ordovician sediments and metasediments, granite and granodiorite (predominantly Silurian), Siluro-Devonian acid volcanics and Late Devonian sediments (Willis 1974). The Ordovician sediments and metasediments are represented by slate, silt stone, sand stone and greywacke, with some Quartz-mica schist and quartzofeldspathic biotite gneiss (Spennemann, 1998). Intruding these Ordovician sediments are Silurian and lower Devonian granites, while middle Silurian – early Devonian acid volcanics partially overlay them. Geological mapping (Surface Geology of Australia 1:5Million data set, 2018) places the proposal area within the Australian geological grouping Dg (Devionian Granites), including granite, syenite, granodiorite and tonalite from the Palaeozoic era.

The NSW 1500k simplified surface geology (available via the seed online portal) divides the proposal area into three types of surface geology;

- Quaternary Lacustrine - more common in the Riverina, Lacustrine deposits form when lakes are filled with sediment during wet periods. After the water evaporates, mud, silt and sand are left in the now dry lake bed.
- Silurian I-formed by the melting of igneous source rocks. Common minerals are quartz, feldspar, and biotite, with a characteristic presence of amphibole.
- The Cenozoic Shepparton Formation -a poorly consolidated clay, silt, sand and gravel commonly found in the Riverina between the Lachlan and Murray Rivers.

The landscape context for the proposal area is based on a number of classifications that have been made at national and regional level for Australia. These include the national Interim Biogeographic Regionalisation for Australia (IBRA) system, Mitchell landscapes, NSW soil landscapes and 1:250,000 scale geological maps. The combination of these four differing resolutions of landform data provides a comprehensive and multi scaled understanding of the landscape within the proposal area and its immediate surroundings.

Interim Biogeographic Regionalisation for Australia

The national Interim Biogeographic Regionalisation for Australia (IBRA) system identifies the proposal area as being located in the South Western Slopes Complex (NSS) which is split into two subregions, the Upper Slopes (NSS01) and Lower Slopes (NSS02), outlined in Table 1 (DEE 2016). The proposal area is located just inside the barrier between the two subregions, lying within the Lower Slopes subregion and surrounded by the Upper Slopes subregion.

The NSW South Western Slopes Bioregion is an extensive area of foothills and isolated ranges comprising the lower inland slopes of the Great Dividing Range, extending from Albury in the south to Dunedoo in the north east, with an area of 8,657,462 hectares. Inland streams pass across the slopes in confined valleys with terraces and local areas of sedimentation. Soils and vegetation are complex and diverse but typified by texture contrast soils and a variety of eucalypt woodlands, making this bioregion the southern equivalent of the Nandewar Bioregion.

Table 1 South Western Slopes complex subregions after Morgan and Terry (1992).

Bioregion - Subregion	Geology	Landforms	Soils
South Western Slopes - Upper Slopes	Ordovician to Devonian folded and faulted sedimentary sequences with inter-bedded volcanic rocks and large areas of intrusive granites.	Steep, hilly and undulating ranges and granite basins. Occasional basalt caps, confined river valleys with terrace remnants.	Shallow stony soils on steep slopes, texture contrast soils grading from red subsoils on upper slopes to yellow subsoils on lower slopes. Alluvial sands, loams and clays.
South Western Slopes - Lower Slopes	As for the Upper Slopes but with larger areas of Tertiary and Quaternary alluvium.	Undulating and hilly ranges and isolated peaks set in wide valleys at the apices of the Riverina alluvial fans.	Similar to the Upper Slopes but with more extensive red-brown earths on undulating plains and more extensive grey clays on alluvium.

Mitchell Landscapes

Further landscape mapping as part of the Mitchell landscapes system (2002) divides the proposal area into two differing landscape types (see Figure 4). These landscapes are the Brokong Plains (Bro), and Murray Lakes, Swamps and Lunettes (Mll) (descriptions of the Mitchell Landscapes are provided in Table 2 below). The Mitchell landscapes provide more specific landform, soil and vegetation profiles for these two landscape areas.

Table 2 Description of the Mitchell Landscapes relevant to the proposal (DECC 2002)

Mitchell Landscape	Landforms	Soils	Vegetation
Brokong Plains Landscape Code: Bro Ecosystem Meso grouping: NSS Lower Slopes	Quaternary alluvial plains with a general elevation of 170m, and a local relief of <10m.	Red-brown texture contrast soils (extensively cleared).	Vegetation has been extensively cleared and cropped, formerly grey box (*Eucalyptus microcarpa*), yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*) and white cypress pine (*Callitris glaucophylla*) woodland to open forest.

Mitchell Landscape	Landforms	Soils	Vegetation
Murray Lakes, Swamps and Lunettes Landscape Code: Mll Ecosystem Meso grouping: RIV Murray	The landscape includes parts of two land systems: *Leaghur* and *Victoria.* Large active freshwater lakes and swamps frequently flooded by the river, generally round or kidney shaped. Often nested within larger relic Quaternary lake features. Beaches, sand and clay pellet lunettes and sand hills on the eastern margins. Relief of lakes and channels to 10m, lunettes to 20m.	Lake beds and associated channels of grey cracking clay, beaches of brown to white sands, lunettes of deep cemented yellow to white sands, with or without interbedded strata of pelleted clay.	Scattered black box *(Eucalyptus largiflorens*), river red gum *(Eucalyptus camaldulensis*), nitre goosefoot (*Chenopodium nitrariaceum*) and lignum (*Muehlenbeckia cunninghamii*) on lakebeds. Shallower swamps with cumbungi (*Typha orientalis*), common reed (*Phragmites* *australis*), spike rush (*Eleocharis* sp.) and water couch (*Paspalum paspalodes*). Numerous aquatic plants in standing water. Lunettes and sand hills with marginal river red gum, and stands of white cypress pine (*Callitris glaucophylla*), prickly wattle (*Acacia victoriae*), sandhill wattle (*Acacia ligulata*), bluebush (*Maireana* sp.) and grasses.

Soil Landscapes

Two soil landscapes occur within the proposal area: Yarra and Kindra. The Doodle Comer Swamp soil landscape is located 400 m to the north-east of the proposal area (eSpade v.02). The area in general is characterised by grey cracking clay soils , with mud, silt and sand occurring in lake and swamp deposits. Residual deposits consist of alluvial and colluvial boulders, gravel and sand. The Yarra and Kindra soil landscapes are described in Table 3.

Table 3 Description of the Soil Landscapes relevant to the proposal (eSpade v.02).

Soil Landscape	Description
Yarra	Gently inclined footslopes of almost totally cleared grassy woodland, ranging from 2-8%. Local relief varies between 10–30 m and elevation between 200–300 m. The soils are comprised of very deep low to moderately drained red, brown and yellow podzolics located on upper and midslopes. Well drained earthy sands are found on fans and parallel drainage lines.
Kindra	Broad gently sloping plains of extensively cleared box woodlands, formed on colluvium below sedimentary hills. Slopes range from 1-3%, local relief is less than 5 m and elevation varies from 130-200 m. Soils include red-brown earths, brown and occasionally red podzolics. These have formed on slopewash and include gravel, sand, silt and clays.

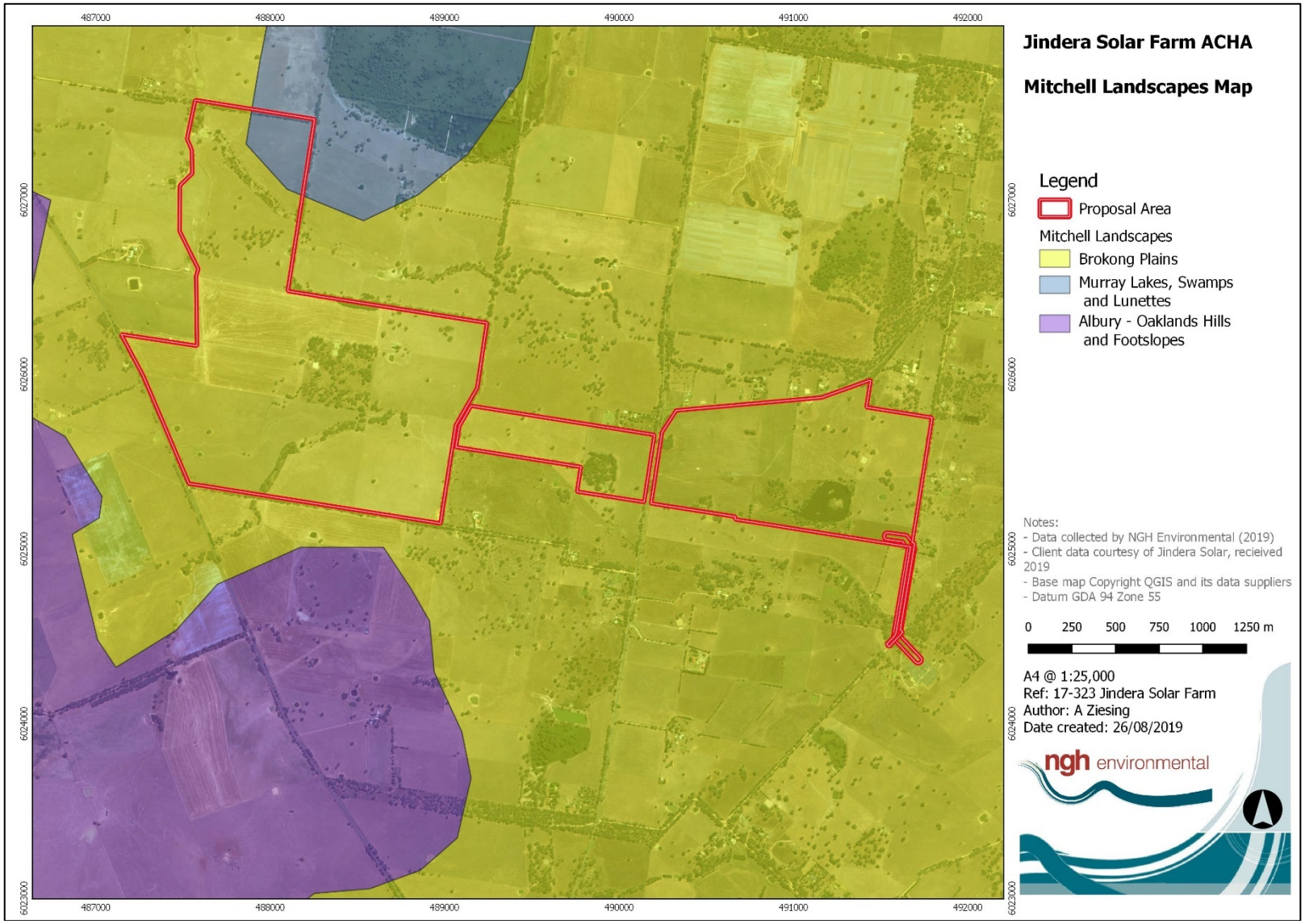


Figure 4 Mitchell Landscapes across the proposal area.

3.1.2 Hydrology and Hydrogeology

The proposal area is located within the Murray Catchment, about 15 km north of the Murray River. The two closest surface water drainage lines are ephemeral creeks. The ephemeral creeks are Dead Horse Creek, which runs through the northern end of the western portion of the proposal area and Kilnacroft Creek, which transects the southern section of western portion of the proposal area. Both creeks run into Bowna Creek, which feeds into Lake Hume, upstream of the Murray River. Additionally, Gum Swamp is located approximately 200 m north of the proposal area. Gum swamp is a seasonal, mostly dry and perennial swamp.

Ten man-made dams occur within the proposal area.

Two hydrogeological landscapes (HGL) occur within the project area: Walla Walla and Burrumbuttock. These are described in more detail in Table 4 below.

Table 4 Description of the hydrogeology.

Soil Landscape	Description
Walla Walla HGL	The region covered by the Walla Walla HGL experiences between 500-700mm of annual rainfall across extensive and broad, gently sloping plains. Semi-confined or unconfined aquifers dominant the region, allowing groundwater to flow through alluvial sediments. Water quality is fresh to marginal, with soils overlying a shallow to intermediate water table, which pools above clay soils in wet conditions.
Burrumbuttock HGL	The Burrumbuttock HGL region covers Gerogery West and parts of Jindera and receives between 550 and 700mm of annual rainfall over rolling to steep hills, undulating low hills and rises, long colluvial slopes and gentle foot slopes and fans. Localised swamp depression and low-lying plains are also present across the wider region.

3.1.3 Vegetation

The native vegetation in the landscape surrounding the proposal area is considered to be predominantly grassy woodland comprised of Blakely's Red gum (*Eucalyptus blakelyi*), River Red Gum (*Eucalyptus camaldulensis*) and Yellow Box (*Eucalyptus melliodora*).

The majority of the proposal area has been cleared for agriculture and is currently used for cropping and grazing sheep and/or cattle. The paddocks have been deep ripped and cultivated in past management practices. Exotic vegetation within the proposal area is comprised of a mixture of cereal crops including canola, wheat and barley. Exotic dominated pastures are heavily grazed by livestock and native groundcover has been entirely lost.

3.1.4 Land Disturbances

Land disturbances within the proposal area are largely those commonly associated with farming practices. There is a history of both low and high intensity farming practices across the landscape. High intensity farming practices include the heavy ploughing of field and initial creation of dams and paddocked areas, while lower intensity practices include pastoral. While mining activities have been recorded in the wider area, there is no indication of mining within the proposal area.

3.1.5 Historic Land Use

European settlement of the Riverina area followed relatively rapidly after Hume and Hovell travelled through the area in 1824.The Jindera area has a long history of intensive agricultural and pastoral use. The majority of the area has been utilised for grazing and crop production since European settlement in the mid 1800's The proposal area is located within the Parish of Huon, County of Goulbourn. Parish maps dating back as far as 1892 provide an indication of the historical land use across the area. The proposal area was occupied from at least 1892, with the parish map showing a combination of private land grants, as well as multiple lots owned by the Commercial Banking Company of Sydney. The area is indicated to be largely utilised for farming purposes (both agricultural and stock farming). North east of the proposal area lies land that is marked as being reserved for travelling stock and camping (reservation date 19th May 1900).

The location of the proposed Jindera Solar Farm is within pastoral and agricultural fields and therefore has been subject to considerable impacts from farming for many decades. Overall, the proposal area would be categorised as highly disturbed through consistent farming practices over many decades, including ripping and ploughing.

Additionally, a powerline passes through the southern portion of the western section of the proposal area. The construction of the powerlines would have caused additional disturbance to the area.

3.1.6 Landscape Context

Most archaeological surveys are conducted in a situation where there is topographic variation, and this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal archaeological sites. As already noted, the ephemeral creeks Dead Horse Creek and Kilnacroft Creek intersect the proposal area. Additionally, Gum Swamp is located within 200 m of the northern portion of the proposal area.

The areas in close proximity to a water source on slightly raised flat areas and hill crests are likely to have been a focus for Aboriginal people in the area. However, prior to European land modifications, this area as a whole may have provided resources, shelter, water and food for Aboriginal people.

The different soil and Mitchell landscapes noted above were not readily identifiable within the proposal area and were not used as a means of landscape differentiation. The landforms were instead determined based on topography identified during the visual inspection of the proposal area during field survey and from the review of detailed contour mapping. The four landforms identified within the proposal area are shown in Figure 5 and detailed below:

- Crests;
- Spurs;
- Slopes; and
- Low lying flats and drainage lines.

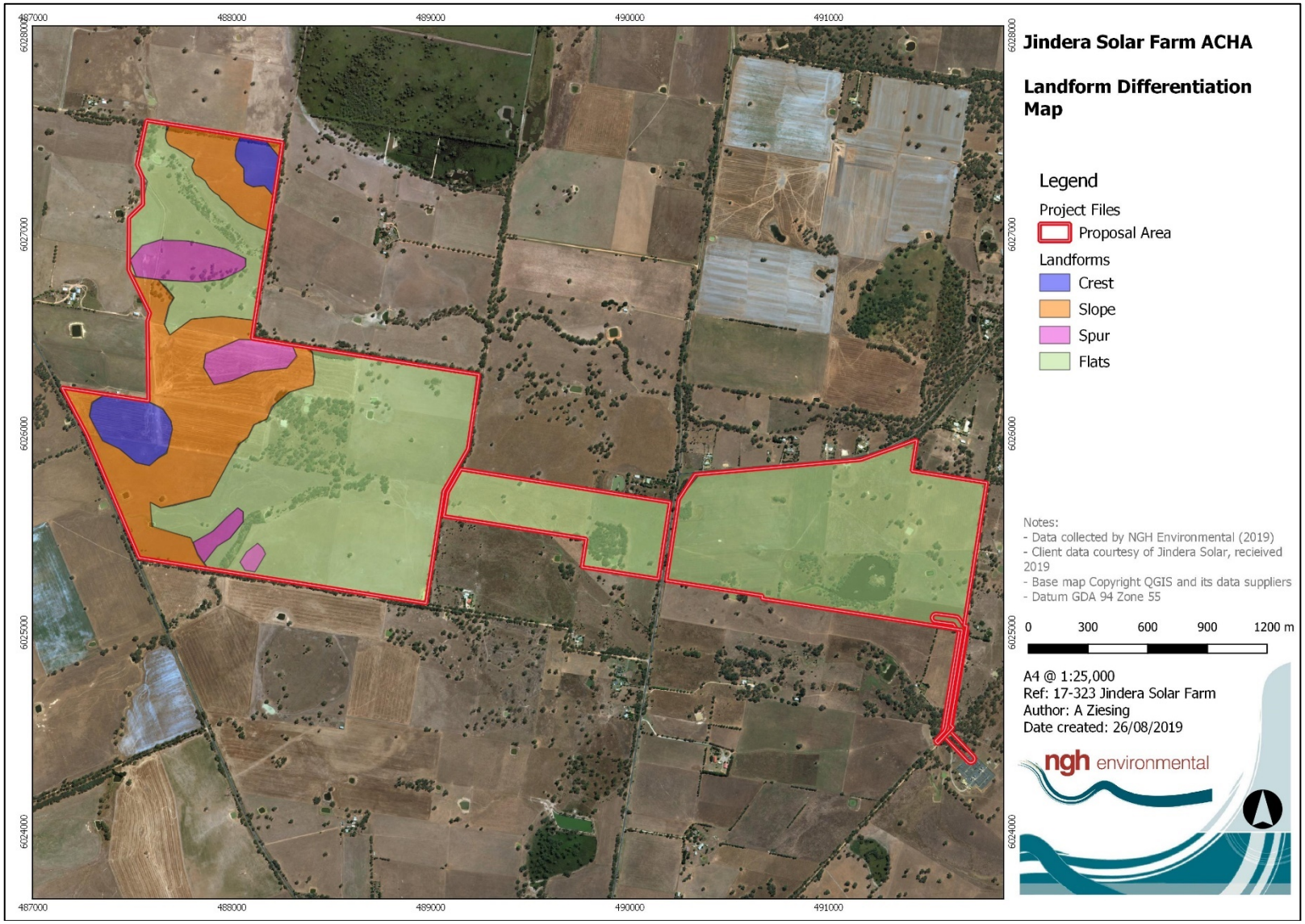


Figure 5 Landform differentiation in the proposal area.

3.2 REVIEW OF ABORIGINAL ARCHAEOLOGICAL CONTEXT

3.2.1 Ethnohistoric Setting

There are several ethnographic recordings of Aboriginal life in the Riverina 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, Peterson & Wesson 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, Peterson & Wesson 2005, pp.8 & 16).

Early mapping of tribal boundaries by Tindale (1940; 1974) and subsequent mapping by Horton (1994) identified the Jindera proposal area as within the Wiradjuri language group. It should be noted however that today not all Aboriginal groups agree with the mapped boundaries presented in Tindale and other publications.

These borders 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. The close proximity to each other also meant that people likely spoke multiple languages and dialects (Howitt 1904, Tindale 1974, MacDonald 1983, Horton 1994).

The Wiradjuri language group was the largest in NSW prior to European settlement extending from the east side of the Riverine plain to the Great Dividing Range and extended from the Murray River at Corowa/Albury north to Dubbo.

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 a number of families. They moved within an area defined by their particular religious sites (MacDonald 1983). Such groups might come together on special occasions such as pre-ordained times for ceremonies, rituals or simply if their paths happened to cross. They may also have joined together at particular times of the year and at certain places where resources were known to be abundant. The archaeological legacy of these gatherings would be larger sites rather than small family camps. They may include large hearth or oven complexes, contain a number of grinding implements and a larger range of stone tools and raw materials.

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

Aboriginal population declined due to disease such as small pox and influenza as well as dispossession from traditional lands and acts of violence against the Aboriginal people which meant that there was great social upheaval and partial disintegration of the traditional way of life. This meant that access to traditional resource gathering and hunting areas, religious life and marriage links and access to sacred ceremonial sites were disrupted or destroyed.

However, despite these disruptions, Aboriginal people continued to maintain their connections to sites and the land in the early days of European settlement. Where Aboriginal people were taken to places like Warangesda, a mission established near Darlington Point in 1880, Brungle Reserve between Gundagai and Tumut, or Moonahcullah mission approximately 50 km west of Deniliquin that was established in 1916, people were able to maintain at least some form of association with country and maintain traditional stories. Wiradjuri dreaming stories still survive to this day, being told in the oral tradition by elders to the next generation of Wiradjuri children.

Material culture

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

Shelters were generally small and appear to have been widely utilised by families while moving around the landscape (Kabaila 1999:120). Their frames were constructed of boughs and sapling branches pulled tightly together, tied with leaves, bark or grass and forming a semi-circular structure (Kabaila 1999). Small campfires would sometimes be placed at the entrance of these shelters for heating and cooking. Evidence of these hearths is often found on elevated flats in close proximity to water sources.

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 1889, 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).

In an archaeological context, few of these items would survive, particularly in an open site context. Anything made from bark and timber and animal skins would decay quickly in an open environment. However, other items, in particular those made of stone would survive where they were made, placed or dropped. Shell material may also survive in an archaeological context. Sources of raw materials, such as the extraction of wood or bark would leave scars on the trees that are archaeologically visible, although few trees of sufficient age survive in the modern context.

Food and Resources

There are a number of ethnographic recordings of Aboriginal life in the Riverina 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 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 was 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 are collected using canoes (Beveridge 1883, p. 18). Bird species including ducks, emus, pelicans, crows, curlews, plains turkeys and their eggs

were hunted and gathered from areas set aside by the Wiradjuri as sanctuaries, ensuring the continued survival of the species as a reliable food resource (Gilmore 1934:165).

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). Possums appear to have been a common part of the diet, weighing generally 3kg, they would be slowly roasted before eating (Kabaila 1999:126; Gammage 2012:226). 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 too (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 22 km east-west x 22 km north-south centred on the proposal area on the 20th of September 2018. The AHIMS Client Service Number was: 371889. The search area extended from Lat, Long -35.9968, 146.7418 to Lat, Long -35.8302, 147.0059 with a buffer zone of 50 m. There were 50 Aboriginal sites and no declared Aboriginal Places recorded in the search area. Figures 6 and 7 shows the locations of the AHIMS sites in relation to the assessment area and Table 5 shows a breakdown the of the site types.

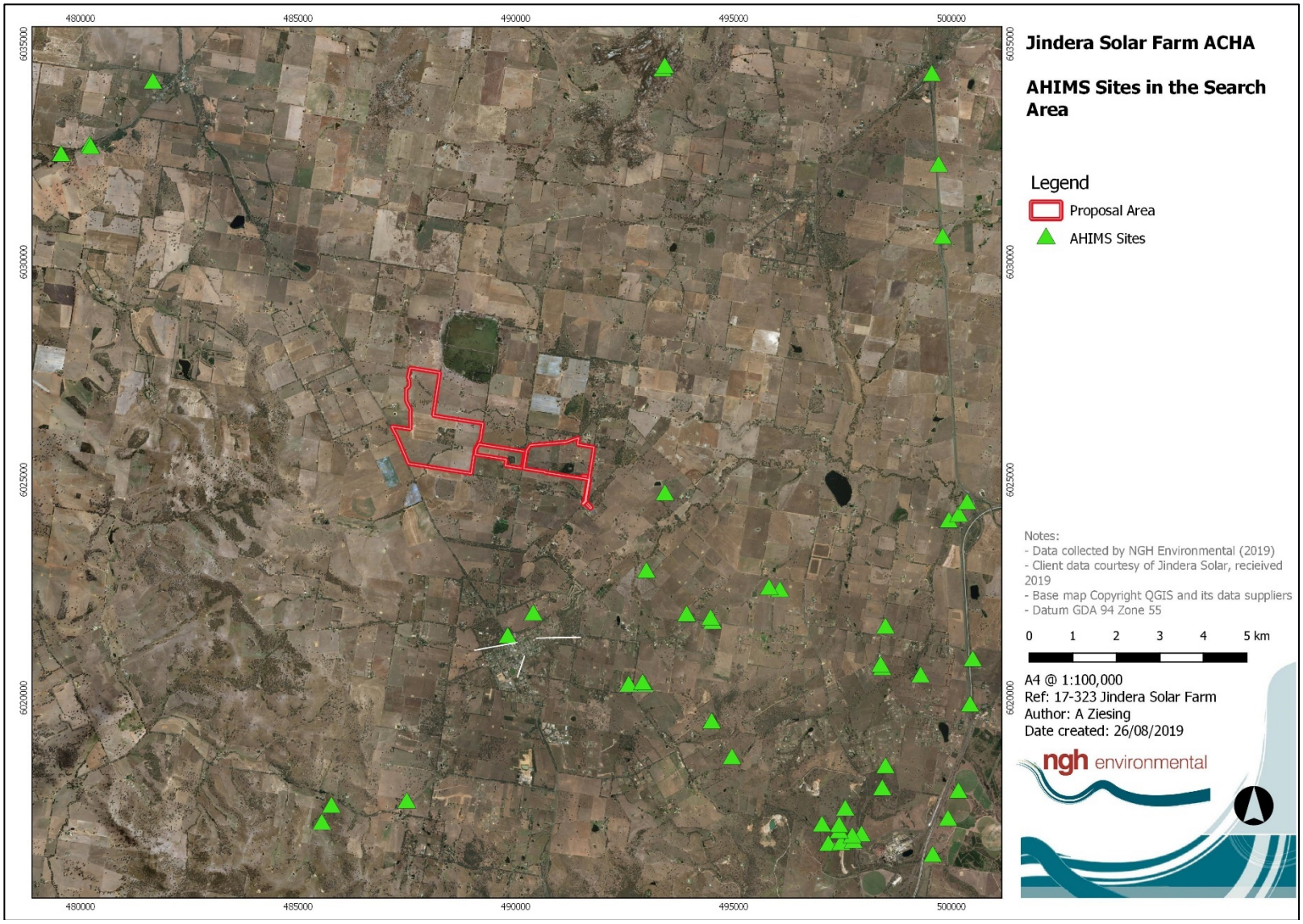


Figure 6 AHIMS Sites in the Search Area.

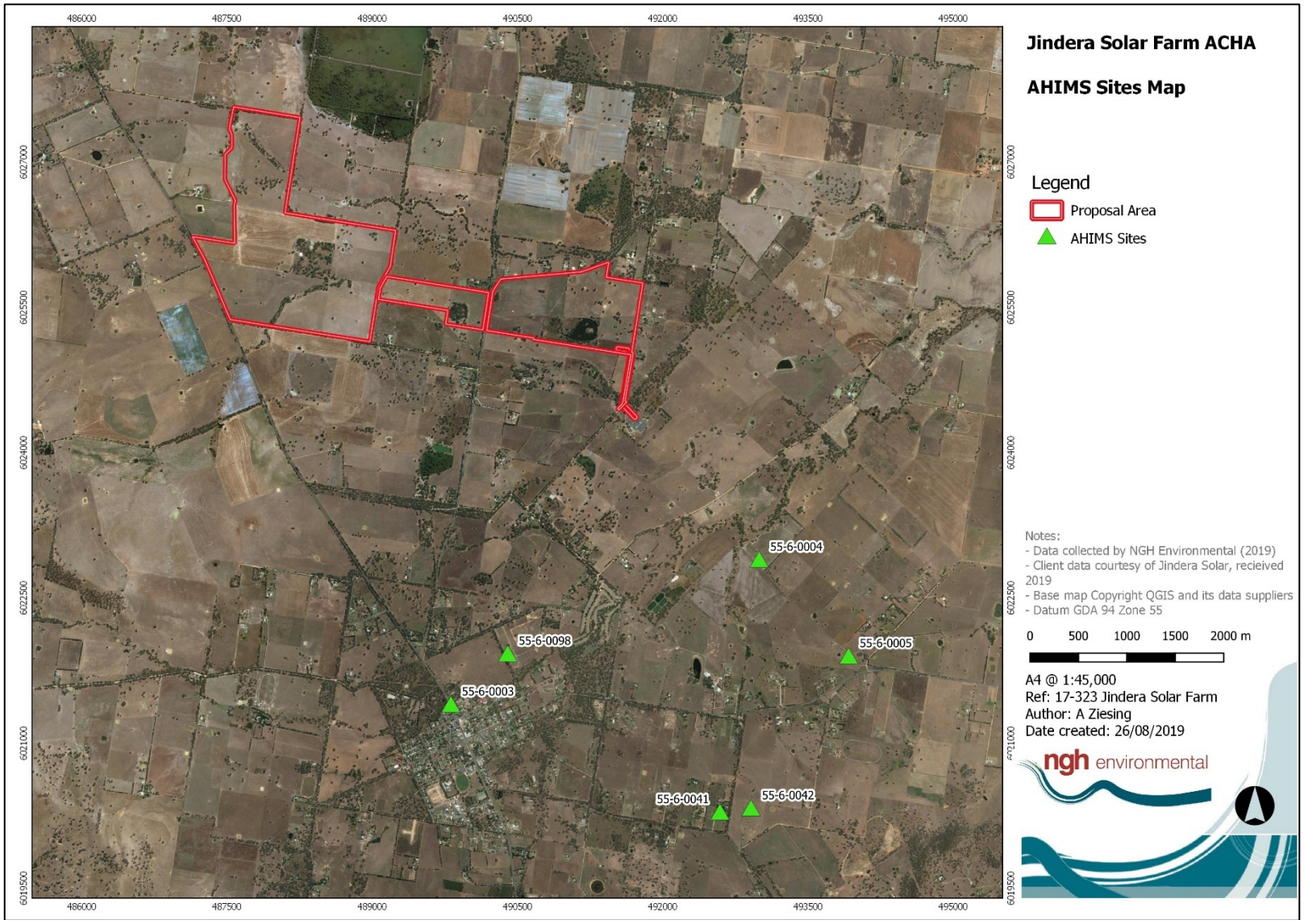


Figure 7 AHIMS Sites in close proximity to the proposal area.

Table 5 Breakdown of previously recorded Aboriginal sites in the region.

Site Type	Number
Artefact (1 or more)	30
Modified Tree (Carved or Scarred)	19
Habitation Structure	1
TOTAL	**50**

There are no sites currently recorded within the proposal area. The closest site to the proposal area, a habitation structure (Gerogery Hills West, Rockshelter 1/ AHIMS # 55-6-0061), is approximately 1.8 km east. The ten other sites recorded within a 5 km buffer of the proposal area included nine artefact sites and a culturally modified tree.

There is a high proportion (38%) of scarred trees recorded in the area especially where there are remnant stands of native trees. Scarred trees provide a tangible link to the past and provide evidence of Aboriginal subsistence activities through the deliberate removal of bark or wood. It is likely that the high proportion of scarred trees in the 20 km area surrounding the proposal area is related to lack of surveys in the area and the more obtrusive nature of scarred trees when compared to small artefact scatters and isolated stone artefacts.

3.2.3 Other register searches

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

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

The results of the NSW SHI database search indicated that there is one previously recorded Aboriginal Place, Doodle Comer, listed under the National Parks and Wildlife Act within the Greater Hume LGA. This recorded Aboriginal Place is not within or in close proximity to the current proposal area.

The results of the NSW SHI database search indicated that four previously recorded heritage sites are listed under the NSW Heritage Act within the Greater Hume LGA. None of the sites are located within or in close proximity to the current proposal area.

The results of the NSW SHI database search indicated that 61 previously recorded heritage sites are listed by the Local and State Agencies within the Greater Hume LGA however none are located within or in close proximity to the current proposal area.

The results of the Australian Heritage Database search indicated that 13 sites are located within the Greater Hume LGA however none of the sites area located within the current proposal area. Three sites are however located in close proximity to the proposal area within the township of Jindera. The sites are the Pioneer Museum, Pioneer Museum Group, Wagners Store which area all located on Urana Road.

The only other known historical heritage site that is known within close proximity to the proposal area is the Huon School (1870-1906) and Huon Park School (1936- 1941) located approximately 1.5 km west of the northern most boundary of the proposal area. The site does not appear to be registered however signage at the site has been erected by the Greater Hume Shire as part of the Burrumbuttock Heritage Signs trail. The information on the placard notes that the Huon school opened as a provisional school on a site on the corner of Nation Road and Urana Road opposite "Elmslie" in August 1870. It did not operate continuously as a school and closed in June 1906. Following the closure of the school the building was moved to "Cedarvale" but it was destroyed in a storm in 1923. The bulbs and a large tree remain to mark the site of the house, as well as the numerous trees on the school site. Huon Park School was opened on the 28th of January 1936. It was situated on the original block of land where the Huon School had previously been. The school was closed in 1941 and the building was relocated and to land leased to the Nation family.

No other known previously recorded heritage sites are located within or adjacent to the proposal area.

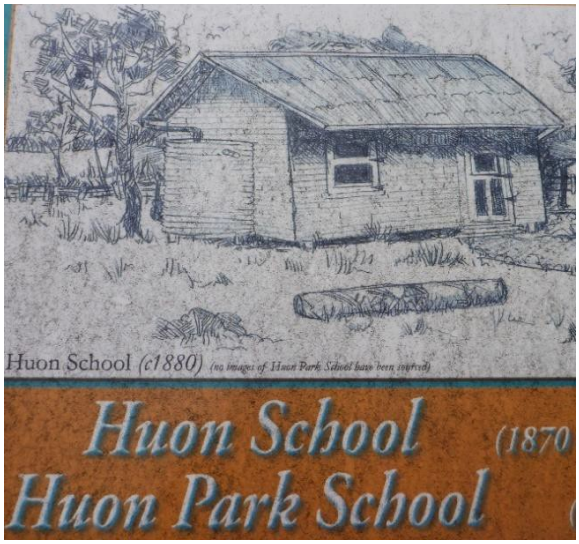


Plate 1. Huon School and Huon Park School placard picture of Huon School c 1880.

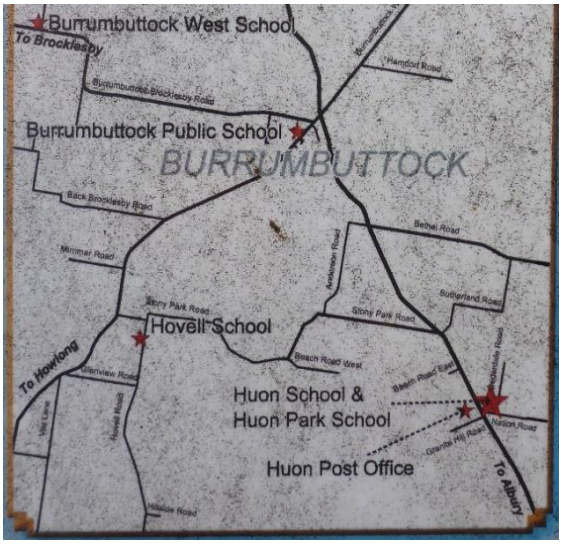


Plate 2. Map of Huon School and Huon Park School on the placard.

3.2.4 Previous archaeological studies

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. There have been no known dated excavations in the Jindera or Albury area, although the archaeological evidence from Lake Mungo, 425 km to the north-west provides ample evidence of Aboriginal occupation dating back 40,00 years (Mulvaney and Kamminga 1999, Hiscock 2007). No regional synthesis of the archaeology has been completed for the Jindera or Albury area. The following are summaries of those archaeological survey reports that have been completed in the Albury region, these have been primarily driven by development and infrastructure requirements.

A survey of the Albury area by Crosby (1978) identified that open camp sites and scarred trees are the most common site types in the Albury Region. Crosby (1978) noted that due to the limited range of usable stone outcropping in the region it is unlikely that Aboriginal quarries will occur, however, areas where vein quartz occurs should be inspected. Additionally, due to geology and topography of the area and lack of large rock outcrops with shelters suitable for painting or banks suitable for carving it is very unlikely that art sites or ceremonial areas will be identified. Crosby's (1978) survey of six sites returned seven Aboriginal artefacts consisting of six scarred trees and a large volcanic cobble.

In 1978 Djekic undertook an archaeological survey for a proposed transmission line from the Wagga Wagga substation to Albury. The route covered approximately 120 km across well-established farming land and passed through approximately 600 m east of the proposal area. During the survey, six scarred trees were located, four of which were most likely the result of Aboriginal use in the area. Stone artefacts were also recorded on a property just outside Culcairn. The artefacts recorded included a small grinding stone, a hammer stone, a broken pebble and a small round stone of local material that appeared to have been pecked on either side. Djekic concluded that the small number of sites located during the survey was a direct result of over 100 years of environmental modification through the intensive development of agriculture in the region.

In 1980 Barz undertook an archaeological survey for a proposed transmission line from Jindera to Ettamogah with a 50 metre wide easement. Numerous isolated artefacts were identified including quartz cores, flakes, thumbnail scraper and a granite flaked piece.

In 1980 Haglund undertook field survey as one aspect of the Hume Shire Villages Water Supply Scheme. The survey area consisted of approximately 90 km of a 6-metre-wide easement for pipelines and five reservoir sites, each approximately 30 metres in diameter. A single scarred tree was recorded during the survey on the border of a pipeline easement. Haglund identified that several adjoining areas may have archaeological potential. The lack of identified sites may have been because of the previous disturbance of the land in the area.

In 1992 a site survey for a proposed tree plantation approximately 10 km to the south east of the current proposal area was undertaken by Smith and Upcher (1992). The study identified five scarred trees, nine open campsites, one open campsite and scarred tree complex and eleven isolated artefacts. All artefacts recorded, with the exception of a single isolated silcrete artefact, were manufactured on a milky quartz which appears to be the primary raw material type for the Albury area. Both box and river redgum were used for manufacturing wooden artefacts consistent with other studies in the region. This study observed that all open campsites were located within 50 m of creek lines and all but one open camp was located on a creek bank. However, erosion into the creek bank to a depth of <10 cm was needed before archaeological material was exposed. Additionally, Smith and Upcher (1992) noted that despite the presence of erosion scars and recently ploughed paddocks on hill tops and slopes within the project area no open camp sites were identified. Scarred trees however, occurred consistently across all of these landforms.

In 1998 Officer, Navin and Kamminga undertook a subsurface testing program for the proposed Wodonga to Wagga Wagga Natural Gas pipeline. The previous surveys, carried out between 1995 and 1997, identified a total of 39 sites, four isolated finds and eight areas of potential archaeological deposit (PAD). Four of these sites and seven PADs were to be impacted by the proposed development and were subject to further investigation. All of these PADs contained *in situ* archaeological material and their associated deposits were thought to extend beyond the proposed pipeline easement. A summary of finds and locations has been provided in Table 6 below.

The Billabong Creek sites were determined to be relatively recent in age and dated to the period following sedimentary infilling of the channel. This suggests an occupational preference for the present shallower channel rather than the past deeper streamline. The assemblage was predominantly vein quartz, with two white quartzite flakes and two sites exhibiting bipolar flaking. This may suggest that this flaking method was not common in the area or wider region during the period represented by the assemblage. Microliths and microblades recovered from Back Creek Swamp, Negarie and Burrumbuttock Creek indicates an age range of less than 4500 years before present (BP) for this assemblage. The overall size of the lithic fragments, in particular the microlith examples, infers a lack of raw material sources in the region. The density of the assemblage indicates that small groups were occupying short-term camps for short periods

along creek banks with no direct evidence of longer-term base camps. In relation to the archaeological site model for this region, these results suggest that continuous areas of artefact distribution should be placed around all fluctuating and stable riparian zones. Most of the artefactual material was identified in subsurface contexts at least 100 m away from larger order and 40 m away from smaller order stream banks and basin edge depressions.

Table 6 Summary of finds for the Wodonga to Wagga Wagga Natural Gas Pipeline Testing Program.

Site Name	No of Test Pits	Finds	Find Type	Location
West Pomigalarna 2	5 mechanical pits	4 artefacts	Milky quartz broken flakes with edgewear and bipolar crushing	Crest of rise adjacent to shallow flood channel on southern side of Murrumbidgee River in ploughed paddock margin.
Buckargingah Creek 1 and 2	25 mechanical pits 19 manual pits	219 lithic items 27 lithic items (57% artefactual)	Bipolar flaking, microblade production, microliths, probable microlith backing flakes	Within 15 m of northern and southern banks of bend in creek line in relation to surface artefacts in ploughed margins of adjacent paddock.
Negarie 1	20 mechanical pits 4 manual pits	62 lithic items (26% artefactual)	Microblades from microlith production including Bondi points.	Elevated western bank of billabong in old flood channel on northern side of Murray River floodplain.
Burrumbuttock Creek 1	8 mechanical pits	32 artefacts	Microdebitage from microlith production including a geometric microlith.	Eastern side of creek line on mid-slope of elevated area.
Petries Creek 1	7 mechanical pits	3 artefacts	Quartz lithic fragments and a bipolar flake.	Western side of creek line on flats associated with basal slopes
Back Creek 2	3 mechanical pits	1 artefact		Elevated southern bank of inside bend of streamline
Back Creek Swamp 2	11 mechanical pits	18 artefacts	Microdebitage from microblade and bipolar flaking	Edge of wetland basin
Billabong Creek Flood Channel 1, 2, & 3	18 mechanical pits	21 artefacts	Microdebitage from microblade flaking	Either side of flood channel

A survey of development areas in Thurgoona by Kelly (2002), located approximately 15 km south-east of the current proposal area, identified a single potential archaeological deposit that was later excavated as part of the Centaur Rd subsurface investigation (Border Archaeology 2006a). A total of 153 artefacts were located during excavation, primarily consisting of quartz debitage. This was similar to survey undertaken of the Hamilton Valley causeway construction site where a single quartz lithic scatter of 12 artefacts was recorded on a river terrace (Border Archaeology 2003).

Survey and subsequent test pitting was undertaken by Border Archaeology (2006b, 2007a) of the Carsten Street Residential Development approximately 13 km south of the current proposal area. The original survey identified 3 quartz lithic scatters, one isolated find, one scarred box tree and an area of high archaeological potential. Visibility was however very low and consequently test pitting was recommended. The 2007 excavations of the Carsten Street Residential Development used a grader to excavate three areas

in 10 cm spits down to approximately 20 cm depth. A total of 303 artefacts were recovered from grader scrape 1 with 86.8% of artefacts recorded manufactured from plain quartz and 12.8% manufactured from crystal quartz. Based upon the authors experience in the Albury region they proposed that "Aboriginal archaeological deposits [are] strongly associated with terrace landform rather than current water course margins" (Border Archaeology 2007a, p.51).

Biosis (2008) undertook site survey of a proposed Albury waste management facility, approximately 11 km south of the current proposal area, and located a single smoky quartz isolated flake within the valley flat associated with a small creek line. Biosis (2008) assessed creek terraces within the project area as having moderate archaeological sensitivity and valley flats and lower and mid valley slopes as having low archaeological sensitivity.

In 2007 Border Archaeology undertook a survey of the proposed Hume Country Club Estate Residential Development, approximately 14km south of the current proposal area. Eight previously unrecorded sites were identified and consisted primarily of quartz debitage (Border Archaeology 2007b). A previously recorded AHIMS site #60-3-0099 was relocated and was subsequently salvaged by Border Archaeology in 2008. During the salvage program 65 quartz artefacts were relocated, primarily consisting of debitage and angular fragments (<3 cm) with a small number of cores, flakes and flaked pieces. The site occurred within a heavily disturbed terrace landform (Border Archaeology 2008).

In 2015 Associates Archaeology and Heritage undertook an ACHA for Lot 204 DP753345 on Drumwood Road, Jindera, located approximately 3 km south of the current proposal area. The area consisted of a 41 ha area on a gentle slope southward of Bowna Creek. The site was located within 200 m of water, but it was predicted by Associates Archaeology and Heritage that while artefacts were likely to be found, they would most probably be in relatively low density because the area was a low-lying creek flat, and more complex residential or tool-making sites are typically located on more raised terrace landforms adjacent to creeks. Two surface flaked stone artefacts were recovered during the initial survey which prompted the need for further investigation in the area. Test excavation was carried out across the proposed sub division area with 82 test pits excavated. A total of eight subsurface artefacts were recovered from 20.5 m^2 of excavated material across the project area. This is an artefact density of 0.36 artefacts/ m^2. The artefacts recovered were all made from white milky quartz and were located on ridge crest, slope and flat topographic units. The artefact types identified during the survey and testing program were all flakes, flake fragments and angular fragments with no cores recorded. Associates Archaeology suggested that the wide distribution of the eight artefacts across the site was considered to demonstrate that the area was subject to frequent land use by Aboriginal people in the past but was not the site of complex / residential activity. Given that the artefacts were spread from the creek flat up to the ridge crest covering an area of up to 500 m from water with very little significant apparent concentration Associates Archaeology noted this was suggestive of the relatively regular, dispersed use of the landscape by Aboriginal people during the course of foraging, hunting and travel. Associates Archaeology concluded that the absence of notable concentrations of artefacts within the project area was consistent with the modelling in the area which suggests that complex moderate-high density lithic sites are found on elevated terraces near to water rather than on low lying flats.

NGH Environmental (2018) undertook survey and subsurface testing for the proposed expansion of the Anderson Clay Mine extraction area, located approximately 12 km south-east of the current proposal area. The field survey identified two PADs in the subject area, termed Andersons PAD 1 and Andersons PAD 2. Under the development proposal disturbance to Andersons PAD 1 was unavoidable, and poor surface visibility meant the PAD was not fully assessed for its potential to contain Aboriginal objects. Therefore, a program of test excavation was undertaken to establish the presence of subsurface archaeological

material. While 25 test pits were proposed for excavation, only 13 were excavated as it was determined that at the completion of the excavation of the 13 test pits that enough data had been gathered to conclude that the area of Andersons PAD 1 had very little topsoil deposit in place and no Aboriginal objects were identified in the excavated test pits. The lack of subsurface deposit may be the result of previous farming practices or that the area has a naturally thin profile however this was unable to be determined as there was also evidence of significant disturbance to the ridge crest. It was consequently determined that Andersons PAD 1 was highly disturbed and modified, and the likelihood of *in situ* archaeology occurring reduced to very low. Despite the highly disturbed area identified during the test excavation program an isolated quartz flake was recorded which indicated that despite the apparent surface disturbance, the area most likely contained an Aboriginal heritage site which has now been largely removed.

Based on the studies discussed above it is possible to suggest that while Aboriginal sites may be expected through all landscapes there does appear to be a pattern of sites that relate to the presence of potential resources for Aboriginal use. In the Albury area the dominant raw material type is quartz. Sites tend to be concentrated on elevated level ground associated with a water source and are noted to consistently occur on raised terrace landforms within 50 m of peripheral or seasonal creeks (Border Archaeology 2007a, 2008; Smith & Upcher 1992). Additionally, the presence of scarred trees on box and river red gums is relatively common and can occur in all landscapes.

Based on site modelling and the prevalence of sites in the surrounding area the site types most likely to be encountered within the Jindera Solar Farm proposal area are quartz lithic scatters, isolated artefacts and scarred trees in remnant old growth vegetation areas bordering and within the proposal area and/or as isolated paddock trees.

3.2.5 Summary of Aboriginal land use

The results of previous archaeological surveys in the region show that there are sites and artefacts present throughout the landscape, albeit concentrated closer to water courses. There appears to be a pattern of site location that relates to the presence of potential resources for Aboriginal use with high density sites generally located in elevated areas adjacent to waterways. Lower density background scatters also occur across undulating plains in proximity to water. The dominate lithology within the area appears to be quartz with lesser quantities of silcrete artefacts. A number of scarred trees are recorded in the area, but this site type tends to occur in areas where old growth trees remain.

In addition, site densities in close proximity to the proposal area appears to be low. This may suggest the seasonal occupation of the area by Aboriginal people though it is more likely that there has been a lack of survey in the area or that land clearing and farming activities have disturbed or removed the cultural material evidence of Aboriginal occupation in the area.

A detailed understanding of Aboriginal land use of the region is lacking, as few in depth studies have been completed in close proximity to the proposal area. It is possible however, to ascertain that proximity to water sources and raw materials was a key factor in the location of Aboriginal sites. It is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape, but the current archaeological record of that activity is limited.

Archaeological Site Location Model

Based on the results of the previous archaeological investigations in the local area, and through extrapolation of sites from surrounding regions it is possible to provide the following model of site location in relation to the proposed Jindera Solar Farm proposal area.

Stone artefact scatters – representing camp sites. These can occur across the landscape, usually in association with some form of resource or landscape unit such as spur and ridge crests or water sources such as creeks, billabongs and swamps. Sand bodies, topographically elevated areas or changes in soils with associated changes in vegetation can also be a desirable location for occupation particularly when they are associated with resource changes. Artefact scatters, if they do occur, are more likely to be characterised as low-density scatters across broad elevated landforms in close proximity to water.

Isolated Artefacts – are present across the entire landscape, in varying densities. As Aboriginal people traversed the 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.

Scarred Trees – these require the presence of mature trees and are likely to be concentrated along major waterways and around swamps areas. While the proposed development area has been predominantly cleared, there are mature trees remaining in the proposal area and this feature is therefore likely to occur.

Hearths/Ovens – are identified by burnt clay used for heat retainers. None are recorded in the district, but they could occur either independently or in association with other Aboriginal cultural features such as campsites, often in association with resource locations. Such places are not obvious within 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 one area of natural outcropping stone however the stone is a conglomerate and not a suitable stone resource material. Therefore, this site type is unlikely to occur.

Shell Middens – are the accumulation of shell material disposed of after consumption. Such places are found along the edges of significant waterways, swamps and billabongs. No such natural features occur and therefore this site type is unlikely to occur.

Burials – are generally found in elevated sandy contexts or in association with rivers and major creeks. No such features exist with the proposal area and therefore such sites are very unlikely to occur.

In summary, the topography and landscape features within the proposed Jindera Solar Farm indicate that this area would likely have been part of the Wiradjuri landscape and has a possibility of providing an archaeological signature. Nonetheless, given that Aboriginal people have lived in the region for tens of thousands of years, there is potential for archaeological evidence to occur throughout the area, this is most likely to be in the form of stone artefacts and modified trees.

3.2.6 Comment on Existing Information

The AHIMS database is a record of those places that have been identified and had site cards submitted to OEH. It is not a comprehensive list of all places in NSW as site identification relies on an area being surveyed and on the submission of site forms to AHIMS. There are likely to be many areas within NSW that have yet to be surveyed and therefore have no sites recorded. However, this does not mean that sites are not present. Within the Jindera area there have only been a few archaeological investigations. The information relating to site patterns, their age and geomorphic context is little understood. The robustness of the AHIMS survey results are therefore considered to be only moderate for the present investigation. There are likely to be sites that exist that have yet to be identified although the scale of farming development has altered the natural landscape in some places. This activity has also greatly disturbed the archaeological record and there are unlikely to be many places that retain *in situ* archaeological material due to the scale

of agricultural and pastoral development. The current study is the most comprehensive assessment of this locality and therefore the results outlined in this report are the most thorough and up to date available.

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

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 was 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 landscape to achieve maximum coverage. Because the proposal site was generally cleared paddocks used for grazing livestock or recently harvested crop fields, transects were spaced evenly with the survey team spread apart at 30 m intervals, walking in parallel lines. The cleared nature of the paddocks 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 a minimum of four people and a maximum of six people which allowed a 120 m to 180 m wide tract of the proposal area to be surveyed with each transect depending the number of people present. 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.

While the proponent has excluded areas of existing viable native vegetation remnants from the development footprint where possible, the areas of remnant vegetation were deemed to have high archaeological potential for mature trees within the proposal site and were inspected for any evidence of Aboriginal scarring (Long 2005). Native paddock trees were also inspected for any evidence of Aboriginal scarring (Long 2005).

NGH believes 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 during each day between the archaeologists and Aboriginal community representatives to ensure all were satisfied and agreed with the spacing and methodology.

The proposal site was divided into four landforms based on contour mapping and visual inspection during field survey. The landforms were crests, spurs, slopes and low lying flats and drainage line as shown previously in Figure 5.

The survey for the Jindera Solar Farm proposal area was undertaken by the team over an initial period of three days from the 6th to the 8th of November 2018. Additional survey was also undertaken on the 21st of January 2019 following the harvesting of a wheat crop in a field that was unable to be surveyed during the initial survey due to poor surface visibility. The additional survey of the field following the harvest was conducted at the request of the RAPs. A further day of survey was conducted on the 5th of March 2019 to ensure an additional small portion of land was surveyed.

Over the course of the survey notes were made about visibility, photos taken and any possible Aboriginal features identified were inspected, assessed and recorded if deemed to be Aboriginal in origin.

4.2 SURVEY COVERAGE

The solar farm area comprised primarily of cleared and cropped paddocks that had been subject to farming activities. Survey transects were undertaken on foot and traversed the proposal area. Visibility within the proposal area was variable however as a whole it generally had poor visibility averaging 10% overall. The effective visibility in the paddocks ranged from 95% in exposures and in recently harvested paddocks to less than 5% in areas with a dense low grass cover. Between the survey participants, over the course of the field survey, approximately, 48 km of transects were walked across the proposal area.

Table 7 below shows the calculations of effective survey coverage and Plates 3-10, show examples of the transects and landforms within the proposal area. Allowing for an effective view width of 5 m for each person and given the variability in the ground visibility across the proposal site overall the survey effectively examined 5.45% of the proposed development footprint.

It is considered that the survey of the Jindera Solar Farm proposal area had sufficient and effective survey coverage. The discovery of a number of Aboriginal sites indicates that the survey technique was effective enough to identify the presence of Aboriginal occupation in the area. Therefore, the results identified are considered a true reflection of the nature of the Aboriginal archaeological record present within the proposal area.

	
Plate 3. View north of low lying flats and drainage lines landscape in the eastern portion of the proposal area.	Plate 4. View east of low lying flats and drainage lines landscape in the western portion of the proposal area.

	
Plate 5. View east down the slopes landscape in the western portion of the proposal area.	Plate 6. View west up the slopes landscape in the western portion of the proposal area in a harvested field.
	
Plate 7. View east along crest landscape in the western portion of the proposal area in a harvested field.	Plate 8. View south-east along crest landscape in the north most portion of the proposal area.
	
Plate 9. View south-east along spur landscape in the north western portion of the proposal area.	Plate 10. View east along spur landscape in the western portion of the proposal area in a harvested field.

Table 7 Transect information.

Survey Section/ Topography	Number of Survey Transects	Exposure type	Proposal Area ha	Surveyed area (length m x width m)	Survey Area m^2	Visibility	Effective coverage (area x visibility) m^2	Proposal Area surveyed (ha)	Percentage of Proposal area effectively surveyed	Survey Archaeological result
Crests	6	Bare ground, vehicle and animal tracks, ploughed ground and disturbance areas	14	720 x 30 2,150 x 25	75,350	40% average	30,140	3.01	21.5	2 Artefact scatters
Spurs	9	Bare ground, vehicle and animal tracks, ploughed ground and disturbance areas	16	1,250 x 30 1, 950 x 25 400 x 25	96,250	25% average	24,062	2.40	15	1 Artefact scatter 3 Isolated finds
Slopes	24	Bare ground, vehicle and animal tracks, dam walls, ploughed ground and disturbance areas	72	1,450 x 30 8,000 x 25	243,500	35% average	85,225	8.52	11.8	3 Artefact scatters 7 Isolated finds
Low lying flats and drainage lines	49	Bare ground, vehicle and animal tracks, dam walls, ploughed ground and disturbance areas	219	3,350 x 30 11,200 x 25 15,500 x 20 2,200 X 10	712,500	5% average	35,625	3.56	1.6	1 Artefact scatters 5 Isolated finds 3 Cultural trees
Total	**88**	**NA**	**321**	**NA**	**1,127,600**	**NA**	**175,052**	**17.5**	**5.45**	**7 Artefact scatters 15 Isolated finds 3 Cultural trees**

4.3 SURVEY RESULTS

Despite the variable visibility encountered during the survey seven artefact scatters and 15 isolated finds were recorded. Four areas of potential archaeological deposit were also identified that required subsurface testing. The Aboriginal community representatives also identified three cultural trees. The details of these sites are outlined below, and their locations shown in Figures 8 and 9. The surface artefact data is provided in Appendix E.

It should be noted that the Aboriginal representative Mark Saddler independently assigned a naming convention to the stone objects and sites he identified during the survey and submitted each individual object as a site to AHIMS following the survey. A total of 12 sites were submitted to AHIMS by Mark Saddler in November 2018. Mark Saddler has also provided NGH with a report on his participation in the survey which is provided in full in Appendix D.

NGH has subsequently complied and reviewed all the artefact data collected during the surveys conducted and has identified that a number of the individual stone artefact sites submitted to AHIMS by Mark Saddler actually form part of larger stone assemblage rather than being an isolated stone object. To ensure the sites are accurately represented on the AHIMS database and not replicated in the system, as this would potentially influence the archaeological modelling of the area in the future, NGH has instead updated the site card information where applicable, keeping the naming conventions originally submitted to AHIMS by Mark Saddler. This approach is also beneficial to the future management of the sites within the proposal area.

NGH has also identified that in one instance Mark Saddler has submitted AHIMS sites cards for objects that form part of the same larger stone assemblage in the north-western portion of the proposal area. These site cards have been updated to note that these sites are duplicates and represent the same large stone assemblage. A copy of the AHIMS site cards submitted by Mark Saddler have been provided in Appendix H along with the sites submitted by NGH.

A summary of all the cultural and archaeological Aboriginal sites recorded during survey within the Jindera proposal area are detailed in Table 8.

Table 8 Summary of all cultural and archaeological Aboriginal sites recorded during survey of the Jindera Solar Farm proposal area.

AHIMS	Name	Type	Notes
55-6-0114	Jindera 487530	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019
55-6-0115	Jindera 488918	Cultural Tree	Originally submitted by Mark Saddler. NGH identify as cultural tree and not an archaeological site.
55-6-0116	Jindera 488995	Cultural Tree	Originally submitted by Mark Saddler. NGH identify as cultural tree and not an archaeological site.
55-6-0117	Jindera 488942	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019
55-6-0118	Jindera 487666	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019

AHIMS	Name	Type	Notes
55-6-0119	Jindera 487828	Isolated Find	Originally submitted by Mark Saddler November 2018.
55-6-0120	Jindera 487973	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019
55-6-0121	Jindera 488172	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019
55-6-0122	Jindera 488179	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019
55-6-0123	Jindera 488004	Isolated Find	Originally submitted by Mark Saddler November 2018.
55-6-0124	Jindera 487595	Isolated Find	Originally submitted by Mark Saddler November 2018.
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019
55-6-0126 (Duplicate of 55-6-0125)	Jindera 488156	Artefact scatter	Originally submitted by Mark Saddler November 2018. Site card updated by NGH in 2019 to note it is a duplicate of AHIMS 55-6-0125.
55-6-0129	Jindera 487613	Isolated Find	Submitted by NGH in 2019
55-6-0149	Jindera Solar IF1	Isolated Find	Submitted by NGH in 2019
55-6-0150	Jindera Solar IF2	Isolated Find	Submitted by NGH in 2019
55-6-0151	Jindera Solar IF3	Isolated Find	Submitted by NGH in 2019
55-6-0152	Jindera Solar IF4	Isolated Find	Submitted by NGH in 2019
55-6-0153	Jindera Solar IF5	Isolated Find	Submitted by NGH in 2019
55-6-0154	Jindera Solar IF6	Isolated Find	Submitted by NGH in 2019
55-6-0155	Jindera Solar IF7	Isolated Find	Submitted by NGH in 2019
55-6-0156	Jindera Solar IF8	Isolated Find	Submitted by NGH in 2019
55-6-0157	Jindera Solar IF9	Isolated Find	Submitted by NGH in 2019
55-6-0158	Jindera Solar IF10	Isolated Find	Submitted by NGH in 2019
55-6-0159	Jindera Solar IF11	Isolated Find	Submitted by NGH in 2019
N/A	Jindera Solar Cultural Tree 1	Cultural Tree	NGH identify as cultural tree and not an archaeological site. Not submitted to AHIMS

4.3.1 Archaeological sites- Artefact scatters

AHIMS #55-6-0114/ Jindera 487530

This site consisted of three quartz flakes and three flaked pieces of quartz scattered across a slope and on the bank of a dam in a paddock with low dense grass cover. The complete flakes were all identified as products of the tertiary stage of reduction. The artefacts were located on a reddish brown clayey loam deposit and visibility within the area was approximately 10% with 90% visibility along the dam bank. The area has been subject to disturbance from the construction of the dam and framing activities in the past. The data for the artefacts recorded in this site are provided in Appendix E.

Plate 11. View of south-east from AHIMS #55-6-0114.

Plate 12. View of quartz flake near dam at AHIMS #55-6-0114.

AHIMS #55-6-0117/ Jindera 488942

This site consisted of single quartz flake and a volcanic ground edge axe located approximately 40 m apart on a flat paddock with low grass cover. The complete flake was identified as products of the tertiary stage of reduction. The axe was noted to have grounding for 45 mm x 18 mm and to have some plough damage. The artefacts were located on a reddish brown clayey loam deposit and visibility within the area was approximately 20%. The area has been subject to disturbance from ploughing and framing activities in the past. The data for the artefacts recorded in this site are provided in Appendix E.

Plate 13. View of north-west of AHIMS #55-6-0117.

Plate 14. View of axe at AHIMS #55-6-0117.

	
Plate 15. View of grounding on axe at AHIMS #55-6-0117.	Plate 16. View of quartz flake at AHIMS #55-6-0117.

AHIMS #55-6-0118/ Jindera 487666

This site consisted of single quartz flake and a sandstone grindstone fragment located approximately 80 m apart on the crest of a paddock that had recently had a canola crop harvested. The grindstone fragment was noted to have some plough damage. The artefacts were located on a reddish brown clayey loam deposit and visibility within the area was approximately 60%. The area has been subject to disturbance from ploughing and framing activities in the past. The data for the artefacts recorded in this site are provided in Appendix E.

	
Plate 17. View of east of AHIMS #55-6-0118.	Plate 18. View of quartz flake at AHIMS #55-6-0118.

AHIMS #55-6-0120/ Jindera 487973

This site consisted of seven artefacts scattered across approximately 100 m on the basal slope of a paddock that had recently had a canola crop harvested. The artefacts recorded included four quartz flakes, a distal fragment of quartz, a flaked piece of quartz and a flaked piece of quartzite. The artefacts were located on a reddish brown clayey loam deposit and visibility within the area was approximately 60%. The area has been subject to disturbance from ploughing and framing activities in the past. The data for the artefacts recorded in this site are provided in Appendix E.

	
Plate 19. View of east of AHIMS #55-6-0120.	Plate 20. View of quartz flake at AHIMS #55-6-0120.

AHIMS #55-6-0121/ Jindera 488172

This site consisted of two artefacts scattered across approximately 40 m on the basal slope of a paddock that had recently had a canola crop harvested. The artefacts recorded included a quartz flake and a flaked piece of quartz. The artefacts were located on a reddish brown clayey loam deposit and visibility within the area was approximately 80%. The area has been subject to disturbance from ploughing and framing activities in the past. The data for the artefacts recorded in this site are provided in Appendix E.

	
Plate 21. View of east of AHIMS #55-6-0121.	Plate 22. View of quartz flake at AHIMS #55-6-0121.

AHIMS #55-6-0122/ Jindera 488179

This site consisted of five artefacts scattered across approximately 150 m on the spur of a paddock that had recently had a canola crop harvested. The artefacts recorded included a five quartz flaked pieces and a river pebble volcanic manuport. The manuport was noted to possible have been used as hammerstone by the Aboriginal representatives. The artefacts were located on a reddish brown clayey loam deposit and visibility within the area was approximately 80%. The area has been subject to disturbance from ploughing and framing activities in the past. The data for the artefacts recorded in this site are provided in Appendix E.

	
Plate 23. View of north east of AHIMS #55-6-0122.	Plate 24. View of river pebble volcanic manuport at AHIMS #55-6-0122.

AHIMS #55-6-0125 (duplicate of AHIMS #55-6-0126)/ Jindera 488212

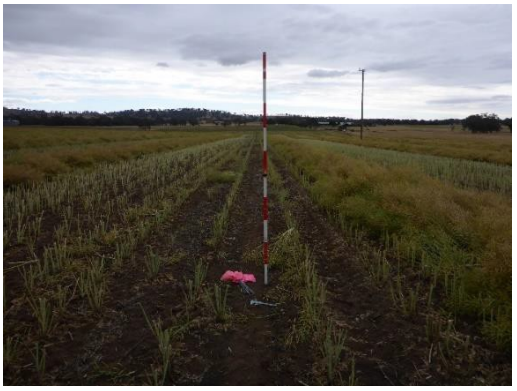
This site consisted of 13 artefacts scattered across approximately 350 m on the crest and down the slope of a paddock that had recently had a canola crop harvested. The artefacts recorded included a nine quartz flakes, two quartz distal fragments, a quartz core and a quartz flaked piece. The Aboriginal representatives noted the vantage point of the crest of the surrounding area including views to Gum Swamp located 200 m north-east of the site. The artefacts were located on a reddish brown clayey loam deposit and visibility within the area was approximately 20%. The area has been subject to disturbance from ploughing and framing activities in the past. The data for the artefacts recorded in this site are provided in AppendixE.

	
Plate 25. View of across crest at AHIMS #55-6-0125.	Plate 26. View of quartz flake at AHIMS #55-6-0125.

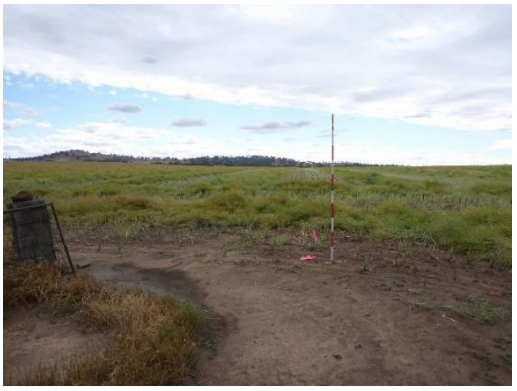
4.3.2 Archaeological sites- Isolated Finds

The details of the isolated finds recorded and submitted to AHIMS by NGH and Mark Saddler are detailed in Table 9 below.

Table 9. Isolated finds

AHIMS #	Site Name	Comments	Pictures
55-6-0119	Jindera 487828	The site consisted of a single quartz flaked piece on the slope of a paddock that had a canola crop recently harvested. The dimensions were 12 (l) x 15 (w) x 8 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area was approximately 60%. .This site was recorded by Mark Saddler.	
55-6-0123	Jindera 488004	The site consisted of a single quartz flake in a paddock that had a canola crop recently harvested. The dimensions were 23 (l) x 15 (w) x 10 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area was approximately 50%. This site was recorded by Mark Saddler.	
55-6-0124	Jindera 487595	The site consisted of a single quartz flake in a paddock that had a canola crop recently harvested. The dimensions were 20 (l) x 16 (w) x 10 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area was approximately 50%. This site was recorded by Mark Saddler.	

AHIMS #	Site Name	Comments	Pictures
55-6-0129	Jindera 487613	The site consisted of a single quartz flake on a farm track adjacent to a fence line. The dimensions were 25 (l) x 55 (w) x 18 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area of the track was approximately 30%. This site was recorded by Mark Saddler.	
55-6-0149	Jindera Solar IF 1	The site consisted of a single quartz flake on the edge of a slightly raised spur adjacent to an ephemeral creek line on an animal track. The dimensions were 35 (l) x 23 (w) x 11 (t). It was recorded as a product of the tertiary stage of reduction. The deposits consisted of a reddish brown clay loam and visibility within the general area was approximately 15%.	
55-6-0150	Jindera Solar IF 2	The site consisted of a single quartz flake on the edge of an ephemeral creek line on an eroded animal track. The dimensions were 6 (l) x 5 (w) x 6 (t). It was recorded as a product of the tertiary stage of reduction. The deposits consisted of a reddish brown clay loam and visibility within the general area was approximately 25%. .	
55-6-0151	Jindera Solar IF 3	The site consisted of a single quartz flake in a cleared paddock with low dense grass cover. The dimensions were 29 (l) x 24 (w) x 6 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area was approximately 5%.	

AHIMS #	Site Name	Comments	Pictures
55-6-0152	Jindera Solar IF 4	The site consisted of a single quartz flake in a paddock that had a canola crop recently harvested. The dimensions were 18 (l) x 20 (w) x 10 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area was approximately 70%.	
55-6-0153	Jindera Solar IF 5	The site consisted of a single quartz flake in a paddock that had a canola crop recently harvested. The dimensions were 33 (l) x 28 (w) x 8 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area was approximately 80%.	
55-6-0154	Jindera Solar IF 6	The site consisted of a single quartz proximal fragment on the track surrounding a paddock that had a canola crop recently harvested. The dimensions were 23 (l) x 20 (w) x 8 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area of the track was approximately 80%.	
55-6-0155	Jindera Solar IF 7	The site consisted of a single quartz flake in a paddock that had a canola crop recently harvested. The dimensions were 26 (l) x 16 (w) x 6 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area was approximately 80%.	

AHIMS #	Site Name	Comments	Pictures
55-6-0156	Jindera Solar IF 8	The site consisted of a single quartz flake in an exposure under a paddock tree The dimensions were 30 (l) x 20 (w) x 15 (t). It was recorded as a product of the tertiary stage of reduction. The deposits consisted of a brown clay loam and visibility within the general area was approximately 70%.	
55-6-0157	Jindera Solar IF 9	The site consisted of a single quartz flake on a farm track. The dimensions were 21 (l) x 25 (w) x 6 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area of the track was approximately 30%.	
55-6-0158	Jindera Solar IF 10	The site consisted of a single quartz proximal fragment on a farm track adjacent to a fence line. The dimensions were 13 (l) x 11 (w) x 4 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area of the track was approximately 30%.	
55-6-0159	Jindera Solar IF 11	The site consisted of a single quartz proximal fragment on a farm track adjacent to a fence line. The dimensions were 10 (l) x 8 (w) x 4 (t). It was recorded as a product of the tertiary stage of reduction. The visibility within the general area of the track was approximately 30%.	

4.3.1 Cultural sites

Two cultural sites (AHIMS #55-6-0115/ Jindera 488918 and AHIMS #55-6-0116/ Jindera 488995) were recorded by the Aboriginal representative Mark Saddler. These sites were both trees which had scarring that NGH archaeologist determined were probably not archaeological in nature. However, Mark Saddler identified the sites Jindera 488918 and Jindera 488995 to be Aboriginal in origin. Therefore, Mark Saddler independently assigned a naming convention to these sites and submitted site cards to AHIMS. Mark Saddler requested that the trees be avoided by the development. Given these sites have been determined by NGH archaeologist not to be conclusively archaeological in nature they are noted in this assessment and shown in the mapping as cultural sites.

An additional cultural site was identified by Andom Rendell (representing the Albury LALC). The site was a tree which had scarring that NGH archaeologists have determined not to be archaeological in nature however it was identified by Andom Rendell as likely to be Aboriginal in origin. No site card has been submitted to AHIMS for this site given the uncertainty of the origins of the scarring on the tree.

Given these three sites have been determined by NGH archaeologist not to be archaeological in nature they are noted in this assessment and shown in the mapping as cultural sites. The details of these cultural sites are outlined below, and their locations shown in Figures 8 and 9.

AHIMS #55-6-0115/ Jindera 488918

This site consists of a tree considered to have cultural significance to Aboriginal people. The tree is located on a flat cleared paddock and at the time of survey was alive and standing but noted to be in poor condition from livestock camping under the shade of the tree. While NGH archaeologist determined that the scars on the tree were not archaeological in nature and noted that they did not conform to the standard scarring morphology accepted for Aboriginal modification (cf. Long 2005) the Aboriginal representative Mark Saddler, who was onsite during survey, considers the tree to have two scars that are identified as being Aboriginal in origin. Consequently, Mark Saddler has submitted a site card to AHIMS for this location and requested that the tree be avoided by the development.

<table>
<tr><td>.  </td><td>  </td></tr>
<tr><td>Plate 27. View east of scar 1 on the cultural site AHIMS #55-6-0115.</td><td>Plate 28. Close up of scar 1 on the cultural site AHIMS #55-6-0115.</td></tr>
</table>

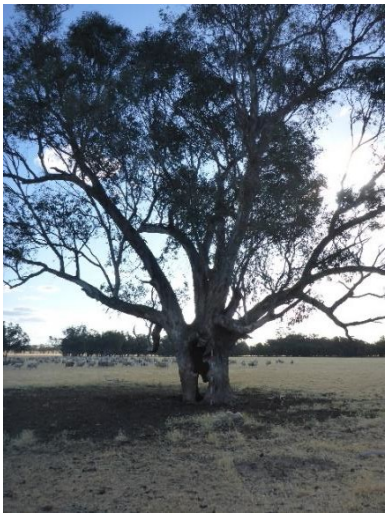


Plate 29. Close up of scar 2 on the cultural site AHIMS #55-6-0115	Plate 30. View west of scar 2 on the cultural site AHIMS #55-6-0115

AHIMS #55-6-0116/ Jindera 488995

This site consists of a tree considered to have cultural significance to Aboriginal people. The tree is located approximately 15 m east of the boundary fence in a flat cleared paddock. At the time of survey the tree was alive and standing in good condition however multiple fallen limbs and stock damage were noted. While NGH archaeologists determined that the scar on the tree was not archaeological in nature and noted that it did not conform to the standard scarring morphology accepted for Aboriginal modification (cf. Long 2005) the Aboriginal representative Mark Saddler, who was onsite during survey, considers the tree to have a single scar that is identified as being Aboriginal in origin. Consequently, Mark Saddler has submitted a site card to AHIMS for this location and requested that the tree be avoided by the development.

	
Plate 31. View north of scar on the cultural site AHIMS #55-6-0116.	Plate 32. Close up of scar on the cultural site AHIMS #55-6-0116.

Jindera Solar Cultural Tree 1

This site consists of a tree considered to have cultural significance to Aboriginal people. The tree is located approximately 35 m south of Kilnacroft Creek in a flat treed area 20 m west of a paddock fence line. At the time of survey the tree was alive and standing in good condition however some stock damage was noted.

While NGH archaeologists determined that the scar on the tree was not archaeological in nature and noted that it did not conform to the standard scarring morphology accepted for Aboriginal modification (cf. Long 2005) the Aboriginal representative Andom Rendell (representing the Albury LALC), who was onsite during survey, considers the tree to have a single scar that is identified as being Aboriginal in origin. The Aboriginal representatives present for the survey requested that the tree be avoided by the development. No site card has been submitted to AHIMS for this site given the uncertainty of the origins of the scarring on the tree.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Plate 33. View north-west of scar on the cultural site Jindera SF Cultural site 1.</td><td>Plate 34. Close up of scar on the cultural site Jindera SF Cultural site 1.</td></tr>
</table>

4.3.2 Consideration of potential for subsurface material

The field survey of the Jindera Solar Farm proposal area in conjunction with an assessment of contour data, archaeological modelling and consideration of the comments from the RAPs have resulted in the identification of four areas considered to have potential for *in situ* subsurface deposits that require further assessment. It was recommended that the four areas of Potential Archaeological Deposit (PADs) (PAD 1-4) are subject to a limited subsurface testing program to establish the true archaeological potential, significance and extent of sites within the proposal area. PAD 4 was covered in a very dense grass cover during the initial field survey. This paddock was noted by the RAPs to require additional survey and/or assessment given the low visibility. By undertaking a limited program of subsurface testing in this paddock the true archaeological potential, significance and extent of sites within the area will be able to be established.

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 remainder of the proposal area outside the four PADs. Consequently, subsurface testing was not warranted across the remainder of the proposal area beyond the four PADs identified.

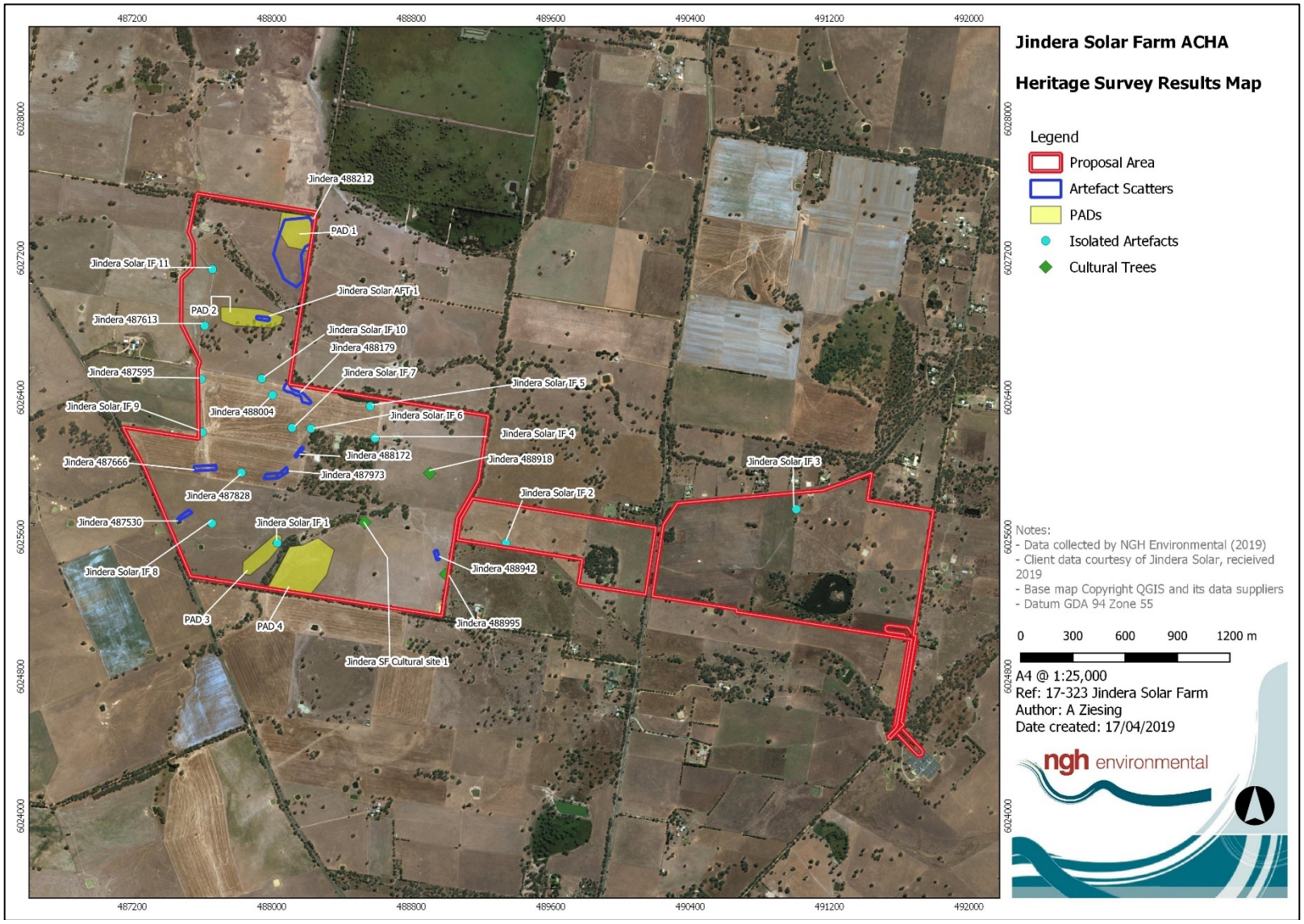


Figure 8 Results from the heritage surveys.

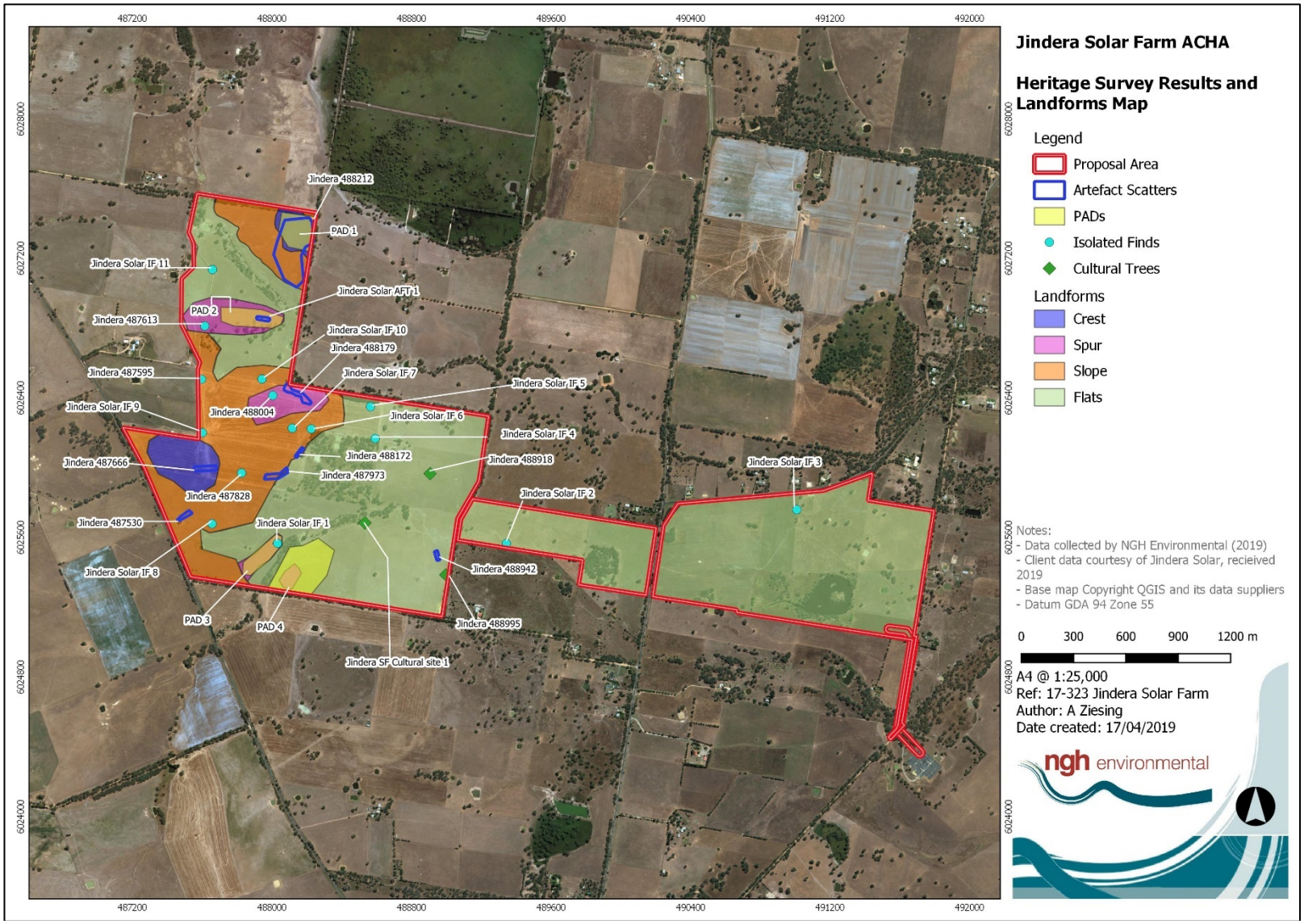


Figure 9 Overview of survey results and landforms.

4.4 EXCAVATION METHODOLOGY

The subsurface excavation of the four areas considered to have potential for *in situ* subsurface deposits was undertaken following the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. As such, the basic parameters of the investigation were limited to the methodology outlined in the Code. The following provides details of the methodology used in the testing strategy for the subsurface testing program within the Jindera Solar Farm proposal area.

Based on the results of the NGH Environmental survey of the proposal area it was determined that subsurface testing was required to investigate the presence and extent of archaeological material at four PADs in the proposal area. The four locations for testing were recorded as PAD 1 to PAD 4 (see Figure 10) and the landscapes consisted of:

- The crest at the site AHIMS# 55-6-0125/ Jindera 488212 (duplicate of #55-6-0126) (PAD 1); and
- The slightly raised ground along spurs in close proximity to Dead Horse Creek (PAD 2) and Kilnacroft Creek (PAD 3 and 4).

It was determined that the most effective way of testing the four PADs within the proposal area was through the hand excavation of a series of test pits along a central baseline transect across each PAD. Test pits were therefore placed along a baseline transect at each PAD area to investigate the potential for subsurface deposit.

Test pits were placed to investigate the PADs at 20 m intervals along a baseline transect in each area to assess the presence or absence of archaeological material. Plates 35 to 44 show the landscape of the PADs tested.

The result was test pits along a baseline in each PAD with additional pits placed when higher densities of subsurface artefacts were recovered to sufficiently assess the area. Test pits were numbered in sequential order as they were excavated from Pit 1 to Pit 50. A total of 52 pits were excavated across the proposal area as shown in Figure 10. The location of the test pits was recorded in the field using a GPS enabled Samsung Tablet, running QFIELD.

Excavation proceeded for all areas in line with the requirements of the Code of Practice and outlined in the methodology provided to the Aboriginal stakeholders. The test pitting methodology involved the following actions.

- Each test pit was 50 cm x 50 cm in area;
- Each pit was excavated by hand to a depth of 5 cm in the first spit;
- Subsequent spits were excavated at 10 cm depths to a clay or until they were unable to be excavated by hand any deeper;
- All excavated material from each spit was dry sieved through a 5 mm mesh;
- Descriptions of soil and any other features were noted on standardised recording sheets;
- Photos were taken of each completed test pit;
- Scale-drawn records of the stratigraphy/soil profile were completed for each test pit;
- A sort through the residual gravels and material retained in the sieve was conducted in the field;
- Any suspected cultural material was retained and bagged according to pit and spit details for later recording in the lab; and
- All test pits were backfilled with the excavated deposit.

The recording and analysis of the artefacts recovered from the test excavations was undertaken at the NGH Environmental office in Wagga Wagga. The artefacts had a range of variables and technological attributes recorded including the following:

- Provenance (pit number, spit number);
- Raw material;
- Technological category;
- Dimensions (for complete flakes this included percussion length, platform, mid and distal width, platform thickness, maximum thickness; for other items the maximum dimensions);
- Platform details (including size, type and presence of overhang removal);
- Cortex (type and %);
- Scar count and location;
- Usewear/retouch type and location; and
- General comments.

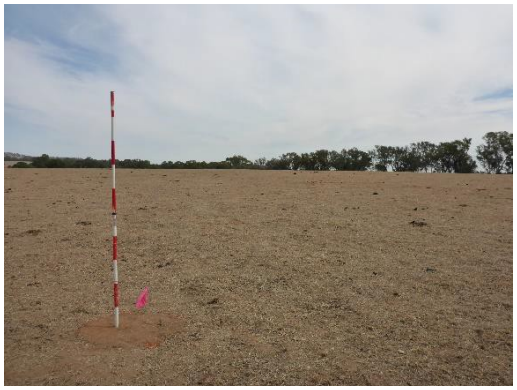
<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Plate 35. View south east from Pit 8 along the baseline at PAD 1.</td><td>Plate 36. View north west from Pit 10 along the baseline at PAD 1.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Plate 37. View from Pit along the cross section baseline at PAD 1.</td><td>Plate 38. View west from Pit 20 along the baseline at PAD 2.</td></tr>
</table>

Plate 39. View north west from Pit 24 along the baseline at PAD 2.

Plate 40. View north from Pit 25 along the baseline at PAD 2.

Plate 41. View north from Pit 47 along the baseline at PAD 3.

Plate 42. View south from Pit 48 along the baseline at PAD 3.

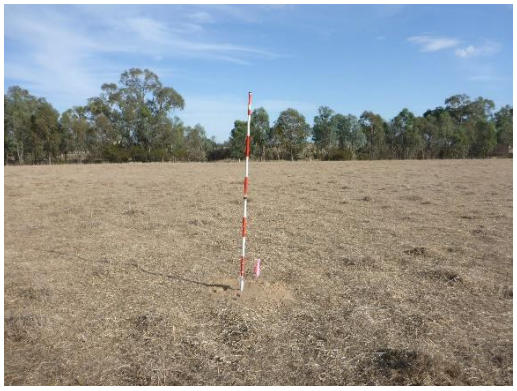


Plate 43. View west from Pit 38 along the baseline at PAD 4.

Plate 44. View south west from Pit 34 along the baseline at PAD 4.

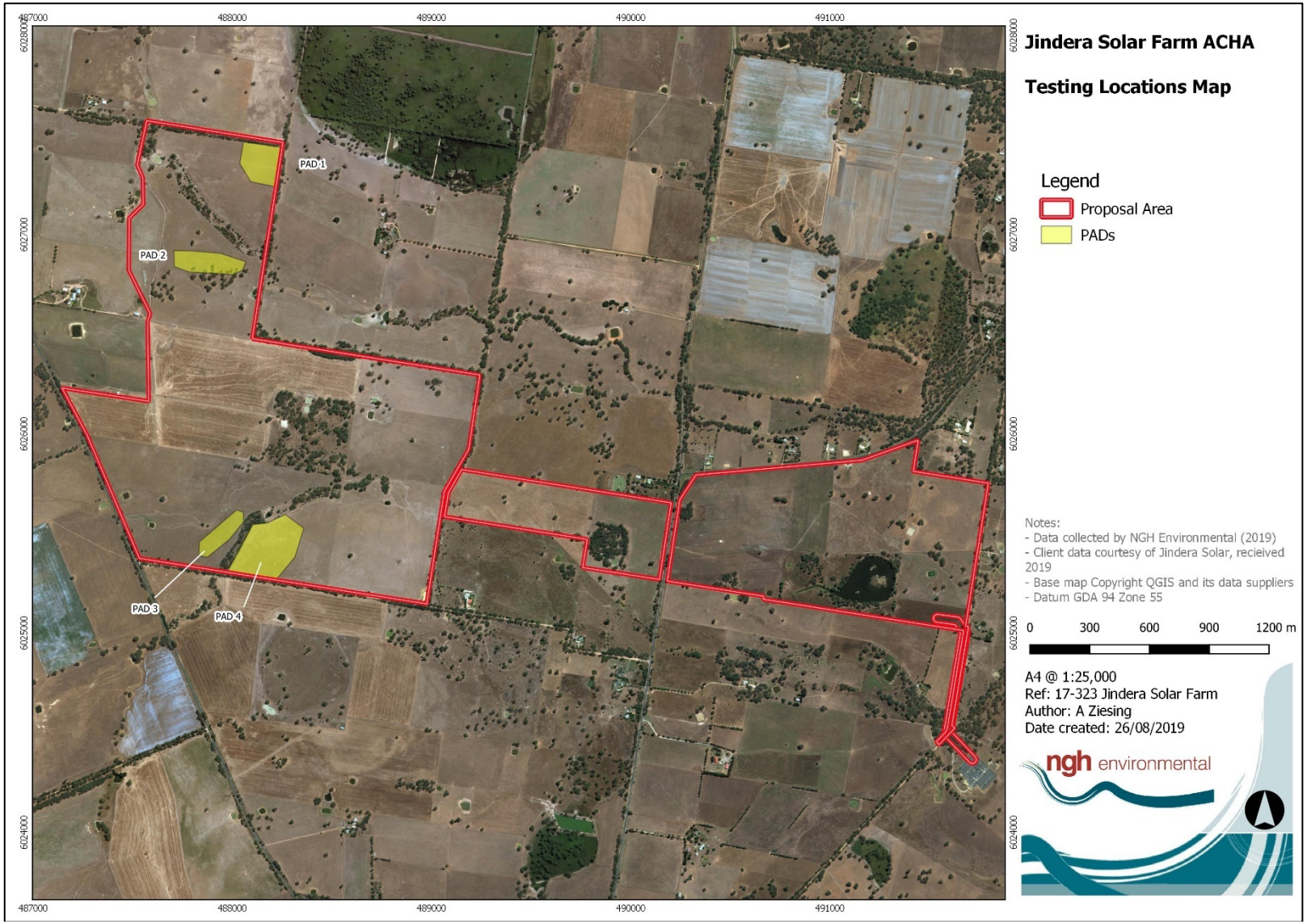


Figure 10 Overview of four subsurface testing locations.

4.5 EXCAVATION RESULTS

4.5.1 Testing Results

A total of 52 test pits were excavated across four area within the proposal area during the subsurface testing program with stone artefacts recovered from 25 pits. The artefacts densities for each of the pits excavated ranged from nil to 12. From the 52 test pits, a total of 2.51 m^3 of deposit was excavated and sieved. Test pits ranged in depth from 10 cm to 31 cm. An overview of the test pits locations is shown in Figures 11 and 12. All soil descriptions and photos are provided in Appendix G.

A total of 80 subsurface artefacts were recovered during the testing program. All the artefacts were manufactured from quartz which is a common lithology for the proposal area and the Jindera area. The typologies recorded included 42 flakes, 16 broken flakes, 14 cores (including a blade core), 7 flaked pieces and a geometric microlith (see Plates 45 to 48). The full details of the 80 subsurface artefacts are provided in Appendix F. The density of artefacts recovered from the excavation provide an indication of the variability of artefact numbers across the landforms investigated. The highest artefact density was identified in pit 37B with 48 artefacts/m^2. The overall density of artefacts across the entire excavated area for all test pits was 6.15/m^2, which is the most accurate representation of the likely artefact occurrence.

4.5.2 Deposit Characteristics

The excavation revealed a largely similar soil profile across each of the four PAD areas with a light brown to reddish-brown silty loam topsoil underlain by a friable silty clay over a compacted clay. The clay layer generally appeared at a depth of 15 to 30 cm. The topsoil stratigraphic unit was marginally deeper to the south west of Kilnacroft Creek, the eastern pits associated with Dead Horse Creek and at the highest point of the ridgeline. The majority of test pits contained small gravels in the upper layers, along with grass root inclusions. Test pit 20 contained a light grey gravel material at 17 to 19 cm depth not seen in any other location. Soil colour was generally light brown to grey south of Dead Horse Creek, redder along the ridgeline and red-brown on either side of Kilnacroft Creek. The colour of the sterile base clay ranged from light brown south of Dead Horse Creek, red brown along Kilnacroft Creek and red on the ridgeline. The characteristics of the main three stratigraphic units identified as part of this assessment are summarised in Table 10 below.

Table 10. Stratigraphic soil profile

Stratigraphic Unit	Sediment Description	Comments	Artefacts Present
1	Compacted fine orange, light brown to reddish brown silty loam with roots, small or no gravels and insects and insect activity noted.	Topsoil layer is light brown to red brown along ridgeline and either side of Kilnacroft Creek. Topsoil layer is deeper and varies from grey to light brown south of Dead Horse Creek.	18 artefacts
2	Friable silty clay with minimal roots, some gravels and insect activity. Some root staining.	Friable layer is light brown to red brown along ridgeline and either side of Kilnacroft Creek. Friable layer is light brown south of Dead Horse Creek.	62 artefacts
3	Compacted red, red brown to light brown clay.	Compacted clay is red on ridgeline, light brown south of Dead Horse Creek and red-brown along either side of Kilnacroft Creek.	No artefacts

Excavation was made difficult by the compaction of the soil due to dryness. Consequently, the primary hand tools used for excavation was mattocks and crowbars. No modern inclusions were present in any of

the test pits and only one small sample of charcoal was encountered during the excavations. The charcoal was identified in Test Pit 43 at a depth of 15 to 25 cm but it was not considered to be unequivocally cultural and therefore was not used for dating of the cultural layers. Bushfires and land clearing in particular are likely to have been responsible for the charcoal found and the pit was noted to have a high level of insect and root activity.

The excavation noted the presence of insects and roots of grasses through the deposits. The impacts of these actions result in the continual movement of soil and through it the movement of stone artefacts, a process known as bioturbation. However the greatest impact on the deposits is through agricultural and pastoral activities of the land including vegetation clearance and ploughing.

4.5.3 Artefact Characteristics

Of the 52 test pits excavated across the proposal area during the subsurface investigation, 25 contained stone artefacts. In total there were 80 stone artefacts recovered. The full details of these are provided in Appendix F. Table 11 shows the breakdown of artefacts excavated by pit number and spit.

Table 11. Distribution of artefacts and cultural materials by test pit and spit.

Test Pit No	SPIT 1 (0-5 cm)	SPIT 2 (5-15 cm)	SPIT 3 (15-25 cm)	SPIT 4 (25-35 cm)	TOTAL
2	1				**1**
6	1	2	1		**4**
7	1				**1**
11	1				**1**
16	1	1			**2**
19	1				**1**
25		2	2		**4**
26	2	2			**4**
27	2				**2**
29		1			**1**
30		10			**10**
35		3			**3**
36		6			**6**
37A		4	5		**9**
37B		8	4		**12**
37C			1		**1**
38		1			**1**
39	1				**1**
40		1			**1**
41		1			**1**
43		1			**1**
45		6	1		**7**
46		3			**3**
48		1			**1**
50	1	1			**2**
Total	**12**	**54**	**14**	**0**	**80**

The distribution through the soil profile shows that the majority of artefacts came from spit 2 (5-15cm below the surface). There was no obvious soil deposit characteristic associated with this level. It is likely that bioturbation and farming activity have resulted in at least some artefacts moving through the soil profile.

Table 12 and Figure 11 show the typological characteristics of the artefacts recovered from the test pits. It is clear that the majority of artefacts were flakes or broken flakes with a relatively high number of cores also recovered. Ten artefacts recorded from the test pits where noted to have been retouched including the single formal tool, a geometric microlith.

Table 12. Test pit artefact characteristics

Test Pit	Flake	Broken Flakes	Core	Flaked Piece	Formal Tools	Total
2	1					**1**
6	2	1	1			**4**
7			1			**1**
11			1			**1**
16	2					**2**
19					1	**1**
25	1	1	1	1		**4**
26	1	3				**4**
27	1	1				**2**
29			1			**1**
30	3	1	1	5		**10**
35	2		1			**3**
36	3	1	2			**6**
37A	**7**		**1**	**1**		**9**
37B	4	5	3			**12**
37C	1					**1**
38	1					**1**
39	1					**1**
40	1					**1**
41	1					**1**
43			1			**1**
45	6	1				**7**
46	2	1				**3**
48	1					**1**
50	1	1				**2**
Total	**42**	**16**	**14**	**7**	**1**	**80**

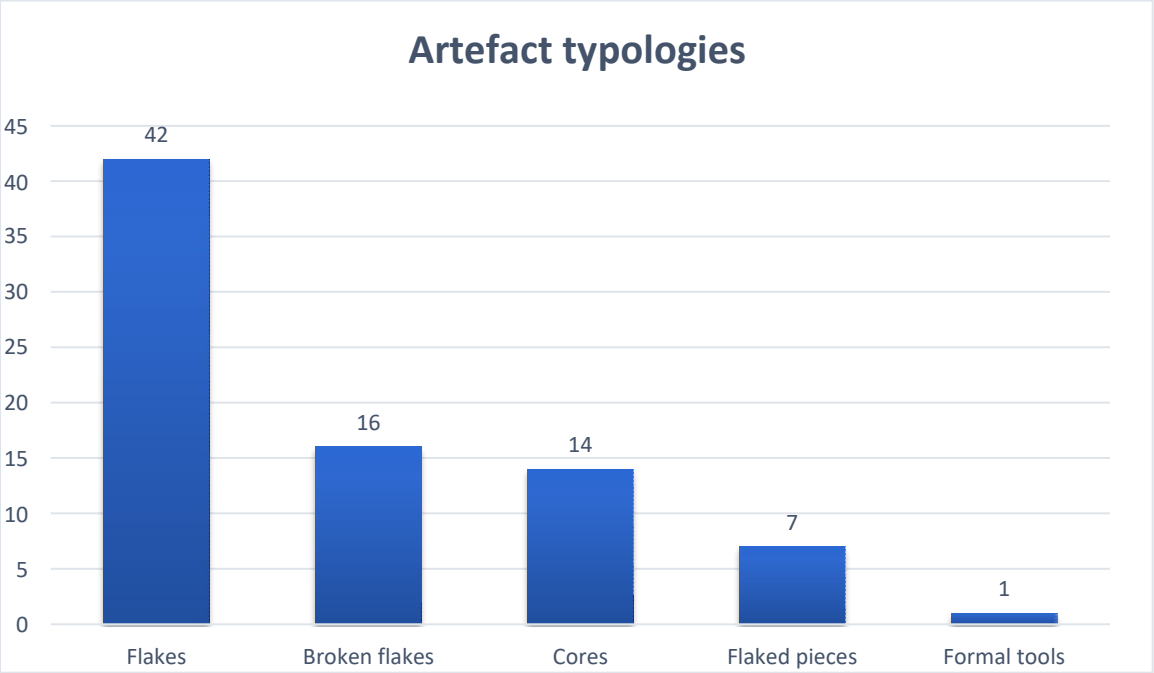


Figure 11. Artefact typologies.

A quartz geometric microlith was recorded in Pit 19. Geometric microliths as a formal tool type are generally associated with a range of behaviours including the maintenance and production of organic tools/objects (woodworking) and the preparation of animal and plant resources. Geometric microliths are characteristic of the Australian small tool tradition that is common in mid Holocene sites. These formal tool types are associated with a wider trend of multi-functional tool kits and the technological response to mobility and changes in resource predictability.

The artefacts recovered from the test pits are likely to be waste materials from the flaking process especially the seven flaked pieces which had no obvious diagnostic features to be assigned a specific artefact typology. The relativity high number of cores may be representative of the high discard rate of raw materials brought into the area.

All the artefacts recovered were manufactured from quartz which tends to be the dominate lithology in the project area and common for the Jindera area. No quartz rock outcrops were observed in the project area suggesting that this raw material was sourced elsewhere and brought into the site.

The average length of the 42 complete quartz flakes was 12.83 mm (standard deviation of 4.46 mm) and the average mass was 0.74 grams. Nine flakes were recorded showing evidence of retouch which have an average length of 14.88 (standard deviation of 3.54 mm). While there was a low number of cores (n=1; 1.9%) recorded during the survey a relatively high number of cores (n=14; 17.5%) were recovered from the subsurface testing program. The high number of cores recorded from the subsurface testing program may be representative of the heavier quartz stones artefacts moving through the soil profile during farming activities, specifically ploughing. The length of the subsurface cores recovered averages 21mm and may also be representative of the low discard rate of quality raw materials in the area until they were exhausted. The lack of diversity of materials and types prevents any further detailed technological analysis.

The technological characteristics of the artefacts would suggest they are part of general purpose toolkit, manufactured as required. The artefacts themselves are typical and do not appear to represent any departure from the basic toolkit used by Aboriginal people in south eastern Australia with stone tools

manufactured as required. The assemblage across the proposal area is suggestive of small ephemeral stopovers by hunters or small family groups for short periods of time.

Plate 45. Artefact 1 White quartz flake (Pit 2 Spit 1)

Plate 46. Artefact 10 White quartz geometric microlith (Pit 19 Spit 1).

Plate 47. Artefact 32 Grey quartz blade core (Pit 35 Spit 2).

Plate 48. Artefact 44 White quartz flake (Pit 37A Spit 3).

Plate 49. Artefact 8 white quartz flake (Pit 16 Spit 1).

Plate 50. Artefact 14 Crystal quartz flake (Pit 25 Spit 3).

4.5.4 Spatial Distribution

The spatial distribution of the cultural material in the proposal area recovered during the subsurface testing program is shown in Figures 12 and 13. The highest artefact density was identified in pit 37B with 48 artefacts/m^2. The overall density of artefacts across the entire excavated area for all test pits was 6.15/m^2, which is the most accurate representation of the likely artefact occurrence. Figure 14 shows all the sites recorded during the survey and subsurface testing program.

It is clear from the mapping that the presence of subsurface cultural material occurred in a relatively distinct concentrations within the raised spurs located either side of Kilnacroft Creek. Observing the pattern of artefact distribution and the gaps across all the areas subject to the test excavation program it appears that all four areas subject to the testing program are characterised by discrete low density clusters of artefacts interspersed with areas of very low or no artefactual material. This is clearly displayed with pit 37A and 37B, which combined contained the highest number of artefacts, flanked with test pit 37C directly adjacent which only had a single artefact. Another example of this is Pit 6 which had the highest density of subsurface artefacts within the crest landform tested however it is flanked by four test pits 20 m either side with three of the pits containing no artefacts while the other had only a single artefact.

Of the 14 test pits (Pit 1 to 14) placed along the crest (PAD 1) within the site AHIMS #55-6-0125 (duplicate of AHIMS #55-6-0126)/ Jindera 488212 seven subsurface artefacts were recovered from four test pits (Pits 2, 6, 7 and 11). The artefacts recovered from the crest were all manufactured from quartz and included three flakes, three cores and a broken flake. Given the pattern of subsurface artefact distribution across the crest it is likely that this crest landform is characterised by discrete low density artefacts interspersed with areas of very low or no artefactual material.

Of the ten test pits (Pit 15 to 24) placed along the slightly raised ground along a spur in close proximity to Dead Horse Creek only two test pits (Pits 16 and 19) contained subsurface artefacts. The artefacts recovered were all manufactured from quartz and included two flakes and a geometric microlith. Given the pattern of subsurface artefact distribution across the slightly raised ground along a spur in close proximity to Dead Horse Creek it is likely that this landform is characterised by discrete very low density artefacts interspersed with areas of no artefactual material. The subsurface artefacts recovered from the testing program have been recorded as the site Jindera Solar AFT 1.

A total of 19 test pits (Pit 25 to 41 including 37A- C) were excavated along the flat slightly raised spur along the eastern bank of Kilnacroft Creek. A total of 52 subsurface artefacts were recovered from 14 test pits (Pits 25, 26, 27, 29, 30, 35, 36, 37A, 37B, 37C, 38, 39, 40 and 41) with the highest density of artefacts was recovered from the board highest point of the spur in close proximity to the creek along the southern boundary of the proposal area, closest to Klinbergs Road. The artefacts recovered included 26 flakes, 11 broken flakes, nine cores (including a blade core) and six flaked pieces. All the artefacts were manufactured from quartz. The artefacts appear to all occur within the flat highest point of the spur with no artefacts recovered from pits 31 to 34 that slope down towards the flats. Given the pattern of subsurface artefact distribution across the slightly raised ground along a spur along the eastern bank of Kilnacroft Creek it is likely that this landform is characterised by discrete clusters of artefacts with the highest density of artefacts within the board flat highest point of the spur near Klinbergs Road with low densities of artefacts interspersed elsewhere with areas of very low or no artefactual material. The subsurface artefacts recovered from the testing program have been recorded as the site Jindera Solar AFT 2.

Of the nine test pits (Pit 42 to 50) excavated along the flat slightly raised spur along the western bank of Kilnacroft Creek five test pits (Pits 43, 45, 46, 48 and 50) contained subsurface artefacts. The 14 artefacts recovered were all manufactured from quartz and included ten flakes, three broken flakes and a core.

Generally, there was a lower concentration of artefacts along the western side of Kilnacroft Creek however this may also be representative of the lower number of test pits excavated compared to the eastern side of Kilnacroft Creek. Given the pattern of subsurface artefact distribution across the slightly raised spur along the western bank of Kilnacroft Creek it is likely that this landform is characterised by discrete low density artefacts interspersed with areas of very low or no artefactual material. The subsurface artefacts recovered from the testing program have been identified within the same landform as the isolated surface find site Jindera Solar IF 1 however to facilitate the AHIMS recording the subsurface material has been identified as the separate site Jindera Solar AFT 3.

Based on an analysis of the spatial patterning of artefact across the proposal area the most likely explanation in terms of the Aboriginal occupation of this area is that it reflects the intermittent and opportune occupation of the area as people travelled through country and occasionally camped in the general area.

4.6 DISCUSSION

The predictions, based on modelling for the proposal area, were that isolated artefacts and artefact scatters consisting predominately of quartz objects were the most likely manifestation of Aboriginal occupation in the proposal area. The results indicate that artefact scatters and Aboriginal objects can occur throughout the landscape, even in areas of highly disturbed farming activities. While Aboriginal sites may be expected through all landscapes there does appear to be a pattern of sites that relate to the presence of potential resources for Aboriginal use.

The survey results have confirmed these predictions with 52 surface stone artefacts recorded as 15 isolated finds and seven artefact scatter occurrences across the proposal area.

Moderate to high archaeological sensitivity was predicted to occur along three elevated spurs with level ground associated with a water source and along a crest in close proximity to a water source overlooking a wetland. While the subsurface testing of these four areas of potential archaeological deposits generally found that there were less artefacts than expected distributed across the crest and elevated spurs throughout the proposal area these landscape features as a whole did contain a low density of quartz surface and subsurface artefacts interspersed with areas of very low or no artefactual material.

A relatively high density of subsurface artefacts was recovered from a high and broad location of an elevated spur along the eastern bank of Kilnacroft Creek supporting the modelling of the region that sites tend to occur on elevated level ground associated with a water source that have been noted to consistently occur on raised landforms within 50 m of peripheral or seasonal creeks. No direct evidence of longer-term base camps was identified within the proposal area.

The sites identified in this assessment are scattered across the proposal area and are representative of the opportunistic use and movement of people through the landscape. The area was likely used intermittently over a period of time for camping, hunting and gathering resources. Based on this assumption, there is every chance that there are similar artefact scatters or isolated artefacts across similar landforms in the Jindera area and that Aboriginal stone objects are more prevalent in this area than previously envisaged.

The majority of the artefacts recorded during the survey and subsurface testing program were manufactured from quartz which is common for the general region with a lesser number of sandstone and volcanic artefacts also recorded. The presence of a grindstone fragment, a ground edge axe, a geometric microlith, cores, flakes, broken flakes and flaked pieces indicates that tool manufacture may have occurred onsite, although the presence of the ground edge ground axe and geometric microlith may imply some completed tools and materials were also brought to the site. The small average size of cores recorded

during the survey and subsurface testing program may be representatives of a low discard rate of quality raw materials in the area until they were exhausted.

The use of a volcanic material for the manufacture of the edge-grounded axes is common for the region however it should be noted that no grinding groove sites has been recorded to date within the AHIMS search area near the proposal area and it is likely that edge-grounded axes in the Jindera area may have been shaped and sharpened elsewhere and brought into the local area.

It should also be noted that the results of this survey and subsurface investigation have substantially increased the number of stone artefact sites recorded in the local area by 44.4% from 30 to 54. There appears to previously be a bias towards more obvious site types in the AHIMS record, with scarred trees previously making up 38% (n=19) of the sites recorded in the area. This is something we consider anomalous in the typical pattern of site recording in Australia. The implications for this relate to significance assessments and the related appraisal of site representativeness. We would argue that there are likely to be many hundreds of such artefact sites in the local area, and that the previous relatively low number of artefact sites in the local area recorded on AHIMS is merely an indication that few surveys have been undertaken in the Jindera area and therefore they are yet to be found.

In terms of the current proposal, extrapolating from the results of this survey and subsurface testing program, it is likely that additional low density surface and subsurface artefacts could occur within the proposed development footprint and the surrounding areas. We consider that there is little value in undertaking further investigations such as salvage excavation based on the generally low density of subsurface material identified through the testing program of areas considered to have the highest archaeological potential for high density *insitu* objects. Based on the land use history of the proposal area, and an appraisal of the results from the field survey and excavation, there is negligible potential for the presence of intact subsurface deposits with very high densities of artefacts within the proposed Jindera Solar Farm area.

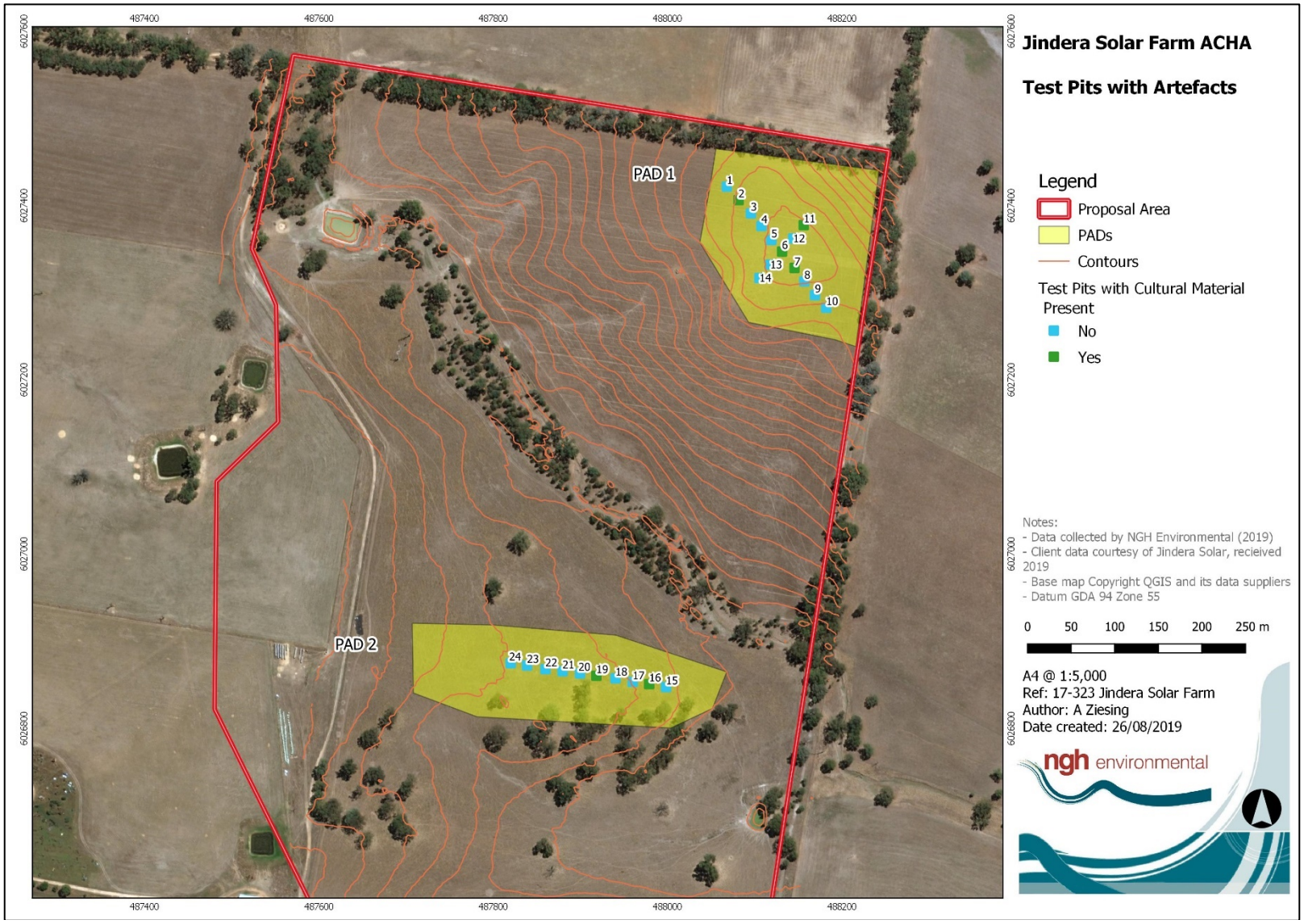


Figure 11 Testing Locations at PAD 1 and PAD 2 showing pits where cultural material was recovered.

Figure 12 Testing Locations at PAD 3 and PAD 4 showing pits where cultural material was recovered.

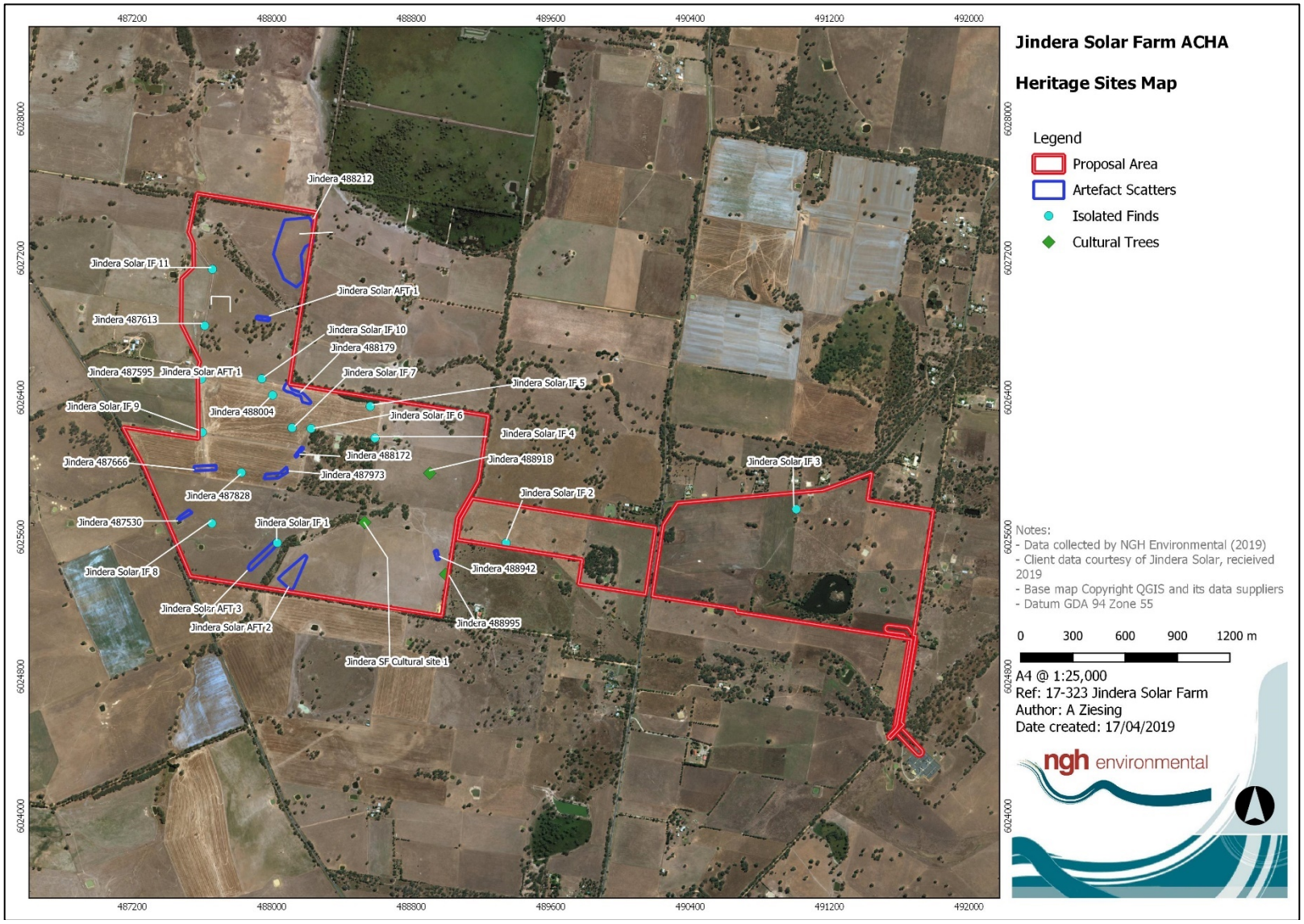


Figure 13 Location of all cultural material recorded in the proposal area.

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

All sites or places have some degree of value, but 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. An opportunity to identify cultural and social value was provided to the Aboriginal representatives for this proposal through the fieldwork and draft reporting process.

Feedback about the cultural value of the sites while in the field with representatives was that all sites hold cultural value to the Aboriginal community. It was clear from the conversations held in the field that the community view the stone artefacts as important and would like to see the surface artefacts collected before any development occurs. It was noted during the conversations that there was importance placed

on collecting the artefacts and placing them in a safe location to avoid future disturbance. The stone axe was noted to be a particular stone artefact type that should be collected prior to damage or development as it was not common for the area and could possibly be used as a teaching object in the local Aboriginal community by the Albury LALC.

Three cultural sites were recorded by the Aboriginal representative during the survey. These sites were all trees which had scaring that NGH archaeologist determined were not archaeological in nature however they were identified by Mark Saddler and/or the Albury LALC representatives to be Aboriginal in origin. These sites are therefore considered to be cultural sites the value of which may only be determined by the local Aboriginal community.

Scientific (archaeological) value.

The research potential of the sites located during this assessment is considered to be low. While the presence of the sites can be used to assist in the development of site modelling for the local landscape, their scientific value for further research is limited.

While the artefacts themselves are intrinsically interesting in terms of their base technical information their current lack of temporal context and the absence of information about local resources makes further conclusions about land use difficult. Their scientific value for further research is also limited due to the disturbed nature of the landscape and the subsequent movement of objects by clearing and ploughing activities. The ground edge axe surface artefact is considered of higher value due to the relative rarity of the artefact compared to common flaking material of cores and flakes. Axes are an indicator of a different tool use and activity, being mostly for the removal of wood from trees that could have been used for a variety of purposes such as carrying dishes, shields, spears and shelter as well as extraction of food such as possums and honey from tree hollows. The presence of an edge-ground axe artefact within the assessment area would indicate that woodworking activities occurred in the area.

The only other potential area of research would be to analyse the edge-ground axe and grindstone fragment identified within the proposal area to see if there are any residues present on either object that could indicate what materials were ground or cut. However, this is likely to be difficult as the items would have been moved around by pastoral and agricultural activity and may have been compromised through contact with agricultural crops and livestock.

The cultural tree sites have no further research potential given that the scars on the trees were unable to be unequivocally determined to be Aboriginal in origin by the NGH archaeologist.

The findings of this project have substantially increased the number of sites listed in the AHIMS database for the area. In terms of representativeness and rarity however, we would argue that there are likely to be many hundreds of such sites in the local area, the lack of sites in AHIMS is merely an indication that few surveys have been undertaken in the Jindera area and therefore they are yet to be found. The nature of Aboriginal occupation in almost any landscape in Australia is that stone artefact sites considerably outnumber any other site type, including scarred trees.

Aesthetic value

There are no aesthetic values associated with the archaeological site per se, apart from the presence of Aboriginal artefacts and cultural sites in the landscape. The modified and heavily disturbed landscape within the solar farm development area however detracts from this aesthetic setting.

Historic Value

There are no known historic heritage values associated with the subject area or the sites identified.

Other Values

The area may have some educational value (not related to archaeological research) through educational material provided to the public about the Aboriginal occupation and use of the area, although the archaeological material is within private property and there is little for the public to see.

6 PROPOSED ACTIVITY

6.1 HISTORY AND LANDUSE

It has been noted above that historically the Jindera solar farm proposal area has been impacted through land use practices, in particular clearing, ploughing and grazing.

The implications for this activity are that the archaeological record has been compromised in terms of the potential for scarred trees to remain outside the areas of remnant vegetation. The implication for stone artefacts is that they may have been damaged or moved but they are likely to be present and remain in the general area they were discarded by Aboriginal people.

Despite these impacts, Aboriginal artefacts and cultural material remain in the area, indicating the presence of past Aboriginal people and providing indications of their use of this landscape.

6.2 PROPOSED DEVELOPMENT ACTIVITY

As noted in section 1.3, the proposal involves the construction of a solar plant with a capacity up to 150 MW (DC). The power generated will be fed into the National Electricity Market (NEM) via a 132 KV overhead cable run to connect the proposal area to the Jindera substation.

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 and spread 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, operations and maintenance buildings, battery units and an electrical substation.

Electrical transmission infrastructure will be required to connect the solar arrays and substation via a 132 KV overhead cable run to the Jindera substation.

A perimeter fence would be constructed around the solar farm and if required vegetation buffers would possibly be planted in some areas for visual screening.

To date TransGrid have not been able to define the scope of any required works within the Jindera Substation lot. As such, the proposed 40 m wide transmission line easement could not be assessed: however, a commitment is made to ensure Aboriginal heritage is appropriately assessed and mitigated, once the scope of work is clarified. If any sites of Aboriginal cultural heritage are identified in the 40 m wide easement, they would be managed in accordance with the type and significance of the site.

In total, the construction phase of the proposal is expected to take up to 11 months. The Jindera Solar Farm is expected to operate for around 30 years. After the initial operating phase, the proposal would either be

decommissioned, removing all above ground infrastructure and returning the site to its existing land capability (12 months), or upgraded with new photo voltaic equipment.

The development activity will therefore involve disturbance of the ground during the construction of the solar farm. Once established however, there would be minimal ongoing disturbance of the ground surface.he final details and timing of the proposed construction activity have yet to be finalised, but it is anticipated that construction could commence in late 2019.

6.3 ASSESSMENT OF HARM

As described in this report, 15 isolated finds, 10 artefact scatters and three cultural trees were located within the assessment area. Table 13 and 14 provides a summary of sites and the site types to be impacted and avoided by the proposed development while Table 15 details the degree of harm and the consequence of that harm upon the heritage value of each site resulting from the proposed works. Figure 15 also shows the location of the sites and the proposed development footprint. It should be noted that design changes to the original layout have been made have avoided the cultural trees within the proposal area.

There is Aboriginal archaeological and cultural material present within the solar farm proposal area and the assessment is that there are likely to be other stone artefacts present as well, although in similar low densities. The proposed level of disturbance for the construction of the solar farm could impact the stone artefacts recorded during the field survey and others that may be present within the areas subject to the subsurface testing program and across other areas of the development site.

A total of 24 sites with stone artefacts (Jindera Solar IF 1, Jindera Solar IF 3 to Jindera Solar IF 11, Jindera 487595, Jindera 487613, Jindera 487828, Jindera 488004, Jindera 488942, Jindera 487530, Jindera 488212/Jindera 488156, Jindera 488172, Jindera 488179, Jindera 487973 and Jindera 487666) are situated within the area of the proposed solar arrays, tracks and fencing that would be impacted by the proposed development (see Figure 15). Only isolated stone artefact Jindera Solar IF 2 will not be impacted by the proposed development footprint.

The impact to the sites with stone artefacts is likely to be most extensive where earthworks occur, such as the installation of cabling, which may involve the removal, breakage or displacement of artefacts. This is considered a direct impact on the sites and the Aboriginal objects by the development in its present form.

The proposed construction methodology for the project will however result in only small areas of disturbance. The construction of access and maintenance tracks may involve some grading but given the nature of the majority of the terrain, this is likely to be minimal. The installation of the solar arrays involves drilling or screwing the piles into the ground and no widespread ground disturbance work such as grading is required to accomplish this. The major ground disturbance will be the trenching for cables and vehicle movement during construction.

The three cultural trees (Jindera 488918, Jindera 488995 and Jindera SF Cultural Site 1) will not be impacted by the proposed development footprint, however, fencing and vegetation screening is proposed to occur in close proximity to two of these sites (Jindera 488995 and Jindera SF Cultural Site 1). To ensure no inadvertent impacts occur to the cultural trees no vegetation screening planting will occur within a 20 m buffer of the sites to ensure the root and tree canopy are not impacted. Any proposed fencing within the 20 m buffer of the culture tree sites Jindera 488995 and Jindera SF Cultural Site 1 will ensure that fence posts and any fencing related activities that may cause ground disturbance will not encroach upon the 20 m buffer of the sites. Additionally, any fencing wire strung will be a minimum of 1 m from the trunk and/or other physical contact with the tree to ensure there is no inadvertent impacts to the trees.

The assessment of harm overall for the project is assessed as moderate.

Table 13. Summary of sites to be impacted and avoided by the proposed development

Sites impacted	Sites avoided
1. Jindera Solar AFT1 (artefact scatter) 2. Jindera Solar AFT2 (artefact scatter) 3. Jindera Solar AFT3 (artefact scatter) 4. Jindera 488942 (artefact scatter) 5. Jindera 487530 (artefact scatter) 6. Jindera 488212 (artefact scatter) 7. Jindera 488172 (artefact scatter) 8. Jindera 488179 (artefact scatter) 9. Jindera 487973 (artefact scatter) 10. Jindera 487666 (artefact scatter) 11. Jindera Solar IF 1 (isolated artefact) 12. Jindera Solar IF 3 (isolated artefact) 13. Jindera Solar IF 4 (isolated artefact) 14. Jindera Solar IF 5 (isolated artefact) 15. Jindera Solar IF 6 (isolated artefact) 16. Jindera Solar IF 7 (isolated artefact) 17. Jindera Solar IF 8 (isolated artefact) 18. Jindera Solar IF 9 (isolated artefact) 19. Jindera Solar IF 10 (isolated artefact) 20. Jindera Solar IF 11 (isolated artefact) 21. Jindera 487595 (isolated artefact) 22. Jindera 487613 (isolated artefact) 23. Jindera 487828 (isolated artefact) 24. Jindera 488004 (isolated artefact)	1. Jindera Solar IF 2 (isolated stone artefact) 2. Jindera 488918 (cultural tree) 3. Jindera 488995 (cultural tree) 4. Jindera SF Cultural Site 1 (cultural tree)

Table 14. Summary of the degree of harm and the consequence of that harm upon site types

Site Type	Type of Harm	Degree of Harm	Consequence of harm	No. of Sites	% of site type
Isolated Finds	Direct	Complete	Total loss of value	14	93.3
	Nil	Nil	Not Applicable	1	6.7
Artefact Scatters	Direct	Complete	Total loss of value	10	100
Cultural site	Nil	Nil	Not Applicable	3	100

Table 15 Identified risk to known sites

AHIMS #	Site name	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
55-6-0162	Jindera Solar AFT1	Poor – 100+ year history of agricultural and pastoral use.	Low	Direct	Total	Total loss of value	No further salvage/ excavation is required.
55-6-0160	Jindera Solar AFT2	Poor – 100+ year history of agricultural and pastoral use. Disturbed by extensive earth works.	Low	Direct	Partial	Partial loss of value	No further salvage/ excavation is required.
55-6-0161	Jindera Solar AFT3	Poor – 100+ year history of agricultural and pastoral use Disturbed by extensive earth works.	Low	Direct	Total	Total loss of value	No further salvage/ excavation is required.
55-6-0117	Jindera 488942	Poor – 100+ year history of agricultural and pastoral use. Disturbed by extensive earth works.	Low to moderate	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0114	Jindera 487530	Poor – 100+ year history of agricultural and pastoral use. Disturbed by extensive earth works.	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212	Poor – 100+ year history of agricultural and pastoral use. Disturbed by extensive earth works.	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0121	Jindera 488172	Poor – 100+ year history of agricultural and pastoral use. Disturbed by extensive earth works.	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.

AHIMS #	Site name	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
55-6-0122	Jindera 488179	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0120	Jindera 487973	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0118	Jindera 487666	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0149	Jindera Solar IF 1	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0150	Jindera Solar IF 2	Poor – 100+ year history of agricultural and pastoral use	Low	None – outside of development footprint	None – outside of development footprint	No loss of value	Ensure avoidance with 5 m buffer around site
55-6-0151	Jindera Solar IF 3	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0152	Jindera Solar IF 4	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0153	Jindera Solar IF 5	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0154	Jindera Solar IF 6	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.

AHIMS #	Site name	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
55-6-0155	Jindera Solar IF 7	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0156	Jindera Solar IF 8	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0157	Jindera Solar IF 9	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0158	Jindera Solar IF 10	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0159	Jindera Solar IF 11	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0124	Jindera 487595	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0129	Jindera 487613	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0119	Jindera 487828	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.
55-6-0123	Jindera 488004	Poor – 100+ year history of agricultural and pastoral use	Low	Direct	Total	Total loss of value	Salvage surface objects prior to development of proposal area.

AHIMS #	Site name	Site integrity	Scientific significance	Type of harm	Degree of harm	Consequence of harm	Recommendation
55-6-0115	Jindera 488918	Poor – 100+ year history of agricultural and pastoral use	Low	None – outside of development footprint	None – outside of development footprint	No loss of value	Ensure avoidance with 20 m buffer around site
55-6-0116	Jindera 488995	Poor – 100+ year history of agricultural and pastoral use	Low	None – outside of development footprint	None – outside of development footprint	No loss of value	Ensure avoidance with 20 m buffer around site
N/A	Jindera Solar Cultural Tree 1	Poor – 100+ year history of agricultural and pastoral use	Low	None – outside of development footprint	None – outside of development footprint	No loss of value	Ensure avoidance with 20 m buffer around site

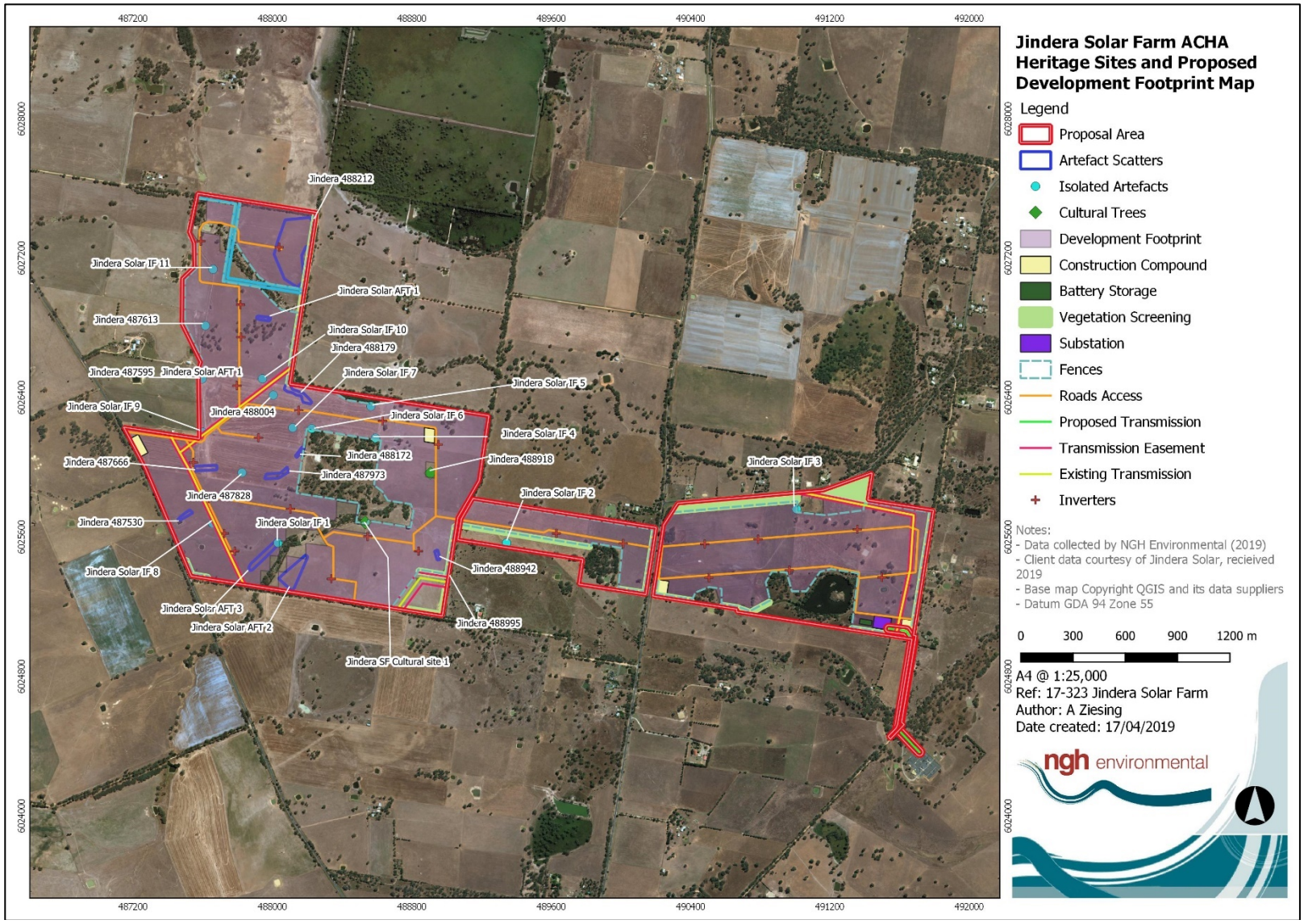


Figure 14 Heritage sites and the proposed development footprint.

6.4 IMPACTS TO VALUES

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

The impact to scientific values for this development are summarised in Section 5 and detailed in Table 15 with the majority of the stone artefact sites rated as having low loss of scientific value. While all but one stone artefact site is noted as having total loss of scientific value it is argued that there are likely to be a number of similar sites in the local area and therefore the impact to the overall local archaeological record is considered to be low.

The stone artefacts have little research value apart from what has already been gained from the information obtained during the present assessment. This information relates more to the presence of the artefacts and in the development of Aboriginal site modelling, which has largely now been realised by the recording.

The intrinsic values of the artefacts themselves may be affected by the development of the proposal area. Any removal of the artefacts, or their breakage would reduce the low scientific value they retain. The impact to the edge-ground axe fragment (within site Jindera 488942) is considered to have low to moderate loss of scientific value given it is an uncommon artefact type in the local area.

The three cultural tree sites (Jindera 488918, Jindera 488995 and Jindera SF Cultural Site 1) will not be impacted by the proposal as per the proposed design in this report. One of the stone isolated artefact sites (Jindera Solar IF 2) will also not be impacted by the proposal.

The proposed development design and the locations of the sites assessed in this report are shown in Figure 15. No other values have been identified that would be affected by the development proposal.

7 AVOIDING OR MITIGATING HARM

7.1 CONSIDERATION OF ESD PRINCIPLES

Consideration of the principles of Ecologically Sustainable Development (ESD) and the use of the precautionary principle was undertaken when assessing the harm to the sites and the potential for mitigating impacts to the sites recorded within the Jindera Solar Farm proposal area. The main consideration was the cumulative effect of the proposed impact to the sites and the wider archaeological record. The precautionary principle in relation to Aboriginal heritage implies that development proposals should be carefully evaluated to identify possible impacts and assess the risk of potential consequences.

In broad terms, the archaeological material located during this investigation is similar to what has been found previously within the wider Greater Hume region and the local Jindera area, comprising of isolated artefacts and low density scatters dominated by quartz lithology. The identification of an additional 25 sites with one or more stone artefacts during this survey and subsurface testing program correlates with previously identified site types in the area.

While there have been archaeological investigations for other projects in the Greater Hume area currently there is no clear regional synthesis of the nature, number, extent and content for archaeological sites within the Greater Hume Shire LGA. Nevertheless, given the size of the geographical area, it is almost certain that there would be similar site types present within the region.

The result of this Aboriginal heritage assessment supports the proposed model of site location and site distribution, whereby objects and sites could be expected to occur across all landscapes and in particular on elevated areas in close proximity to a water source, even in areas of highly disturbed farming activities. The results of this Aboriginal heritage assessment suggest that more sites could be expected to occur in the area than was previously envisaged.

The implications for ESD principles are that in fact more sites are likely to be present in the region than previously thought, which reduces the individual value of the particular sites within the proposal site, as they are likely to be represented elsewhere. It must be recognised that large parts of the region have been heavily cleared, farmed and developed through the construction and maintenance of roads and residential structures and therefore other sites are also likely to have been disturbed. The conclusion that similar sites exist reduces the representative values of the sites within the proposal area. It should also be noted that not all sites recorded during this survey fall within the proposed development footprint and that the sites outside the development footprint will not be impacted by the proposed solar farm development.

As noted above, the archaeological values of the sites within the development footprint, considering the scientific, representative and rarity values assigned to them was deemed to be low. In terms of representativeness and rarity the previous low number of overall sites in AHIMS for the local area was merely an indication that few surveys have been undertaken in the immediate Jindera area and therefore they are yet to be found. It is believed therefore that the proposed impacts to the stone artefact sites through the development of this particular solar farm proposal would not adversely affect the broader archaeological record for the local area or the region.

The principle of inter-generational equity requires the present generation to ensure that the sites and diversity of the archaeological record is maintained or enhanced for the benefit of future generations. We believe that the diversity of the archaeological record is not compromised by development of this solar farm proposal, particularly given that three cultural trees sites and an isolated stone artefact will be avoided by the development. Further to this, the number of yet unknown sites in the wider region allow opportunity for identification by future generations.

We estimate, that while the current development proposal will impact the majority of the stone artefact sites identified, the overall cumulative impact on the archaeological record for the region is likely to be minimal, assuming a similar density of artefact sites remain across the wider region. Therefore, it is argued that the cumulative impacts of the proposal are not enough to reject outright the development proposal.

7.2 CONSIDERATION OF HARM

Avoiding harm to the 15 isolated finds, 10 artefact scatters and three cultural trees identified within the proposed Jindera Solar Farm proposal area is technically possible through avoidance. However, the scattered nature of the stone artefact sites across the area would pose serious design constraints on the solar farm proposal. Where possible the design has already been altered to avoid remnant vegetation and the three cultural tree sites.

Based on the assessment of the sites and in consideration of discussions with the Aboriginal representatives during the field survey and subsurface testing program, it is not considered necessary to prevent all development at the solar farm location, or for total avoidance of the stone artefact sites identified within the solar farm area.

The stone artefact sites have been shown to be in highly disturbed contexts with little remaining scientific value. Aboriginal cultural value has been determined by the local Aboriginal community to be generally low enough to not prevent the development proposal proceeding.

A total of 24 sites with stone artefacts (Jindera Solar IF 1, Jindera Solar IF 3 to Jindera Solar IF 11, Jindera 487595, Jindera 487613, Jindera 487828, Jindera 488004, Jindera 488942, Jindera 487530, Jindera 488212/Jindera 488156, Jindera 488172, Jindera 488179, Jindera 487973 and Jindera 487666) are situated within the area of the proposed solar arrays, tracks, cables and fencing. The most likely cause of harm to these sites with stone artefacts will therefore be through ground preparation such as vegetation clearance, installation of the posts and solar arrays.

However, the question remains about possible occurrence of artefacts and cultural material within the balance of the solar farm site. It is possible and considered likely that additional artefacts will be present, most likely in the form of isolated artefacts or small low density scatters. Without knowing their exact locations, it is difficult to manage the impacts. We do not consider that the risk of such disturbances means the development should be abandoned. The archaeological material identified in the survey and subsurface testing program, and potentially present in the remainder of the development area is not of sufficient value to reject the development proposal.

Mitigation of harm to cultural heritage sites generally involves some level of detailed recording to preserve the information contained within the site. Mitigation can be in the form of minimising harm, through slight changes in the development plan or through direct management measures of the sites and Aboriginal objects.

Given the avoidance of the three cultural trees (Jindera 488918, Jindera 488995 and Jindera SF Cultural Site 1) a site type deemed to contain significance to the Aboriginal community, and one of the stone artefact sites (Jindera Solar IF 2) it is argued here that mitigation in the form of alteration is not feasible or warranted within the remainder of the solar farm area in this situation. However, the surface stone artefact sites within the development footprint that will be impacted by the proposed works are conducive to salvage as a mitigation strategy as requested by the Aboriginal representatives during the field survey.

It is recommended that the impacted sites with surface stone artefacts are salvaged by an archaeologist with representatives of the registered Aboriginal parties prior to the proposed development commencing. The artefacts should be collected and moved to a safe area within the property that will not be subject to any ground disturbance.

Mitigation in the form of salvage excavation would not be feasible or warranted for the sites recorded with subsurface stone artefacts

The Aboriginal community representatives onsite during the field survey and subsurface testing program noted their preference for the surface artefacts and the subsurface artefacts recovered during the testing program to be relocated and reburied outside the development footprint within the proposal area prior to development commencing.

The edge-ground axe fragment recorded within AHIMS #55-6-0117/ Jindera 488942 was noted to be a practically uncommon artefact in the area and the representatives from the Albury LALC requested that the artefact is salvaged and retained by the Albury LALC to be used for training and educational purposes within the local Aboriginal community. This could be done under a care agreement with OEH. A care agreement is a document that sets out the obligations of OEH and the Aboriginal person or Aboriginal organisation for the long-term safekeeping of the transferred Aboriginal object/s. The Aboriginal person or organisation does not become the owner of the Aboriginal objects. All required documentation for a care agreement could be provided to OEH as part of the review of the Cultural Heritage Management Plan for the proposal area and in full consultation with the other Registered Aboriginal Parties for the project.

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 Jindera 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 current archaeological survey and subsurface testing program of the area;
- 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. The development avoids the three cultural tree sites Jindera 488918, Jindera 488995 and Jindera SF Cultural Site 1. A minimum 20 m buffer should be in place around each cultural tree to prevent any inadvertent impacts to the canopy and root system.
2. To ensure no inadvertent impacts occur to the three cultural tree sites no plantings for the vegetation screening or any form of ground disturbance during fencing actives can occur within the 20 m buffer zone. Any fencing wire installed will be a minimum of 1 m from physical contact with any part of the tree.
3. If complete avoidance of the 15 isolated find sites and 10 artefact scatters recorded within the proposal area is not possible the surface stone artefacts within the development footprint must be salvaged. The salvage of these objects must occur prior to the proposed work commencing. Until salvage has occurred a minimum 5 m buffer must be observed around all stone artefact sites.
4. The collection and relocation of the surface artefacts should be undertaken by an archaeologist with representatives of the registered Aboriginal parties and be consistent with Requirement 26 of the *Code of practice for Archaeological Investigation of Aboriginal Objects in New South Wales.* The salvage of Aboriginal objects can only occur following development consent that is issued for State Significant Developments and must occur prior to any works commencing.
5. All artefacts recovered from the subsurface testing program currently in temporary care at NGH Wagga Wagga office must be reburied in line with recommendation 4 and in an appropriate location within the proposal area that will not be subject to any ground disturbance.
6. All objects salvaged, including those recovered from the subsurface testing program, must be have their reburial location submitted to the AHIMS database. An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works.
7. A minimum 5 m buffer should be observed around all sites with stone artefact that are being avoided by the proposed development.
8. Once the proposed transmission line easement area has been defined by Transgrid, further assessment of this area will be required. If Aboriginal cultural heritage sites are identified, they must also be managed in accordance with their type and significance, which may include collection and reburial as outlined in Recommendation 3 and 6 above.

9. Jindera Solar Pty Ltd should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal artefacts during the construction of the solar farm and management of known sites and artefacts. The Plan should include the unexpected finds procedure to deal with construction activity. Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties.

10. 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.

11. Further archaeological assessment would be required if the proposal activity extends beyond the area assessed in this report. This would include consultation with the registered Aboriginal parties and may include further field survey.

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APPENDIX A ABORIGINAL CONSULTATION

Public Notice placed in the Eastern Riverina Chronicle on 8th August 2018.

6 EASTERN RIVERINA CHRONICLE Wednesday, August 8, 2018 easternriverinachronicle.com.au

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EXHIBITION OF THE DRAFT GREATER HUME COUNCIL- SECTION 7.12 DEVELOPMENT CONTRIBUTIONS PLAN 2018 - ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

In accordance with the requirements of Clause 28 of the Environmental Planning and Assessment Regulations 2000 Council hereby advises that it is exhibiting for public comment the draft Greater Hume Council Section 7.12 Development Contributions Plan 2018 which if adopted will apply to the entire Greater Hume Council area except land that is subject to a Section 7.11 Development Contribution Plan. In accordance with Clause 32(1) of the Environmental Planning and Assessment Regulation 2000 this is a subsequent plan to the Greater Hume Council S94A Levy Development Contributions Plan 2017 which replaces that plan.

The Draft Plan will assist Council to provide public infrastructure by enabling the imposition of conditions on all development consents and complying development certificates requiring payment of a contribution pursuant to Section 7.12 of the Environment Planning and Assessment Act 1979.

The Draft Plan is available for viewing and comment for 28 days from 8 August 2018 on Council's website **www.greaterhume.nsw.gov.au** and at Council's Customer Service Centres at:

- Culcairn, 40 Balfour Street between the hours of 8.30am to 5.00pm Monday to Friday.
- Holbrook, 39 Young Street between the hours of 8.30am to 5.00pm Monday to Friday.
- Jindera Hub, 83 Urana Street between the hours of 9.00am to 5.00pm Monday to Friday. (Closed 1.00pm to 1.45pm).
- Walla Walla, Commercial Street between the hours of 12.30pm and 4.30pm Monday to Thursday and 11.00am to 12.30pm and 1.30pm to 5.00pm Friday.
- Henty, 32 Sladen Street between the hours of 11.00am to 5.30pm Tuesday to Friday. (Closed Monday and Tuesday to Friday 1.00pm to 1.45pm).

Any submissions made in relation to the exhibition must be in writing and addressed to Greater Hume Council, PO Box 99 Holbrook NSW 2644 and be received by 5.00pm on 5 September 2018. All submissions will be considered to be a public document unless privacy is expressly requested.

For further information in relation to this matter please do not hesitate to contact Director Environment & Planning, Mr Colin Kane, on 6044 8828, 8.30am to 5.00pm Monday to Friday.

Public Notices

Notification for registration of interest for Aboriginal stakeholders

NGH Environmental has been contracted by Green Switch Australia to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for a proposed solar farm at Jindera, NSW. The assessment area includes Lot 2 DP213465; Lots 70, 90, 133-136, 138-141, 147, 148, and 153-155 DP753342; and Lots 1-3 DP1080215 in the Greater Hume 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 **22 August 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.

Public Notices

NSW Government
Local Land Services

Weed Spraying of Travelling Stock Reserves (TSR)

Riverina Local Land Services advises that field staff and authorised contractors will be conducting spraying operations on Travelling Stock Routes and Reserves (TSR) to control classified priority weeds between **1 August 2018 and 30 June 2019.** Advice notices will be placed on TSR when spraying is in operation.

This maintenance program is aimed at reducing weed infestation impacting on biodiversity, livestock health and farm production.

Domestic animals may be prohibited from the areas during this period and children should be supervised.

For more information please contact your nearest Local Land Services office or the regional office in Wagga Wagga on (02) 6923 6300.

Personal Notices

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Organisation	Contact	Action	Date Sent	Reply Date	Replied by	Response
OEH	South West Branch	Letter Via Email	2/08/2018	10/08/2018	letter via email	list of additional stakeholders provided by OEH
NTScorp		Letter Via Email	2/08/2018			
National Native Title Tribunal						Search undertaken no Native Title determination
Office of Registrar Aboriginal Land Rights Act		Letter Via Email	2/08/2018			
Murray Local land services		Letter Via Email	2/08/2018			
Greater Hume Shire Council		Letter Via Email	2/08/2018	7/08/2018	Letter via email	
Albury and District Local Aboriginal Land Council	Sam Kirby	Letter Via Email	2/08/2018	21/08/2018	letter via email	The Albury & District LALC would like to register our interest to participate
Local Newspaper		Eastern Riverina Classifieds	8/08/2018			
OEH list of potential stakeholders						
Albury and District Local Aboriginal Land Council		already written to see above				
Wagga Wagga Local Aboriginal Land Council		Letter Via Email	13/08/2018			
Yalmambirra		Letter Via Email	13/08/2018			
Mungabareena Aboriginal Corporation		Letter Via Post	13/08/2018			
Denise McGrath		Letter Via Email	13/08/2018			
Leonie McIntosh		Letter Via Email	13/08/2018			
Nancy Rooke		Letter Via Post	13/08/2018			
Dan Clegg		Letter Via Email	13/08/2018			
Alice Williams		Letter Via Post	13/08/2018			

Organisation	Contact	Action	Date Sent	Reply Date	Replied by	Response
Bundyi Aboriginal Cultural Knowledge	Mark Saddler	Letter Via Email		13/08/2018	letter via email	I wish to express my interest in the Aboriginal Cultural Heritage Assessment (ACHA) for a proposed solar farm at Jindera, NSW.
Survey Methodology						
Albury and District Local Aboriginal Land Council	Sam Kirby	via email	21/09/2019			
Bundyi Aboriginal Cultural Knowledge	Mark Saddler	via email	21/09/2019			
Albury and District Local Aboriginal Land Council	Sam Kirby	follow up email reminder that comments due 19 oct	11/10/2018			
Bundyi Aboriginal Cultural Knowledge	Mark Saddler	follow up email reminder that comments due 19 oct	11/10/2018	11/102018	via email	no issues raised noted "All looks to be Ok at this stage"
Bundyi Aboriginal Cultural Knowledge	Mark Saddler	via email	17/10/2018			supplied rates and insurance details
Albury and District Local Aboriginal Land Council	Sam Kirby	phone call	22/10/2018			KB called Sam re rates, insurances and comment on methodology.
Albury and District Local Aboriginal Land Council	Sam Kirby	KB follow up reminder email re rates and insurances	24/10/2018	24/10/2018	via email	Sent through rates and insurances
OEH provided notification of registered parties		via email	2/11/2018	6/11/2018	via email	acknowledged email of RAPs
Testing Methodology						
Bundyi Aboriginal Cultural Knowledge	Sam Kirby	Testing methodology sent by email	19/12/2018			
Albury and District Local Aboriginal Land Council	Mark Saddler	Testing methodology sent by email	19/12/2018			

Organisation	Contact	Action	Date Sent	Reply Date	Replied by	Response
Additional Fieldwork for survey						
Bundyi Aboriginal Cultural Knowledge	Mark Saddler	email re additional survey now crop harvested	9/01/2019	10/01/2019	phone call	Mark confirm availability for 21 Jan additional survey
Albury and District Local Aboriginal Land Council	Sam Kirby	email re additional survey now crop harvested	9/01/2019	10/01/2019	via email	Sam confirmed availability for 21 Jan additional survey
Reminder sent re testing methodology comments						
Bundyi Aboriginal Cultural Knowledge	Sam Kirby	reminder sent via email comments due COB today	1/02/2019	1/02/2019	via phone	noted was happy with the methodology and had not additional comments, glad some testing was being undertaken
Albury and District Local Aboriginal Land Council	Mark Saddler	reminder sent via email comments due COB today	1/02/2019	1/02/2019	via email	noted all good
OEH notification of testing						
OEH	John Gilding	14 days notification of testing and methodology sent to OEH via email	7/02/2019	8/02/2019	via email	Thanks for notifying OEH regional office of your intention to undertake subsurface testing excavation under the CoP (OEH 2010). It is noted that consultation is being undertaken in accordance with requirements under Part 6 of the Act (Aboriginal consultation requirements for proponents 2010), which includes review and comment by the local Aboriginal community and that these same stakeholders will be involved in fieldwork. OEH has reviewed the proposed method and it appears to meet the CoP and legislative requirements inclusive of identification of off site locations for storage and further assessment of lithic artefacts, a relocation plan and also updating of AHIMS register reflecting activities effecting sites.

Organisation	Contact	Action	Date Sent	Reply Date	Replied by	Response
Draft ACHA for review						
Bundyi Aboriginal Cultural Knowledge	Mark Saddler	sent via email	17/04/2019	17/04/2019	via email	Your report seems to be OK, thanks for caring about my mob and our country.
Albury and District Local Aboriginal Land Council	Sam Kirby	sent via email	17/04/2019			
Sent reminder re comments						
Albury and District Local Aboriginal Land Council	Sam Kirby	sent via email	13/05/2019			
Albury and District Local Aboriginal Land Council	Sam Kirby	sent via email	20/05/2019			
Albury and District Local Aboriginal Land Council	Sam Kirby	phone call with KB-LALC will try and review asap and provide any comments before COB 22 may and acknowledge report will be finalised at end of week	21/05/2019			

Correspondence received from Mark Saddler on the Draft ACHA, 17th April 2019

From: Mark Saddler <marksad@live.com.au>
Sent: Wednesday, 17 April 2019 3:38 PM
To: Kirsten Bradley <kirsten.b@nghenvironmental.com.au>
Subject: RE: Jindera Solar Farm ACHA draft

Yamma (hello) Kirsten,

Your report seems to be OK, thanks for caring about my mob and our country.

Guwayu (Safe Travels)

Mark Saddler,
Cultural Awareness,
School & Tour Programs,
Bundyi Cultural Tours,
www.bundyiculture.com.au
Ph 0412 693 030

I respectfully acknowledge the traditional custodians of my land "The Wiradjuri people

APPENDIX B AHIMS SEARCH

Cullurally sensitive information withheld.

APPENDIX C BUNDYI CULTURAL SERVICES (2018) JINDERA SOLAR FARM SURVEY REPORT

Bundyi Cultural Services

Mark Saddler

Jindera Solar Farm.
Jindera & Glenellen Rd
Glenellen, NSW.

6th 7th 8th November 2018

Bundyi Cultural Services, Mark Saddler

Artwork by Mark Saddler. (Copyright)

Artwork Title, Murrawarra (stand your ground, protect)

This report was compiled by Bundyi Cultural Services, Mark Saddler.

Contents:

"I would like to acknowledge the traditional custodians of this land, my land, "The Wiradjuri People"

What I record and find is dedicated to those who have gone before us, to those present and to those who will follow us"

Mark Saddler, Wiradjuri Gibirr (man)

Travelling Stock Reserves (TSRs)

Travelling Stock Reserves (TSRs) are parcels of Crown land reserved under legislation for use by travelling stock. Local Land Services is responsible for the care, control and maintenance of almost 500,000ha of TSRs in NSW.

TSRs provide pasture reserves for travelling or grazing stock. These reserves can be beneficial in times of drought, bushfire or flood. They are also used for public recreation, apiary sites and for conservation.

Local Land Services manages the land to strike a balance between the needs of travelling or grazing stock and the conservation of native species.

The role of Local Land Services role in managing TSRs includes:

- Authorising and monitoring stock, recreation and apiary site use
- Controlling noxious weeds
- Controlling pest animals and insects
- Provision and maintenance of fencing, watering points and holding yards
- Consideration of land management and animal health legislation.

Local Land Services has developed the first draft state-wide planning framework for TSRs to support the future management of this land. We are now keen to hear from the public with their opinions on how to manage TSRs in the future. We want to understand the values people hold important for TSRs, including biodiversity and Aboriginal cultural heritage values.

The draft state-wide framework allows for the development of TSR regional management plans to facilitate more consistent and transparent management, resourcing and reporting.

NSW Travelling Stock Reserves Draft State Planning Framework 2016-19
TSR State Planning Framework Fact Sheet
Frequently asked questions

3

Aboriginal objects:

Aboriginal objects are physical evidence of the use of an area by Aboriginal people. They can also be referred to as 'Aboriginal sites', 'relics' or 'cultural material'.

Aboriginal objects include:

* Physical objects, such as stone tools, Aboriginal-built fences and stockyards, scarred trees and the remains of fringe camps
* Material deposited on the land, such as middens
* The ancestral remains of Aboriginal people.

Handicrafts made by Aboriginal people for sale are **not** 'Aboriginal objects' under the NPW Act. Known Aboriginal objects and sites are recorded on OEH's Aboriginal Heritage Information Management System (AHIMS). If you find a site you should report it to us.

Protecting Aboriginal objects and places:

You will need to exercise due diligence in determining whether your actions will harm Aboriginal objects. The **Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW** http://www.environment.nsw.gov.au/resources/cultureheritage/ddcop/10798ddcop.pdf This link will explain and provide practical guidance about what due diligence means. Anyone who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability objects offence if they later harm an Aboriginal object.

An Aboriginal Heritage Impact Permit (AHIP) can be issued by OEH under Part 6 of the NPW Act where harm to an Aboriginal object or Aboriginal place cannot be avoided. An AHIP is a defence to a prosecution for harming Aboriginal objects and/or Aboriginal places if the harm was authorised by the AHIP and the conditions of that AHIP were not contravened.

Find out about AHIPs, due diligence and care agreements see **Information on Aboriginal Heritage Impact Permits.** http://www.environment.nsw.gov.au/licences/Section87Section90.htm

Purpose of code of practice for Due Diligence.

This code of practice is to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP). The National Parks and Wildlife Act 1974 (NPW Act) provides that a person who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later unknowingly harm an object without an AHIP.

The NPW Act allows for a generic code of practice to explain what due diligence means. Carefully following this code of practice, which is adopted by the National Parks and Wildlife Regulation 2009 (NPW Regulation) made under the NPW Act, would be regarded as 'due diligence'. This code of practice can be used for all activities across all environments.

This code sets out the reasonable and practicable steps which individuals and organisations need to take in order to: 1 identify whether or not Aboriginal objects are, or are likely to be, present in an area 2 determine whether or not their activities are likely to harm Aboriginal objects (if present) 3 determine whether an AHIP application is required.

If Aboriginal objects are present or likely to be present and an activity will harm those objects, then an AHIP application will be required. Information about the permits and how to apply for them can be obtained through the Department of Environment, Climate Change and Water (DECCW) website at

www.environment.nsw.gov.au/licences/index.htm.

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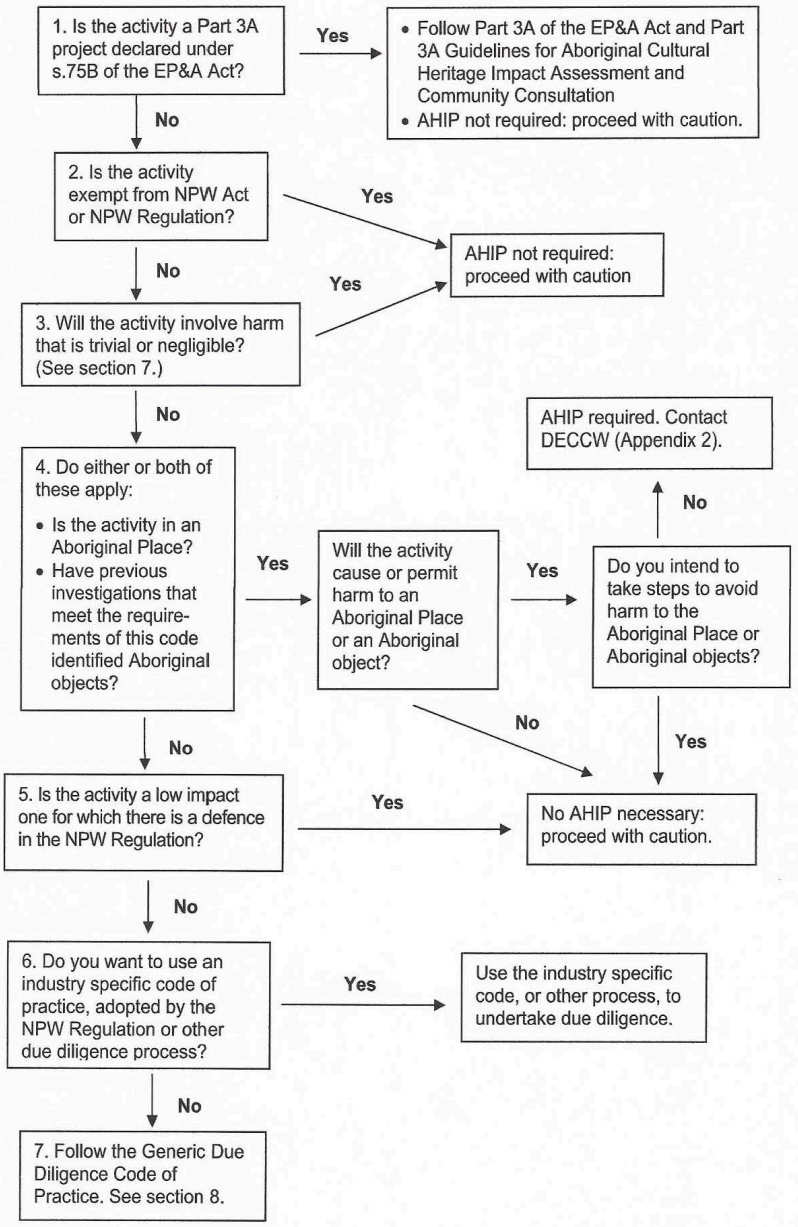
1 Do you need to use this due diligence code?



6

AHIMS Data Base Search.

Office of Environment and Heritage

AHIMS Web Services (AWS)

Search Result

Purchase Order/Reference : 12.11.18

Client Service ID : 382166

Mark Saddler

P.O.Box 8005 Kooringal Post Office
Kooringal New South Wales 2650
Attention: Mark Saddler

Email: marksad@live.com.au

Date: 12 November 2018

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 55, Eastings : 488000 - 489000, Northings : 6027000 - 6028000 with a Buffer of 1000 meters. Additional Info : Due Diligence, conducted by Mark Saddler on 12 November 2018.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

6 Aboriginal sites are recorded in or near the above location.
0.00 Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.

If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.

You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.

AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;

Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,

Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.

Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.

This search can form part of your due diligence and remains valid for 12 months.

3 Marist Place, Parramatta NSW 2150
Locked Bag 5020 Parramatta NSW 2220
Tel: (02) 9585 6380 Fax: (02) 9873 8599

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

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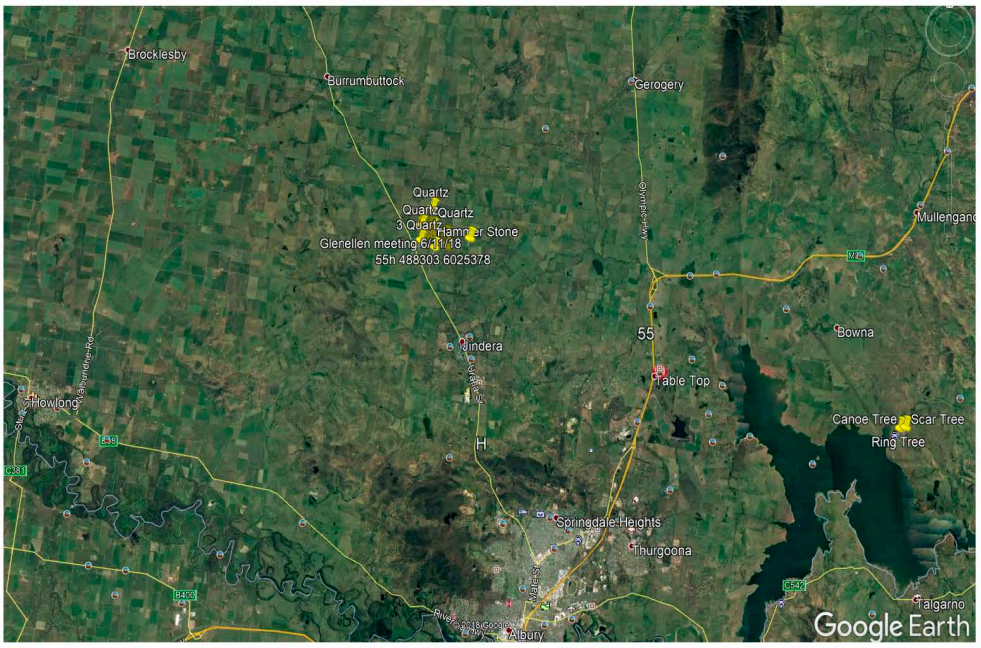
Map and reference location to site:



Site recordings and location of site cards relevant to this site:

Site name	Jindera Solar Farm. Jindera & Glenellen Rd Glenellen, NSW.		
Recorder	Mark Saddler		
Contact details	Ph 0412 693 030	Email:	marksad@live.com.au
Date prepared	13/11/2018	Web:	http://www.bundyiculture.com.au/

AHIMS ID (Site Card ID)	Site Type	Location of Site Cards on Web Page.	Date Recorded
55-6-0114	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0115	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0116	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0117	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0118	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0119	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0120	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0121	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0122	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0123	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0124	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0125	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0126	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018
55-6-0129	Item	http://www.environment.nsw.gov.au/awssapp/login.aspx	10/11/2018

Contacts:

Stakeholder details	Responsibilities	
Bundyi Cultural Services, Mark Saddler	Cultural Advisor, Recorder, Knowledge Holder	0412 693 030

To find out more about Cultural Site Management, rules and protection go to this these web page links for more in depth information.

Do you need to use the due diligence code?

http://www.environment.nsw.gov.au/resources/cultureheritage/ddcop/10798ddcop.pdf

OEH **legislation** which ensures that Aboriginal cultural heritage must be considered as part of land management practices.

http://www.environment.nsw.gov.au/conservation/aboriginalculture.htm

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Site Report and Recommendations.

13/11/2018

Jindera Solar Farm, NSW.

On my site inspection on the 6th 7th & 8th November 2018, I inspected a large property known as Jindera Solar Farm on the corners of Jindera and Glenellen Roads, Glenellen, NSW. Many artefacts were found and recorded in this area **(see Page 9, Site Recordings)**

With regards to this cultural survey I want to point out and make the following recommendations,

- The paddock in **Photo 1 (Page 12)** is an area that requires test pits due to high chance of artefacts. **Google Earth Grid Ref 55H 488054 6027339**
- The two paddocks in **Photo 2 (Page 12) & Photo 3 & Photo 4 (Page 13)** Were areas that the ground cover was very thick and hard to see the ground. These areas will need to recheck after the crops and ground cover are gone.

Google Earth Grid Ref 55H 490521 6025489 55H 488303 6025378

In this area, I noticed many species of bird including Grass Parrots, Willy Wag Tail, Eagles, Galah, Cockatoo and White Winged Chough to name a few. Also tracks of Echidna were also seen as well as some evidence of Tree Goanna and many Kangaroo were also seen on the day.

The area also has some regrowth of salt bush, some native plants and young tree suckers.

This area has been heavily impacted by cattle and machinery. All care must be taken from this time on to minimise any further damage Aboriginal sites from being driven over, and any scar trees need protective fencing to stop cattle and horse damage.

I would insist that all Aboriginal Sites are treated with respect and that any work in this area take into consideration any impact on these very important sites.

I would also ask for the planting of native trees that would enhance the area for both people and bird life. Some Bull Oak trees would also add to the area and may assist in the habitat for Glossy Black Cockatoo.

Any Aboriginal items that have been recorded and that need to be moved should be done so in the presence of an Elder or community member, also any items that can not be moved (scar trees, etc) should have exclusions zones placed around them and all workers be given some cultural awareness training or education, also to be done by local Elders or community members.

Any items that must be moved will be returned and placed back into country by local Elders. Also, whilst the solar farm is under construction I would ask that local Aboriginal people be employed to assist in the work and to also look out, care for and record any other items that may surface due to construction work.

I would be happy to assist as the plans are draw for the solar farm in the future with regards to Aboriginal site protection.

Procedures to work around Aboriginal sites can be found at this link,

http://www.aboriginalheritage.org/sites/legislation/

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Photo 1
(Area that requires test pits)
55H 488054 6027339

Photo 2
(Areas that the ground cover was very thick and hard to see the ground)
55H 490521 6025489 55H 488303 6025378

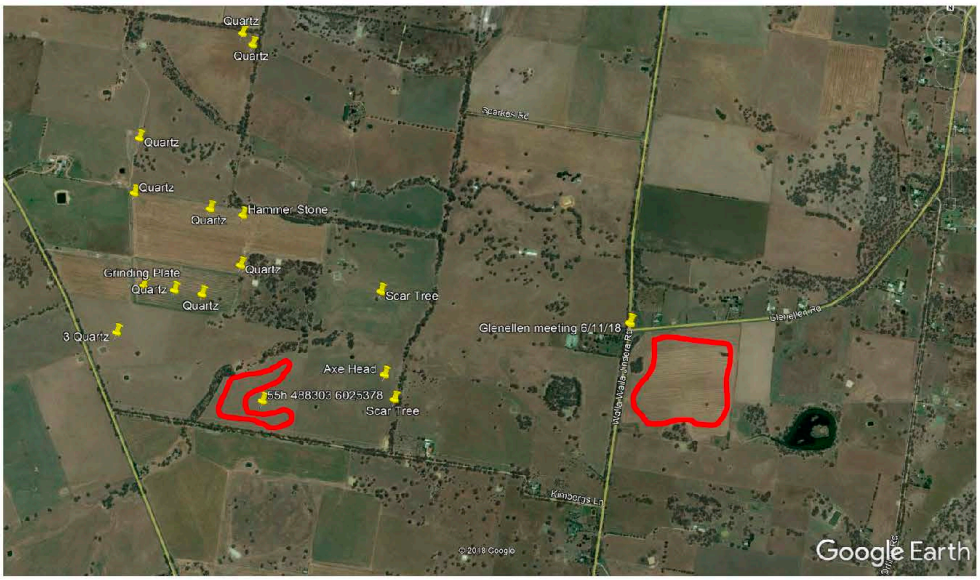


Photo 3
(Area under crop and heavy ground cover)
55H 490521 6025489

Photo 4
(Area under crop and heavy ground cover and at times hard to see my own feet)
55H 490521 6025489

References:

OEH, http://www.environment.nsw.gov.au/

Local Land Services, http://www.lls.nsw.gov.au/livestock/stock-routes

Mark Saddler, Cultural Advisor and Knowledge holder, www.bundyiculture.com.au

Goggle Earth Maps, https://www.google.com/earth/

Aboriginal Heritage, http://www.aboriginalheritage.org/sites/legislation/

Prepared on 13/11/2018 by:
Mark Saddler, Bundyi Cultural Services
P.O.B 8005 Kooringal Post Office NSW 2650
Ph: 0412 693 030
Email: marksad@live.com.au
Web: www.bundyiculture.com.au

APPENDIX D BUNDYI CULTURAL SERVICES (2019) JINDERA SOLAR FARM LETTER

21/01/2019

NGH Environmental

Kirsten Bradley, Heritage Consultant.

Unit 8, 27 Yallourn St Fyshwick ACT 2609.

Yamma Kirsten,

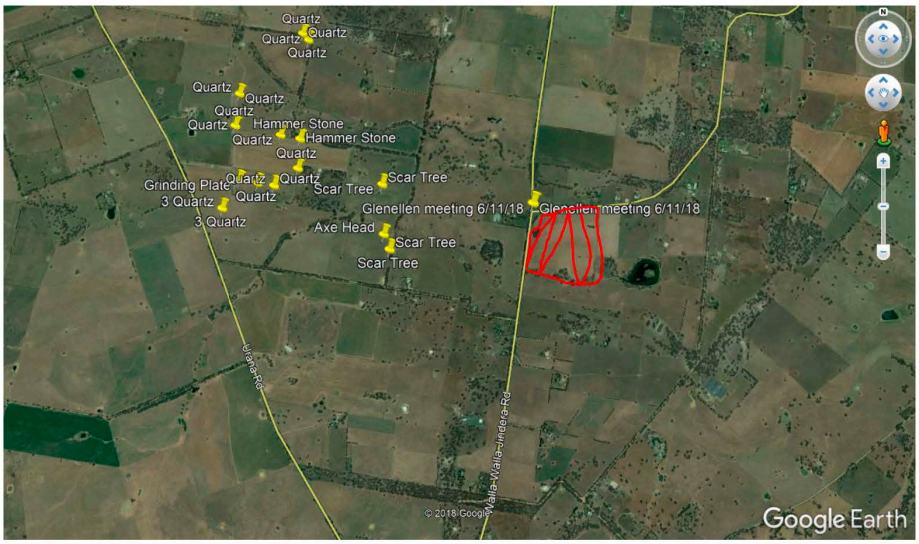
Re- JINDERA SOLAR FARM.

Today we conducted a cultural survey over area that was unable to be done due to poor visibility.

I'm now very comfortable with the walk and survey. No artefacts were found in this area.

I look forward to doing the next part of this survey which I hope will include test pits at the areas that we have recorded that are very important.

The following photo is of the area that we walked today. Area is highlighted in red.



Guwayu (safe travels)

Mark Saddler,

Bundyi Culture.

Ph 0412 693 030

Email: marksad@live.com.au

APPENDIX E SURFACE ARTEFACT DATA

AHIMS#	Site Name	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Platform surface	Platform type	Termination	Reduction stage	Comments
55-6-0124	Jindera 487595	Flake	Quartz	<20	20	16	10	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0129	Jindera 487613	Flake	Quartz	<60	25	55	18	Flake scar	Broad	Hinge	Tertiary (no cortex)	
55-6-0119	Jindera 487828	Flaked Piece	Quartz	<20	12	15	8				Tertiary (no cortex)	
55-6-0123	Jindera 488004	Flake	Quartz	<30	23	15	10	Flake scar	Focal	Feather	Tertiary (no cortex)	
55-6-0149	Jindera Solar IF 1	Flake	Quartz	<40	35	23	11	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0150	Jindera Solar IF 2	Flake	Quartz	<10	6	5	6	Flake scar	Focal	Feather	Tertiary (no cortex)	
55-6-0151	Jindera Solar IF 3	Flake	Quartz	<40	29	24	6	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0152	Jindera Solar IF 4	Flake	Quartz	<20	18	20	10	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0153	Jindera Solar IF 5	Flake	Quartz	<40	33	28	8	Flake scar	Focal	Feather	Tertiary (no cortex)	
55-6-0154	Jindera Solar IF 6	Proximal Fragment	Quartz	<30	23	20	8	Flake scar	Focal		Tertiary (no cortex)	
55-6-0155	Jindera Solar IF 7	Flake	Quartz	<30	26	16	6	Crushed	Focal	Feather	Tertiary (no cortex)	
55-6-0156	Jindera Solar IF 8	Flake	Quartz	<30	30	20	15	Crushed	Focal	Feather	Tertiary (no cortex)	
55-6-0157	Jindera Solar IF 9	Flake	Quartz	<30	21	25	6	Flake scar	Broad	Feather		

AHIMS#	Site Name	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Platform surface	Platform type	Termination	Reduction stage	Comments
55-6-0158	Jindera Solar IF 10	Proximal Fragment	Quartz	<20	13	11	4	Flake scar	Broad		Tertiary (no cortex)	
55-6-0159	Jindera Solar IF 11	Proximal Fragment	Quartz	<10	10	8	4	Flake scar	Focal		Tertiary (no cortex)	
55-6-0114	Jindera 487530	Flaked Piece	Quartz	<20	15	16	8				Tertiary (no cortex)	
55-6-0114	Jindera 487530	Flaked Piece	Quartz	<30	28	22	14				Tertiary (no cortex)	
55-6-0114	Jindera 487530	Flaked Piece	Quartz	<20	0	0	0				Tertiary (no cortex)	
55-6-0114	Jindera 487530	Flake	Quartz	<30	25	11	7	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0114	Jindera 487530	Flake	Quartz	<30	26	18	7	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0114	Jindera 487530	Flake	Quartz	<20	19	16	8	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0117	Jindera 488942	Axe	Volcanic	<100	122	85	28					Axe Blank With Grounding 45 X 18, Plough Damage
55-6-0117	Jindera 488942	Flake	Quartz	<30	25	20	15	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0118	Jindera 487666	Grindstone	Sand stone	<180	176	126	47					grindstone - plough marks on back.
55-6-0118	Jindera 487666	Flake	Quartz	<30	30	29	8	Flake scar	Broad	Feather	Tertiary (no cortex)	

AHIMS#	Site Name	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Platform surface	Platform type	Termination	Reduction stage	Comments
55-6-0120	Jindera 487973	Flaked Piece	Quartzite	<60	48	59	21					possible hammerstone
55-6-0120	Jindera 487973	Flaked Piece	Quartz	<20	14	8	4					
55-6-0120	Jindera 487973	Flake	Quartz	<20	19	14	8	Flake scar	Broad	Feather		
55-6-0120	Jindera 487973	Flake	Quartz	<20	19	15	3	Flake scar	Focal	Feather		
55-6-0120	Jindera 487973	Distal Fragment	Quartz	<40	38	26	14			Hinge		
55-6-0120	Jindera 487973	Flake	Quartz	<30	18	25	5	Flake scar	Broad	Feather		
55-6-0120	Jindera 487973	Flake	Quartz	<10	11	12	3	Flake scar	Broad	Feather		
55-6-0121	Jindera 488172	Flaked Piece	Quartz	<20	0	0	0					
55-6-0121	Jindera 488172	Flake	Quartz	<40	31	28	8	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0122	Jindera 488179	Flaked Piece	Quartz	<20	0	0	0					
55-6-0122	Jindera 488179	Flaked Piece	Quartz	<30	0	0	0					
55-6-0122	Jindera 488179	Flaked Piece	Quartz	<20	0	0	0					
55-6-0122	Jindera 488179	Flaked Piece	Quartz	<30	0	0	0					Plough Damage

AHIMS#	Site Name	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Platform surface	Platform type	Termination	Reduction stage	Comments
55-6-0122	Jindera 488179	Manuport	volcanic	<60	54	56	24					Riverine Pebble With Possible pitting, possible use as a hammerstone
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flaked Piece	Quartz	<20	0	0	0					
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<10	6	6	3	Flake scar	Focal	Feather		
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Distal Fragment	Quartz	<20	17	24	9			Step		2 negative scars
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<10	9	10	6	Flake scar	Focal	Feather		
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<20	12	7	6	Flake scar	Focal	Feather		

AHIMS#	Site Name	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Platform surface	Platform type	Termination	Reduction stage	Comments
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<20	7	16	6	Crushed	Broad	Feather		
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<20	13	14	4	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<30	16	21	7	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Core	Quartz	<40	34	24	18					single platform cores, 2 scars
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<20	20	20	7	Flake scar	Broad	Feather	Tertiary (no cortex)	
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<20	20	20	7	Flake scar	Broad	Feather	Tertiary (no cortex)	

AHIMS#	Site Name	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Platform surface	Platform type	Termination	Reduction stage	Comments
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Flake	Quartz	<30	23	16	5	Flake scar	Focal	Feather	Tertiary (no cortex)	
55-6-0125 (Duplicate of 55-6-0126)	Jindera 488212 (duplicate of Jindera 488156	Distal Fragment	Quartz	<20	10	18	5			Feather	Tertiary (no cortex)	

APPENDIX F SUBSURFACE ARTEFACT DATA

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
1	Jindera 488212	2	1	Flake	Quartz		18	14	10	1.19	Flake Scar	Broad	Feather	Tertiary	Retouch along RLM extending for 11 mm initiated from dorsal surface
2	Jindera 488212	6	1	Proximal Fragment	Quartz		11	9	18	0.42	Flake Scar	Broad		Tertiary	
3	Jindera 488212	6	2	Core	Quartz		11	11	8	0.77				Tertiary	2 platforms, 4 neg flake scars
4	Jindera 488212	6	2	Flake	Quartz		8	9	10	0.21	Flake Scar	Broad	Step	Tertiary	
5	Jindera 488212	6	3	Flake	Quartz		9	10	11	0.25	Flake Scar	Broad	Feather	Tertiary	Edge damage on RLM for 5mm, top of Spit 3
6	Jindera 488212	7	1	Core	Quartz		20	17	6	1.69				Secondary	5% vein cortex, 3 platforms, 3 neg flake scars
7	Jindera 488212	11	1	Core	Quartz		21	17	6	1.77				Tertiary	2 platforms, 2 neg flake scars
8	Jindera Solar AFT 1	16	1	Flake	Quartz		11	16	10	0.49	Flake Scar	Focal	Feather	Secondary	10% vein cortex, Retouch along RLM extending for 6mm initiated from ventral surface
9	Jindera Solar AFT 1	16	2	Flake	Quartz		8	8	8	0.26	Flake Scar	Broad	Hinge	Tertiary	

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
10	Jindera Solar AFT 1	19	1	Geometric Microlith	Quartz		17	11	8	1.07				Tertiary	Crescent shaped geometric microlith, steep retouch extending along left curved margin, curved right margin with straight unretouched edge, slight incurving on both proximal and distal margins
11	Jindera Solar AFT 2	25	2	Proximal Fragment	Quartz		18	18	6	1.95	Flake Scar	Broad		Tertiary	
12	Jindera Solar AFT 2	25	2	Flaked Piece	Quartz	<10				0.2				Tertiary	
13	Jindera Solar AFT 2	25	3	Core	Quartz		22	11	6	3.01				Secondary	40% Vein cortex, 3 platforms 3 neg flake scars, Some shovel damage
14	Jindera Solar AFT 2	25	3	Flake	Quartz		20	11	4	1.87	Ridge	Focal	Step	Tertiary	Retouch along RLM extending for 12mm initiated from dorsal surface
15	Jindera Solar AFT 2	26	1	Medial Fragment	Quartz		14	5	4	0.41	Flake Scar	Focal	Feather	Tertiary	

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
16	Jindera Solar AFT 2	26	1	Flake	Quartz		12	11	8	0.46	Ridge	Focal	Feather	Secondary	15% vein cortex
17	Jindera Solar AFT 2	26	2	Proximal Fragment	Quartz		13	11	14	0.8	Flake Scar	Broad		Tertiary	
18	Jindera Solar AFT 2	26	2	Distal Fragment	Quartz		15	6	0	0.72			Feather	Tertiary	
19	Jindera Solar AFT 2	27	1	Flake	Quartz		11	7	7	0.23	Flake Scar	Focal	Feather	Tertiary	
20	Jindera Solar AFT 2	27	1	Proximal Fragment	Quartz		5	11	7	0.16	Flake Scar	Broad		Tertiary	
21	Jindera Solar AFT 2	29	2	Core	Quartz		15	21	8	6.93				Secondary	50% vein cortex
22	Jindera Solar AFT 2	30	2	Proximal Fragment	Quartz		11	14	28	0.7	Flake Scar	Broad		Tertiary	Modern shovel damage
23	Jindera Solar AFT 2	30	2	Core	Quartz		15	14	15	0.96				Secondary	30% vein cortex, 1 platform and 2 neg flake scars

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
25	Jindera Solar AFT 2	30	2	Flake	Quartz		19	10	47	0.92	Flake Scar	Broad	Feather	Secondary	20% vein cortex, modern shovel damage. Retouch along RLM extending for 17mm initiated from dorsal surface
26	Jindera Solar AFT 2	30	2	Flake	Quartz		6	6	5	0.08	Flake Scar	Focal	Feather	Tertiary	Modern breakage
27	Jindera Solar AFT 2	30	2	Flaked Piece	Quartz	<10				0.02				Tertiary	Modern breakage
28	Jindera Solar AFT 2	30	2	Flaked Piece	Quartz	<10				0.19				Tertiary	Modern breakage
29	Jindera Solar AFT 2	30	2	Flaked Piece	Quartz	<10				0.07				Tertiary	Modern breakage
30	Jindera Solar AFT 2	30	2	Flaked Piece	Quartz	<10				0.26				Tertiary	Modern breakage
31	Jindera Solar AFT 2	30	2	Flaked Piece	Quartz	<10				0.07				Tertiary	Modern breakage
32	Jindera Solar AFT 2	30	2	Flake	Quartz		13	11	5	0.69	Flake Scar	Broad	Feather	Secondary	10% vein cortex

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
33	Jindera Solar AFT 2	35	2	Blade Core	Quartz		42	37	2	40.77				Secondary	60% vein cortex, 1 platform, 1 neg flake scar removed from dorsal surface
34	Jindera Solar AFT 2	35	2	Flake	Quartz		13	10	4	0.49	Crushed	Focal	Feather	Tertiary	
35	Jindera Solar AFT 2	35	2	Flake	Quartz		10	11	5	0.26	Flake Scar	Broad	Step	Tertiary	Retouch along LLM extending for 7mm initiated from dorsal surface
36	Jindera Solar AFT 2	36	2	Flake	Quartz		16	12	4	1.21	Flake Scar	Broad	Feather	Tertiary	
37	Jindera Solar AFT 2	36	2	Core	Quartz		15	25	N/A	4.19				Secondary	30% vein cortex, 2 platforms and 2 neg flake scars
38	Jindera Solar AFT 2	36	2	Flake	Quartz		14	12	10	0.84	Crushed	Crushed	Feather	Tertiary	
39	Jindera Solar AFT 2	36	2	Core	Quartz		14	17	6	3.9				Secondary	20% vein cortex, 2 platforms and 2 neg flake scars
40	Jindera Solar AFT 2	36	2	Distal fragment	Quartz		9	7	5	0.21			Hinge	Tertiary	

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
41	Jindera Solar AFT 2	36	2	Flake	Quartz		12	9	6	0.34	Ridge	Broad	Feather	Secondary	10% vein cortex
42	Jindera Solar AFT 2	37 A	2	Flake	Quartz		7	6	4	0.12	Ridge	Focal	Step	Secondary	5% Vein Cortex
43	Jindera Solar AFT 2	37 A	2	Flaked Piece	Quartz	<20				0.25				Tertiary	Modern breakage
44	Jindera Solar AFT 2	37 A	2	Flake	Quartz		10	6	2	0.3	Ridge	Focal	Plunging	Secondary	10% vein cortex, modern breakage
45	Jindera Solar AFT 2	37 A	2	Flake	Quartz		21	11	2	1.19	Flake Scar	Broad	Feather	Tertiary	Modern breakage on proximal RLM and medial LLM
46	Jindera Solar AFT 2	37 A	3	Flake	Quartz		14	16	16	0.78	Flake Scar	Broad	Step	Tertiary	
47	Jindera Solar AFT 2	37 A	3	Flake	Quartz		15	11	4	0.51	Crushed	Crushed	Feather	Tertiary	Modern shovel damage to platform
48	Jindera Solar AFT 2	37 A	3	Flake	Quartz		7	11	4	0.19	Ridge	Focal	Feather	Tertiary	

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
49	Jindera Solar AFT 2	37 A	3	Flake	Quartz		6	5	6	0.09	Ridge	Focal	Plunging	Tertiary	Chip created during excavation by shovel
50	Jindera Solar AFT 2	37 A	3	Core	Quartz		26	21	1	8.33				Tertiary	2 platforms, 4 neg flake scars
51	Jindera Solar AFT 2	37 B	2	Core	Quartz		24	15	N/ A	5.09				Tertiary	1 platform, 3 neg flake scars
52	Jindera Solar AFT 2	37 B	2	Proximal Fragment	Quartz		17	12	N/ A	1.24	Flake Scar	Broad		Tertiary	
53	Jindera Solar AFT 2	37 B	2	Core	Quartz		34	18	N/ A	9.92				Secondary	50% Pebble Cortex, 2 platforms and 2 neg flake scars
54	Jindera Solar AFT 2	37 B	2	Distal Fragment	Quartz		7	6	N/ A	0.2			Hinge	Tertiary	
55	Jindera Solar AFT 2	37 B	2	Proximal Fragment	Quartz		8	9	N/ A	0.3	Flake Scar	Focal	N/A	Tertiary	
56	Jindera Solar AFT 2	37 B	2	Flake	Quartz		12	7	3	0.29	Ridge	Focal	Feather	Tertiary	Modern breakage on ventral surface from shovel

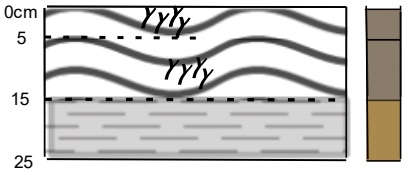
#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
57	Jindera Solar AFT 2	37 B	2	Core	Quartz		20	12	18	2.22				Secondary	5% vein cortex, 1 platform and 3 neg flake scars
58	Jindera Solar AFT 2	37 B	2	Flake	Quartz		20	14	3	1.62	Flake Scar	Broad	Feather	Tertiary	Top of spit
59	Jindera Solar AFT 2	37 B	3	Flake	Quartz		9	8	3	0.69	Flake Scar	Broad	Hinge	Tertiary	Top of spit
60	Jindera Solar AFT 2	37 B	3	Flake	Quartz		20	22	6	4.02	Flake Scar	Broad	Plunging	Secondary	Top of spit, 30% vein cortex
61	Jindera Solar AFT 2	37 B	3	Proximal Fragment	Quartz		21	12	8	1.31	Flake Scar	Broad		Tertiary	Top of spit
62	Jindera Solar AFT 2	37 B	3	Distal Fragment	Quartz		8	7	5	0.18			Feather	Tertiary	
63	Jindera Solar AFT 2	37 C	3	Flake	Quartz		14	9	12	0.64	Flake Scar	Focal	Step	Tertiary	
64	Jindera Solar AFT 2	38	2	Flake	Quartz		13	9	3	0.34	Flake Scar	Broad	Feather	Tertiary	Retouch along RLM extending for 5mm initiated from dorsal surface

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
65	Jindera Solar AFT 2	39	1	Flake	Quartz		12	7	4	0.24	Crushed	Crushed	Feather	Tertiary	
66	Jindera Solar AFT 2	40	2	Flake	Quartz		11	11	2	0.32	Flake Scar	Focal	Feather	Tertiary	Retouch along entirety of DM and LLM initiated from dorsal surface
67	Jindera Solar AFT 2	41	2	Flake	Quartz		12	10	N/A	0.42	Ridge	Focal	Feather	Tertiary	Edge damage on entirety of DM
68	Jindera Solar AFT 3	43	2	Core	Quartz		16	15	5	1.46				Secondary	20% vein cortex, 1 platform, 3 neg flake scars, top of spit
69	Jindera Solar AFT 3	45	3	Flake	Quartz		26	21	4	6.03	Flake Scar	Broad	Plunging	Secondary	50% vein cortex
70	Jindera Solar AFT 3	45	2	Flake	Quartz		16	15	4	0.98	Flake Scar	Broad	Feather	Tertiary	Retouch along DM extending for 7mm initiated from dorsal surface
71	Jindera Solar AFT 3	45	2	Flake	Quartz		10	11	3	0.34	Flake Scar	Broad	Feather	Tertiary	
72	Jindera Solar AFT 3	45	2	Flake	Quartz		8	4	2	0.11	Ridge	Focal	Feather	Tertiary	

#	Site Name	Test Pit #	Spit #	Type	Raw Material	Size class (mm)	Length	Width	Thickness	Weight (g)	Platform surface	Platform type	Termination	Reduction stage	Comments
73	Jindera Solar AFT 3	45	2	Flake	Quartz		8	6	2	0.08	Ridge	Focal	Step	Tertiary	Modern breakage
74	Jindera Solar AFT 3	45	2	Flake	Quartz		15	7	11	0.45	Ridge	Focal	Hinge	Secondary	20% vein cortex
75	Jindera Solar AFT 3	45	2	Proximal Fragment	Quartz		15	10	7	0.99	Crushed	Crushed		Tertiary	Top of Spit
76	Jindera Solar AFT 3	46	2	Flake	Quartz		15	9	6	0.51	Ridge	Focal	Feather	Tertiary	
77	Jindera Solar AFT 3	46	2	Flake	Quartz		10	8	12	0.27	Flake Scar	Broad	Hinge	Tertiary	
78	Jindera Solar AFT 3	46	2	Distal Fragment	Quartz		7	5	3	0.16			Step	Tertiary	
79	Jindera Solar AFT 3	48	2	Flake	Quartz		16	12	4	0.49	Ridge	Focal	Feather	Tertiary	Retouch along LLM extending for 7mm from ventral surface
80	Jindera Solar AFT 3	50	2	Flake	Quartz		12	7	3	0.18	Ridge	Focal	Feather	Tertiary	

APPENDIX G STRATIGRAPHIC SOIL PROFILES

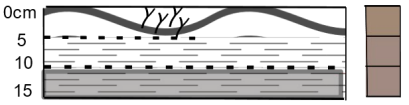
Jindera SF
Pit # 001



10 YR 3/3 Dusky Red	Fine silty loam with roots. Very dry.
10 YR 3/3 Dusky Red	Fine silty loam with very few roots. Clay content increasing with depth.
10 YR 4/8 Red	Very compact. Increasing clay content with depth. Clay at 20cm but extra 5cm excavated to confirm.

Silty loam · Silty Clay · Compaction · Root/Insect · Gradual Boundary
Silt · Clay · Base of Excavation · Sharp Contact

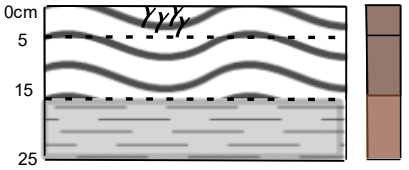
Jindera SF
Pit # 002



7.5 YR 4/4 Brown	Small gravel inclusions and roots. 1 quartz flake recovered fro silty soil with minimum clay content..
2.5 YR 4/3 Reddish Brown.	Less gravel content. Clay content increasing with depth.
2.5 YR 4/3 Reddish Brown.	Compact clay.

Silty loam · Silty Clay · Compaction · Root/Insect · Gradual Boundary · Sharp Contact
Silt · Clay · Cracking · Base of Excavation

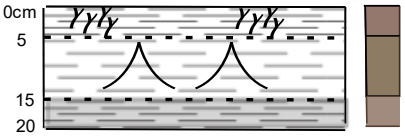
Jindera SF
Pit # 003



2.5 YR 3/4 Dusky Reddish Brown	Fine silty loam with some clay content. Fine grass roots and dead grass.
2.5 YR 3/4 Dusky Reddish Brown	Fine silty loam with some clay content. Increasing clay content with depth.
2.5 YR 4/6 Red	Very compacted silty clay.

Silty loam · Silty Clay · Compaction · Root/Insect · Gradual Boundary · Sharp Contact
Silt · Clay · Cracking · Base of Excavation

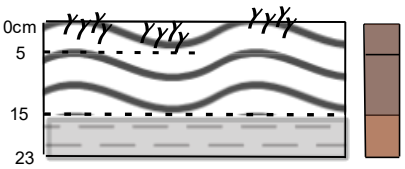
Jindera SF
Pit # 004



2.5 YR 3/4 Dark Reddish Brown	Minimal stone content. Lots of grass roots.
10 YR 3/4 Dusky Red	Friable crumbly clay.
5 YR 4/3 Dark Reddish Brown	Plastic and compact clay..

Sand | Silty Clay | Compaction | Root/Insect | Gradual Boundary | Sharp Contact
Silt | Clay | Cracking | Base of Excavation

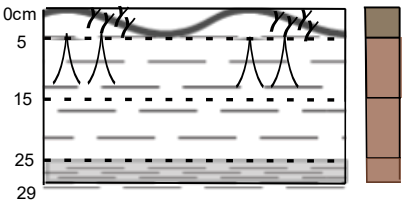
Jindera SF
Pit # 005



2.5 YR 3/4 Dark Reddish Brown	Very compact from 2cm due to dry grass. Some silty loam with grass roots.
2.5 YR 3/4 Dark Reddish Brown	Fine silty loam with clay content.
2.5 YR 4/8 Red	Fine silty clay.

Silty loam | Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

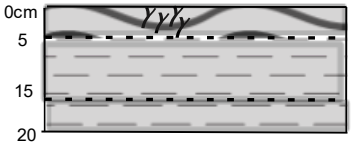
Jindera SF
Pit # 006



10 YR 3/4 Dusky Red	Loose fine silty loam with high root content. 1 quartz artefact.
2.5 YR 4/6 Red	Friable silty clay with no moisture and some gravels. Two quartz artefacts.
2.5 YR 4/6 Red.	Clay with minimal silcrete gravels.
2.5 YR 4/6 Red.	Very compacted clay with minimal gravels.

Silty loam | Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

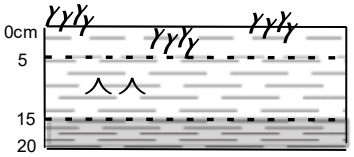
Jindera SF
Pit # 007



2.5 YR 3/4 Dusky Reddish Brown	Very compacted due to grasses. Fine sily loam with grass roots throughout.
2.5 YR 3/4 Dusky Reddish Brown	Fine silty clay.
2.5 YR 4/8 Red	Very compacted clay.

Silty loam | Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

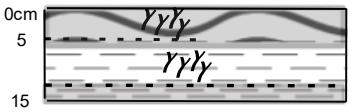
Jindera SF
Pit # 008



2.5 YR 3/4 Dark Reddish Brown	Silty clay with grass roots.
2.5 YR 4/6 Red	Friable silty clay with grass roots.
2.5 YR 4/6 Red	Compact clay.

Sand | Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

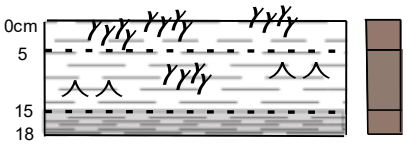
Jindera SF
Pit # 009



2.5 YR 3/4 Dark Reddish Brown	Compacted silty loam with grass roots.
2.5 YR 3/4 Dark Reddish Brown	Silty clay with few grass roots. Clay content increasing with depth.
	Compact clay.

Silty loam | Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Sharp Contact | Base of Excavation

Jindera SF
Pit # 010



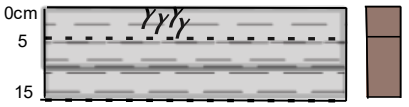
2.5 YR 3/4 Dark Reddish Brown — Silty clay with grass roots.

5 YR 3/3 Dark Reddish Brown — Friable clay with minimal roots.

5 YR 3/4 Reddish Brown. — Compacted clay.

Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

Jindera SF
Pit # 011

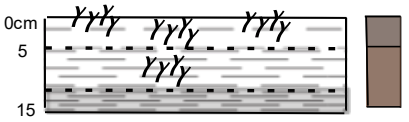


2.5 YR 3/4 Dusky Reddish Brown — Compacted silty clay with grass roots. Ants nest in S wall.

2.5 YR 3/4 Dusky Reddish Brown — Compacted clay.

Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Sharp Contact | Base of Excavation

Jindera SF
Pit # 012

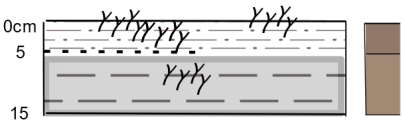


5 YR 3/2 Dark Reddish Brown — Silty clay with grass roots.

5 YR 3/4 Dark Reddish brown — Compact clay at 13cm. Minimal root inclusions.

Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Clay | Root/Insect | Base of Excavation

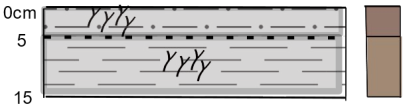
Jindera SF
Pit # 013



5 YR 3/4 Dark Reddish Brown	Silty clay with small gravels and root matter.
5 YR 3/4 Dark Reddish Brown	Compacted clay with small gravels and root matter.

Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Clay | Root/Insect | Base of Excavation

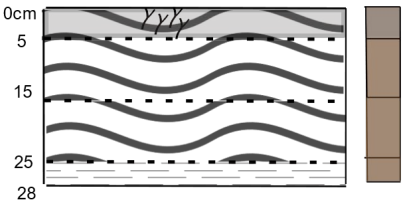
Jindera SF
Pit # 014



2.5 YR 3/4 Dark Reddish Brown	Compacted silty clay with grass roots.
2.5 YR 3/6 Dark Red	Very compacted clay.

Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Clay | Root/Insect | Base of Excavation

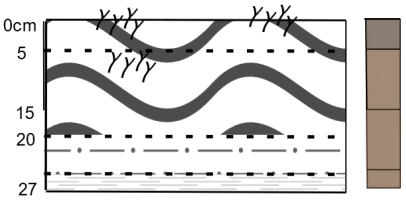
Jindera SF
Pit # 015



7.5 YR 4/2 Brown	Compacted fine silty loam with grass roots.
7.5 YR 4/4 Brown	Fine silty loam.
7.5 YR 4/4 Brown	Silty loam with increasing compaction and clay content with depth.
7.5 YR 4/4 Brown	Compacted clay.

Silty loam | Compaction | Gradual Boundary | Sharp Contact
Clay | Root/Insect | Base of Excavation

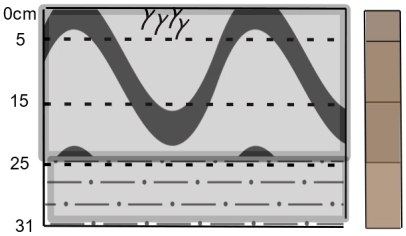
Jindera SF
Pit # 016



7.5 YR 3/2 Dark Brown — Fine silty loam with one artefact.
7.5 YR 4/4 Brown — Silty loam with one artefact and some roots.
7.5 YR 5/4 Brown — Silty clay with silt content lessening and clay content increasing with depth.
7.5 YR 4/4 Brown — Compact clay.

Silty loam | Silty Clay | Compaction | Gradual Boundary
Clay | Root/Insect | Sharp Contact | Base of Excavation

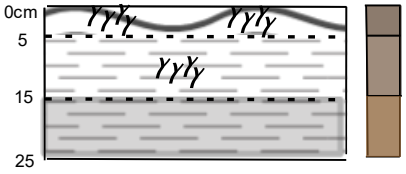
Jindera SF
Pit # 017



7.5 YR 4/3 Brown — Compact fine silty loam with roots.
7.5 YR 4/4 Brown — Very compacted fine silty clay loam.
7.5 YR 4/4 Brown — Very compacted fine silty clay loam.
7.5 YR 5/4 Dark Reddish Brown — Very compacted fine silty clay.

Silty loam | Compaction | Gradual Boundary | Sharp Contact
Silty Clay | Root/Insect | Base of Excavation

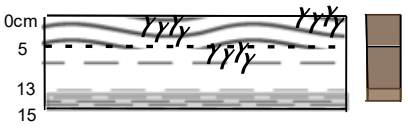
Jindera SF
Pit # 018



7.5 YR 3/3 Dark Brown — Silty loam with grass roots.
7.5 YR 4/3 Brown — Silty clay with minimal grass roots.
7.5 YR 4/5 Strong Brown — Compacted clay.

Silty loam | Silty Clay | Root/Insect | Gradual Boundary
Clay | Compaction | Sharp Contact | Base of Excavation

Jindera SF
Pit # 019

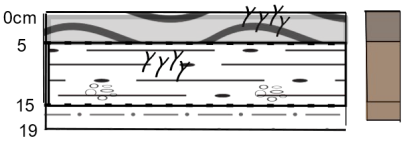


7.5 YR 3/4 Dark Brown — Compact silty loam roots throughout, 1 quartz artefact.

7.5 YR 3/4 Dark Brown — Small root inclusions silty clay and compact clay at 13cm.

Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Clay | Root/Insect | Base of Excavation

Jindera SF
Pit # 020



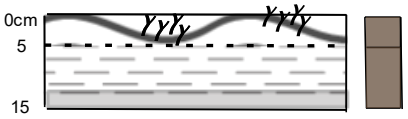
7.5 YR 4/3 Brown — Compacted silty loam with root and grass seed inclusions.

7.5 YR 5/2 Brown — Silty clay with one artefact and some roots.

7.5 YR 5/2 Brown — Silty clay with silt content lessening and clay content increasing with depth.

Silty loam | Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Clay | Gravels | Root/Insect | Base of Excavation

Jindera SF
Pit # 021

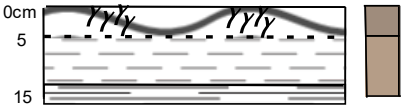


7.5 YR 3/3 Dark Brown — Silty loam with some roots inclusion. Spider burrow in NW corner.

7.5 YR 4/4 Brown — Silty clay until 12cm and changed to Compacted clay until 15cm.

Silty loam | Silty Clay | Root/Insect | Gradual Boundary
Clay | Compaction | Sharp Contact | Base of Excavation

Jindera SF
Pit # 022

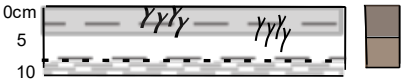


7.5 YR 4/3 Brown — Silty loam with grass roots.

7.5 YR 5/4 Brown — Silty clay with minimal grass roots to 13cm. Compacted clay.

Silty loam | Silty Clay | Compaction | Gradual Boundary
Clay | Root/Insect | Sharp Contact | Base of Excavation

Jindera SF
Pit # 023

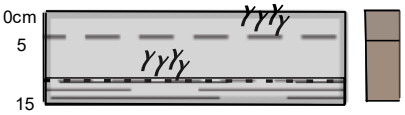


7.5 YR 3/2 Dark Brown — Compacted silty clay, with grass and root inclusions.

7.5 YR 4/3 Dark Brown — Compacted silty clay with small roots. Compact clay at 13cm.

Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Clay | Root/Insect | Base of Excavation

Jindera SF
Pit # 024

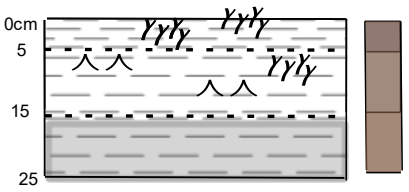


7.5 YR 4/2 Brown — Compacted silty clay with root and grass seed inclusions.

7.5 YR 4/3 Brown — Silty clay with some roots. Compact clay at base.

Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Clay | Root/Insect | Base of Excavation

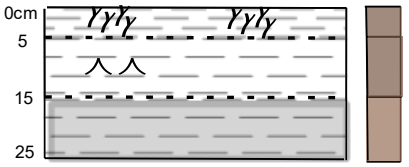
Jindera SF
Pit # 025



2.5 YR 3/3 Dark Reddish Brown	Silty clay with small gravels and roots.
5 YR 4/3 Redish Brown	Friable clay with some roots and 3 artefacts.
5 YR 4/4 Brown	Compact clay with 2 artefacts at top of spit.

Silty Clay — Compaction — Root/Insect — Gradual Boundary
Clay — Cracking — Sharp Contact — Base of Excavation

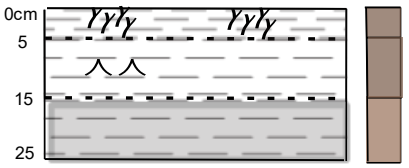
Jindera SF
Pit # 026



5 YR 4/3 Reddish Brown	Silty clay with grass roots and small gravels. 2 artefacts.
5 YR 4/3 Reddish Brown	Friable clay with 2 artefacts. Compact clay at 15cm.
5 YR 5/4 Reddish Brown	Compact clay.

Silty Clay — Compaction — Root/Insect — Gradual Boundary
Clay — Cracking — Sharp Contact — Base of Excavation

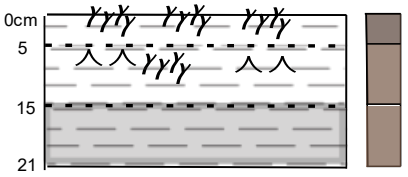
Jindera SF
Pit # 026



5 YR 4/3 Reddish Brown	Silty clay with grass roots and small gravels. 2 artefacts.
5 YR 4/3 Reddish Brown	Friable clay with 2 artefacts. Compact clay at 15cm.
5 YR 5/4 Reddish Brown	Compact clay.

Silty Clay — Compaction — Root/Insect — Gradual Boundary
Clay — Cracking — Sharp Contact — Base of Excavation

Jindera SF
Pit # 028



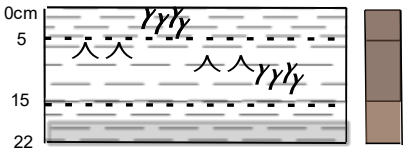
5 YR 3/2 Dark Reddish Brown — Silty friable clay with small gravel and root inclusions.

5 YR 4/3 Reddish Brown — Friable clay with minimal root inclusions.

5 YR 4/3 Reddish Brown — Gravelly compact clay.

Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

Jindera SF
Pit # 029



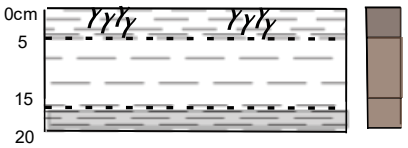
5 YR 3/3 Dark Reddish Brown — Silty clay with small gravels and roots.

5 YR 4/3 Reddish Brown — Friable clay with some roots and 2 artefacts.

5 YR 4/4 Reddish Brown — Friable clay to 18cm and compact clay 18-22cm.

Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

Jindera SF
Pit # 030



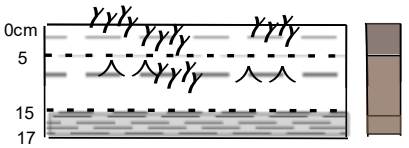
5 YR 3/2 Dark Reddish Brown — Silty friable clay with small root and gravel incluions.

5 YR 4/3 Reddish Brown — Clay with some root inclusions and 8 artefacts.

5 YR 4/3 Reddish Brown — Compact clay.

Silty Clay | Compaction | Root/Insect | Gradual Boundary | Sharp Contact
Clay | Cracking | Base of Excavation

Jindera SF
Pit # 031



5 YR 3/2 Dark Reddish Brown — Silty clay. Grass and gravel inclusions.

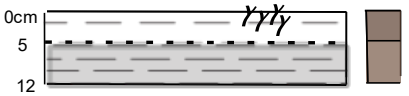
5 YR 4/3 Reddish Brown — Friable clay with minimal root inclusions.

5 YR 4/3 Reddish Brown — Compact clay.

Silty Clay | Compaction | Root/Insect | Gradual Boundary

Clay | Cracking | Sharp Contact | Base of Excavation

Jindera SF
Pit # 032



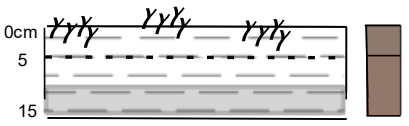
5 YR 3/3 Dark Reddish Brown — Silty friable clay with root inclusions.

5 YR 4/3 Reddish Brown — Compact clay.

Silty Clay | Compaction | Gradual Boundary | Sharp Contact

Clay | Root/Insect | Base of Excavation

Jindera SF
Pit # 033



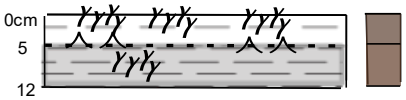
5 YR 3/3 Dark Reddish Brown — Gravelly silty clay with roots and ant burrows.

7.5 YR 3/4 Dark Brown — Friable clay with minimal silt and root inclusions. 1 artefact recovered. Compact clay at 10cm.

Silty Clay | Compaction | Root/Insect | Gradual Boundary

Clay | Cracking | Sharp Contact | Base of Excavation

Jindera SF
Pit # 034



5 YR 3/2 Dark Reddish Brown

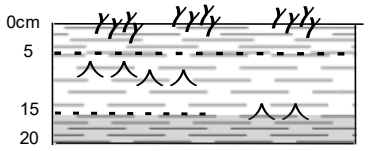
5 YR 4/3 Reddish Brown

Small gravels, roots in a layer of silty clay.

Silty clay with root inclusions and 1 artefact at top of spit.

Silty Clay | Compaction | Root/Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

Jindera SF
Pit # 035



5 YR 3/2 Dark Reddish Brown

5YR 3/3 Dark Reddish Brown

7.5 YR 4/4 Brown

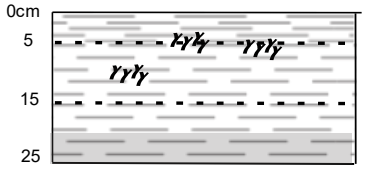
Silty clay with root and gravel inclusions.

Friable clay with 3 artefacts.

Compact clay.

Silty Clay | Compaction | Root / Insect | Gradual Boundary
Clay | Cracking | Sharp Contact | Base of Excavation

Jindera SF
Pit # 036



5 YR 3/2 Dark Reddish Brown

5YR 3/3 Dark Reddish Brown

5 YR 4/4 Reddish Brown

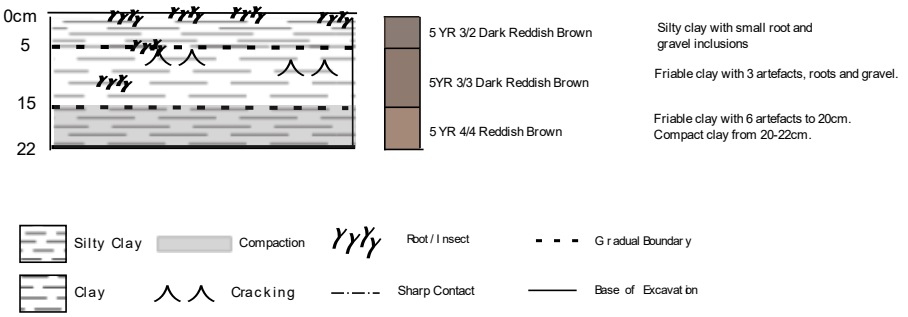
Gravelly silty clay with some root inclusions.

Friable clay with less gravels and roots with 4 artefacts.

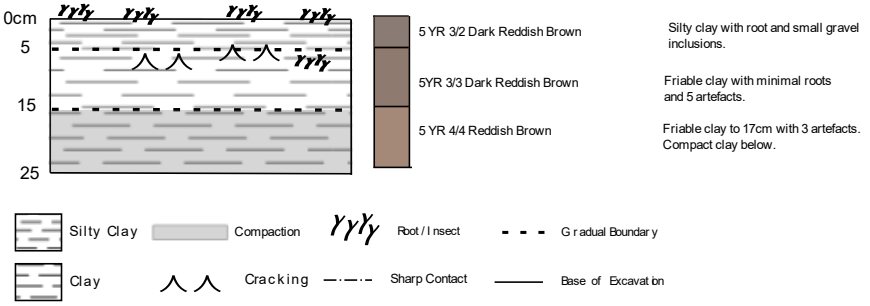
Friable clay to 20cm then compact clay below.

Sand | Silty Clay | Compaction | Root / Insect | Gradual Boundary
Silt | Clay | Cracking | Sharp Contact | Base of Excavation

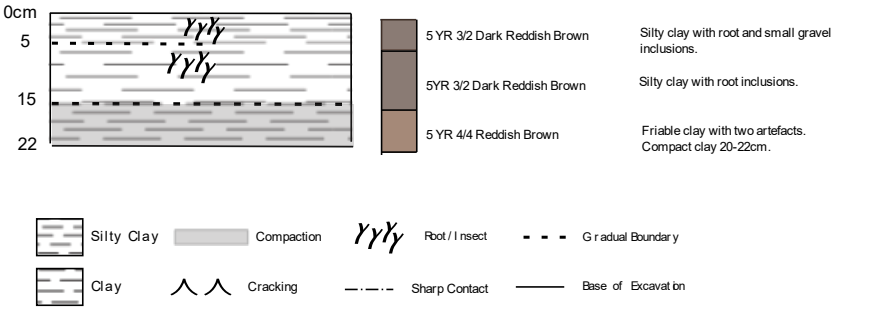
Jindera SF
Pit # 037a



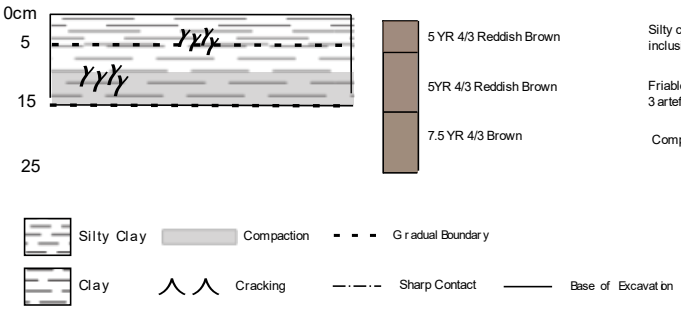
Jindera SF
Pit # 037b



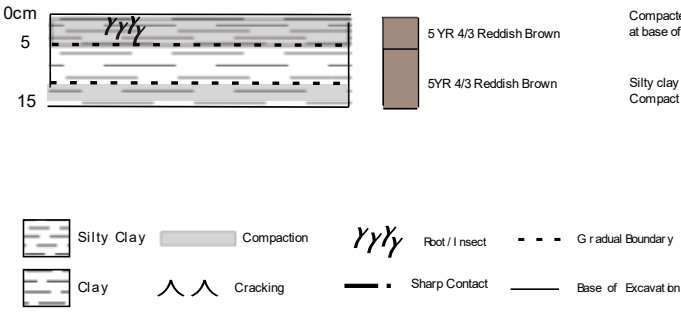
Jindera SF
Pit # 037c



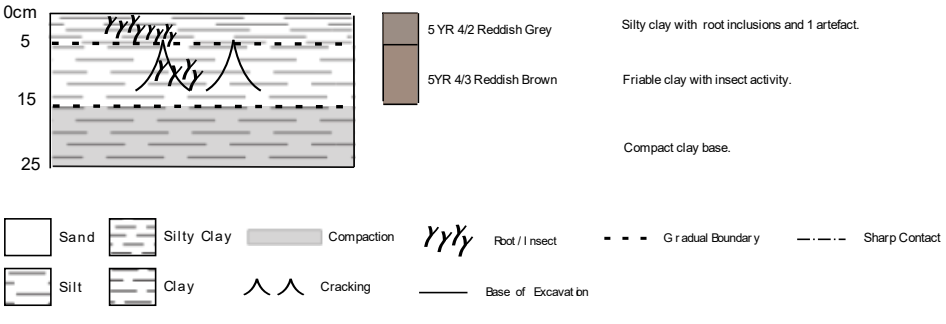
Jindera SF
Pit # 038



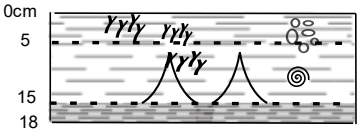
Jindera SF
Pit # 039



Jindera SF
Pit # 040



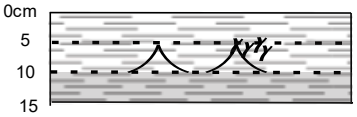
Jindera SF
Pit # 041



5 YR 3/2 Dark Reddish Brown — Silty clay with root inclusions and gravels.
5YR 3/2 Dark Reddish Brown — Friable clay with insect activity and 1 artefact.
5YR 3/3 Dark Reddish Brown — Compact clay base with small orange clay balls along western wall.

Sand | Silty Clay | Compaction | Root / Insect | Gradual Boundary | Sharp Contact
Silt | Clay | Cracking | Base of Excavation

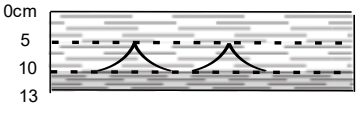
Jindera SF
Pit # 042



5 YR 3/2 Dark Reddish Brown — Silty clay with gravel and root inclusions and 1 artefact.
5YR 3/2 Dark Reddish Brown — Friable silty clay with minimal root and gravel inclusions.
5YR 4/3 Reddish Brown — Compact clay base.

Sand | Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Silt | Clay | Cracking | Base of Excavation

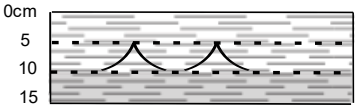
Jindera SF
Pit # 043



5 YR 4/3 Reddish Brown — Silty clay with root inclusions.
5YR 4/3 Reddish Brown — Friable silty clay.
5YR 4/3 Reddish Brown — Compact clay base.

Sand | Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Silt | Clay | Cracking | Base of Excavation

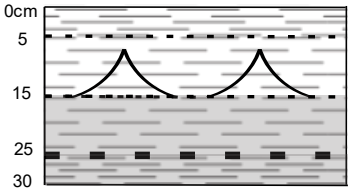
Jindera SF
Pit # 044



5 YR 3/4 Reddish Brown — Silty clay with root inclusions and 1 artefact.
5YR 3/4 Reddish Brown — Friable silty clay.
5YR 3/4 Reddish Brown — Compact clay base.

Sand | Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Silt | Clay | Cracking | Base of Excavation

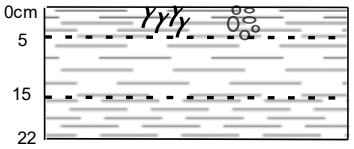
Jindera SF
Pit # 045



5 YR 3/2 Dark Reddish Brown — Silty clay, quite compacted with root matter. Small gravels throughout.
5YR 3/3 Dark Reddish Brown — Friable clay 7-10cm. Compacted clay 10cm onwards. 5 artefacts. no gravels, minimal root inclusions.
7.5 YR 4/4 Brown — Marginal friability but otherwise compact clay. Tree root in southern portion. Plastic clay at 20cm and 2 artefacts.
7.5 YR 4/6 Strong Brown — Continue into compact clay for 5cm to ensure sterlie. No artefacts and slightly gravelly at base.

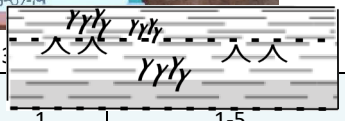
Sand | Silty Clay | Compaction | Gradual Boundary | Sharp Contact
Silt | Clay | Cracking | Base of Excavation

Jindera SF
Pit # 046



5 YR 4/3 Darrk Reddish Brown — Silty clay with some root and small gravel content.
5YR 3/3 Dark Reddish Brown — Friable silty clay. 2 artefacts in upper half of spit 2. 1 artefact recovered in 10-15cm depth.
5 YR 4/4 Reddish Brown — Compact clay with no inclusions at 19cm. Continues to 22cm depth into sterile clay.

Sand | Silty Clay | Compaction | Root/Insect | Gradual Boundary | Sharp Contact
Silt | Clay | Cracking | Base of Excavation

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
1	488068	1	1-5	Dusky reddish brown compacted fine silty loam. Root inclusions noted. PH is 5.5	
	6027421	2	5-15	Dusky reddish brown compacted fine silty loam. Minimal roots and no gravel inclusions. Clay content increasing at 10cm depth. PH = 5.5	
		3	15-25	Reddish brown compact silty clay, becoming redder with depth. Compact clay at 20cm depth. PH =5.5	
2	488081	1	1-5	Brown silty loam topsoil with root and small gravel inclusions. PH=5.5	1
	6027406	2	5-15	Reddish brown silty clay with minimal roots and gravels. Compact red clay at 10cm depth. PH= 5	
 Pit 1 Spit 3				 Pit 2 Spit 3	
3	488095	1	1-5	Dusky reddish brown compacted fine silty loam. Root inclusions noted. PH is 5.5	
	6027391	2	5-15	Dark reddish brown fine silty clay. Compact clay at 12cm depth. No inclusions.	
		3	15-25	Red clay with minimal silt content. No other inclusions. PH=5.5	
 Pit 3 				 Pit 4 Spit 3	
4	488107	1	1-5	Compact dark reddish brown silty loam. Roots and gravels noted. PH=5.5	
	6027376	2	5-15	Dark reddish brown friable silty clay. No inclusions. PH = 5.5	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
		3	15-25	Dark reddish brown clay. Minimal small gravel inclusions. PH=5.5	
5	488119	1	1-5	Very compacted dark reddish brown fine silty clay loam with roots. PH = 5.5	
	6027360	2	5-15	Dark reddish brown silty clay loam. Clay content increasing at 12cm depth. No inclusions. PH = 5.5	
		3	15-20	Reddish brown fine silty clay becoming red clay at 20cm depth. No inclusions. PH = 5.5	
 Pit 5 Spit 3				 Pit 6 Spit 4	
6	488131	1	1-5	Loose dusky red silty loam with root inclusions. More friable with depth PH = 5.5	1
	6027347	2	5-15	Red friable silty loam with some small quartz and silcrete pebbles. PH = 5.5	2
		3	15-25	Friable red silty clay with minimal silcrete gravels. Compaction increasing with depth. PH = 5.5	1
		4	25-29	Very compacted red clay minimal pebbles. PH= 5.5. Could not hand excavate past 29cm depth.	
7	488145	1	1-5	Very compact dark reddish brown fine silty clay loam. Roots throughout. PH = 5.5	1
	6027328	2	5-15	Very compact fine silty clay. Compact red clay at 15cm depth. No inclusions. PH = 5.5	
		3	15-20	Compact red clay. No inclusions. PH = 5.5. Could not hand excavate past 20cm depth.	
8	488157	1	1-5	Dark reddish brown silty loam with roots noted. PH = 5.5	
	6027313	2	5-15	Red silty clay with compact red clay at 15cm depth. No inclusions. PH = 5.5	
		3	15-20	Compact red clay with no inclusions. PH = 5.5. Could not hand excavate past 20cm depth.	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
 Pit 7 Spit 3				 Pit 8 Spit 3	
9	488169	1	1-5	Very compacted dark reddish brown silty loam with grass roots. PH = 5.5	
	6027297	2	5-15	Compact dark reddish brown silty clay with no inclusions. Compact red clay at 10cm depth. PH = 5.5. Continued excavation to end of spit.	
10	488182	1	1-5	Dark reddish brown silty loam with root inclusions. PH = 5.5	
	6027282	2	5-15	Dark reddish brown friable silty clay with no inclusions. Compaction increasing with depth. PH = 5.5	
		3	15-18	Compacted reddish brown clay at 15cm depth. Continued excavation to 18cm depth.	
 Pit 9 Spit 2				 Pit 10 Spit 3	
11	488156	1	1-5	Compacted dark reddish brown silty clay loam with root and insect inclusions. PH = 5.5	1
	6027377	2	5-15	Red silty clay becoming clay at 7cm depth. Continued excavation to end of spit. PH = 5.5	
12	488144	1	1-5	Compact, but friable dark reddish brown silty clay loam with root inclusions. PH = 6	
	6027362	2	5-15	Friable dark reddish brown silty clay with minimal root inclusions. Compact red clay at 13cm depth. PH = 5.5	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
 Pit 11 Spit 2				 Pit 12 Spit 2	
13	488117	1	1-7	Compact dark reddish brown silty clay loam with root and small gravel inclusions. PH= 5 Excavated slightly too deep.	
	6027332	2	7-15	Friable silty dark reddish brown. No inclusions. PH = 5	
14	488105	1	1-5	Compact dark reddish brown silty clay loam with root inclusions. PH = 7	
	6027317	2	5-15	Very compacted dark red silty clay to 13cm depth. No inclusions. Compact red clay below. PH = 7	
 Pit 13 Spit 2				 Pit 14 Spit 2	
15	487998	1	1-5	Very compacted fine brown silty loam with root inclusions. PH = 5.5	
	6026847	2	5-15	Very fine silty clay loam becoming lighter in colour with depth. Clay content increasing with depth. PH = 5.5	
		3	15-25	Compacted fine silty clay loam. No inclusions. Compaction increasing with depth. PH = 5.5	
		4	25-28	Very compact light brown fine clay. No inclusions. PH = 5.5. Unable to hand excavate past 28cm depth.	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
 Pit 15 Spit 4				 Pit 16 Spit 4	
16	487978	1	1-5	Dark brown silty loam with root inclusions. PH = 5.5. One artefact recovered.	1
	6026850	2	5-15	Brown silty loam root staining. One artefact recovered. PH = 5.5	1
		3	15-25	Brown silty clay becoming more compact with depth. No inclusions. Clay content increasing with depth. PH = 5.5	
		4	25-27	Compact brown clay with no inclusions. Unable to hand excavate past 27cm depth. PH = 5.5	
 Pit 17 Spit 4				 Pit 18 Spit 3	
17	487960	1	1-5	Compact very fine silty brown loam with root inclusions. PH= 5.5	
	6026850	2	5-15	Very compacted fine brown silty clay loam with no inclusions. Clay content and compaction increasing with depth. PH = 5.5	
		3	15-25	Very compacted fine brown silty clay loam with no inclusions. Light brown clay at silty clay at 18 cm depth. PH 5.5	
		4	25-31	Very compacted light brown silty clay with no inclusions. Compact clay at 30cm depth. PH =5.5. Unable to hand excavate past 31cm depth.	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
18	487940	1	1-5	Dark brown silty clay loam with root and quartz gravel inclusions. PH = 5.5	
	6026857	2	5-15	Brown compact clay loam becoming friable clay at 19cm depth. Minimal root inclusions. PH = 5.5	
		3	15-25	Strong brown compact clay with no inclusions. PH = 5	
 Pit 19 Spit 2				 Pit 20 Spit 3	
19	487918	1	1-5	Compact dark brown silty clay loam with roots throughout. One artefact recovered. PH = 5.5	1
	6026860	2	5-15	Dark brown compact silty clay to 13cm depth. No inclusions except root staining. Continued excavation to end of spit. PH = 5.5	
20	487899	1	1-5	Very compacted fine brown silty loam with root inclusions. PH = 5.5	
	6026863	2	5-15	Compacted fine brown silty clay to 14cm depth. Light grey gravelly silty loam below. PH = 5.5	
		3	15-19	Compacted very fine light brown silty clay with gravels. PH = 5.5. Could not hand excavated past 19cm depth.	
 Pit 21 Spit 2				 Pit 22 Spit 2	
21	487879	1	1-5	Dark brown silty clayey loam. Root and insects noted. Soil is compact. PH= 5.5	
	6026865	2	5-15	Brown friable silty clay with no inclusions. Compact clay at 12cm depth. PH = 5.5	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
22	487859	1	1-5	Compacted brown fine silty loam. Root and some gravels noted. Soil is compact. PH= 5.5	
	6026868	2	5-15	Very compacted brown fine silty clay with no inclusions. Compaction and clay content increasing with depth. Compacted clay at base of spit. PH = 5.5	
 Pit 23 Spit 2				 Pit 24 Spit 2	
23	487838	1	1-5	Very compacted dark brown silty clay loam with root inclusions. PH= 5.5	
	6026872	2	5-10	Very compacted silty clay with no inclusions. Compacted clay at 8cm depth. PH = 5.5. Could not hand excavate past 10cm depth.	
24	487820	1	1-5	Compacted brown fine silty loam. Root and some gravels noted. Soil is compact. PH= 5.5	
	6026875	2	5-15	Very compacted brown fine silty clay with no inclusions. Compaction and clay content increasing with depth. Compacted clay at base of spit. PH = 5.5	
 Pit 25 Spit 3				 Pit 26 Spit 3	
25	488086	1	1-5	Compact but friable dark reddish brown silty clay with small gravel and root inclusions. PH = 6	
	6025336	2	5-15	Friable reddish brown silty clay with minimal root inclusions. Three artefacts recovered. PH= 5.5	2

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
		3	15-25	Compacted reddish brown silty clay with no inclusions. Two artefacts recovered from top of spit. PH = 5. Continued excavation into compacted clay for 5cm.	2
26	488095	1	1-5	Compact but friable reddish brown silty clay with small gravel and root inclusions. PH = 6. Two artefacts recovered.	2
	6025352	2	5-15	Friable reddish brown silty clay with minimal root inclusions. Two artefacts recovered. PH = 5. Compact slightly friable clay at 15cm depth.	2
		3	15-25	Friable reddish brown clay with no inclusions. Continued excavation to compacted clay at base of spit. PH = 6.5	
 Pit 27 Spit 3 (incorrect pit number on board)				 Pit 28 Spit 3	
27	488106	1	1-5	Friable reddish brown silty clay. Root and small gravels noted. PH= 5	
	6025368	2	5-15	Friable dark reddish brown silty clay with minimal roots and small gravels. Root staining at centre of pit. Two artefacts recovered. PH = 6	2
		3	15-23	Friable reddish brown silty clay with no inclusions. Compact clay at 20cm depth. PH = 6.5. Could not hand excavate past 23cm depth.	
28	488118	1	1-5	Friable dark reddish brown silty clay. Root and small gravels noted. PH= 5	
	6025385	2	5-15	Friable reddish brown silty clay with minimal roots and small gravels. Caterpillar burrows throughout pit. PH = 6	
		3	15-21	Friable reddish brown clay with no inclusions. Compact clay at 17cm depth. PH = 6.5. Could not hand excavate past 21cm depth.	
29	488131	1	1-5	Friable dark reddish brown silty clay. Root and small gravels noted. PH= 5	
	6025401	2	5-15	Friable reddish brown silty clay with minimal roots and small gravels. Two artefacts recovered. PH = 6.5	1
		3	15-22	Friable reddish brown clay with no inclusions. Compact clay at 18cm depth. PH = 6.5. Could not hand excavate past 22cm depth.	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
 Pit 29 Spit 3				 Pit 30 Spit 3	
30	488142	1	1-5	Friable dark reddish brown silty clay. Root and small gravels noted. PH= 5	
	6025418	2	5-15	Friable reddish brown silty clay with minimal roots inclusions. Eight artefacts recovered but some broken with shovel. PH = 6.5	10
		3	15-20	Friable reddish brown clay with no inclusions. Compact clay at 18cm depth. PH = 6.5. Could not hand excavate past 20cm depth.	
31	488155	1	1-5	Friable dark reddish brown silty clay. Root, insect and small gravels noted. PH= 6	
	6025434	2	5-15	Friable reddish brown silty clay with minimal roots inclusions. Compact clay at 15cm depth. PH = 6	
		3	15-17	Compact reddish brown clay with no inclusions. Some ant burrows noted. PH = 6.5. Could not hand excavate past 17cm depth.	
 Pit 31 Spit 3				 Pit 32 Spit 2	
32	488167	1	1-5	Friable, but compact dark reddish brown silty clay to 3cm depth. Root inclusions noted. PH= 6	
	6025450	2	5-12	Friable reddish brown silty clay with minimal roots inclusions to 10cm depth. Compact clay at 10-12cm depth. PH = 6. Could not hand excavate past 12cm depth.	
33	488179	1	1-5	Compact dark reddish brown silty clay. Root and gravels noted. PH= 5	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
	6025467	2	5-15	Dark brown friable silty clay with minimal root inclusions. Artefact recovered at 8 cm below surface. Compact clay at 10cm depth, continued excavation to end of spit. PH = 6.5	
34	488190	1	1-5	Dark reddish brown silty clay. Root, gravels and insects noted. Soil is compact. PH= 6	
	6025483	2	5-12	Friable reddish brown silty clay with less root inclusions and no gravels. Artefact recovered at 6 cm below surface. Continued excavation into compact clay at 12cm depth.	
 Pit 33 Spit 2				 Pit 34 Spit 2	
35	488054	1	1-5	Friable dark reddish brown silty clay. Root and small gravels noted. PH= 6.5	
	6025361	2	5-15	Friable dark reddish brown silty clay with minimal roots inclusions. Three artefacts recovered, one in situ at 13cm depth. PH = 6.5	3
		3	15-20	Friable brown silty clay with no inclusions. Compact clay 15-18cm depth. Continued excavation into compact clay to 20 cm depth. PH = 7	
36	488070	1	1-5	Friable dark reddish brown silty clay. Significant root and small gravels noted throughout. 2° slope west to creek line. PH= 6	
	6025347	2	5-15	Friable dark reddish brown silty clay with minimal root and gravel inclusions. Four artefacts recovered. PH = 6	6
		3	15-25	Friable brown silty clay with no inclusions. Compact clay at 20cm depth and ants nest noted. Continued excavation into compact clay to 25 cm depth. PH = 6	
37A	488101	1	1-5	Friable dark reddish brown silty clay. Root, insects and small gravels noted. PH= 7	
	6025321	2	5-15	Friable dark reddish brown silty clay with minimal roots inclusions, and some staining from ant burrows. Three artefacts recovered. PH = 6.5	4
		3	15-22	Friable brown silty clay with no inclusions. Six artefacts recovered from top of spit. Compact	5

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
				clay 20cm depth. Continued excavation into compact clay to 22 cm depth. PH = 7	
 Pit 35 Spit 3				 Pit 36 Spit 3	
37B	488100	1	1-5	Friable dark reddish brown silty clay. Root, insects and small gravels noted. PH= 7	
	6025322	2	5-15	Friable dark reddish brown silty clay with minimal roots inclusions, and some staining from ant burrows. Eight artefacts recovered. PH = 6	8
		3	15-25	Friable brown silty clay with no inclusions. Three artefacts recovered from top of spit. Compact clay 17cm depth. Continued excavation into compact clay to 25 cm depth. PH = 7	4
 Pit 37A Spit 3				 Pit 37B Spit 3	
37C	488101	1	1-5	Friable dark reddish brown silty clay. Root and small gravels noted. PH= 6	
	6025324	2	5-15	Friable dark reddish brown silty clay with minimal roots inclusions. PH = 6	
		3	15-22	Friable brown silty clay with no inclusions. Two artefacts recovered from top of spit. Compact clay 18cm depth. Continued excavation into compact clay to 22 cm depth. PH = 7 Could not hand excavate past 22cm depth.	1
38	488114	1	1-5	Friable dark reddish brown silty clay. Root and small gravels noted. PH= 5	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
	6025343	2	5-15	Friable dark reddish brown silty clay with minimal root and gravel inclusions. Three artefacts recovered. Compact clay appearing at base of spit. PH = 5.5	1
		3	15-25	Compact brown clay. Continued excavation into compact clay to 25 cm depth to ensure no cultural material. PH = 5	
 Pit 37C Spit 3				 Pit 38 Spit 3	
39	488079	1	1-5	Compacted reddish brown silty clay. Root inclusions noted. One artefact recovered. PH= 5	1
	6025362	2	5-15	Reddish brown silty clay with some insect activity. Compact clay at base of spit. PH = 5	
40	488061	1	1-5	Dark reddish grey silty clay. Significant root and gravel content noted. One artefact recovered. PH= 5	
	6025372	2	5-15	Friable reddish brown silty clay with minimal root inclusions. Compact clay from 12-15cm depth. PH = 5	1
 Pit 39 Spit 2				 Pit 40 Spit 2	
41	488113	1	1-5	Dark reddish brown silty clay. Some root and gravel content noted. PH= 5	
	6025309	2	5-15	Friable dark reddish brown silty clay with minimal root and insect inclusions. One artefact recovered. Compact clay from 15cm depth. PH = 6.5	1

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
		3	15-25	Compact dark reddish brown clay with small orange clay balls along western portion of test pit. PH = 6. Could not hand excavate past 18cm depth.	
42	488027	1	1-5	Dark reddish brown silty clay with root and small gravel inclusions. Slight easterly slope to creek line. One artefact recovered. PH= 5.5	
	6025579	2	5-15	Friable reddish brown clay with minimal silt content, roots and gravel inclusions. Compact clay at 10-12cm depth. PH = 6	
 Pit 41 Spit 3				 Pit 42 Spit 2	
43	488014	1	1-5	Friable reddish brown silty clay. Root inclusions noted. PH= 5	
	6025563	2	5-13	Friable reddish brown silty clay with no inclusions. Compact clay at 10cm depth. PH = 5.5. Could not hand excavate past 13cm depth.	1
44	488002	1	1-5	Compact reddish brown silty clay. Root inclusions noted. One artefact recovered at base of spit. PH= 6	
	6025549	2	5-15	Friable reddish brown silty clay with some root inclusions. Charcoal smearing in NE corner at base of spit 2 from burnt roots. Compact clay at 10cm depth. PH = 6.5.	
 Pit 43 Spit 2 (incorrect pit number on board)				 Pit 44 Spit 2	
45	487987	1	1-5	Compact dark reddish brown silty clay. Root inclusions noted. PH= 5	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
	6025534	2	5-15	Friable dark reddish brown silty clay with some root inclusions. Five artefacts recovered. Compact clay at 7-10cm depth. PH = 6	6
		3	15-25	Brown compact clay with minimal friability. Tree root in southern portion of test pit. Two artefacts recovered. Plastic clay at 20cm depth. PH = 5.5	1
		4	25-30	Continued excavation into compact strong brown clay to ensure no cultural material. Slightly gravelly at base of spit. PH = 6. Cold not hand excavate past 30cm depth.	
46	487974	1	1-5	Dark reddish brown silty clay. Root and small gravels noted. PH= 6.5	
	6025517	2	5-15	Friable dark reddish brown silty clay with two artefacts recovered in top of spit and one artefact in lower half. PH = 6	3
		3	15-25	Friable reddish brown silty clay with no inclusions to 19cm depth. Compact reddish brown clay from 19-22cm depth. PH =6. Could not hand excavate past 22cm depth.	
 Pit 45 Spit 4				 Pit 46 Spit 3	
47	487962	1	1-5	Dark reddish brown silty clay with minimal root and gravel inclusions. Two artefacts recovered. PH= 5.5	
	6025502	2	5-15	Friable reddish brown clay to 10cm depth. Compact clay from 10-15cm depth. PH = 5	
48	487893	1	1-5	Dark reddish brown silty clay with minimal root and gravel inclusions. PH= 5.5	
	6025452	2	5-15	Friable dark reddish brown clay to 13cm depth. Two artefacts recovered from top of spit. Compact clay from 13-15cm depth. PH = 5	1
49	487884	1	1-5	Very compacted reddish brown silty clay with root inclusions. PH= 5.5	
	6025435	2	5-15	Very compacted reddish brown silty clay with no inclusions. Clay content and compaction increasing with depth. PH = 5.5	
		3	15-25	Compacted reddish brown clay with some mottling at base. No inclusions noted. PH = 5.5	

Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
 Pit 47 Spit 2				 Pit 48 Spit 2	
50	487875	1	1-5	Compact dark reddish brown silty clay to 2cm depth. Friable silty clay below. Root inclusions noted. One artefact recovered at base of spit. PH= 6	1
	6025419	2	5-15	Dark reddish brown friable silty clay with minimal root inclusions. Artefact recovered at 10cm depth. PH = 5.5	1
		3	15-25	Friable reddish brown silty clay to 20 cm depth. Compact clay from 20-25cm depth. No inclusions. PH = 5.5	
 Pit 49 Spit 3				 Pit 50 Spit 3	

APPENDIX H SITE CARDS

Cullurally sensitive information withheld