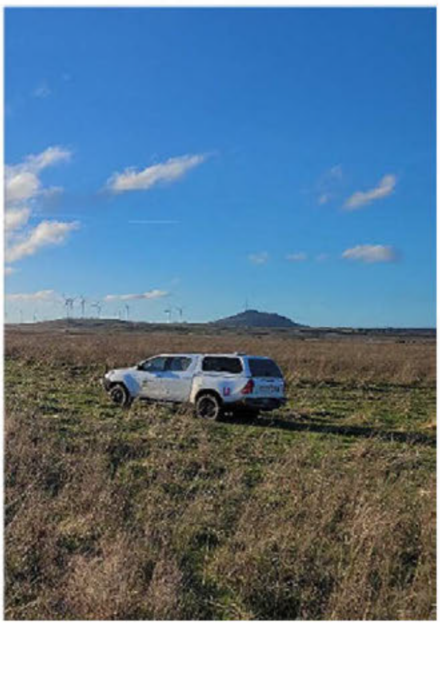
Aboriginal Cultural Heritage Assessment

Blind Creek Solar Farm

February 2022

Project Number: 20-403



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Document verification

Project Title:	Blind Creek Solar Farm
Project Number:	20-403
Project File Name:	20-403 Blind Creek Solar Farm ACHA_ Final_ PUBLIC VERSION

Revision	Date	Prepared by	Reviewed by	Approved by
FINAL	7/12/2021	Jorge Fuenzalida Miralles, Jakob Ruhl	Ali Byrne and Jakob Ruhl	
Draft v2	9/12/2021	Jorge Fuenzalida Miralles, Jakob Ruhl, Matthew Barber, Ali Byrne	Ali Byrne and Matthew Barber	Matthew Barber
Final Draft	20/12/2021	Jorge Fuenzalida Miralles, Jakob Ruhl, Matthew Barber, Ali Byrne	Ali Byrne and Matthew Barber	Jakob Ruhl
Final	14/02/2022	Jorge Fuenzalida Miralles	Jorge Fuenzalida Miralles	Jakob Ruhl

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Acronyms, abbreviations and definitions

APZ	Asset Protection Zone (Bushfire Protection Setback)
AC	Alternating current
ACHA	Aboriginal Cultural Heritage Assessment Report
ACHCRP	Aboriginal Cultural Heritage Consultation Requirements for Proponents
ACT	Australian Capital Territory
AEP	Annual Exceedance Probability
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ASL	Above sea level
BCSF	Blind Creek Solar Farm
BCT	Blind Creek Testpit
BP	Before Present
CHMP	Cultural Heritage Management Plan
Cm	Centimetres
Cwth	Commonwealth
DC	Direct current
DECCW	(Former) Department of Environment, Climate Change and Water (NSW) (now DPIE)
DEM	Digital Elevation Model
Development footprint	The area comprised of all proposed ground disturbance works
DP	Deposited Plan
DPC	Department of Premier and Cabinet
DPIE	Department of Planning, Industry and Environment (NSW)
EBA	Event Based Analysis
EIS	Environmental impact statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
ESD	Ecologically Sustainable Development
ha	Hectares
IBRA	Interim Biogeographic Regionalisation for Australia
ICOMOS	International Council on Monuments and Sites
km	Kilometres

kV	Kilovolt
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
LiB	Lithium-ion Battery
m	Metres
mm	Millimetres
MW	Mega-watts
MWh	Mega-watt hours
NGH	NGH Pty Ltd
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
OEH	(Former) Office of Environment and Heritage (NSW) (now EES)
OSL	Optically Stimulated Luminescence
PAD(s)	Potential Archaeological Deposit(s)
PCU(s)	Power Conversion Unit(s)
PV	Photovoltaic
RAP(s)	Representative Aboriginal Party (Parties)
SEARs	Secretary's Environmental Assessment Requirements
SHE	South-Eastern Highlands Bioregion
SSD	State Significant Development
UNESCO	United Nations Educational, Scientific, and Cultural Organization

Executive summary

Introduction

NGH Pty Ltd (NGH) was commissioned by Blind Creek Solar Farm Pty Ltd (BCSF) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to inform an Environmental Impact Statement (EIS) for the State Significant Development (SSD#: 13166280) referred to as the Blind Creek Solar Farm.

The BCSF is proposed within a 700-hectare development footprint on land extending from the south eastern shoreline of Lake George, ACT. The BCSF site is accessed via Tarago Road, approximately 8km north of Bungendore, NSW, and 35km northeast of Canberra, Australian Capital Territory (ACT), within the Queanbeyan-Palerang Local Government Area (LGA) (Parishes of Currandooly and Ellenden, County of Murray).

The Project Site lies within the traditional lands of the Ngunawal people.

The Project Site is located within the boundary of the Ngambri Local Aboriginal Land Council (LALC).

The proposed works to construct the proposed solar farm have the potential to impact on Aboriginal heritage sites and objects which are protected under the *NSW National Parks and Wildlife Act 1974* (NPW Act). This ACHA report is to provide the Department of Planning, Industry and Environment (DPIE) and Heritage NSW with information about the nature, extent and significance of any Aboriginal objects and/or Aboriginal places and their values. The project was conducted in line with the following requirements outlined in:

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

Aboriginal Consultation

The consultation with Aboriginal stakeholders was undertaken in accordance with Clause 60 of the *National Parks and Wildlife Amendment Regulation 2019* following the consultation steps outlined in the guidelines. The full list of consultation steps, including those groups and individuals who were contacted, and a consultation log is provided in Appendix A. As a result of this process, 17 Aboriginal groups registered their interest in the proposal. No other party registered their interest, including the entities and individuals recommended by statutory bodies and government heritage departments. The fieldwork components of this assessment included the participation of Aboriginal community representatives from the registered Aboriginal parties to this project. A copy of the draft report was provided to all the registered parties for comment. A list of comments received and how these were addressed by NGH and the Proponent are included within the Consultation Log (Appendix A).

Project proposal

Construction of the proposed solar farm will include the following ground disturbing activities:

- Installation of upright piles to support the PV modules,

- Trenching to connect these modules to inverters,
- Deeper trenching to connect these inverters to the substation,
- Construction of access tracks to allow for construction and maintenance of the site,
- The construction of a substation comprising a switching station, transformers, control buildings storage facility and carparking,
- Temporary construction laydown and offices, and
- Fencing.

Background setting

NGH undertook a review of previous archaeological studies undertaken within the Lake George region. This included primarily consultant reports spanning the past 4 decades but also included, significantly, the academic research of Dr Amy Mosig-Way during her PhD work (2018). A number of these previous studies, including Dr Mosig-Way's PhD research, were immediately adjacent and/or overlapped with the proposed Blind Creek Solar Farm Project Site, and are therefore directly relevant.

This body of work indicates that:

- There are 18 previously recorded Aboriginal heritage sites within the Project Site, listed on the NSW Aboriginal Heritage Information Management System (AHIMS)
- The proposed Blind Creek Solar Farm Project Site has archaeological sensitivity
- This archaeological sensitivity includes both surface and subsurface potential
- That low lying areas could generally be described as having low archaeological sensitivity, whilst elevated sand bodies have the highest archaeological sensitivity
- That site patterning is not understood in relation to distance from the lake's shoreline. However, it is posited that patterning has a direct relationship to the fluctuating height of the Lake George waterline.

NGH developed a survey and testing methodology in accordance with an archaeological landform predictive model. This was considered an appropriate first step to address the challenges faced by the size of the Project Site and poor ground visibility due to dense grass cover resulting from high rainfall preceding field surveys. In consultation with Heritage NSW and the registered Aboriginal parties to this project, NGH proposed an ACHA methodology that aimed to predict and test the archaeological sensitivity of the subject land to assist the Proponent in designing the development footprint to avoid highly sensitive archaeological landforms or to develop strategies to mitigate any potential impacts. This approach influenced the Proponent to entirely avoid impact on previously undisturbed strandlines adjacent to Lake George, even prior to commencement of fieldwork.

Field results

Fieldwork was completed in two stages.

Stage 1 was completed from 22 July to 6 August 2021.

- A total of 4 isolated finds and 5 artefact scatters were recorded during the surface survey.
- A total of 101 test pits were excavated and 330 subsurface artefacts were excavated, the majority of which were located on landforms which were predicted to contain moderate to high archaeological sensitivity but which also sampled areas of predicted low sensitivity.

- The maximum depth of excavation was 1 metre, with the majority of pits terminating before this depth was reached. Archaeological deposits were generally found from 0-50cm depth (or within the first five (10cm deep) spits. Sterile clays were generally encountered within 0-10cm in the floodplain and low-lying areas.
- Elevated, sandy areas were found to have the highest archaeological sensitivity during the Stage 1 test excavation. Artefacts were predominantly quartz, followed by silcrete and chert. A relatively high ratio of chert was recovered from one test pit.

The preliminary results of the first stage of fieldwork identified that archaeological sensitivity increased in relatively flat, elevated sandy deposits and within proximity to a waterway. The identification of surface archaeology was, as predicted, directly related to the presence of ground exposures and visibility, with artefact scatters generally found on eroding, sandy deposits. It should be noted that it is likely more surface artefacts are present across the site.

Based on the preliminary results of the first stage of fieldwork, the Proponent again sought to avoid areas of identified archaeological sensitivity, contributing to further changes to the original development footprint. Since the change was not wholly represented in the original methodology (NGH; June, 2021), a revised methodology was provided to all registered Aboriginal parties (Stage 2). The standard 28-day period of review lapsed without any comments from the RAPs apart from agreement.

Stage 2 was completed from 18 to 22 October 2021.

- A total of 7 isolated surface artefacts and 22 surface artefact scatters were recorded during the surface survey.
- A total of 27 test pits were excavated and 79 subsurface artefacts were recorded, all of these test pits were located on landforms which were predicted to contain moderate to high archaeological sensitivity.
- High archaeological sensitivity was identified in relation to the local sandy rises within the southern section of the undulating plain.
- High archaeological sensitivity was identified in relation the creek terrace in proximity to the proposed location of the substation.
- During the second fieldwork stage, a site of cultural heritage value was recorded. This site was located outside of the Project Site but within proximity of an access track. NGH have confirmed with the Aboriginal knowledge holder that proposed track works will not physically impact upon the site nor upon its cultural values.

Assessment of Harm

The proposed number of piles varies form 105,000 to 210,000 but when multiplied by the cross-sectional area, it is possible to estimate the ground surface disturbance from piles as 0.3-0.6ha depending on the final design. NGH has used the conservative estimate, but this can be understood as the upper limit. In addition, trenching for infrastructure, access tracks and ancillary facilities will also cause ground disturbance to some extent. Overall, approximately 6% (44 ha of 720 ha) of the development footprint (less than 4% of the site area) is expected to be impacted by these activities.

There are a total of 77 Aboriginal heritage sites within the Project Site, which include 18 previously registered AHIMS sites, 38 isolated artefacts and artefact scatter sites recorded by NGH, and 21 areas containing subsurface artefacts recorded by NGH during the fieldwork for this assessment. Three out 18 previously recorded AHIMS, 17 of the 27 BCSF artefact scatter sites and 9 of the 11

BCSF isolated finds are situated within the development footprint area of the proposed transmission line, solar arrays, tracks, cables, office parking and temporary facilities. The most likely cause of harm to the artefacts will be through ground preparation activities such as vegetation clearance, installation of the solar array piles and solar arrays, tracks and underground cabling.

Mitigation of Harm

Mitigation in the form of alteration of the development footprint has already been achieved through the removal of highly archaeologically sensitive landforms, namely the previously undisturbed strandline (ie. apart from the historically quarried area within the strandline) and large portions of elevated sand bodies, and a buffer zone along riparian corridors. The removal of these areas from development has resulted in the preservation of the following sites within the BCSF Project Site:

- 14 out of 18 previously registered AHIMS sites;
- 10 out 27 NGH recorded artefact scatters;
- 2 out of 11 NGH recorded isolated artefacts; and
- protection of any potential and subsurface deposits within these archaeologically sensitive landforms. Based on the assessment of the significance of these landforms, these sites are also likely to represent sites with higher scientific research value.

Collection of surface artefacts and open area salvage excavation are proposed as ways to further mitigate the archaeological impact. To effectively target the most appropriate locations for salvage excavation, we have considered the assessed archaeological significance of landforms across the Project Site, the test excavation results, the level of proposed impact, and the opportunities that mitigation options might offer. The salvage assessment has included the following overlapping criteria:

- Areas of high development impact – where ground disturbance is such that archaeological material may not survive;
- Areas of identified archaeological sites or areas of moderate-high archaeological potential – to ensure that any salvage excavation effort will have a reasonable chance of yielding sufficient data;
- Areas coinciding with the relevant landforms to answer the research questions – to address the landscape based questions.

The areas identified for salvage excavation include:

Creek Terrace - location for the proposed substation and BESS

In consideration of the landform, impacts, and sensitivity, NGH suggest that a salvage excavation area in the order of 10-30m^2 would be sufficient. This could be undertaken in one area but NGH consider that having at least two open area excavations would provide the best chance of recovering information to answer the research questions.

Elevated Sand Body – location for some solar arrays and underground cabling.

The area of this landform impacted by the development is small with much preserved from impact. This landform has also been subject to excavation from Mosig Way and therefore considerable data is already available. However, we consider that an excavation area in the range of 5-10m^2 would be suitable to retrieve sufficient additional information, noting that the impacts would be on sloped ground rather than on the crest, which may reduce the archaeological potential.

Undulating Plain – location for solar arrays, underground cabling, and tracks.

> Consideration of the variable impacts of the proposed development on this landform would suggest that targeted salvage excavation in the areas with the highest impact, where they coincide with elevated sandy areas, would yield excellent archaeological results. NGH suggest that in this landform, considering its size, open area excavation ranging from 20-50m^2 would be advisable. Salvage in this landform would best be served through excavating 2-3 separate areas to maximise the research value and also to maximise the recovery of a sample of Aboriginal cultural material.

NGH suggest that salvage excavation in the three landform areas identified would provide the maximum benefit in retrieval of archaeological information to address the possible research questions and also provide the best opportunity to recover a suitable range of Aboriginal cultural material that may be preserved for future generations and researchers. Excavation totals ranging from 35-90m^2 in the identified landforms would be expected to provide adequate archaeological data. However, we also suggest a contingency of another 20m^2 should also be allowed for, in case there are unexpected finds during the salvage excavations or construction phase that would warrant additional excavation to retain the archaeological information.

Salvage excavations would be undertaken by qualified archaeologists with the assistance of the Aboriginal community. The excavations would need to be placed in areas with a high confidence of locating relatively undisturbed cultural deposits based on the result of the testing programme.

Table 1-1. Site impact assessment and significance.

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
1.	57-2-0059	Lakelands;	Undulating Plain	Active	Moderate	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection.
2.	57-2-0020	Currandooly 2; Lake George;	Flat	Active	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
3.	57-2-0702	CWF2-IF-02	Beach	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
4.	57-2-0703	CWF2-IF-03	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
5.	57-2-0704	CWF2-IF-04	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
6.	57-2-0707	CWF2-IF-07	Strandline	Active	Low	Track maintenance	Direct	Total surface	Total Loss of Value	Surface collection
7.	57-2-0708	CWF2-IF-08	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
8.	57-2-0790	West Creek Dairy PAD 1	Floodplain	Archaeological disturbance	Nil	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	No further work required.
9.	57-2-0917	Willow Sands	Elevated Sand Body	Active. Eroding	High	No Impact Proposed	-	-	-	Excise area from proposed works
10.	57-2-0642	Grantham Park 3	Elevated Creek Flat	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
11.	57-2-0732	CWF2-S-01	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
12.	57-2-0733	CWF2-S-02	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
13.	57-2-0734	CWF2-S-03	Elevated Creek Flat	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
14.	57-2-0735	CWF2-S-04	Beach	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
15.	57-2-0736	CWF2-S-05	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
16.	57-3-0213	Bridge Creek/Currandooly	Saddle	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
17.	57-3-0458	Bridge Ck SU2/L1	Creek Terrace	Active	Low	Overhead transmission line works	Direct	Total surface. Partial subsurface	Total loss of surface value. Partial loss of subsurface value	Surface collection
18.	57-2-1155	BCSF: Isolated Find 1	Strandline	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
19.	57-2-1156	BCSF: Isolated Find 2	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
20.	57-2-1157	BCSF: Isolated Find 3	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal	Assumed Total Loss of	Surface collection

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
								subsurface	Value	
21.	57-3-0480	BCSF: Isolated Find 4	Hillslope	Disturbed	Low	Substation construction	Direct-	Total surface, partial subsurface	Partial Loss of Value	Avoid/Salvage
22.	57-2-1158	BCSF: Isolated Find 5	Strandline	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
23.	57-2-1159	BCSF: Isolated Find 6	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
24.	57-2-1160	BCSF: Isolated Find 7	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
25.	57-2-1161	BCSF: Isolated Find 8	Low Spurs	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
26.	57-2-1162	BCSF: Isolated Find 9	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
27.	57-2-1175	BCSF: Isolated Find 10	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
28.	57-3-0489	BCSF: Isolated Find 11	Hillslope	Disturbed	Low	Future development zone (associated with substation/solar farm infrastructure)	Total	Total surface. Partial subsurface	Partial Loss of Value	Surface collection
29.	57-2-1176	BCSF: Artefact Scatter 1	Floodplain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
30.	57-2-1177	BCSF: Artefact Scatter 2	Strandline	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
31.	57-2-1178	BCSF: Artefact Scatter 3	Elevated Creek Flat	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
32.	57-2-1179	BCSF: Artefact Scatter 4	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
33.	57-2-1180	BCSF: Artefact Scatter 5	Elevated Sand Body	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
34.	57-2-1181	BCSF: Artefact Scatter 6	Strandline	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
35.	57-2-1163	BCSF: Artefact Scatter 7	Strandline	Disturbed	Low	Track maintenance	Direct	Total surface	Total Loss of Value	Surface collection
36.	57-2-1164	BCSF: Artefact Scatter 8	Strandline	Disturbed	Low	Track maintenance	Direct	Total surface	Total Loss of Value	Surface collection
37.	57-2-1165	BCSF: Artefact	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface.	Assumed Total Loss of	Surface collection

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
		Scatter 9						Minimal subsurface	Value	
38.	57-2-1166	BCSF: Artefact Scatter 10	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
39.	57-2-1167	BCSF: Artefact Scatter 11	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
40.	57-2-1168	BCSF: Artefact Scatter 12	Undulating Plain	Disturbed	Moderate	Track maintenance	Direct	Total surface	Total loss of value	Surface collection
41.	57-2-1169	BCSF: Artefact Scatter 13	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
42.	57-2-1170	BCSF: Artefact Scatter 14	Undulating Plain	Disturbed	Moderate	Track maintenance	Direct	Total surface	Total loss of value	Surface collection
43.	57-2-1171	BCSF: Artefact Scatter 15	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
44.	57-2-1172	BCSF: Artefact Scatter 16	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
45.	57-2-1174	BCSF: Artefact Scatter 17	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
46.	57-3-0481	BCSF: Artefact Scatter 18	Saddle	Disturbed	Low	Track maintenance	Direct	Total surface	Total loss of value	Surface collection
47.	57-3-0482	BCSF: Artefact Scatter 19	Creek Terrace	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
48.	57-3-0483	BCSF: Artefact Scatter 20	Creek Terrace	Disturbed	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
49.	57-3-0484	BCSF: Artefact Scatter 21	Creek Terrace	Disturbed	Moderate	Overhead transmission line works	Direct	Total surface. Partial subsurface	Total loss of surface value. Partial loss of subsurface value	Surface collection
50.	57-3-0485	BCSF: Artefact Scatter 22	Creek Terrace	Disturbed	Moderate	Overhead transmission line works	Direct	Total surface. Partial subsurface	Total loss of surface value. Partial loss of subsurface value	Surface collection
51.	57-3-0490	BCSF: Artefact Scatter 23	Creek Terrace	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
52.	57-3-0486	BCSF: Artefact Scatter 24	Creek Terrace	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
53.	57-3-0487	BCSF: Artefact Scatter 25	Hillslope	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
54.	57-3-0488	BCSF: Artefact Scatter 26	Creek Terrace	Disturbed	Low	Continued use of quarry haul road	Direct	Total surface	Total loss of value	Surface collection
55.	57-2-1173	BCSF: Artefact Scatter 27	Gentle Slopes	Disturbed	Moderate	Continued use of quarry haul road	Direct	Partial surface	Partial loss of value	Surface collection
56.	57-2-1185	BCSF: Cluster 1	Low Spurs	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
57.	57-2-1190	BCSF: Cluster 2	Low Spurs	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
58.	57-2-1196	BCSF: Cluster 3	Undulating Plain	Disturbed	High	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform
59.	57-2-1197	BCSF: Cluster 4 (BCSF Hearth)	Undulating Plain	Disturbed	High	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform
60.	57-2-1191	BCSF: Cluster 6	Elevated Sand Body	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
61.	57-2-1199	BCSF: Cluster 7	Elevated Sandy	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
62.	57-2-1153	BCSF: Cluster 8	Elevated Sand Body	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
63.	57-2-1200	BCSF: Cluster 9/BCSF:Transect 3	Hillslope	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
64.	57-2-1188	BCSF: Cluster 10	Flat	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
65.	57-2-1186	BCSF: Cluster 11	Flat	Disturbed	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
66.	57-2-1187	BCSF: Cluster 12	Flat	Disturbed	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
67.	57-3-0491	BCSF: Cluster 15	Creek Terrace	Disturbed	High	Substation Works	Direct	Total subsurface	Total loss of value	Open area subsurface excavation within representative area of creek terrace landform.
68.	57-2-1189	BCSF: Cluster 16	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.
69.	57-2-1184	BCSF: Transect 1	Undulating Plain	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.
70.	57-2-1201	BCSF: Transect 2	Elevated Creek Flat	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
71.	57-2-1194	BCSF: Transect 4	Basal Slopes	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
72.	57-2-1198	BCSF: Transect 5	Basal Slopes	Disturbed	Medium	No Impact Proposed	-	-	-	Excise area from proposed works

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
73.	57-3-0492	BCSF: Transect 6	Creek Terrace/Hillslopes	Disturbed	Medium	Substation Works	Direct	Total subsurface	Total loss of value	Open area subsurface excavation within representative area of creek terrace landform. No further works required on the hillslope landform.
74.	57-2-1193	BCSF: Transect 7	Strandline	Disturbed	Low	Track maintenance	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required within historical sand mining area of strandline
75.	57-2-1195	BCSF: Isolated Pit 3 (A to C)	Undulating Plain	Disturbed	Low	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.
76.	57-2-1192	BCSF: Isolated Pit 4	Undulating Plain	Disturbed	Low	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.

Table 1-2. Landform impacts and mitigation measures.

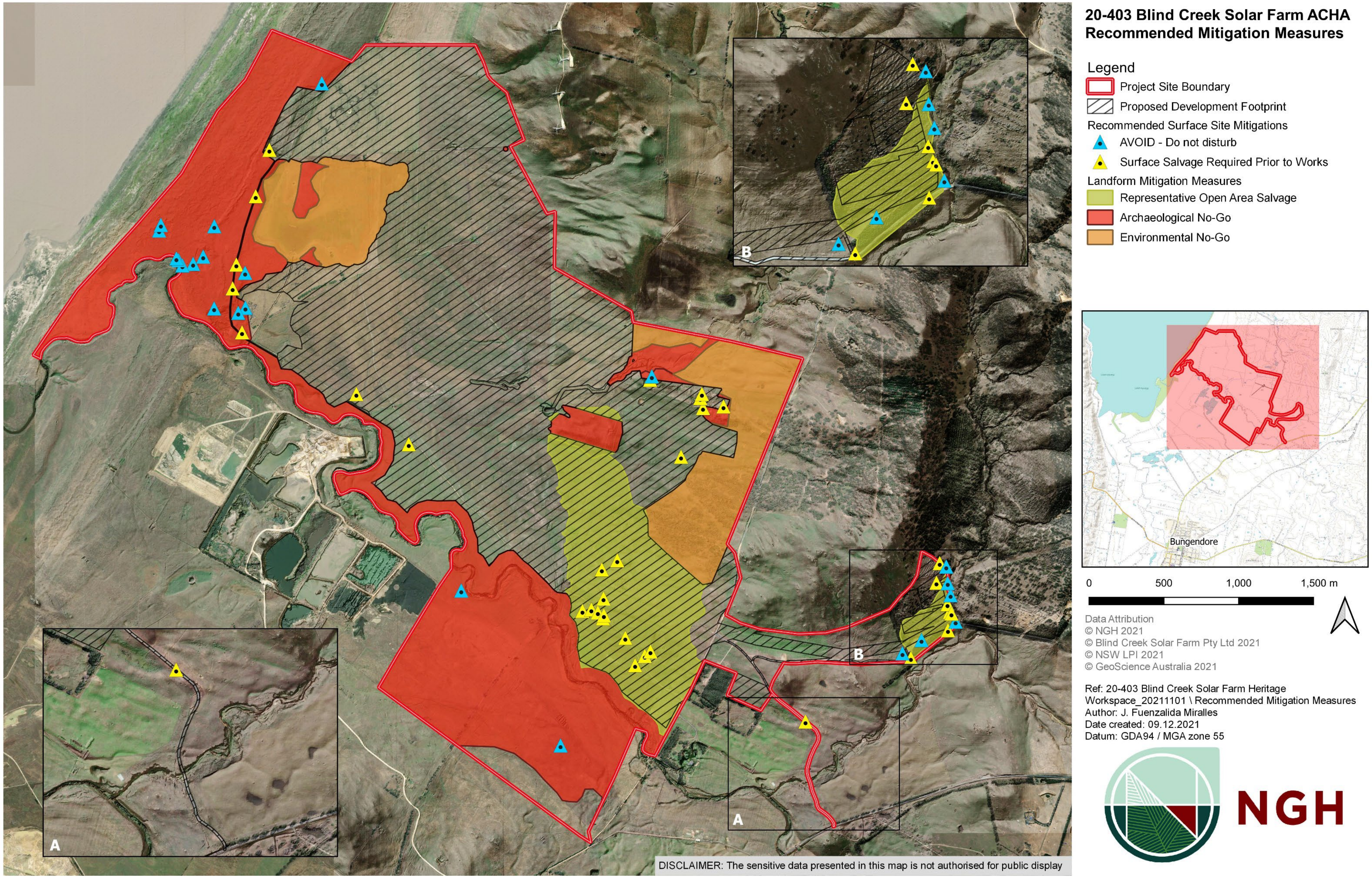
Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
Strandline	High	10 test pits $2.5m^2$	1 artefact	Installation of solar modules within the previously disturbed, historical quarry areas only.	The proponent removed all undisturbed areas within this landform from the proposed development footprint to mitigate the potential impact of the project upon the archaeology of the Project Site. Recommendation: Works to proceed within historical quarry areas as mapped in Figure 9-6.
Beach	High	Nil	Nil	None	The proponent removed this landform from the proposed development footprint to mitigate the potential impact of the project upon the archaeology of the Project Site. Recommendation: Avoided by development footprint.
Elevated Sand Body	High	15 test pits $3.75m^2$	163 artefacts	Installation of solar modules have been limited to a small area that mostly includes a previously disturbed, historical sand mining area and the basal slopes of the sand body which are considered to have less sensitivity.	The proponent removed almost all undisturbed areas within this landform from the proposed development footprint to mitigate the potential impact of the project upon the archaeology of the Project Site. Recommendation: Surface collection. Installation of solar array only. Sample open area salvage excavation where warranted.

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
Elevated Creek Flat	High	11 test pits 2.75m^2	6 artefacts	Installation of solar modules Track works	The proponent has removed any works within the riparian corridor of Butmaroo Creek. Other areas of this landform associated with Wright Creek will only be impacted by a small area of solar array piles and a track. Recommendation: Works to proceed.
Waterway (Creekline)	High	Nil	Nil	Installation of two causeways	Works will be within the creek line only. Recommendation: Works to proceed.
Creek Terrace	High	8 test pits 2m^2	51 artefacts	Substation infrastructure (transformers, control room, and car parking). BESS Track works Overground cabling	The NGH test excavations indicated that this landform has more archaeological sensitivity than suggested by previous studies. Mitigation strategies should address the extent and nature of proposed works within this sensitive landform. Recommendation: Avoid selected sites, surface collection of others. Open area, subsurface excavation of sample within impact area of least disturbed deposits.
Flat	Moderate	20 test pits 5m^2	69 artefacts	None	Due to environmental and archaeological issues, the proponent has removed this entire landform to

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
					mitigate the potential impact of the project upon the archaeology of the Project Site.
Low Spurs	Low-Moderate	10 test pits $2.5m^2$	3 artefacts	Solar modules Track works Underground cabling	Excavations revealed lower and sparser density of artefacts than expected. Recommendation: Salvage collection of any surface artefacts.
Saddle	Moderate	Nil	Nil	Underground cabling	Moderate potential outside disturbances but limited impact. Recommendation: Works to proceed with no further assessment or salvage required.
Undulating Plain	Moderate to High	26 test pits $6.5m^2$	84 artefacts	Solar modules Track works Underground cabling	The NGH test excavations indicated that this landform has more archaeological sensitivity than suggested by previous studies. Mitigation strategies should address the extent and nature of proposed works within this sensitive landform. Recommendation: Surface artefact collection. Open area, subsurface excavation of sample where significant ground disturbance may occur.

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
Floodplain	Low	5 test pits 1.25m²		Solar modules Track works Underground cabling	Low archaeological potential with mostly solar arrays and therefore low development impact. Recommendation: Salvage of recorded surface artefacts.
Hillslope	Low	12 test pits 3m²	15 artefacts	Underground cabling Substation Transformers Carpark Future expansion area	High impact but in largely high disturbance area due to pine plantation and sand mine. Recommendation: Avoid certain sites, surface collection of others if impacted.
Drainage / Erosion Depression	Low	Nil	Nil	None	The proponent has excised this area from the proposed works.
Basal Slopes	Low	10 test pits 2.5m²	17 artefacts	Solar Arrays Track works Underground cabling	Limited archaeological potential, generally low development impact. Recommendation: Works to proceed.
Wetland Depression / Lagoon	Low	Nil	Nil	None	The proponent has excised this area from the proposed works.

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
Wrights Creek Depression	Low	Nil	Nil	Solar Arrays Underground cabling	Very low archaeological potential with minor development impacts. Recommendation: Works to proceed.



Recommended Mitigation Measures

Recommendations

The recommendations are based on the following information and considerations:

- Results of the current archaeological assessment of the area;
- Consideration of results from other local archaeological studies;
- Results of consultation with the registered Aboriginal parties;
- Appraisal of the proposed works,
- Legislative context for the development proposal; and
- Current NSW Aboriginal Heritage guidelines.

It is recommended that:

1. The proposed solar farm development be granted approval with conditions for management of Aboriginal heritage including the recommendations outlined below.
2. The proponent must prepare a Cultural Heritage Management Plan (CHMP) to outline management steps and requirements for ongoing management of cultural heritage values within the construction, operation and decommissioning stages of the project. The CHMP may include some of the following elements, with agreement of relevant stakeholders.
    a. Management of known sites;
    b. Management of high sensitivity areas excluded from the project footprint;
    c. Management of unexpected finds; and
    d. Ongoing consultation and engagement with the local Aboriginal community.
3. All cultural material recovered from the subsurface testing programme which is currently in temporary care at the NGH Canberra office be reburied in accordance with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* in an appropriate location within the Project Site as agreed with the registered Aboriginal parties. The reburial location must be submitted to the AHIMS database and will not be impacted in the future.
4. Any recorded surface artefacts that cannot be avoided by the development footprint must be salvaged by community collection prior to the commencement of ground disturbing works. The collection and relocation of the artefacts should be undertaken by an archaeologist with representatives of the registered Aboriginal parties in accordance with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. The map shown in Figure 9-6 must be used as a guide for undertaking community collections. The artefacts should be collected and moved to a safe area within the property that will not be subject to any ground disturbance.
5. All objects salvaged must 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.
6. A Cultural Smoking Ceremony should be considered if requested by the Aboriginal community to take place to cleanse any artefacts salvaged during the reburial.
7. Representative subsurface salvage excavations, as outlined in Section 9.3.1, should be undertaken within the following landforms where significant ground disturbance works such as cabling or infrastructure is proposed.

- Elevated Sand Body
- Undulating Plains
- Creek Terrace

The excavations would be undertaken within relatively undisturbed deposits (or deposits assumed to be undisturbed) and be aimed at retrieving important scientific information about the nature and age of the sites. The detailed research aims should be guided by those identified in this assessment and other researchers. This includes detailed analysis of the stone artefact technology and landuse.

8. A selection of salvaged artefacts could be stored securely on-site (within the Cultural Learning Zone, for eg.) for easy access by the local Aboriginal community for education and cultural purposes such as Open Days, (contingent upon the consensus of comments received from RAPs on this ACHA report).
9. The cultural site identified during the assessment must remain outside any development approval area and thus be avoided by all activity related to the construction and operation of the solar farm.
10. It is recommended that the Proponent continue to consult with the Aboriginal community should the proposal receive approval regarding any conditions of consent concerning Aboriginal cultural heritage.
11. In the event that human remains are discovered during the works, all work must cease in the immediate vicinity. Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal. Should the remains be identified as Aboriginal in origin Heritage NSW will identify the appropriate course of action.
12. Any changes to the proposed Project Site footprint that has not been assessed by this report should be subject to further assessment.

Part of the BCSF development proposal is the provision of an *Indigenous Cultural Heritage Learning Zone*, an area set aside by the Proponent to provide the Aboriginal community access to the shore of the lake to engage in cultural practices on Country and as a place to teach and learn Aboriginal cultural connection and heritage. This area might be a place where the registered Aboriginal parties might agree to re-bury salvaged artefacts. Additionally, the Landowners would offer the opportunity in consultation with the Aboriginal community for a selection of artefacts to be kept securely (details to be confirmed) in the Cultural Learning Zone to be used for community presentations such as an annual Open Days.

1. Introduction

1.1 The Project

The Blind Creek Solar Farm Pty Ltd propose to construct the Blind Creek Solar Farm (BCSF) within a 700ha development footprint on land extending from the south-eastern shoreline of Lake George, ACT (location provided in Section 1.4 and shown in Figure 1-2 and Figure 1-3 below). The BCSF project would involve the construction, operation and decommissioning of a photovoltaic (PV) solar array that would supply electricity to the national electricity grid. The BCSF would generate up to 420MW (DC) (350MW (AC)) and produce up to approximately 800,000MWh in a typical meteorological year.

The BCSF project has been designated a State Significant Development (SSD #:13166280) and approval will be assessed under an Environmental Impact Assessment (EIA).

NGH has been informed that the traditional name for Lake George is either ‘Ngungara’ or ‘Weerewa’ (with variations on the spelling), depending upon the traditional language of the speaker. The name recorded by Charles Throsby in the 1820s for Lake George was Wee:ree:waa, which is now frequently spelled ‘Weerewa’. The name Weerewa has been suggested to be a Wiradjuri word and not the name used by the local Aboriginal people who used the word, ‘Ngungara’. NGH refers to ‘Lake George’ only for consistency with reference to environmental and geographic mapping and data. This report uses ‘Weerewa’ when quoting historical, European references, and we use Ngungara/Weerewa when referring to the name that local and visiting Aboriginal people are likely to have used.

1.2 Aboriginal Cultural Heritage Assessment of the proposed Blind Creek Solar Farm

NGH Pty Ltd (NGH) has been engaged by Blind Creek Solar Farm Pty Ltd to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to inform an Environmental Impact Statement (EIS) as part of the EIA approval process.

The purpose of this ACHA report is to provide an assessment of the Aboriginal cultural values associated with the BCSF Project Site and to assess the cultural and scientific significance of any Aboriginal heritage objects and sites identified, in accordance with the Secretary’s Environmental Assessment Requirements (SEARs) for this SSD project.

The draft ACHA will be provided to the registered Aboriginal parties to this project for their review and comment, as well as to Heritage NSW, prior to the finalisation of the assessment.

1.3 Report format and purpose

For the purposes of this assessment, NGH prepared the report in accordance with the following guidelines:

- 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 (DECCW 2010a); and
- Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010b).

The proposed works to construct the proposed solar farm have the potential to impact on Aboriginal heritage sites and objects. An ACHA is required to undertake a thorough assessment of the Aboriginal heritage and possible impacts of the proposal. The requirements for the assessment are provided in the SEARs, issued 11 February 2021 which state:

Heritage – *including an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development and consultation with the local Aboriginal community in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents.*

Heritage NSW provided the following government agency advice to the SEARs:

"The area of the Lake George sand deposits has already been identified in the South-east and Tablelands Regional Plan 2036 as an important cultural landscape. Heritage NSW advises that a full archaeological assessment, including test excavations, will be required because Aboriginal sites with subsurface potential have already been identified within the Project Site. Test excavations need to be undertaken as part of the upfront EIS assessment to inform the design and approvals process for the whole area that will be affected by the development. Cumulative impact to the archaeological resource of the Lake George area will also need to be considered. Any assessment that will be undertaken to inform the EIS, such as geotechnical investigations, must also consider impacts on Aboriginal cultural heritage." (Heritage NSW, SEARs for SSD-13166280, 21 February 2021).

This ACHA report is to provide the Department of Planning, Industry and Environment (DPIE) and Heritage NSW with information about the nature, extent and significance of any Aboriginal objects and/or Aboriginal places and their values.

The objectives of the assessment were to:

- Conduct Aboriginal consultation as specified in clause 60 of the National Parks and Wildlife Regulation 2019, using the consultation process outlined specified in the Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010) (ACHCRP);
- Undertake a field survey of the Project Site to identify and record any Aboriginal objects and identify any areas that may have subsurface potential for Aboriginal objects;
- Undertake subsurface testing, as recommended by Heritage NSW within the Stage Agency Advice to the SEARs;
- Undertake an assessment of the archaeological and cultural values of the Project Site and any Aboriginal objects therein;
- Record all Aboriginal cultural heritage objects and places within the Project Site and submit these sites to the AHIMS;
- Assess the cultural and scientific significance of any archaeological material, and
- Provide management recommendations for any Aboriginal objects found.

This report is divided into the following sections:

Table 1-1. NGH ACHA report format by sections

Section number	Heading	Description
1	Introduction	Provides basic information about: • The proposed project, including location and the Proponent

Section number	Heading	Description
		• The purpose of the report • Personnel and acknowledgements.
2	Aboriginal stakeholder consultation process	Outlines the Aboriginal consultation process including which Aboriginal stakeholder groups registered an interest in the project. Consultation Log is included as Appendix A.
3	Project methodology and limitations	Outlines the approach to the assessment and identifies the study limitations.
4	Background setting	Provides information relevant to the heritage assessment of the Project Site including about the environment and landscape, historical use and disturbance, and ethnographic and archaeological context. Provides landscape mapping and Aboriginal site predictions.
5	Archaeological investigation results – Surface survey	Provides the results of surface survey including coverage analysis.
6	Archaeological investigation results - Subsurface testing results	Provides results of testing programme including analysis of finds and deposit characteristics.
7	Discussion	Provides commentary on the results in relation to the archaeological record and the development proposal.
8	Cultural heritage values and statement of significance	Discusses the cultural, scientific, aesthetic and historic heritage values of sites and landforms.
9	Assessment of harm Avoiding and mitigation of harm	Outlines the proposed development works and potential impacts. Considers ESD principles and appraisal of harm and potential mitigation measures. Provides an impact assessment of the proposal on the heritage sites.
10	Legislative context	Gives summary of the legislative framework for the assessment.
11	Conclusions	Provides a summary of findings and changes to the project.
12	Recommendations	List of recommended actions to enable the project to proceed and manage the impacts to the sites.
13	References	Provides a list of all references used within this assessment report.

1.4 Location

The proposed Blind Creek Solar Farm site is located along Tarago Road, approximately 8km north of Bungendore, NSW, and 35km north-east of Canberra, ACT, refer to Figure 1-2 and Figure 1-3, and within the Queanbeyan-Palerang Local Government Area (LGA) (Parishes of Currandooly and Ellenden, County of Murray).

The Project Site comprises of 1225ha within the following Lot and Deposited Plans (DPs):

- Lot 1 DP237079
- Lot 1 DP1154765
- Lot 2 DP1154765
- Lot 2 DP1167699
- Lot 2 DP237079
- Lot 3 DP237079
- Lot 4 DP237079
- Lot 9 DP237079
- Lot E DP38379

The substation and battery pad (if AC coupled) would occupy a portion of Lot 1 DP456698.

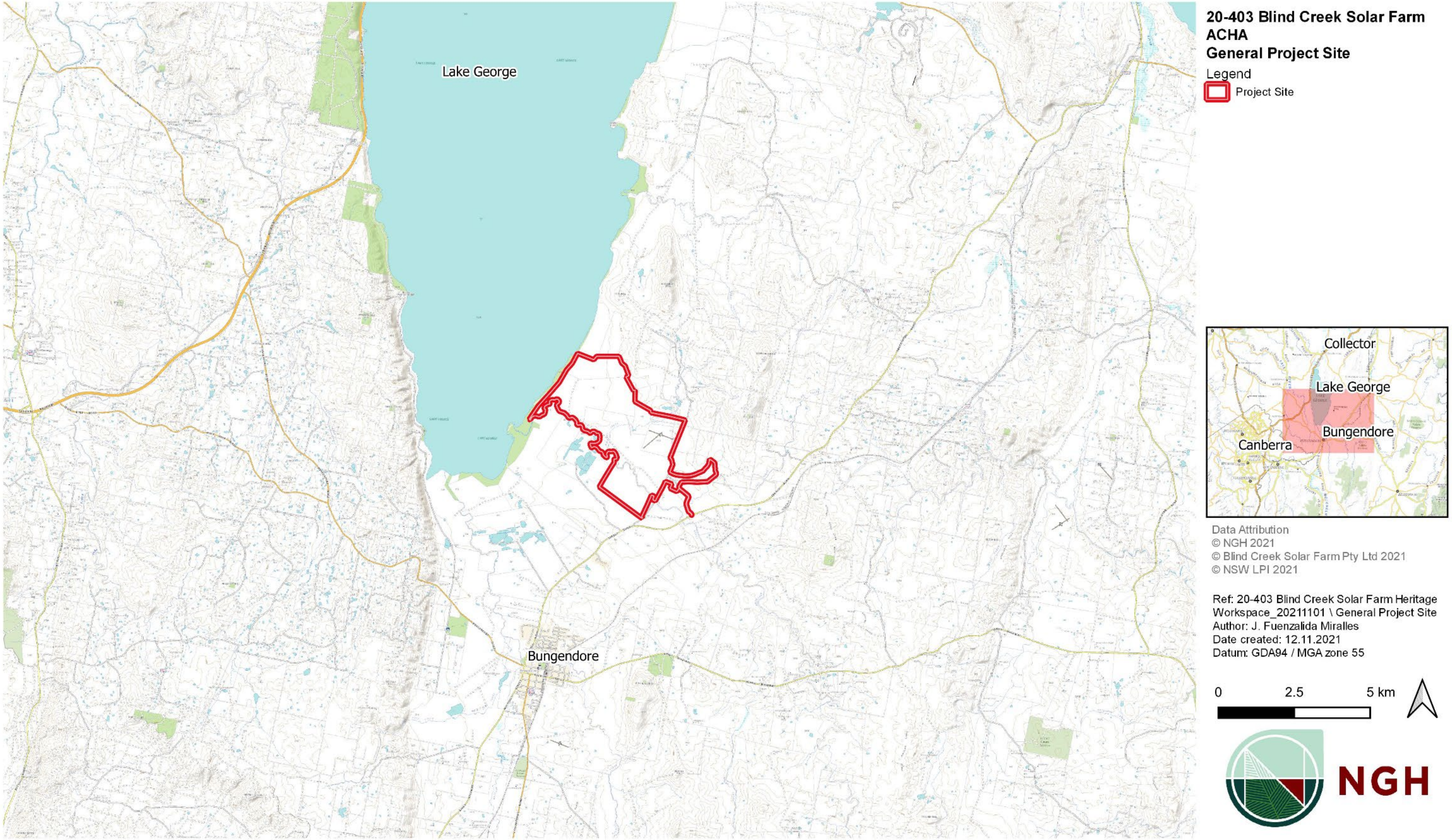


Figure 1-1 Blind Creek Solar Farm Project Site location map

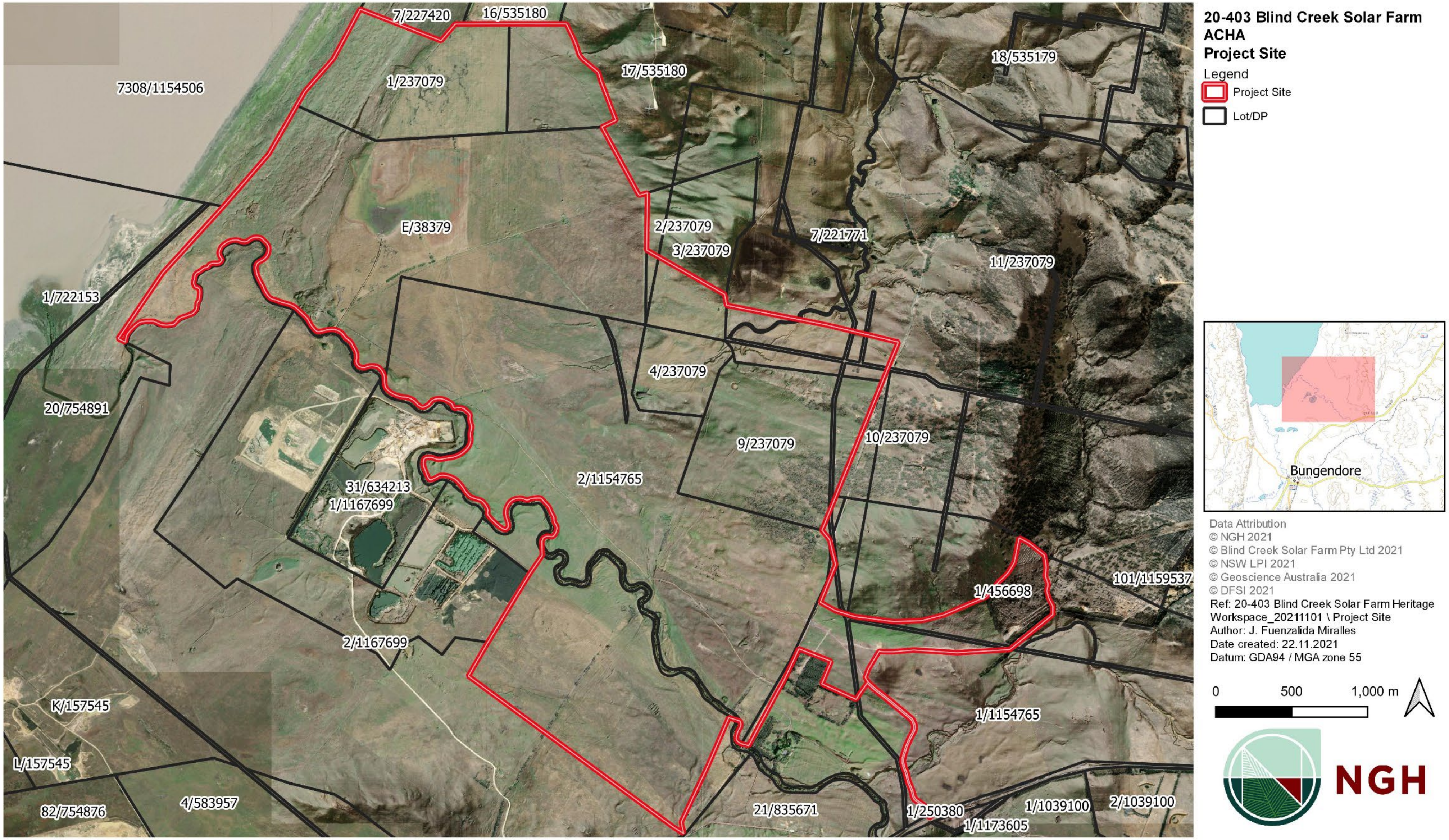


Figure 1-2. Blind Creek Solar Farm Project Site

1.5 Project proposal summary

The Proposal includes the following main items of infrastructure:

- Up to 850,000 PV solar modules mounted on a single axis tracking system.
- Up to 85 inverters and transformers, most likely containerised in modified shipping containers, together known as Power Conversion Units ('PCUs').
- Steel mounting frames with pile-driven foundations to hold the tracking system.
- An onsite 330kV substation containing up to four transformers and associated switchgear to facilitate connection to the national electricity grid. This will cut into the existing 330kV transmission line that passes through the site.
- Energy storage devices and equipment, including up to 300MW of lithium-ion batteries with inverters (PCUs). The batteries may be configured in either a DC-coupled format by distributing batteries through the site, or in an AC-coupled layout by placing all batteries in a purpose-built facility.
- Underground power cabling to connect solar modules, combiner boxes, PCUs and batteries.
- Underground auxiliary cabling for power supplies, data services and communications.
- Buildings to accommodate a site office, switchgear, protection and control facilities, maintenance facilities, storage and staff amenities.
- A communications tower for high reliability grid operations.
- Internal tracks for construction, operation, and maintenance activities.
- Internal fencing of paddocks to contain grazing livestock.
- External perimeter fencing.
- Paddock fencing.
- Native vegetation planting to provide visual screening for specific receivers if any are required.

During the construction phase, temporary facilities would be established on the site. These will include:

- A construction laydown area with secure compound.
- Construction site offices and amenities.
- Car and bus parking areas for construction staff.

Further and more detailed information relating to the construction and infrastructure requirements and the potential associated ground disturbance are provided in Section 9.1.

Figure 1-3 provides an indicative design, upon which this assessment is largely based. Design may change according to engineering, construction and approval requirements.

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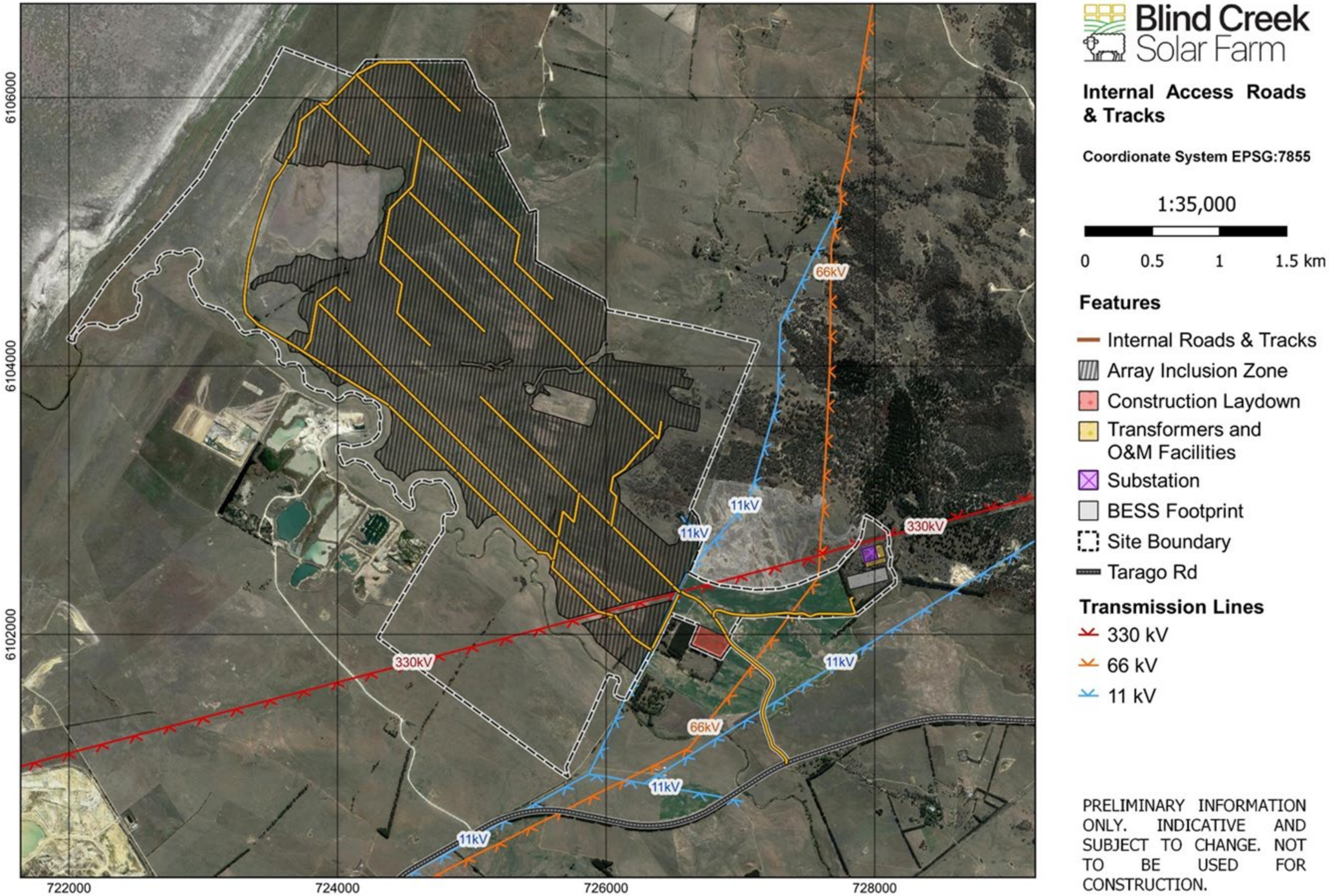

Figure 1-3. Blind Creek Solar Farm Project Site and development footprint showing indicative ground disturbance activities (Source: BCSF).

1.5.1 Proposed Cultural Heritage Learning Zone

The BCSF proposal includes the establishment of an Indigenous Cultural Heritage Learning Zone. The Landowner has committed to the establishment of a Cultural Heritage Learning Zone on approximately two square kilometres in between the proposed solar array and the lake shoreline.

The area includes the geographical landscape termed a "strandline", which has been identified in this study as having high cultural value and archaeological sensitivity. This landform area was removed early in the project design phase to avoid impact to Aboriginal heritage. As part of consideration of the cultural values of the area and Lake George, the landowner wished to provide access for the local Aboriginal community to the Project Site and specifically the shoreline, as well as provide an opportunity for ongoing cultural learning. It was considered that such an area be set aside as part of the development approval process. The area set aside, pending development approval would be the western most extent of the Project Site, along the strandline and foreshore of the lake and be approximately 2 sq km in area, although exact boundaries would ultimately be determined though agreement with the landowner, Blind Creek Solar Farm and relevant crown land boundaries. The zone could be used in ways such as:

- Be made available to archaeologists to further improve the scientific knowledge of this area;
- Be the location for annual open day sponsored by BCSF Pty Ltd whereby Aboriginal knowledge holders will be engaged to inform attendees about the cultural heritage of Lake George. Currently there is no public access to the lake. The open day would give traditional owners connection to the lake that has been lost for more than a century.
- The location for burial of artefacts collected through the testing programme or salvaged prior to development.

Detail about the Cultural Heritage Learning Zone and its ongoing management has yet to be determined. This will be informed through ongoing consultation with RAPs.

1.6 Project personnel

The assessment was undertaken by NGH archaeologists Jakob Ruhl and Jorge Fuenzalida Miralles including research, Aboriginal community consultation, and report preparation. NGH archaeologists, Jorge Fuenzalida Miralles, Ali Byrne, Kirwan Williams, Miles Robson, Tom Knight, Bronwyn Partell and Matthew Barber participated in the survey and subsurface testing field work.

NGH Director/Principal Heritage Consultant Matthew Barber reviewed the report for quality assurance purposes.

Consultation with the Aboriginal community was undertaken following the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. A total of 17 Aboriginal groups registered their interest in the proposal.

Based on the consultation guidelines, six of the registered Aboriginal parties to this project were selected to participate in each of the two stages of fieldwork undertaken:

- Ngambri Local Aboriginal Land Council
- Buru Ngunawal Aboriginal Corporation
- Freeman and Marx
- Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation

- Yurwang Gundana Consultancy Cultural Heritage Services
- Didge Ngunawal Clan

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

1.7 Acknowledgements

NGH acknowledges that we work on the traditional lands of the Ngun(n)awal people and recognises the enduring connection to the land. We pay our respects to elders, past present and emerging.

NGH wish to acknowledge Jackie Taylor, Senior Team Leader, and Dr Sarah Robertson, Archaeologist, of the Aboriginal Cultural Heritage Regulation – South, for the provision of guidance in the preparation of the ACHA methodology.

Special thanks to Dr Amy Mosig-Way for her ongoing interest and advice regarding this project and the archaeology of the Lake George region.

2. Aboriginal consultation process

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

Stage 1 – Notification of project proposal and registration of interest.

Stage 2 – Presentation of information about the proposed project.

Stage 3 – Gathering information about cultural significance.

Stage 4 – Review of draft cultural heritage assessment report.

The consultation steps completed are outlined below and supporting documentation including correspondence with groups and individuals who registered, as well as a consultation log, is provided in Appendix A. A summary of actions carried out in following these stages are as follows.

Stage 1. Letters outlining the development proposal and the need to carry out an ACHA were sent to the Ngambri LALC and various statutory authorities including Heritage NSW, as identified under section 4.1.2 of the ACHCRP. An advertisement was placed in the local newspaper, the *Canberra Times*, on 25 February 2021 seeking registrations of interest from Aboriginal people and organisations (see Appendix A). Letters were then sent to all Aboriginal organisations identified by the relevant authorities (primarily Heritage NSW), with a request for all interest parties to register. In each instance, the closing date for submission was 14 days from receipt of the letter.

As a result of this process, 17 Aboriginal groups registered their interest in the proposal.

The Aboriginal community groups who registered an interest in the project were:

- Ngambri LALC
- Buru Ngunawal Aboriginal Corporation
- Didge Ngunawal Clan
- Ngunawal Heritage Aboriginal Corporation
- PD Ngunawal Consultancy
- [redacted]
- [redacted]
- Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation
- Freeman and Marx
- Muragadi Heritage Indigenous Corporation
- Murri Bidgee Mullangari Aboriginal Corporation
- Merrigarn Indigenous Corporation
- Yurwang Gundana Consultancy Cultural Heritage Services
- Oak Hill Enterprises
- [redacted]
- [redacted]
- [redacted]

As a courtesy to all the registered parties we have only included brief summaries of correspondence for this project. However, detailed information and correspondence logs can be provided on request to Heritage NSW. The Consultation Log in Appendix A will be redacted in all public versions of this report.

Stage 2. On 11 June 2021, an *Assessment Methodology* document for the proposed Blind Creek Solar Farm was sent to the 17 of the Registered Aboriginal Parties (RAPs) 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 values associated with the Project Site and/or any Aboriginal objects contained therein. A minimum of 28 days was allowed for a response to the document.

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

Stage 3a. The *Assessment Methodology* outlined in Stage 2 included a written request to provide any information that may be relevant to the cultural heritage assessment of the 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 survey and testing fieldwork was undertaken from 22 July 2021 to 6 August 2021, and six of the 17 registered groups were selected for fieldwork participation by the Proponent based on local knowledge, connection and experience. The groups who participated in the fieldwork included:

- Buru Ngunawal Aboriginal Corporation
- Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation
- Yurwang Gundana Consultancy Cultural Heritage Services
- Ngambri LALC
- Freeman and Marx Pty Ltd
- Didge Ngunawal Clan

The preliminary results of the fieldwork led to the Proponent to seek to minimise impact to identified archaeological sites and sensitivity by altering the Project Site and the development footprint to allow the opportunity of installing solar arrays within areas of archaeological sensitivity that had been previously disturbed by historical sand quarrying. As a result, alterations to the original Project Site were made and a new methodology was sent out to RAPs.

Stage 3b. On 16 September 2021, an addendum letter to the *Assessment Methodology* document for the proposed Blind Creek Solar Farm was sent to the RAPs listed above. This letter provided all RAPs with an update on the status of the proposed solar farm, including the changes that had occurred to the Project Site as a result of the preliminary results from the July/August fieldwork. The document invited comments regarding the updated proposed methodology and changes to the Project Site and sought any information regarding known Aboriginal cultural significance values associated with the updated Project Site and/or any Aboriginal objects contained therein. A date for the proposed additional fieldwork was also provided to RAPs within the letter. A minimum of 28 days was allowed for a response to the document.

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

No response regarding cultural information was received in response to the letter and updated methodology.

Stage 3c. The second round of fieldwork for additional survey and testing was undertaken from 18-22 October 2021, and the same six of the 17 registered groups were selected for fieldwork participation by the Proponent. The groups who participated in the fieldwork included:

- Buru Ngunawal Aboriginal Corporation
- Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation
- Yurwang Gundana Consultancy Cultural Heritage Services
- Ngambri LALC
- Freeman and Marx Pty Ltd
- Didge Ngunawal Clan

Stage 4. In December 2021, 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. The consultation period ended on February 7th 2022.

2.1 Aboriginal community feedback

In consultation with Aboriginal knowledge holders throughout this project, NGH has been informed that:

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

NGH has considered the comments but as there are no specific comments relating to our recommendations, we suggest that the proponent continue consulting the RAPs through the next phase of the project. This is reflected in our updated recommendations which state:

- "It is recommended that the Proponent continue to consult with the Aboriginal community should the proposal receive approval regarding any conditions of consent concerning Aboriginal cultural heritage."

3. Project methodology and limitations

The project methodology was guided by the State Agency Advice provided by Heritage NSW to inform the SEARs, which required the ACHA to:

- address the archaeological sensitivity and heritage significance of the area of the Lake George sand deposits, identified as a cultural landscape in the South-east and Tablelands Regional Plan 2036, and
- complete a full archaeological assessment, including test excavations.

To appropriately address the Heritage NSW advice and the heritage sensitivity of the Project Site, NGH consulted with both Heritage NSW and Dr Amy Mosig-Way (University of Sydney; Australian Museum) to develop an appropriate, draft ACHA methodology to guide survey and test excavation (this report provides further detail regarding the survey and test excavation methodology in section 4 – Archaeological Investigation Results). The draft ACHA methodology was accepted by Heritage NSW and the registered Aboriginal parties, with no comments or issues raised during the consultation period.

NGH modelled the ACHA methodology on the work of Dr Mosig-Way. Dr Mosig-Way completed her PhD (2018) at Lake George on how to best undertake a test excavation within open, unbounded landscapes and employed a deductive method to analyse stone tool assemblages to understand past human behaviour. Her work is particularly relevant to this project as she has investigated both within and adjacent to the BCSF Project Site. Additionally, a PhD provides a level of research, data and analysis to which most ACHAs do not typically have access for guidance and comparison.

Dr Mosig-Way used a method called ‘Event based analysis’ (EBA) to sequence buried stone artefact assemblages, particularly in the open landscape, as opposed to rock shelter deposits. Artefacts can move overtime vertically through deposits, particularly sandy deposits, as a result of root and animal movements and environmental processes that erode and aggrade the deposit over time, essentially leading to the mixing of artefacts and artefactual deposits, termed bioturbation. EBA includes several methods, including artefact refitting, to help deduce when an artefact assemblage is mixed and is made up of multiple events that occurred at different times.
Dr Mosig-Way therefore warns against the making of whole-of-assemblage comparative analyses, since artefact densities within sites can be skewed by the mixing of deposits.

The key challenge for the NGH investigation was first how to identify the presence of Aboriginal heritage sites when, as Dr Mosig-Way notes, the enduring characteristics of the Lake George sites is their “patchy” nature, and secondly how to compare our results, and assess the significance of the heritage, when our program was test excavation as opposed to open area excavation.

In order to address the inconsistent nature of the artefact distribution across the landscape, NGH, like Mosig-Way (2018), first completed a landform-based, archaeological predictive model based on previous archaeological studies completed within the region, some of which were either adjacent or intersected with the proposed Blind Creek Solar Farm Project Site. Areas of aeolian deposition, along with lake shore strandlines, have been previously identified as offering good conditions for the preservation and stratification of occupational episodes (Attenbrow 1984; Hughes & Spooner 2010; Packard 1986a).

Based on this modelling, the Proponent removed the strandline landform from the proposed development footprint to avoid impacts to this landform in order to reduce the anticipated impact to the Aboriginal heritage resource.

The initial step for the assessment methodology was therefore to define landform boundaries for the Project Site. This was undertaken through use of Digital Elevation Modelling (DEM), where satellite and contour data were used to determine elevation and slope and mapped using GIS. Based on this data, and through use of the DEM with aerial photography and soils data, the Project Site was divided into a number of landforms. Each landform was then grouped into a sensitivity category of High, Medium and Low potential to contain significant numbers of stone artefacts. The landform category, and the assigned archaeological sensitivity formed the basis for the archaeological assessment for the Project.

NGH undertook a two-stage approach of survey and test excavation to assess the predicted landform-based, archaeological sensitivity model in relation to the proposed development impact footprint.

Previous studies had identified that surface archaeology existed in differing densities but with varying site integrity. However, the Project Site is large, and visibility was very low due to dense vegetation cover at the time of the assessment, so the effectiveness of survey to identify surface artefacts was considered to be limited. Surface survey assisted somewhat in ground truthing of the desktop landform mapping, but due to minor changes in topography and length of grass cover in particular, some difficulty to assess the precise landform boundaries in the field was encountered. So, whilst survey was included as a component of the investigation methodology, more emphasis was placed on the test excavation.

During her PhD subsurface excavations, Mosig-Way used landform mapping to identify areas to survey, the results of which she used to recommend areas that were most likely to have stratified deposits. However, this was not the primary aim of NGH, as the ACHA required assessment of the potential impacts by the proposed BCSF works across the entire Project Site. Therefore, NGH investigated areas not only predicted as having high sensitivity but those areas of low to moderate sensitivity too. The aim of this was to evaluate the accuracy of the desktop, landform, archaeological sensitivity mapping, so that we could make broad-scale landform assessments. Additionally, NGH sought to provide an opportunity to answer the research question about site patterning across the landscape, and specifically how site patterning changed as one moved further away from the lake shoreline.

To address the irregular nature of heritage sites within the Proposal Site, NGH partially adopted the methodology employed by Mosig-Way (2018), which was to cluster test pits in the attempt to capture discreet, archaeological signatures that might be missed if broadly spaced, linear or grid patterns of test pits were used. Whilst Mosig-Way used three test pits oriented in an triangle, NGH used a cross pattern of five test pits spaced approximately five metres from a central pit and five metres from the nearest test pit in the cluster. This approach was consistent with the requirements of the Code of Practice, and no pits were placed within 5 m of another. Also, at no site was more than 5% of the sites or PAD area excavated, thereby also meeting the requirements of the Code of Practice.

The scale of the Project Site however, also necessitated the use of test pits in transects and on occasion placement of isolated test pits. The transects were positioned in areas to test across a landform where it was considered necessary to examine a broader area, while isolated test pits were placed where particular examination of a feature or clarification of stratigraphic profiles was required. Further details of the testing methodology are provided in Section 6.2.

Based on the previous information and investigation methods outlined above, the aim of this assessment was to be able to effectively characterise the archaeological sensitivity of landforms, and attempt to identify discreet, high density, archaeological deposits.

The specific objectives of the assessment methodology were therefore to:

- Produce a comparable data set to previous archaeological studies completed within proximity of the Project Site, particularly that of Dr Mosig-Way;
- Produce an accurate landform archaeological sensitivity predictive model and test that model in order to make reasonably accurate archaeological sensitivity assessments of landforms present in the Project Site;
- Produce data that might inform site patterning across the Project Site, particularly how sites may change the further investigations are from the lake shoreline;
- Identify discreet and well stratified archaeological deposits that might be further investigated through open area excavations.

Broadly, the archaeological aims of the project were to:

- Identify the presence or absence of Aboriginal cultural material within the impact areas.
- Assess the likely extent and nature of any such cultural material.
- Assess the archaeological significance of any cultural material.
- Provide an opportunity for Aboriginal stakeholders to assess the cultural significance of any material.
- Assess the management requirements for any cultural material.

NGH sought advice and guidance from Heritage NSW in order to develop a methodology that would meet the expectations set by the Heritage NSW Government Heritage Advice to the SEARs and to appropriately address the significant archaeological and cultural heritage values of Lake George. NGH Director/Principal Heritage Consultant Matthew Barber, Principal Heritage Consultant Jakob Ruhl, and Heritage Consultant Jorge Fuenzalida Miralles, consulted with Jackie Taylor, Senior Team Leader, and Dr Sarah Robertson, Archaeologist, of the Aboriginal Cultural Heritage Regulation – South regarding the approach. Heritage NSW provided technical guidance and gave their in-principle support to the landform approach proposed by NGH.

3.1 Study limitations

Over such a large area of investigation, there are always limitations encountered in assessing the archaeological record and this project was no exception. However, the approach undertaken by NGH, and through consultation with the Aboriginal community and Heritage NSW adopted for the Blind Creek Solar Farm Project Site, had some of the limitations managed as best as possible. Below is a list of the limitations and the approach to overcome them, as far as practical for this assessment.

Survey coverage. The Winter and Spring of 2021 was particularly wet which provided highly favourable conditions for grass growth across the Project Site. It had been noted that the scale of the Project Site was large which ordinarily would have provided challenges to adequately survey the area. However, with the high level of grass cover and low surface visibility, it was obvious that comprehensive survey of the entire Project Site was unlikely to be effective or practical. Undertaking survey for the sake of walking was not an effective means of discovering surface sites, which were expected to be predominantly made up of stone artefacts.

Nevertheless, site survey was undertaken, with care taken to cover at least a portion of each landform that may be affected by the development proposal. The survey was undertaken in the standard method of transects with archaeologists and Aboriginal representatives walking across the area.

The Lake George area has the benefit of having been subject to a large number of archaeological assessments, mostly for sand mining and other development purposes as part of impact assessment and approval studies. This, combined with the more recent PhD research conducted by Mosig-Way, provided the assessment team with an excellent understanding of the archaeological setting and context, providing detailed information for modelling Aboriginal site occurrences and patterning. This information was used in the establishment of detailed landform mapping for the Project Site and the categorisation of areas of High, Moderate and Low archaeological sensitivity. NGH believes this information and approach offsets the lack of physical surface survey.

Test excavation. The test excavation programme was aimed at sampling a range of landforms. The size of the Project Site meant that although the main landforms were subject to testing, the programme was by necessity biased slightly towards the landforms of higher archaeological sensitivity. It was clear during the survey that areas such as the low floodplain were highly susceptible to flooding and indeed this was the case during parts of the survey where water was lying across large areas of the lowest landforms. It may be argued that limiting the testing in such areas reduces the potential for finding archaeological deposits, which in some senses is true from a stratified sampling perspective.

However, NGH considered that the evidence for the presence of archaeological material in such low sensitivity landforms was genuinely low and therefore concentrating subsurface testing effort in such circumstances was no warranted and an ineffective use of time and resources. Rather, it was thought that undertaking subsurface testing in landforms that were of moderate potential, or even areas where the archaeological sensitivity was not clearly established was a higher priority. As such, testing was focused on areas of moderate sensitivity to provide better data for making decisions about the actual presence of sites and to provide evidence on which the impact assessment could be based.

It is a limitation in the study that additional testing may have been undertaken in some landforms, but we consider, based on the evidence from previous assessments, the results of surface survey and the nature of the Solar Farm impacts, that the targeted landform-based approach to testing was justified and acceptable.

Data analyses. The information obtained from the archaeological survey and the test excavation programme was mainly the presence, or absence, of stone artefacts. It is possible to undertake a wide range of analyses of such data under a scientific investigative framework such as a PhD. However, the limitation of the current assessment is that there is limited time in which to undertake such analyses. The PhD work by Mosig-Way was used as a basis for some of the research questions for the current assessment. However, the type of analyses completed by Mosig-Way was more detailed and extensive than that complete for the current investigation. Some basic analysis of the data was achievable, but some of the research questions, particularly in relation to the numbers of artefacts recovered from the testing and the ability to conduct refitting exercises, was not possible.

Nevertheless, some areas of archaeological research and questions relating to the occupation of the area by Aboriginal people were able to be formulated, which aids in the establishment of research potential of the area for future researchers to investigate.

4. Background setting

4.1 Review of landscape context

Understanding the landscape context of the Project Site may assist us to better understand the archaeological modelling of the area and assist to identify local resources which may have been utilised by Aboriginal people. This landscape assessment is based on a number of classifications that have been made at national and regional levels for Australia.

4.1.1 General description

The Project Site is located within close proximity to the significant hydrological landscape of Lake George. Lake George is 69km long, north to south, and 19km wide, east to west. The lake is 700m above sea level. The lake is believed to be more than a million years old and has no outflow to rivers or oceans (endorheic) (Abell 1985, p.2). The Lake George Escarpment on the western side of the lake was formed along a fault line blocking creeks and rivers that previously drained into the Yass River, forming the Lake, which extends for approximately 25km in length and 10km in width (Abell 1985:4).

The Project site typically slopes from east to west with elevations ranging from about 674m AHD at Lake George to 720m AHD. On its northern flank the Project site abuts a relatively steep terrain which rises to an elevation of about 900m AHD. The Project Site includes undulations and rises, with increasing slope gradients to the north-east, east, and south-east. The paddocks are predominantly covered with exotic grassy vegetation, the density of which varies with seasonal conditions, interspersed with cropping cycles for weed control. A section of remnant native woodland has been excised by the proponent.

The national Interim Biogeographic Regionalisation for Australia (IBRA) identifies the Project Site as being located within the South-eastern Highlands Bioregion (SEH) (NSW DPIE n.d.). The SEH Bioregion comprises of ten subregions: Hill End, Orange, Bathurst, Kanangra, Oberon, Crookwell, Bungonia, Murrumbateman, Western Fall, and Monaro. The Project Site is within the Monaro subregion which is described in Table 4-1 IBRA Subregion Monaro Description, below.

Further landscape mapping conducted by Mitchell (DECCW 2002) identifies two landscape types within the Project Site. These are the Lake George Complex, which covers the majority of the Project Site, and the Gundary Plains, which covers a small portion of the eastern Project Site. These landscapes are described in Table 4-1 and Table 4-2 below.

Table 4-1 IBRA Subregion Monaro Description.

Subregion	Geology	Landforms
Monaro	Block faulted ranges and closed lake basins in Silurian and Devonian acid fine grained sedimentary and metamorphic rocks with some granites. Extensive areas of thin Tertiary basalt flows over lake and river sediments.	Sloping plateau rising from 600m to 1300m north to south. Structural ridges of more resistant rock. Stepped plains on basalt with intervening low areas of granite or sedimentary rocks. Numerous shallow lakes and swamps, a few permanents; many are closed basins and periodically dry. Area is in rain-shadow with rainfall 450-700mm.

Table 4-2 Mitchell Soil Landscape Descriptions

Soil Landscape	Description
Lake George Complex	Closed drainage basins of Quaternary lakes and swamps set within block faulted ranges. Extensive Tertiary quartz gravel, sand, and mud overlying Silurian-Devonian gneissic granite and Silurian quartz sandstone and mudstone. General elevation 700m, local relief of lake beds <50m, rounded hills stand above the plain to 900m. Eastern margins with well-developed sandy lunettes. Maximum lake depths about 7m, may be dry for periods of years or vary in water level over decades. Evidence of much greater extent and depth during the Pleistocene ice ages. Self-mulching grey clays on the lakebeds, yellow earths on the lunettes. Wet tussock grasslands of spear grass (Austrostipa sp.) and Poa sp. with kangaroo grass (*Themeda triandra*) on lake margins, now extensively altered by exotics. Clumps of sparse stunted snow gums (*Eucalyptus pauciflora*) on low hills and sandy lunettes. Common reed (*Phragmites australis*) around freshwater seepage areas on lake margins.
Gundary Plains	Wide open valleys with abandoned terraces and Quaternary lakebeds on lower Devonian siltstone, sandstone, andesite and quartz felspar porphyry. General elevation 75m, local relief <30m. Yellow, hard setting texture-contrast soils with distinct bleached A2 horizons. Grasslands of spear grass (Austrostipa sp.) and kangaroo grass (*Themeda triandra*) with small clumps of sparse snow gum (*Eucalyptus pauciflora*) on rounded rocky hills and sandy lunettes of former lakes.

4.1.2 Geology

Due to the proximity of the Project Site to the Lake George fault line, and the age of the lake formation, there are several geological formations found within the Project Site. These are described in detail in Table 4-3.

Table 4-3 Geological formation present throughout the Project Site (Colquhoun et al. 2020).

Geological Formation	Description
Lake Strandlines	Part of the Cenozoic Sedimentary Province. Characterised by unconsolidated poorly to well sorted rounded gravel interbedded with varying amounts of well sorted medium to coarse grained sand. Deposits form low rises with asymmetric cross-sections marking prior lake levels. Some may be relict lunettes. Formed within a transitional depositional environment during the Quaternary period of the Cenozoic.
Abercrombie Formation	Part of the Lachlan Orogen supergroup. Characterised by brown and buff to grey, thin-to thick-bedded, fine to coarse grained mica quartz (+/- feldspar) sandstone, interbedded with laminated siltstone and mudstone. Sporadic chert-rich units. Formed within a deep marine – siliciclastic and biochemical depositional environment during the early to mid-Ordovician.
Alluvium	Part of the Cenozoic Sedimentary Province. Characterised by unconsolidated grey to brown to beige humic (+/-) micaceous silty clay, quartz (+/-) lithic silt, fine to medium grain quartz rich to quartz lithic sand, polymictic pebble to gravel (as sporadic

Geological Formation	Description
	lenses); sporadic paleosol horizons. Formed within a terrestrial-fluvial depositional environment during the Quaternary period of the Cenozoic.
Lockhart Igneous Complex – Gabbro – Dolerite Phase	Part of the Thurralilly Suite. Characterised by green to black, medium to coarse grained, equigranular to intensely foliated, commonly ophitic, hornblende (+/-) pyroxene olivine dolerite to gabbro; the dominant lithology is granite. Formed within a shallow crustal (continental I-type) depositional environment during the Lower Devonian.
Elleden Granite	Part of the Thurralilly Suite. Characterised by leucocratic, medium grained, equigranular, biotite (+/-) muscovite granite with a marginal phase of fine to medium grained, leucocratic, porphyritic, granite and microgranite. Formed within a shallow crustal (continental I-type) depositional environment during the Lower Devonian.
Colluvium	Characterised by poorly sorted, weakly cemented to unconsolidated colluvial lenses of polymictic conglomerate with medium to very coarse-grained sand matrix; interspersed with unconsolidated clayey and silty red-brown (aeolian) sand layer, modified by pedogenesis. Formed during a transitional (marine to terrestrial) depositional environment during the Quaternary.
Residual Deposits	Characterised by a weakly-consolidated regolithic residuum such as soil or saprolite mostly developed in-situ as a result of advanced weathering and/or pedogenesis. Formed within a terrestrial (fluvial) depositional environment during the Quaternary.

The geological formations found within and in close proximity to the Project Site suggest that raw stone material for the manufacture of stone tools, specifically quartz and mudstone, was locally available. It should also be noted that the presence of different geological formations does not exclude the possibility that superior raw material types were traded from other regions.

Archaeological studies undertaken in proximity to the proposed Blind Creek Solar Farm indicate that there are no rock outcrops in the Project Site and that artefacts were made from blocks of stone brought from elsewhere. The source of the lithic material recovered during archaeological excavations within and near to the Project Site is unknown. Whilst quartz and chert were available locally, there are no known quarried sources of silcrete in the Lake George region.

4.1.3 Soils

The type and condition of natural soils can provide information about the potential for evidence of past use by Aboriginal people to remain present in subsurface deposits. The Project Site is comprised of two soil landscapes as mapped within eSpade; these are described in Table 4 4 below.

Table 4 4 Soil landscapes present within the Project Site (State of NSW and Department of Planning, Industry and Environment 2020)

Soil Profile	Description
Coopers	Characterised by old lake beaches, dunes and sandsheet on Quaternary alluvium with deep to

Soil Profile	Description
	very deep (>100cm), very poorly drained Hydrosols and Stratic Rudosols (Alluvial Soils) on Ngungara/Weereewa. Moderately deep to very deep (>90cm), imperfectly drained Brown Chromosol (Yellow Podzolic Soils) on old beaches. Well-drained Stratic Rudosols (Siliceous Sands) on beach dunes. Moderately deep to very deep, poorly drained Stratic Rudosols (Alluvial Soils) on swales. Soil acidity ranges from slightly acidic to neutral (pH 5.5 – 6.5) in the topsoil to neutral to slightly alkaline (pH 6.5 - 8.5) in the subsurface soils. Local limitation includes highly erodible non-cohesive soils, localised seasonal waterlogging, and wind erosion hazards.
Taylors Creek	Characterised by extremely shallow (<40cm), well-drained Rudosols (Lithosols) and Tenosols (Earthy Sands) on crest or adjacent to outcrops. Moderately deep to shallow (<80cm), moderately well-drained Red Kandosols (Red Earths) and Red Chromosols (Red Podzolic Soils) on upper and midslopes. Moderately deep (<10cm), poorly drained Kurosols (Soloths) and Sodosols (Solodic Soils) on lower slopes and drainage lines. Soil acidity ranges from slightly acidic to neutral (pH 5.5 – 6.5) in the topsoil to neutral to slightly alkaline (pH 6.0 – 7.5) in the subsurface soil. Local limitations include seasonal waterlogging, gully erosion risks, localised sheet erosion risks, localised shallow soils, localised non-cohesive soil, and localised rock outcrops.

The varying acidity of the soils suggests that there is a possibility for organic archaeological material to remain within the topsoil in areas that contain a neutral pH. Furthermore, the numerous erosion hazards indicate that durable archaeological material located in upper soil layers, such as stone artefacts, will have likely been displaced from their original position. The presence of shallow soils within the Taylors Creek landscape suggests that there may be a reduced potential for intact subsurface archaeological remains in those areas, although the geotechnical results suggests that the deposits within the Project Site are relatively deep (greater than 2m in depth). Deep deposits in unmodified land have the potential to contain *in situ* archaeological deposits.

Geotechnical testing

Geotechnical testing was undertaken for the Blind Creek Solar Farm proposal (Douglas Partners 2021). The purpose of these investigations was to assess the subsurface soil and groundwater conditions of the proposal site. The geotechnical investigations included the excavation of two test pits, drilling of eleven boreholes, two electrical resistivity tests and also the testing of select samples within a laboratory.

The results of the geotechnical testing provided an indication of the subsurface soil deposits throughout the Project Site:

- The western portion of the site is underlain with Quaternary deposits of alluvium, colluvium, aeolian and strandline units.
  - Alluvium soils are characterised by gravels, sand, silty clay and black organic clay.
  - Strandline deposits are paleo-beach deposits that have formed in sandy spits along the shoreline of Lake George. The strandline formation is generally characterised by a higher portion of sand and gravels than is seen in the alluvium deposits. These deposits relate to the changing or receding shoreline of the lake.
  - Colluvium deposits are comprised of fanglomerate and poorly formed conglomerates, gravel and sand.
  - Aeolian deposits are comprised of a fine quartz sand.

- The eastern portion of the proposal site is underlain by the Devonian Ellenden Granite of the Bega Batholith Group.

The results of the geotechnical investigations highlighted three consistent units across all testing locations:

- Topsoil – a sandy deposit varying from loose to medium densities, ranging from 15-20cm in all borehole locations, while the topsoil characteristics of the two test pits excavated highlighted a more-loose-and-fine to medium grained silty sand, reaching depths between 25-30cm.
- Sand – the deposit underlying the topsoil in all geotechnical investigation locations consisted of sand, with highly variable densities from loose to compact. The sand was typically fine grained with some medium grained sands occurring at depth. Within the eleven boreholes, the deposits reached a minimum depth of 90cm to a maximum depth of 3m. Within the two test pits excavated, the sand deposits reached 1-2m in depth.
- Silty Clay – Sandy Clay – Clayey Sand. The underlying stratigraphy present within the geotechnical results identifies more of a ranging difference throughout the Project Site. This deposit is characterised by clay of a low to high plasticity that is dense to very dense terminating at depths between 3-5m. Within the eleven boreholes, the stratigraphy varied from a silty clay to a clayey sand. This deposit had ranging plasticity and density from low to high, with the deposit terminating between 2.05-3.2m in depth.

There were no colluvial or strandline deposits recorded at any geotechnical testing locations. The results of the laboratory testing also highlight the varied pH across the proposal site, with the majority of tested soils being moderately acidic with a pH between 5.8 and 8.1.

The results of the geotechnical testing highlight three main deposits present across the proposal site. The testing has identified deep sandy deposits across the site with the potential to contain archaeological material. The characteristics of the soils described in the geotechnical results indicate that while there are some changes evident in the stratigraphy of the Project Site, the characteristics of the soil across the site is similar.

4.1.4 Hydrology

Lake George is one of the largest saltwater endorheic lakes in Australia when full. The lake is ephemeral and in recent decades has been predominantly dry. The proposed Blind Creek Solar Farm is located on the south-eastern shoreline of the lake and extends approximately 5-6km to the west.

The Lake is fed by precipitation directly onto the lake’s surface, with the remaining inflow from short streams no greater than ~20km in length. The main named creeks within the proposed Blind Creek Solar Farm are Butmaroo (locally known as Deep), Wrights, and Bridge (locally known as Blind).

Sediments within the basin preserve evidence of multiple permanent and dry lake conditions in the past and scientists have researched the chronology of recent lake shoreline sediments in order to reconstruct Holocene hydrologic variability at Lake George (Fitzsimmons & Barrows 2010, p.1). The Optically Stimulated Luminescence (OSL) chronology indicates three distinct periods of permanent lake conditions up to 15–18m depth over the Holocene period, at approximately 10–8, 6–2.4 and 0.7–0.3 (thousand years ago), with lower lake levels occurring in between those events. The chronology is broadly synchronous with comparable records of Holocene climatic variability across south-eastern Australia.

In her PhD thesis (2018), Amy Mosig-Way refers to the work of Coventry and Walker, as well as Fitzsimmons and Burrow in particular, to illustrate how water levels fluctuated during the Holocene with the height of waters extending the lake's shoreline up to 5km further east than today. Mosig-Way summarises the fluctuations (2018: 20), which NGH has used to provide the following chronology that is also shown in Figure 4-1 below (BP: *before present*):

- 7,000 BP, the lake was dry or ephemeral.
- 6,000BP, the lake rose approximately 17m to produce 'deep, freshwater conditions (Fitzsimmons & Barrows 2010, p.595) (Singh & Geissler 1985, p.419).
- 4,000BP, the lake was once again ephemeral.
- 3,200BP, the lake returned to deep, freshwater conditions with a rise of approximately 11.5m (Fitzsimmons and Barrows 2010:595).
- 600-300BP, another ephemeral period, followed by the most recent lake highstand to 15m-18m (Fitzsimmons and Barrows 2010, p.595).

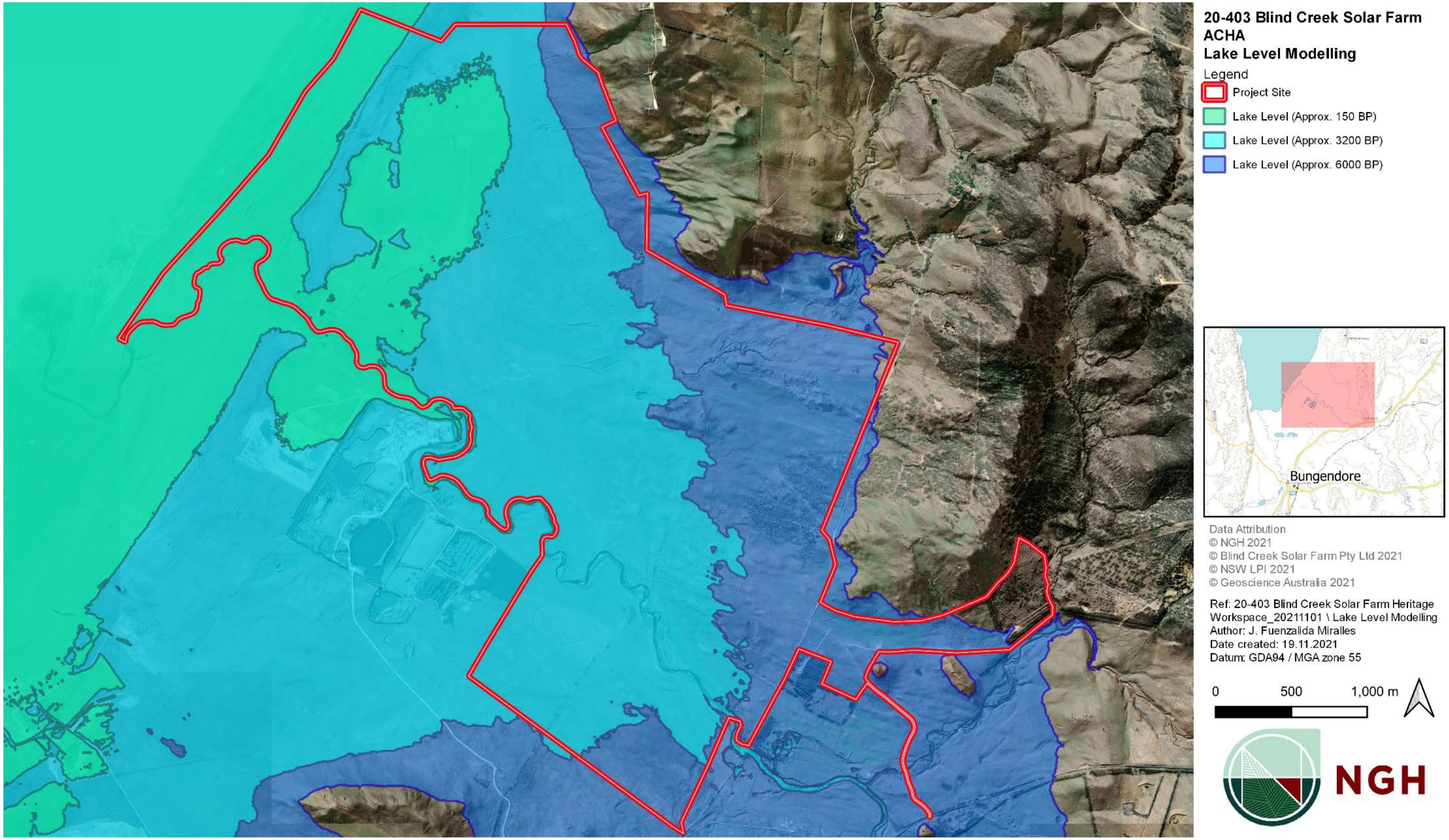

Figure 4-1 Modelling of the approximate levels of Lake George over time using current 1 metre contour data.

4.1.5 Topography

The topography of the Project Site includes a variety of landforms but can be described broadly as consisting of a beach and raised strandline; a lagoon and floodplain; undulating floodplains and basal slopes; creek lines, creek terraces and elevated sandy deposits. The topography rises to the north and east of the Project Site.

Geomorphological studies state that a number of shoreline ridges are preserved between 4m and 37m above the deepest point of Lake George (Coventry 1973, 1977), the most prominent of which lie at approximately 12m, 18m and 37m above the lakes deepest point (Coventry 1973).

The higher lake heights would have provided periods over the Holocene where floodplains would have been inundated, and elevated areas within the Project Site would have had easy and direct access to the water and resources (refer to Figure 4-1 above).

4.1.6 Flora and fauna

The majority of the Project Site consists of exotic pasture and cropland on flats. These areas have a long history of cultivation, cropping, pasture improvement, and grazing since the initial European settlement approximately 200 years ago. Understanding the nature of the flora and fauna that would have been present prior to colonisation is important in determining the types of resources which may have been available to Aboriginal people living in the area.

Mosig-Way provides some comparative analysis between Holocene conditions and those observed today, pointing out that broadly speaking they would have been quite similar (Mosig-Way 2018, p.20). She writes that pollen and spore records from artefacts found on the northern end of the Lake George basin show that 'open eucalypt woodland with an under-storey dominated by grasses and herbaceous taxa' has predominated in the region for the last 9,300 years (Dodson 1986, p.231). Dr Mosig-Way uses to Dodson to emphasize that the climatic changes after the establishment of this vegetation, were 'not great enough to lead to any significant change in vegetation, which suggests that they were within about 250mm/year precipitation and + 5°C mean annual temperature of those at present' (Dodson 1986, p.247).

An ephemeral rainfall-dependent wetland which is cultivated during dry periods is located in the west of the site and a Snow Gum and Manna Gum woodland occupy the flats and lower slopes in the east of the site, particularly around the airstrip. These areas would once have contained abundant resources such as native wetland herbs including Grass Poly and Austral Mudwort in the wetland, and large eucalyptus trees in the woodlands, home to birds, arboreal and terrestrial mammals and reptiles. These areas, which have been excised from the development footprint, demonstrate that the local area would have supplied important resources food, medicine and other items.

Early European visitors to the lake observed that game abounded on the lake and its surroundings, including wild duck and swans (*Goulburn Evening Post* 1952, p.2).

4.2 Ethnographic and European context

4.2.1 Ethnographic setting

Lake George is located within the Southern Tablelands region of NSW. There are several ethnographic recordings of Aboriginal life in the NSW Southern Tablelands region from the 1800s that 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, brought by Europeans, that greatly affected the population sizes and distribution of people within the landscape. Consequently, European records may not necessarily reflect pre-contact population distributions and traditional ways of life (Dowling 1997; Littleton & Allen 2007).

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).

4.2.2 Tribal boundaries

Early mapping of tribal boundaries by Tindale (Tindale 1940, 1974) and subsequent mapping by Horton (Horton 1994) identified the proposed BCSF area as within the Ngun(n)awal 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 perhaps not static, they were most likely fluid, expanding and contracting over time to the movements of smaller family or clan groups. These boundaries may have ebbed and flowed through contact with neighbours, the seasons and periods of drought and abundance. The proximity to each other also meant that people likely spoke multiple languages and dialects (Howitt 1904; Tindale 1974; Horton 1994).

The boundaries of Ngun(n)awal people are described as: Queanbeyan to Yass, Tumut to Boorowa, and east to beyond Goulburn; on highlands west of the Shoalhaven River (Tindale 1974). The 2008 Palerang Council Thematic Heritage Study for Lake George, Molonglo Valley and Burra (Plowman 2008) asserts that the main tribes in the Lake George and Molonglo Plains area were the Moolinggoolah and the Mulwaree. Lake George was called Weereewaa (and various other spellings), and they shared parts of the district with other tribes or clans. To the south of Lake George and east of Bungendore the Moolinggoolah and the Mulwaree shared the area with the Kamberri and the Parramarragoo (Plowman 2008:10). These neighbouring groups were linked by customs, ceremonies and kinship networks, although the Weereewaa people may have had an aggressive disposition which was known to other more distant Tribes (Jackson-Nakano 1998:4).

4.2.3 Pre-settlement practice

Movement in the region occurred in set patterns, defined by ceremonial and ritual activities and resource availability (Waters Consultancy 2017:58). The people who lived around Lake George could rely on sustenance from mammals including kangaroos, wallabies, wallaroos, wombats; birds including emus; and moths for food, with lesser amounts of fish and vegetables incorporated into their diets. Smaller game obtained for food included lizards, possums, birds, mussels, bird eggs, yams, berries, grubs and grass seed (Avery 1994). Occasionally smaller family groups would come together in gatherings of a thousand or more people in order to make use of seasonal resources (‘Welcome to Ngunnawal Country’ 2021). In the summer months, the Ngun(n)awal people travelled to the Bogong moth aestivation sites within the mountains to exploit this regular food source (Koettig 1981, pp.3–4).

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.

Material culture prior to European arrival is uncertain but presumably would have been wide-ranging in items, utilising the range of available resources (Avery 1994). Items used by local Aboriginal people were recorded by Bennett in 1834, Wright in 1923 and Bluett in 1927, including wooden implements of shields, spears, boomerangs and nulla-nullas, as well as stone axes, bone awls used for sewing skin, shells to remove flesh, and kangaroo and possum skin rugs (as cited in Avery 1994).

In an archaeological context, few of these material culture items would survive, particularly in an open site context. Anything made from bark and animal parts would decay quickly in an open environment. However, other items, particularly those made of stone, would survive where they were made, placed, or dropped. Shell material may also survive in an archaeological context. The utilisation of raw materials, such as the extraction of wood or bark, would leave scars on trees that are archaeologically visible, although few trees of sufficient age survive in the modern context. Outcropping stone sources also provide clues to their use through flaking, although pebble beds may also provide sources of stone, which leave no archaeological trace.

Proximity to resources, particularly food and water sources was a key factor in the location of Aboriginal sites. It is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape, but current archaeological records of that activity are limited. Topography too was a key factor in the use of the landscape as it defined suitable travel routes and areas providing access to water and shelter from the elements. Lake George was a great resource, however it was also a landscape of intangible, cultural and spiritual significance. An Aboriginal knowledge holder is recorded in the Ginninderry Development Project (Waters Consultancy 2017:81) explaining that songlines and pathways go from the Ginninderra Falls area to Gungahlin and out to Lake George.

The surveyor William Govett travelled through the Lake George area in the early 1830s and recorded the following account of a corroboree:

> *Corrobory – or a particular dance of the natives. I was once present and witnessed this most extraordinary dance of the Blacks which took place near Lake George called by the natives "Weriwa"- I understand this ceremony only takes place upon the friendly meeting of two tribes after a fight or dispute, to celebrate the cessation of hostilities. On this occasion there were a hundred and eighty collected together, men, women and children, and the place chosen very suited to the purpose being a small open spot, clear of timber, but surrounded on all sides by the darkness of the forest.*

The Canberra Times reported, providing no reference however, that in 1838, in the horse paddock of the Deep Creek "Cottage," the last of the tribal wars between the Aboriginal people of Goulburn and Murrumbidgee and Cooma, and Queanbeyan and Bungendore took place (*The Canberra Times* 1958).

4.2.4 Exploration

Weereewa (Lake George) was first seen by European explorers in 1820. Joseph Wild was sent by Dr Charles Throsby to find water south of Sutton Forest in the Southern Tablelands.

Wild's account of his discovery of the lake is given in a letter written for him to Throsby by Sylvester Hall, clerk to the road party, from “Wollondellie" on August 28, 1820 (Jones 1952):

> *"On the day you (Throsby) parted from him (Wild) (Saturday, the 29th) after a direction about S.W., he (Wild) came in view of the Lake Weerawa from a hill at four miles distance. Arriving at the N. end of the lake. he turned towards the southwards on a level bank grassy to the water's edge and found the land good pasture but unfavourable for cultivation. From the hills the party saw the fires of the natives who appeared numerous. 'They pursued their course on Sunday over capital land to the southward by the bank of the lake and slept between two creeks on the E. side. On Monday the 21st he followed the lake and encamped at a creek at the southern point-all this day over very excellent land, fit for any purpose, clear of timber. A strong westerly wind caused a heavy rolling surf like the ocean."*

4.2.5 Pastoralism

Of the parcels of land within the Project Site, the first land holder was Captain Joseph Thompson (Lot 2 D.P. 1167699). Captain Joseph Thompson was a merchant seaman who arrived in NSW in 1806. Thompson owned a large herd of cattle, which was managed for him at Bathurst and Goulburn. In 1827, he sent the animals to Lake George, where he was granted land in 1835 bounded to the north by “Currondolee” creek that flowed into the south-eastern end of the lake. Thompson named his homestead *Grantham Park* (Barrow 2012, p.39). Grantham Park was acquired later that same year by Auditor General, William Lithgow. William Lithgow established a property on the opposite side of the ‘Great Creek’, also known as Deep Creek, referred to today as Butmaroo Creek.

The Currandooley estate came into being when William Lithgow, who had been granted land on the eastern shore of Lake George purchased Richard Brooks' adjoining estate to the south (Turalla) and Allen's farm on Deep Creek. These holdings were consolidated into the one property named Currandooley. After Lithgow’s death in 1864, Patrick Hill Osborne purchased the Currandooley property. The 1866 real estate listing notes that the property contained 16,784 acres, almost in one block; had a ‘never-ending supply’ of fresh water from Butmaroo (also referred to as Deep Creek); and access to additional grazing land when the lake receded exposing a ‘vast area of pasturage’, where ‘thousands of sheep and cattle may feed on the splendid herbage of salsolaceous plants upon which the cattle graze with avidity and improve rapidly, and which has all the invaluable properties of the far-famed saltbush’ (*Sydney Morning Herald* 1866, p.11).

Pat Osborne lived in a cottage built originally by Thompson on Deep Creek, believed to be the original Grantham Park homestead (Barrow 2012:40), located approximately 100m south of the creek (pers comms. Mr Dom Osborne, 16.08.2021). During 1869-70, severe storms repeatedly inundated the cottage. One account referenced by Barrow recounts that the family escaped one flood episode by exiting the cottage via a window and leaving by boat, only to return once the waters receded to find 2-4 feet of sand covering the floor of the cottage (Barrow 2012:39). These experiences may have motivated Osborne to build a new homestead on higher ground.

From the time of European exploration (1820), the Project Site and region was mostly cleared of vegetation to provide grazing country to cattle and sheep.

The Osborne family descendants have continued to live on and farm the land. The properties in the area contain a number of residences and associated agricultural structures such as shearing sheds and accommodation, work and storage sheds, fencing, stockyards, communications infrastructure, local sealed and unsealed roads and tracks.

With the exception of sand quarrying, major ground disturbance is characterised by the establishment of tracks and construction of dams. The removal of the native woodlands would have also influenced erosion across the Project Site, specifically along creek lines and valleys. The removal of trees will have also removed any potential occurrences of scarred trees.

At present, the Project Site is privately owned and predominantly used for grazing and cropping, with a single operational sand quarry within the Project Site. Previous cropping, requiring ploughing, will disturb the top layer of soil to the depth of the ploughshare (usually between 10cm-15cm but up to 30cm) therefore potentially affecting the integrity of any Aboriginal sites. However, localised artefact movement is common through natural process such as bioturbation and does not necessarily affect overall site context. Additionally, ploughing will not disturb deeper archaeological deposits below the plough zone.

A view of a portion of the Project Site at the height of its cropping phase in 2011 can be seen in Figure 4-2 below.

Figure 4-2 An example of the Project Site in a cropping phase (circa 2012 Google Earth Pro 2021)

4.2.6 Sand quarries

The sand deposits within the region are known to be of a high quality for construction purposes. A total of three operational sand quarries are located close to the Project Site. Previously geotechnical investigations within the Project Site also confirm that many of the sand deposits reach substantial depths. The historic imagery shows that pre-1967, the current Project Site had not been used for its sand resources. By 1976, historical imagery appears to show the appearance of three new sand extraction areas within the Project Site (see Figure 4-3), the largest of which was close to the shores of Lake George along the strandline landform; the remaining two areas are smaller and located closer to Currandooley Road. Imagery from that year also shows a small runway for aircraft in the east of the Project Site, close to Currandooley Road, which the Osborne family understand to have been constructed circa 1946.

By 1985 it appears that the three sand mining quarries that were active had been decommissioned and three new quarries had been opened near the mouth of Butmaroo Creek in the 9-year interlude. The 1985 aerial image indicates that of the three new quarries, only one was in use at the time the imagery was collected. It is also during this time that Bungendore Sands began its mining operation adjacent to the Project Site on the south-western side of Butmaroo Creek.

By 1992 most sand mining activities within the current Project Site had ceased, with a single active quarry adjacent to the proposed substation site. The termination of these activities within the

Project Site coincides with the expansion of sand mining activities at Bungendore Sands to the west and other sand mining quarries in the region.

It is useful to understand how the now-disused quarry sites may have impacted the Aboriginal archaeological sites. In their investigation of the Bungendore Sands Quarry to the west, Hughes *et al*. (1984:3) provided a detailed description of the sand quarrying activities that took place within that quarry. These activities are likely to represent some of those undertaken within the sand quarries in the current Project Site. Within Bungendore Sands, quarry operators mined for 'clean' sands (no topsoils) from the centre of the beach-ridge. In the process of accessing this sand, the topsoils were removed by a bulldozer and piled in heaps around the margins of the quarry pit (which Hughes et al. termed 'scaped heaps'). Hughes *et al*. also recorded that when the quarrying activities extended further outwards, these 'scraped heaps' were moved to the new margin of the quarry or were re-spread over the ground surface in order to stabilise some areas of the mine and encourage the regrowth of grass. Due to this process, in the areas where sand mining activities have taken place, there is very little topsoil that remains in situ. Furthermore, Hughes et al. reported that the 'clean' sand that was recovered from the centre of the beach-ridges was loaded onto trucks through a conveyor belt system that removed any gravels or unwanted material (including Aboriginal objects) before the sand was removed from the site. The remaining gravel material was placed back on the floor of the quarry in what Hughes *et al*. termed 'gravel heaps'. While the sand mining activities recorded by Hughes *et al*. (1984) are relevant to the Bungendore Sands Quarry to the west, it is likely that these processes were similar to the smaller sand quarries that are present within the current Project Site. As a result, it is likely that these areas were heavily disturbed by these practices and moved a significant amount of previously unknown Aboriginal heritage deposits to the surface. Therefore, any surface artefacts recorded in association with 'scraped' or 'gravel' heaps are likely to instead characterise the material present in the subsurface deposits of former sand quarry areas and their associated landforms.

Figure 4-3 1976 Historical Imagery over the entire Project Site It is clearly visible that by 1976 three separate sand quarrying operations had been set up within the Project Site. A small airfield is also visible to the south of the middle sand quarry. (Generalised outline of project area in red indicative only.)

4.2.7 Impact of European settlement

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.

Soon after European arrival in the area (approximately 1820), the Aboriginal population likely began to decline, due to diseases such as smallpox and influenza. It should also be noted that massacres of Aboriginal people occurred throughout NSW, the majority of which were not recorded in the written histories of the state. However, many of these stories have been passed down through oral histories within the Aboriginal community, including down through the generations of Ngunawal People. [redacted]

The Proposal Site is within what was the "19 Counties" (the then limits of legal settlement) and was subject to land grants in the 1830s. European land practices included intensive grazing (particularly with sheep), clearing, fencing, damning, ringbarking of trees, and culling of native fauna that resulted in complete eradication of some species, and further disenabled Aboriginal people from maintaining traditional lifestyles and created reliance on government handouts ('Buru Ngunawal Aboriginal Corporation' n.d.; Avery 1994). However, it was not only dispossession of land and disease with which Aboriginal people had to contend but also the violent behaviour of the Europeans. Charles Throsby wrote to the Colonial Secretary on 7 September 1824 regarding stockmen and servants of Richard Brooks who had forcibly taken two young girls from the Lake George area. This and other outrages, as described by Governor Darling in a Government Notice (1826) had resulted in a large and angry gathering of Aboriginal people about Lake George and at Inverary Park (Waters Consultancy 2017:26).

Small Aboriginal reserves began to be created throughout NSW from the 1850s, with many more declared in the 1870s, including at Yass in 1875 (NSW Department of Planning, Industry and Environment 2012). With the establishment of the Aboriginal Protection Board in 1883, the lives of Aboriginal communities throughout NSW were increasingly intruded on, and further 'Aboriginal Stations/Reserves' were established including Oak Hill in the 1880s, Brungle in 1888, Edgerton in 1909, and Hollywood in 1934 ('About Oak Hill' 2019). Much of the Aboriginal population within the region were removed to these reserves, and regulations and limitations governing Aboriginal people's lives continued to increase ('Buru Ngunawal Aboriginal Corporation' n.d.; Waters Consultancy Pty Ltd 2010).

However, despite these impacts by the end of the twentieth century, the Aboriginal population had begun to grow again across NSW. This was largely unrecognised by Europeans in the period, who did not consider any Aboriginal people who they did not consider 'full blood' and as such assumed the Aboriginal population was becoming extinct. Despite these impacts, the Ngun(n)awal were able to maintain their connections to sites and the land and were able to maintain their seasonal patterns of movement to some extent, with several accounts of ceremonies continuing into the 1860s ('Buru Ngunawal Aboriginal Corporation' n.d.).

4.2.8 Ongoing connections

The people of Nungara/Weereewa have well-established links to the land of which the Project Site falls. Their cultural connection and occupation of the land has been well documented by the presence of Aboriginal objects in the area and recorded oral histories. The results of previous archaeological surveys in the region show that there are sites and artefacts present throughout the landscape within and surrounding the Project Site, albeit concentrated around waterways and elevated, flat and sandy deposits. The landscape surrounding the Project Site has been identified as a transport route between major resources in the wider region.

4.2.9 Understanding intangible cultural associations

Intangible Aboriginal cultural heritage values can be described as the meaning people or cultural groups give to places across the landscape or the associations they have with them. These places may or may not have physical traits, but the associated meaning and value is held within people's minds, memories and continued activities and knowledge. Whilst intangible values generally speaking can be of a social or historical nature, the distinguishing feature of 'intangible Aboriginal cultural heritage values' can also be the cultural element such as stories of cultural events, religious significance, spirituality, the intergenerational layers of cultural connection to place, knowledge of how to maintain and use natural resources, and undertaking cultural activities.

The proposed new legal framework for Aboriginal cultural heritage in NSW acknowledges that the current NPW Act does not include a definition of Aboriginal cultural heritage that captures the full scope of Aboriginal cultural expression and practice. Accordingly, proposed changes to the Act will redefine 'Aboriginal cultural heritage' to encompass 'living, traditional or historical practices, ancestral remains, representations, expressions, beliefs, knowledge and skills and associated environment, places, landscapes, objects and materials that Aboriginal people recognise as part of their cultural heritage' (OEH 2017:11).

The concept of a 'cultural landscape' is a relatively new one in the field of heritage conservation and management and attempts to capture both material and non-material elements. In 1996 the World Heritage Committee adopted a definition for cultural landscapes of outstanding universal value: Cultural landscapes represent the 'combined works of nature and of man' ...illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal (UNESCO World Heritage Centre 2008).

[redacted]

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4.3 Archaeological context

4.3.1 AHIMS search

The purpose of the ACHA is to investigate the presence and extent of any Aboriginal sites within or adjacent to the Project Site and to assess their significance and any possible impacts resulting from the proposed works. As part of the desktop assessment for this project, an extensive search was undertaken of the Aboriginal Heritage Information Management System (AHIMS).

The AHIMS register is maintained by Heritage NSW and provides a database of previously recorded Aboriginal heritage sites. An extensive search provides basic information about any sites previously identified within a search area. However, an AHIMS 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 Heritage NSW to add to the database. As a starting point, the search will indicate whether any sites are known within or adjacent to the investigation area.

An initial search of the AHIMS database was conducted using a map search over the general Lake George area. The parameters for this search were as follows:

- Client Service ID: 547771
- Date:05/11/2020
- From: -35.2482 (Latitude), 149.4097 (Longitude)
- To: -35.1457 (Longitude), 149.5724 (Longitude)
- Buffer: 50m
- Number of Aboriginal sites and Aboriginal objects found: 103
- Number of declared Aboriginal Places found: 1 (within 50km).

The Aboriginal Place identified in the search is Millpost Axe Quarry, located approximately 16km south-east the Proposal Site.

Of the 103 registered sites within the search parameters, 18 archaeological sites currently recorded on AHIMS are within the Project Site. Table 4-5 breaks down the sites identified in the region by site type, while the sites located within the Proposal Site are summarised in Table 4-6 below and can be seen in Figure 4-4 below.

Table 4-5 Breakdown of previously recorded Aboriginal sites in the region

Site Type	Number
Artefact	86
Potential Archaeological Deposit (PAD)	14
Art (pigment or engraved)	2

Site Type	Number
Potential Archaeological Deposit (PAD), Artefact	1
Total	103

As the initial AHIMS extensive search had lapsed its 12-month validity a new AHIMS extensive search was conducted on the 25th February 2022. The parameters for this search were as follows:

- Client Service ID: 662695
- Date: 25/02/2022
- The search was conducted using a shapefile search over the project site with a 200 m buffer
- Number of Aboriginal sites and Aboriginal objects found: 92
- Number of declared Aboriginal Place found: 0

Of the 92 registered sites within this search a total of 59 – including a restricted site – were recorded and submitted as sites as a part of this assessment. The remaining 33 sites were represented in the original AHIMS extensive search conducted on the 5th November 2020. As a result, all AHIMS sites within and adjacent to the project site have been considered by this study.

[redacted]

Figure 4-4 AHIMS Sites within the broader project area

[redacted]

Figure 4-5 AHIMS sites located within the Project Site

Table 4-6 AHIMS sites within or adjacent to the Project Site

Site Number	Site Name	Site Type	Distance to Project (m)	Site Status on AHIMS
57-2-0059	Lakelands;	Artefact	Within the Project Site	Valid
57-2-0020	Currandooly 2; Lake George;	Artefact	Within the Project Site	Valid
57-2-0588	Grantham Park 2	Artefact	28 m south-west of the Project Site	Valid
57-2-0676	CSF-SU38/L1	Artefact	20m east of the Project Site	Valid
57-2-0701	CWF2-IF-01	Artefact	2m south-west of the Project Site	Valid
57-2-0702	CWF2-IF-02	Artefact	Within the Project Site	Valid
57-2-0703	CWF2-IF-03	Artefact	Within the Project Site	Valid
57-2-0704	CWF2-IF-04	Artefact	Within the Project Site	Valid
57-2-0705	CWF2-IF-05	Artefact	9m north-east of the Project Site	Valid
57-2-0707	CWF2-IF-07	Artefact	Within the Project Site	Valid
57-2-0708	CWF2-IF-08	Artefact	Within the Project Site	Valid
57-2-0790	West Creek Dairy PAD 1	PAD	Within the Project Site	Valid
57-2-0917	Willow Sands	Artefact, PAD	Within the Project Site	Valid
57-2-0642	Grantham Park 3	Artefact	Within the Project Site	Valid
57-2-0732	CWF2-S-01	Artefact	Within the Project Site	Valid
57-2-0733	CWF2-S-02	Artefact	Within the Project Site	Valid
57-2-0734	CWF2-S-03	Artefact	Within the Project Site	Valid
57-2-0735	CWF2-S-04	Artefact	Within the Project Site	Valid
57-2-0736	CWF2-S-05	Artefact	Within the Project Site	Valid
57-3-0213	Bridge Creek/Currandooly	Artefact	Within the Project Site	Valid
57-3-0458	Bridge Ck SU2/L1	Artefact	Within the Project Site	Valid
57-3-0459	Bridge Ck SU2/L2	Artefact	45m east of the Project Site	Valid

Site Number	Site Name	Site Type	Distance to Project (m)	Site Status on AHIMS
57-3-0460	Bridge Ck SU2/L3	Artefact	60m east of the Project Site	Valid
57-3-0463	Bridge Ck SU3/L3	Artefact	70m east of the Project Site	Valid

4.3.2 Archaeological context

A significant number of studies have been undertaken in the areas surrounding Lake George and Bungendore which provide a sound archaeological context for the Project Site which are summarised below.

A large portion of the archaeological investigations conducted within the region are a result of the high demand for aggregates and sand around the Canberra region from the 1970s into the late 1990s. Other extensive research conducted in the area has been academically focused, including detailed PhD research. As such, the results identify a large extent of research throughout the region, with archaeological investigations occurring across differing landforms allowing a detailed understanding of the archaeological potential within the Project Site.

In 1980, Flood recovered several artefacts from the excavation of well stratified layers of aeolian sands on the eastern side of Lake George. She also completed dating of these deposits to between 17,000 and 23,000 years BP (Flood 1980). These results suggest that there was intermittent or seasonal occupation of the Lake George region by Aboriginal people potentially as early as 23,000 years ago.

In 1981 Koettig surveyed a corridor for the Federal Highway upgrade from Willow Tree Creek, Collector to the ACT border, identifying 33 artefact scatters, 12 isolated artefacts, three PADs, and two historic sites; two possible scarred trees were identified within separate open sites (Koettig 1981). A variety of artefact types were recorded, including nine backed blades (four quartz, three chert, and two silcrete) along with several cores, scrapers, blades, retouched flakes, hatchets, and other processing tools. The raw materials recorded within these artefacts comprised of quartz, chert, silcrete, basalt, other fine-grained sedimentary, and chalcedonic material. It was noted from this survey that the majority of sites occurred along ridges and spurs with sites also identified along creek lines. This initial survey was followed by subsurface testing and salvage at four sites by Koettig (Koettig 1981). A subsurface knapping floor consisting of 12 backed blades was recorded 14cm to 26cm below the ground surface at one of the sites situated adjacent to a watercourse. This feature was dated to 2,000 - 4,000 years BP.

In 1984 Baker and Feary assessed a proposed sand and gravel mining area known as 'Windermere' near Collector, NSW (Baker & Feary 1984). The sand and gravel deposit represented one of many relict shoreline features around Lake George associated with past higher lake levels. Surface survey and test excavations were carried out across the beach ridge Project Site, with one artefact scatter (n=4) identified in association with Currawang Creek. The low number of surface finds determined the necessity to complete the test pitting program to determine stratigraphic origins of the assemblage. A total of 30 test pits were excavated to an average of 30cm in depth. A total of 133 subsurface finds were recovered from 30 test pits with artefacts noted to be concentrated within the eastern portion of the beach ridge; these included several blades, retouched flakes, and cores. A range of silcrete, chert, volcanic and quartz artefacts comprised the subsurface assemblage. It was determined that the focus for past Aboriginal occupation was on the eastern portion of the 'spit' that was present within the proposed mining area. It was also suggested that the 'spit' was occupied for short durations during a period where swamps had formed in the area after the lake level had dropped. As a result it was determined to be likely that the site had been used to exploit resources in the surrounding swamps that were present in the area before European settlers drained them (Wilson 1968, p.59 as cited in Baker and Feary 1984, p.10).

In 1984 Hughes, Barz and Hiscock surveyed the proposed Bungendore Sands Quarry located to the southeast of Lake George and within the current Project Site (Hughes, Barz & Hiscock 1984). A total of 427 artefacts and 174 non-artefactual manuports were recorded across a relict beach ridge which was 500m wide and 2.5km in length. The majority of artefacts recorded were complete flakes (some retouched) with cores, retouched flakes, grindstones, and hammerstone/anvils also being recorded. Hughes et al. (1984, p.8-9) also suggest that while non-bipolar techniques were the most common within the site, the presence of two quartz bipolar cores and variety of hammerstones/anvils suggests that bipolar techniques were also used to reduce quartz cores to smaller sizes. Quartz was noted to have been the dominant lithology amongst flaked artefacts, with smaller amounts of silcrete and quartzite being present. The identified grindstones were of volcanic rock while all but one of the hammerstone/anvils were of quartzite. While no radiocarbon dates were recorded, it was noted that the beach ridge was comprised of mid to late Holocene sand deposits. Combined with the similar archaeological assemblages to the nearby dated sites of Nardoo and Butmaroo I, it was suggested that the site was less than 1000 years old.

In 1984, Haglund and Associates conducted an archaeological survey of a proposed sand quarry at Bungendore approximately 3km west of the current Project Site (Haglund And Associates 1984). The survey area was located on old lacustrine beaches and sand bars that were composed of medium to coarse textured sands and gravels with some soil formation with a prominent beach ridge bisecting the area. While no Aboriginal artefacts were located during the survey, Haglund and Associates identified that it is highly likely that artefacts are located within subsurface deposits in the beach ridges due to the subsurface investigations that had been conducted in nearby sand mining leases. Haglund and Associates recommended that further subsurface investigations be carried out, however it is unknown as to whether these took place.

In 1985 ANUTECH Pty Ltd archaeologist Allan Lance conducted an archaeological survey of a proposed sand quarry on the 'Currandooley Lease', partially within the southern portion of the current Project Site that is associated with Bridge Creek (Lance 1985). As a part of these investigations, both surface and subsurface excavations were conducted. During the surface survey, Lance identified that the topsoil had been removed in several places within the site due to stock movement. Furthermore, erosion on the southern side of a pine plantation had revealed an area of approximately $80m^2$, and a small gully had exposed sediments over an area of approximately 20m x 5m to a depth of 1.5m in the western portion of the site. Despite the elevated surface visibility due to the erosion events associated with the site, no Aboriginal stone artefacts were observed by Lance. Lance also recorded that a number of backhoe pits had been dug by the client to determine the extent of the sand body in the area. It was found that the sand body reached a maximum depth of 2.5m in some areas but was a shallow as 0.5m in others, with an underlying geology of bedrock, shale, and granite. Lance recorded that the sand was uniform in size and very fine in texture throughout the area; there was also limited soil development and no lithification of sands at the base of the deposits. As a result, Lance stated that it was likely that the sand deposit was formed during the mid to late Holocene, within the last 5,000 years. During the subsurface excavation, Lance investigated the pits dug by a backhoe and sieved the material that was removed from the pits. Only two pits were recorded as containing Aboriginal artefacts, both of which were located near the south-eastern boundary of the sand deposit; only one spoil heap contained artefacts. Due to the presence of archaeological material, Lance proceeded to excavate a 1m x 1m pit using standard archaeological methods; the results of this excavation are described in Table 4-7 below.

Table 4-7 Results of excavations conducted by Lance along Bridge Creek (ANUTECH Pty Ltd 1985)

Spit	Description
1 (0 – 10cm)	Turf and grey sand
2 (10 – 20cm)	Angular gravels
3 (20 – 30cm)	6 quartz artefacts
4 (30 – 40cm)	13 quartz artefacts, 3 silcrete artefacts
5 (40 – 50cm)	4 quartz artefacts
6 (50 – 60cm)	7 quartz artefacts, 1 silcrete artefact
7 (60 – 70cm)	3 quartz artefacts
8 (70 – 80cm)	1 quartz artefact
9 (80 – 90cm)	No artefacts, soil damp

The artefactual material was retrieved from between 20-80cm beneath the surface, with concentrations at 30-40cm and 50-60cm. While the majority of the raw material represented by this assemblage was quartz, some silcrete was also recovered which suggests that there was a slight variance in the raw material used in the area in the past. Lance described the artefacts as mostly being unmodified flakes and flaked pieces less than 1cm in length. He also recorded the presence of a non-bipolar quartz core within spit 3 and a translucent quartz broken backed blade from one of the backhoe pits. It was also noted that two of the silcrete artefacts were larger than their quartz counterparts, one of which was 5cm and displayed previous use-wear from small flake scars that were present on one edge. Lance concluded that due to the prevalence of quartz artefacts within the assemblage, that it largely dates from the last 1,000 years due to similar assemblages being found in other sites in the region. However, it was noted that the presence of a backed blade towards the bottom of the excavated deposits suggest that the lower parts may date back further than 1000 years.

In 1986 Packard also completed a review of previous archaeological investigations into sand bodies within 100km of Canberra including Shoalhaven, Yass, the Lachlan and Murrumbidgee Catchments, with the closest site at Windermere approximately 21km north of the current Project Site (Packard 1986a). A site survey was completed to determine the origin and nature of sand deposits in the Southern Tablelands and relate these to the occurrence of associated archaeological materials. Advice was provided on the appropriate management of all investigated sand bodies. Of the 26 sample locations across the Southern Tablelands, 20 had Aboriginal sites recorded, resulting in a total of 22 newly identified sites. These sites consisted of artefact scatters located on the floors and benches of quarries. Bipolar artefacts and retouched flakes were more often identified in aeolian deposits as opposed to alluvial deposits and backed blades were the opposite. The majority of sites were located within 500m of a permanent or semi-permanent water source, with the average distance being 325m. Quartz was the dominant lithology across the sites, followed by silcrete, quartzite and chert. Formal tools were identified at 64% of the sites. Over 80% of the sand deposits investigated contained newly identified archaeological sites suggesting these landforms have very high Aboriginal cultural sensitivity.

Packard wrote that sites in sand deposits on the Southern Tablelands:

- Are relatively common.
- Are predominantly open sites with scatters of stone artefacts.
- Have been found in the full range of deposit types and locations.
- Are typically low to very low artefact densities on the surface, and low to relatively high densities below the surface. Where artefacts are absent from the top horizons of artefactual deposits, Packard posits that this is more likely a product of post-European sand deposition or taphonomic processes rather than Indicating abandonment.
- Contain cultural materials normally only within the top 100cm or less of the deposits.
- Generally display only limited vertical patterning, but in some cases have distinctive horizontal patterning of artefacts in the form of discrete stone tool flaking areas or focused activity areas.
- Very rarely display hearths, baked clay lumps, charcoal, or organic remains. This is In contrast with the situation elsewhere In NSW. Considering the rapid through-flow of water and subsequent rate of leaching in sand deposits it is to be expected that hearths consisting purely of charcoal would not survive in great numbers in the archaeological record for long.
- Are typically dated to be less than 1,000 years old.
- Whilst lithic types vary, quartz is the most common.
- While sites with either bipolar artefacts or "Bondaian"/"microblade" artefacts are relatively common they are rarely found at the one site.
- Are generally found close to a water source. However, other factors of site location would have influenced usage of sand deposits. These deposits would have represented distinct resource/activity zones in themselves. Additionally, sand areas provide a softer and dryer surface for digging, sitting and camping.
- Have not yet revealed any evidence of Aboriginal burials. This is in contrast to elsewhere in NSW. Packard refers to previous ethnohistorical research into burials found in the Southern Tablelands and describes the grave sites being dug into rocky, clayey and gritty (i.e., sandy) deposits. They also sometimes refer to rocks, grave goods such as stone tools, and organic matter such as sticks being included.

In 1986, Packard surveyed areas proposed for sand, gravel and topsoil mining on the Glencoe and Rutherfield properties along the Yass River and Gundaroo Creek to the north of Gundaroo (Packard 1986b). Four stone artefact sites and an isolated find were recorded with the majority of sites located on elevated areas in red sandy deposits in close proximity to water. When Packard returned to undertake test pit excavations, he could not locate two of the sites previously noted with surface artefacts close to the riverbank. It was suggested that this was the result of flooding events that had occurred since the initial recording. Packard excavated eight test pits in red sandy deposits near the Yass River across three areas (RYR1, GYR1 and GYR2) where there were no surface artefacts visible. He recovered a total of 103 artefacts from seven pits between 5cm and 45cm below the surface. The majority of the artefacts recovered were manufactured from quartz with some silcrete and other materials. All three sites excavated were noted to contain artefacts produced using bipolar techniques. A single quartz retouched artefact was also noted. Packard (1986a) noted that the sites excavated on slopes tended to have lower artefact densities than those excavated on the level terrace area, and he suggested that sandy deposits in close proximity to the Yass River were a more attractive for camping than previously thought.

In 1986 Packard also surveyed an area approximately 6.5km along the Yass River and Brooks Creek, downstream of Gundaroo for a proposed sand, gravel and topsoil extraction development (Packard 1986c). No sites were identified during this survey despite sites being located in areas with similar topographic features to the north of Gundaroo. Packard suggested that this might be due to the extensive disturbance in the area from previous soil mining and that there was no distinct level, sandy, well-drained areas that might have been a focus for Aboriginal activities and occupation.

In 1992 Packard conducted an archaeological investigation of the proposed sand quarry extension within Lot 31 Potion 8 at Currandooley; adjacent and to the south of the current Project Site on the western banks of Butmaroo Creek (Packard 1992). The site survey conducted found few ground exposures which would allow for potential site detection. Recent aerial photography was used to identify areas that contained a high percentage of ground surface exposures, and the subsequent pedestrian survey was focussed on these areas. The exposed areas comprised of stock tracks, vehicle tracks, and areas near gates/fence lines. Furthermore, the creek banks and associated low, terrace-like landform within the Project Site were also surveyed. Only one quartz isolated artefact was recorded during this survey (as a broken flake), it was found within an exposed coarse sandy deposit in a cattle wallow next to a fence. No artefacts or subsurface features were identified within the visible bank exposures along the creek. However, Packard noted that there was a high density of freshly fractured quartz gravels in some areas due to the dumping of the clays and gravels to create a diversion bank. As a result, it was more difficult to identify potential artefacts in these areas.

The subsurface investigations were conducted over eleven trenches, although only eight of these trenches provided suitable conditions for archaeological investigations (Packard 1992, p.11). While both the excavated material and trench walls were examined for archaeological content, Packard reported that the field team was generally only able to sieve 75–90% of the excavated deposits with a 5mm mesh sieve. Furthermore, it was reported that sieving was not possible once the excavations reached the strongly clayey bed which was encountered between 50–100cm depths. Of the eight suitable trenches excavated, only four yielded an archaeologically significant density of artefacts (Trenches 1, 3, 7, and 8). Packard stated that the artefact material present in these trenches suggested that the raised sandy ground closest to the creek lines were highly sensitive. Other areas within the ridgelines further away from the creek were of a lower sensitivity and areas within subdued drainage area were archaeologically sterile. However, Packard also stated that this artefact distribution pattern may have been caused by the placement of trenches within a 'lumpy' density pattern such as what was done at Bridge Creek 1. A total of 799 artefacts were recovered within the 8 trenches (see Table 4-8 below). The raw material composition was as follows: quartz 68.84%, silcrete 24.40%, and 'other' 6.76%.

Table 4-8 Results of the subsurface archaeological excavation of the proposed sandy quarry extension at Lot 31, Portion 8 (Packard 1992, p.14)

Trench	Quartz Artefacts		Silcrete Artefacts		Other Artefacts		Total Artefacts Per Trench
1	102	50%	81	40%	20	10%	**203**
2	22	66.6%	6	18.1%	5	15.1%	**33**
3	206	96.7%	3	1.4%	4	1.9%	**213**
4	2	28.6%	3	42.8%	2	28.6%	**7**
5	21	63.6%	6	18.1%	6	18.1%	**33**
6	-	-	-	-	-	-	**-**
7	119	58.6%	81	40%	3	1.4%	**203**
8	78	72.9%	15	14%	14	13.1%	**107**
Total Artefacts	**550**	**68.84%**	**195**	**24.40%**	**54**	**6.76%**	**799**

In 1993 ANUTECH Pty Ltd completed an Environmental Impact Assessment including an archaeological and heritage study of the proposed Telecom Radio Base Site and Cable Line at Gearys Gap, approximately 10km north-west of the current Project Site (ANUTECH Pty Ltd 1993). The study area lies within the Lake George Range within the Lake George Escarpment along the western edge of this expansive natural water source. A quartz reef was also identified on the proposed powerline location making quartz the dominant lithology in this area. Significant disturbance from vegetation clearance, grazing, fencing, vehicle access track construction and historic mining activities was noted across the area. Despite this, two artefact scatters and one isolated artefact were identified on the base station site. Both scatters had been exposed by sheet erosion. The isolated find (GGBS IF1) was a white quartz broken flake identified just below the crest of a flat-topped east-west running ridgeline overlooking Lake George. Drainage lines pass within 200m of this site and an intermittent creek within 300m. The first artefact scatter (GGBS 1) was comprised of a variety of quartz flakes, broken flakes, and flaked pieces along with a single chert flake and porphyritic volcanic flake. Furthermore, two quartz bipolar cores and a single non-bipolar quartz core were identified. This site was located on a gently sloping east-west running ridgeline extending on to the flat top of the ridge, approximately 100m south of an ephemeral creek. A drainage line runs through the site connecting into the nearby creek. The second artefact scatter (GGBS 2), consisting of one quartz flake, flaked piece, broken flake, blade core, and core, was identified on the flat top of a low knoll on an east-west running ridgeline 200m south of an ephemeral creek line. It was argued that additional artefacts were located around GGBS IF1 due to its location of a ridgeline close to a waterway, with some potential for subsurface material in the five to ten centimetres of silty deposits that were present. Furthermore, at GGBS 1 it was suggested that the artefacts were eroding from subsurface archaeological deposits that were present in the top five to ten centimetres of soil deposits in the area. GGBS 2 was determined to contain no potential for subsurface archaeological deposits due to the shallow, shale rich soils.

In 1993 Hughes completed archaeological survey and excavations for the Federal Highway duplication Lake George, NSW (Hughes 1993). These investigations included the mechanical excavation of eight pits into the sand body forming a crest of the Lake George Embankment across the proposed road easement. The average dimensions of the pits were 1-2m continuing to a depth of approximately 2m. The deposits encountered in six pits excavated around Murray’s Lagoon contained topsoils of beach gravels and sands overlying lake silts and clays. No artefacts were recovered from these pits. Surface artefacts were identified on the crest of the embankment and three pits were excavated into the sand deposit to determine the spatial relationship between these pits and other features present on the Embankment. Originally, all sand recovered was proposed for sieving however the moisture content prevented the deposit moving easily through the mesh and trowels and rakes were used in an effort to identify artefacts. It was estimated that only 25% of artefacts present within the sand were able to be detected using this method. All three pits contained a 10-20cm thick humic topsoil overlying a disturbed mottled sand deposit with minimal fine gravel inclusions that extended for approximately 10cm. Below this the deposit comprised of gravelly sands and sandy gravels to a depth of 2.5m. Pit 1 contained five quartz artefacts, present between 15-65cm depth. Pit 2 contained seven quartz and 2 silcrete artefacts between 5-50cm depth. Pit 3 did not contain any artefacts. These results suggest that a large archaeological site extends across the sand covered portions at the northern end of the Embankment, which rises to approximately 2-5m above the Collector Creek floodplain and the floor of Murray’s Lagoon. No artefacts were located on the western side of the Embankment where sand had not accumulated.

In 2000, Bowen completed an archaeological survey of a proposed sand quarry extraction area and access track to the north of Ondyong Point, Lake George (Bowen 2000). One artefact scatter, consisting of two quartz flakes, and an area of moderate archaeological potential were identified. Extensive site disturbances resulting from wombat burrows and pastoral practices within the proposed extraction area reduced subsurface potential however it was determined that the level area of the sand deposit contained moderate subsurface archaeological potential, but that any archaeological deposit would be unlikely to be *in situ* due to the disturbances outlined above. For this reason, test pit excavations were considered unwarranted for this project.

In 2005, Austral Archaeology Pty Ltd completed an ACHA for the proposed Capital Wind Farm located between Tarago and Bungendore to the east of Lake George, partially within the current Project Site (Austral Archaeology Pty Ltd 2005). A total of five newly identified sites, including two artefact scatters and three isolated finds were recorded across the proposed wind farm site. Four of these sites were associated with gently sloping topography surrounding creek tributaries and the fifth site was located on moderately sloping ridgeline. Five areas of potential archaeological deposit (PAD) were also identified. One PAD was associated with a surface artefact scatter and the remaining five were associated with Lake George and the permanent creek lines which traverse the proposed wind farm area. Subsequent test excavations of four of these PADs was undertaken by Austral Archaeology Pty Ltd in 2009, resulting in a total of 83 manually excavated test pits. A total of 348 artefacts were recovered from these excavations, with the majority (n=210) retrieved from the proposed wind turbine location in the closest proximity to Lake George (Austral Archaeology Pty Ltd 2009). The subsurface assemblage comprised of quartz, quartzite, silcrete and chert, with the former representing the dominant lithology. The results of the subsurface investigations confirmed the higher slopes and crests as areas of use whilst travelling through the landscape but not as foci of industry or occupation.

In 2007, Saunders surveyed approximately 83ha for a proposed rural subdivision along the Yass River and Back Creek Roads, approximately 25km north-west of the current Project Site (Saunders 2007). A small low-density artefact scatter and an isolated artefact were the only two sites located. Both sites had grey silcrete artefacts that were located on either the basal slope of a low spur or a spur crest. Saunders concluded that along the Yass River and its tributaries areas of gentle slope within 100m of a water source and level elevated areas within 150m of the Yass River have the highest archaeological sensitivity.

In 2008, Cultural Heritage Management Australia conducted an archaeological assessment of Lot 32, DP634213, Grantham Park, NSW adjacent to the Project Site on the southern banks of Butmaroo Creek (Cultural Heritage Management Australia 2008). During the field survey conducted as part of the assessment two Aboriginal sites were identified, GP1/Pad1, an isolated artefact, and GP2/Pad2, an open artefact scatter; the site GP2/Pad2 is within the current Project Site. Both sites were recorded on slightly elevated terraces and were assessed to have high potential for subsurface archaeological deposits. However, both sites were assessed as containing a low scientific significance due to their prevalence throughout the region and the level of prior disturbance associated with the area. Cultural Heritage Management Australia recommended that further subsurface investigations should be undertaken within the landforms associated with both sites and noted that the significance of these sites should be reassessed base on the findings of the excavations.

In 2009, Austral Archaeology undertook test excavations for the Capital Wind Farm located approximately 1km to the north of the BCSF Project Site on gently sloping topography surrounding creek tributaries and moderately sloping ridgelines. A total of 348 artefacts were recovered from these excavations, with the majority (n=210) retrieved from the proposed wind turbine location in the closest proximity to Ngungara/Weereewa. The subsurface assemblage comprised of quartz, quartzite, silcrete and chert, with the former representing the dominant lithology. The excavations took place within the hill and gully landforms located to the north of the current Project Site. Austral concluded that the results of the subsurface investigations confirmed the higher slopes and crests as areas of use whilst travelling through the landscape but not as foci of industry or occupation.

In 2010, Heritage Consulting Australia Pty Ltd undertook an Aboriginal Cultural Heritage site investigation of AHIMS registered site 57-2-0121 within the Currandooley Lease, Bungendore NSW, adjacent to the current Project Site on the southern banks of Butmaroo Creek (Heritage Consulting Australia 2010). HCA noted that after Packard's initial investigations of the quarry in 1992, an additional investigation was conducted by Lance (2009a as cited in Heritage Consulting Australia 2010). These investigations included the excavation of test trenches under NPWS Consent to Destroy and Permit to Salvage No. 683. HCA reports that subsequent sand quarrying activities removed the majority of the deposits that were investigated by Lance, with the exception of an area within the eastern side of the lease on the northern banks of Butmaroo Creek. At the request of the sand quarry operator, HCA was contracted to perform site protection of five areas which contain occupation deposits that were identified by Lance (2009b as cited in Heritage Consulting Australia 2010); these are visible in Figure 4-6 below.

Figure 4-6 Aerial view of the five locations which contain occupational deposits that were identified by Lance (2009b as cited in Heritage Consulting Australia 2010, p.22). The current Project Site is north and east of the highlighted yellow line and the sand quarry

While Locations 1 and 2 were located further away from Butmaroo Creek along an aeolian sand slope, Locations 3, 4, and especially 5 are located in high sensitivity areas due to their location within elevated sand bodies in association with Butmaroo Creek. During the survey, artefacts were only found within Locations 4 and 5; the sites within other locations were not able to be relocated or only contained PADs. However, HCA note that this does not diminish their potential for subsurface material, as Locations 1, 2, and 3 contained high potential for subsurface archaeological deposits. The concluding site significance statements for all five locations are described in Table 4-9 below. It should be noted that Location 5 is the most representative location for the areas in proximity to Butmaroo Creek within the current Project Site due to the low to medium surface disturbances and intact subsurface deposits.

Table 4-9 Conclusion of the site protection works conducted by Heritage Consulting Australia (adapted from Heritage Consulting Australia 2010, p.15)

Location	Site Integrity	Research Potential	Contents	Representativeness	Archaeological Significance	Aboriginal Significance
1	Low: area prone to erosion, artefact not relocated during survey	Moderate: possible concentrations of subsurface artefacts in the PAD in the aeolian sand	Low: isolated artefact, possible subsurface cultural heritage deposits	Low: similar, better-preserved sites occur elsewhere through this sand body	Low	Moderate
2	Moderate to High: PAD is subsurface, possible *in situ* deposits.	Moderate: possible concentrations of subsurface artefacts in the PAD in the aeolian sand	Low: possible subsurface cultural heritage deposits	Low: similar sites occur through the region	Moderate	Moderate
3	Moderate: PAD is subsurface, possible *in situ* deposits	Moderate: there has been quarrying next to the PAD, but aeolian sand in pit wall is *in situ*	Low: possible subsurface cultural heritage deposits	Low: similar sites occur through the region	Low to Moderate	Moderate
4	Moderate: highly disturbed connect from quarrying activities	Low: surface artefacts, possible subsurface artefacts	Moderate: flaked stone artefacts and a hammerstone	Low: similar, better-preserved sites occur through the region	Low to Moderate	Moderate
5	High: artefacts exposed on the ground surface, *in situ* subsurface cultural heritage deposits	High: Stratified site near Butmaroo Creek	High: flaked artefacts	High: sections of undisturbed artefact scatter near a water-course	High	High

In 2010, Austral Archaeology Pty Ltd was commissioned to prepare an Aboriginal archaeological and cultural heritage assessment for Capital Wind Farm II, which is mostly adjacent and to the north of the proposed Blind Creek Solar Farm Project Site but also overlapped. Austral Archaeology assessed three areas over the course of surface surveys conducted as a part of this project. One of these areas, Survey Area 1, was partially located within the current Project Site (see Figure 4-7 below). A description of each of the survey transects can be seen in Table 4-10 below along with the surface artefacts recorded within the survey area (S denotes artefact scatter while IF denotes and isolated find).

Figure 4-7 View of Survey Area 1 and associated survey transects performed by Austral Archaeology (2010, p.36). The approximate BCSF Project Site is highlighted in yellow.

Table 4-10 Description of Survey Transects at “survey area 1” performed by Austral Archaeology within the current Project Site (adapted from Austral Archaeology 2010:41)

Survey Transect	Description	Landform Unit	Potential	Surface Artefacts Recorded
T01	Mainly flat. Sand mining activity has been undertaken in the area. This has caused various depressions and embankments that at first glance look like dams but are too widespread over the area. Low tufted grass and scots thistle grow throughout the transect. (Area has several scatters and isolated finds. Area is defined as PAD (CWF2-PAD-01) due to proximity to Wrights Creek and artefact concentrations on the surface within the area. General surface visibility is around 45%.	Creek Bank	High	#57-2-0701: CWF2-IF-01 #57-2-0702: CWF2-IF-02 #57-2-0703: CWF2-IF-03 #57-2-0732: CWF2-S-01 #57-2-0733: CWF2-S-02 #57-2-0734: CWF2-S-03 #57-2-0735: CWF2-S-04 #57-2-0736: CWF2-S-05
		Flat	Low to Moderate	
T02	Mainly flat. Sand mining activity has been undertaken in the area. This has caused various depressions and embankments that at first glance look like dams but are too widespread over the area. Low tufted grass and scots thistle grow throughout the transect. (Area has several scatters and isolated finds. Area is defined as PAD (CWF2-PAD-01) due to proximity to Wrights Creek and artefact concentrations on the surface within the area. General surface visibility is around 45%.	Creek Bank	High	
		Flat	Low to Moderate	
T03	Lake George shoreline. Extensive quartz fragments throughout the transect. There is a slight rise where the old shoreline is situated. This runs the entire length of the study area. Low tufted grass and scots thistle grow throughout the transect. General surface visibility is around 50%.	Flat	Low to Moderate	#57-2-0737: CWF2-S-06
T04	Lake George shoreline. Extensive quartz fragments throughout the transect. There is a slight rise where the old shoreline is situated. This runs the entire length of the study area. Runs through recently ploughed paddocks. General surface visibility is around 70%	Flat	Low to Moderate	#57-2-0706: CWF2-IF-06 #57-2-0707: CWF2-IF-07 #57-2-0738: CWF2-S-07
T05	Runs through recently ploughed paddocks. General surface visibility is around 70%	Flat	Low to Moderate	-

Survey Transect	Description	Landform Unit	Potential	Surface Artefacts Recorded
T06	Runs through fallow paddocks. High grass and thistle grow throughout. General surface visibility is around 30%	Flat	Low to Moderate	#57-2-0704: CWF2-IF-04 #57-2-0705: CWF2-IF-05
T07	Runs through several paddocks with varying general surface visibility. Some area with low cropped grass. Some with waist high grass. Main exposure is along a drainage line in the eastern section of the transect. General surface visibility is around 35%	Flat	Low to Moderate	#57-2-0707: CWF2-IF-07 #57-2-0708: CWF2-IF-08
		Ridgeline	High	
		Slope	Low to Moderate	

In total – and throughout all three Survey Areas – Austral Archaeology recorded 31 isolated finds, 30 open artefact scatters, and 2 PADs for a total of 63 new sites. Eleven of the sites recorded by Austral Archaeology are within the current Project Site, all of which are clustered in the western end. Within the sites identified by Austral Archaeology, 158 flakes were identified along with 39 cores and 21 tools. The most common raw material was quartz (65.14%), followed by silcrete (30.73%), basalt (1.83%), chert (0.92%), river stone cobbles (0.92%), and mudstone (0.48%). Artefact types recorded included broken, distal, medial, proximal, and whole flakes, along with flaked pieces, flake tips, and unidentified pieces. Of the tools that were identified, they were comprised of blades, broken blades, backed blades, scrapers, Bondi points, edge ground axe heads, hammer stones, Pirri points, and blade cores. Austral Archaeology argued that the presence of microblades and microblade portions suggested that they may have been manufactured and/or discarded within the study area. Of the eleven sites identified within the current Project Site only two, CWF2-IF-07 and CWF2-S-04, were identified as containing a moderate potential for new information as well as a moderate representativeness, rarity, and research potential. The remaining nine sites were assessed as representing low potential for new information as well as low representativeness, rarity, and research potential. While Austral Archaeology did not recommend any further investigations for the sites recorded within the Project Site, they noted that these sites should be salvaged through collection and relocation should there be any potential impacts on them.

In 2012, New South Wales Archaeology Pty Ltd (NSW Archaeology) conducted an Aboriginal cultural heritage assessment for the proposed Collector Wind Farm, approximately 22km north by north-west of the current Project Site (New South Wales Archaeology 2012). The development area covered approximately 900ha, with overall impacts to occur in 47ha. The area was divided into 50 survey units and was visually inspected, covering an area of approximately 298ha. A total of four potential scarred trees and five Aboriginal objects were located. The objects comprised low density artefact scatters and were located in low sloping areas on gentle undulating crests, on the shoulder of a crest within 50m of a first order creek and on an undulating ridge adjacent to a minor saddle. These objects were assessed as having low archaeological significance. Visibility across the survey was low due to high levels of grass cover and, because of this, it was predicted that further stone artefacts would be present in the areas of proposed impact, on the ground and subsurface. These potential sites were considered likely to be of low to very low density and the area was assessed as having low archaeological significance.

In 2014, Bowen completed an Aboriginal due diligence assessment for the proposed 10 lot rural subdivision of the Loch Fyne property, along Brooks Creek Lane, Gundaroo, approximately 22km north-west of the current Project Site; the study area comprised 462ha of land near Lake George (Bowen 2014). As a result of the survey, two new artefact scatter sites (LFI and LF2) were identified in disturbed contexts produced through natural erosion and access track grading respectively. LF1 was located on the northern side of a ridgeline, consisting of 15 quartz and chert artefacts. LF2 was located on the base slope an eroded section of soil created from the machine grading of an access road and comprised one chert and one quartz artefact. Both sites were considered to have potential for *in situ* subsurface archaeological deposits despite these disturbances. Test excavation was recommended, if these PADs were to be impacted, to determine the Aboriginal cultural heritage significance and characteristics of the surface sites and to develop an appropriate site management strategy. To date, no excavations have been undertaken at these sites.

In 2016, OzArk completed an archaeological study for the proposed development of a Caravan Park at Shingle Hill Mosig-Way, near Gundaroo, NSW, approximately 15km north-west of the current Project Site (OzArk Environmental and Heritage Management Pty Ltd 2016). A total of two sites of Aboriginal cultural heritage were recorded during the survey, consisting of two isolated artefacts, identified in disturbed contexts, resulting from farming practices and erosion. One artefact was a silcrete flake and the other was a chert flake.

In 2018 as part of her Doctoral thesis, Mosig-Way investigated the aeolian sand bodies and areas around Lake George. A total of 37,395 artefacts were excavated from three areas, on the south-eastern side of Lake George which were analysed. Mosig-Way was interested to learn how best to test "open, unbounded" landscapes as compared to, for example, a rock shelter deposit. Open area, sandy deposits often present an archaeological palimpsest, meaning that different temporal events can become mixed, either through deflation of a deposit or through historical or bioturbation processes.

The early Holocene has been characterised in comparison to the late Holocene by some studies (Johnson 1979; Bowdler and O'Connor 1991; White and O'Connell 1982 as cited in (Hiscock & Attenbrow 1998, p.49) to broadly comprise conservative artefact discard and limited lithic materials and artefact typologies. By comparison, the late Holocene has been described by those same studies as being characterised by a high discard rate; a greater variety of lithic material than previously; as well as a change in artefact technologies and typologies. Arguments for the "sudden" change between the early and late Holocene were based on only using data obtained from excavations where archaeological deposits were distinct and of a high density, and where vertical movement of artefacts is either minimal or understood (Johnson 1979, p.116-117, as referenced by Hiscock and Attenbrow 1998, p.49). Certainly, the need to understand taphonomic processes is important in the analysis of an excavation. Since the Lake George region includes sandy deposits where a 'mixed' deposit would deprive the archaeologist of the opportunity to identify different temporal events through an analysis of the artefacts alone, Mosig-Way (2018) used a method termed 'Event based analysis' (EBA) which includes re-fitting of artefacts to make sense of deposits where vertical movement of artefacts may have occurred.

Through the application of EBA, Mosig-Way wanted to learn what site patterning across a landscape could tell us about past human behaviour as opposed to relying solely on the analysis of stone artefacts. This led Mosig-Way to explore how an archaeological excavation methodology, specifically test pitting, can impact the results. In her analysis of previous archaeological studies completed in the Lake George region, Mosig-Way points out that findings appear to be biased by the sampling methodology employed. She believed that discrepancies stem from the interplay between intra-site variability and variations in test-pitting methodologies. Variation in size and spacing of the test-units coupled with variations in the internal distribution of artefacts, can result in variations in site characterisation. Some key findings by Mosig-Way are outlined below.

- Artefacts associated with hearths were not typically found within the hearth site itself, but within 1m.
- The most enduring characteristic of the Lake George sites is their patchy nature. She argues that the archaeology of Lake George suggests that sites are frequently characterised by an uneven spread in artefact densities and raw materials, with discrete high-density patches separated by areas of much lower density or sterility.
- The sites excavated prior to Mosig-Way (2018) with the highest maximum densities, of more than 200 artefacts/m2, were located on relict beach ridges (Currandooley, WE-1, Rose Lagoon and Lake Bathurst), aeolian sand sheets (Butmaroo 1 and Bridge Creek 1) or alluvial terraces (C-AB2, G17).

In 2019, NGH undertook an Aboriginal Heritage constraints assessment for the proposed subdivision at the Lake George Winery, approximately 20km north by north-west of the current Project Site. As the design plans were yet to be finalised NGH provided mapping of areas of archaeological sensitivity within the subdivision area so that the potential impacts to Aboriginal heritage could be considered during the designing phases for the proposed subdivision. The results of the desktop assessment indicated that archaeologically sensitive landforms exist along a hill crest, ridgeline and elevated spurs located between several ephemeral drainage lines associated with Chain of Ponds and Gundaroo Creeks and expansive areas of undisturbed native forest vegetation. It was noted that if these areas cannot be avoided by the proposed subdivision, further heritage investigation would need to be undertaken.

4.4 Aboriginal site prediction

The proposed development for the Blind Creek Solar Farm lies within an archaeologically sensitive and well researched area. While it is known that there is high archaeological potential across many landforms within the Project Site (notably these are predominantly the elevated landforms), there are also a number of landforms that the previous research and archaeological modelling for the region would indicate hold a low archaeological potential. The Project Site has been categorised into 16 landforms, as highlighted in Figure 4-8. Table 4-11 provides a description of each landform, along with the archaeological potential and an indication of the previous archaeological excavations that have occurred.

4.4.1 Consideration of potential for subsurface material

The Project Site was divided into separate landforms based on a combination of topography and elevation, vegetation, hydrology and slope. Each of the landforms was then categorised into their archaeological sensitivity and classed as either: high, medium, or low. These categories of predicted archaeological sensitivity were based on desktop analysis of previous regional, archaeological studies.

High sensitivity

A total of six landforms within the Project Site were previously marked as containing a high potential for subsurface archaeological material. These landforms were:

- Beach,
- Elevated creek flat,
- Elevated sand body,
- Holocene beach ridge, and
- Strandline landforms.

Moderate sensitivity

A total of four landforms were previously marked as containing moderate potential for subsurface archaeological material. These landforms were:

- Creek terrace,
- Flat,
- Low spurs, and
- Saddle landforms.

Low sensitivity

A total of seven landforms were previously marked as containing a low potential for subsurface archaeological material. These landforms were:

- Basal slopes,
- Floodplain,
- Hillslope,
- Wetland depression,
- Gentle slopes,
- Undulating plain, and

- Drainage/erosion depressions.

The low sensitivity areas are typically characterised by shallow sandy deposits (less than 30cm and thereafter becoming increasingly clayey or hitting bedrock) which previous archaeological studies have identified as containing less sensitivity to the deeper sandy deposits found in elevated, flat areas.

It is clear from the previous archaeological studies and landform mapping of the Project Site that there are archaeologically sensitive landforms contained within it and there should be expectations for finding Aboriginal sites in the current assessment.

Table 4-11 Archaeological potential of landforms within the Project Site

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
Strandline	Defined as the ridge between the current lake level and the floodplain and depression. Likely formed by continuous movement of lake shore level to leave banded lines of deposits. High sand content and target of sand extraction activity. Consists of a narrow band of elevated deposits, gently or moderately inclined.	High	Portions of this landform was surveyed as a part of the Capitol II Wind Farm (Austral Archaeology 2010). This landform was also excavated by Packard (1992) who found a high density of 799 artefacts across 8 test pits.	No geotechnical investigations on this landform.
Beach	Comprises current shoreline, extending from the current waterline to the Strandline or Beach Ridge. This area represents the receding waterline of Lake George and is a low gradient slope to the water's edge.	High	Portions of this landform was surveyed as a part of the Capitol II Wind Farm (Austral Archaeology 2010). Packard's (1992) results indicate a lower subsurface potential than the strandline landform, however this area is still considered to hold a high archaeological sensitivity.	Bore Hole 9: 0-15cm: Top soil/sand; fine grained, grey, poorly graded, trace silt, medium dense. 15-90cm: Sand; fine grained, pale grey, poorly graded, trace silt, medium dense. Aeolian. 90cm-1.7m: Sand; fine to coarse grained, brown, trace low to medium plasticity clay, very stiff. Alluvial. 1.7-2.4m: clay; medium plasticity, brown, with silt and fine to coarse grained sand, hard. Alluvial 2.4-2.9m: clay; medium plasticity, brown with mottled orange, with silt

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				and fine to medium grained sand, firm. Alluvial 2.9-3.1m: sand' fine grained, orange/yellow brown, poorly graded, loose. Alluvial.
Holocene Beach Ridge	Previously identified as area south of Butmaroo Creek to contain an elevated area of a former shoreline and characterised as a elongated, nearly straight, low ridge, built up by waves and usually modified by wind during the Holocene. Ground survey failed to find substantial evidence of this feature.	High	This landform has one registered AHIMS site that describes the elevated area as a Holocene beach ridge and identifies a potential artefact scatter across the entire landform. Due to the moving nature of sands it is considered that there is a high potential for subsurface archaeological deposits.	No geotechnical investigations on this landform.
Elevated Sand Body	Elongated, gently curved, low ridge built up by wind on the margin of the lake or depression. These ridges are elevated above surrounding terrain and are clearly definable based on elevation and the high sand content and are often targets for sand extraction.	High	These landforms have been subject to previous archaeological excavations (Mosig-Way 2018; Packard 1992; CHMA 2008; ANUTECH 1985). All results indicate a high archaeological potential across elevated sand bodies within the Lake George region.	No geotechnical investigations on this landform.
Elevated Creek Flat	Defined as a landform pattern including one or more terraces and often associated with but slightly elevated above the flood plain. May be subject to	High	These landforms have been subject to previous archaeological excavations (Mosig-Way 2018; Packard 1992; CHMA 2008; ANUTECH 1985). All	No geotechnical investigations on this landform.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
	flood events but also may be above some flood levels.		results indicate a high archaeological potential across elevated creek flats within the immediate region.	
Waterway (Creekline)	The course (or channel) occupied by a creek running through a landscape including the immediate bank on both sides.	High	These landforms have been subject to previous archaeological excavations (Mosig-Way 2018; Packard 1992; CHMA 2008; ANUTECH 1985). All previous research indicates a strong link between archaeological sites and waterways.	No geotechnical investigations on this landform.
Creek Terrace	Defined as a small but elevated flat aggraded or eroded by channelled or overbank stream flow, standing above a bank and no longer frequently inundated; a former valley flat or part of a former flood plain	Moderate	These landforms have been subject to previous archaeological excavations (Austral Archaeology 2009; Packard, 1992; CHMA 2008; ANUTECH 1985). All results indicate a moderate archaeological potential for creek terrace landforms within the immediate region.	No geotechnical investigations on this landform.
Flat	A broad, level to very minor undulating landform, may be associated with floodplain or lake bed deposits.	Moderate	Packard (1992) conducted test excavations across flat landforms, however notably more associated with water sources. There have been no excavations within the immediate region that have produced results from	No geotechnical investigations on this landform.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
			flats that are not associated with water sources.	
Low Spurs	Characterised by low ridges of land descending from a hill or ridge, elevated above the surrounding landscape and separated by drainage channels. This landform includes those drainage channels as they are wide and ephemeral. The spurs are generally low gradient, and have wide, flat crests.	Moderate	No archaeological investigations across a low spur landform in the immediate region, however archaeological modelling would indicate a moderate potential.	Bore Hole 3: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, loose, trace low plasticity with rootlets. 20-90cm: Sand; fine to medium grained, orange/grey brown, poorly graded, trace silt, medium dense. Aeolian. 90cm-1.9m: Sand; fine to medium grained, orange/grey brown, poorly graded, trace silt, dense. Alluvial. 1.9-2.05m: clay; medium to high plasticity, red/grey brown, with fine to coarse grained sand, very stiff. Alluvial 2.05-2.7m: clayey sand; fine grained, red/grey brown, medium to high plasticity clay, dense to very dense. Alluvial. Bore Hole 7: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, loose, trace low plasticity with rootlets.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				20cm-1m: Sand; fine grained, pale grey, poorly graded, trace silt, loose then dense from 60cm. Aeolian. 1-1.9m: clay; medium plasticity, brown, trace fine to coarse grained sand, trace silt, very stiff. Alluvial. 1.9-2.55m: clay; medium plasticity, grey brown, trace fine to coarse grained sand, silt and gravel inclusions (<6mm), stiff to hard. Alluvial 2.55-2.85m: sandy clay; low to medium plasticity, brown, fine to coarse grained sand, trace gravel (<5 m), stiff to very stiff. Alluvial. 2.85-3.1m: sand; fine to medium grained, grey/brown, poorly graded, trace silt, loose. Alluvial. Bore Hole 5: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, loose, trace low plasticity with rootlets. 20cm-1m: Sand; fine to medium grained, pale grey brown, poorly graded, trace silt, loose to medium dense. Aeolian. 1-3m: Sand; fine to medium grained, pale yellow then yellow brown from

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				2.3m, poorly graded, trace silt, medium dense. Aeolian.
Saddle	For the Project Site, is a broad area or lower elevation between two ridges or hills.	Moderate	No archaeological investigations across a saddle landform in the immediate region, however archaeological modelling indicates moderate potential.	Bore Hole 2: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, medium density, trace low plasticity with rootlets. 20cm-1.2m: Sand; fine grained, pale yellow grey, poorly graded, trace silt, loose to medium dense, dense to very dense from 95cm. Aeolian. 1.2-1.6m: silty sand; fine grained, grey brown, poorly graded, non-plastic silt, dense to very dense, alluvial. 1.6-2.3m: clayey sand; fine to coarse grained, grey brown, low plasticity, trace gravel (<60mm) and cobble (<120mm), dense. Alluvial. 2.3-2.7m: clay; low to moderate plasticity, brown, with silt and fine grained sand, trace very high strength cobbles (<75mm), very stiff to hard. Alluvial.
Undulating Plain	Area of generally low elevation terrain, interspersed with slightly elevated	Low	Packard's (1992) results indicate the low-lying landforms, including the	Bore Hole 4:

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
	ground that form mostly east-west orientated rises between shallow depressions. This landform has a low but discernible relief of approximately 1-2 metres.		undulating plain, have a low potential for subsurface archaeological deposit.	0-20cm: Topsoil/sand; fine to medium grained, grey brown, poorly graded, trace low plasticity, very loose, rootlets. 20cm-1.8m: sand; fine grained, pale grey brown transitioning to orange brown at 1.1m, poorly graded, trace silt, very loose to loose but medium dense from 75cm. Aeolian. 1.8-2.8m: sand; fine to coarse grained, dark grey brown, well graded, trace silt and low plasticity clay, medium dense but loose to medium dense from 2.2m. Alluvial. 2.8-3.1m: Sand; fine grained quartz sand, orange brown, mottled grey, poorly graded, trace silt, loose to medium dense. Alluvial. Bore Hole 6: 0-20cm: Top soil/sand; fine grained, grey, poorly graded, medium density, trace silt with rootlets. 20cm-1.4m: Sand; fine grained, pale grey then orange brown from 70cm, poorly graded, medium dense. Aeolian.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				1.4-2.3m: clay; medium plasticity, grey/orange brown, with some fine to coarse grained sands and trace silt, dense. alluvial. 2.3-2.7m: clayey sand; fine to coarse grained, grey brown, well graded, low to medium plasticity, medium dense to dense. Alluvial. 2.7-3.2m: clay; moderate plasticity, grey with mottled orange brown, with silt and trace fine to coarse grained sand. Alluvial.
Floodplain	Alluvial plain characterised by frequent active aggradation by overbank stream flow or through high lake-fill episodes. The first area inundated within this landscape after rain or floods, the lowest lying area.	Low	The results of Packard's (1992) investigations at Currandooley indicate that there are some artefacts within the floodplain landform, however these are found in extremely low densities and are unlikely to be *in situ*, the result of the depositional nature of a floodplain environment.	Bore Hole 8: 0-20cm: Top soil/sand; fine grained, grey, poorly graded, medium density, trace silt, with rootlets. 20cm-1.2m: Sand; fine grained, pale grey brown, poorly graded, low plasticity silt, medium dense then dense to very dense from 75cm. Aeolian. 1.2-2.1m: clayey sand; fine grained, grey brown with mottled orange, low plasticity with trace medium to high plasticity clay seams, dense to very dense. Aeolian.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				2.1-3m: clay; low to moderate plasticity, pale grey brown with mottled orange, with silt and trace fine to coarse grained sand, firm to stiff. Alluvial. Bore Hole 10: 0-20cm: Top soil/sand; fine grained, grey, poorly graded, medium density, trace silt. 20-80cm: Sand; fine to medium grained, brown, poorly graded, low plasticity silt, medium dense then dense to very dense from 75cm. Aeolian. 80cm-1.7m: clay; low plasticity, brown, with silt and fine to medium grained sand, hard. Alluvial. 1.7-2.3 m: Sand; fine to coarse grained, brown, trace silt, loose. Alluvial. 2.3-3m: silty clay; medium plasticity, with fine grained sand, soft to firm. Alluvial. Bore Hole 11: 0-20cm: topsoil/sand; fine grained, grey, poorly graded, trace silt, very loose.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				20-90cm: sand; fine grained, pale grey brown, poorly graded, trace silt, loose to medium dense. Aeolian. 90cm-1.9m: clayey sand; fine to medium grained, orange brown/brown, poorly graded, low plasticity clay, dense to very dense. Alluvial. 1.9-3m: clay; medium plasticity, dark grey brown, with silt and fine grained sand inclusions, hard then very stiff from 2.6m. Alluvial.
Hillslope	Gently inclined to moderate slope, commonly simple, eroded by sheet wash, creep or water-aided mass movement.	Low	The results of the Austral Archaeology (2009) subsurface investigations confirmed the higher slopes and crests as areas of use whilst travelling through the landscape but not as foci of industry or occupation. The predictive models widely accepted for Aboriginal occupation habits indicate that there is low potential for permanent or semi-permanent sites on landforms with moderate to high degrees of slope. While these landforms were likely traversed at some point, land use is believed to have been sporadic.	Pit 1: Topsoil/silty sand: fine to medium grained, grey brown, poorly graded, with rootlets (bioturbation), very loose. Depth 30cm. Sand: Fine grained, pale grey/brown, poorly graded, very loose to loose, trace silt, aeolian. Depth: 30cm -1m. Clay: Medium to high plasticity, red/grey brown, with some fine grained sand, stiff to very stiff, alluvial. Depth: 1-1.1m. Clayey sand: fine grained, yellow to brown, poorly graded, low plasticity, dense to very dense to 3m then loose

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				to medium dense, alluvial. Depth: 1.1-3.5m Pit 13: Topsoil/silty sand: fine to medium grained sand, grey brown, poorly graded, with rootlets (bioturbation), very loose. Depth 25cm. Sand: Fine grained, pale yellow/grey, poorly graded, very loose to loose but medium dense from 1.05m and dense to very dense from 1.2m, trace silt, alluvial. Depth: 25cm-2m. Clayey sand: fine grained, yellow brown, poorly graded, low plasticity, dense to very dense, alluvial. Depth: 2-3m.
Drainage / Erosion Depression	Defined as a level to gently inclined, long, narrow, shallow open depression with smoothly concave cross-section.	Low	Packard (1992) conducted archaeological testing across subdued drainage areas and found them to be archaeologically sterile.	No geotechnical investigations on this landform.
Basal Slopes	Areas of moderately to very gently inclined waning lower slope at the base of major ridges and hills, associated with colluvial sediment movement.	Low	The results of the Austral Archaeology (2009) subsurface investigations confirmed the slopes as areas of use whilst travelling through the landscape but not as focus of industry or	Bore Hole 12: 0-20cm: topsoil/sand; fine grained, grey, poorly graded, trace silt, medium dense.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
			occupation. The predictive models widely accepted for Aboriginal occupation habits indicate that there is low potential for permanent or semi-permanent sites on landforms with moderate to high degrees of slope. While these landforms were likely traversed at some point, land use is believed to have been sporadic.	20cm-1.25m: sand; fine grained, pale grey brown, poorly graded, with silt inclusions, loose. Aeolian. 1.25-2.1m: clay; low to medium plasticity, grey brown, with silt and trace sand (fine grained) inclusions, very stiff. Alluvial. 2.1-3m: clay; medium plasticity, grey brown, with silt and trace sand (fine grained) inclusions, very stiff. Alluvial.
Wetland Depression / Lagoon	A closed depression behind the strandline and part of the floodplain. This area is the lowest within the Project Site and at time of survey contained shallow water.	Low	No archaeological investigations within a lagoon environment in the immediate region, however one registered AHIMS site, an isolated stone artefact, is located immediately adjacent to a lagoon landform (on the elevated strandline to the west).	No geotechnical investigations on this landform.

[redacted]

Figure 4-8 Landforms within the Project Site (note that this map was included in the Project Methodology and some information is now superseded)

The Aboriginal site modelling for the region to date suggests that Aboriginal sites are common within proximity to waterways and any associated elevated landforms, in particular within the sand bodies. These studies also suggest that the overwhelming majority of site types in the region are comprised of isolated artefacts and artefact scatters, with significant potential for subsurface archaeological deposits on unmodified landforms. The previously recorded AHIMS sites in the region support this conclusion. While the historical land use of the Project Site has caused surface and subsurface disturbances at some locations, this has largely served to bring subsurface deposits of archaeological material to the surface. The presence of Butmaroo Creek, Wrights Creek, and associated elevated sand landforms within the current Project Site – as well as the proximity to the shores of Lake George and Bridge Creek to the south – significantly increases likelihood of encountering Aboriginal heritage sites within the current Project Site.

The likely archaeological site types for the local area, and the potential for their presence within the Project Site, is outlined in Table 4-12 below.

Table 4-12 Aboriginal Site Prediction Statements

Site Type	Site Description	Potential
Stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations over a large area to isolated finds within discrete landforms	High potential to occur as either isolated finds or in high or low-density scatters in association with waterways or elevated sand landforms within the Project Site. Late Holocene artefact assemblages are characterised broadly as having higher artefact densities than early Holocene assemblages (Mosig-Way 2018).
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material	High potential to occur within the Project Site in proximity to waterways or within elevated sand landforms.
Hearths	Concentrated charcoal associated with cultural features (not to be confused with tree clearing or bushfires)	Potential to occur within Project Site in association with other occupation evidence.
Modified Trees	Trees that have undergone cultural modification	Low potential to occur due to the historical clearing of vegetation to allow for grazing.
Burials	Internments.	Burial practices differ from region to region. In the Yass district, Aboriginal people traditionally buried their dead in graves in rocky soils on the tops of stony hills (White and Cane 1986 referred to by Dibden 2013: 21). NGH are not aware of any burials related to Lake George.

5. Archaeological investigation results - surface survey

The results of the archaeological surveys undertaken for this project are outlined within this chapter (Chapter 5). Chapter 6 contains all results of the test excavation programme undertaken within the Project Site, while Chapter 7 provides a discussion of the results as a whole.

5.1 Survey strategy

The Project Site is currently covered by vegetation, primarily pasture and sedge grasses, with pockets of eucalypt and pine woodlands in some areas, due to good seasonal rains. Visibility was generally poor with few areas of exposure present, reducing the ability to find surface artefact sites. The proposed approach to the survey was therefore to sample the Project Site, rather than conduct a full pedestrian survey of the entire area. Survey was undertaken to identify whether Aboriginal objects were present on the surface and to verify archaeologically sensitive landforms.

Where possible the vegetation was mown in selected areas prior to the pedestrian survey, providing higher visibility in landforms where vegetation would have made surface survey impractical or ineffective. Unfortunately, this practice was unable to be used across the entire Project Site due to the cost, time, and biodiversity impact of mowing an area of this size.

Wherever pedestrian survey was undertaken, notes would be taken about visibility, landforms and coverage to comply with the requirements for documenting survey coverage under the Code of Practice. The purpose of the surface survey was to identify surface archaeological sites and verify the accuracy of the desktop landform mapping, linking all landforms within the Project Site to their relative archaeological potential. In some instances, vehicles were used to drive to a landform, where pedestrian sample survey was then undertaken to ensure a satisfactory level of coverage and corroboration with the landform mapping with on-ground verification.

The targeted landforms for the survey included areas identified as being within the footprint of the solar farm infrastructure and also included landforms that were not assessed by previous archaeological studies.

The visual inspection and mapping of these landforms was used to confirm the proposed subsurface testing programme within certain landforms across the Project Site.

Survey transects were undertaken on foot and focused on areas within the Project Site which would be both impacted by the development and anticipated to contain some archaeological sensitivity. The survey was undertaken with the survey team spread out and walking in parallel lines, variously spaced from 10-50m apart. At the end of a transect, the team would reposition along the end of the transect and then walk back in the opposite direction. This effectively provided large swathes of survey coverage across different landforms and was therefore efficient and effective. The survey was, by design, intended to confirm the predictive model, as well as focus on areas of likely higher sensitivity and find surface sites.

The survey was impeded by a variety of factors, including grass and thick vegetation due to good seasonal conditions. However, to ameliorate the conditions the survey was aided by mowing areas of interest and by timing the survey for colder months when grass cover was minimised.

5.2 Survey coverage

Areas of visibility were often limited to patches of bare ground, vehicle tracks, and animal tracks/burrows. Visibility within the Project Site ranged 0% to 30% depending on the landform. Visibility within exposures also varied significantly, ranging from 0% to 30%.

Table 5-1 below shows the calculations of effective survey coverage for the survey and Plate 5-1 to Plate 5-28 below show examples of the landforms and visibility within the Project Site. The approximate areas of survey are also shown in Figure 5-1 below.

Over the course of the survey, approximately 37km of transects were walked across the Project Site per person by an average of 5 team members. Calculating the distance and people present, a total of approximately 185km was walked across the Project Site. Allowing for an effective view width of 5m for each person and given the variability in the ground visibility across the Project Site, overall, the archaeological survey effectively examined approximately 0.51% of the Project Site.

NGH considers that the effective survey coverage of the development footprint within the Project Site was poor. However, this was to be expected, given the good growing season and the grass cover that was present. To counteract the coverage, NGH utilised knowledge from other archaeological surveys to supplement the results through extrapolation and confirmation of the landforms present within the Project Site. This was made possible due to the previous archaeological studies that have taken place within and adjacent to the current Project Site which informed the predictive model and provided modelling for the consideration of locations for subsurface archaeological testing.

The discovery of a significant number of Aboriginal objects during the survey of the Project Site indicates that the survey technique was effective enough to identify the presence of Aboriginal occupation and in what landform areas it was concentrated. While the effective survey coverage was low, NGH considers that the results identified are a true reflection of the nature of the Aboriginal archaeological record present within the surface of the Project Site.

	
Plate 5-1 View east over the Project Site within the floodplain landform.	Plate 5-2 View north-west over the Project Site within the floodplain landform.

	
Plate 5-3 View west over the Project Site from the northern bank of Butmaroo creek.	Plate 5-4 View west over the Project Site within the elevated creek flat landform adjacent to Butmaroo Creek.
	
Plate 5-5 View east over the Project Site within the beach landform.	Plate 5-6 View west over the Project Site within the beach landform.
	
Plate 5-7 View west over the Project Site within the wetland depression landform.	Plate 5-8 View east over the Project Site within the wetland depression landform.

	
Plate 5-9 View south over the Project Site within the elevated sand body landform.	Plate 5-10 View east over the Project Site within the elevated sand body landform.
	
Plate 5-11 View west over the Project Site within one of the elevated sand body landforms.	Plate 5-12 View north over the Project Site within one of the elevated sand body landforms.
	
Plate 5-13 View south over the Project Site within the undulating plain landform.	Plate 5-14 View west over the Project Site within the undulating plain landform.

Plate 5-15 View south over the Project Site within the low spurs landform.

Plate 5-16 View west over the Project Site within the low spurs landform.

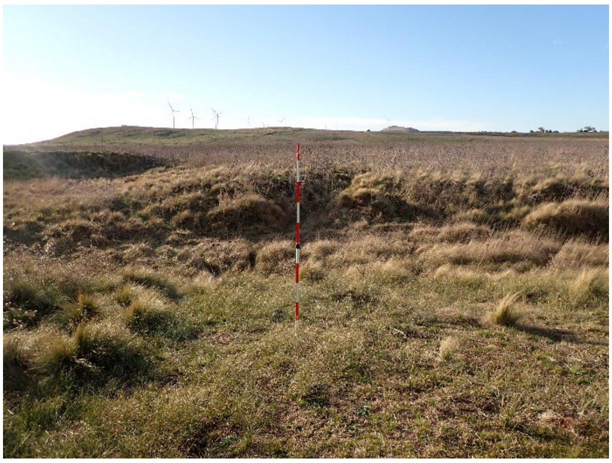

Plate 5-17 View north over the Project Site within the elevated creek flat landform.

Plate 5-18 View south over the Project Site within the elevated creek flat landform.

Plate 5-19 View north over the Project Site within the hillslopes landform.

Plate 5-20 View west over the Project Site within the hillslopes landform.

	
Plate 5-21 View east over the Project Site within the saddle landform.	Plate 5-22 View south over the Project Site within the saddle landform.
	
Plate 5-23 View north over the Project Site within the hillslopes landform.	Plate 5-24 View north-east by east over the Project Site within the hillslopes landform as it transitions into the creek terrace.
	
Plate 5-25 View west over the Project Site within the basal slopes landform.	Plate 5-26 View south over the Project Site within the strandline landform.

	
Plate 5-27 View north over the Project Site within the low spurs landform.	Plate 5-28 View north over the Project Site within the waterway and elevated creek terrace landforms at Bridge Creek.

Table 5-1 Transect information

Landforms	Number of Survey Transects	Exposure Type	Landform Area (ha)	Surveyed Area (length m x width m)	Survey Area m^2	Visibility	Effective Coverage (area x visibility m^2)	Area Effectively Surveyed (ha)	% of Project Site Effectively Surveyed	Survey Result
Strandline	7	Bare ground, disturbed deposits, vehicle tracks, and historical sand mining areas, animal tracks/burrows	57	646 x 15 465 x 15 499 x 25 80 x 5 192 x 40 1313 x 25 168 x 40	76,765	6%	4,605.9	0.46	0.80%	2 x Isolated Artefacts 4 x Artefact Scatters
Beach	4	Bare ground, animal tracks/burrows	74	330 x 15 389 x 15 388 x 15 365 x 15	22,080	3%	662.4	0.066	0.89%	Nil
Elevated Sand Body	11	Bare ground, vehicle tracks, historical sand mining areas, animal tracks/burrows	32	347 x 15 325 x 25 174 x 10 147 x 15 151 x 15 184 x 15	37,970	8%	3,037.6	0.304	0.95%	2 x Isolated Artefacts 3 x Artefact Scatters 1 x

Landforms	Number of Survey Transects	Exposure Type	Landform Area (ha)	Surveyed Area (length m x width m)	Survey Area m²	Visibility	Effective Coverage (area x visibility m²)	Area Effectively Surveyed (ha)	% of Project Site Effectively Surveyed	Survey Result
				261 x 10 64 x 10 33 x 15 230 x 25 247 x 25						previously recorded AHIMS site
Elevated Creek Flat	6	Bare ground, animal tracks/burrows, erosion	145	67 x 15 150 x 15 72 x 5 214 x 15 156 x 15 750 x 30	31,665	4%	1,266.6	0.126	0.08%	1 x Artefact Scatter
Waterway (Creek line)	Nil	N/A	7	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Creek Terrace	5	Pine plantation, bare ground, animal tracks/burrows, vehicle tracks	10	83 x 25 22 x 15 204 x 30 291 x 30 155 x 30	21,905	10%	2,190.5	0.219	2.19%	7 x Artefact Scatters

Landforms	Number of Survey Transects	Exposure Type	Landform Area (ha)	Surveyed Area (length m x width m)	Survey Area m²	Visibility	Effective Coverage (area x visibility m²)	Area Effectively Surveyed (ha)	% of Project Site Effectively Surveyed	Survey Result
Flat	Nil	N/A	83	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Low Spurs	9	Bare ground, animal tracks/burrows, vehicle tracks, road verge	152	172 x 15 464 x 15 527 x 15 620 x 15 560 x 25 138 x 30 215 x 30 614 x 25 280 x 30	75,085	4%	3,003.4	0.3	0.20%	1 x Isolated Artefact
Saddle	4	Bare ground, recently planted seeds, vehicle tracks, erosion, road verge	20	736 x 30 420 x 30 1020 x 20 1025 x 20	75,580	12%	9,069.6	0.907	4.535%	1 x Artefact Scatter
Undulating Plain	8	Bare ground, animal tracks/burrows, vehicle tracks	114	719 x 15 807 x 15 755 x 15 670 x 15	104,270	15%	15,640.5	1.56	1.36%	4 x Isolated Artefacts 8 x

Landforms	Number of Survey Transects	Exposure Type	Landform Area (ha)	Surveyed Area (length m x width m)	Survey Area m²	Visibility	Effective Coverage (area x visibility m²)	Area Effectively Surveyed (ha)	% of Project Site Effectively Surveyed	Survey Result
				284 x 30 578 x 10 1125 x 25 586 x 30						Artefact Scatters
Floodplain	11	Bare ground, vehicle tracks, boggy/marshy areas	323	1167 x 15 1042 x 25 1102 x 5 534 x 15 1012 x 40 414 x 25 308 x 25 666 x 40 478 x 20 531 x 25 1741 x 25	208,605	8%	16,688.4	1.66	0.51%	1 x Artefact Scatter 1 x previously recorded AHIMS site
Hillslope	5	Bare ground, animal tracks/burrows, vehicle tracks, pine forest	14	54 x 30 291 x 30 213 x 30 224 x 25	25,600	9%	2,304	0.23	1.64%	2 x Isolated Artefact 1 x Artefact

Landforms	Number of Survey Transects	Exposure Type	Landform Area (ha)	Surveyed Area (length m x width m)	Survey Area m^2	Visibility	Effective Coverage (area x visibility m^2)	Area Effectively Surveyed (ha)	% of Project Site Effectively Surveyed	Survey Result
		plantation		163 x 20						Scatter
Basal Slopes	9	Animal tracks/burrows, bare ground	112	512 x 30 369 x 30 129 x 20 163 x 20 200 x 30 148 x 30 450 x 40 531 x 40 324 x 20	88,430	3%	2,652.9	0.265	0.23%	Nil
Wetland Depression / Lagoon	1	Vehicle tracks, bare ground, animal tracks/burrows	49	678 x 5	3,390	15%	508.5	0.05	0.102%	Nil
Drainage/Erosion Depressions	Nil	Nil	17	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Gentle Slopes	3	Road verges	15	145 x 20 626 x 20	20,460	4%	818.4	0.081	0.54%	1 x Artefact

Landforms	Number of Survey Transects	Exposure Type	Landform Area (ha)	Surveyed Area (length m x width m)	Survey Area m^2	Visibility	Effective Coverage (area x visibility m^2)	Area Effectively Surveyed (ha)	% of Project Site Effectively Surveyed	Survey Result
				252 x 20						Scatter
TOTAL	**83**	**-**	**1224**	**-**	**791,805**	**8%**	**62,448.70**	**6.245**	**0.51%**	**-**

Note that subsequent to the field survey and calculation of the survey coverage, some amendments to the landforms were made and these are outlined in section 5.3.2. The survey coverage and mapping below are based on the survey at the time to provide a more accurate indication of the coverage based on the landforms as defined prior to survey.

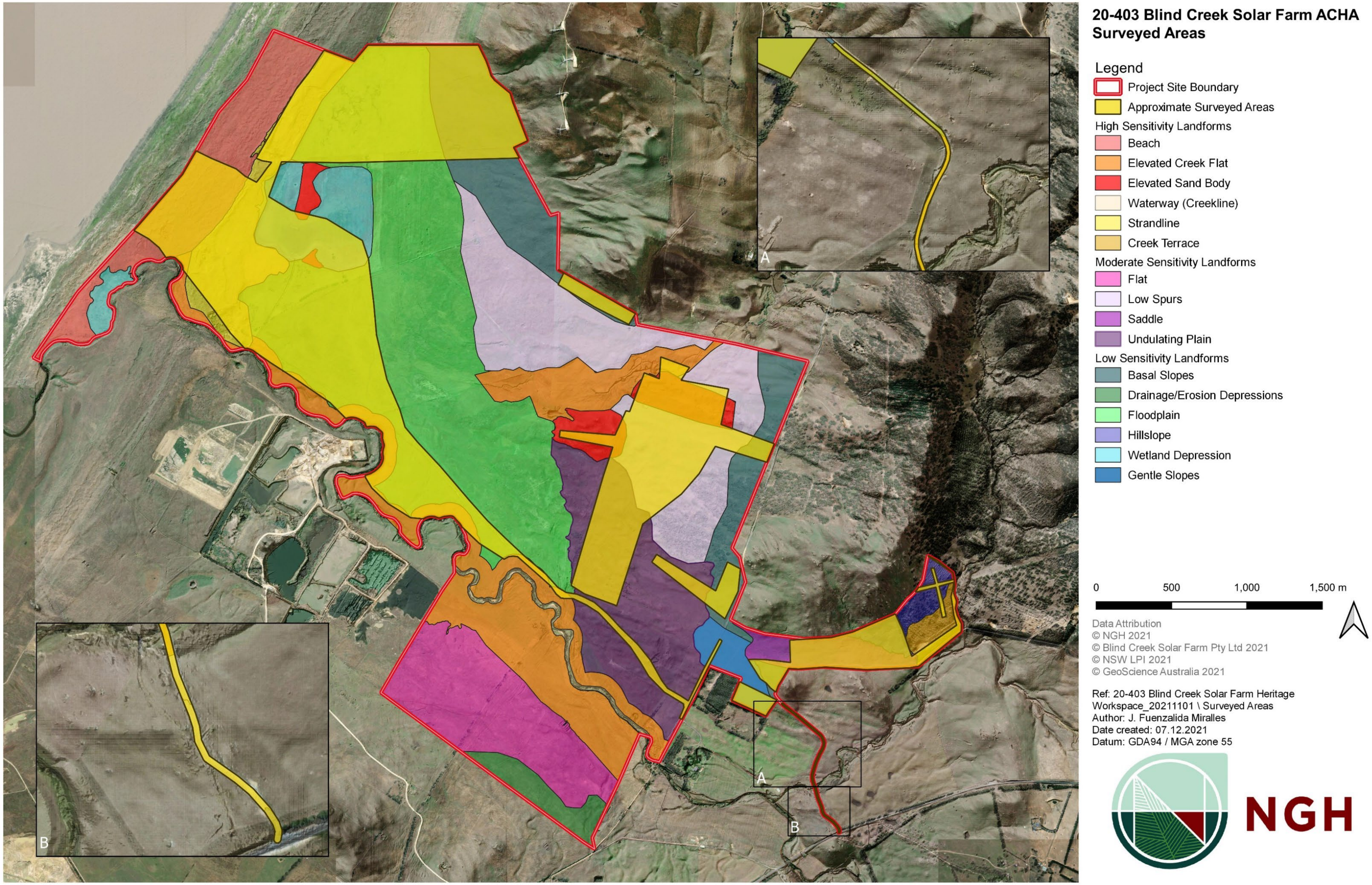

Figure 5-1 Approximate Surveyed Areas within the Project Site for the proposed Blind Creek Solar Farm

5.3 Survey results

5.3.1 Field survey results

Despite the low visibility encountered during the survey, a total of 38 new sites, comprised of 11 isolated finds and 27 artefact scatters, were identified. While attempts were made to relocate the previously recorded AHIMS sites within the Project Site, the limited ground visibility prevented their relocation. The new sites have been recorded as the following:

- From BCSF: Isolated Find 1 to BCSF: Isolated Find 11
- From BCSF: Artefact Scatter 1 to BCSF: Artefact Scatter 27

A brief description of the survey results is provided in Table 5-2 below. The more detailed site information for all BCSF: Isolated Finds and BCSF: Artefact Scatters is provided in Appendix B. Figure 5-3 to Figure 5-5 show the location of the new and previously recorded sites within the Project Site.

Table 5-2 Summary of survey results and recorded surface artefacts within the Project Site

Landform Sensitivity	Total Area (ha)	Surveyed Area (ha)	Percentage of Area Surveyed	Effective Survey Coverage (refer to Table 5-1) (ha)	Percentage of Total Area Effectively Surveyed	Surface Sites Recorded	Sites recorded per Ha of effective coverage
High	325	19.04	5.86%	1.175	0.36%	4 Isolated Artefacts 15 Artefact Scatters	16.2
Medium	369	25.50	6.91%	2.7414	0.74%	5 Isolated Artefacts 9 Artefact Scatters	5.1
Low	530	34.65	6.54%	2.286	0.43%	2 Isolated Artefacts 3 Artefact Scatters	2.2

Previously recorded AHIMS sites

The GPS locations of the previously recorded AHIMS sites were inspected during the field survey. All AHIMS sites within the Project Site that were not examined during the survey were not in proximity to the development area and therefore were not considered to be at risk of harm from the proposed development.

AHIMS #57-2-0059/Lakelands

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was inundated with water and as a result ground visibility was nil. It is assumed that this site is still extant. Plate 5-29 and Plate 5-30 below show the general visibility encountered across the site. The site is located within the undulating plain landform.

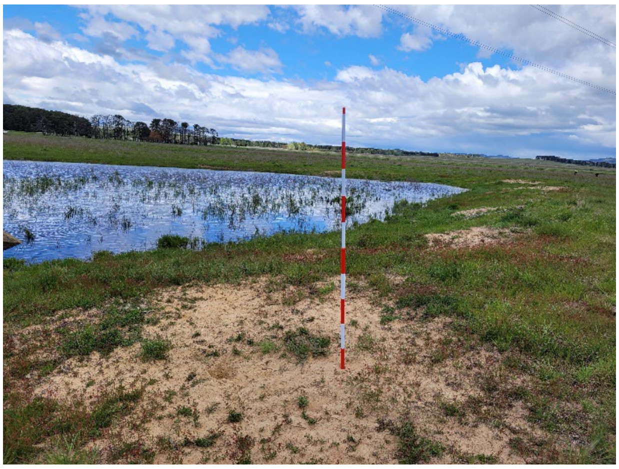

Plate 5-29 View south over AHIMS#57-2-0059. The site is located in the middle of the pond.

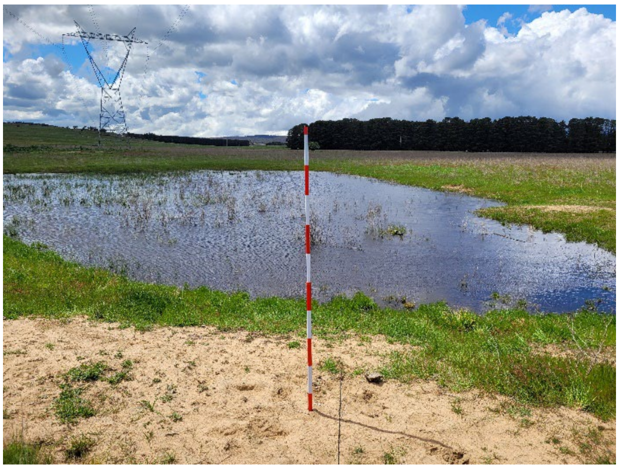

Plate 5-30 View east over AHIMS#57-2-0059.

AHIMS #57-2-0702/CWF2-IF-02 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the beach landform.

AHIMS #57-2-0703/CWF2-IF-03 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the strandline landform.

AHIMS #57-2-0704/CWF2-IF-04 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the strandline landform.

AHIMS #57-2-0707/CWF2-IF-07

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the strandline landform.

AHIMS #57-2-0708/CWF2-IF-08 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the strandline landform.

AHIMS #57-2-0732/CWF2-S-01 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the strandline landform.

AHIMS #57-2-0733/CWF2-S-02 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the strandline landform.

AHIMS #57-2-0734/CWF2-S-03 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. BCSF: Artefact Scatter 1, identified during this assessment, is potentially associated with this AHIMS site as it was recorded 45m north-west. It is assumed that this site is still extant. The site is located within the creek terrace landform.

AHIMS #57-2-0735/CWF2-S-04 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the creek terrace landform.

AHIMS #57-2-0736/CWF2-S-05 – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was covered with vegetation allowing for less than 5% ground surface visibility. It is assumed that this site is still extant. The site is located within the strandline landform.

AHIMS #57-2-0790/West Creek Dairy PAD 1

The GPS location of this previously recorded site was thoroughly inspected during this survey. The PAD was relocated, and it was determined that the area should be tested to verify the existence of the PAD (refer to Section 6 below). Plate 5-31 and Plate 5-32 below show the general visibility encountered across the site. The site is located within the floodplain landform.

	
Plate 5-31 View north-east over AHIMS#57-2-0790.	Plate 5-32 Ground surface visibility at AHIMS#57-2-0790.

AHIMS #57-2-0917/Willow Sands – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey. The PAD was relocated and is determined to be in good condition considering that the southern portion of the PAD is eroding into a historical sand mine. BCSF: Artefact Scatter 5, identified during this assessment, was recorded on the southern boundary of the PAD and is likely to be associated with intact subsurface deposits. Plate 5-33 and Plate 5-34 below show the general visibility encountered across the site. The site is located within the elevated sand body landform.

	
Plate 5-33 View south over AHIMS #57-2-0917.	Plate 5-34 Ground surface visibility at AHIMS#57-2-0917.

AHIMS #57-3-0213/Bridge Creek/Currandooly – *No impact proposed*

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was not identified. The site was partially inundated with water, which allowed for no ground visibility, and partially covered with low lying vegetation and detritus, which allowed for less than 5% ground surface visibility. BCSF: Artefact Scatter 18, identified during this assessment, is potentially associated with this AHIMS site due to its proximity. It is assumed that this site is still extant. Plate 5-35 and Plate 5-36 below show the general visibility encountered near the site. The site is located within the saddle landform.

	
Plate 5-35 View south over AHIMS#57-3-0213. The AHIMS site is located in the middle of the pond at the back of the image.	Plate 5-36 Ground surface visibility near AHIMS#57-3-0213.

AHIMS #57-3-0458/Bridge Ck SU/L1

The GPS location of this previously recorded site was thoroughly inspected during this survey however the previously recorded material was unable to be relocated. The site was partially located within an existing vehicle track allowing for visibility up to 35% within the track exposures, with the remainder of the site being covered in low lying vegetation and detritus allowing for less than 5% ground surface visibility. BCSF: Artefact Scatters 20, 21, and 22, identified during this assessment, are potentially associated with this AHIMS site due to their proximity. It is assumed that this site is still extant. Plate 5-37 and Plate 5-38 below show the general visibility encountered across the site. The site is located within the creek terrace landform.

	
Plate 5-37 View south over AHIMS#57-3-0458.	Plate 5-38 Ground surface visibility near AHIMS#57-3-0458.

5.3.2 Consideration of archaeological landform sensitivity

Due to the nature of the sampling for surface archaeological survey proposed in the methodology, specific areas of PAD were not identified. Instead, the Project Site was divided into separate landforms, as described in Section 4.4, based on a combination of topography and elevation, vegetation, hydrology and slope. Each of the landforms was then categorised into their archaeological sensitivity and classed as either: high, medium, or low. These categories were originally based on desktop analysis of past survey results, modelling and predicted archaeological potential. The sensitivity categories relate to the potential for significant numbers of surface or subsurface artefacts to be present.

Following the field survey and based on the survey results for the Project Site, the assessment of the archaeological potential for archaeological sites was re-evaluated while also still considering the broader archaeological modelling for the area, results of previous investigations surrounding the Project Site, review of historical aerial images and comments from RAPs attending the survey fieldwork. As a results, the landform predictive model was updated to reflect these changes, these updates are provided in Figure 5-2 below. The following definitions were formulated to explain each of the sensitivity categories.

High sensitivity

A total of six landforms within the Project Site were previously marked as containing a high potential for archaeological material (see Figure 4-8) These landforms were:

- Beach,
- Elevated creek flat,
- Elevated sand body,
- Waterway banks
- Holocene beach ridge, and
- Strandline landforms.

Following the surveys, the Holocene beach ridge was incorporated into the flat landform and the creek terrace landform was elevated from medium to high based on the results of the survey and consideration of the landform as a whole. In addition, the Elevated Creek Flat landform was amended to account for a depression area associated with Wrights Creek. This new landform was labelled Wrights Creek Depression and was assessed as having low archaeological potential.

Over the course of the archaeological surveys all of these landforms were partially or fully surveyed except for the Holocene beach ridge/flat landform, which was visually inspected in order to determine potential testing locations. These landforms are located throughout the Project Site and are generally represented by a fine creamy light brown to light yellow sand. From a landscape perspective, the archaeological survey showed that these areas are either dominant features in the landscape or located close to the major waterways or waterbodies in the area. Previous archaeological studies have also suggested that these elevated sandy areas contain significant potential for subsurface archaeological material. The presence of previously recorded AHIMS sites and large sites recorded during the current assessment within these landforms also reinforces their sensitivity. As a result, the archaeological modelling suggests that these landforms are likely to contain the majority of evidence for Aboriginal occupation in the region.

This conclusion is clearly supported by comparing the survey results between the three sensitivity categories. The landform group comprising the high sensitivity areas had 19 locations recorded as sites, in 1.175ha of effective survey coverage, giving a ratio of 16.2 sites per Ha of effective survey coverage. This is considered a very high ratio and supports the contention of this assessment that certain landforms are demonstrably more sensitive than others for archaeological sites.

Moderate sensitivity

A total of five landforms were initially mapped as having moderate potential for archaeological material. These landforms were:

- Creek terrace,
- Flat,
- Low spurs, and
- Saddle landforms.

Following the survey, the creek terrace landform was elevated to high sensitivity and the undulating plain landform was elevated from low to medium sensitivity. Both of these landforms were elevated based on the results of the survey and consideration of the landforms as a whole. The amendment of the classification of the undulating plain landform was determined with reference to the expectation that the artefacts would be clustered in discrete but dense sites within the local sandy rises that form the high points of the undulating plains. Due to the landscape approach that NGH has taken for the purposes of this assessment it was important to consider the lower sensitivity areas of the landform in conjunction with the high. As a result, while the sensitivity within the low-lying areas of the undulating plain is predicted to contain low archaeological sensitivity, the local sandy rises that form the high points within this landform are predicted to contain a high archaeological sensitivity. Therefore, as a whole the undulating plain landform is considered to have medium archaeological sensitivity.

Over the course of the archaeological surveys all of these landforms were surveyed with the exception of the Flat on the southern side of Butmaroo Creek, due to this area identified as likely being removed from the project footprint. These landforms are located within the eastern portions of the Project Site and are usually within proximity to waterways. The topsoils in these landforms are generally represented by a loamier sand compared with those found in the high sensitivity landforms. Previously recorded AHIMS sites are also located within some of these landforms in the Project Site, indicating that there is potential for artefacts across these landforms. Due to their position in the landscape these landforms also act as transitionary landforms between areas of high and low sensitivity. This suggests that some archaeological material may be found in lower densities when compared to the neighbouring high sensitivity landforms.

In comparing the relative ratio of sites per effective survey coverage, the Moderate landforms contained 5.1 sites per effective survey Ha. This is significantly less than the high landforms and justifies a different category.

Low sensitivity

A total of seven landforms were previously marked as containing a low potential for archaeological material. These landforms were:

- Basal slopes,
- Floodplain,
- Hillslope,
- Wetland depression,
- Gentle slopes,

- Undulating plain, and
- Drainage/erosion depressions.

As previously mentioned, the sensitivity for the undulating plain landform was elevated after the results of the survey. These landforms are considered to contain low archaeological sensitivity due to their positions in the landscape, which reduce their likelihood of having been intensively occupied in the past.

The Wrights Creek Depression landform was added to this category. This landform comprises the location where Wrights Creek dissipates into a low depression with no defined creek channel. At the time of inspection it contained ankle deep water across a broad area and as such could not be considered elevated or of archaeological potential. The location of this landform is shown in Figure 5-2 below.

The low sensitivity areas are represented by increasingly loamy/clayey soils, which previous archaeological studies have identified as containing less sensitivity to the sands found in areas of high and medium sensitivity. However, Aboriginal artefacts were located within some of these landforms during the surveys and an area of PAD has been previously identified within the floodplain. This indicates that there may be some potential for archaeological sites and subsurface deposits.

Within the group of landforms comprising the low sensitivity category, only 2.2 sites per effective survey coverage hectare were recorded. This is less than the moderate group and is used as evidence that there is a real and substantive difference in the archaeological potential of the various landforms. Based on these comparative results, we are very confident that the assessment methodology used in the delineation of landforms and the subsequent impact and management measures considered further in this report are based on sound archaeological evidence.

As a result of this assessment, it was determined that a programme of subsurface testing would be required in order to examine whether archaeological deposits are present within the six landforms predicted to contain low sensitivity. The previously recorded PAD within the floodplain should also be assessed by this testing. The results of the testing programme are provided in Section 6.3

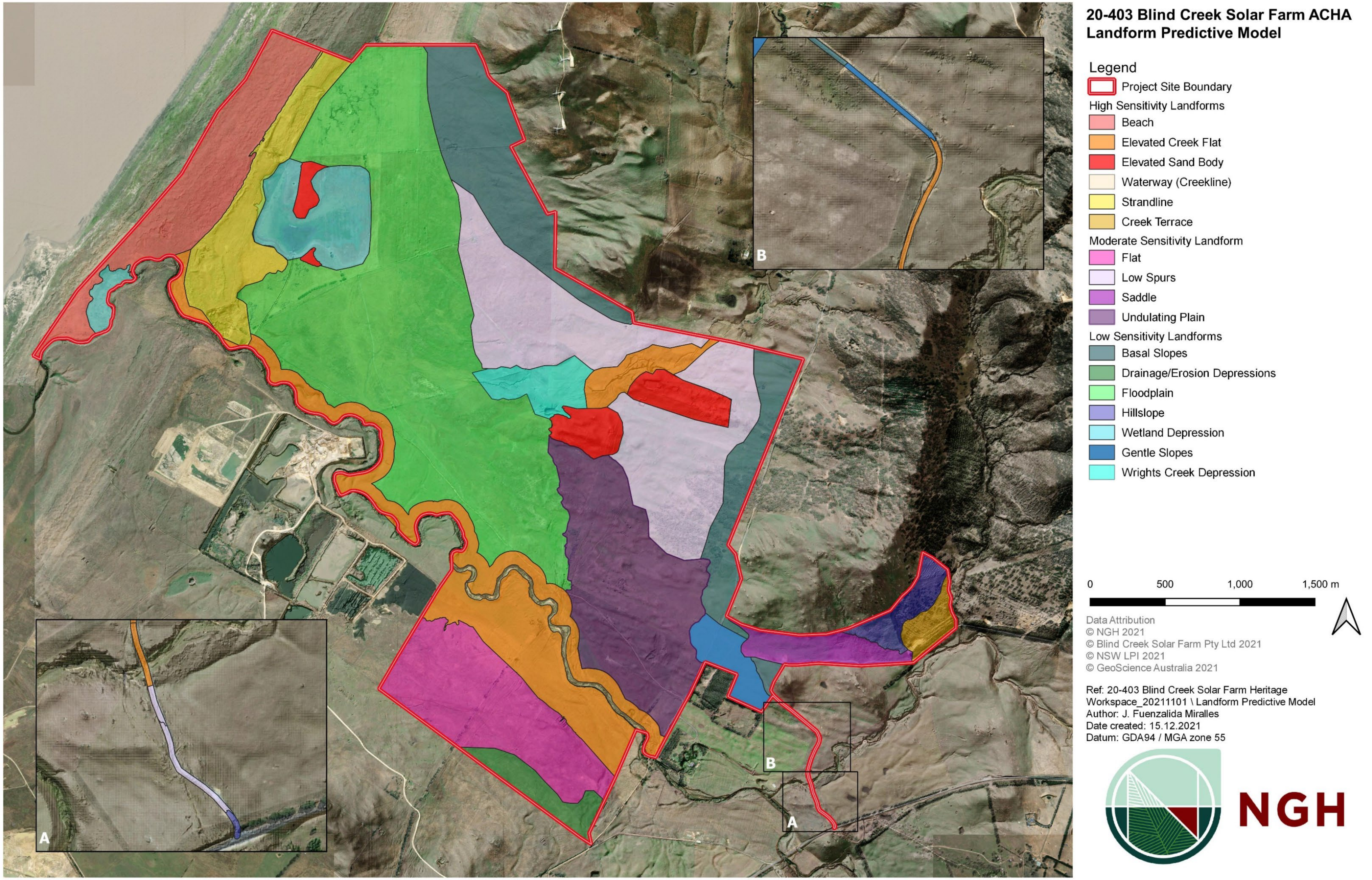

Figure 5-2 Updated landform predictive model post NGH (2021) survey

[redacted]

Figure 5-3 Archaeological Survey Results – Map 1 of 3

[redacted]

Figure 5-4 Archaeological Survey Results – Map 2 of 3

[redacted]

Figure 5-5 Archaeological Survey Results - Map 3 of 3

5.4 Culturally identified sites

No sites containing intangible heritage values were identified by RAPs within the Project Site.

During the second visit to the Project Site in October 2021, an NGH archaeologist Jorge Fuenzalida Miralles was informed by a representative of the Aboriginal community that there was a cultural site within proximity to a portion of the Project Site. It should be noted that only Aboriginal people can comment on cultural and spiritual heritage values. The representative requested that a female archaeologist be made available so that this site may be examined further. As a result, NGH archaeologist Bronwyn Partell revisited the site with the representative on 31 October 2021. The result of this site visit was that the area was confirmed to be outside of the Project Site. The area was confirmed as containing cultural heritage values. The site was recorded and demarcated within a specific area that has been recorded as BCSF Cultural Site (AHIMS #57-2-1154). Due to the nature of the site containing cultural values, the area will be recorded as a restricted site. It should be noted that the proponent has confirmed that all proposed works will avoid the area entirely, ensuring that this cultural site is unharmed.

The presence of this site within the landscape establishes that the area has strong intangible heritage values that do not leave an archaeological record. Therefore, care should be taken to ensure that other areas which have not been assessed as part of this project are subject to cultural assessment for intangible heritage values, prior to any works taking place.

No other sites containing intangible heritage values were identified by RAPs within the Project Site, as surveyed.

6. Archaeological investigation results - subsurface testing

6.1 Subsurface testing aims

The purpose of the subsurface testing programme within the Project Site was to provide an assessment of the potential extent and significance of subsurface cultural material within the landforms present within the Project Site that may be impacted by the proposed works for the Blind Creek Solar Farm.

The aim of the subsurface testing programme of the landforms which will be impacted by the proposed works was to:

- Comply with current NSW legislation and heritage guidelines.
- Identify the presence and nature of any Aboriginal sites within the various landforms across the Project Site.
- Determine if AHIMS #57-2-0790/West Creek Dairy PAD 1 has subsurface archaeological potential.
- Determine if and how the proposed works would impact any sites and determine any appropriate mitigation measures.
- Undertake a basic analysis of any artefacts recovered to record the technological or other artefactual features of the site.
- Date any material deemed in situ to establish the age of the Aboriginal site.
- If possible, identify if there are any conclusions to be drawn about land use by past Aboriginal people.

6.2 Excavation methodology

The subsurface excavation of the areas considered to have potential for *in situ* subsurface deposits within the Project Site was undertaken with reference to the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* and in accordance with the approved methodology for the project. As such, the basic parameters of the investigation are in keeping with those outlined in the Code. The following provides details of the methodology used in the testing strategy for the subsurface testing programme within the Project Site.

The test excavation targeted areas within landforms which were unmodified and also examined a range of sensitivity levels of those landforms within the Project Site, based on the model provided in the methodology. The number and extent of test pits required was initially estimated through a desktop appraisal but was also amended in the field based on the results of the survey and as testing progressed and the observed conditions of the landforms.

Due to the amount of data available from previous archaeological excavations within the region, and more specifically within and surrounding the Project Site, a targeted approach to testing was adopted where each landform to be potentially impacted was sampled.

Test pit clusters and transects

The excavation approach involved the use of 'clusters' of test pits as well as transects of test pits. This method was decided largely based upon the results of Dr Amy Mosig-Way's extensive research for a PhD thesis within and near the Project Site in 2018 (Mosig-Way 2018). NGH also consulted directly with Dr Mosig-Way regarding the methodology (19.05.2021; 28.05.2021; 02.06.2021) in order to determine the best approach. The results of Mosig-Way's (2018) investigation indicated that the archaeological deposits in the area are characterised by small knapping floors averaging 3-5m in size. It was determined therefore that some flexibility in the approach was necessary and that in some areas, test pits should be excavated in closer proximity to each other than traditionally wider spacing in transect form.

<u>Clusters</u>:

Initially it was proposed to excavate five test pits at 5m intervals (creating a cross or + formation). However, due to examination of factors in the field, including the expanse of some landforms, this was changed to intervals of 10m. This change was discussed in the field with the Aboriginal site representatives, and it was agreed by all that this should occur.

These clusters were positioned in random locations across the differing landforms with the intention of confirming the predictive model of archaeological sensitivity of each landform (low, moderate, high) that will be subject to impacts as a result of the proposed development. This approach was determined based upon the data and results available from other archaeological investigations in the area, the landforms present within the Project Site, and the footprint of potential impact for the proposal. Clusters of test-pits were deemed as the most appropriate as the sites in this landscape are normally discrete, 3-5m diameter knapping floors, with no-to-minimal archaeological evidence in between these small concentrations.

Clusters were therefore aimed at assumed specific site or occupation events, as described by Mosig-Way. They were appropriate to examine any intra site differences or variations and to characterise a site in the same topographic and environmental ecotone, thus avoiding any potential bias in artefact distribution that may occur if testing across a landform. The clusters were also seen as having a higher likelihood to intersect features such as hearths or flaking floors where they may exist at a site.

There was a total of 15 clusters of excavation pits placed at random intervals across six different landforms within the Project Site. The clusters were placed at random intervals based on the conditions of the landform and in consideration of the topography, levels of disturbance and in consultation between the archaeologists and Aboriginal community.

<u>Transects</u>:

Transects were excavated across the Project Site in an attempt to understand the archaeological potential of these landforms further. Initially it was considered that the transects would be placed at 50m intervals. However, on consideration in the field this was reduced to 20m to better fulfill the aims of the investigation. This change was discussed and agreed with the Aboriginal community representatives on site.

The placement of transects in some landforms was to supplement the archaeological evidence obtained through the cluster of test pits. While the clusters were aimed at intersecting the small discrete artefact flaking or camping events, the transects were aimed at discovering different information including the presence of low-density background scatter of artefacts, the potential extent or spread of artefacts across a landform and to examine any situations where densities may increase or decrease across a landform, for example in proximity to water or other resources.

Transects also provided general information on the variation of soil deposits across sections of a landform.

Isolated pits:

Isolated pits were excavated within two landforms in the Project Site in order to provide further understanding about the stratigraphic deposit present within these areas. The isolated pits were placed randomly in areas where a cluster or transect of pits were not appropriate. While the clusters and transects were expected to provide information regarding the presence or absence of subsurface archaeological deposits within the landforms of the Project Site, the isolated pits were expected to provide information on the stratigraphic profiles within certain areas of the Project Site.

The use of isolated pits was discussed and agreed with the Aboriginal community representatives on site.

Excavations:

All excavation was undertaken as follows:

- Hand excavation using shovels and trowels, pits were a minimum of 50cm x 50cm in area. Triggers to expand the pits were in place, allowing flexibility to increase the area excavated based on excavated material, including cultural features, and where high densities (>100/m2) of artefacts were recovered;
- The removal of deposit in the initial excavation unit across each landform type was done in 5cm levels or 'spits' with subsequent excavation units at 10cm unless features found required a different strategy;
- Sieving of deposits (dry sieving) through a 5mm mesh;
- Any potential cultural material was retrieved from the sieve and bagged and labelled according to PAD, pit and spit for later recording and analysis in the laboratory.
- Proceed with excavation until completed (reaching base clay, bedrock or other reason for termination);
- Photography of site prior, during and post excavation as well as photos of all finished pits; and
- At completion of excavation, backfill test pits (with sieved material is possible or clean fill if required).

Following the completion of the fieldwork, the material retrieved from the sieving process was sorted and all Aboriginal objects were recorded and analysed. The temporary storage of the artefacts is at the NGH Canberra Office, Unit 8, 27 Yallourn Street Fyshwick ACT 2609.

6.3 Excavation results

6.3.1 Testing results

A total of 127 test pits were excavated during the subsurface testing programme undertaken for the Blind Creek Solar Farm within the Project Site. These test pits were excavated either as a part of Clusters, Transects, or as Isolated Pits. A total of 16 Clusters, 7 Transects, and 6 Isolated Pits were excavated during the July and October excavation periods.

The location of the test pits was recorded in the field using a GPS enabled Samsung Tablet, running QField. The location of the 127 test pits excavated across the Project Site are shown in Figure 6-5 below. The 127 test pits were excavated across 10 landforms located within the Project Site. The remaining 7 landforms were not tested due to their low predicted sensitivity, their location outside of the development footprint, or due to the conditions within those landforms preventing excavation (i.e., waterlogged soils). The landforms tested within the Project Site, along with how many test pits were located within each of them, can be seen in Table 6-1 below. The results of both surface and subsurface investigation are also compared to the proposed development footprint for the Blind Creek Solar Farm in Figure 6-6 to Figure 6-8 below. It should be noted that BCT Transect 5 was excavated at a point where the Project Site extended further south.

Table 6-1 Landforms tested within the Project Site

Landform (Sensitivity)	BCT Cluster/Transect	Number of Test Pits
Floodplain (Low)	BCT Cluster 5	5
Undulating Plain (Moderate)	BCT Transect 1, BCT Cluster 3, BCT Cluster 4, BCT Cluster 16, BCT Isolated Pit 3A – 3C, BCT Isolated Pit 4	26
Low Spurs (Moderate)	BCT Cluster 1, BCT Cluster 2	10
Elevated Sand Body (High)	BCT Cluster 6, BCT Cluster 7, BCT Cluster 8	15
Elevated Creek Flat (High)	BCT Transect 2, BCT Isolated Pit 1, BCT Isolated Pit 2	11
Basal Slope (Low)	BCT Transect 4, BCT Transect 5	10
Flat (Moderate)	BCT Cluster 10, BCT Cluster 11, BCT Cluster 12, BCT Cluster	20

Landform (Sensitivity)	BCT Cluster/Transect	Number of Test Pits
	13	
Hillslope (Low)	BCT Transect 3, BCT Cluster 9	12
Creek Terrace (Moderate)	BCT Transect 6, BCT Cluster 15	8
Strandline (High)	BCT Cluster 14, BCT Transect 7	10

From the 127 test pits excavated across the 10 landforms within the Project Site a total of 409 stone artefacts were recovered from a total of 61 test pits. A total of 21 areas (BCSF: Cluster, BCSF: Transect, or BCSF: Isolated Pit) contained subsurface artefacts, each area has been recorded as an individual site on AHIMS. The total soil volume excavated and sieved during the subsurface testing programme was 18.65m^3 and test pits ranged in depth from 15cm to 100cm. A summary of soil descriptions is provided in Section 6.3.2 below and full descriptions of test pits are provided in Appendix C.

Stone artefacts were identified within all landforms that were tested, except for the floodplain.

[redacted]

Figure 6-1 Overview of test pits with subsurface archaeological material within the northern portions of the Project Site – Map 1 of 5

[redacted]

Figure 6-2 Overview of test pits with subsurface archaeological material within the northern portions of the Project Site – Map 2 of 5

[redacted]

Figure 6-3 Overview of test pits with subsurface archaeological material within the northern portions of the Project Site – Map 3 of 5

[redacted]

Figure 6-4 Overview of test pits with subsurface archaeological material within the northern portions of the Project Site – Map 4 of 5

[redacted]

Figure 6-5 Overview of test pits with subsurface archaeological material within the northern portions of the Project Site – Map 5 of 5

[redacted]

Figure 6-6 Proposed development footprint and identified archaeological sites - Map 1 of 3

[redacted]

Figure 6-7 Proposed development footprint and identified archaeological sites - Map 2 of 3

[redacted]

Figure 6-8 Proposed development footprint and identified archaeological sites - Map 3 of 3

The test pits from which artefacts or cultural material such as hearths were recovered are listed in Table 6-2 below. The remainder of the pits did not contain Aboriginal objects.

Table 6-2 Test Pits where archaeological evidence was recorded

AHIMS Site No.	Site (Cluster or Transect)	Test Pit No.	Landform
57-2-1185	BCT Cluster 1	Pit 2, Pit 5	Low Spurs
57-2-1190	BCT Cluster 2	Pit 1	Low Spurs
57-2-1196	BCT Cluster 3	Pit 1, Pit 2, Pit 3, Pit 4, Pit 5	Undulating Plain
57-2-1197	BCT Cluster 4	Pit 1, Pit 3, Pit 4, Pit 5	Undulating Plain
57-2-1191	BCT Cluster 6	Pit 1, Pit 2, Pit 3, Pit 4, Pit 5	Elevated Sand Body
57-2-1199	BCT Cluster 7	Pit 2, Pit 3	Elevated Sand Body
57-2-1153	BCT Cluster 8	Pit 1, Pit 2, Pit 3, Pit 4, Pit 5	Elevated Sand Body
57-2-1200	BCT Transect 3/Cluster 9 BCT Cluster 9	T3 Pit 5/C9 Pit 1 Pit 2, Pit 4	Hillslope
57-2-1188	BCT Cluster 10	Pit 1, Pit 2, Pit 3, Pit 4, Pit 5	Flat
57-2-1186	BCT Cluster 11	Pit 1, Pit 3	Flat
57-2-1187	BCT Cluster 12	Pit 3, Pit 5	Flat
57-3-0491	BCT Cluster 15	Pit 2, Pit 3, Pit 4, Pit 5	Creek Terrace
57-2-1189	BCT Cluster 16	Pit 1, Pit 3, Pit 4, Pit 5	Undulating Plain
57-2-1184	BCT Transect 1	Pit 1	Undulating Plain
57-2-1201	BCT Transect 2	Pit 1, Pit 2, Pit 3	Elevated Creek Flat
57-2-1194	BCT Transect 4	Pit 2	Basal Slopes
57-2-1198	BCT Transect 5	Pit 3, Pit 4, Pit 5	Basal Slopes
57-3-0492	BCT Transect 6	Pit 1, Pit 2, Pit 3, Pit 4	Creek Terrace/Hillslope
57-2-1193	BCT Transect 7	Pit 5	Strandline

AHIMS Site No.	Site (Cluster or Transect)	Test Pit No.	Landform
57-2-1195	BCT Isolated Pit	Pit 3A, Pit 3B, Pit 3C	Elevated Creek Flat
57-2-1192	BCT: Isolated Pit	Pit 4	Undulating Plain

6.3.2 Deposit characteristics

A description of the main characteristics of the deposits by landform are provided below, including a summary of the presence or absence of Aboriginal objects within the stratigraphic layers. The full soil descriptions of each test pit are provided in Appendix C. A representative stratigraphic profile from one test pit within each landform is provided in Appendix D.

Strandline

Unit	Image	Sediment Description	Cultural Material Present
1	 Example of the typical profile for units 1 to 6 within BCT Transect 7, Pit 1 Spit 6 (Northern wall profile)	Medium dark grey brown humic sand with occasional pebbles/gravels. c. 0 10cm	-
2		Mixed horizon layer with lenses of grey brown, pale grey, and yellow brown sand. c. 0–25cm	Yes
3		Pale grey slightly pebbly/gravely sand with occasional gravels. c. 10–30cm	-
4		Pale grey fine sand. c. 30–55cm	-
5		Slightly coarser pale grey sand with pebble and gravel content. c. 40–50cm	-
6		Pale yellow grey, compact fine sand. c. 50–60cm.	-
7		Orange to pale grey mottled sandy clay. c. 55 60cm	-

Elevated sand body

Unit	Image	Sediment Description	Cultural Material Present
1		Light brown fine loamy sand	Yes

Unit	Image	Sediment Description	Cultural Material Present
	 Example of the typical profile for units 1 to 5 within BCT Transect 6, Pit 4 Spit 10 (Northern wall profile)	with rootlets. c. 0–20cm	
2		Dark brown loamy sand with many grass roots. c. 0–20cm	Yes
3		Light brown fine silty sand with rootlets and some charcoal content. c. 15–30cm	Yes
4		Yellowish brown sandy loam with some rootlets. c. 20–90cm	Yes
5		Pale yellow fine silty sand with few pebbles. c. 20–90cm	Yes

Elevated creek flat

Unit	Image	Sediment Description	Cultural Material Present
1	 Example of the typical profile for units 1, 3, 4, and 5 within BCT Transect 2, Pit 1 Spit 5 (Northern wall profile)	Dark brown sandy loam with grass roots and gravels.	-
2		Yellow brown slightly coarse sand c. 0–20cm	-
3		Yellowish brown sandy loam with some gravels	-
4		Coarse-grained yellow sand with frequent gravels c. 20–40cm	Yes
5		Fine-grained yellow sand with some gravels. c. 15–75cm.	Yes
6		Fine-grained pale yellow sand. c. 15–50cm	Yes

Unit	Image	Sediment Description	Cultural Material Present
7		Pale yellow sandy clay. c. 30–50cm.	-
8		Yellowish brown loamy clay. c. 0–30cm	-

Creek terrace

Unit	Image	Sediment Description	Cultural Material Present
1	 Example of the typical profile for units 1 to 6 within BCT Cluster 15, Pit 4 Spit 5 (Northern wall profile)	Fine-grained light grey brown mottled sand. Roots present. c. 0–15cm	Yes
2		Fine-grained pale yellow grey mottled sand with bioturbation mixing present. c. 10–30cm	Yes
3		Fine-grained pale grey sand. Occasional orange mottling present. c. 10–30cm	Yes
4		Fine-grained yellowish sand. Moisture increasing with depth. c. 30–60cm	Yes
5		Fine-grained dark yellow-orange sand c. 30–45cm	Yes
6		Mottled grey and orange sandy day with occasional broken root fragments and pale grey sand veins. c. 40–60cm	-

Undulating plain

Unit	Image	Sediment Description	Cultural Material Present
1	 Example of the typical profile for units 1,2,3,5,6, and 7 within BCT Cluster 3, Pit 1 Spit 5 (Northern wall profile).	Fine-grained dark brown loamy sand with grass roots and very few charcoal inclusions. c. 0–15cm	
2		Coarse-grained light brown silty sand with very few charcoal inclusions. White and dark brown loamy sand mottling also present. c. 15–25cm	
3		Medium-grained brownish yellow sand. c. 20–60cm	
4		Coarse-grained black loamy sand. Charcoal stained lens. c. 20–25cm	
5		Pale yellowish-brown silty loam with few small ironstone fragments and degrading coffee rock staining	
6		Pale yellow silt with few ironstone fragments and some coffee rock mottling.	
7		Brownish yellow sand	
8		Coarse-grained yellowish brown silty clay loam with few charcoal fragments and coffee rock staining	
9		Yellowish brown silty clay with few small ironstone fragments and heavy coffee rock mottling	

Flat

Unit	Image	Sediment Description	Cultural Material Present
1		Fine-grained dark brown soil	Yes

Unit	Image	Sediment Description	Cultural Material Present
2		Fine-grained pale brownish yellow sand with charcoal fragments. c. 10–35cm	Yes
3		Medium-grained yellow sand with some organic content and few charcoal fragments. c. 30–50cm	Yes
4	Example of the typical profile for units 1 to 4 within BCT Cluster 10, Pit 5 Spit 7 (Northern wall profile)	Pale brownish yellow sand with orange clay mottling. c. 35–50cm	Yes
5		Dark brown clayey loam with many grass roots and some charcoal. c. 0–25cm	No
6		Yellowish grey clay loam. c. 20–30cm	No
7	Example of the typical profile for units 5 to 6 within BCT Cluster 13, Pit 2 Spit 4 (Northern wall profile)	Pale yellow sandy clay. c. 25–30cm	No

Low spurs

Unit	Image	Sediment Description	Cultural Material Present
1		Fine-grained dark brown	No

Unit	Image	Sediment Description	Cultural Material Present
		loamy sand with grass roots and occasional ironstone fragments. c. 0–25cm	
2		Medium-grained light brownish to yellow silty sand with some ironstone and manganese as well as grass roots. c. 25–45cm	Yes
3		Coarse-grained yellow silty sand. c. 45–55cm	No
4	Example of the typical profile for units 1 to 4 within BCT Cluster 2, Pit 3 Spit 6 (Northern wall profile)	Mottled yellow to orange sandy clay. c. 50–60cm	Yes

Hillslope

Unit	Image	Sediment Description	Cultural Material Present
1		Dark brown sandy loam with gras roots. c. 0–5cm	No
2		Pale yellowish brown silty sand with few grass roots. Pebbles and larger cobbles also present. c. 15–50cm	Yes
3		Loamy silty clay with some gravel and larger rocks. c. 5–50cm	No

Unit	Image	Sediment Description	Cultural Material Present
4	 Example of the typical profile for units 1, 3, and 4 within BCT Cluster 9, Pit 1/Transect 3, Pit 5 Spit 8 (Northern wall profile)	Dark yellowish brown silty to sandy clay with frequent gravels, pebbles, and larger cobbles. c. 40–50cm	Yes

Basal slopes

Unit	Image	Sediment Description	Cultural Material Present
1		Dark brown sandy loam with frequent grass roots. c. 0–10cm	No
2		Pale brown sandy silt with few grass roots and few charcoal fragments. c. 10–40cm	Yes
3		Pale yellow brown silty sand with frequent gravels. c. 40–50cm	No

Unit	Image	Sediment Description	Cultural Material Present
4	 Example of the typical profile for units 1 to 4 within BCT Transect 4, Pit 3 Spit 6 (Northern wall profile)	Dark yellowish brown silty clay with frequent pebbles to cobbles including some ironstone fragments. Large boulders large than pit also encountered c. 50–70cm	Yes

Floodplain

Unit	Image	Sediment Description	Cultural Material Present
1		Dark brown sandy loam with frequent grass roots and very few small charcoal fragments. c. 0–10cm	
2		Pale mottled grey and brown silty clay loam with very few charcoal fragments. c. 10–25cm.	

Unit	Image	Sediment Description	Cultural Material Present
3	 Example of the typical profile for units 1 to 3 within BCT Cluster 5, Pit 4 Spit 4 (Northern wall profile)	Greyish brown clay with some red and orange mottling. Few ironstone and manganese flecks.	

The subsurface testing programme revealed 8 main sediment units across the tested landforms within the Project Site along with several more unique units. Where clay deposits were reached before 80cm, these pit locations coincided with areas of disturbance from sand mining, suggesting that upper soil deposits had been at least been partially removed. Very little bioturbation was observed within the pits, with only small roots being consistently recorded throughout the site. Only one cluster showed evidence for some bioturbation from 0-50cm, and this was located in vicinity to the pine plantation.

All pits were placed on level or gently sloping ground throughout the Project Site. While the majority of test pits were placed on local sandy rises, some were also placed within the lower lying floodplains and drainage channels to provide some broader sampling of locations. Gravels and clays were generally encountered within the lower sections of these landforms in depressions or at lower elevations. Where disturbances have occurred, they have generally removed the artefact bearing sandy deposits or contributed to its erosion into the landscape.

The soil formation process in the elevated sandy landforms appears to include deeper deposits within sand bodies, probably through aeolian accumulation or through colluvial soil movement on the basal slopes. As a result, artefact bearing deposits are likely to extend deeper within these landforms.

The disturbances associated with modern land use include sand extraction, farming, fencing, track construction and ploughing. All of these disturbances have, to varying degrees, disturbed or removed some of the natural deposits present within their respective landforms, a process which has also potentially removed any artefact bearing deposits in those landforms. However, it should be noted that in landforms with higher sensitivity these disturbances have created exposures where artefacts are likely to erode into from adjacent sandy landforms. Many of the artefact scatters recorded in this assessment are expected to have formed in a similar process.

It should be noted that while the water table was not always reached during the excavation of the majority of test pits excavated, it was reached within the low spurs, low-lying sections of the undulating plain, and hillslope landforms. As a result, the areas where it was recorded the subsurface testing programme was hampered as once the water table was reached and water started to inundate the pits the testing had to stop and photos taken as quickly as possible.

6.3.3 Recovered material from test pits

The recording and analysis of the artefacts recovered from the subsurface testing programme was undertaken at the NGH office in Canberra by archaeologists Kirsten Bradley and Miles Robson. The artefacts had a range of variable and technological attributes recorded.

As noted above, 62 of the 127 test pits contained stone artefacts throughout the Project Site. A total of 409 stone artefacts were recovered from the subsurface testing across the following nine landforms. A breakdown of the artefacts recovered from the test pits within each landform, along with the average artefact density/m^2 of those landforms, can be seen in Table 6-3 below.

Table 6-3 Subsurface artefacts recovered within the tested landforms in the Project Site.

Landform	Number of Recorded Artefacts	Number of Test Pits	Average Artefact Density/m^2
Undulating Plain	84	26	12.92/m^2
Low Spurs	3	10	1.2/m^2
Elevated Sand Body	163	15	43.47/m^2
Elevated Creek Flat	6	11	2.18/m^2
Basal Slope	17	10	6.8/m^2
Flat	69	20	13.8/m^2
Hillslope	15	10	6/m^2
Creek Terrace	51	10	20.4/m^2
Strandline	1	10	0.4/m^2
Floodplain	0	5	-
TOTAL	**409**	**127**	**12.88/m^2**

A comparison of the results by the sensitivity landform groups is shown in Table 6-4. This shows that based on the data, the high landforms had the highest average artefact density, and the moderate and low followed in descending order. This further confirms the results of the surface survey and site density and reinforces that the landforms are appropriately categorised in terms of the archaeological material present in each. The table also shows that there was no preferential sample bias towards the highest sensitivity group, as this group only contained 28% of test pits but over 41% of artefacts. The Moderate group had nearly 52% of test pits and recovered just over 50% of artefacts, suggesting a balanced ratio of artefacts to testing, while the Low group contained just under 20% of the number of test pits but only retrieved under 8% of total artefacts. These results provide further evidence of the nature of the distribution of stone artefacts through the Project Site based on the assessed landforms and provides a sound basis on which to draw conclusions and make management decisions.

Table 6-4. Breakdown of subsurface results by sensitivity group

Landform Sensitivity	No of test pits	Percentage of all test pits	No. of artefacts recovered	Percentage of artefacts recovered	Average artefact density m^2
High	36	28.35%	170	41.57%	18.89
Moderate	66	51.97%	207	50.61%	12.55
Low	25	19.69%	32	7.82%	5.12

The subsurface artefact data is provided in Appendix E, and a breakdown of the stone artefact data has been provided in Table 6-5 to Table 6-7 below. The spatial distribution of the subsurface archaeological material recovered during the subsurface testing programme is shown from Figure 6-1 to Figure 6-5 above. Furthermore, the results of all surface and subsurface artefacts recorded during the NGH assessments are compared to approximate modelling of the different levels that Lake George was known to have since 6000 BP in Figure 7-1 and Figure 7-2 below.

The spatial distribution of stone artefacts recorded during the subsurface testing programme is shown by spit in Table 6-5 below. The table shows that the majority of artefacts (n=378, 92.42%) were recovered from Spits 1 to 5 (0-50cm), with fewer (n=29, 7.09%) in Spits 6 to 8 (60-80cm) and only isolated artefacts (n=2, 0.49%) in Spits 9 and 10 (90-100cm). Due to the size of the Project Site and variation in the landforms present within it, it is difficult to characterise the disturbance present within the excavated deposits. Generally, within areas where no obvious or extensive surface disturbances are present it must be assumed that there has been some limited disturbance through actions such as land clearing, minor ploughing, grazing and in some areas minor flooding. Erosional factors through droughts may also have played a part in altering the ground surface.

The nature of subsurface disturbances within areas, such as the historical sand mines or pine plantation, is complicated. Within the sand mining areas, approximately 1m of sand was removed during the mining process, likely destroying any artefact bearing deposits in the process. Within the pine plantation ground disturbance is also likely to be extensive, based on an assumed standard practice of clearing natural vegetation, then ripping the ground and planting of pines. Harvesting is also assumed to result in significant disturbance with felling and stockpiling by machinery. The remnant stumps, branches etc from the logging would most likely have been windrowed or stockpiled by machinery and left to rot.

Despite the assumed level of disturbance for the pine plantation, there was limited surface or subsurface evidence for disturbance within the pine plantation. For example, within BCT Transect 6 the test pits showed minimal evidence for disturbance and bioturbation within the deposits and no tree root features were visible within the stratigraphy. However, the pits within BCT Cluster 15 showed some evidence for larger roots within the deposits, especially in the second and third spits where the majority of artefactual material was recorded. As a result, it is possible that artefacts recorded in association with these root features have been disturbed via bioturbation in this area.

The overwhelming majority of dense artefact distributions were within sandy deposits present throughout the Project Site. While the base of these sandy deposits often extended past 100cm, the artefact bearing deposits generally ceased after Spit 6 (60cm). The artefacts recovered from the lower Spits were usually located within the elevated sand body or basal slope landforms, both of which represent some of the landforms with high elevation across the Project Site. It was noted that these sandy elevated areas were likely to contain deeper deposits and have deeper artefact bearing deposits as a result.

The raw material types of the recovered artefacts are shown in Table 6-6 and are shown in Figure 6-9 below. The majority of artefacts were manufactured from quartz (n=237, 57.97%), with silcrete (n=91, 22.45%) and chert (n=73, 17.85%) also prominent (see Plate 6-1 to Plate 6-12 below); crystal quartz (n=6, 1.47%), quartzite (n=1, 0.24%), and basalt (n=1, 0.24%) were also present. It should also be noted that within these raw material categories further variations in quality, grain, and colour were observed, with several types each of quartz, silcrete, and chert being observed within the assemblage.

The technological characteristics of the stone artefacts recorded during the subsurface testing programme are shown in Table 6-7 and in Figure 6-10 below. The table shows that the artefacts recovered can be grouped into complete flakes (n=164, 40.10%) (such as seen in Plate 6-1 to Plate 6-3 below), flaked pieces (n=164, 40.10%), distal flake portions (n=43, 10.50%), proximal flake portions (n=18, 4.40%), longitudinally broken right flakes (n=6, 1.47%), medial flake portions (n=6, 1.47%), cores (n=4, 0.98%) (see Plate 6-4 and Plate 6-5 below), core fragments (n=2, 0.49%) (see Plate 6-6 below), and longitudinally broken left flakes (n=2, 0.49%). Of these artefacts, three backed blades (0.73%) (see Plate 6-7 and Plate 6-8 below) along with a single Pejar point (0.24%) (see Plate 6-9 below) were recorded; it should be noted that all three of these tool types were silcrete.

The subsurface density of artefacts recovered from the test pits during the current assessment averaged 12.88/m^2 across all 127 pits. The subsurface archaeological material appears to occur within the landforms that were predicted to contain a high or moderate archaeological sensitivity, with low densities being present in landforms mapped as containing a low sensitivity. Of these landforms the elevated sand bodies contain the highest densities of archaeological material, with an average of 43.73/m^2 over 15 test pits, with BCT Cluster 8 Pit 1 reaching a density of 228/m^2. Other high densities were recorded in BCT Cluster 8 Pit 4 with 140/m^2, BCT Cluster 15 Pit 3 with 120/m^2, BCT Cluster 10 Pit 4 with 96/m^2, and BCT Cluster 3 Pit 1 and BCT Cluster 8 Pit 3 with 60/m^2.

The large number of complete, proximal, medial, and distal flakes recorded during the testing, suggests that flaking activities occurred at these site locations. The presence of incomplete flakes, where flakes often break or shatter during the manufacturing process, indicates that some manufacture of tools was undertaken, rather than merely retouching of artefacts at these sites.

The presence of few retouched or backed artefacts (less than 1%) would indicate however, that either the flaking process was not focused on manufacturing large numbers of formalised items such as backed artefacts, or that they were removed from the site for use in the broader landscape. Such questions could only be answered through extensive additional research.

Backed artefacts are known to occur very rarely in late Pleistocene to early Holocene contexts and occur most frequently in deposits of mid- to late Holocene age, between ~4000 and 1500ya (Attenbrow et al. 2009; Hiscock and Attenbrow 1998). Their distribution in the test excavation assemblage within the current areas of investigation in the south-eastern section of Lake George, considering the lake fluctuations within the last 6,000 years, suggest that the sites here are of a mid to late Holocene age.

At other sites in this region and in eastern Australia silcrete and other fine-grained rock-dominated assemblages characterised by the presence of backed artefacts of mid to late Holocene age were replaced with quartz dominated assemblages with few backed artefacts and an increased use of bipolar flaking (see, for example, Attenbrow 2006:197–198, 2010:85–104; Flood 1980:276–283;

Hiscock 2008:145–161; Lampert 1971; Packard 1986a). This change was underway in coastal regions by about 1500 BP (Attenbrow 2010:120–121).

Although no hammerstones or anvils were found as part of the subsurface testing programme, it should be noted that two were identified during the archaeological surveys indicating that they are present in the area. Furthermore, while only four complete cores were identified within the subsurface assemblage, three of these came out of the elevated sand body landform within BCT Cluster 8; the remaining core was found in the southern portion of the undulating plains landform within BCT Cluster 3. The low density of cores across the excavated landforms, compared with the recorded artefact densities, suggests that cores may have been removed from the sites and kept as part of the toolkits when people left the area. The lack of cortex on the artefacts also suggests that materials were imported to the area already partially reduced. While the stone artefacts recovered from the subsurface testing programme vary greatly in their typology and lithology, they are typical of the region and do not represent any departure from the basic toolkit used by Aboriginal people in the area.

Plate 6-1 to Plate 6-8 show a selection of the cultural material recovered from the subsurface testing programme.

Table 6-5 Spatial distribution of stone artefacts by spit. A full spatial breakdown by area, test pit, and spit is in Appendix E.

Spit (depth in cm)	Total artefacts recovered
1 (0-10cm)	54
2 (10-20cm)	102
3 (20-30cm)	124
4 (30-40cm)	58
5 (40-50cm)	40
6 (50-60cm)	15
7 (60-70cm)	9
8 (70-80cm)	5
9 (80-90cm)	1
10 (90-100cm)	1
TOTAL	**409**

Table 6-6 Breakdown of stone artefact lithology by area and test pit.

Area	Test Pit	Lithologies						
		Quartz	Chert	Silcrete	Crystal Quartz	Quartzite	Basalt	TOTAL
Cluster 1	2	1						**1**
	5	1						**1**
Cluster 2	1			1				**1**
Cluster 3	1	4	1	10				**15**
	2	1		1	1			**3**
	3			1				**1**
	4	2	1					**3**
	5	3						**3**
Cluster 4	1	6						**6**
	3	9						**9**
	4			1				**1**
	5	2			1			**3**
Cluster 6	1	8	1					**9**
	2	1			1			**2**
	3	7	4					**11**
	4		2					**2**
	5	4		2				**6**
Cluster 7	2		1					**1**
	3	8						**8**
Cluster 8	1	10	47					**57**
	2	7						**7**
	3	15						**15**
	4	25		9	1			**35**
	5	6	4					**10**
Cluster 9	2		2					**2**
	4	2						**2**
Cluster 10	1	4	1	1				**6**
	2	3						**3**
	3	7		1	1			**9**
	4	24						**24**
	5	4						**4**

Area	**Test Pit**	**Lithologies**						
		Quartz	Chert	Silcrete	Crystal Quartz	Quartzite	Basalt	TOTAL
Cluster 11	1	5		8				**13**
	3			6				**6**
Cluster 12	3	1						**1**
	5	1		2				**3**
Cluster 15	2	1		8			1	**10**
	3			30				**30**
	4	1						**1**
	5			3				**3**
Cluster 16	1	2						**2**
	3	1		1				**2**
	4	2						**2**
	5	13				1		**14**
Transect 1	1	5			1			**6**
Transect 2	1	3						**3**
	2	1						**1**
	3	2						**2**
Transect 3	5	7	3					**10**
Transect 4	2	4	1					**5**
Transect 5	3		1					**1**
	4	5		1				**6**
	5	3	2					**5**
Transect 6	1	2		1				**3**
	2		1					**1**
	3		1	2				**3**
	4	1						**1**
Transect 7	1	1						**1**
Isolated Pit	3A	2						**2**
	3B	3						**3**
	3C	2		1				**3**
	4	5		1				**6**
TOTAL		**237**	**73**	**91**	**6**	**1**	**1**	**409**

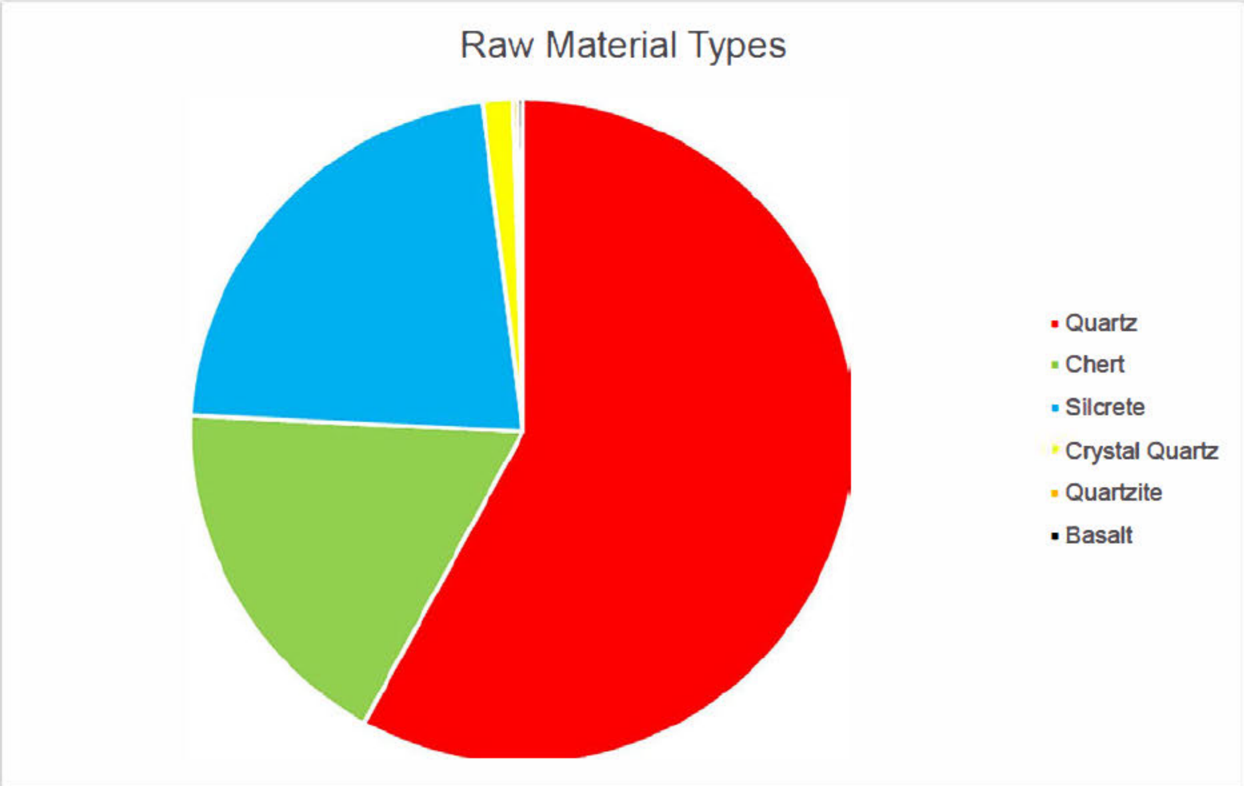

Figure 6-9 Raw material types by quantity, recorded during the subsurface testing for the proposed Blind Creek Solar Farm.

Table 6-7 Breakdown of stone artefact typologies by area and test pit.

Area	Test Pit	Typologies								
		Complete Flake	Core	Core Fragment	Distal Flake	Flaked Piece	Long Splits	Medial Flake	Proximal Flake	TOTAL
Cluster 1	**2**	1								**1**
	5	1								**1**
Cluster 2	**1**				1					**1**
Cluster 3	**1**	9	1		2	3				**15**
	2	3								**3**
	3	1								**1**
	4	3								**3**
	5	2				1				**3**
Cluster 4	**1**	3				3				**6**
	3	3			1	5				**9**
	4	1								**1**
	5				1	2				**3**
Cluster 6	**1**	3			2	3	1			**9**
	2					2				**2**
	3	3			2	6				**11**
	4	1				1				**2**

Area	Test Pit	Typologies								
		Complete Flake	Core	Core Fragment	Distal Flake	Flaked Piece	Long Splits	Medial Flake	Proximal Flake	TOTAL
	5	3				3				**6**
Cluster 7	**2**					1				**1**
	3	3			1	4				**8**
Cluster 8	**1**	17	3		8	22	1	2	4	**57**
	2	4			1	2				**7**
	3	4				11				**15**
	4	13			6	13	1	1	1	**35**
	5	3			2	5				**10**
Cluster 9	**1**	1								**1**
	2	1			1					**2**
	4	1				1				**2**
Cluster 10	**1**	3			1	2				**6**
	2	1				2				**3**
	3	2				6	1			**9**
	4	9			2	11	2			**24**
	5	1				2			1	**4**
Cluster 11	**1**	3			2	4		1	3	**13**
	3			1	2	1	1		1	**6**

Area	Test Pit	Typologies								
		Complete Flake	Core	Core Fragment	Distal Flake	Flaked Piece	Long Splits	Medial Flake	Proximal Flake	TOTAL
Cluster 12	**3**	1								**1**
	5	2				1				**3**
Cluster 15	**2**	2				6		1	1	**10**
	3	11		1	2	13			3	**30**
	4					1				**1**
	5	1					1		1	**3**
Cluster 16	**1**	1				1				**2**
	3	1				1				**2**
	4					2				**2**
	5	5			1	6			2	**14**
Transect 1	**1**	4			2					**6**
Transect 2	**1**	2				1				**3**
	2	1								**1**
	3	1			1					**2**
Transect 3	**5**	7				2				**9**
Transect 4	**2**	3				2				**5**
Transect 5	**3**	1								**1**
	4	6								**6**

Area	Test Pit	Typologies								
		Complete Flake	Core	Core Fragment	Distal Flake	Flaked Piece	Long Splits	Medial Flake	Proximal Flake	TOTAL
	5	5								**5**
Transect 6	**1**	1				1		1		**3**
	2	1								**1**
	3	2			1					**3**
	4					1				**1**
Transect 7	**5**					1				**1**
Isolated Pit	**3A**					2				**2**
	3B					3				**3**
	3C					2			1	**3**
	4	3			1	2				**6**
TOTAL		**164**	**4**	**2**	**43**	**164**	**8**	**6**	**18**	**409**

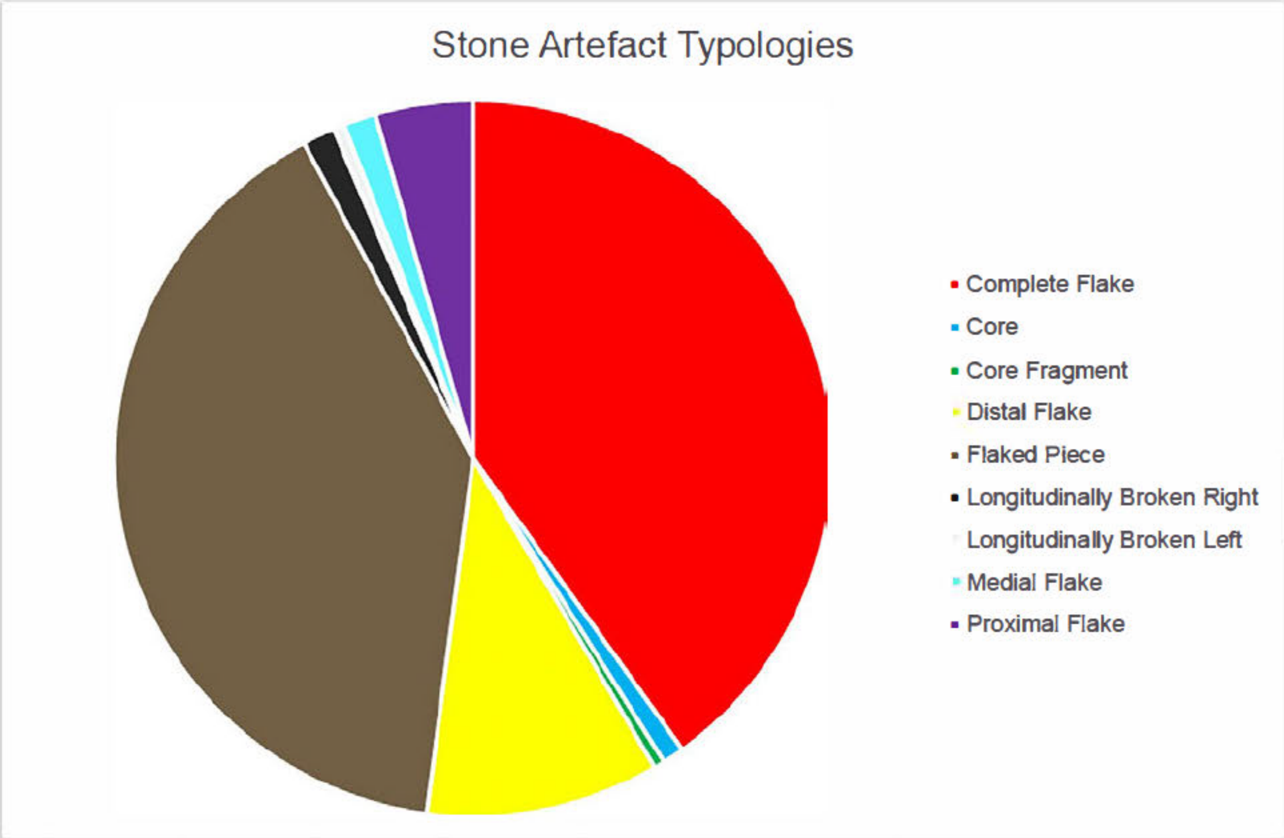

Figure 6-10 Stone artefact typologies by quantitiy, recorded during the subsurface testing for the proposed Blind Creek Solar Farm.

Plate 6-1 Close up of the ventral surface of a quartz complete flake recovered from BCT Cluster 10 Pit 1, Spit 2.

Plate 6-2 Close up of the dorsal surface of a quartz complete flake recovered from BCT Cluster 4 Pit 3, Spit 2.

Plate 6-3 Close up of the dorsal surface of a silcrete complete flake recovered from BCT Transect 5 Pit 4, Spit 6.

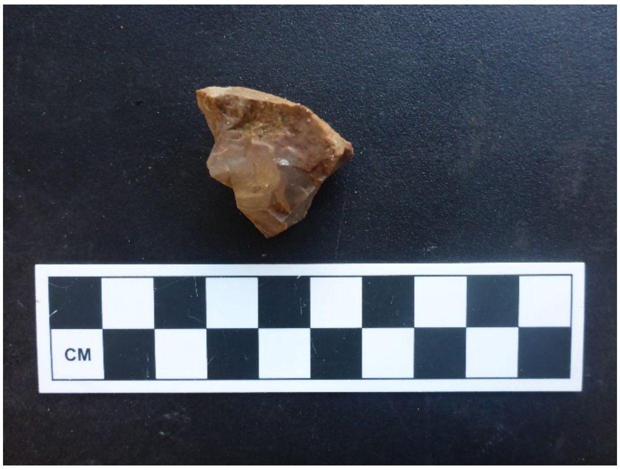

Plate 6-4 Close up of a single platform silcrete core recovered from BCT Cluster 8 Pit 1, Spit 2. A total of two negative flake scars were identified on the core along with 20% terrestrial cortex.

Plate 6-5 Close up of a single platform silcrete core recovered from BCT Cluster 8 Pit 1, Spit 3. A single negative flake scar was identified on the core along with 20% terrestrial cortex.

Plate 6-6 Close up of a single platform broken silcrete core recovered from BCT Cluster 15 Pit 3, Spit 3. A total of four negative flake scars were identified along with 40-50% terrestrial cortex.

Plate 6-7 Close up of the dorsal surface of a silcrete backed blade recovered from Cluster 8 Pit 4, Spit 2.

Plate 6-8 Close up of the dorsal surface of a silcrete backed blade recovered from BCT Cluster 15 Pit 3, Spit 3. Note the minor retouch along the left margin and that the colour and texture of the silcrete is the same as that of the core in Plate 6-6.

Plate 6-9 Close up of the dorsal surface of the silcrete Pejar point recovered from BCT Cluster 15 Pit 3, Spit 3. Note the steep retouch evident on the upper left margin, partially backing along the upper ridges, and presence of two negative flake scars.

Plate 6-10 Close up of the dorsal surface of a chert complete flake recovered from BCT Transect 3 Pit 5, Spit 6.

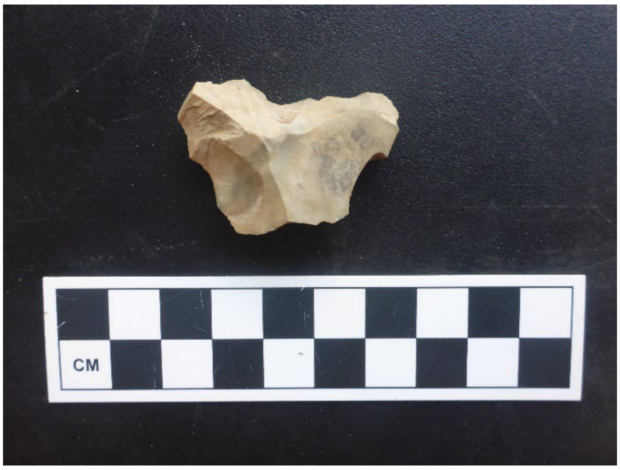

Plate 6-11 Close up of the dorsal surface of a chert complete flake recovered from BCT Transect 4 Pit 2, Spit 3.

Plate 6-12 Close up of the ventral surface of a chert complete flake recovered from BCT Cluster 8 Pit 5, Spit 2.

BCSF: Hearth

An archaeological feature that was determined to have been a hearth was recorded within BCT Cluster 4 Pit 5. Beginning in Spit 3 (20–30cm) scattered flecks of charcoal began to appear within the sandy deposit, continuing in Spit 4 (30–40cm). By Spit 5 (40–50cm) larger chunks (~1-3cm) of charcoal began to appear in the centre of the pit and would continue until Spit 8 (70–80cm), where the charcoal density began to reduce as it continued into Spit 9 (80–90cm). The feature ended in Spit 9 and the pit was terminated. A progressive view of the hearth feature from Spit 6 is visible from Plate 6-13 to Plate 6-18. There was little evidence for the presence of a burnt archaeological feature in the spits above, indicating that it was a discrete event. Furthermore, two clay nodules/balls were associated with the feature in Spits 6 and 7 (see Plate 6-20 below). While 3 subsurface artefacts were recorded in this pit, they were all recorded above Spit 5 where the main feature began. Furthermore, within the entirety of BCT Cluster 4, BCT Isolated Pit 3 (A – C) and 4, as well as BCT Cluster 3, all of which were on the same landform in proximity to one another, no artefacts were found in Spit 5 or below. It should also be noted that no bone or shell material was found in association with this feature. A charcoal sample of the feature was also taken for the purposes of radiocarbon dating.

During the second field visit in October 2021 an isolated pit (BCT Isolated Pit 3) was placed adjacent to the old quarry track 75m south-west of the BCT Cluster 4 Pit 5. Within this pit a similar feature began to appear at the base of Spit 3 in the north-eastern corner. As a result, Pit 3 was expanded to the east and then again to the south, forming an L shape with three connected 50cm x 50cm pits (Pit 3A, 3B, and 3C). The pits were taken down in 5cm units until the end of the feature was reached at Spit 7 (60–75cm). At this point it was determined that the feature was likely to have been a large tree root system that had been historically burnt due to the vertical and horizontal shape of the features within the three pits. A progressive view of the excavation of this burnt feature is visible from Plate 6-21 to Plate 6-30 below.

It was determined that the archaeological feature identified in BCT Cluster 4 Pit 5 is likely to be a hearth. The reasoning for this assessment was derived from several factors:

- The feature was small in size and discrete within the pit. Combined with the depth at which it was recorded it suggests that the feature is not likely to have been a burnt-out root system.
- While no artefacts were found to be associated with the hearth feature, the presence of small clay nodules/balls suggests that the feature was a small hearth as clay is not known to naturally occur at that depth or in that form in the area.
- While no bone or shell was associated with the feature this does not eliminate the fact that this hearth may have been used for cultural purposes, such as a signal fire, or simply to keep warm in what is an exposed landscape.
- The feature excavated in BCT Isolate Pit 3A – C is characteristic of a burnt tree feature. This is due to the large and intense burnt layer that is connected and runs horizontally and vertically across a wide area.
    - This feature is different from that recorded in BCT Cluster 4 Pit 5, which was a small and discrete feature that was not connected to a wider feature. This further suggests that the BCT Cluster 4 Pit 5 feature is not a burnt tree feature as the two share very few similarities.
- Mosig-Way (2018) excavated several hearths in different landforms throughout the area for her PhD thesis (between 2200–2400m away from BCT Cluster 4 Pit 5). Plate 6-31 and Plate 6-32 below show two examples of hearths excavated by Mosig-Way. It is clear that

while the hearths are larger, their overall shape, colour, and depth are similar to the hearth feature recorded within BCT Cluster 4 Pit 5.

- It should also be noted that some of the hearths recorded by Mosig-Way (2018:121) were carbon dated. The hearth visible in Plate 6-31 in particular was dated to 3955±28 BP. Other hearths within the Wrights Creek Lagoon area were dated from 1267±28 to 4575±29 BP, suggesting that the area was used repeatedly over a significant period of time.

As a result of the information that was recorded during the subsurface testing programme, it was determined that this feature is likely to be a small hearth that is associated with the Aboriginal use of the area. Unfortunately, the specific purpose for the hearth cannot be determined at this time. The site has been recorded separately on AHIMS as BCSF: Cluster 4 (AHIMS #57-2-1197).

	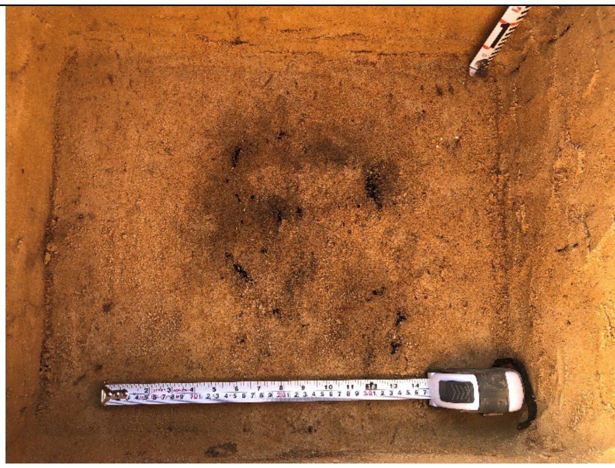
Plate 6-13 View of the base of BCT Cluster 4 Pit 5, Spit 6. Note that at this level the small and discrete hearth feature is clearly visible.	Plate 6-14 Close up of the hearth feature at the base of Spit 6. Note the staining of the sands around the feature.
	
Plate 6-15 View of the base of BCT Cluster 4 Pit 5, Spit 7. Note that while the radius of the hearth feature appears to reduce slightly, the charcoal staining increases slightly.	Plate 6-16 Close up of the hearth feature at the base of Spit 7. Note that the radius of the feature has reduced.

Plate 6-17 View of the base of BCT Cluster 4 Pit 5, Spit 9. Note that the hearth feature clearly ends within the 80cm to 90cm range.

Plate 6-18 View of the northern wall of BCT Cluster 4 Pit 5. Note that no evidence for the hearth feature is visible in the exposed stratigraphy, indicating that the feature was destroyed as a result of the testing.

Plate 6-19 Close up of a clay ball recorded within BCT Cluster 4 Pit 5, Spit 5. Note that no burnt clay is visible.

Plate 6-20 Close up of a clay ball recorded within BCT Cluster 4 Pit 5, Spit 5. Note that this is a different view of the clay ball visible in Plate 6-19. Furthermore, no burnt clay is visible.

Plate 6-21 View of the base of BCT Isolated Pit 3A/B, Spit 3. Note that a dark burnt layer extends through both pits.

Plate 6-22 View of the partially excavated burnt feature within BCT Isolated Pit 3A/B.

	
Plate 6-23 View of the eastern wall of BCT Isolated Pit 3B, Spit 5 and Pit 3C, Spit 2. Note that the feature is connected horizontally and vertically over a wide area.	Plate 6-24 View of a horizontal burnt feature at the base of BCT Isolated Pit 3C, Spit 2.
	
Plate 6-25 View of a horizontal burnt feature at the base of BCT Isolated Pit 3C, Spit 3. Note that the feature reduces in size slightly.	Plate 6-26 View of a horizontal burnt feature at the base of BCT Isolated Pit 3C, Spit 3. Note that the feature has again reduced in size.
	
Plate 6-27 View of the vertical and horizontal burnt features on the northern wall of BCT Isolated Pit 3A/B, Spit 5.	Plate 6-28 View of the base of BCT Isolated Pit 3A/B, Spit 6. Note that the feature is slowly reducing.

	
Plate 6-29 View of the vertical and horizontal burnt features on the northern wall of BCT Isolated Pit 3A/B, Spit 6. Note that the feature is significantly darker and more stained than the hearth which was recorded in BCT Cluster 4 Pit 5.	Plate 6-30 View of the vertical feature on the eastern wall of BCT Isolated Pit 3B/C, Spit 7. Note that the feature has ended in this section, revealing a large and connected burnt feature across three pits.
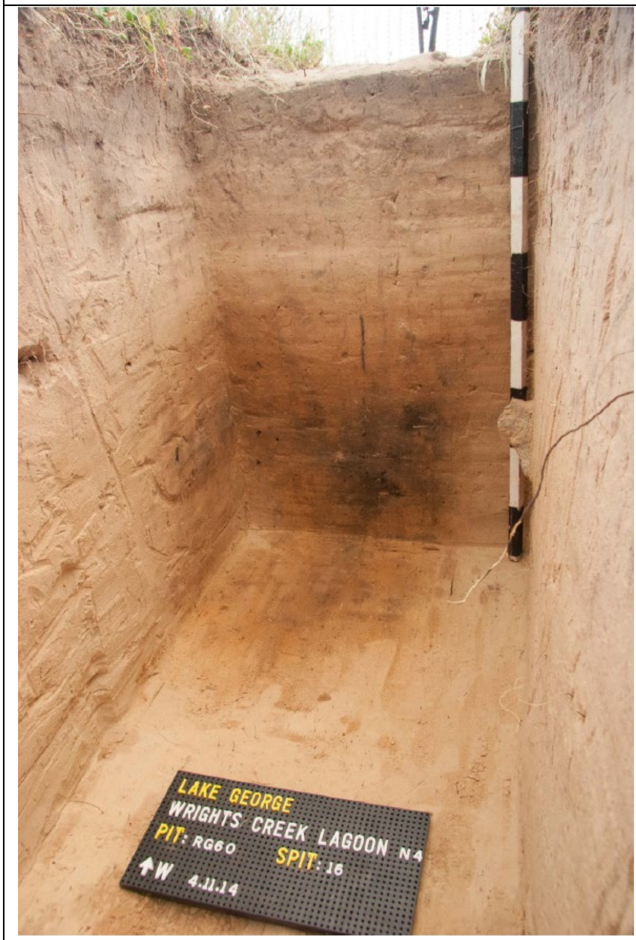	
Plate 6-31 View of the western wall of a pit-hearth excavated by Mosig-Way (2018) as a part of her PhD thesis. It should be noted that hearth-stones were also recorded in association with this feature. Image sourced from Mosig-Way (2018b:59).	Plate 6-32 View of a hearth excavated by Mosig-Way (2018) as a part of her PhD thesis. Image sourced from Mosig-Way (2018b:79).

7. Discussion

This section discusses the results of the field surveys and test excavation programme as a whole.

The primary issue in reviewing previous archaeological studies is that each project may not easily, or at all, be compared with one another. Unless the approaches and the datasets are similar, false comparisons may be made resulting in a skewing of the significance. Mosig-Way refers within her PhD thesis to the works of Koettig (1986) and Kintigh (1988) who point out that all archaeology is a mere sample, and each archaeologist makes decisions which affect the methodology and therefore the results. Mosig-Way references Koettig who argued that differences between sites may well reflect the methodological differences between studies rather than the archaeological record (Mosig-Way 2018: 33).

Previous studies in the area suggest that sites are frequently characterised by an uneven spread in artefact densities and raw materials, with discrete high-density patches separated by areas of much lower density or sterility. At some sites, such as Bridge Creek 1 and Currandooley, discrete concentrations of different raw materials were visible, and these concentrations were attributed to discrete 'workshops' or knapping areas (Lance 2009a as referenced in Mosig-Way 2018; Packard 1988:10). The sites with the highest maximum densities, of more than 200 artefacts/m^2, were located on relict beach ridges (Currandooley, WE-1, Rose Lagoon and Lake Bathurst), aeolian sand sheets (Butmaroo 1 and Bridge Creek 1) or alluvial terraces (C-AB2, G17). Both Packard and Mosig-Way point out that a lack of surface artefacts does not necessarily indicate subsurface sterility, in fact quite the opposite was found with high density subsurface artefact deposits found in areas where the surface artefact numbers were low.

Despite the generally limited ground and exposure visibility, surface artefacts were recorded on ten of the seventeen landforms within the Project Site. While it is acknowledged that the surface survey effective coverage was low, the survey results were able to show a pattern in site distribution and was able to confirm or enhance the predictive modelling based on the identified landforms. The reliability and applicability of the survey results were then used to confirm and refine the subsurface testing methodology.

The sites identified in this assessment were predominantly located within the undulating plain landform that connects a large area north of Butmaroo Creek to one of the elevated sand bodies south of the terminus of Wrights Creek. It should also be noted that this area is located approximately where the level of Lake George is understood to have been around 3200BP. Large scatters were also identified within the track/road exposures of the creek terrace and gentle slopes landforms, the former of which is located approximately where the level of Lake George is understood to have been around 6000BP. Smaller scatters were also identified within three areas of historical sand mining in the creek terrace and elevated sand body landforms along with scatters in the floodplain, strandline, elevated creek flat, and hillslope landforms. The results of this assessment confirm that there are still Aboriginal objects within the Project Site even in highly disturbed areas such as some of the historic sand mines and the roads/tracks passing through the area.

The results of this survey largely reinforce arguments made by previous archaeological studies in the region which suggest that Aboriginal occupation of the region was likely intensely focused within certain landforms across the region. Within the Project Site it was theorised that this would mainly be in the local sandy rises that are present throughout the area. The large scatters recorded during this survey, such as BCSF: Artefact Scatters 12, 20, 21, and 27, not only contain a variety of typologies and raw material types but also provide valuable insight into the potential subsurface archaeological deposits present in the adjacent landforms. This is especially the case within BCSF: Artefact Scatters 12, 20, and 21, which confirmed that the undulating plain and creek terrace landforms were of a higher archaeological sensitivity than was originally predicted. The results of the test excavations showed that while artefacts were recovered from every landform with the exception of the floodplain, the densities in which they were recorded varied across the site. Generally, all sandy landforms that are elevated above their adjacent landforms were found to contain comparatively moderate to high density of artefacts. Only BCT Clusters 8, 10, and 15 contained a high number of artefacts (n=124, 46, and 44 respectively), these clusters were located within the elevated sand body, flat, and creek terrace landforms. BCT Clusters 3, 4, 6, 11, and 16 contained a medium number of artefacts (n=25, 19, 30, 19, and 20 respectively), these clusters were located within the undulating plain, elevated sand body, and flat landforms. All other BCT Clusters and Transects with subsurface artefacts contained <15 artefacts per area and are therefore considered as having a low density. Many of these testing areas were located within proximity to the estimated shoreline of Lake George throughout different periods of time (especially around the time of 3200BP and 6000BP), suggesting that the use of these landforms may have been linked to the different water levels of Lake George throughout time.

The questions regarding occupation events and their relation to different lake levels is difficult to answer and beyond the scope available in this assessment report. However, the results of the investigation demonstrate that there are many avenues of archaeological research available within the broader Lake George basin that warrant consideration. It may not be possible to answer some of these questions in relation to the timing of occupation on different relic shorelines due to factors such as bioturbation and historic land use as well as the progressive nature of the rise and fall of the lake over millennia. It is likely to be very difficult to pinpoint particular lake levels to occupation events.

However, as a result, the subsurface testing programme and the survey results confirmed the overall accuracy of the predictive modelling that was developed as a part of the methodology.

The density and extent of material recovered from the subsurface testing programme indicated that the large portions of the Project Site, with some notable exceptions, is relatively undisturbed with low, medium, and high-density cultural material present, mainly within the upper 30cm of deposit. However, it should be noted that there is variability in levels of disturbance and even in areas of high artefact density, some disturbances were observed. Those areas that had clearly been subject to ploughing also still contained artefacts, showing that even though artefacts may have been displaced by some land use practices, artefacts remain within the deposits.

Generally, in areas where obvious surface disturbances (such as the pine plantations, historic structures, fences, sand mines, infrastructure, etc) are present the disturbance is clear, with at least a metre of upper deposits being removed by the sand mining activities in particular. Testing in disturbed areas, such as at BCT Cluster 14 and BCT Isolated Pit 4, revealed that the amount of sand removed during mining or track construction events has largely removed the artefact bearing deposits from these areas. However, the majority of the Project Site is comprised of 'lesser' disturbances such as stock grazing, vegetation clearance, and ploughing; all of which have likely resulted in disturbances within the top 30cm of deposit. In these areas it is likely that deposits deeper than 30cm are relatively undisturbed, apart from land clearing and bioturbation. It should also be noted that within elevated areas the artefact bearing deposit may extend deeper into the deposits. This is evidenced by the fact that the only artefacts recorded in Spits 7, 8, 9, and 10 (from 70-100cm below surface) throughout the Project Site were within the elevated sand body, undulating plain, or basal slope landforms; all of which represent areas where the localised elevations were above their adjacent landforms and had deeper soil profiles.

Of the known historical sand mines within the Project Site, all are within landforms predicted to contain medium or high archaeological sensitivity. This is largely due to the fact that the sands targeted for mining are generally located within elevated sandy rises, a landform feature that is common in areas of moderate to high archaeological sensitivity. As a result, in these areas where mining has occurred, it is highly likely that the archaeological record has been destroyed due to the removal of the artefact bearing deposits. Any remnant material that has been exposed or left behind as a result of this disturbance should be considered as being located within a disturbed context. The fact that the undisturbed portions of some of these landforms revealed significant densities of subsurface artefacts further reinforces this suggestion. Some of the tracks that have been created across the Project Site are also likely to have disturbed archaeological material. Where these tracks cross landforms containing high and medium archaeological sensitivity it is likely that their creation has disturbed at least the upper archaeological deposits especially within the undulating plain and creek terrace landforms, where the tracks cut into and have removed sections of local sandy rises. The presence of archaeological material in test pits located close to these sections of the track show that artefact bearing deposits exist and therefore were potentially removed from those areas during the establishment of these tracks.

The predicative modelling for the immediate region identifies that the local sandy rises throughout the Project Site were the focus of Aboriginal occupation. The landforms and resource rich environment of Lake George and Butmaroo/Bridge Creek would have been conducive to occupation, even as the water level of Lake George fluctuated over time. The artefactual finds recovered from the current testing programme suggest that there was either an intense or repeated use over time across the Project Site focused around local sandy rises. This is consistent with the results of Mosig-Way's (2018) previous archaeological excavations which recorded several high-density flaking floors completely separated from one another. Her work went as far as to refit spatially isolated flakes to a core and establish individual flaking events within a wider flaking floor. While no definite refits were established within the current testing programme, the similar lithic materials present within the same pit and spit (such as seen in Plate 6-6 and Plate 6-8 above) reinforce her findings and the potential for recording individual flaking events within the Project Site.

The presence of four backed artefacts (less than 1% of the assemblage) is consistent with previous archaeological excavations which contained a similar small percentages of formal tool types within an assemblage (eg Koettig 1986 and Mosig-Way 2018). The presence of a small number of tool types suggests that intensive tool manufacturing was not undertaken in the areas that were examined. Furthermore, it should be noted that one of the three silcrete backed artefacts was located within a pit containing 140 artefacts/m^2 along the estimated shoreline of Lake George at approximately 3200BP. The remaining two silcrete backed artefacts and Pejar point were located at the easternmost portion of the Project Site within a pit containing 120 artefacts/m^2,150m from the estimated shoreline of Lake George at approximately 6000BP. However, it is not possible with any certainty to confirm these artefacts are associated with the lake levels as they are just as likely associated with favourable occupation at the nearby Bridge and Dry Creeks.

The lack of formal tool types or retouched and utilised artefacts within test pits suggest that there was little formalised tool making being undertaken within the area. Further analysis of technological features on the artefact assemblage may be able to elucidate the nature of flaking activity, such as whether amorphous, multi-purpose artefacts were being made or whether formalised implements such as backed artefacts were being made that were subsequently removed from the sites. Such analyses were beyond the scope of the current assessment, but such questions would be available for future research efforts.

While the lack of terrestrial or lacustrine faunal remains recovered from excavations suggests that the main camps were not in these areas identified by this testing programme, this could also be due to the neutral to slightly acidic soils which would have prevented the preservation of organic material. Furthermore, the variety of lithic materials recorded in the surface and subsurface artefacts suggests that a significant amount of raw material was imported to the site for flaking purposes, especially considering that silcrete and chert are not locally available in the Project Site. While the variation in the colour of the silcrete and chert may suggest that different sources were being used, a more detailed investigation needs to be undertaken before any conclusions can be drawn about the significance of the raw material variation. However, the variety of raw materials present, both across the Project Site and within some of the excavated sites, suggests that the area was visited repeatedly, with people bringing different stone materials at different times.

The results of this assessment have shown that while a varied level of historical disturbance is present throughout the Project Site, a coherent narrative can be formed about the archaeological sensitivity of the landforms present in the area. While not all local sandy rises were tested throughout the Project Site, almost all that were revealed a medium to high density of subsurface artefacts, suggesting that they were heavily favoured by Aboriginal people. However, the results of this subsurface testing programme do not definitively answer how intensely these landforms were occupied or for how long a period of time. While a certain level of inference can be established about the nature of the archaeology and landscape use by Aboriginal people, it is considered that the current archaeological assessment has provided further avenues of archaeological research that could be investigated in other studies.

An important element of the investigation is the confirmation that the landform-based approach to the assessment has proven to be sound and furthermore, the categorisation of the landforms into groups of High, Moderate and Low archaeological sensitivity has been shown to be an accurate reflection of the archaeological record across the Project Site. This has been confirmed by both the surface survey in terms of numbers of sites found and also the results of the subsurface testing programme. The assessment process can therefore be undertaken with a high degree of certainty that the archaeological results have been accurately determined and the impacts of the development proposal can therefore be appropriately determined along with potential management strategies.

7.1 Former lake levels

Utilising contour data, it was possible to extrapolate the likely lake fill heights at three different periods through the late Holocene. Using the information collated by Fitzsimmons and Barrows (2010) the assumed lake fill levels at approximately 6,000BP (700m ASL), 3,200BP (685m ASL) and recent 150BP (679m ASL) were mapped, as discussed in Section 4.1.4. As the lake fluctuated from dry and empty to full well above contemporary levels, it is assumed that Aboriginal occupation of the landscape was adjusted according to the conditions. Over this period, people would have adapted to the rise and fall of the lake levels, and it is expected that foreshore camping would have occurred wherever the lake level was at the time.

Mapping of the lake levels, however, provides an opportunity to examine what the landscape may have been at these times during the past. This is useful to examine the potential for relict shorelines to be identified and to see if there is any correlation between the presence of Aboriginal artefacts in the present-day landscape.

Figure 7-1 and Figure 7-2 show the assumed lake fill levels at the dates of 150BP, 3,200BP and 6,000BP as different examples of lake levels.

The level at 150BP is higher than current level, with lake water extending along Butmaroo Creek and into what is identified in the current landscape as low depression and floodplain landforms. What is immediately striking is that the elevated Strandline landform sits high above the water line and separates the main lakebed from the floodplain area. In a site modelling context, an elevated landform which remains dry while also in proximity to aquatic resources would likely be a favourable location for occupation. During this period, Butmaroo Creek may also have been wider, and the higher water levels within the creeks and lake would have resulted in greater frequency of inundation within the floodplain. In terms of predicted archaeological evidence, the remaining identified landforms within the Project Site would likely have been similarly accessible through this lake level phase and therefore a similar occupation strategy and land use would be expected.

At approximately 3,200BP, the lake level was considerably higher than present. The mapped lake level shows the entire floodplain landform and Butmaroo Creek completely inundated. Interestingly, the elevated strandline and much of the undulating plain would also have been under water. The shoreline at this contour level is of interest as it shows a broken shoreline, with small points, peninsulas, and bays, equating to higher and lower ground. Although in some senses the mapping at 3,200BP is a random date and the lake levels would have fluctuated, the nature of the broken shoreline is likely to have influenced Aboriginal occupation.

It may be assumed, based on existing modelling, that higher, elevated sandy deposits would have been a focus of occupation. The points and peninsulas shown in the mapping would have been likely targets for occupation, elevated above the waterline. It is particularly interesting to note that there is a high density of artefacts located on some of these elevated areas that would have been on the shore at this time. In particular, the elevated sand body shown in inset B of Figure 7-1 contained the test pits with the highest artefact numbers recorded in the test excavation programme. This high density coincides with this feature being an elevated point at the approximate lake level at about 3,200BP. Similarly, some elevated areas containing high artefact numbers were found in the undulating plain landform, such as that shown in Inset F of Figure 7-2.

The evidence is that such elevated landforms were a focus of activity when lake levels were much higher than present. Some of these elevated areas were identified as containing deep sandy deposits during the testing so the potential for older cultural material at depth must be considered for these areas.

At the highest lake level mapped, following the 700m ASL contour, nearly the entire Project Site would have been under water. The shoreline at this time would have been the basal slopes of the hills that surround the lake basin. The one area within the Project Site that would not have been inundated is the extreme eastern end of the project, at the proposed substation location. These hill slope and terrace landforms would have been elevated above the creek and edge of the lake and would also be expected to have been a focus of Aboriginal occupation.

The contour mapping should not be taken as definitive lake shorelines, it simply provides an indication of the potential shoreline morphology. As noted, the lake has always fluctuated, and this mapping confirms the level of inundation at various periods in the late Holocene. While it potentially shows where the focus of Aboriginal occupation may have been, and by extrapolation areas of archaeological potential at different periods, it cannot be assumed that all evidence of this occupation remains. The rise and fall of the lake, and the deposition and erosion of sediments that that would have brought, means that there is no certainty that evidence from these occupation events remains *in situ*.

It is also worth noting that where the archaeological record is preserved, the occupation would have been on dry land. Although this seems an obvious statement, it is important because the extent of dry land fluctuated, and therefore the opportunity for Aboriginal people to camp and use the land also fluctuated. On broader and less defined landforms then, the archaeological evidence is likely to be more dispersed and the archaeological record is likely to be graduated from areas of low potential where water was more likely to be present to areas of highest potential that were dry for longer and have better preservation conditions, such as elevated sand bodies. This supports the findings from the analysis of density data, that some landforms are more archaeologically rich, and it is these that ought to be subject to preservation.

The contour mapping and the archaeological evidence so far recorded does provide a basis for assessing the potential archaeological record within the Project Site, and also more broadly within the Lake George basin. Investigations of the nature of Aboriginal occupation have been undertaken over a number of decades within the basin but the corroborative evidence for the former lake levels and the archaeological evidence based on elevation and nature of deposits is strengthened by the results from this assessment.

The potential for investigating various research questions regarding the Aboriginal land use and how that may have been affected or influenced by different lake levels was well established before this assessment. Preservation of some of these elevated sandy features would provide increased potential for meaningful archaeological investigation including a higher potential for deeper and older deposits.

[redacted]

Figure 7-1 Overview of all NGH surface and subsurface artefacts and registered AHIMS sites compared to estimated lake level modelling – Map 1 of 2

[redacted]

Figure 7-2 Overview of all NGH surface and subsurface artefacts and registered AHIMS sites compared to estimated lake level modelling – Map 2 of 2

8. 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 (Australian ICOMOS 2013). Criteria used for assessment are:

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

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

8.1 Significance assessment

Social or cultural value

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

Songlines and pathways have been previously reported to connect the Ginninderra Falls area to Ngarra/Weereewa (Waters Consultancy 2017: 79) and the local Aboriginal community informed NGH that the Project Area included cultural significance with particular reference to water and the mythologies of the lake. These intangible heritage values have tangible representation through landscape features such as stone outcrops and the stone artefacts. The RAPs would like to see the surface artefacts recorded across the Project Site either avoided by any future development, or if this cannot be achieved, collected before any construction works occurs. They would like them placed in a safe location to avoid future disturbance. A site for the relocation of cultural material would have to be inspected by Aboriginal representatives as part of the management process. All Aboriginal representatives in attendance agreed that Aboriginal community members must be present when the surface collection salvage programme and relocation occurs.

The community agree that local sandy rises are highly sensitive and have the potential to contain further evidence which may help interpret Aboriginal occupation in the region.

It should also be noted that a cultural site was recorded adjacent to but outside the Project Site boundary.

No other information regarding the social or cultural values to the sites recorded or the Project Site in general were provided during this assessment by the Aboriginal community. Further opportunity to provide information was provided during the report review stage.

Scientific (archaeological) value

The research potential of sites located within the Project Site is considered to be high where they are located in relatively undisturbed local sandy rises. The presence of sites within these landforms is likely to significantly contribute to the further development of site modelling for the local landscape as well as providing a further understanding of the Aboriginal occupation in relation to Lake George and Butmaroo and Bridge Creek, especially in relation to possible different lake level phases.

A significant number of surface artefacts were recorded during the two rounds of survey that were undertaken. It should be noted that the majority of these artefacts are likely to be within disturbed contexts as they were often recorded within exposures created during historical disturbance events. In spite of this, the recorded surface artefacts likely indicate the presence potential subsurface archaeological material in adjacent undisturbed areas of these landforms. The most prominent examples of this were represented by the significant artefact scatters located within the undulating plain and creek terraces adjacent to localised sandy rises.

The majority of the landforms where subsurface testing took place within the Project Site were noted to contain little disturbance, meaning that the majority of the Aboriginal objects recovered from the subsurface testing programme is likely to have been *in situ* material from artefact bearing deposits throughout the site. The exceptions to this are where sand mining have removed a large amount of sand from these landforms or in the pine plantation area which has been deeply ripped and disturbed. In landforms where lesser disturbances have taken place (such as ploughing, or cattle grazing) it is likely that only the top 30cm of deposit has been disturbed, leaving a potentially undisturbed artefact bearing deposit beneath.

Both the surface and subsurface artefacts recorded within the Project Site are interesting in terms of the variety of recorded lithology types and raw material types. Considering that the majority of the subsurface artefacts are likely to be *in situ* deposits, their temporal context is important in order to gain further understandings about the Aboriginal occupation of the area. The variety of raw materials is also of interest and requires further investigation as it may provide a better understanding as to which materials were imported to the area and from where.

The large and varied assemblage of artefacts that was recorded as a part of the archaeological survey and subsurface testing programme show that there is a significant potential for archaeological deposits to remain in landforms mapped as having medium to high archaeological sensitivity. The presence of a possible hearth in the undulating plains landform provides further evidence of occupation and the potential to obtain dateable material to provide evidence of site ages. The location of the hearth is also associated with the approximate shoreline for Lake George at around 3200BP. There is potential that further investigations into the landform associated with the hearth may reveal more information about how Aboriginal people used the landscape at that time, especially if material can be dated that links occupation to our understanding of the changes in the shoreline of Lake George.

The elevated sand body and creek terrace landforms are similar in that they are associated with the estimated shoreline of Lake George at around 3200BP and 6000BP respectively. As a result, these areas hold a significant scientific value for further research into the site patterning and Aboriginal occupation strategy of the area where it has been determined that potential large subsurface archaeological deposits remain, such as in the aforementioned creek terrace and elevated sandy body landforms as well as the local sandy rises of the undulating plains landform.

The research potential of the previously recorded AHIMS sites within the Project Site varies from low to high. Where only surface AHIMS sites are present they are likely to only represent a low to medium scientific significance. However, where they can be associated with nearby local sandy rises, they are likely to represent a medium to high scientific significance as they provide an indication of the potential intact subsurface deposits. Where these sites are associated with historical sand mines it is considered that they will be of a low scientific value due to their removal from their archaeological context. AHIMS Site #57-2-0917 is the most scientifically significant previously recorded AHIMS site in the area. While testing of the site in the past revealed a significant subsurface deposit, the recording of surface artefacts eroding from the side of the landform suggests that a significant archaeological deposit still remains within the local sandy rise associated with the site.

It should also be noted that although no Aboriginal burials have been recorded in the region, ethnographic evidence suggests that they were often located within local sandy rises.

The Aboriginal heritage sites within the Project Site can be considered individually. Each site had its scientific significance assessed based on the ability of the site to answer research questions about the Aboriginal occupation and land use of the area. Such an approach would typically consider the number of artefacts or other features, such as hearths, present at each individual site location. The more artefacts or features present, including the variety of artefact materials and types, the more valuable the site would be for research purposes. It may be considered therefore that sites with less than 50 artefacts have low research potential while those with more than 100 artefacts would likely be moderate to high and those with hundreds of artefacts or with flaking events or associated hearths at a high level of scientific value.

Defining scientific significance for individual sites within the Project Site may however be misleading as the extent of many of the sites has not been established. Instead, the significance of landforms, based on their archaeological signature determined through survey and testing is likely to be a more reliable indicator of significance. Nevertheless, scientific significance is assessed for sites in Table 9-2. Table 8-1 below provides a breakdown of the key scientific significance considerations for each landform.

Table 8-1 Scientific significance of landforms in the Project Site.

Landform	Potential for high density sites	Generalised landform integrity (some impacts)	Summary of scientific value
Undulating Plain	Moderate to High	Moderate (clearing, ploughing, tracks and fences)	Moderate
Low Spurs	Low-Moderate	Moderate (clearing, ploughing, tracks and fences)	Low-Moderate
Elevated Sand Body	High	Moderate (clearing, sand mining)	High
Elevated Creek Flat	Low - Moderate	Moderate (clearing)	Moderate
Basal Slope	Low	Moderate (clearing, fences)	Low
Flat	Moderate	Moderate (clearing, ploughing)	Moderate
Hillslope	Moderate	High (pine plantation, clearing)	Low
Creek Terrace	Moderate-High	Moderate (clearing, pine plantation)	Moderate
Strandline	High	Moderate-High (sandmining localised areas)	High
Floodplain	Low	Low- Moderate (ploughing)	Low
Beach	High	Low	High
Saddle	Moderate	Moderate (clearing)	Moderate
Wetland/Depression	Low	Low	Low
Gentle Slope	Low	Low	Low
Drainage/Erosion Depressions	Low	Low	Low

Aesthetic value

There are no aesthetic values associated with the archaeological sites per se, apart from the presence of Aboriginal artefacts in the landscape and its aspect to Lake George. However, the presence of the Capital Wind Farm in the landscape and presence of non-native vegetation detracts from the overall aesthetic setting of the landscape. Additionally, the artefacts are either mostly buried or too small to see easily so there is no aesthetic value in them, and they don't form obvious feature within the landscape.

Historic value

Historic information of Aboriginal people living on the land includes relevant archival, historic and ethnohistoric sources as well as existing data bases such as the NSW Aboriginal Heritage Information Management System (AHIMS) and Australian Government and State heritage registers.

The Project Site was settled by Europeans from the 1830s. Whilst European explorers of the region and early visitors relate that Aboriginal people were in the area, there seem to be no accounts of Aboriginal people living and/or working in proximity of the Project Site thereafter. Small Aboriginal reserves began to be created throughout NSW from the 1850s, with many more declared in the 1870s, including at Yass in 1875 (NSW Department of Planning, Industry and Environment 2012). As detailed in section 4.2 of this report, much of the Aboriginal population within the region were removed to reserves, and regulations and limitations governing Aboriginal people's lives continued to increase ('Buru Ngunawal Aboriginal Corporation' n.d.; Waters Consultancy Pty Ltd 2010).

No registered Aboriginal party to this project has alerted NGH to an historical association between Aboriginal people and the Project Site and neither were the Proponent aware of any historical association.

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. The presentation of educational material about the Aboriginal occupation and use of the area could be developed in consultation with the local Aboriginal community and used at the proposed Indigenous Cultural Heritage Learning Zone annual Open Day.

There are limited opportunities in public education with sites as they are currently identified as most of the archaeological material is small, hidden and therefore of limited visual use. However, there may be opportunities in relation to the landscape, including more broadly the history of the lake and based on these preliminary results the history of Aboriginal occupation of the area in relation to different lake levels.

The educational value may be therefore in either relation to the local Aboriginal community and teaching young people or could be more broadly applied to the population in terms of Aboriginal history of the region.

9. Assessment of harm

9.1 Proposed development impacts

Construction of a solar farm includes both ground and subsurface disturbances which are described in detail in this section. However, the extent of the disturbances which will result from the proposed development is low in comparison to other potential developments for this site such as sand mining or residential development.

In the early stage of the project, the proposed development footprint was amended in consultation with NGH, with the intention of avoiding impacts to areas identified to have high archaeological sensitivity. The assessment approach and methodology are discussed in Section 3, followed by archaeological predictive modelling in Section 4.3.

Disturbance to Aboriginal objects and sites will occur within the 12-18 month construction period, with operation and decommissioning phases unlikely to result in any disturbance beyond that which will occur during construction. Construction will include the following ground disturbing activities:

- Installation of upright piles to support the PV modules,
- Trenching to connect these modules to inverters,
- Deeper trenching to connect these inverters to the substation,
- Construction of access tracks to allow for construction and maintenance of the site,
- The construction of a substation comprising a switching station, transformers, control buildings storage facility and carparking,
- Temporary construction laydown and offices, and
- Fencing.

The nature of these disturbances is outlined in detail below.

The array at the Blind Creek Solar Farm will include up to 850,000PV solar modules mounted on single axis tracking tables. The tracking tables can be in two configurations, which impact the pile density and therefore the ground disturbance from piles. A certain amount of design flexibility is required, which is why two options are provided below. In terms of the assessment of impact.

1-in-Portrait (1P): Approximately 0.25 piles per panel (210,000 piles in total)

2-in-Portrait (2P): Approximately 0.125 piles per panel (105,000 piles in total)

Based on the number of piles, multiplied by the cross-sectional area, it is possible to estimate the ground surface disturbance from piles as 0.3-0.6ha depending on 1p or 2p design. NGH has used the conservative estimate, but this can be understood as the upper limit.

In addition to the above, trenching for infrastructure, access tracks and ancillary facilities will also cause ground disturbance to some extent. Overall, approximately 6% of the development footprint (less than 4% of the site area) is expected to be impacted by these activities. A summary estimate of proposed ground disturbance by works is provided in Table 9-1 below, which is followed by a detailed description of each of the proposed works.

Table 9-1 Proposed ground disturbance calculations by proposed works.

Proposed ground disturbance	Description	Unit Area m^2	Number of units	Total footprint size (Ha)
Tracks	Shallow cut/grading with introduced fill using engineering material	4000	25	10
PCU Pads	1m cable pit below, piles for platform	50	85	0.425
Centralised BESS	Level cut; foundations, and carpark	30000	1	3
Tracker Piles	Driven I-Beam or sigma beam	.00275	210000	0.5775
AC Underground Cables	Trenched cables	300	20	.6
DC Underground Cables	Trenched cables, or possibly cable tray	3	31500	9.45
Cut and Fill	Fill dams and voids in disused quarries; remove European earthworks	30000	1	3
Substation, control room and store	Level; cut; foundations, and carpark	125000	1	12.5
Switching station	Level; cut; foundations, and carpark	10000	1	1
Laydown	Level	41000	1	4.1
Comms Tower	Concrete foundation for monopole	10	1	0.001
			Total proposed disturbance area	**44.65**
			Total proposed footprint (approx.)	**720**
			% of footprint to be disturbed (approx.)	**6%**

9.1.1 Solar array piles

Piles would be driven into the ground to support the solar array's mounting system. Each pile is a steel profile, such as an i-beam or channel, up to 275mm wide and 100mm deep, and pile depth will be greater than 1m into the ground. The pile heights will vary according to topography and expected flood level. Ground disturbance will be limited to the piles themselves, as well as churning of topsoils by tracked machines used to install the piles. Flat plate PV modules would be installed and mounted across the site. Each of them would be linked to an inverter and a transformer.

Plate 9-1. Example of machinery typically used to drive poles into the ground for the solar array supports. (source: NGH stock image).

Plate 9-2. Example of typical distances between array support poles (source: NGH stock image).

The spacing between rows of modules is expected to be up to 9m. Where possible, driven-pile foundations would be used, as they minimise the soil disturbance and can be installed quickly. In locations where the soil is not compatible with driven-piles, helical or screw piles may be used. This may require additional processes such as pre-drilling and grouting if bedrock is encountered, but this is not expected at this site.

9.1.2 Power conversion units

Each sub-array will be connected to a housed power conversion unit ('PCU'). The purpose of the PCU is to convert direct current (DC) electricity, generated by the solar panels, to alternating current (AC) which is used by the national electricity grid. The conversion is performed by inverters, and the voltage is stepped up to the site's reticulation value (approximately 33kV) using transformers. The PCUs hold all power conversion devices, switchgear, communication devices, and ancillary equipment.

The precise layout of PCUs within the BCSF solar array is subject to detailed design and technology selection. An indicative design includes a single PCU which includes one inverter and one transformer and is connected to 12,000 solar modules forming a subarray and under this configuration, approximately 85 PCUs of this size would be needed. The PCUs would be constructed on a concrete foundation, or a pile as required by detail design. This design is indicative only, as it is possible that an alternative architecture may be selected. For this site, it is most likely that the PCU will be installed on piles to raise the unit above 1% AEP flood level (approximate 1 in 100-year event). An example of a PCU product that could be used in this configuration is shown in Figure 9-1.

Ground disturbance associated with PCUs is to a large extent associated with the 'cable pit' below the PCU, which allows underground cabling to enter under the unit (see Figure 9-2).

Figure 9-1 Typical housed PCUs used within a commercial solar power plant (source SMA). The dimensions of this specific product are 6058mm (W) * 2896mm (H) * 2438mm (D)

Figure 9-2 PCU installed on pile foundation. Courtesy Octopus Investments Australia

9.1.3 Underground cabling

Two types of cable are necessary on the site: DC and AC. Competing requirements dictate whether they are installed above or below ground. While above-ground cabling would reduce ground disturbance, underground cabling improves the resilience, safety, agricultural access and visual impact of the site and is therefore the preferred option.

DC cabling connects each 'string' of panels (approximately 30) to the PCU. They may be installed either in cable trays above ground, or in trenches to Australian Standards. If the cable was installed underground approximately 20ha of the Project Site would be disturbed for this purpose (2.8% of the development footprint). AC cabling connects the PCUs with the substation. As this is far higher voltage and more dangerous it must be installed at a depth of at least 500mm (typically 600mm – 800mm) following the relevant Australian Standard (see Figure 9-3). Approximately one Ha would be disturbed by AC cabling (0.15% of the development footprint).

Figure 9-3 Example of AC cabling at a depth of 500mm, a similar style of underground cabling will be adopted for the proposed Blind Creek Solar Farm

9.1.4 Energy storage

The Proposal has been designed to include energy storage in the form of batteries to firm the generating capacity.

Subject to detailed design, the Proposal is seeking approval for up to 300MW storage with 2 hours of full export capacity (600MWh) using Lithium-ion batteries (LiBs). The LiBs would be constructed on concrete footings or driven piles, as required, to provide stable and resilient service. The physical layout of the batteries on the site will be specified during the detailed design phase with two configurations identified below. These configurations are indicative only, and it is possible that a hybrid or alternative architecture may be selected. Figure 9-4 below provides an indicative layout of an AC coupled storage system which is similar to that intended for the BCSF.

Figure 9-4 Example of an AC-coupled energy storage facility. The Hornsdale Power Reserve is 100MW / 129MWh and has a footprint of less than one hectare (Source Hornsdale Power Reserve)

9.1.5 Transmission network connection

To connect to the national electricity grid, the Proposal will make use of the existing 330kV transmission line that traverses the site. This line connects Canberra to Kangaroo Valley. To facilitate this connection, a new transmission substation will be constructed as part of this Proposal.

It would be built on the eastern edge of the development footprint and would have a footprint of approximately one hectare. For ongoing operation and maintenance of the substation, it can be accessed via Blind Creek Road and use existing internal access tracks.

To connect the solar array to the national electricity grid, additional transformers would be installed.

The proposal allows for up to four transformers to be installed for this purpose, in addition to those already included in the PCUs. These transformers would be located at the onsite substation.

9.1.6 Associated operations buildings

For the ongoing operation of the solar farm, permanent buildings would be installed for control, switch room and storage facilities. Indicative descriptions of these buildings are provided below. Each building would contain essential fire safety equipment as required by the relevant standards.

Control room and Site Office

This facility would be a single storey building, up to approximately 20m x 10m. It would contain an office and amenities for staff (toilet, kitchen, first aid, potable water supply, etc.) as required for the safe operation of the site.

The foundations, finishings, and other features would be designed as required by relevant standards.

Switch room

A building footprint of approximately 20m x 5m and approximately 5m high would be constructed for the HV switch room, with services, protection and control facilities. The building may be installed on stilts and will be designed and constructed to meet relevant standards.

Storage shed

A storage shed with footprint of approximately 20m x 15m and approximately 6m high would be constructed. The building will have appropriately designed foundations, finishing's and other features as required by relevant standards.

Communications tower

A communications tower will be installed. This tower will be monopole in design and up to 25m tall. It will be connected underground with power and communication cables for most of its length and may be overhead close to the substation, operations buildings etc.

9.1.7 Site access and internal tracks

Site access

The site will be accessed from the Tarago Road, which runs between Tarago and Bungendore.

Three existing access points were considered: Blind Creek Entrance, Currandooley Road Entrance and Bungendore Sands Entrance. It was found that the Blind Creek Entrance had the least impacts on local traffic and requires the least amount of work to upgrade.

The Blind Creek Entrance requires some widening to accommodate turn treatments, but the intersection already has suitable sightlines.

The final intersection designs would be completed in consultation Queanbeyan-Palerang Regional Council following approval of the Proposal.

Internal tracks

The site will use both existing tracks (approximately 6.6km), upgraded where necessary, and new tracks where none exist (approximately 20km). The tracks within the array will also form laneways for movement of sheep between blocks as part of the regenerative agri-solar plan.

The final design for new tracks will not be completed until post approval. The internal tracks would be constructed of local or engineered fill, crowned for run-off and topped with a gravel cap. In areas of the Wrights Creek Floodplain and in sensitive archaeological areas, the native soil disturbance will be minimised by laying imported fill and gravel over the native soils.

The existing roads, which service the laydown compound and the substation would be approximately 4–6m wide (including shoulders and any required drainage), whilst newly constructed internal roads would be approximately 3.5–5m wide.

Access tracks would be clearly marked on the site environmental management plan and passing lanes and turning circles would be provided to internal tracks in line with the bushfire management plan.

The low-level crossing over Blind (Bridge) Creek will require upgrades, including the replacement of blocked culvert drains and resurfacing with concrete.

The new crossing will be approximately 5m wide at the road level, with a flare outward by approximately one metre to the exposed bedrock of the creek (see Figure 9-5 and Plate 9-3 below). The pipes would be sized to facilitate crossings in normal flood conditions (approx. one in five-year flood) and will act to preserve connectivity. The battered sides and drains of the existing ramps in and out of the crossing may be reinforced with loose stone to stabilise them during flood conditions (see Plate 9-4 below).

Figure 9-5. Proposed new crossing over Blind Creek. Concrete deck to be approximately 5m wide (Source: Stride Renewables).

Plate 9-3 The repaired crossing would be similar to the one depicted here. (Source: Stride Renewables).

Plate 9-4 Example of the battered side of the creek crossing with loose stones as reinforcement. (Source: Stride Renewables).

9.1.8 Security and fencing

Solar panel array area

The solar array will be located on private land with no public access. For this reason, the area will be fenced.

Substation/Battery area

The substation area would be enclosed by a security fence in accordance with safety requirements.

9.1.9 Landscaping and revegetation

Landscaping and screen planting would be undertaken in some sections of the perimeter of the development site to minimise visual impacts. Tree and shrub species suited to site conditions would be used, placed and selected to avoid shading impacts on the array and to achieve effective screening of the solar farm infrastructure.

The ten-metre minimum bushfire protection setback (APZ) from solar farm infrastructure would be applied to the solar farm, in accordance with Planning for Bush Fire Protection guidelines (RFS 2019). Where remnant or planted woody vegetation is present within the development footprint, an APZ buffer of minimum 10m would be maintained between this vegetation and solar farm infrastructure.

Areas disturbed during the construction phase would be stabilised and revegetated with suitable perennial grass species immediately after construction.

9.1.10 Temporary construction facilities

The site will require up to 10 transportable offices. These will be removed at the conclusion of construction. The offices may be powered with either an off-grid solar-based solution or through a connection to the nearby 11kV network.

A construction laydown would be established adjacent to the site offices. This area would include a cleared gravel pad and would be used to unload vehicles, store materials and vehicles.

9.1.11 Decommissioning and rehabilitation

At the end of the Proposals life, decommissioning and rehabilitation of the site will be undertaken. During the decommissioning process, all below-ground infrastructure would be removed to a depth of 500mm or less. All above-ground infrastructure will also be removed, with the possible exception of the 330kV substation. Rehabilitation of the site would commence at this stage.

9.2 Consideration of Ecologically Sustainable Development (ESD) principles and cumulative impacts

Consideration of the principles of Ecologically Sustainable Development (ESD) as part of this assessment has been undertaken ensure that the proposed development meets the needs of the present without compromising the ability of future generations to meet their own needs. The three principles that are most relevant to the assessment of harm to sites are the Precautionary Principle, Intergenerational Principle and the Diversity Principle.

Inter-generational equity requires the present generation to ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. The Blind Creek Solar Farm project respects the ongoing and important connection that the Aboriginal community has to the Project Site, Lake George and broader region generally through the use of the precautionary principle throughout the ACHA process and the consideration of the principles of ESD. 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. The aim of the assessment process has been to avoid impact to Aboriginal heritage wherever possible.

Where impact cannot be avoided in order that the proposed project might remain viable, the main consideration was the cumulative effect of the proposed impact to the sites and the wider archaeological record. Heritage assessments of current and previous development projects within the Lake George region have resulted in an increase in the knowledge of site location, Aboriginal land use of area and size of sites in the region. Though some of these sites have been impacted by developments, they have contributed to the understanding of cultural heritage in the region.

An important first step in the use of the precautionary principle throughout the assessment process was establishing a predictive model of archaeological sensitivity of landforms across the Project Site. The aim was to highlight early in the ACHA process those areas that were likely to have high archaeological and cultural sensitivity, so that heritage considerations would begin to influence the project design. The Proponent addressed these preliminary constraints by proposing a development footprint that would avoid large sections of the Project Site, including the highly archaeologically sensitive beach and strandline landforms along the shore of the lake. This preliminary development footprint was provided to all registered Aboriginal parties within the draft ACHA methodology for review and comment.

Fieldwork was undertaken in accordance with the methodology, and this identified both surface artefacts and archaeologically sensitive areas, further recommending areas of high sensitivity to be avoided where possible. These and other project constraints prompted the Proponent to again reconsider the proposed development footprint. This led to a revision of the proposed Project Site and development footprint in order to further avoid areas of high archaeological sensitivity, whilst seeking areas where it would be appropriate to develop the solar farm, such as utilising previously disturbed areas and landforms of low to moderate archaeological sensitivity.

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. The land use disturbances that have occurred to date have impacted the sites in some ways but, with the exception of areas subject to sand mining, the impacts have been relatively minor and relate to the movement and displacement of artefacts through the soil profile. This leads us to conclude that the current diversity of the archaeological record has not been significantly impacted within the Project Site, although the integrity of site deposits is questionable in some locations. Inter-generational principles have been considered in the assessment process through multiple modifications of the development footprint at various intervals and in formulating the management recommendations relating to the project. This includes mitigation measures and opportunities for enhancement of scientific knowledge where impacts may be unavoidable.

NGH have assessed that the archaeological record in this region will not be severely compromised by development of this particular solar farm proposal if appropriate mitigation measures are followed as outlined within this report.

The diversity principle mandates that the conservation of archaeological diversity and integrity should be a fundamental consideration in decision making. This assessment therefore will consider the diversity of the archaeological record and the impact that the proposed development would have upon it. This includes consideration of the ability of the project to avoid sites, to mitigate impacts and to salvage information where avoidance is not possible, in the context of the significance assessment. While acknowledged that diversity of the archaeological record is very important, the Diversity Principle does not mandate that no impacts can occur, as long as the diversity of the archaeological record can the maintained.

The field results have shown the archaeological record within the Project Site, and by extrapolation the wider Lake George Basin, to contain a broad low density scatter of surface and subsurface stone artefacts, with clusters forming what may be termed sites. The sites are spread across a range of landforms, although disproportionately, based on topographic and environmental features that can be grouped into areas of low, moderate or high archaeological sensitivity or potential. The categorisation of landforms, and confirmation of the accuracy of these categories, provide the opportunity to develop management recommendations that account for the diversity within the Project Site, and this has been adopted for this assessment.

It should be noted that whilst the ground disturbance of a solar farm includes relatively small, discrete impacts through the installation of the support piles to the arrays, this over a large area has a cumulative impact. It means that a large number of piles across a large area represent a likelihood of impacting upon archaeological deposits and artefacts, although that impact would be limited and is not considered to represent total harm or complete removal of the sites from the landscape. The installation of underground services in trenches will have a greater impact to the landscape, but these are limited to linear areas and do not extend across the whole Project Site.

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. The cumulative impact to the overall archaeological record of Lake George has also been considered. The ground disturbance works during construction will impact and compromise some of the archaeological features. However, compared to other impacts such as the sand mining industry, the impacts of the solar farm must be considered as less, even considering the scale of the proposed project.

The cumulative impacts for the project are assessed as moderate to high where trenching would occur within areas of moderate to high archaeological sensitivity but would be considered low to moderate in areas where piles are placed in the same landforms. Although there is a difference in the level of ground disturbance, we consider the cumulative impacts across the Project Site to be low to moderate. This accounts for both the cumulative impacts to the archaeological sites within the Project Site and also the cumulative impact to the suite of sites within the Lake George basin, which will largely remain intact, subject to continuing land use practices and excluding sand mining activity.

The key potential impact to archaeological or scientific heritage values is disturbance of discrete sites that have research potential. This potential impact can be mitigated through avoidance or, where this is not possible, by providing the opportunity for salvage, which will allow gathering of more information from the sites through open area excavation. Cumulative impacts from development can also be partly mitigated through an increased understanding of landscape use and increased knowledge in the wider community of the extent of Aboriginal occupation and use of the land.

NGH consider that while the current development proposal will impact many of the identified sites, the overall cumulative impact on the archaeological record for the region has been significantly reduced through the measures already implemented with reduction in the project footprint and also through the application of the mitigation measures recommended within this report (refer to Section 9.3 and Section 12). Therefore, it is argued that the cumulative impacts of the proposal are not enough to outright reject the development proposal and that the impacts can be effectively managed.

9.3 Mitigation of harm

Since there are varying degrees of archaeological sensitivity across the Project Site, avoidance of all sites and areas of sensitivity is not possible for the project to remain viable. However, avoiding harm to some areas of high archaeological sensitivity has been achieved through the project design process by avoiding those areas from the proposed development.

Based on the assessment of the sites, and in consideration of discussions with the registered Aboriginal party representatives during the field survey, it is not considered necessary to prevent all development but instead develop a suite of mitigation measures that will meet the requirements of ESD principles, intergenerational equity, and mitigate impact to heritage values through a combination of avoidance, salvage, further investigations, and ongoing cultural learning opportunities.

Dr Mosig-Way highlighted in her PhD the issue that the depositional environment at Lake George consisting of aeolian, or wind-blown, sands does not preserve well the separation of discrete events, as artefacts are prone to moving vertically through the sandy deposit and mixing with artefacts from different events. Additionally, there is the potential for wave action of varying lake heights to have impacted upon surface artefacts and even subsurface deposits, not to mention historical disturbances such as sand quarrying, ploughing, development of pastoral tracks and animal movements, including rabbits and wombats. The problems therefore are understanding whether an artefact assemblage is one event or multiple events over time, and then comparing those sites across the landscape to understand site patterning as a proxy for landscape use over time.

There are a total of 78 Aboriginal heritage sites within the Project Site, which include 18 previously registered AHIMS sites, 38 isolated artefacts and artefact scatter sites recorded by NGH, and 21 areas containing subsurface artefacts recorded by NGH during the fieldwork for this assessment. Three out 18 previously recorded AHIMS, 17 of the 27 BCSF artefact scatter sites and 9 of the 11 BCSF isolated finds are situated within the development footprint area of the proposed transmission line, solar arrays, tracks, cables, office parking and temporary facilities. The most likely cause of harm to the artefacts will be through ground preparation activities such as vegetation clearance, installation of the solar array piles and solar arrays, tracks and underground cabling.

The question remains about possible occurrence of artefacts and cultural material within the balance of the solar farm site. It is considered likely that additional artefacts will be present, most likely in the form of isolated artefacts or very small, low density scatters within the low-lying areas, and increasing in occurrence and densities in elevated, level, sand deposits. We do not consider that the risk of such disturbances means the development should not be progressed. A combination of avoidance, salvage, additional open area excavations and stop work measures for significant finds would reduce the potential impact upon existing sites, potential sites, and research opportunities to an acceptable level.

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.

Mitigation in the form of alteration of the development footprint has already been achieved through the removal of highly archaeologically sensitive landforms, namely the previously undisturbed strandline (ie. apart from the historically quarried area within the strandline) and large portions of elevated sand bodies, and a buffer zone along riparian corridors. The removal of these areas from development has resulted in the preservation of the following sites within the BCSF Project Site:

- 14 out of 18 previously registered AHIMS sites;
- 10 out 27 NGH recorded artefact scatters;
- 2 out of 11 NGH recorded isolated artefacts; and
- protection of any potential and subsurface deposits within these archaeologically sensitive landforms. Based on the assessment of the significance of these landforms, these sites are also likely to represent sites with higher scientific research value.

It is not possible to mitigate all of the remaining recorded sites left within the development footprint, comprising 17 sites within the high archaeologically sensitive landforms; 21 within the moderate and 7 within the low category. However, it is possible to salvage those surface sites by collecting and recording the artefacts.

Finally, the consideration of harm is also linked to the potential for each landform to contain significant archaeological material. The scientific or archaeological significance assessment outlined in Section 8.1 provides a guide as to the likely impacts from which commensurate mitigation measures can be developed.

For those three landform areas with potentially high significance, Beach, Strandline and Elevated Sand Body, the development footprint has been amended to preserve most of those landforms. Where development may overlap with some of those areas, then any surface sites present should have artefacts collected to preserve them. Some of those areas may also warrant targeted salvage excavation, if undisturbed areas are impacted by significant ground disturbance such as cabling or erection of facilities and infrastructure.

Those landforms identified within the moderate scientific significance category should also have any surface artefacts collected prior to construction. As some of the landforms in this category are largely impacted by the proposal but contain evidence of consistently moderate to high artefact numbers, this category of land is also identified as warranting open area salvage excavation. Such excavation would be targeted at areas of known artefact density where they coincide with high levels of development impact such as cabling and infrastructure. Salvage excavation should be aimed at extracting relevant information to answer specific research questions about the nature of the Aboriginal use of the landscape.

Those landform categories that were identified as having low scientific significance are not considered suitable for detailed salvage programme. It may be that surface stone artefacts from the few sites known within this category are collected but no further archaeological salvage is considered necessary.

Figure 9-6 shows the delineation of landform categories with mitigation actions considered appropriate for the relevant level of significance and archaeological research potential.

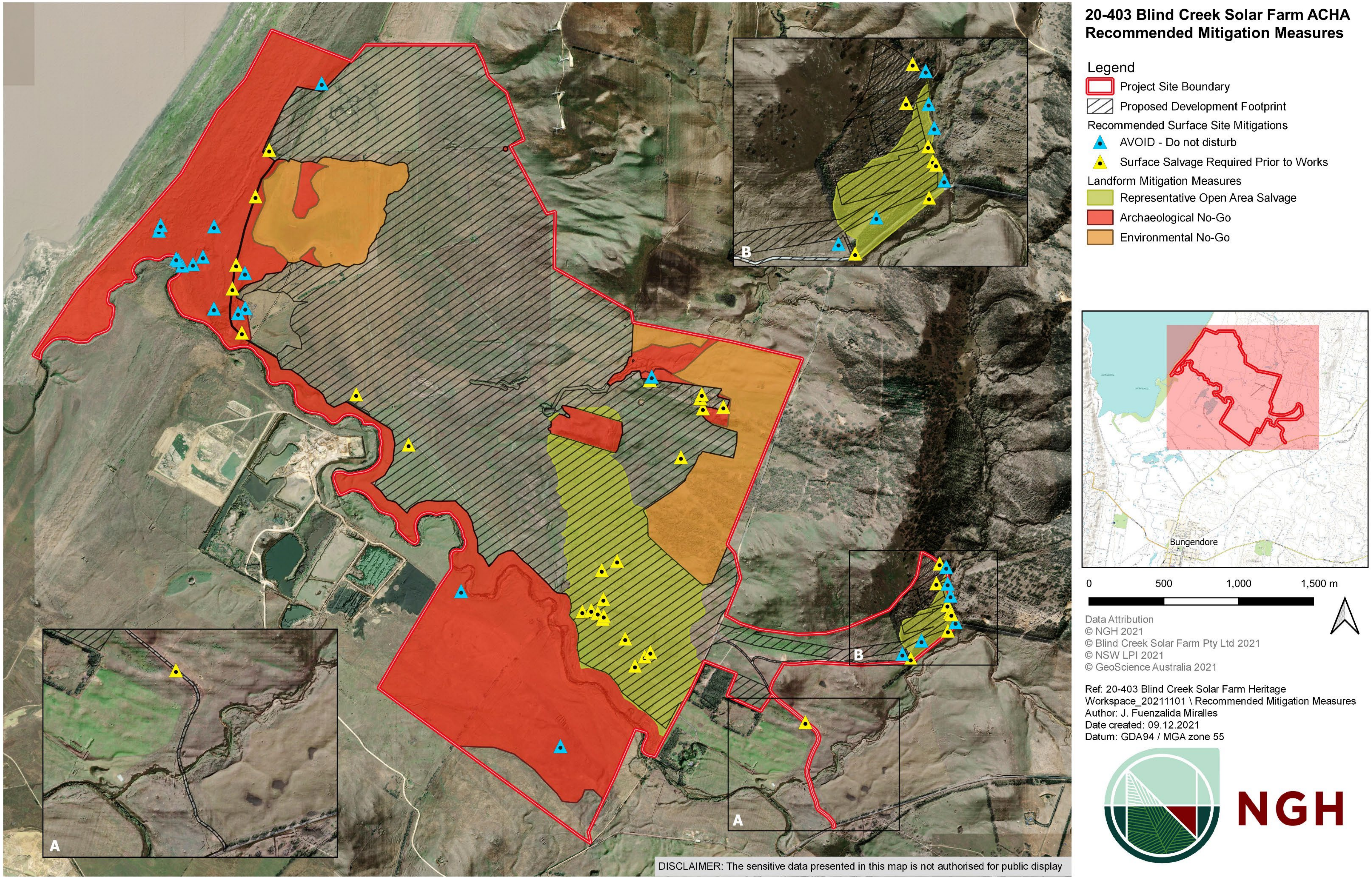

Figure 9-6 Proposed mitigation measures.

9.3.1 Open area excavation

Despite being unable to avoid direct impacts to Aboriginal archaeological sites entirely, the extent of the development impacts can be partially offset through an appropriate management and mitigation strategy. Part of the strategy is to collect the stone artefacts that were recorded on the ground surface during the survey in order to remove them from harm. These artefacts would be stored or placed in a suitable location to be accessible to future generations and researchers. For the subsurface archaeological sites, which include artefacts and hearths, surface collection is not appropriate, and these sites cannot be salvaged in the same way.

However, there is an opportunity to salvage some of the important scientific data contained within the subsurface sites through conducting targeted salvage excavations. Conducting salvage excavations provides the opportunity to further archaeological, scientific, and cultural knowledge about the sites and how they were utilised by Aboriginal people.

Previous archaeological studies relevant to the BCSF have consisted mostly of limited test-pitting, with only two of the studies at Currandooley and Bridge Creek 1 including small open area excavations (Packard 1988; Lance 2009a). Mosig Way provides a comparative analysis of test pitting completed at Lake George by Packard (1992) and CHMA (2008) and Lance (2009a). She found that open area excavation of sites at Lake George that had previously been test pitted resulted in a very different characterisation of sites, with open area excavations significantly more successful at locating artefacts than test pitting alone.

Our principal research questions are:

1. How and when did past peoples utilise the landscape, and is there any evidence of change?
2. What evidence is there of people either adapting to or mastering changes, and acting as agents and innovators?
3. Are there any discernible differences in the archaeology from potential different periods of the Holocene; and
4. What have been the impacts of land use on the archaeological record.

Based on the results of this assessment and in consideration of the results from the research by Mosig Way, Packard, and others, there are a number of analytical methods that could be used through a salvage programme that would enhance the archaeological knowledge of Aboriginal use of the Lake George area and contribute to this research question. Although not exhaustive or restrictive, some of the opportunities salvage excavation could provide in terms of research may include the investigation of:

- Spatial distribution of artefact raw materials – does the spatial distributing of raw materials indicate a temporal change influenced by availability and/or procurement strategies;
- Spatial variability in stone artefact technology – how does landform and other taphonomic processes impact sites and does this interspatial variation indicate temporal variation between sites;
- Depth of deposits and interpretation of age of artefactual/cultural material; What is the nature of the spatial and temporal relationship between hearth and stone artefact features?
- Examination of the relationship between the archaeological record and previous high stand lake levels.

To effectively target the most appropriate locations for salvage excavation, we have considered the assessed archaeological significance of landforms across the Project Site, the test excavation results, the level of proposed impact, and the opportunities that mitigation options might offer. The salvage assessment has included the following overlapping criteria:

- Areas of high development impact – where ground disturbance is such that archaeological material may not survive;
- Areas of identified archaeological sites or areas of moderate-high archaeological potential – to ensure that any salvage excavation effort will have a reasonable chance of yielding sufficient data;
- Areas coinciding with the relevant landforms to answer the research questions – to address the landscape based questions.

Wherever each of these criteria coincide within the Project Site it is considered an appropriate area in which any salvage excavation is likely to be effective in addressing the research questions and retrieving sufficient samples of cultural material for posterity.

Based on the results of the current assessment, and after appraisal of the development proposal, the following landforms are considered to meet the criteria to warrant salvage excavation.

1. **Creek Terrace -** location for the proposed substation and BESS

   During the test excavation, NGH excavated eight test pits and identified 51 artefacts (26 artefacts per m^2).

   The NGH test excavations indicated that this landform has more archaeological sensitivity than suggested by previous studies and it is the location of likely substantial impact through the construction of the substation and BESS. Although much of this landform is heavily disturbed through operation of a pine plantation, the testing results show that there remains a substantial archaeological deposit. The drawback may be that this area has poor stratigraphic integrity, but it may be possible to target less disturbed portions of this landform. In addition, the landform is adjacent to the highest lake level at the 700m ASL contour at approximately 6,000BP and therefore could assist to answer the research questions relating to high lake levels in the mid Holocene.

   In consideration of the landform, impacts, and sensitivity, NGH suggest that a salvage excavation area in the order of 10-30m^2 would be sufficient. This could be undertaken in one area but NGH consider that having at least two open area excavations would provide the best chance of recovering information to answer the research questions.

2. **Elevated Sand Body** – location for some solar arrays and underground cabling.

   During the test excavation, NGH excavated 15 test pits and identified 163 artefacts (44 artefacts per m^2).

   Most of these mapped landforms have been excised from the development footprint due to their assessed high archaeological sensitivity and significance. However, small portions are subject to impact, although most of these areas have been significantly altered by previous sand mining activity or are on the steeper basal slopes of the sand body. Where small areas of this landform are less disturbed and not subject to sand mining impacts, there is likely to be archaeological deposits remaining. Although the actual impact to this landform is more limited than others, with only piles and some smaller trenching present, the generally higher archaeological potential warrants salvage excavation. The landform is also prominent and elevated, being located within a plains landscape, which has periodically been a shoreline as lake levels rose and fell. It is therefore an excellent target for investigating this aspect of the research.

The area of this landform impacted by the development is small with much preserved from impact. This landform has also been subject to excavation from Mosig Way and therefore considerable data is already available. However, we consider that an excavation area in the range of 5-10m^2 would be suitable to retrieve sufficient additional information, noting that the impacts would be on sloped ground rather than on the crest, which may reduce the archaeological potential.

3. **Undulating Plain** – location for solar arrays, underground cabling, and tracks.

   NGH excavated 26 test pits and identified 84 artefacts (12.9 artefacts per m^2) and identified a possible hearth in this landform.

   The testing results showed this landform to have a variable artefact distribution with moderate to high densities of artefacts in some areas (particularly where sandy rises occur) and lower densities in others. However, as a landform, it did have higher artefact density than expected. The impacts to this landform are generally lower, with piles from arrays the main impact, although in the southern end of the landform it is expected that trenching for cabling would be required which would result in high impact.

   The landform is undulating and mapping of the lake levels at the 685m ASL at approximately 3,200BP would seem to suggest that there were elevated areas that would likely have formed either the shoreline or small elevated points or peninsulas above the water line. Additionally, the location of a possible hearth by NGH during the test excavation could provide an opportunity to investigate any relationship between stone artefacts and the hearth, as well as provides a dating opportunity. As such, this intermediate lake level would provide an interesting focus for research questions relating to different lake levels.

   Consideration of the variable impacts of the proposed development on this landform would suggest that targeted salvage excavation in the areas with the highest impact, where they coincide with elevated sandy areas, would yield excellent archaeological results. NGH suggest that in this landform, considering its size, open area excavation ranging from 20-50m^2 would be advisable. Salvage in this landform would best be served through excavating 2-3 separate areas to maximise the research value and also to maximise the recovery of a sample of Aboriginal cultural material.

NGH suggest that salvage excavation in the three landform areas identified would provide the maximum benefit in retrieval of archaeological information to address the possible research questions and also provide the best opportunity to recover a suitable range of Aboriginal cultural material that may be preserved for future generations and researchers. Excavation totals ranging from 35-90m^2 in the identified landforms would be expected to provide adequate archaeological data. However, we also suggest a contingency of another 20m^2 should also be allowed for, in case there are unexpected finds during the salvage excavations or construction phase that would warrant additional excavation to retain the archaeological information.

Salvage excavations would be undertaken by qualified archaeologists with the assistance of the Aboriginal community. The excavations would need to be placed in areas with a high confidence of locating relatively undisturbed cultural deposits based on the result of the testing programme. The use of dating including C14 for organic material such as charcoal should be utilised where hearth features are identified. In areas lacking hearths, OSL dating should also be undertaken to establish a stratigraphic timeline to assist with identifying the cultural chronology. Stone artefact analyses in particular will also be essential in understanding the Aboriginal use of the area, through comparisons with different landforms, temporal context and flaking technology. Stone tool analyses might include an artefact specialist to identify and record bipolar flaking, retouch and use wear, heat treatment of lithic material, and undertake some re-fitting of artefacts.

9.4 Impact assessment

The following Table 9-2 provides an assessment of the scientific significance of sites within the Project Site as well as an assessment of impacts to the sites and an estimate of the level of harm posed by the impact.

Table 9-3 provides an assessment of the impact to the landforms recorded within the Project Site and an appraisal of the level of harm and relevant mitigation measures for each landform.

Table 9-2. Site impact assessment and significance.

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
1.	57-2-0059	Lakelands;	Undulating Plain	Active	Moderate	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection.
2.	57-2-0020	Currandooly 2; Lake George;	Flat	Active	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
3.	57-2-0702	CWF2-IF-02	Beach	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
4.	57-2-0703	CWF2-IF-03	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
5.	57-2-0704	CWF2-IF-04	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
6.	57-2-0707	CWF2-IF-07	Strandline	Active	Low	Track maintenance	Direct	Total surface	Total Loss of Value	Surface collection
7.	57-2-0708	CWF2-IF-08	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
8.	57-2-0790	West Creek Dairy PAD 1	Floodplain	Archaeological disturbance	Nil	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	No further work required.
9.	57-2-0917	Willow Sands	Elevated Sand Body	Active. Eroding	High	No Impact Proposed	-	-	-	Excise area from proposed works
10.	57-2-0642	Grantham Park 3	Elevated Creek Flat	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
11.	57-2-0732	CWF2-S-01	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
12.	57-2-0733	CWF2-S-02	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
13.	57-2-0734	CWF2-S-03	Elevated Creek Flat	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
14.	57-2-0735	CWF2-S-04	Beach	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
15.	57-2-0736	CWF2-S-05	Strandline	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
16.	57-3-0213	Bridge Creek/Currandooly	Saddle	Active	Low	No Impact Proposed	-	-	-	Excise area from proposed works
17.	57-3-0458	Bridge Ck SU2/L1	Creek Terrace	Active	Low	Overhead transmission line works	Direct	Total surface. Partial subsurface	Total loss of surface value. Partial loss of subsurface value	Surface collection
18.	57-2-1155	BCSF: Isolated Find 1	Strandline	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
19.	57-2-1156	BCSF: Isolated Find 2	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
20.	57-2-1157	BCSF: Isolated Find 3	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface.	Assumed Total Loss of	Surface collection

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
								Minimal subsurface	Value	
21.	57-3-0480	BCSF: Isolated Find 4	Hillslope	Disturbed	Low	Substation construction	Direct-	Total surface, partial subsurface	Partial Loss of Value	Avoid/Salvage
22.	57-2-1158	BCSF: Isolated Find 5	Strandline	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
23.	57-2-1159	BCSF: Isolated Find 6	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
24.	57-2-1160	BCSF: Isolated Find 7	Undulating Plain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
25.	57-2-1161	BCSF: Isolated Find 8	Low Spurs	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
26.	57-2-1162	BCSF: Isolated Find 9	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
27.	57-2-1175	BCSF: Isolated Find 10	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
28.	57-3-0489	BCSF: Isolated Find 11	Hillslope	Disturbed	Low	Future development zone (associated with substation/solar farm infrastructure)	Total	Total surface. Partial subsurface	Partial Loss of Value	Surface collection
29.	57-2-1176	BCSF: Artefact Scatter 1	Floodplain	Disturbed	Low	Panel construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
30.	57-2-1177	BCSF: Artefact Scatter 2	Strandline	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
31.	57-2-1178	BCSF: Artefact Scatter 3	Elevated Creek Flat	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
32.	57-2-1179	BCSF: Artefact Scatter 4	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
33.	57-2-1180	BCSF: Artefact Scatter 5	Elevated Sand Body	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
34.	57-2-1181	BCSF: Artefact Scatter 6	Strandline	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
35.	57-2-1163	BCSF: Artefact Scatter 7	Strandline	Disturbed	Low	Track maintenance	Direct	Total surface	Total Loss of Value	Surface collection
36.	57-2-1164	BCSF: Artefact Scatter 8	Strandline	Disturbed	Low	Track maintenance	Direct	Total surface	Total Loss of Value	Surface collection

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
37.	57-2-1165	BCSF: Artefact Scatter 9	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
38.	57-2-1166	BCSF: Artefact Scatter 10	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
39.	57-2-1167	BCSF: Artefact Scatter 11	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
40.	57-2-1168	BCSF: Artefact Scatter 12	Undulating Plain	Disturbed	Moderate	Track maintenance	Direct	Total surface	Total loss of value	Surface collection
41.	57-2-1169	BCSF: Artefact Scatter 13	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
42.	57-2-1170	BCSF: Artefact Scatter 14	Undulating Plain	Disturbed	Moderate	Track maintenance	Direct	Total surface	Total loss of value	Surface collection
43.	57-2-1171	BCSF: Artefact Scatter 15	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial surface. Minimal subsurface	Assumed Total Loss of Value	Surface collection
44.	57-2-1172	BCSF: Artefact Scatter 16	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
45.	57-2-1174	BCSF: Artefact Scatter 17	Elevated Sand Body	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
46.	57-3-0481	BCSF: Artefact Scatter 18	Saddle	Disturbed	Low	Track maintenance	Direct	Total surface	Total loss of value	Surface collection
47.	57-3-0482	BCSF: Artefact Scatter 19	Creek Terrace	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
48.	57-3-0483	BCSF: Artefact Scatter 20	Creek Terrace	Disturbed	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
49.	57-3-0484	BCSF: Artefact Scatter 21	Creek Terrace	Disturbed	Moderate	Overhead transmission line works	Direct	Total surface. Partial subsurface	Total loss of surface value. Partial loss of subsurface value	Surface collection
50.	57-3-0485	BCSF: Artefact Scatter 22	Creek Terrace	Disturbed	Moderate	Overhead transmission line works	Direct	Total surface. Partial subsurface	Total loss of surface value. Partial loss of subsurface value	Surface collection
51.	57-3-0490	BCSF: Artefact Scatter 23	Creek Terrace	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
52.	57-3-0486	BCSF: Artefact Scatter 24	Creek Terrace	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
53.	57-3-0487	BCSF: Artefact	Hillslope	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
		Scatter 25								
54.	57-3-0488	BCSF: Artefact Scatter 26	Creek Terrace	Disturbed	Low	Continued use of quarry haul road	Direct	Total surface	Total loss of value	Surface collection
55.	57-2-1173	BCSF: Artefact Scatter 27	Gentle Slopes	Disturbed	Moderate	Continued use of quarry haul road	Direct	Partial surface	Partial loss of value	Surface collection
56.	57-2-1185	BCSF: Cluster 1	Low Spurs	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
57.	57-2-1190	BCSF: Cluster 2	Low Spurs	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
58.	57-2-1196	BCSF: Cluster 3	Undulating Plain	Disturbed	High	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform
59.	57-2-1197	BCSF: Cluster 4 (BCSF Hearth)	Undulating Plain	Disturbed	High	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform
60.	57-2-1191	BCSF: Cluster 6	Elevated Sand Body	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
61.	57-2-1199	BCSF: Cluster 7	Elevated Sandy	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
62.	57-2-1153	BCSF: Cluster 8	Elevated Sand Body	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
63.	57-2-1200	BCSF: Cluster 9/BCSF:Transect 3	Hillslope	Disturbed	Low	No Impact Proposed	-	-	-	Excise area from proposed works
64.	57-2-1188	BCSF: Cluster 10	Flat	Disturbed	High	No Impact Proposed	-	-	-	Excise area from proposed works
65.	57-2-1186	BCSF: Cluster 11	Flat	Disturbed	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
66.	57-2-1187	BCSF: Cluster 12	Flat	Disturbed	Moderate	No Impact Proposed	-	-	-	Excise area from proposed works
67.	57-3-0491	BCSF: Cluster 15	Creek Terrace	Disturbed	High	Substation Works	Direct	Total subsurface	Total loss of value	Open area subsurface excavation within representative area of creek terrace landform.
68.	57-2-1189	BCSF: Cluster 16	Undulating Plain	Disturbed	Moderate	Panel Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.
69.	57-2-1184	BCSF: Transect 1	Undulating Plain	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.
70.	57-2-1201	BCSF: Transect 2	Elevated Creek Flat	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
71.	57-2-1194	BCSF: Transect 4	Basal Slopes	Disturbed	Low	Panel Construction	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required
72.	57-2-1198	BCSF: Transect 5	Basal Slopes	Disturbed	Medium	No Impact Proposed	-	-	-	Excise area from proposed works

No.	AHMIS #	Site name	Landform	Site integrity	Scientific significance	Impact Activity	Type of harm	Degree of harm	Consequence of harm	Recommendation
73.	57-3-0492	BCSF: Transect 6	Creek Terrace/Hillslopes	Disturbed	Medium	Substation Works	Direct	Total subsurface	Total loss of value	Open area subsurface excavation within representative area of creek terrace landform. No further works required on the hillslope landform.
74.	57-2-1193	BCSF: Transect 7	Strandline	Disturbed	Low	Track maintenance	Partial	Partial subsurface	Partial loss of value	No further subsurface archaeological works are required within historical sand mining area of strandline
75.	57-2-1195	BCSF: Isolated Pit 3 (A to C)	Undulating Plain	Disturbed	Low	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.
76.	57-2-1192	BCSF: Isolated Pit 4	Undulating Plain	Disturbed	Low	Panel and Track Construction	Partial	Partial subsurface	Partial loss of value	Open area subsurface excavation within representative area of undulating plain landform.

Table 9-3. Landform impacts and mitigation measures.

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
Strandline	High	10 test pits 2.5m^2	1 artefact	Installation of solar modules within the previously disturbed, historical quarry areas only.	The proponent removed all undisturbed areas within this landform from the proposed development footprint to mitigate the potential impact of the project upon the archaeology of the Project Site. Recommendation: Works to proceed within historical quarry areas as mapped in Figure 9-6.
Beach	High	Nil	Nil	None	The proponent removed this landform from the proposed development footprint to mitigate the potential impact of the project upon the archaeology of the Project Site. Recommendation: Avoided by development footprint.

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
Elevated Sand Body	High	15 test pits 3.75m^2	163 artefacts	Installation of solar modules have been limited to a small area that mostly includes a previously disturbed, historical sand mining area and the basal slopes of the sand body which are considered to have less sensitivity.	The proponent removed almost all undisturbed areas within this landform from the proposed development footprint to mitigate the potential impact of the project upon the archaeology of the Project Site. Recommendation: Surface collection. Installation of solar array only. Sample open area salvage excavation where warranted.
Elevated Creek Flat	High	11 test pits 2.75m^2	6 artefacts	Installation of solar modules Track works	The proponent has removed any works within the riparian corridor of Butmaroo Creek. Other areas of this landform associated with Wright Creek will only be impacted by a small area of solar array piles and a track.

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
					Recommendation: Works to proceed.
Waterway (Creekline)	High	Nil	Nil	Installation of two causeways	Works will be within the creek line only. Recommendation: Works to proceed.
Creek Terrace	High	8 test pits $2m^2$	51 artefacts	Substation infrastructure (transformers, control room, and car parking). BESS Track works Overground cabling	The NGH test excavations indicated that this landform has more archaeological sensitivity than suggested by previous studies. Mitigation strategies should address the extent and nature of proposed works within this sensitive landform. Recommendation: Avoid selected sites, surface collection of others. Open area, subsurface excavation of sample

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
					within impact area of least disturbed deposits.
Flat	Moderate	20 test pits $5m^2$	69 artefacts	None	Due to environmental and archaeological issues, the proponent has removed this entire landform to mitigate the potential impact of the project upon the archaeology of the Project Site.
Low Spurs	Low-Moderate	10 test pits $2.5m^2$	3 artefacts	Solar modules Track works Underground cabling	Excavations revealed lower and sparser density of artefacts than expected. Recommendation: Salvage collection of any surface artefacts.
Saddle	Moderate	Nil	Nil	Underground cabling	Moderate potential outside disturbances but limited impact. Recommendation:

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
					Works to proceed with no further assessment or salvage required.
Undulating Plain	Moderate to High	26 test pits 6.5m^2	84 artefacts	Solar modules Track works Underground cabling	The NGH test excavations indicated that this landform has more archaeological sensitivity than suggested by previous studies. Mitigation strategies should address the extent and nature of proposed works within this sensitive landform. Recommendation: Surface artefact collection. Open area, subsurface excavation of sample where significant ground disturbance may occur.
Floodplain	Low	5 test pits		Solar modules Track works	Low archaeological potential with mostly solar arrays and

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
		$1.25m^2$		Underground cabling	therefore low development impact. Recommendation: Salvage of recorded surface artefacts.
Hillslope	Low	12 test pits $3m^2$	15 artefacts	Underground cabling Substation Transformers Carpark Future expansion area	High impact but in largely high disturbance area due to pine plantation and sand mine. Recommendation: Avoid certain sites, surface collection of others if impacted.
Drainage / Erosion Depression	Low	Nil	Nil	None	The proponent has excised this area from the proposed works.
Basal Slopes	Low	10 test pits $2.5m^2$	17 artefacts	Solar Arrays Track works Underground cabling	Limited archaeological potential, generally low development impact. Recommendation: Works to proceed.

Landform	Archaeological Potential	- # of pits excavated - sqm	- Total # of artefacts	Works proposed in this landform	Recommendations and Mitigation Strategy
Wetland Depression / Lagoon	Low	Nil	Nil	None	The proponent has excised this area from the proposed works.
Wrights Creek Depression	Low	Nil	Nil	Solar Arrays Underground cabling	Very low archaeological potential with minor development impacts. Recommendation: Works to proceed.

10. Legislative context

Aboriginal heritage is primarily protected under the NSW *National Parks and Wildlife Act 1974* (NPW Act) and the National Parks and Wildlife Regulation 2019. The NPW Act is administered by Heritage NSW, part of the NSW Department of Planning, Industry and Environment (DPIE). However, the protection and management of Aboriginal objects is the responsibility of Heritage NSW, part of the NSW Department of Premier and Cabinet (DPC).

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.

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

The *Environmental Planning and Assessment Act 1979* (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.

This project will be assessed under an Environmental Impact Assessment through the State Significant Development (SSD) process and the Secretary's Environmental Assessment Requirements (SEARs) for SSD-13166280. The ACHA will support an Environmental Impact Statement (EIS). This approval pathway does not require an AHIP (Section 90 of the NPW Act) to impact upon Aboriginal heritage but the same procedures and guidelines are followed, in particular the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

11. Conclusion

The impact of the proposal varies across the Project Site based on the type of activities to be undertaken. Whilst the proposed solar arrays will result in limited, discrete ground disturbance as a result of the installation of piles to support the solar arrays, other activities such as the construction of the substation and trenching for the installation of cables, will result in greater displacement of soils and therefore greater potential disturbance of sites. Survey and test excavations can only generally provide a sample of an area and therefore we can only extrapolate the results to describe the archaeological signature and character of the subject area. Although there were some limitations to the survey and test excavations, NGH did identify numerous isolated artefacts, artefact scatters and subsurface artefact deposits. In doing so, we were able to confirm and amend the archaeological sensitivity of the various landforms throughout the Project Site to various extents. Within these areas of sensitivity, the most significant are elevated, level areas, characterised by sandy deposits and located above waterways or low lying areas. Within these areas, Aboriginal stone artefacts are clearly present in a variety of densities and lithologies.

This BCSF assessment did not include artefact refitting, which Dr Amy Mosig-Way successfully completed in her research. Dr Mosig-Way used *event-based* analysis to sequence identified stone knapping and artefact discard events. NGH did, however, model the test excavation technique for this project on the research of Dr Mosig-Way, using clusters of test pits in the attempt to capture discrete sites. Significantly, in spite of the large Project Site area, NGH managed to record a hearth and numerous discrete concentrations of stone artefacts. When compared to the results of Mosig-Way (2018), the results of NGH's archaeological investigations support the hypothesis that *in situ* archaeological deposits tend to be discrete. There appears to be an absence of large, stable artefactual deposits indicating repeated use of a location by numerous individuals over long periods of time. Instead, the result of the NGH investigations would support the characterisation of the area as a place utilised for short term events variously over time determined by the height of the lake. The archaeological evidence that remains as a result of this use includes small areas of distinct sites, typically located on elevated, sandy landforms. Therefore, low-lying areas would typically have been either under water or boggy through most of the past 10,000 years. Any accumulation of artefacts located in low lying areas are most likely to be the result of sporadic and opportunistic occupation during dry periods.

As outlined in Section 9.2, the Proponent has already, throughout the project design phases, taken into account archaeologically sensitive landforms with regards to the proposed development footprint and have accordingly removed all of the undisturbed strandline landform from the proposed development footprint. Additionally, certain expressions of the elevated sand body landform were also removed and designated as 'no-go zones' from the development after the results of the first field visit. NGH further suggest that the proposed impacts across the Project Site could be partially mitigated by the research opportunities presented by open area excavations. Since the project cannot avoid all areas of moderate to high archaeological sensitivity, open area excavations would allow for detailed analysis to be completed in order to better understand site patterning across landforms and therefore how Aboriginal people utilised the area over time.

12. Recommendations

The recommendations are based on the following information and considerations:

- Results of the current archaeological assessment of the area;
- Consideration of results from other local archaeological studies;
- Results of consultation with the registered Aboriginal parties;
- Appraisal of the proposed works,
- Legislative context for the development proposal; and
- Current NSW Aboriginal Heritage guidelines.

It is recommended that:

1. The proposed solar farm development be granted approval with conditions for management of Aboriginal heritage including the recommendations outlined below.
2. The proponent must prepare a Cultural Heritage Management Plan (CHMP) to outline management steps and requirements for ongoing management of cultural heritage values within the construction, operation and decommissioning stages of the project. The CHMP may include some of the following elements, with agreement of relevant stakeholders.
    a. Management of known sites;
    b. Management of high sensitivity areas excluded from the project footprint;
    c. Management of unexpected finds; and
    d. Ongoing consultation and engagement with the local Aboriginal community.
3. All cultural material recovered from the subsurface testing programme which is currently in temporary care at the NGH Canberra office be reburied in accordance with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* in an appropriate location within the Project Site as agreed with the registered Aboriginal parties. The reburial location must be submitted to the AHIMS database and will not be impacted in the future.
4. Any recorded surface artefacts that cannot be avoided by the development footprint must be salvaged by community collection prior to the commencement of ground disturbing works. The collection and relocation of the artefacts should be undertaken by an archaeologist with representatives of the registered Aboriginal parties in accordance with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. The map shown in Figure 9-6 must be used as a guide for undertaking community collections. The artefacts should be collected and moved to a safe area within the property that will not be subject to any ground disturbance.
5. All objects salvaged must 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.
6. A Cultural Smoking Ceremony should be considered if requested by the Aboriginal community to take place to cleanse any artefacts salvaged during the reburial.
7. Representative subsurface salvage excavations, as outlined in Section 9.3.1, should be undertaken within the following landforms where significant ground disturbance works such as cabling or infrastructure is proposed.
    - Elevated Sand Body

- Undulating Plains
- Creek Terrace

The excavations would be undertaken within relatively undisturbed deposits (or deposits assumed to be undisturbed) and be aimed at retrieving important scientific information about the nature and age of the sites. The detailed research aims should be guided by those identified in this assessment and other researchers. This includes detailed analysis of the stone artefact technology and landuse.

8. A selection of salvaged artefacts could be stored securely on-site (within the Cultural Learning Zone, for eg.) for easy access by the local Aboriginal community for education and cultural purposes such as Open Days, (contingent upon the consensus of comments received from RAPs on this ACHA report).
9. The cultural site identified during the assessment must remain outside any development approval area and thus be avoided by all activity related to the construction and operation of the solar farm.
10. The Proponent continue to consult with the Aboriginal community should the proposal receive approval regarding any conditions of consent concerning Aboriginal cultural heritage.
11. In the event that human remains are discovered during the works, all work must cease in the immediate vicinity. Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal. Should the remains be identified as Aboriginal in origin Heritage NSW will identify the appropriate course of action.
12. Any changes to the proposed Project Site footprint that has not been assessed by this report should be subject to further assessment.

Part of the BCSF development proposal is the provision of an *Indigenous Cultural Heritage Learning Zone*, an area set aside by the Proponent to provide the Aboriginal community access to the shore of the lake to engage in cultural practices on Country and as a place to teach and learn Aboriginal cultural connection and heritage. This area might be a place where the registered Aboriginal parties might agree to re-bury salvaged artefacts. Additionally, the Landowners would offer the opportunity in consultation with the Aboriginal community for a selection of artefacts to be kept securely (details to be confirmed) in the Cultural Learning Zone to be used for community presentations such as an annual Open Days.

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Appendix A Consultation Log

Appendix A

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
4/03/2021	Letter sent requesting information about Aboriginal stakeholders	Heritage NSW		heritagemailbox@environment.nsw.gov.au	Email	Letter sent to relevant agencies requesting for the information of Aboriginal Stakeholders	Deadline for receipt of information by 18 March 2021	JFM
4/03/2021	Letter sent requesting information about Aboriginal stakeholders	Ngambri LALC		reception@ngambri.com.au	Email	Letter sent to relevant agencies requesting for the information of Aboriginal Stakeholders	Deadline for receipt of information by 18 March 2021	JFM
4/03/2021	Letter sent requesting information about Aboriginal stakeholders	NTS Corp		information@ntscorp.com.au	Email	Letter sent to relevant agencies requesting for the information of Aboriginal Stakeholders	Deadline for receipt of information by 18 March 2021	JFM
4/03/2021	Letter sent requesting information about Aboriginal stakeholders	Office of the Registrar		adminofficer@orala.nsw.gov.au	Email	Letter sent to relevant agencies requesting for the information of Aboriginal Stakeholders	Deadline for receipt of information by 18 March 2021	JFM
4/03/2021	Letter sent requesting information about Aboriginal stakeholders	Queanbeyan-Palerang Council		council@qprc.nsw.gov.au	Email	Letter sent to relevant agencies requesting for the information of Aboriginal Stakeholders	Deadline for receipt of information by 18 March 2021	JFM
8/03/2021	Received response from NTSCorp forwarding the information of Ngambri LALC to NGH	NTS Corp		information@ntscorp.com.au	Email	Received response from NTSCorp forwarding the information of Ngambri LALC to NGH	No action required	JFM
10/03/2021	Received the DPC Heritage NSW RAP list from Heritage NSW	Heritage NSW		heritagemailbox@environment.nsw.gov.au	Email	Received the DPC Heritage NSW RAP list from Heritage NSW with the information for potential RAP groups in the area	Use information to update TAB 2 (Agency Identified List)	JFM
18/03/2021	Letter sent requesting information about Aboriginal stakeholders	South East Local Land Services		enquiry.southeast@lls.nsw.gov.au	Email	Letter sent to relevant agencies requesting for the information of Aboriginal Stakeholders	Deadline for receipt of information by 1 April 2021	JFM
18/03/2021	Second email sent to QPC requesting information about Aboriginal Stakeholders	Queanbeyan-Palerang Council		council@qprc.nsw.gov.au	Email	Letter sent as QPC have not responded to the initial email sent 14 days ago	-	JFM
18/03/2021	Received email from QPC with recommended Aboriginal parties to contact	Queanbeyan-Palerang Council		-	Email	QPC provided details of 2 potential Aboriginal stakeholders. Details updated in Tab 2	Use information to update TAB 2 (Agency Identified List)	JFM

Newspaper Advertisement

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
24/02/2021	Advert placed in the Canberra times for circulation on the 25 February 2021	NGH		Contact within Canberra Times: classifieds@canberratimes.com.au	Email	Placed advert found in the advertisement folder of the main log	Any parties must register prior to 11 March 2021	JFM

Stage 1 (Registrations of Interest)

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
8/03/2021	Received registration of interest from Ngambri LALC	Ngambri LALC		reception@ngambri.com.au	Email	Registered as a RAP group for the project. Additional email sent back asking for the information of any other potential stakeholders. Information added to Tab 3 (Registrations).	No action required	JFM
15/03/2021	Received registration of interest from Buru Ngunawal Aboriginal Corporation	Buru Ngunawal Aboriginal Corporation		wallbell@bigpond.net.au	Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
19/03/2021	ROI Email requesting registrations of interest sent out to all parties identified by agencies (Tab 2)	NGH			Email	Emails sent as a BCC to 49 recipients. Contact details are in Tab 2	Registration period closes 2 April 2022	JFM
19/03/2021	Separate email sent to Ngambri LALC and BNAC with ROI letter	NGH			Email	ROI letter sent to Ngambri LALC and BNAC for further context of the project. Both parties were notified that they have already been registered	No action required	JFM
19/03/2021	Received email from Didge Ngunawal Clan wishing to register as a party to the project	Didge Ngunawal Clan		didgengunawalclan@yahoo.com.au	Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
22/03/2021	Received email from Ngunawal Heritage Aboriginal Corporation wishing to register as a party to the project	Ngunawal Heritage Aboriginal Corporation			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
22/03/2021	Received email from PD Ngunawal Consultancy wishing to register as a party to the project	PD Ngunawal Heritage Aboriginal Corporation			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
23/03/2021	Received email from Kalari Ngunnawal Pajong Wallabalooa Descendants wishing to register as a party to the project	Kalari Ngunnawal Pajong Wallabalooa Descendants			Phone/email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
23/03/2021	Received email from Karlari Ngunnawal Descendants wishing to register as a party to the project	Karlari Ngunnawal Descendants			Phone/email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]
24/03/2021	Received email from Thunderstone Aboriginal Cultural Services Pty Ltd wishing to register as a party to the project	Thunderstone Aboriginal Cultural Services			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
25/03/2021	Received email from Freeman and Marx Pty Ltd wishing to register as a party to the project	Freeman and Marx Pty Ltd			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
30/03/2021	Received email from Muragadi Heritage Indigenous Corporation wishing to register as a party to the project	Muragadi Heritage Indigenous Corporation			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
30/03/2021	Received email from Murri Bidgee Mullangari Aboriginal Corporation wishing to register as a party to the project	Murri Bidgee Mullangari Aboriginal Corporation			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
30/03/2021	Received email from Merrigarn Indigenous Corporation wishing to register as a party to the project	Merrigarn Indigenous Corporation			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
6/04/2021	Received email from Yurwang Gundana Consultancy Cultural Heritage Services wishing to register as a party to the project	Yurwang Gundana Consultancy Cultural Heritage Services			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
6/04/2021	Received email from Oak Hill Enterprises wishing to register as a party to the project	Oak Hill Enterprises			Email	Registered as a RAP group for the project. Information added to Tab 3 (Registrations).	Sent email back thanking them for registration	JFM
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]		
22/04/2021	List of RAPs sent to Heritage NSW and Ngambri LALC	NGH			Email	Sent list of RAPs to HNSW and NLALC as per the consultation requirements. Those who did not wish to have their details released to the LALC were identified as 'unidentified individuals'	No action required	JFM
29/04/2021	NGH received email from Ngambri LALC with concerns about some registered parties for the project	Ngambri LALC			Email	Raised concerns over nine RAP groups who registered an interest in the project	Email sent back thanking them for their information and informing them about our obligations under AHCRP but that we wish to ensure that traditional owners and local knowledge holders are given the oppurutnity to come out to the site. Email saved: \\10.0.11.1\Active\Projects\2020\20-403 Blind Creek Solar Farm EIS\Aboriginal Community Consultation\Aboriginal Community Consultation\4. Stage 2_3 Methodology\Incoming	JFM

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
4/06/2021	Received email from Ngambri LALC to say that they have made contact with two of the groups from their earlier email and no longer have concerns for those two groups.	Ngambri LALC			Email	Made contact with two of the above groups and are no longer concerned with their interest in the project	Sent email back thanking them for their update and informing them that NGH hope to send the methodology soon (11/06/2021)	JFM

Stage 2_3 (Methodology)

Date	Proposed methdology for archaeological works and gathering of cultural information provided to all RAPs all registered parties	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
11/06/2021	Methodology sent out to all RAPs in the Registered Tab (Tab 3) as a Bcc. Requested for responses to be received by COB 9 July 2021	NGH			Email (Bcc)	Sent methodology to all RAPs via BCC email.	Responses requested by COB 9 July 2021	JFM
11/06/2021	Methodology sent out to four parties via registered/express post. Requested for responses to be received by COB 9 July 2021	NGH			Mail (see codes in Tab 3)	Sent methodology to all RAPs via registered/express post	Responses requested by COB 9 July 2021	JFM
15/06/2021	Correction email sent to all parties due to the wrong date being entered for the end of the commenting period (showed 2 July 2021 but was supposed to be 9th July 2021)	NGH			Email/Mail (see mail codes in Tab 3)	Sent a correction email/mail to all RAPs due to an incorrect date being given	No further action required	JFM
15/06/2021	Received response from Muragadi Heritage Indigenous Corporation, agrees with the recommendations made by the existing methodology.	Muragadi Heritage Indigenous Corporation			Email	Responded to the methodology with no additional comments. Agrees with all recommendations made in the existing methodology.	Email sent back thanking them for their response	JFM
15/06/2021	Received response from DNC, agrees with the existing methodology	Didge Ngunawal Clan			Email	Responded to the methodology with no additional comments. Agrees with the existing methodology.	Email sent back thanking them for their response	JFM
22/06/2021	Received response from Clive Freeman. Agrees with the existing methodology and noted that the approach of the methodology was great and appropriate to the sensitivity of the area.	Freeman & Marx Pty Ltd			Email	Responded to the methodology with no additional comments. Agrees with the existing methodology.	Email sent back thanking them for their response (24/06/2021)	JFM

Date	Proposed methdology for archaeological works and gathering of cultural information provided to all RAPs all registered parties	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
2/07/2021	Received response from NHAC, agrees with the existing methodology. Reiterated that Ngungara (Lake George) is a highly spiritual and significant place to Ngunawal people as their creator Budjabulya (water spirit) lives within Ngungara.	Ngunawal Heritage Aboriginal Corporation			Email	Responded to the methodology with no additional comments. Agrees with the existing methodology.	Email sent back thanking them for their response (5/07/2021)	JFM
7/07/2021	Email sent to all RAPs who have not responded to the methodology that the review period ends this Friday 9th July 2021. Also requested the rates and relevant insurances from groups who wished to be considered for fieldwork by the proponent	NGH			Email	Email sent to all RAPs who have not responded to the methodology that the review period ends this Friday 9th July 2021. Also requested the rates and relevant insurances from groups who wished to be considered for fieldwork by the proponent	Await responses	JFM
7/07/2021	Received email from Murri Bidgee Mullangari Aboriginal Corporation agreeing with the existing methodology and recommendations for further assessment. Also provided rates and insurances and wished to be considered for fieldwork	Murri Bidgee Mullangari Aboriginal Corporation			Email	Received email from Murri Bidgee Mullangari Aboriginal Corporation agreeing with the existing methodology and recommendations for further assessment. Also provided rates and insurances and wished to be considered for fieldwork	Email sent back thanking them for their response and provision of rates/insurances (8/07/2021)	JFM
7/07/2021	Received email from Muragadi Heritage Indigenous Corporation with questions about the progress of the project	Muragadi Heritage Indigenous Corporation			Email	Received email from Muragadi Heritage Indigenous Corporation with questions about the progress of the project	Replied to email with update on status of the project	JFM
7/07/2021	Received email from Merrigarn Indigenous Corporation agreeing with the recommendations made in the methodology. Also provided a copy of their rates and insurances.	Merrigarn Indigenous Corporation			Email	Received email from Merrigarn Indigenous Corporation agreeing with the recommendations made in the methodology.	Replied to email thanking them for their response and informing that their rates and insurances have been passed onto the client (8/07/2021).	JFM
8/07/2021	Received response from NLALC with no comments to add to the methodology. Also provided copy of insurances and rates	Ngambri Local Aboriginal Land Council			Email	Received response from NLALC with no comments to add to the methodology. Also provided copy of insurances and rates	Replied to email thanking them for their response and informing that their rates and insurances	JFM

Date	Proposed methdology for archaeological works and gathering of cultural information provided to all RAPs all registered parties	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
							have been passed onto the client (8/07/2021).	
9/07/2021	Recieved rates from Yurwang Gundana Cultural Heritage Services (YGCHS)	Yurwang Gundana Cultural Heritage Services			Email	YGCHS provided rates and insurances	Replied to their email thanking them for their rates and informed them that they would require insurances to be considered for fieldwork. (9/07/2021)	JFM
9/07/2021	Received phone call from Yurwang Gundana Cultural Heritage Services (YGCHS) regarding rates and insurances for the project. Discussion continued via email	Yurwang Gundana Cultural Heritage Services			Email	Received phone call from Yurwang Gundana Cultural Heritage Services (YGCHS) regarding rates and insurances for the project. Discussion continued via email	Discussion continued via email	JFM
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]		
9/07/2021	Methodology review period lapsed at COB with no further comments received from RAPs	NGH			N/A	Methodology review period lapsed at COB with no further comments received from RAPs	N/A	JFM

Stage 2_3 (Fieldwork)

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
9/07/2021	At request of client, invitation was sent out to 5 RAP groups inviting them to attend the archaeological fieldwork for the 19 July to 30 July 2021. Also informed invited RAPs that the proponent is offering a $1000 (ex GST) daily rate for one representative to attend from each group.	NGH			Email	Invites sent out to: Ngambri LALC, Buru Ngunawal Aboriginal Corporation, Didge Ngunnawal Clan, Yurwang Gundana Cultural Heritage Services, and Freeman & Marx Pty Ltd.	Await responses from RAPs	JFM
9/07/2021	Follow up email to invitation sent to correct incorrect date in original email	NGH			Email	Follow up email to invitation sent to correct incorrect date in original email	Await responses from RAPs	JFM

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
9/07/2021	Received email from YGCHS confirming their availability and agreeing to the set rate offered by the client.	Yurwang Gundana Cultural Heritage Services			Email	Agreed with $1000 (ex. Gst) daily rate and informed NGH that insurances had been organised and that they would send through their documentation as it was received	Responded to their email with thanks and confirming information about rates and start time	JFM
9/07/2021	Received email from Freeman and Marx Pty Ltd informing NGH that they will have a representative available for the work	Freeman & Marx Pty Ltd			Email	Accepted daily rate offered by client	Provide further details about COVID safety, start time, etc ASAP	JFM
9/07/2021	Received email from Didge Ngunawal Clan confirming availability to participate in fieldwork	Didge Ngunawal Clan			Email	Provided thanks for the invitation from client and requested particulars be sent through asap	Provide further details about COVID safety, start time, etc ASAP	JFM
12/07/2021	Received email from Murri Bidgee Mullangari Aboriginal Corporation regarding whether the proponent has chosen site officers yet	Murri Bidgee Mullangari Aboriginal Corporation			Email	Received email from Murri Bidgee Mullangari Aboriginal Corporation regarding whether the proponent has chosen site officers yet	Response sent back with explanation that NGH are still trying to sort out logistics and that we are not sure about the situation (re COVID) yet. Provide further details ASAP (14/07/2021).	JFM
12/07/2021	Received email from YGCHS. Agreed with the existing methodology. Asked for the location of the site and a meeting point for fieldwork	Yurwang Gundana Cultural Heritage Services			Email	Received email from YGCHS. Agreed with the existing methodology. Asked for the location of the site and a meeting point for fieldwork	Provide further details about COVID safety, start time, etc ASAP. Await details of workers insurance.	JFM
13/07/2021	Received email from YGCHS with a copy of their workers insurances	Yurwang Gundana Cultural Heritage Services			Email	Received email from YGCHS with a copy of their workers insurances	No further action required	JFM
14/07/2021	After internal NGH discussion it was determined that due to COVID concerns from the client, RAPs, and field staff that only RAPs from outside of hotspot LGAs should be allowed on site for COVID safety reasons. As a result, all RAPs who reside in the Greater Sydney area needed to be contacted in order to determine if they would be travelling to site from hotspot LGAs or had family out of Sydney who could attend.	NGH			Internal discussion	After internal NGH discussion it was determined that due to COVID concerns from the client, RAPs, and field staff that only RAPs from outside of hotspot LGAs should be allowed on site for COVID safety reasons. As a result, all RAPs who reside in the Greater Sydney area needed to be contacted in order to determine if they would be travelling to site from hotspot LGAs or had family out of Sydney who could attend.	Contact DNC and YGCHS as both groups are registered in Sydney. All other RAP groups are registered outside of Sydney and were not considered to be a risk for transmitting COVID.	JFM

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
14/07/2021	Contacted YGCHS via phone to request if the workers who will attend fieldwork are travelling from the Greater Sydney area. YGCHS services confirmed that all site personnel have been outside of Sydney for at least the last two weeks. YGCHS informed NGH that they had been staying with family near Canberra for the last month	NGH			Phone	Contacted YGCHS via phone to request if the workers who will attend fieldwork are travelling from the Greater Sydney area. YGCHS services confirmed that all site personnel have been outside of Sydney for at least the last two weeks. YGCHS informed NGH that they had been staying with family near Canberra for the last month	No further action required. Send further details about fieldwork ASAP	JFM
14/07/2021	Contacted DNC via phone to request if the workers who will attend fieldwork are travelling from the Greater Sydney area. DNC confirmed that they did not have any personnel available from out of the Sydney area. NGH informed them that if they were not able to find site officers who were not Sydney based they would not be able to attend fieldwork.	NGH			Phone	-	Await response from DNC	JFM
14/07/2021	Contacted Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation (Thunderstone) to check if they were had availability to attend fieldwork due to potential site officer cancellations due to COVID restrictions. Thunderstone informed NGH that they could be available	NGH			Phone	Due to COVID concerns NGH contacted Thunderstone to see if they had availability in the event that another group was unable to attend due to COVID restrictions	Thanked them for their understanding at short notice. Send further details about fieldwork ASAP<	JFM
14/07/2021	DNC informed NGH that they had a site officer based in Queanbeyan available to work for the duration of the project.	DNC			Phone	-	Thanked DNC for their understanding and assistance. Send further details about fieldwork ASAP.	JFM
Note that only YGCHS and DNC were contacted due to their organisations being registered to addresses in Sydney					-	-	-	-
14/07/2021	Received email from Ngambri LALC confirming their availability for the fieldwork and acceptance of the proponents daily rate. Further attached insurances.	Ngambri LALC			Email	Received email from Ngambri LALC confirming their availability for the fieldwork and acceptance of the proponents daily rate. Further attached insurances.	Thanked NLALC for their response. Respond ASAP with further fieldwork details	JFM
16/07/2021	Received email from Ngambri LALC requesting further information for the meeting times and location	Ngambri LALC			Email	Received email from Ngambri LALC requesting further information for the meeting times and location	Respond ASAP	JFM

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
16/07/2021	NGH informed all 6 RAPs invited for fieldwork that fieldwork had to be postponed for a week due to a staff member falling ill (non-COVID related). NGH confirmed that some small survey would likely take place late next week but no details could be confirmed at this stage. The fieldwork commencement date was changed to the 26 July 2021.	NGH			Email	Staff illness forced the postponement of fieldwork and all RAPs were informed of the delay. Details to be sent through asap.	Await responses. Send further details ASAP	JFM
16/07/2021	Receive phone call from Buru Ngunawal Aboriginal Corporation with thanks for invitation for fieldwork and requesting further information.	Buru Ngunawal Aboriginal Corporation			Phone	Receive phone call from Buru Ngunawal Aboriginal Corporation with thanks for invitation for fieldwork and requesting further information.	Provide further details about start times, dates, etc ASAP	JFM
20/07/2021	NGH informed all 6 RAPs invited for fieldwork that fieldwork is to begin with some minor survey on 22nd July 2021 with main testing beginning on 26th July 2021. The aim of the small surveys was to confirm areas to be tested next week. NGH understands the short notice in the timing but asked if any groups could be made available.	NGH			Email	Informed RAPs of beginning of fieldwork and requested all availability for short survey on Thursday 22nd July before main testing program begins 26th July 2021	Await responses from RAPs	JFM
20/07/2021	Called Buru Ngunawal Aboriginal Corporation to inform them of a delay in the start dates for fieldwork due to NGH resourcing issues. Confirmed the further details will be sent through ASAP.	NGH			Phone	Called Buru Ngunawal Aboriginal Corporation to inform them of a delay in the start dates for fieldwork due to NGH resourcing issues. Confirmed the further details will be sent through ASAP.	Provide further details about start times, dates, etc ASAP	JFM
20/07/2021	YGCHS confirmed availability for all fieldwork. Requested start location.	YGCHS			Email	Confirmed availability for all fieldwork	Thanked them for the understanding despite the short notice. Provided a map with the meeting place for all fieldwork	JFM
20/07/2021	DNC confirmed availability of site officer for all fieldwork	DNC			Email	Confirmed availability for all fieldwork	Thanked them for the understanding despite the short notice. Provided a map with the meeting place for all fieldwork	JFM
21/07/2021	After all invited RAPs confirmed for fieldwork an update email was sent to remaining RAPs informing them that the	NGH			Email	Sent to all RAPs in Tab 3 minutes the six that were invited by the proponent for fieldwork.	Await any response with concerns/etc.	JFM

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
	proponent has not chosen their organisations for fieldwork. NGH also thanked all those who had provided feedback and cultural knowledge so far and informed that all organisations will continue to be consulted at all further stages of the ACHA							
21/07/2021	Received phone call from NLALC requesting further information about fieldwork start dates and meeting place	Ngambri LALC			Phone	Requested further fieldwork information. Informed them that NGH still hopes that fieldwork will begin 23 July 2021.	Follow up email sent with map of meeting place to the email.	JFM
21/07/2021	Received phone call from Freeman& Marx requesting information for the meeting place for fieldwork	Freeman & Marx Pty Ltd			Phone	Requested meeting place information. Informed that I would send them a map ASAP	NGH sent map of meeting place to Freeman & Marx (21/07/2021)	JFM
22/07/2021	Received email from Muragadi Heritage Indigenous Corporation wishing to understand why the had not been selected for fieldwork	Muragadi Heritage Indigenous Corporation			Email	Wished to know why the proponent had not invited them for fieldwork as Bungendore is their home country.	Responded 15 September 2021. Apologised for the extreme delay in the message (due to fieldwork). Relayed concerns to proponent and informed Muragadi that why we understood their concerns about not having been selected for fieldwork, that it was a commercial decision on the part of the proponent. Awai response.	JFM
21/07/2021	Received follow up email from NLALC with the contact number for the site officer that will be sent out for fieldwork.	Ngambri LALC			Email	Received follow up email from NLALC with the contact number for the site officer that will be sent out for fieldwork.	Sent email back thanking them for the information	JFM
22/07/2021	Received confirmation from Thunderstone for availability for fieldwork beginning 26th July. Insurances also provided.	Thunderstone Aboriginal Cultural Services			Email	Received confirmation from Thunderstone for availability for fieldwork beginning 26th July. Insurances also provided.	Thanked them for their response and understanding of the short notice given. Respond with further details and start times ASAP	
7/21/2021	Received follow up email from NLALC with the contact number for the site officer that will be sent out for fieldwork.	Ngambri LALC			Email	Received follow up email from NLALC with the contact number for the site officer that will be sent out for fieldwork.	Sent email back thanking them for the information	JFM

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
7/22/2021	Received confirmation from Thunderstone for availability for fieldwork beginning 26th July. Insurances also provided.	Thunderstone Aboriginal Cultural Services			Email	Received confirmation from Thunderstone for availability for fieldwork beginning 26th July. Insurances also provided.	Thanked them for their response and understanding of the short notice given. Respond with further details and start times ASAP	
7/23/2021	Sent email to all 6 RAP groups with formal and final information regarding the archaeological survey and testing works that will take place beginning 26 July/2021. This include COVID safety precautions and requirements	NGH			Email	Invites sent out to: Ngambri LALC, Buru Ngunawal Aboriginal Corporation, Didge Ngunnawal Clan, Yurwang Gundana Cultural Heritage Services, Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation, and Freeman & Marx Pty Ltd.	Await any response with concerns/etc.	JFM
24/07/2021	Fieldwork commenced	NGH			-	-	-	JFM
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
16/09/2021	NGH provided an updated methodology (with new development footprint) to RAPs for a 28-day review. All RAPs were informed that a second round of fieldwork would commence to assess new areas after the review period ends	NGH			Email (and via post to those who did not have email addresses)	NGH provided an updated methodology (with new development footprint) to RAPs for a 28-day review. All RAPs were informed that a second round of fieldwork would commence to assess new areas after the review period ends.	Await response from RAPs. Review period ends COB 14 October 2021.	JFM
19/09/2021	Received email from YGCHS with no comments on the updated methodology.	YGCHS			Email	Agreed with the updated methodology	No further action required.	JFM
2/10/2021	Received response from Ngunawal Heritage Aboriginal Corporation with thanks for providing an updated methodology. NHAC agreed with the revised methodology proposed for the second round of fieldwork.	NHAC			Email	Received response from Ngunawal Heritage Aboriginal Corporation with thanks for providing an updated methodology. NHAC agreed with the revised methodology proposed for the	No further action required.	JFM

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
	Also noted that it is important to stay consistent with current guidelines and requirements when developing strategies to involve Aboriginal stakeholders.					second round of fieldwork. Also noted that it is important to stay consistent with current guidelines and requirements when developing strategies to involve Aboriginal stakeholders.		
5/10/2021	Notification of intention to undertake test excavations under the Code of Practice provided to HNSW.	NGH			Email	Provided notification of intention to undertake test excavations under the Code of Practice commencing 18th October 2021	No further action required.	JFM
12/10/2021	At the request of the proponent, NGH invited the same 6 RAP groups for the second round of fieldwork commencing 18th October 2021. Details of fieldwork activities, staff and meeting time provided to all 6 RAPs along with the SWMS and COVID precautions. ALL SITE STAFF REQUIRED TO BE VACCINATED	NGH			Email	Invites sent to 6 RAPs to request for participation in second round of fieldwork	Await responses from RAPs	JFM
12/10/2021	Received email from YGCHS confirming their availbility to attend fieldwork beginning 18th October and stating their fully vaccinated status	YGCHS			Email	Confirmed availability for all fieldwork	No further action required,	JFM
13/10/2021	Received email from Thunderstone ACS confirming vaccinated status and availability to attend fieldwork commencing 18th October 2021.	Thunderstone Aboriginal Cultural Services			Email	Confirmed availability for all fieldwork	No further action required.	JFM
14/10/2021	DNC responded to updated methodology and request for availability for fieldwork. Agreed with the methodology.	DNC			Email	Agreed with methodology and confirmed availability for fieldwork	No further action required.	JFM
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]						

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
	[redacted]							
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]						

Date	Invitations sent to NAMES requesting participation in field work on DATES	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
[redacted]	[redacted]	[redacted]						

Stage 4 (Draft Report)

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
20/12/2021	Draft ACHA sent to all RAPs via email or registered post. (Freeman & Marx Pty Ltd, PD Ngunawal Consultancy, Yurwang Gundana CCHS, Corroboree Aboriginal Corporation, Muragadi HIC, Thunderstone, Konanggo, Merrigarn Indigenous Corporation, Murri Bidgee Mullangari AC, Ngambir LALC, Buru Ngunawal Aboriginal Corporation, Didge Ngunawal Clan, Kalari Ngunnawal Pajong Wallabalooa Descendants, Ngunawal Heritage Aboriginal Corporation, Oak Hill Enterprises).	NGH			Email/text/registered post	NGH provided the draft ACHA to all RAPs for the review and comment.	Await responses by 28 January 2022	12/20/2021
21/12/2021	NGH texted all RAPs to ensure that they were able to open the email file transfer link, and to alert others that the report was coming by registered post.	NGH						12/21/2021
21/12/2021	YGCHS replied saying that they were unable to open the link attached to the email.	Yurwang Gundana Cultural Heritage Services			Email	NGH responded with a new link to the ACHA. Await response from YGCHS.	Await response	12/21/2021
22/12/2021	Received email from DNC regarding the draft ACHA. They note that they were able to open the report and are happy for the project to proceed	Didge Ngunawal Clan			Email	DNC agreed with the draft ACHA	NGH responded with thanks for their participation and endorsement (14/02/2022).	12/22/2021
23/12/2021	Received email from YGCHS informing that the new link and original link to the ACHA have both started working.	Yurwang Gundana Cultural Heritage Services			Email	YGCHS informed NGH that they have been able to access the report.	Await further response with any comments	12/23/2021

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
19/01/2022	YGCHS provided response to ACHA. They have no comments with the report and agree with the recommendations made. Also asked about what the next stage is for work on the solar farm.	Yurwang Gundana Cultural Heritage Services			Email	YGCHS informed NGH that the agree with the draft ACHA. Asked about further work.	NGH responded to YGCHS (21/01/2022) thanking them for their response and involvement with the project. Also provided further information about the next stages for the solar farm from an Aboriginal heritage perspective and confirmed that they would be according to the recommendations made in the ACHA (and conditions of consent).	1/19/2022
28/01/2022	NGH sent email with a reminder of the ACHA comment deadline to all RAPs. (Freeman & Marx Pty Ltd, PD Ngunawal Consultancy, Yurwang Gundana CCHS, Corroboree Aboriginal Corporation, Muragadi HIC, Thunderstone, Konanggo, Merrigarn Indigenous Corporation, Murri Bidgee Mullangari AC, Ngambir LALC, Buru Ngunawal Aboriginal Corporation, Didge Ngunawal Clan, Kalari Ngunnawal Pajong Wallabalooa Descendants, Ngunawal Heritage Aboriginal Corporation, Oak Hill Enterprises)	NGH			Email	NGH sent email to all RAPs reminding them of the deadline for ACHA comments	Await response to the ACHA	1/28/2022
28/01/2022	Received response from Muragadi regarding the draft ACHA. They agreed with the recommendations made in the report.	Muragadi Heritage Indigenous Corporation			Email	Muragadi provided no further comments on the ACHA	NGH responded with thanks for their participation and endorsement (14/02/2022).	1/28/2022
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
28/01/2022	Received response from MBMAC regarding the draft ACHA. They endorse the recommendations made in the report	Murri Bidgee Mullangari Aboriginal Corporation			Email	MBMAC provided no further comments on the ACHA	NGH responded with thanks for their participation and endorsement (14/02/2022).	JFM

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
30/01/2022	Received response from Freeman and Marx regarding the draft ACHA. They expressed that the report is good and have no further comments to add besides what was already discussed on site.	Freeman and Marx Pty Ltd			Email	Freeman and Marx provided no further comments on the ACHA	NGH responded with thanks for their participation and endorsement (14/02/2022).	JFM
31/01/2022	Received response from Ngambri LALC informing NGH that they have no comments on the ACHA. The also thanked NGH for the work done on the project and the ease of working with them.	Ngambri LALC			Email	Ngambri LALC provided no further comments on the ACHA.	NGH responded thanking them for their response and for the work they have done thus far on the project.	JFM
31/01/2022	Received response from BNAC thanking NGH for the report and requesting an extension of the review period to allow for an appropriate response to be given.	Buru Ngunawal Aboriginal Corporation			Email	BNAC requested an extension to the review period to allow for them to provide comments.	NGH responded thanking them for the reply and asked if there was a possibility that BNAC could provide a response prior to the 4/02/2022 due to timing constraints with the EIS. NGH add that they wish to include all comments and address the concerns that BNAC may have with the ACHA	JFM
31/01/2022	Received response from BNAC indicating that they may be able to provide comments by COB Wednesday. BNAC also stated that this will be at an additional cost which will now be the norm for any report comment required.	Buru Ngunawal Aboriginal Corporation			Email	BNAC indicated that they would be able to provide comments by COB 2/02/2022. Also noted that an additional cost will be charged for the comment	NGH thanked BNAC for the reply and informed them that they will pass this information onto the proponent. NGH also requested what the extra charge is and if it is similar to an out-of-pocket expense as described in section 3.4 of the ACHCRP (2010). (01/02/2022)	JFM
31/01/2022	Received response from Thunderstone requesting an extension to make comments to the Friday 4th February 2022.	Thunderstone Aboriginal Cultural Services Pty Ltd			Email	Thunderstone requested an extension to the review period to allow for them to provide comments.	NGH responded thanking them for the email and asked if there was a possibility that NGH could receive comments sooner than Friday due to deadlines with the EIS submission. NGH add that they want to include any comments that he has (31/01/2022). Await response from Thunderstone.	JFM
1/02/2022	NGH sent follow up email to BNAC stating that due to other commitments that BNAC have with work in the region, the proponent can extend the	NGH			Email	Provided an extension to BNAC (until 07/02/2022) to allow them to review and provide comment on the draft	Await further response.	JFM

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
	review/comment deadline to 07/02/2022. It is hoped that the extra time will allow BNAC to review and provide comment on the ACHA.					ACHA.		
1/02/2022	Received response from Thunderstone stating that he cannot make any comments on the ACHA for the time due to other commitments that have prevented their ability to review the document.	Thunderstone Aborigincal Cultural Services Pty Ltd			Email	Thunderstone informed NGH that at this stage they cannot provide comments due to other commitments.	NGH responded acknowledging that Thunderstone are busy. Furthermore, given the importance of consultation to the project. The proponent offered Thunderstone an extension to 7 February 2022, to provide any comments on the ACHA. It is hoped that this extra time will allow Thunderstone to review the report. (01/02/2022).	JFM
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
6/02/2022	Received response from Thunderstone on the draft ACHA and provided further cultural information. Also provided an additional recommendation.	Thunderstone Aboriginal Cultural Services Pty Ltd			Email	NGH received comments and cultural knowledge from Thunderstone.	NGH	JFM
7/02/2022	NGH received BNAC's response to the draft ACHA and further cultural information. BNAC also informed NGH that an invoice will be issued for the production of the response due to the time taken to read the report and respond accordingly.	Buru Ngunawal Aboriginal Corporation			Email	NGH received comments and cultural knowledge from BNAC.	NGH thanked BNAC for their response and cultural information provided for the draft ACHA. With regards to payment, NGH requested further information regarding the invoice so that they may pass this information onto the proponent (07/02/2022). Incorporate changes into the ACHA	JFM
9/02/2022	NGH sent Thunderstone an email responding to the email of Thunderstone (6/02/2022) clarifying the details of	NGH			Email	NGH provided info to Thunderstone regarding a comment received on the	Await further response.	JR

Date	Action	Organisation	Address	Email	Method of Contact	Details	Action Required	Sent/Received By (NGH Personnel)
	proposed underground trenching and requesting clarification on whether this information was sufficient, or what additional information was required.					ACHA		
9/02/2022	NGH consultant (Jorge Fuenzalida Miralles) rang and spoke to Tyronne Bell of Thunderstone to discuss the feedback received (6/02/2022) on the draft ACHA. A consensus was reached.	NGH and Thunderstone Aborigincal Cultural Services Pty Ltd			Phone		NGH to follow-up phone call with email as confirmation of what was discussed and the consensus reached.	JFM
15/02/2022	NGH sent Thunderstone email with how the draft report had been amended in accordance with the feedback received from Thunderstone (6/02/2022) and the subsequent phone call (9/02/2022).	NGH			Email	NGH did not receive a reply from Thunderstone Aborigincal Cultural Services Pty Ltd. NGH assumed that on the basis of the emails sent and the phone conversation that Thunderstone were satisfied with the information provided and the changes made.	Closed. No further action required.	
25/04/2022	NGH provided all RAPs the finalised (redacted) version of the Blind Creek ACHA as submitted along with the EIS via email or registered post.	NGH			Email/Registered Post	NGH provided all RAPs a copy of the redacted finalised ACHA as submitted with the EIS.	No action required	JFM

Appendix B BCSF (NGH, 2021) Isolated Artefact and Artefact Scatter Site Descriptions

Appendix B BCSF (NGH, 2021) Isolated Artefact and Artefact Scatter Site Descriptions

BCSF: Isolated Finds

BCSF: Isolated Find 1 – AHIMS #57-2-1155

This site consists of a single isolated fine-grained silicious distal fragment within a slightly elevated sandy loam exposure in an existing farm track. The sandy loam deposit was creamy brown in colour with imported gravels lain over to create a track; visibility was approximately 20%. As this Aboriginal object is located alongside imported gravels in the centre of a track running through the floodplain landform, it is likely that it has been redeposited in its present location during formation of the track. It is also possible that flooding or other erosional events have moved the artefact to its present location. Plate B-1 and Plate B-2 below show the location and visibility across the site.

Plate B-1 View east over BCSF: Isolated Find 1 within a small exposure in a track. The artefact is located at the base of the range pole in the image.

Plate B-2 View west over BCSF: Isolated Find 1 within a small exposure in a track. The artefact is located at the base of the range pole in the image.

BCSF: Isolated Find 2 – AHIMS #57-2-1156

This site consists of a single white quartz flaked piece, <10mm size class, within exposed sandy loam soils on a very gentle slope. The sandy deposit was creamy white in colour with frequent scattered grass clumps growing throughout allowing for a visibility of 30%. The area has been disturbed through previous activities associated with grazing cattle and ploughing throughout the landform. While this Aboriginal object is located within an area that is associated with cropping and cattle grazing, these disturbances are likely to have only resulted in superficial surface disturbances and are unlikely to have moved surface artefacts very far. As a result, it is likely that this artefact is located within close proximity to its original depositional location on the gentle slope. Plate B-3 and Plate B-4 below show the location and visibility across the site.

	
Plate B-3 Close up view of BCSF: Isolated Find 2.	Plate B-4 View north over BCSF: Isolated Find 2 within a sandy exposure on a very gentle slope within the undulating plain. The artefact is located at the base of the range pole in the image.

BCSF: Isolated Find 3 – AHIMS #57-2-1157

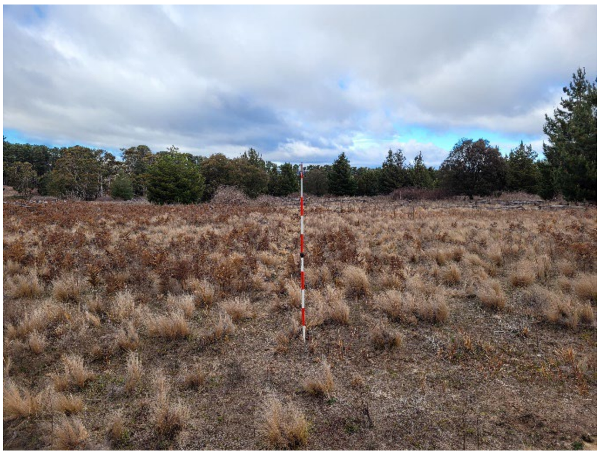
This site consists of a single silcrete flaked piece within a sandy exposure on a low rise. The size class of the artefact was less than 40mm. The sandy deposit was creamy white in colour with frequent clumping of grass growing throughout allowing for a visibility of 30% within the exposure. The area has been disturbed through previous activities associated with grazing cattle and ploughing throughout the landform. While this Aboriginal object is located within an area that is associated with cattle grazing and ploughing, these disturbances are likely to have only resulted in superficial surface disturbances and are unlikely to have moved surface artefacts very far. As a result, it is likely that this artefact is located within close proximity to its original depositional location on the low rise. Plate B-5 and Plate B-6 below show the location and visibility across the site.

Plate B-5 View north west over BCSF: Isolated Find 3 within a sandy exposure on a low rise within the undulating plain. The artefact is located at the base of the range pole in the image.

Plate B-6 View north over BCSF: Isolated Find 3 within a sandy exposure on a low rise within the undulating plain. The artefact is located at the base of the range pole in the image. Note the plough lines.

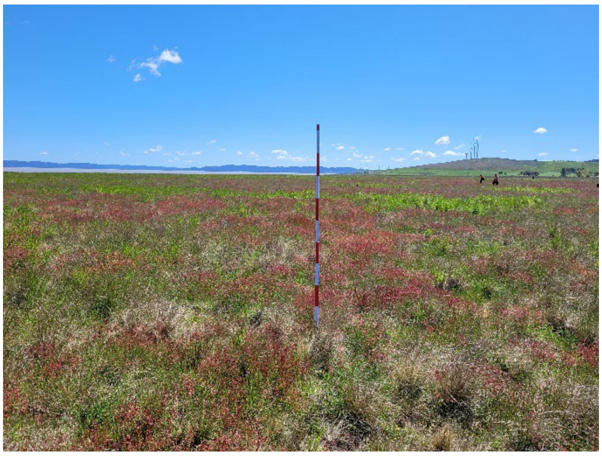
BCSF: Isolated Find 4 – AHIMS #57-3-0480

This site consists of a single white quartz flake within a sandy exposure on a very gentle slope. The size class of the artefact was less than 20mm. The sandy deposit was light cream white in colour with some moss cover allowing for a visibility of 60% within the exposure. The area has been disturbed through previous landscape modifications associated with plantation forestry and the maintenance of an electricity easement. The exposure that the artefact was located in was associated with a wombat burrow. This Aboriginal object is located within an area of disturbance which varies from medium, within the electricity easement, to high, where animal burrows and plantation rows are present. However, due to the artefact being located within an exposure created by an animal burrow, it is likely that this artefact was removed from a subsurface deposit. This suggests that there is potential for archaeological deposits in areas where significant subsurface disturbances have not occurred. Plate B-7 and Plate B-8 below show the location and visibility across the site.

	
Plate B-7 Close up view of BCSF: Isolated Find 4.	Plate B-8 View south over the landform near BCSF: Isolated Find 4. The artefact is located in a sandy exposure created by a wombat burrow in the brush, approximately 20 m south east of the range pole (left mid-ground on image).

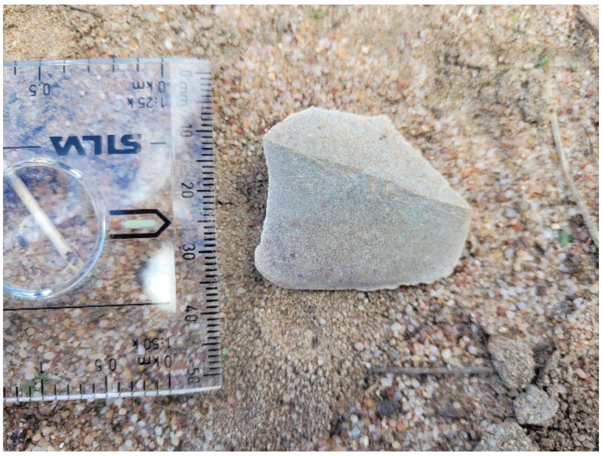
BCSF: Isolated Find 5 – AHIMS #57-2-1158

This site consists of a single white quartz flaked piece within a sandy exposure on the strandline landform. The size class of the artefact was less than 30mm. The sandy deposit was white in colour with clumps of grass and weeds growing throughout allowing for less than 5% visibility within the small exposure. The isolated find is located approximately 35m north east of an area within the strandline that was subjected to historical sand mining. While this Aboriginal object was located within a relatively undisturbed area it is likely associated with the historical sand mine, suggesting that it is within a disturbed context. Plate B-9 and Plate B-10 show the location and visibility across the site.

	
Plate B-9 Close up view of BCSF: Isolated Find 5.	Plate B-10 View north over the strandline landform near BCSF: Isolated Find 5. Note to low ground visibility

BCSF: Isolated Find 6 – AHIMS #57-2-1159

This site consists of an isolated grey silcrete complete flake within a small sandy exposure on the undulating plain landform. The size class of the artefact was less than 40mm. The sandy deposit was white in colour with clumps of grass and weeds growing throughout allowing for less than 10% visibility within the small exposure. The isolated find is located approximately 75m south west of the old quarry track as it passes through the undulating plains landform. This artefact is located in a relatively undisturbed context as the undulating landform has been subjected to stock grazing. As a result, this Aboriginal object has likely eroded out of one of the adjacent local sandy rises that are characteristic of the undulating plain. Plate B-11 and Plate B-12 below give a close up view of the artefact.

	
Plate B-11 Close up view of the dorsal surface of BCSF: Isolated Find 6.	Plate B-12 Close of view of the ventral surface of BCSF: Isolated Find 6.

BCSF: Isolated Find 7 – AHIMS #57-2-1160

This site consists of an isolated cream silcrete complete flake within a small sandy exposure on the undulating plain landform. The size class of the artefact was less than 30mm. The sandy deposit was white in colour with clumps of grass and weeds growing throughout allowing for less than 10% visibility within the small exposure. The isolated find is located approximately 35 m south west of the old quarry track as it passes through the undulating plains landform. This artefact is located in a relatively undisturbed context as the undulating landform has been subjected to stock grazing. As a result, this Aboriginal object has likely eroded out of one of the adjacent local sandy rises that are characteristic of the undulating plain. Plate B-13 and Plate B-14 below give a close up view of the artefact.

	
Plate B-13 Close up view of the dorsal surface of BCSF: Isolated Find 7.	Plate B-14 Close of view of the ventral surface of BCSF: Isolated Find 7.

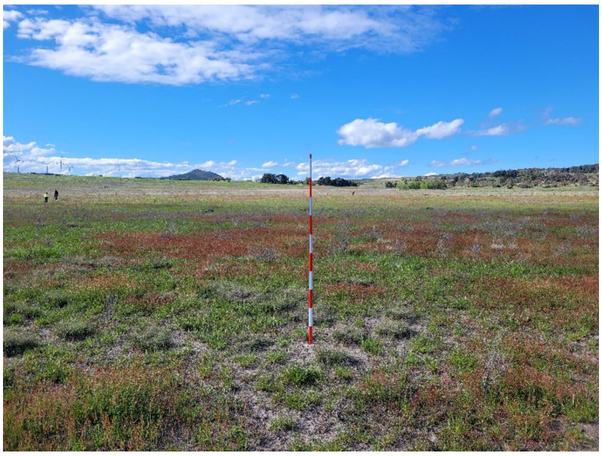
BCSF: Isolated Find 8 – AHIMS #57-2-1161

This site consists of a single milky quartz flaked piece within a sandy exposure on the strandline landform. The size class of the artefact was less than 20mm. The sandy deposit was creamy brown in colour with clumps of grass and weeds growing throughout allowing for less than 80% visibility within the small exposure in the low spurs landform. The Aboriginal object is located within an exposure that was likely be created through stock activity causing erosion. Plate B-15 and Plate B-16 show the location and visibility across the site.

	
Plate B-15 Close up view of the quartz flaked piece at BCSF: Isolated Find 8.	Plate B-16 View north over the sandy exposure at BCSF: Isolated Find 8.

BCSF: Isolated Find 9 – AHIMS #57-2-1162

This site consists of an isolated quartz medial flake within a small sandy exposure on the elevated sand body landform. The size class of the artefact was less than 40mm. The sandy deposit was white in colour with clumps of grass and weeds growing throughout allowing for less than 10% visibility within the small exposure. The isolated find was located within a previous sand mining area which had clearly removed a significant amount of sandy deposit from the landform. As a result, this Aboriginal object is likely to be remnant material from an exposed archaeological deposit that has been disturbed due to the historical mining activities within this section of the landform. Plate B-17 and Plate B-18 below give a close up view of the artefact and general location and visibility across the site.

	
Plate B-17 Close up view of BCSF: Isolated Find 9.	Plate B-18 View north over the small exposure at BCSF: Isolated Find 9.

BCSF: Isolated Find 10 – AHIMS #57-2-1175

This site consists of an isolated red silcrete proximal flake within a small sandy exposure on the elevated sand body landform. The size class of the artefact was less than 30mm. The sandy deposit was creamy white in colour with clumps of grass and weeds growing throughout allowing for less than 5% visibility within the small exposure. The isolated find was located within a previous sand mining area which had clearly removed a significant amount of sandy deposit from the landform. As a result, this Aboriginal object is likely to be remnant material from an exposed archaeological deposit that has been disturbed due to the historical mining activities within this section of the landform. Plate B-19 and Plate B-20 below give a close up view of the artefact and general location and visibility across the site.

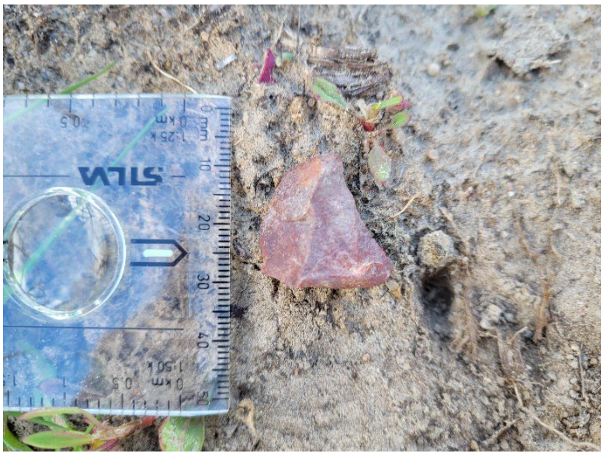


Plate B-19 Close up view of the dorsal surface of BCSF: Isolated Find 10.	Plate B-20 View north over the small exposure at BCSF: Isolated Find 10.

BCSF: Isolated Find 11 – AHIMS #57-3-0489

This site consists of an isolated quartz complete flake within a small sandy exposure on the hillslope landform. The size class of the artefact was less than 20mm. The sandy deposit was creamy brown in colour with clumps of grass and weeds growing throughout allowing for less than 5% visibility within the small exposure. The isolated find was located within a disturbed context due to its association with the nearby pine plantation and transmission corridor. As a result, this Aboriginal object is likely to be remnant material that has been exposed due to the historical activities associated with the pine plantation or nearby electricity easement. Plate B-21 and Plate B-22 below give a close up view of the artefact and general location and visibility across the site.

	
Plate B-21 Close up view of the dorsal surface of BCSF: Isolated Find 11.	Plate B-22 View west over the small exposure at BCSF: Isolated Find 11.

BCSF: Artefact Scatters

BCSF: Artefact Scatter 1 – AHIMS #57-2-1176

This site consists of two quartz artefacts in a scatter measuring 1m x 1m. The two artefacts were a flaked piece with a size class less than 60mm and a medial fragment with a size class less than 50mm. Both artefacts were located within a clayey loam deposit with grass cover allowing for a visibility of 5%. The area has been superficially disturbed through cattle grazing. As the Aboriginal objects were located in the middle of the floodplain landform, it is possible that these artefacts have been subject to limited movement through flooding or other erosional events. Plate B-23 and Plate B-24 below show the artefacts present within the site.

	
Plate B-23 Close up view of the quartz flaked piece artefact at BCSF: Artefact Scatter 1.	Plate B-24 Close up view of the quartz medial fragment artefact at BCSF: Artefact Scatter 1.

BCSF: Artefact Scatter 2 – AHIMS #57-2-1177

This site consists of three quartz artefacts in a scatter measuring 6m x 3m. The three artefacts were a flaked piece with a size class less than 40mm, a medial fragment with a size class less than 20mm, and a distal fragment with a size class less than 10mm. All three artefacts were located within a loamy sand deposit with grass cover allowing for a visibility of 10%. The area has been superficially disturbed through cattle grazing. Plate B-25 and Plate B-26 below show the artefacts present within the site.

	
Plate B-25 Close up view of the quartz flaked piece artefact at BCSF: Artefact Scatter 2.	Plate B-26 Close up view of the quartz distal fragment artefact at BCSF: Artefact Scatter 2.

BCSF: Artefact Scatter 3 – AHIMS #57-2-1178

This site consists of two quartz artefacts in a scatter measuring 1m x 1m. The two artefacts were a flaked piece with a size class less than 30mm and a complete flake with a size class less than 20mm. Both artefacts were located within a sandy deposit eroding from the creek bank on the north side of Butmaroo Creek; visibility within the exposure was 90%. The area has been superficially disturbed through previous landscape modifications and use associated with cattle grazing; this has also caused the creek banks to erode significantly. As the Aboriginal objects were located within an eroding exposure within the elevated creek flat landform, it is likely that they had eroded from a deposit within the intact creek flat. Plate B-27 and Plate B-28 below show the location and visibility across the site.

	
Plate B-27 View west over BCSF: Artefact Scatter 3 within a sandy eroding exposure within the elevated creek flat. The artefacts are located around the base of the range pole in the image.	Plate B-28 View west over BCSF: Artefact Scatter 3. Note that the artefacts have likely eroded from deposits within the creek flat.

BCSF: Artefact Scatter 4 – AHIMS #57-2-1179

This site consists of four quartz and four silcrete artefacts in a scatter measuring 65m x 25m. The artefact types were complete and broken flakes within several sandy exposures with superficial surface disturbances. The sandy deposits were creamy brown in colour with sparse clumps of grass growing throughout allowing for approximately 80% visibility within the exposures. The area has been disturbed through the use of the area for cropping and cattle grazing. As a result, these disturbances are likely to have caused the erosion of these artefacts into the exposures they were recorded in. Plate B-29 and Plate B-30 below show the location and visibility across the site and a close up of one of the quartz artefacts that was recorded.

	
Plate B-29 View west over BCSF: Artefact Scatter 4 within an exposure on the undulating plain landform.	Plate B-30 Close up of one of the quartz artefacts located within the exposure at BCSF: Artefact Scatter 4.

BCSF: Artefact Scatter 5 – AHIMS #57-2-1180

This site consists of two quartz and one silcrete artefact in a scatter measuring 30m x 5m. The two quartz artefacts were a flake and a retouched flake, while the silcrete artefact was a proximal fragment. All three artefacts were located within sandy exposures on an embankment, which have been caused by animal burrows and the erosion of an elevated sand body landform. The sandy deposits were a light creamy brown in colour with sparse clumps of grass growing throughout allowing for approximately 70% visibility within the exposures. The area has been subjected to significant disturbances associated with sand mining and cattle grazing. The artefacts were found at the transition between the historical sand mining area and the existing elevated sand body landform on which AHIMS site #57-2-0917, a registered PAD, is located. As a result, the artefacts are likely to be associated with the PAD at AHIMS site #57-2-0917. Plate B-31 and Plate B-32 below show some of the artefacts present within the site.

Plate B-31 Close up view of the silcrete artefact located at BCSF: Artefact Scatter 5.

Plate B-32 Close up view of one of the quartz artefacts located at BCSF: Artefact Scatter 5.

BCSF: Artefact Scatter 6 – AHIMS #57-2-1181

This site consists of two quartz artefacts in a scatter measuring 45m x 10m. The two quartz artefacts were a proximal flake and a flaked piece. Both were located in highly disturbed sandy exposures within the strandline landform. The sandy deposit was light creamy brown in colour with sparse clumps of grass growing throughout allowing for approximately 75% visibility within the exposures. The area has been subjected to significant disturbances through previous landscape modifications associated with sand mining. The artefacts were found at the transition between the historical sand mining area to the north east and the existing strandline landform to the south west. It is likely that the two artefacts recorded within this scatter have eroded from existing deposits within the strandline.

BCSF: Artefact Scatter 7 – AHIMS #57-2-1163

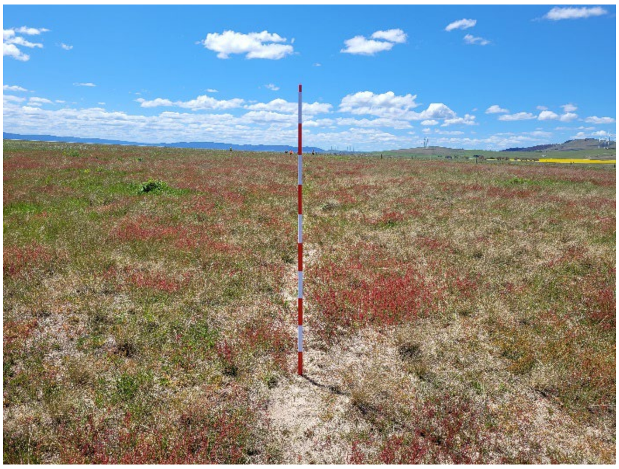
This site consists of four quartz flaked pieces in a scatter measuring 13m x 8m. The artefacts were located within a disturbed and exposed section of an old vehicle track on the strandline landform. The sandy deposit was white in colour with sparse clumps of grass growing throughout allowing for approximately 40% visibility within the exposure. The area has been disturbed through previous landscape modifications associated with the erection of a fenceline and use as an old quarry haul road. The Aboriginal objects may have been brought to the surface during the construction of the fence and operation of the road. While there is a possibility that the artefacts were brought in with the recycled material that was used in the construction of the track it is unlikely that this has occurred. Plate B-33 and Plate B-34 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

Plate B-33 Close up view of the four quartz flaked pieces located at BCSF: Artefact Scatter 7.

Plate B-34 View north over the sandy exposure within the old quarry track at BCSF: Artefact Scatter 7.

BCSF: Artefact Scatter 8 – AHIMS #57-2-1164

This site consists of two quartz artefacts, a distal fragment and a flaked piece, in a scatter measuring 4m x 2m. The artefacts were located within a disturbed and exposed section of an old vehicle track on the strandline landform. The sandy deposit was white in colour with sparse clumps of grass growing throughout allowing for approximately 30% visibility within the exposure. The area has been disturbed through previous landscape modifications associated with the old quarry haul road. The Aboriginal objects recorded are likely to be remnant material that was brought to the surface during the construction and use of track. While there is a possibility that the artefacts were brought in with the recycled material that was used in the construction of the track it is unlikely that this has occurred. Plate B-35 and Plate B-36 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-35 Close up view of the distal quartz artefact located at BCSF: Artefact Scatter 8.	Plate B-36 View north over the sandy exposure within the old quarry track at BCSF: Artefact Scatter 8.

BCSF: Artefact Scatter 9 – AHIMS #57-2-1165

This site consists of five quartz artefacts, four flaked pieces and a complete flake, within a scatter measuring 13m x 7.5m. The artefacts were located within an exposed section bordering a historic sand mining area within the undulating plain landform. The sandy deposit was light yellow in colour with sparse clumps of grass growing throughout allowing for a visibility up to 85% within the exposure. The area is associated with historical sand mining activities and is disturbed, especially to the immediate south of the recorded scatter where a water pool has formed. The Aboriginal objects are likely to be remnant material that has eroded out of an intact subsurface archaeological deposit within the undisturbed sandy landform to the immediate north. Plate B-37 and Plate B-38 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

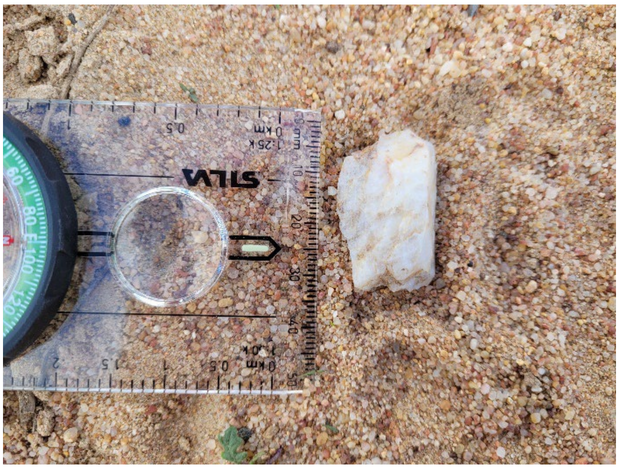


Plate B-37 Close up view of a quartz complete flake located at BCSF: Artefact Scatter 9.	Plate B-38 View south over the sandy exposure next to the historically mined area at BCSF: Artefact Scatter 9.

BCSF: Artefact Scatter 10 – AHIMS #57-2-1166

This site consists of seven quartz artefacts, six flaked pieces and a complete flake, within a scatter measuring 12m x 9m. The artefacts were located within an exposed section bordering a historic sand mining area within the undulating plain landform. The sandy deposit was light yellow in colour with sparse clumps of grass growing throughout allowing for visibility up to 70% within the exposure. The area is associated with historical sand mining activities and is disturbed, especially to the immediate south of the recorded scatter. The Aboriginal objects are likely to be remnant material that has eroded out of an intact subsurface archaeological deposit within the undisturbed sandy landform to the immediate north. Plate B-39 and Plate B-40 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-39 Close up view of a quartz complete flake located at BCSF: Artefact Scatter 10.	Plate B-40 View west over the sandy exposure on the edge of the historically mined area at BCSF: Artefact Scatter 10. Note that the exposures are likely representative of the subsurface deposits within the undisturbed landforms to the west.

BCSF: Artefact Scatter 11 – AHIMS #57-2-1167

This site consists of four quartz artefacts, three flaked pieces and a complete flake, within a scatter measuring 1m x 15.5m. The artefacts were located within small, isolated exposures on relatively undisturbed sections of the undulating plains landform. The sandy deposit was yellow in colour with sparse clumps of grass were growing throughout allowing for a visibility up to 70% within the small exposures. While not clearly associated with nearby historical sand mining activities, it is likely that the surface has been somewhat disturbed in this area through historical stock grazing. The Aboriginal objects are likely to be material that has eroded out of intact subsurface archaeological deposit within the landform. Plate B-41 and Plate B-42 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

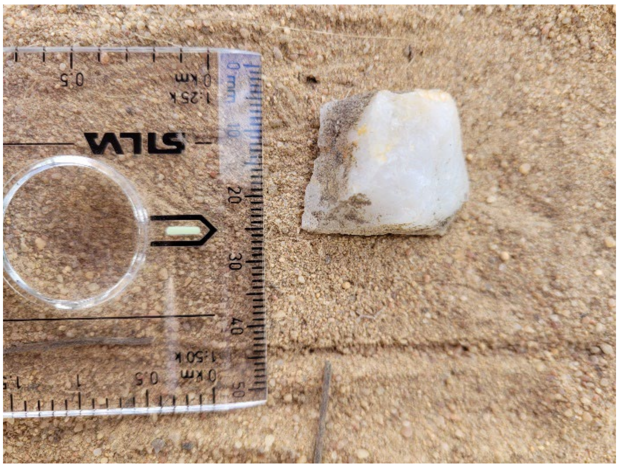
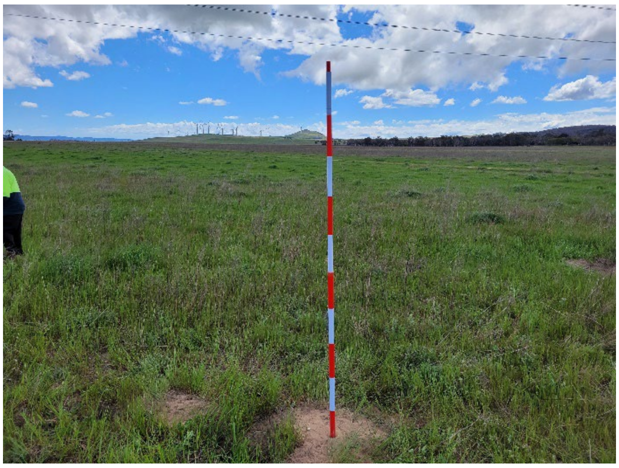
	

Plate B-41 Close up view of a quartz complete flake located at BCSF: Artefact Scatter 11.	Plate B-42 View north over two of the small sandy exposures at BCSF: Artefact Scatter 11. Note that the ground visibility around the scatters is low.

BCSF: Artefact Scatter 12 – AHIMS #57-2-1168

This site consists of at least eight artefacts, with an upper limit of between 50 – 100 artefacts, within a scatter measuring 95m x 12m; a single diaphyseal bone fragment (mammal) was also identified. Of the recorded artefacts one quartzite hammerstone, one quartzite anvil, one broken quartzite hammerstone, two distal flakes (quartz and silcrete), one quartz medial flake, one chert flaked piece, one fine-grained sedimentary retouched flake, and one chert core fragment were identified. The artefacts were located within an exposed section of the existing old quarry track that cuts through one of the sandy rises within the undulating plains landform. Sparse clumps of grass and some blue metal/track fill was scattered across the track. Visibility within the extent of the artefact scatter along the track was 85%. The track itself is associated with the operation of historical sand mines further west and has caused significant disturbance to the adjacent landform. Furthermore, as it is still actively used as an internal farm access track it is likely that surface disturbances are still occurring. The Aboriginal objects are likely to have eroded out of intact subsurface archaeological deposits on the adjacent local sandy rises, it is also possible that the artefacts were remnant material from the original landform that was cut through during the establishment of the track. While there is a possibility that the artefacts were brought in with the recycled material that was used in the construction of the track it is unlikely that this has occurred. Plate B-43 to Plate B-54 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-43 Close up view of the dorsal surface of the fine-grained sedimentary retouched flake located at BCSF: Artefact Scatter 12. Note the steep retouch along the distal margin and distal left and right margins as well as the negative flake scars.	Plate B-44 Close up view of the ventral surface of the fine-grained sedimentary retouched flake located at BCSF: Artefact Scatter 12. Note the retouch along the distal margin and distal left and right margins.

Plate B-45 Close up view of the quartzite hammerstone located at BCSF: Artefact Scatter 12. Note that its large size indicates that it was not used for retouch or flaking on some of the smaller artefacts that comprise this artefact scatter.

Plate B-46 Close up view of the quartzite hammerstone located at BCSF: Artefact Scatter 12. Note large negative flake scars on the surface of the hammerstone suggesting that flakes were deliberately removed from the artefact.

Plate B-47 Close up view of the chert core fragment located at BCSF: Artefact Scatter 12.

Plate B-48 Close up view of the silcrete distal fragment located at BCSF: Artefact Scatter 12. Note the potential micro-retouch along the distal margin.

Plate B-49 Close up view of a quartz flake located at BCSF: Artefact Scatter 12.

Plate B-50 Close up view of a quartz distal flake located at BCSF: Artefact Scatter 12. Note the parallel margins.

Plate B-51 Close up view of the quartzite anvil located at BCSF: Artefact Scatter 12. Note that some negative flake scars along its margins, along with other hammerstone damage, suggest that an attempt was made to use this as a hammerstone.

Plate B-52 Close up view of the quartzite anvil located at BCSF: Artefact Scatter 12. Note the clear anvil pitting on the artefact.

Plate B-53 View west over the old quarry track and BCSF: Artefact Scatter 12 at its easternmost extent. Note that the visible artefacts are within the exposed section of the track.

Plate B-54 View east over the old quarry track BCSF: Artefact Scatter 12 at its westernmost extent. Note that the track cuts through a slightly local sandy rise.

BCSF: Artefact Scatter 13 – AHIMS #57-2-1169

This site consists of four quartz flaked pieces within a scatter measuring 8m x 7m. The artefacts were located within an exposure on relatively undisturbed sections of the undulating plains landform. The sandy deposit was light yellow in colour with clumps of grass growing throughout allowing for a visibility up to 50% within the exposure. While not clearly associated with nearby historical sand mining activities, it is likely that the surface has been somewhat disturbed in this area through historical cattle grazing. The Aboriginal objects are likely to be remnant material that has eroded out of intact subsurface archaeological deposit within the deeper and undisturbed deposits of the landform. Plate B-55 and Plate B-56 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-55 Close up view of the quartz flaked pieces located at BCSF: Artefact Scatter 13.	Plate B-56 View north over the sandy exposure at BCSF: Artefact Scatter 13. Note that the ground visibility around the scatter is low.

BCSF: Artefact Scatter 14 – AHIMS #57-2-1170

This site consists of at least three artefacts, with an upper limit of approximately 12 artefacts, within a scatter measuring 14m x 7m. The artefacts were comprised of a variety of lithologies and raw materials (including silcrete, chert, and quartz). The artefacts were located within small exposures on disturbed sections of the undulating plains landform adjacent to the old quarry track. The sandy deposit was light yellow in colour with clumps of grass growing throughout allowing for a visibility up to 50% within the exposure. The exposures containing the scatter were likely created as a direct result of the adjacent track. The Aboriginal objects are likely to be remnant material that has eroded out of intact subsurface archaeological deposit within adjacent local sandy rise. While there is a possibility that the artefacts were brought in with the recycled material that was used in the construction of the track it is unlikely that this has occurred. Plate B-57 and Plate B-58 below provide a close up of recorded artefacts as well as the location and visibility across the site.

	
Plate B-57 Close up view of some of the silcrete and chert artefacts located at BCSF: Artefact Scatter 14.	Plate B-58 View west over the old quarry track and associated sandy exposure at BCSF: Artefact Scatter 14.

BCSF: Artefact Scatter 15 – AHIMS #57-2-1171

This site consists of at least six artefacts, with an upper limit of approximately 12 artefacts, within a scatter measuring 10m x 20m. The artefacts were comprised of a variety of lithologies and raw materials (including silcrete, chert, and quartz). The artefacts were located within small exposures on the elevated sandy portions of the undulating plains landform. The sandy deposit was light brown in colour with clumps of grass growing throughout allowing for a visibility up to 65% within the exposure. While not clearly associated with nearby historical sand mining activities, it is likely that the surface has been somewhat disturbed in this area through historical cattle grazing. The Aboriginal objects are likely to be remnant material that has eroded out of intact subsurface archaeological deposit within the deeper and undisturbed deposits of the landform. Plate B-59 and Plate B-60 below provide a close up of the recorded artefacts within the site.

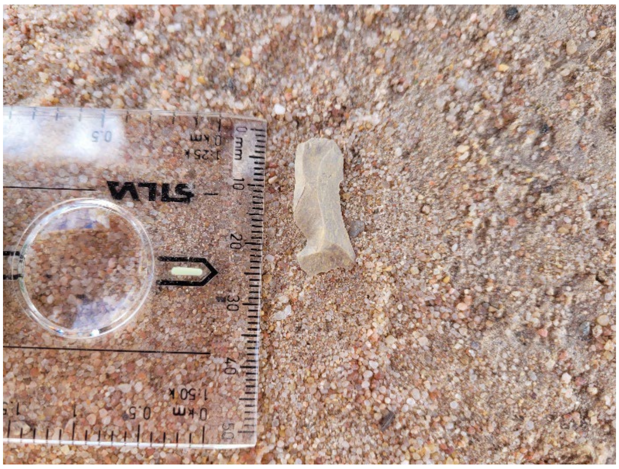


Plate B-59 Close up view of the dorsal surface of a silcrete complete flake located at BCSF: Artefact Scatter 15.	Plate B-60 Close up view of the dorsal surface of a silcrete complete flake located at BCSF: Artefact Scatter 15.

BCSF: Artefact Scatter 16 – AHIMS #57-2-1172

This site consists of four quartz artefacts, two flaked pieces, a proximal flake and a distal flake, within a scatter measuring 5m x 3m. The artefacts were located within very small exposures at the base of a historical sand mine within the elevated sand body landform. The sandy deposit was light brown in colour with grass covering the majority of the exposure allowing for a visibility up to 5%. This artefact scatter is clearly located within a landform that has been significantly disturbed via historical sand mining. Further disturbances from ploughing and cattle grazing are likely to have further displaced artefacts in the area. The Aboriginal objects are likely to be remnant material that has eroded out of the historically mined area. Plate B-61 and Plate B-62 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-61 Close up view of the dorsal surface of a quartz proximal flake located at BCSF: Artefact Scatter 16.	Plate B-62 View north over the small exposures within the old sand mining area at BCSF: Artefact Scatter 16.

BCSF: Artefact Scatter 17 – AHIMS #57-2-1174

This site consists of four flaked artefacts, three quartz and one chert, within a scatter measuring 13.5m x 9m. The artefacts were located within exposures on an local sandy rise in a historical sand mining area. The sandy deposit was light brown in colour with clumps of grass allowing for up to 45% visibility within the exposure. The landform that this artefact scatter is located on is clearly associated with the sand mine that historically operated in this area. However, as it is located on the eastern boundaries of the mined area it is unknown as to how much of the original landform has been removed. Further disturbances from cattle grazing and wombat burrows are likely to have further displaced artefacts in the area. The Aboriginal objects are likely to be remnant material that has eroded out of the historically mined area. Plate B-63 and Plate B-64 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

Plate B-63 Close up view of the two quartz flaked pieces and one chert flaked piece located at BCSF: Artefact Scatter 17.

Plate B-64 View north over the exposures on the local sandy rise within the old sand mining area at BCSF: Artefact Scatter 17.

BCSF: Artefact Scatter 18 – AHIMS #57-3-0481

This site consists of three artefacts, two quartz flaked pieces and a broken silcrete flake, within a scatter measuring 4.5m x 0.5m. The artefacts were located an exposure on the side of an existing quarry haul road within the saddle landform. The deposit was a mix of imported road gravels and light brown humic sandy loam from the adjacent saddle landform with clumps of grass allowing for up to 40% visibility within the exposure. While located within the saddle landform, the artefact scatter is located within a heavily disturbed context at the junction of a quarry road and service track. The scatter is also located within 75m of both a historical sand mine and active sand mine. The Aboriginal objects are likely to be remnant material that has eroded or washed down from the nearby historical sand mine or active sand mine. Plate B-65 and Plate B-66 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-65 Close up view of the silcrete broken flake located at BCSF: Artefact Scatter 18.	Plate B-66 View north over the quarry haul road adjacent to the exposure at BCSF: Artefact Scatter 18. The artefact scatter is located on the north side of the road at the base of the vehicle.

BCSF: Artefact Scatter 19 – AHIMS #57-3-0482

This site consists of two quartz artefacts, a proximal flake and a flaked piece, as well as a silcrete distal flake within a scatter measuring 1.5m x 57m. The artefacts were located within exposures at the base of an active sand mine and eroding from exposed banks on the borders of the mine within the creek terrace landform. The sandy deposit was light yellow in colour with sparse clumps of grass and detritus allowing for up to 90% visibility within the exposure. While located within the creek terrace landform, the artefact scatter is located within a heavily disturbed context associated with the active sand mine present in the area. The Aboriginal objects are likely to be remnant material that has been exposed in their present locations as a direct result of disturbances associated with the active sand mine. Plate B-67 and Plate B-68 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

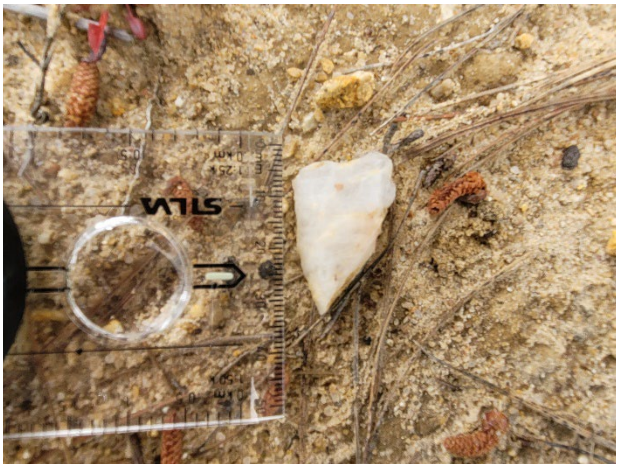


Plate B-67 Close up view of the quartz proximal flake located at BCSF: Artefact Scatter 19.

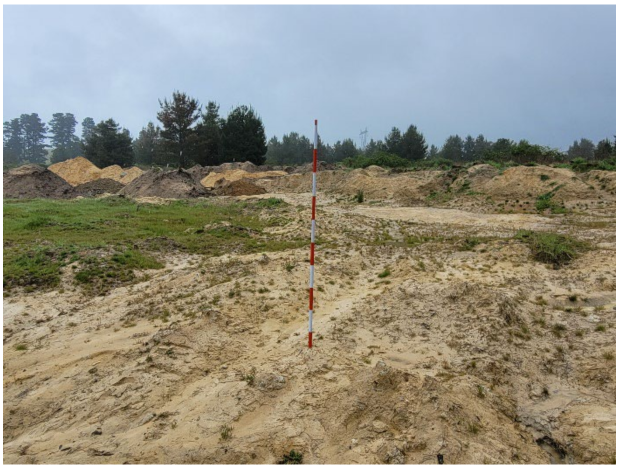


Plate B-68 View north over the active sand mine and associated exposures in the centre of BCSF: Artefact Scatter 19. Note the variation in ground visibility caused by the vegetation and detritus.

BCSF: Artefact Scatter 20 – AHIMS #57-3-0483

This site consists of at least seven artefacts, a quartz proximal flake, core, and two complete flakes as well as a silcrete complete flake, medial fragment, and flaked piece, with an upper limit of approximately 15 artefacts in a scatter measuring 46m x 35m. The artefacts were located within exposures created by a vehicle track associated with the operation of the nearby pine plantation within the creek terrace landform. It should be noted that more artefacts are likely to be present within the scatter in areas where visibility was poor. The sandy deposit was light brown in colour with grass cover and detritus allowing for up to 10% visibility within the limited exposures. While located within the creek terrace landform, the artefact scatter is located within a disturbed context due to the presence of a vehicle track. The Aboriginal objects are likely to be remnant material that has been exposed in their present locations as a direct result of disturbances associated with the vehicle track. Plate B-69 to Plate B-72 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

Plate B-69 Close up view of the dorsal surface of the quartz proximal flake located at BCSF: Artefact Scatter 20.

Plate B-70 Close up view of the quartz core located at BCSF: Artefact Scatter 20.

Plate B-71 Close up view of the silcrete complete flake located at BCSF: Artefact Scatter 20.

Plate B-72 View north over the exposures caused by a vehicle track at BCSF: Artefact Scatter 20. Note that further artefacts are likely to be present in areas of the scatter where visibility was poor.

BCSF: Artefact Scatter 21 – AHIMS #57-3-0484

This site consists of at least three artefacts, a silcrete blade, a chert proximal flake, and a quartz flaked piece, with an upper limit of approximately 10 artefacts in a scatter measuring 20m x 8m. The artefacts were located within exposures created by a vehicle track associated with the operation of the nearby pine plantation within the creek terrace landform. Furthermore, the vehicle track was likely cut into a sandy rise adjacent to the west, removing some sandy deposits and potentially exposing subsurface deposits. It should be noted that more artefacts are likely to be present within the scatter in areas where visibility was poor. The sandy deposit was light brown to light yellow in colour with grass cover and detritus allowing for up to 35% visibility within the limited exposures. While located within the creek terrace landform, the artefact scatter is located within a disturbed context due to the presence of a vehicle track. The Aboriginal objects are likely to be remnant material that has eroded from the local sandy rise to the west as a direct result of disturbances associated with the vehicle track. Plate B-73 to Plate B-76 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

Plate B-73 Close up view of the dorsal surface of the silcrete blade located at BCSF: Artefact Scatter 21.

Plate B-74 Close up view of the dorsal surface of the chert proximal flake located at BCSF: Artefact Scatter 21. Note the large amount of cortex present on the artefact.

Plate B-75 View north over the exposures caused by a vehicle track at BCSF: Artefact Scatter 21. Note that further artefacts are likely to be present in areas of the scatter where visibility was poor.

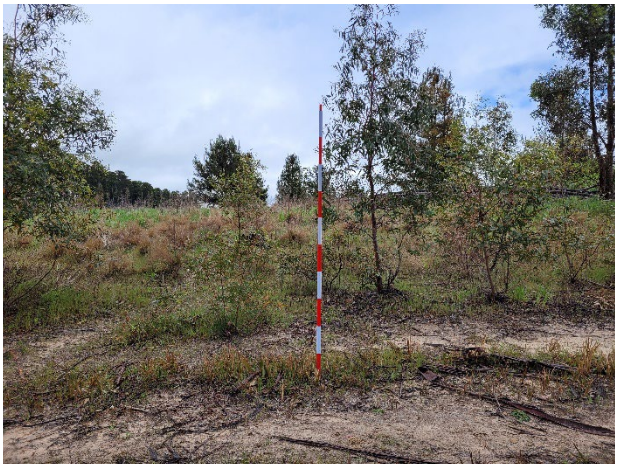


Plate B-76 View west over the exposures caused by a vehicle track at BCSF: Artefact Scatter 21. Note that the track has cut into the sandy rise adjacent to the west.

BCSF: Artefact Scatter 22 – AHIMS #57-3-0485

This site consists of three quartz artefacts, a distal flake and two flaked pieces, within a scatter measuring 4m x 4m. The artefacts were located within exposures created by a vehicle track associated with the operation of the nearby pine plantation within the creek terrace landform. The humic sandy deposit was brown in colour with grass cover and detritus allowing for up to 20% visibility within the limited exposures. While located within the creek terrace landform, the artefact scatter is located within a disturbed context due to the presence of a vehicle track. The Aboriginal objects are likely to be remnant material that has eroded from the local sandy rise to the west as a direct result of disturbances associated with the vehicle track. Plate B-77 and Plate B-78 below provide a close up of the recorded artefacts within the site.

Plate B-77 Close up view of the ventral surface of the quartz distal flake located at BCSF: Artefact Scatter 22.

Plate B-78 Close up view of the dorsal surface of the quartz distal flake located at BCSF: Artefact Scatter 22.

BCSF: Artefact Scatter 23 – AHIMS #57-3-0490

This site consists of at least four quartz flaked pieces within a scatter measuring 7m x 8m. The artefacts were located within exposures created by a vehicle track associated with the operation of the nearby pine plantation within the creek terrace landform. The sandy deposit was light brown to light yellow in colour with large gravels, grass cover, and detritus allowing for up to 5% visibility within the limited exposures. While located within the creek terrace landform, the artefact scatter is located within a disturbed context as the artefacts were located amongst imported gravels used within the existing vehicle track. The Aboriginal objects are likely to be remnant material that has been exposed in their present locations as a direct result of disturbances associated with the vehicle track. However, it should be noted that there is a possibility that these artefacts were brought in with the other track gravels.

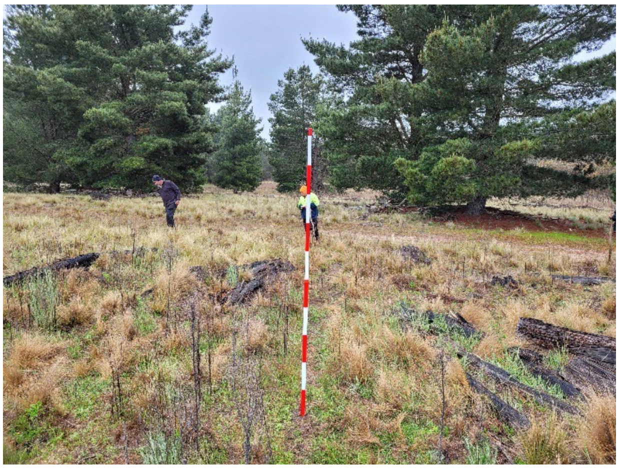
BCSF: Artefact Scatter 24 – AHIMS #57-3-0486

This site consists of two artefacts, a chert complete flake and a silcrete proximal flake, within a scatter measuring 10.5m x 5.5m. The artefacts were located within exposures created by a vehicle track associated with the operation of the nearby pine plantation within the creek terrace landform. The sandy deposit was light brown in colour with grass cover and detritus allowing for up to 10% visibility within the limited exposures. While located within the creek terrace landform, the artefact scatter is located within a disturbed context due to the presence of a vehicle track. The Aboriginal objects are likely to be remnant material that has been exposed in their present locations as a direct result of disturbances associated with the vehicle track. Plate B-79 and Plate B-80 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-79 Close up view of the dorsal surface of the chert complete flake located at BCSF: Artefact Scatter 24.	Plate B-80 View north over the exposures caused by a vehicle track at BCSF: Artefact Scatter 24. Note that further artefacts are likely to be present in areas of the scatter where visibility was poor.

BCSF: Artefact Scatter 25 – AHIMS #57-3-0487

This site consists of three quartz flaked pieces within a scatter measuring 13.5m x 4.5m. The artefacts were located within exposures created by a small track within the hillslope landform. The sandy deposit was light yellow in colour with grass cover and detritus allowing for up to 40% visibility within the limited exposures. The artefact scatter is located within a disturbed context due to the presence of the small track. The Aboriginal objects are likely to be remnant material that has been exposed in their present locations as a direct result of disturbances associated with the vehicle track. Plate B-81 and Plate B-82 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-81 Close up view of a quartz flaked piece located at BCSF: Artefact Scatter 25.	Plate B-82 View east towards the exposures caused by a small track at BCSF: Artefact Scatter 25.

BCSF: Artefact Scatter 26 – AHIMS #57-3-0488

This site consists of four chert artefacts, one core and three flaked pieces, within a scatter measuring 8m x 3.5m. The artefacts were located within exposures created by the quarry haul road running east west within the creek terrace landform. The road has clearly been graded and gravelled and as such is has been heavily disturbed. The deposit was an imported fill/gravel with up to 10% visibility within the limited exposures. All four artefacts are of the same material/colour and it is likely that the three flaked pieces were removed from the core via vehicle damage. It is difficult to ascertain where the Aboriginal objects were initially removed from, it is equally likely that they have eroded onto the road from nearby elevated sandy deposits or were brought in with the road gravels. Plate B-83 and Plate B-84 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

	
Plate B-83 Close up view of a chert core located at BCSF: Artefact Scatter 25.	Plate B-84 View east towards the exposures caused by the active quarry haul road at BCSF: Artefact Scatter 25.

BCSF: Artefact Scatter 27 – AHIMS #57-2-1173

This site consists of at least eleven artefacts, three silcrete complete flakes, one silcrete proximal flake, one silcrete medial flake, three silcrete flaked pieces, two chert flaked pieces, and one quartz flaked piece, in a scatter measuring 192m x 31m. The artefacts were located within small, isolated exposures on either side of the graded quarry road within the gentle slopes landform. The exposures were likely created as a direct result of the construction of the road, which was cut into the landform in this area. The sandy deposits were brownish yellow in colour with grass cover and detritus allowing for up to 35% visibility within the limited exposures. The artefact scatter is located within a heavily disturbed context due to its association with the adjacent quarry road. The Aboriginal objects are likely to be remnant material that has been exposed in their present locations as a direct result of disturbances associated with the construction and continued use of the quarry haul road. Plate B-85 to Plate B-88 below provide a close up of the recorded artefacts as well as the location and visibility across the site.

Plate B-85 Close up view of the dorsal surface of the silcrete complete flake located at BCSF: Artefact Scatter 27.

Plate B-86 Close up view of the dorsal surface of a silcrete medial flake located at BCSF: Artefact Scatter 27. Note the different material from other silcrete artefacts across the site.

Plate B-87 Close up view of the dorsal surface of a quartz flaked piece located at BCSF: Artefact Scatter 27.

Plate B-88 View east over the quarry haul road and the associated small, isolated exposures located at BCSF: Artefact Scatter 27. Note that all artefacts recorded in this scatter were recorded on either side of the road shoulders.

Appendix C NGH Subsurface Excavation Spit Sheets

Appendix C NGH Subsurface Excavation Spit Sheets

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 1	1	Western pit of cluster	1	5	Dark brown sandy loam (fine-grained) with grass roots.	0
			2	10	As above, with some charcoal.	0
			3	15	As above.	0
			4	20	As above.	0
			5	25	As above, with some ironstone.	0
			6	30	Light yellow silty loam (medium-grained) with some ironstone and manganese, as well as grass roots.	0
			7	35	Light yellow silty loam with occasional grass roots.	0
			8	40	As above.	0
			9	45	Very light yellow loam with occasional grass roots.	0
			10	50	Yellow silty loam (coarse-grained) with occasional grass roots and manganese.	0
			11	55	Yellowish brown silty loam (coarse-grained).	0

Pit 1 Spit 11

Pit 1 Spit 11 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 1</td><td rowspan="6">2</td><td rowspan="6">Central pit of cluster</td><td>1</td><td>10</td><td>Dark brown sandy loam.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Light yellowish brown sandy to silty loam (fine-grained) with some grass roots.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Light yellowish-brown silty loam (fine-grained).</td><td>1</td></tr>
<tr><td>4</td><td>40</td><td>Yellowish orange silty loam (medium to coarse-grained) with small stone inclusions.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>Light yellow sandy to silty loam (fine-grained) with ironstone and occasional small roots.</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>Dark yellowish brown silty loam (fine-grained) to clay with iron stone.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 2 Spit 6</td><td colspan="2">

Pit 2 Spit 6 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 1	3	Northern pit of cluster	1	10	Dark brown sandy loam with frequent grass roots and occasional small charcoal flecks.	0
			2	20	As above; transitioning to light brown silty loam with occasional fine grass roots and charcoal flecks.	0
			3	30	Light brown silty loam with occasional fine grass roots, few charcoal fragments and occasional flecks of manganese.	0
			4	40	Light brown to yellow silt with fine grass roots, manganese and small ironstones.	0
			5	50	Pale yellowish brown silt with fine grass roots and ironstone fragments; transitioning to yellowish brown clay at base.	0
			6	60	Pale yellowish-brown clay with occasional fine grass roots, manganese and frequent ironstone fragments.	0
	 Pit 3 Spit 6				 Pit 3 Spit 6 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 1	4	Southern pit of cluster	1	10	Dark brown sandy loam with frequent grass roots and charcoal fragments.	0
			2	20	As above; transitioning to light brown silty loam with frequent grass roots and occasional small charcoal fragments.	0
			3	30	Pale brownish yellow silt with few grass roots and small charcoal fragments.	0
			4	40	Pale greyish brown silt (fine-grained), with few fine roots and few small ironstone fragments.	0
			5	50	Light greyish yellow silty loam to clay with occasional small charcoal fragments and few ironstone fragments.	0
			6	60	Yellowish brown clay (compact) with few fine roots, frequent ironstone fragments and occasional manganese flecks.	0
	 Pit 4 Spit 6				 Pit 4 Spit 6 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 1</td><td rowspan="6">5</td><td rowspan="6">Eastern pit of cluster</td><td>1</td><td>10</td><td>Dark greyish-brown humic sandy loam with frequent grass roots.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Pale brown sand with grass roots and few small charcoal fragments.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Light brown silty loam (coarse-grained) with few grass roots, small charcoal fragments and degraded ironstone staining.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Pale yellowish-brown silty loam (coarse-grained) with few grass roots and evidence of degraded ironstone staining.</td><td>1</td></tr>
<tr><td>5</td><td>50</td><td>Dark yellowish brown silty loam (coarse-grained) with few small manganese flecks present.</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>Yellowish brown silty clay (compact) with manganese flecks and heavy degraded ironstone staining.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 5 Spit 6</td><td colspan="2">

Pit 5 Spit 6 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 2	1	Central Pit	1	5	Light brown loamy sand (fine-grained) with very few grass roots and very few pebbles.	0
			2	10	Very light brown loamy sand with very few grass roots and very few pebbles.	0
			3	15	As above, with very few grass roots, very few pebbles and some orange clay mottling.	0
			4	20	Light brownish white loamy sand (fine-grained) with some pebbles and few black and brown mottling.	0
			5	25	Very light yellowish white sand with few pebbles and very few charcoal.	0
			6	30	As above, with some pebbles.	0
			7	35	As above.	0
			8	40	As above.	0
			9	45	As above.	0
			10	50	As above.	0
			11	55	Very light yellowish orange sandy clay with some gravel.	0
			12	60	As above.	0
			13	65	As above, with more gravel.	1
			14	70	As above, with clay content at 40%.	0

Pit 1 Spit 14

Pit 1 Spit 14 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 2	2	Northern Pit	1	10	Dark brown loamy sand (fine-grained) with very few grass roots, very few pebbles and some mottling.	0
			2	20	As above; transitioning to light brownish white silty sand with vey few grass roots, few dark brown loamy sand mottling, very few orange clay inclusions and decomposed root feature in NE corner.	0
			3	30	Light brownish white silty sand with very few dark brown loamy sand mottling, very few orange clay and decomposed root feature in NE corner.	0
			4	40	Light brownish white silty sand with very few dark brown loamy sand mottling and some gravel.	0
			5	50	As above; transitioning to mottled grey and orange clay with some gravel.	0
			6	55	Mottled grey and orange clay (loosely compacted) with some gravel; water table encountered.	0
	 Pit 2 Surface				 Pit 2 Spit 6 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="6">BCT Cluster 2</td><td rowspan="5">3</td><td rowspan="5">Western Pit</td><td>1</td><td>10</td><td>Dark grey loamy to silty sand (fine-grained) with few grass roots and few gravel; transitioning at base to light brown silty sand (fine-grained) with some dark grey to silty sand (fine-grained) mottling.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Light brown silty sand with very few grass roots, few gravel and very few silty sand (fine-grained) with some dark grey to silty sand (fine-grained) mottling.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>As above.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>Light brown silty sand with some gravel; water table encountered.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 3 Spit 5</td><td colspan="2">

Pit 3 Spit 5 Eastern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 2	4	Southern Pit	1	10	Dark grey loamy sand (fine-grained) with few grass roots, few gravel and light brown and white silty sand (fine-grained) mottling at base.	0
			2	20	Transitioning to light brown silty sand (fine-grained) with few grass roots, few gravel, some charcoal mottling and dark grey loamy sand (fine-grained) mottling.	0
			3	30	As above.	0
			4	40	Light brown silty sand (fine-grained) with few gravel, some charcoal mottling and dark grey loamy sand (fine-grained mottling).	0
			5	50	As above	0
			6	60	As above	0
			7	70	As above, with some orange clay mottling and decomposed root feature in NW corner at base.	0

Pit 4 Spit 7

Pit 4 Spit 7 Western wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 2	5	Eastern Pit	1	10	Light brown sand (fine-grained) with few grass roots; transitioning to light brown silty sand (fine-grained).	0
			2	20	Light brown silty sand (fine-grained) with very few grass roots and very few light brown sand (fine-grained) mottling.	0
			3	30	As above.	0
			4	40	Light brown silty sand (fine-grained) with few gravel.	0
			5	50	As above, with some dark grey sand mottling (possible decomposed root in NW corner).	0
			6	60	As above.	0

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 3	1	Central Pit	1	5	Dark brown loamy sand (fine-grained) with few grass roots, few gravel and very few charcoal inclusions.	0
			2	10	As above.	0
			3	15	As above; transitioning (at base) to light brown silty sand (coarse-grained) with very few charcoal inclusions as well as white and dark brown loamy sand mottling.	1
			4	20	Light brown silty sand (coarse-grained) with very few charcoal inclusions as well as white and dark brown loamy sand mottling.	5
			5	25	As above.	2
			6	30	As above.	5
			7	35	Light brown silty sand (coarse-grained) with very few charcoal inclusions as well as very few white and dark brown loamy sand mottling.	2
			8	40	As above.	0
			9	45	As above.	0
			10	50	As above.	0
			11	55	As above.	0
			12	60	As above.	0
			13	65	As above.	0

Pit 1 Spit 13

Pit 1 Spit 13 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 3	2	Northern pit of cluster	1	10	Dark brown humic sandy loam (slightly compacted) with frequent grass roots and occasional small charcoal fragments.	0
			2	20	Light greyish-brown silty loam (fine-grained; slightly compacted) with few grass roots and few small charcoal fragments.	0
			3	30	Pale yellowish-brown silty loam with few small ironstone fragments and degraded coffee rock staining.	1
			4	40	Pale yellow silt (slightly compacted) with few ironstone fragments and few coffee rock mottling.	2
			5	50	Yellowish brown silty clay loam (coarse-grained; slightly compacted) with few small charcoal fragments and degraded coffee rock staining.	0
			6	60	Yellowish brown silty clay with few small ironstone fragments and heavy coffee rock mottling.	0

Pit 2 Spit 6

Pit 2 Spit 6 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 3	3	Western pit of cluster	1	10	Dark brownish grey humic sandy loam with frequent grass roots.	0
			2	20	Pale yellowish brown silty loam (slightly compacted) with few grass roots and occasional small charcoal fragments.	0
			3	30	Pale yellowish brown silty loam (slightly compacted) with some ironstone and very few charcoal fragments.	1
			4	40	As above.	0
			5	50	Pale yellowish brown silty clay loam (compacted) with heavy degraded coffee rock mottling and manganese flecks.	0
			6	60	Yellowish brown silty clay (compacted) with heavy degraded coffee rock mottling and manganese flecks.	0
	 Pit 3 Spit 6				 Pit 3 Spit 6 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 3	4	Southern Pit	1	10	Dark brown loamy sand with few grass roots, very few gravel and some black loamy sand and charcoal mottling.	0
			2	20	As above; transitioning to black loamy sand (coarse-grained) with very few charcoal; transitioning (at c.16 cmbs) to mottled black loamy sand and light brown sand with very few ironstone and very few charcoal.	0
			3	30	Mottled black loamy sand and light brown sand with very few ironstone, very few gravel and very few charcoal.	2
			4	40	Light brown sand with very few ironstone, very few gravel and very few charcoal.	1
			5	50	As above.	0
			6	60	As above.	0
	 Pit 4 Spit 6				 Pit 4 Spit 6 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 3</td><td rowspan="6">5</td><td rowspan="6">Eastern pit of cluster</td><td>1</td><td>10</td><td>Dark brown sandy loam (very loosely compacted) with frequent grass roots and few small charcoal fragments.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Pale yellowish brown sandy silt with few grass roots and occasional small charcoal fragments.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>As above.</td><td>3</td></tr>
<tr><td>4</td><td>40</td><td>Yellowish brown silty loam (coarse-grained; compacted) with few small ironstone fragments.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>Dark yellowish brown silty clay loam with few grass roots and few degraded coffee rock mottling.</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>Dark yellowish brown silty clay with few ironstone fragments and heavy degraded coffee rock.</td><td>0</td></tr>
<tr><td colspan="4">Pit 5 Spit 6</td><td colspan="2">Pit 5 Spit 6 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 4	1	Central Pit	1	5	Dark loamy soil with organic matter, many grass roots and charcoal.	0
			2	10	Orange sandy soil (fine-grained) with some charcoal.	0
			3	15	Medium to dark orange sandy soil (fine-grained).	2
			4	20	Medium orange sandy soil (fine to medium-grained).	0
			5	25	As above, with some grass roots.	2
			6	30	Yellow to orange sand (fine to medium-grained) with grass roots.	2
			7	35	As above, with some small charcoal.	0
			8	45	Yellow to orange sand (fine to medium-grained), with possible organic decay feature at base.	0
			9	50	As above.	0
			10	55	As above, with new organic feature (possible root).	0

Pit 1 Spit 10

Pit 1 Spit 10 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 4	2	Northern Pit	1	10	Silty sandy loam with grass roots.	0
			2	20	As above, with streaks of vertical brown loam (possible disturbance).	0
			3	30	As above, with grass roots and possible disturbance continuing up to 25 cmbs.	0
			4	40	Yellow sand with very few grass roots.	0
			5	50	As above.	0
	 Pit 2 Spit 5				 Pit 2 Spit 5 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 4	3	Western Pit	1	10	Dark brown sandy loam with grass roots.	1
			2	20	Yellow sand.	2
			3	30	As above, with very few organic matter.	6
			4	40	Yellow sand with very few organic matter and charcoal.	0
			5	50	Yellow sand with pockets of bleached pale sand, organic matter and an old root remnant in the SW corner.	0
			6	60	Yellow sand with very few organic matter and charcoal.	0

Pit 3 Spit 6


Pit 3 Spit 6 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 4	4	Southern Pit	1	10	Dark brown silty sand with organic matter and many grass roots.	0
			2	20	Brownish yellow sand (medium-grained) with some charcoal.	0
			3	30	As above.	0
			4	40	As above.	1
			5	50	As above.	0
			6	60	As above.	0
	 Pit 4 Spit 6				 Pit 4 Spit 6 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 4	5	Eastern Pit	1	10	Dark brown humic silty sand (fine to medium-grained) with some grass roots.	0
			2	20	As above; transitioning to dark brownish yellow sand (medium grained) with some grass roots.	1
			3	30	Brownish yellow to yellow sand with some roots and charcoal.	0
			4	40	As above.	2
			5	50	Yellow sand (medium-grained) with large charcoal fragments and one thing long root.	0
			6	60	As above; transitioning to brownish grey stained sand with one clay nodule.	0
			7	70	Brownish grey stained sand (compacted) with clay nodules and yellow sand mottling around feature.	0
			8	80	Brownish grey stained sand (compacted) with clay nodules.	0
			9	90	Brownish yellow sand.	0


Pit 5 Spit 9


Pit 5 Spit 9 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 5	1	Central pit of cluster	1	5	Dark brown sandy loam (compacted) with frequent grass roots.	0
			2	10	Dark brown sandy loam with few fine roots and very few small charcoal fragments.	0
			3	15	Pale mottled grey and brown silty clay loam with very few charcoal fragments.	0
			4	20	Pale mottled grey and brown silty clay (compacted) loam with few grass roots.	0
			5	25	Mottled grey and brown silty clay (compacted) with few grass roots and occasional charcoal fragments.	0
			6	30	Greyish brown clay (compacted) with few grass roots and some manganese flecks.	0

Pit 1 Spit 6

Pit 1 Spit 6 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 5	2	Northern pit of cluster	1	10	Dark brown silty loam (compacted) with frequent grass roots and few charcoal flecks.	0
			2	20	Pale greyish brown silty clay loam with some grass roots and very few small charcoal fragments.	0
			3	30	Pale brown silty clay (compacted) with frequent gravel including ironstone fragments.	0
			4	35	Brown clay with red mottling, grass roots and few ironstone fragments.	0

Pit 2 Spit 4

Pit 2 Spit 4 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 5	3	Western pit of cluster	1	10	Dark brown sandy loam with frequent grass roots.	0
			2	20	Pale greyish brown silty clay loam with few grass roots and few charcoal fragments.	0
			3	30	Pale greyish brown silty clay (compacted) with few small ironstone fragments.	0
			4	40	Dark reddish brown clay (very compacted) with few grass roots and frequent ironstone fragments.	0
	 Pit 3 Spit 4				 Pit 3 Spit 4 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">BCT Cluster 5</td><td rowspan="4">4</td><td rowspan="4">Southern Pit</td><td>1</td><td>10</td><td>Dark brown loamy to clayey soil with grass roots.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Silty sand mottled with dark brown loam with some clay inclusions, few grass roots and one stone.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>As above.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>As above; transitioning to orange clay mottled with dark brown silt.</td><td>0</td></tr>
<tr><td colspan="4">Pit 4 Spit 4</td><td colspan="2">Pit 4 Spit 4 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">BCT Cluster 5</td><td rowspan="4">5</td><td rowspan="4">Eastern pit of cluster</td><td>1</td><td>10</td><td>Dark greyish brown sandy loam with frequent grass roots and bioturbation.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Pale greyish brown with dark greyish brown sandy loam mottling, few grass roots and few small charcoal fragments.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Pale greyish brown with dark greyish brown sandy loam mottling and few grass roots.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Reddish brown clay (compacted) with few small ironstone fragments and occasional charcoal fragments.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 5 Spit 4</td><td colspan="2">
Pit 5 Spit 4 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 6	1	Central pit of cluster	1	5	Dark brown sandy loam with frequent grass roots and few charcoal fragments.	0
			2	10	Dark brown sandy loam with frequent grass roots and occasional charcoal flecks.	0
			3	15	Pale greyish brown silty loam with occasional grass roots.	1
			4	20	Pale greyish brown silt with few grass roots.	0
			5	25	Pale brown silt with occasional grass roots.	0
			6	30	As above, with manganese flecks.	0
			7	35	As above.	0
			8	40	Pale yellowish brown sandy silt with manganese flecks.	0
			9	45	Pale brown silt with manganese flecks.	0
			10	50	As above.	3
			11	55	As above.	1
			12	60	As above.	1
			13	65	Pale brown silt (very fine-grained).	0
			14	70	Pale brown silt (very fine-grained) with manganese flecks.	0
			15	75	As above.	0
			16	80	As above.	1
			17	85	As above.	1
			18	90	As above.	0
			19	95	As above, with large clay inclusions.	1
			20	100	As above.	0

Pit 1 Spit 20

Pit 1 Spit 20 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 6	2	Northern pit of cluster	1	10	Light brown loamy sand (fine-grained) with few grass roots.	0
			2	20	As above; transitioning to light brown silty sand (fine-grained) with very few grass roots and some large charcoal fragments.	0
			3	30	Light brown silty sand (fine-grained) with small feature with charcoal in NE corner.	0
			4	40	Pale brown silt.	1
			5	50	As above, with manganese flecks.	1
			6	60	As above, with few grass roots.	0
			7	70	As above.	0
			8	80	Pale brown silt with manganese flecks.	0
			9	90	As above.	0
			10	100	As above, with degraded coffee rock staining.	0

Pit 2 Spit 10


Pit 2 Spit 10 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 6	3	Northern pit of cluster	1	10	Dark brown sandy loam with frequent grass roots and few charcoal fragments.	4
			2	20	Pale brown silt with occasional small charcoal fragments.	0
			3	30	Light brown silt with few small charcoal fragments.	0
			4	40	Pale grey silt with manganese fleck.	0
			5	50	Pale brown silt with few fine roots and frequent manganese flecks.	7
			6	60	Pale brownish grey silt with few fine roots and manganese flecks.	0
			7	70	Pale brown silt with manganese flecks.	0
			8	80	Brownish grey silt with manganese flecks.	0
			9	90	Brownish grey silt with few small charcoal fragments and frequent manganese flecks.	0
			10	100	Brownish grey silt with manganese flecks and degraded coffee rock staining at base.	0
	 Pit 3 Spit 10				 Pit 3 Spit 10 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 6	4	Northern pit of cluster	1	10	Light brown sand (fine-grained) with grass roots.	0
			2	20	As above; transitioning to light brown silty sand (fine-grained) with faint black mottling and faded coffee rock as well as grass roots.	2
			3	30	Light brown silty sand (fine-grained) with coffee rock mottling and grass roots.	0
			4	40	As above.	0
			5	50	As above.	0
			6	60	Light brown silty sand (fine-grained) with coffee rock mottling, grass roots and manganese flecks.	0
			7	70	As above.	0
			8	80	Light brown silty sand (fine-grained) with very few coffee rock mottling.	0
			9	90	As above.	0
			10	100	As above.	0

Pit 4 Spit 10

Pit 4 Spit 10 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 6	5	Eastern pit of cluster	1	10	Dark brown sandy loam with frequent grass roots and frequent charcoal fragments.	0
			2	20	Dark greyish brown sandy loam with heavy charcoal concentration (possibly burnt tree roots).	0
			3	30	As above; with few grass roots.	1
			4	40	Pale brown silt with few charcoal fragments.	1
			5	50	Pale brown silt with occasional charcoal fragments.	1
			6	60	Pale brown silt with very few charcoal fragments and few grass roots.	0
			7	70	Pale brown silt with occasional charcoal fragments and manganese flecks.	3
			8	80	Pale brownish yellow silt with manganese flecks.	0
			9	90	Yellowish brown silt with greyish brown silt mottling and frequent manganese.	0
			10	100	Yellowish brown silt with degraded coffee rock staining.	0

Pit 5 Spit 10

Pit 5 Spit 10 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="11">BCT Cluster 7</td><td rowspan="10">1</td><td rowspan="10">Western Pit</td><td>1</td><td>5</td><td>Brown soil (fine-grained).</td><td>0</td></tr>
<tr><td>2</td><td>10</td><td>Light brown soil (fine-grained) with organic matter, grass roots and some charcoal; transitioning to light brown sand.</td><td>0</td></tr>
<tr><td>3</td><td>15</td><td>Light brown silty sand (fine-grained) with charcoal fragments.</td><td>0</td></tr>
<tr><td>4</td><td>20</td><td>Very light brown silty sand (fine-grained).</td><td>0</td></tr>
<tr><td>5</td><td>25</td><td>As above.</td><td>0</td></tr>
<tr><td>6</td><td>30</td><td>Very light brown silty sand (fine-grained) with root intrusion.</td><td>0</td></tr>
<tr><td>7</td><td>35</td><td>Very light brown to yellow silty sand (fine-grained).</td><td>0</td></tr>
<tr><td>8</td><td>40</td><td>As above, with gravel and pebbles.</td><td>0</td></tr>
<tr><td>9</td><td>45</td><td>Very light brown to yellow silty sand (fine-grained) with some organic matter and grass roots.</td><td>0</td></tr>
<tr><td>10</td><td>50</td><td>As above.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 1 Spit 10</td><td colspan="2">
Pit 1 Spit 10 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 7	2	Central Pit	1	10	Dark brown soil with grass roots.	0
			2	20	Light brown sand (fine-grained) with charcoal.	0
			3	30	Light brown sand (fine-grained).	1
			4	40	Pale yellow sand (fine-grained).	0
			5	50	As above.	0
	 Pit 2 Spit 5				 Pit 2 Spit 5 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 7	3	Northern Pit	1	10	Brown silty to sandy loam (fine-grained) with grass roots.	1
			2	20	Light brown silty sand (fine-grained) with small charcoal cluster (eastern section).	0
			3	30	Yellow silty sand (fine-grained).	5
			4	40	Yellow silty sand (fine-grained).	2
			5	50	Yellowish orange sand (fine-grained; compacted).	0
			6	60	As above.	0

Pit 3 Spit 6

Pit 3 Spit 6 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">BCT Cluster 7</td><td rowspan="4">4</td><td rowspan="4">Eastern Pit</td><td>1</td><td>10</td><td>Dark brown loamy sandy soil (medium to fine-grained) with charcoal.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above; transitioning to light brown sand (fine-grained; at 15cmbs).</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Light brown sand (fine-grained; compacted) with few charcoal.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Light brown sand (fine-grained; compacted).</td><td>0</td></tr>
<tr><td colspan="4">
Pit 4 Spit 10</td><td colspan="2">
Pit 4 Spit 10 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="6">BCT Cluster 7</td><td rowspan="5">5</td><td rowspan="5">Southern Pit</td><td>1</td><td>10</td><td>Brown silty sand with few grass roots as well as some quartz and other pebbles.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Light brown humic sand.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Yellow sand with few organic matter.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Yellow sand with few organic matter and very few pebbles.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>As above.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 5 Spit 5</td><td colspan="2">
Pit 5 Spit 5 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 8	1	Central	1	10	Dark brown loamy sand with many grass roots and few gravel.	2
			2	20	Yellowish brown sandy loam with some grass roots and few gravel.	14
			3	30	As above.	30
			4	40	As above.	7
			5	50	Yellowish brown sandy loam with some grass roots.	4
			6	60	As above.	0
			7	70	As above, with diagonal linear charcoal feature across SE corner.	0
			8	80	Pale yellow sand (fine-grained).	0

Pit 1 Spit 8

Pit 1 Spit 8 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 8	2	North	1	5	Dark brown loamy sand with many grass roots and rhizomes.	0
			2	10	Dark brown loamy sand with some grass roots and rhizomes.	0
			3	15	As above.	0
			4	20	Yellowish brown sandy loam.	0
			5	25	As above.	2
			6	30	As above.	1
			7	35	As above.	0
			8	40	As above.	4
			9	45	As above.	0
			10	50	As above.	0
			11	55	As above.	0
			12	60	As above.	0

Pit 2 Spit 12

Pit 2 Spit 12 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 8</td><td rowspan="6">3</td><td rowspan="6">West</td><td>1</td><td>10</td><td>Brown sandy loam with grass roots.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Yellow sand (fine-grained).</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>As above, with some quartz inclusions.</td><td>8</td></tr>
<tr><td>4</td><td>40</td><td>Yellow sand (fine-grained).</td><td>4</td></tr>
<tr><td>5</td><td>50</td><td>As above, with dark green rocks (fine-grained).</td><td>3</td></tr>
<tr><td>6</td><td>60</td><td>As above.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 3 Spit 6</td><td colspan="2">
Pit 3 Spit 6 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 8</td><td rowspan="6">4</td><td rowspan="6">South</td><td>1</td><td>10</td><td>Light brown loamy sand with many grass roots.</td><td>6</td></tr>
<tr><td>2</td><td>20</td><td>Yellow sand (fine-grained).</td><td>7</td></tr>
<tr><td>3</td><td>30</td><td>As above, with some organic matter and gravel.</td><td>4</td></tr>
<tr><td>4</td><td>40</td><td>Yellow sand (fine-grained).</td><td>15</td></tr>
<tr><td>5</td><td>50</td><td>As above.</td><td>1</td></tr>
<tr><td>6</td><td>60</td><td>As above.</td><td>2</td></tr>
<tr><td colspan="4">
Pit 4 Spit 6</td><td colspan="2">
Pit 4 Spit 6 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 8	5	East	1	10	Dark brown loamy sand with many grass roots.	0
			2	20	Yellowish grey sandy loam with many grass roots.	0
			3	30	Pale yellow sand (fine-grained).	8
			4	40	As above.	4
			5	50	As above.	3
			6	60	As above.	0
			7	70	As above.	0
			8	80	As above.	0

Pit 5 Spit 8

Pit 5 Spit 8 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 9	2	Northern Pit	1	10	Dark brown loam with grass roots; transitions to brown loamy silty clay with few gravel and some large rocks.	0
			2	20	Brown loamy silty clay with reddish purple mottling, many gravel and large rocks as well as some charcoal.	0
			3	30	Light brown loamy silty clay with reddish purple mottling, few gravel and large rocks.	2
			4	40	As above.	0
			5	53	As above; water table reached at base (west).	0
	 Pit 2 Spit 5				 Pit 2 Spit 5 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 9	3	Western Pit	1	10	Dark brown sandy loam with frequent grass roots and occasional charcoal fragments.	0
			2	20	Pale yellowish brown silt with few grass roots.	0
			3	30	Light yellowish brown silt with few pebbles and cobbles.	0
			4	40	Light yellowish brown silt with frequent pebbles and cobbles as well as occasional charcoal fragments; water table encountered.	0
	 Pit 3 Spit 4				 Pit 3 Spit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 9	4	Southern Pit	1	10	Dark greyish brown humic sandy loam with frequent grass roots and few charcoal fragments.	0
			2	20	As above; transitioning to yellowish brown silt with few grass roots.	0
			3	30	Dark yellowish brown sandy silt with frequent gravel.	0
			4	40	Dark yellowish-brown silty clay with frequent gravel as well as some pebbles and cobbles.	1
			5	50	As above; water table encountered.	1
	 Pit 4 Spit 5				 Pit 4 Spit 5 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="4">BCT Cluster 9</td><td rowspan="3">5</td><td rowspan="3">Eastern Pit</td><td>1</td><td>10</td><td>Dark brown sandy loam topsoil with frequent grass roots and few cobbles.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Light brown silt with few grass roots and few charcoal fragments.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Light brown silt with frequent pebbles and cobbles; bedrock encountered at base.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 5 Spit 3</td><td colspan="2">
Pit 5 Spit 3 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 10	1	Western Pit	1	5	Dark brown soil (fine-grained).	1
			2	10	Pale yellowish brown sand (fine-grained) with charcoal fragments.	2
			3	15	Pale brownish yellow sand (fine-grained) with charcoal fragments.	1
			4	20	As above.	2
			5	25	Pale brownish yellow sand (medium-grained) with few gravel.	0
			6	30	As above.	0
			7	35	As above, with orange clay mottling at southwest corner.	0
			8	40	Pale brownish yellow sand with orange clay mottling.	0

Pit 1 Spit 8

Pit 1 Spit 8 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="6">BCT Cluster 10</td><td rowspan="5">2</td><td rowspan="5">Central Pit</td><td>1</td><td>10</td><td>Light brown soil.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Light brown sand (fine-grained) with some pebbles and diagonal feature at base (possible trench).</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Light brown sand (fine-grained) with some pebbles.</td><td>3</td></tr>
<tr><td>4</td><td>40</td><td>Light brown sand (fine-grained) with some pebbles and orange oxide mottling at base.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>Light brown sand (fine-grained) with orange oxide mottling.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 2 Spit 5</td><td colspan="2">
Pit 2 Spit 5 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 10	3	Northern Pit	1	10	Dark brown soil.	0
			2	20	Light brown sandy silt (fine-grained).	2
			3	30	As above.	2
			4	40	As above.	4
			5	50	As above, with orange oxide mottling at NW corner.	1

Pit 3 Spit 5

Pit 3 Spit 5 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 10	4	Eastern Pit	1	10	Dark brown silty to sandy loam with few grass roots.	0
			2	20	Brown silty sand with very few grass roots.	3
			3	30	Yellow sand (medium-grained) with some organic content, very few gras roots and occasional charcoal specks.	14
			4	40	As above, with few gravel and pebbles.	6
			5	50	As above, with orange clayey sand mottling at base.	1
			6	60	As above.	0
	 Pit 4 Spit 6				 Pit 4 Spit 6 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="8">BCT Cluster 10</td><td rowspan="7">5</td><td rowspan="7">Southern Pit</td><td>1</td><td>10</td><td>Dark brown silty sandy loam (fine-grained) with grass roots and few gravel.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Brown to light brown silty sand with very few grass roots.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Yellow to light yellow sand (fine to medium-grained) with few gravel and pebbles.</td><td>2</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>2</td></tr>
<tr><td>5</td><td>50</td><td>As above, with organic and charcoal feature at NE corner, and orange sandy clay at southern half (west section left unexcavated)</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>As above.</td><td>0</td></tr>
<tr><td>7</td><td>65</td><td>As above.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 5 Spit 7</td><td colspan="2">
Pit 5 Spit 7 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 11	1	Central Pit	1	5	Dark brown loamy sand with many grass roots and some charcoal.	0
			2	10	As above.	0
			3	15	Dark brown sandy loam with some grass roots.	2
			4	20	Light brownish yellow sand with some grass roots.	3
			5	25	As above.	2
			6	30	As above.	4
			7	35	As above.	2
			8	40	As above.	0
			9	45	As above.	0
			10	50	As above.	0
			11	55	As above, with orange yellow clay at base.	0


Pit 1 Spit 11


Pit 1 Spit 11 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 11	2	Northern Pit	1	10	Dark brown loamy sand with many grass roots.	0
			2	20	Pale yellowish grey sandy loam with some grass roots.	0
			3	30	Pale yellow sand (fine-grained).	0
			4	40	As above.	0
			5	50	As above.	0
	 Pit 2 Spit 5				 Pit 2 Spit 5 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 11	3	Eastern Pit	1	10	Dark brown loamy sand with grass roots.	0
			2	20	As above.	0
			3	30	Pale yellow sand (fine-grained).	6
			4	40	As above.	0
			5	50	Pale yellow sandy clay.	0
	 Pit 3 Spit 5				 Pit 3 Spit 5 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 11	4	Southern Pit	1	10	Dark brown loamy sand.	0
			2	20	As above.	0
			3	30	Pale yellow grey sand with charcoal concentrations.	0
			4	40	Pale yellow grey sand.	0
			5	50	As above.	0
			6	60	Pale yellow grey sand with some gravel.	0


Pit 4 Spit 6


Pit 4 Spit 6 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 11	5	Western Pit	1	10	Dark brown loamy sand with many grass roots, few gravel and pebbles as well as some charcoal.	0
			2	20	As above.	0
			3	30	Pale yellow sand (fine-grained) with some gravel and pebbles.	0
			4	40	Pale yellow sand (fine-grained).	0
			5	50	As above, with orange clay mottling at base.	0


Pit 5 Spit 5


Pit 5 Spit 5 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 12	1	Eastern Pit	1	5	Brown soil (medium to coarse-grained) with organic matter.	0
			2	10	Brownish orange soil (medium to coarse-grained) with very few pebbles.	0
			3	15	Orange soil (medium to coarse-grained) with very few pebbles.	0
			4	20	As above.	0
			5	25	As above, with circular feature (possibly organic) at base.	0
			6	30	As above; circular feature (possibly organic) terminates at base.	0
			7	35	Orange soil (coarse-grained) with many gravel and pebbles (rounded; possibly river pebbles).	0
			8	40	Orange soil (very coarse-grained) with many gravel and pebbles.	0

Pit 1 Spit 8

Pit 1 Spit 8 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">BCT Cluster 12</td><td rowspan="4">2</td><td rowspan="4">Central Pit</td><td>1</td><td>10</td><td>Dark brown soil (medium to coarse-grained).</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Brownish orange soil with pebbles.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>As above.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Orange brown soil (very coarse-grained) with many gavel and pebbles.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 2 Spit 4</td><td colspan="2">
Pit 2 Spit 4 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 12	3	Northern Pit	1	10	Dark brown silty sand (medium-grained) with few organic matter, few grass roots and very few pebbles.	1
			2	20	Light brown sand with few organic matter and very few gravel.	0
			3	30	Orange brown soil (medium to coarse-grained) with pebbles.	0
			4	40	Orange brown soil (medium to coarse-grained).	0

Pit 3 Spit 4

Pit 3 Spit 4 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="4">BCT Cluster 12</td><td rowspan="3">4</td><td rowspan="3">Southern Pit</td><td>1</td><td>10</td><td>Greyish brown silty sand with very few grass roots and very few gravel; transitioning to orange sand (coarse-grained) at base.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Orange sand (coarse-grained) with few gravel.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Orange red sand (coarse-grained) with few gravel.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 4 Spit 3</td><td colspan="2">
Pit 4 Spit 3 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 12</td><td rowspan="6">5</td><td rowspan="6">Western Pit</td><td>1</td><td>10</td><td>Brown soil (fine-grained) with grass roots.</td><td>1</td></tr>
<tr><td>2</td><td>20</td><td>Yellowish brown soil with dark brown soil along eastern edge; transitioning to yellow silty soil.</td><td>1</td></tr>
<tr><td>3</td><td>30</td><td>Light yellow soil (fine-grained) with dark brown feature in the middle.</td><td>1</td></tr>
<tr><td>4</td><td>40</td><td>Yellowish brown soil (medium-grained) with orange mottling, some pebbles, and dark brown feature in the middle (possibly decomposing or burnt tree root).</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>Yellowish orange soil (coarse-grained) with many pebbles.</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>Light yellow sand (medium to coarse-grained) with orange clay mottling and high frequency of pebbles.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 5 Spit 6</td><td colspan="2">
Pit 5 Spit 6 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 13	1	Central Pit	1	5	Dark brown fine sandy loam. Rootlets from grass and vegetation above. No gravels. Very little moisture. Some compaction from roots and stock.	0
			2	10	As above transitioning to a light brown slightly loamy fine sand. Increasing moisture. No gravels. Rootlets present. Some compaction. Increasing gravels (<5mm, <1%)(slightly)	0
			3	15	Light brown slightly loamy fine sand as above. Similar gravels (<5mm, <1%). Moisture increasing (fairly wet).	0
			4	20	As above. Similar gravels (<5mm, <1%). Moisture increasing.	0
			5	25	As above transitioning into a mottled clay (charcoal fleks <1%).	0
			6	30	As above	0
			7	35	As above	0
			8	40	As above	0

Pit 1 Spit 4

Pit 1 Spit 4 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">BCT Cluster 13</td><td rowspan="4">2</td><td rowspan="4">Northern Pit</td><td>1</td><td>10</td><td>Dark brown sandy loam, dry and loose compaction. Frequent grass roots. No other inclusions present. (A1 horizon)</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Pale yellowish-brown silt, loose compaction and dry in texture. Few fine roots. No other inclusions.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Compact yellow-brown silty clay transitioning into a compact dark yellowish-brown clay (B horizon). Few fine roots. Few small manganese pieces.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Continuation of compact yellowish-brown clay, slightly damp. Thick roots present. Occasional small ironstone fragments also within matrix. Stop excavation.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 2 Spit 4</td><td colspan="2">

Pit 2 Spit 4 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 13	3	Western Pit	1	10	Brown clay loam with many grass roots. No gravel.	0
			2	20	Brown clay loam. No gravel.	0
			3	30	Yellowish grey clay loam. No gravel.	0
	 Pit 3 Spit 4				 Pit 3 Spit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 13	4	Southern Pit	1	10	Dark brown sandy loam topsoil (A1 horizon). Soil is loosely impacted and slightly damp. Frequent grass roots. High gravel content.	0
			2	20	Pale yellowish-brown silty loam, slightly compact and slightly damp. Few fine roots. Few small quartz pebbles present.	0
			3	30	Dark yellowish-brown silty clay, compact and slightly damp. Few fine roots. Few small cobble stones present.	0
			4	40	Dark yellowish0brown mottled clay (B horizon). Few fine roots. No other inclusions. Stopped excavations.	0
	 Pit 4 Spit 4				 Pit 4 Spit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 13	5	Eastern Pit	1	10	Dark brown loam with many grass roots and some charcoal.	0
			2	20	Dark brown loam with some charcoal.	0
			3	30	Dark brown clay loam with high frequency of charcoal; transitioning to pale yellow sandy clay.	0

Pit 5 Spit 3

Pit 5 Spit 3 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 14	1	Easting 723636 Northing 6105716	1	5	Medium to dark greyish brown humic sand.	0
			2	10	As above; transitioning to mottled pale yellow grey sand with quartz gravel.	0
			3	15	Mottled pale yellow grey sand with quartz gravel.	0
			4	20	As above; transitioning to mottled dark yellow and pale grey clay.	0

Pit 1 Surface

Pit 1 Spit 4 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 14	2	Easting 723636	1	10	Medium to dark greyish brown coarse sand with yellowish mottling at base.	0

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="3"></td><td rowspan="2"></td><td rowspan="2"></td><td>2</td><td>20</td><td>As above; transitioning to pale to medium yellow mottled sand with gravel.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Pale to medium yellow mottled sand with grave; transitioning to mottled grey and yellow sandy clay and clay.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 2 Surface</td><td colspan="2">
Pit 2 Spit 3 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="3">BCT Cluster 14</td><td rowspan="2">3</td><td rowspan="2">Easting 723640

Northing 6105735</td><td>1</td><td>10</td><td>Medium to dark greyish brown fine humic sand; transitioning to slightly mottled coarser grey brown sand.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Mottled grey sand with gravel; transitioning to mottled yellow grey clay at base.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 3 Surface</td><td colspan="2">

Pit 3 Spit 2 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 14	4	Easting 723646 Northing 6105723	1	10	Medium to dark greyish brown humic sand with pale yellowish grey mottling at base; transitioning to 'clean' pale yellowish grey sand.	0
			2	20	'Clean' pale yellowish grey sand with some bioturbation mottling which extends into the lower spits at points; transitioning to medium greyish brown sand with pebbles (highly compacted) with pockets of orange sand and sand nodules.	0
			3	30	Medium greyish brown sand with pebbles (highly compacted) with pockets of orange sand and sand nodules, and 'clean' pale yellowish grey sand with some bioturbation mottling extending from upper levels at points.	0
			4	35	As above; transitioning to mottled grey and orange clay and sandy clay (compact).	0
	 Pit 4 Surface				 Pit 4 Spit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 14	5	Easting 723629 Northing 6105730	1	10	Medium to dark greyish brown humic sand.	0
			2	15	As above; transitioning to yellow, grey and brown mottled and mixed sand as well as yellow and grey sandy clay (compact).	0
	 Pit 5 Surface				 Pit 5 Spit 2 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="6">BCT Cluster 15</td><td rowspan="5">1</td><td rowspan="5">Easting 728115

Northing 6102467</td><td>1</td><td>10</td><td>Medium to dark grey brown humic sand with mottling at base; transitioning to ‘clean’ pale grey fine sand with occasional patches of orange mottling.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>‘Clean’ pale grey fine sand with occasional patches of orange mottling.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>As above; transitioning to ‘clean’ dark yellowish orange fine sand.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>‘Clean’ dark yellowish orange fine sand.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>As above; transitioning to orange sandy clay with veins of pale grey sand.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 1 Spit 5</td><td colspan="2">

Pit 1 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 15	2	Easting 728108 Northing 6102472	1	10	Medium greyish brown sand with some root mixing.	0
			2	20	As above; transitioning to mottled yellow and grey sand with some root mixing.	3
			3	30	Mottled yellow and grey sand with some root mixing; transitioning to 'clean' pale yellowish grey fine sand.	3
			4	40	'Clean' pale yellowish grey fine sand.	1
			5	50	As above.	3
			6	60	As above; transitioning to mottled grey and orange sandy clay.	0

Pit 2 Spit 6

Pit 2 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 15</td><td rowspan="6">3</td><td rowspan="6">Easting 728107

Northing 6102459</td><td>1</td><td>10</td><td>Medium grey fine sand.</td><td>1</td></tr>
<tr><td>2</td><td>20</td><td>As above; transitioning to pale yellowish grey fine sand with bioturbation.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Pale yellowish grey fine sand with bioturbation; transitioning to ‘clean’ yellow fine sand.</td><td>27</td></tr>
<tr><td>4</td><td>40</td><td>‘Clean’ yellow fine sand.</td><td>1</td></tr>
<tr><td>5</td><td>50</td><td>As above.</td><td>1</td></tr>
<tr><td>6</td><td>60</td><td>As above; transitioning to orange sand with occasional broken rock fragments; water table reached at base.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 3 Spit 6</td><td colspan="2">

Pit 3 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 15	4	Easting 728119 Northing 6102457	1	10	Mixed medium grey and brown fine sand; transitioning to pale yellow grey mottled fine sand.	0
			2	20	Pale yellow grey mottled fine sand; transitioning to pale grey fine sand.	0
			3	30	Pale grey fine sand; transitioning to 'clean' yellow fine sand.	0
			4	40	'Clean' dark yellowish orange fine sand.	1
			5	45	'Clean' dark yellowish orange fine sand; transitioning to orange clay with veins of 'clean' dark yellowish orange fine sand.	0
	 Pit 4 Spit 5				 Pit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 15	5	Easting 728119 Northing 6102469	1	5	Mixed pale grey, yellowish grey and pale brown sand with pebbles.	0
			2	10	As above.	2
			3	15	As above.	1
			4	20	As above.	0
			5	25	'Clean' pale to medium yellow sand, and mixed pale grey, yellowish grey and pale brown sand with pebbles intrusion from previous layer.	0
			6	30	As above.	0
			7	35	As above.	0
			8	40	'Clean' pale to medium yellow sand.	0
			9	45	As above.	0
			10	50	As above, with some dark orange motting; transitioning to dark orange sand (semi-cemented) with black cemented sandy nodules (possibly manganese).	0
			11	55	Dark orange sand (semi-cemented) with black cemented sandy nodules (possibly manganese).	0
			12	60	As above.	0
			13	65	As above.	0
			14	70	As above.	0
			15	75	As above; transitioning to dark orange sand and yellow mottled sand.	0
			16	80	Dark orange sand and yellow mottled sand.	0

Pit 1 Spit 16

Pit 1 Spit 16 Eastern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Cluster 16	1	Central Pit	1	5	Medium yellowish brown coarse sand.	0
			2	10	As above.	0
			3	15	As above, with mottling and bioturbation at interface with next layer; transitioning to 'clean' yellow sand.	0
			4	20	'Clean' yellow sand.	2
			5	25	As above.	0
			6	30	As above.	0
			7	35	As above.	0
			8	40	As above.	0
			9	45	As above.	0
			10	50	As above.	0
			11	55	As above.	0
			12	60	As above.	0
			13	65	As above.	0
			14	70	As above.	0
			15	75	As above.	0
			16	80	As above, with grey and orange mottling.	0
	 Pit 1 Surface				 Pit 1 Spit 16 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="9">BCT Cluster 16</td><td rowspan="8">2</td><td rowspan="8">Northern Pit</td><td>1</td><td>10</td><td>Medium yellowish brown coarse sand.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above, with mottling and bioturbation at interface with next layer; transitioning to ‘clean’ yellow sand.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>‘Clean’ yellow sand.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>2</td></tr>
<tr><td>5</td><td>50</td><td>As above.</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>As above.</td><td>0</td></tr>
<tr><td>7</td><td>70</td><td>As above, with more grey and orange mottling.</td><td>0</td></tr>
<tr><td>8</td><td>80</td><td>As above; water table reached at base.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 2 Spit 8</td><td colspan="2">
Pit 2 Spit 8 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 16</td><td rowspan="6">3</td><td rowspan="6">Western Pit</td><td>1</td><td>10</td><td>Yellowish brown coarse sand</td><td>1</td></tr>
<tr><td>2</td><td>20</td><td>As above, with pale yellow mottling at base of layer; transitioning to yellow sand, with extensive root and rootlet penetration with associated mixing to base of excavation</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Yellow sand, with extensive root and rootlet penetration with associated mixing to base of excavation.</td><td>1</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>As above.</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>As above.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 3 Surface</td><td colspan="2">

Pit 3 Spit 6 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">BCT Cluster 16</td><td rowspan="6">4</td><td rowspan="6">Southern Pit</td><td>1</td><td>10</td><td>Yellowish brown sand with occasional charcoal fragments</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above; transitioning to yellow sand, with pockets and seams of humic, darker sand possibly due to introduction and mixing by tree roots.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Yellow sand with pockets and seams of humic, darker sand possibly due to introduction and mixing by tree roots.</td><td>1</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>As above.</td><td>1</td></tr>
<tr><td>6</td><td>60</td><td>As above.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 4 Spit 6</td><td colspan="2">

Pit 4 Spit 6 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="9">BCT Cluster 16</td><td rowspan="8">5</td><td rowspan="8">Eastern Pit</td><td>1</td><td>10</td><td>Medium yellowish brown coarse sand.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above, with bioturbation motting at base of layer; transitioning to yellow sand.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Yellow sand.</td><td>1</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>3</td></tr>
<tr><td>5</td><td>50</td><td>As above; transitioning to slightly darker yellow sand (possibly due to moisture).</td><td>7</td></tr>
<tr><td>6</td><td>60</td><td>Slightly darker yellow sand (possibly due to moisture).</td><td>2</td></tr>
<tr><td>7</td><td>70</td><td>As above.</td><td>1</td></tr>
<tr><td>8</td><td>80</td><td>As above; transitioning to yellow sand with dark orange mottling; water table reached at base.</td><td>0</td></tr>
<tr><td colspan="4">Pit 5 Spit 8</td><td colspan="2">Pit 5 Spit 8 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 1	1	-	1	5	Brown sandy loam with some organic matter.	0
			2	10	As above.	0
			3	15	Yellowish grey sand.	0
			4	20	Yellowish grey sand with charcoal feature at centre.	0
			5	25	Pale yellow sand.	0
			6	30	As above, with some clay at NE corner.	4
			7	35	Pale yellow sand with some quartz inclusions.	2
			8	40	Pale yellow sand with some quartz and ironstone inclusions.	0
			9	45	As above.	0
			10	50	As above.	0
			11	55	As above.	0
			12	60	As above.	0

Pit 1 Spit 12

Pit 1 Spit 12 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 1	2	-	1	10	Dark brown sandy loam; transitioning to pale yellow sand (at 8 cmbs).	0
			2	20	Pale yellow sand with brown loam mottling.	0
			3	30	Pale yellow sand with few quartz gravel.	0
			4	40	As above.	0
			5	50	Pale yellow sand.	0
			6	60	As above, with layer of quartz inclusions lying on grey clay at base.	0
	 Pit 2 Spit 6				 Pit 2 Spit 6 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 1	3	-	1	10	Dark brown loamy sand with some quartz pebbles.	0
			2	20	Greyish yellow sandy clay with some quartz pebbles.	0
			3	30	As above.	0
			4	40	As above; orange clay at base.	0
	 Pit 3 Spit 4				 Pit 3 Spit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 1	4	-	1	10	Dark brown clay loam	0
			2	20	As above.	0
			3	30	As above; water table encountered.	0
	 Pit 4 Spit 3				 Pit 4 Spit 3 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">Transect 1</td><td rowspan="4">5</td><td rowspan="4">-</td><td>1</td><td>10</td><td>Dark brown silty clayey sand with grass roots.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Pale brown silty sand with occasional quartz pebbles.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Pale brown silty sand with high frequency of quartz gravel and pebbles.</td><td>0</td></tr>
<tr><td>4</td><td>35</td><td>Orange clay with pale brown silty sand mottling.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 5 Spit 4</td><td colspan="2">

Pit 5 Spit 4 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 1	6	-	1	10	Dark brown silty clay sand with grass ro0ts.	0
			2	20	Brown clayey sand with quartz gravel and pebbles.	0
			3	27	Orange clay mottled with brown clayey sand.	0

Pit 6 Spit 3

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 1	7	-	1	10	Dark brown humic clay.	0
			2	20	Grey clayey sand.	0
			3	30	As above.	0
			4	40	As above; transitioning to reddish orange clay at base.	0


Pit 7 Spit 4


Pit 7 Spit 4 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 2	1	-	1	10	Dark brown sandy loam with many grass roots and some gravel.	0
			2	20	Yellowish brown sandy loam with some gravel.	1
			3	30	Yellow sand (coarse-grained) with frequent gravel.	1
			4	40	Yellow sand (fine-grained) with dense gravel layer at base.	1
			5	50	Yellow sand (fine-grained).	0
	 Pit 1 Spit 5				 Pit 1 Spit 5 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 2	2	-	1	10	Dark brown sandy loam with many grass roots.	0
			2	20	Pale yellow sand (fine-grained) with some grass roots and very few gravel.	0
			3	30	Pale yellow sand (fine-grained) with some gravel.	0
			4	40	As above.	1
			5	50	As above.	0
			6	60	As above.	0
	 Pit 2 Spit 6				 Pit 2 Spit 6 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="6">Transect 2</td><td rowspan="5">3</td><td rowspan="5">-</td><td>1</td><td>10</td><td>Dark brown sandy loam with many grass roots.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Yellow brown sandy loam.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Pale yellow sand.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>As above, with orange clay mottling.</td><td>2</td></tr>
<tr><td colspan="4">
Pit 3 Spit 5</td><td colspan="2">
Pit 3 Spit 5 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="6">Transect 2</td><td rowspan="5">4</td><td rowspan="5">-</td><td>1</td><td>10</td><td>Dark brown sandy loam with many grass roots.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Dark brown sandy loam; transitioning to white sand (fine-grained) at 25 cmbs.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>White sand (fine-grained).</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>As above.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>As above.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 4 Spit 5</td><td colspan="2">
Pit 4 Spit 5 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 2	5	-	1	10	Dark brown loamy sand with some grass roots.	0
			2	20	As above.	0
			3	30	Pale yellow sand.	0
			4	40	Pale yellow to white sand.	0
			5	50	As above.	0

Pit 5 Spit 5

Pit 5 Spit 5 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 2	6	-	1	10	Dark brown sandy loam.	0
			2	20	Yellowish brown sandy clay.	0
			3	30	Pale yellow sandy clay.	0
			4	40	As above	0
			5	50	As above	0

Pit 6 Spit 5

Pit 6 Spit 5 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 2	7	-	1	10	Dark brown sandy loam with yellowish brown clay mottling and some grass roots.	0
			2	20	Brown sandy loam with yellowish brown clay mottling.	0
			3	30	Yellowish brown clay.	0
	 Pit 7 Spit 3				 Pit 7 Spit 3 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 2	8	-	1	10	Yellowish grey clay loam.	0
			2	20	As above, with one quartz stone.	0
			3	30	Yellowish grey clay loam; transitioning to yellowish brown clay layer at base.	0
	 Pit 8 Spit 3				 Pit 8 Spit 3 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 2	9	-	1	5	Brown loamy sand with grass and thistle roots.	0
			2	10	Brown loamy sand with yellowish brown clay mottling.	0
			3	15	As above.	0
			4	20	As above.	0
			5	30	As above.	0
			6	40	As above.	0

Pit 9 Spit 6

Pit 9 Spit 6 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 3	1	-	1	5	Dark brown sandy loam with grass roots and very few gravel.	0
			2	10	As above.	0
			3	15	As above; transitioning to light brown silty sand at base.	0
			4	20	Light brown silty sand with very few grass roots, very few gravel and some yellowish brown clay mottling.	0
			5	25	As above.	0
			6	30	Light brown silty sand with few gravel and some yellowish brown clay mottling.	0
			7	35	As above, with some cobbles.	0
			8	40	As above; water table encountered.	0

Pit 1 Spit 8

Pit 1 Spit 8 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 3	2	-	1	10	Dark brown sandy loam; transitioning to light brown silty sand.	0
			2	20	Light brown sandy silt with few grass roots and few charcoal fragments.	0
			3	30	Dark yellowish brown silt with occasional charcoal fragments.	0
			4	40	Yellowish brown silt with few charcoal fragments; water table encountered.	0
	 Pit 2 Spit 4				 Pit 2 Spit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 3	3	-	1	10	Dark brown sandy loam with frequent grass roots and occasional charcoal fragments.	0
			2	20	Light brown silt with few pebbles.	0
			3	30	Light brown silt with few grass roots and occasional charcoal fragments; water table encountered.	0
	 Pit 3 Spit 3				 Pit 3 Spit 3 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 3	4	-	1	10	Dark brownish grey sandy loam with frequent grass roots.	0
			2	15	Light brownish grey silt with occasional charcoal fragments; water table encountered at base.	0
	 Pit 4 Spit 3				 Pit 4 Spit 3 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 3/ Cluster 9 Pit 1	5	-	1	10	Dark brownish grey humic sandy loam with frequent grass roots.	0
			2	20	Light brown silt with dark brownish grey sandy loam mottling, few grass roots and frequent charcoal flecks.	0
			3	30	Light brown silt with frequent charcoal fragments.	0
			4	40	Light yellowish brown silt with quartz cobbles and very few charcoal fragments.	0
			5	50	Dark yellowish brown silt with quartz pebbles and cobbles.	3
			6	60	Dark yellowish brown clayey sand with frequent gravel and occasional charcoal fragments.	3
			7	70	Dark yellowish brown sandy clay (coarse-grained) with frequent gravel and few cobbles.	3
			8	80	Dark yellowish brown sandy clay with few cobbles pebbles.	0

Pit 5 Spit 8

Pit 5 Spit 8 Northern wall profile

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="3">Transect 3</td><td rowspan="2">6</td><td rowspan="2">-</td><td>1</td><td>10</td><td>Dark loamy soil with grass roots with very few charcoal fragments; transitioning to dark brown loamy silty clay with large rocks at NE corner.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above, with some charcoal fragments; bedrock and water table encountered.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 6 Spit 2</td><td colspan="2">
Pit 6 Spit 2 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 4	1	-	1	5	Dark brown loamy fine sand with grass roots.	0
			2	10	As above; transitioning to pale brown clayey sand with grass roots.	0
			3	15	Pale brown clayey sand with dark brown mottling, some grass roots and very few gravel to pebbles.	0
			4	20	As above.	0
			5	25	As above.	0
			6	30	As above	0
			7	35	As above; transitioning to brown clay with red clay mottling.	0
			8	40	Brown clay with red clay mottling and some charcoal flecks.	0
			9	45	As above	0
			10	50	As above	0
			11	55	As above	0
			12	60	As above	0


Pit 1 Spit 12


Pit 2 Spit 12 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 4	2	-	1	10	Dark brown sandy loam with frequent grass roots.	0
			2	20	Pale brown sandy silt with few grass roots and few charcoal fragments.	0
			3	30	Pale brown silt with very few charcoal fragments.	3
			4	40	Pale brown silt with occasional charcoal fragments.	2
			5	50	Pale yellow brown silt with frequent gravel.	0
			6	60	Dark yellowish brown silty clay with frequent pebbles to cobbles, including some ironstone fragments.	0
			7	70	Dark reddish brown clay with frequent pebbles and cobbles, including frequent ironstone fragments.	0
	 Pit 2 Spit 7				 Pit 2 Spit 7 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="7">Transect 4</td><td rowspan="6">3</td><td rowspan="6">-</td><td>1</td><td>10</td><td>Dark brown sandy loam with frequent grass roots.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Light greyish brown sandy silt few grass roots.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Pale yellowish brown silt with occasional charcoal fragments.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Pale yellowish brown silt with few grass roots.</td><td>0</td></tr>
<tr><td>5</td><td>50</td><td>Pale yellowish-brown silty clay with some pebbles and cobbles.</td><td>0</td></tr>
<tr><td>6</td><td>60</td><td>Dark yellowish brown silt with frequent pebbles and cobbles, including ironstone fragments; bedrock encountered at base.</td><td>0</td></tr>
<tr><td colspan="4">

Pit 3 Spit 6</td><td colspan="2">

Pit 3 Spit 6 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">Transect 4</td><td rowspan="4">4</td><td rowspan="4">-</td><td>1</td><td>10</td><td>Dark brown loamy sand (fine-grained) with grass roots and very few gravel.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above; transitioning to light brown sand (fine-grained) with dark brown mottling, grass roots and very few charcoal flecks at 15cmbs.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Light brown sand (fine-grained) with dark brown mottling, grass roots and very few charcoal flecks; transitioning to reddish brown clay with light brown sand mottling, as well as some gravel and cobbles including ironstone and some quartz.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Reddish brown clay with light brown sand mottling, as well as some gravel and cobbles including ironstone and some quartz.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 4 Spit 4</td><td colspan="2">
Pit 4 Spit 4 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">Transect 4</td><td rowspan="4">5</td><td rowspan="4">-</td><td>1</td><td>10</td><td>Dark brown sandy loam with frequent grass roots and occasional small charcoal fragments.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above; transitioning to yellowish brown sandy silt with few grass roots and frequent pebbles and cobbles.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Light yellowish brown silt with frequent ironstone pebbles and cobbles.</td><td>0</td></tr>
<tr><td>4</td><td>40</td><td>Dark yellowish brown silty clay with frequent ironstone cobbles; bedrock encountered at c. 37-40 cmbs.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 5 Spit 4</td><td colspan="2">
Pit 5 Spit 4 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">Transect 5</td><td rowspan="4">1</td><td rowspan="4">-</td><td>1</td><td>5</td><td>Fine dark brown loamy sand. Rootlets from grasses and vegetation above. Very few gravels (<5mm, <1%). Fairly wet</td><td>0</td></tr>
<tr><td>2</td><td>10</td><td>As above transitioning into a light brownish silty sand. Very few gravels (<5mm, <1%). Fairly wet</td><td></td></tr>
<tr><td>3</td><td>15</td><td>As above. Charcoal fleks start appearing (<1%). Very wet. Very few gravels (<5mm, <1%)</td><td></td></tr>
<tr><td>4</td><td>20</td><td>As above. Charcoal fleks increasing (<5%). Very wet, Very few gravels (<5mm, <1%). End of excavation due to hitting water table.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 1 Spit 2</td><td colspan="2">
Pit 1 Spit 2 Northern wall profile</td></tr>
</table>

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="4">Transect 5</td><td rowspan="3">2</td><td rowspan="3">-</td><td>1</td><td>10</td><td>Dark greyish-brown sandy loam, loose compaction and slightly damp. Frequent grass roots. No other inclusions.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>Pale yellowish-brown silty loam, damp, slightly compact. Few fine roots present. Occasional small charcoal fragments also present.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Very damp yellow-brown silt, slightly compact. Few fine roots present. Very clean soil no inclusion hit water table at 300mm – stopped excavation.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 2 Spit 3</td><td colspan="2">
Pit 2 Spit 3 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 5	3	-	1	10	Dark greyish-brown sandy loam, frequent grass roots. Loosely compacted and slightly damp in texture. Small gravel inclusions 2-5mm in diameter	1
			2	20	Transition into a light yellowish-brown silt, loose compaction and slightly damp. A2 horizon. Few fine root. Increase in quantity of gravel inclusions	0
			3	30	Very wet light yellowish-brown silt, very soft and loose compaction. Few small natural quartz pebble inclusions. Hit water table at 300mm – stopped excavation.	0
	 Pit 3 Spit 3				 Pit 3 Spit 3 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 5	4	-	1	10	Fine dark brown loamy slightly silty sand. Rootlets from grass and vegetation above. Moderate compaction (from roots and stock). Very little moisture. No gravels	0
			2	20	As above transitioning to a fine light orangey brown silty sand at halfway of spit. Gravels beginning to appear (<5mm, <5%) makes sand feel coarse. Increasing (slightly) moisture. Significant quartz content from 'bedrock', Decreasing rootlets. Some charcoal fleks (<0.5%).	2
			3	30	Fine light orangey brown silty sand. Gravels beginning to appear (<5mm, <5%) significant amount of quartz. Hit large rock in SE corner. Increasing moisture level. Very few charcoal fleks (<0.5%)	0
			4	40	As above. Gravels getting bigger (<10mm, <10%). Large chunks of quartz coming out, very large (<30 cm) rock in SE corner, quartz inclusions eroding from rock.	0

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
					Increasing moisture level. Very few charcoal fleks (<1%)	
			5	50	As above. Gravels increasing (<10mm, <10%). Same as above with quartz and large rock. Getting fairly wet.	0
			6	60	As above. Gravels similar. Same as above with quartz and large rock. Water starting to pool at base.	1
			7	70	As above. Excavation ended due to pooling water.	2

Pit 4 Spit 7

Pit 4 Spit 7 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 5	5	-	1	10	Coarse-grained, dark brownish-grey sandy loam topsoil A1 horizon. Frequent grass roots. High gravel content 2-5mm in diameter.	2
			2	20	Transition into a dark yellowish-brown sandy loam A2 horizon at 150mm depth. Very coarse-grained, high quantity of gravel inclusions 2-5mm in diameter.	0
			3	30	Dark yellowish brown sandy loam, coarse-grained particles. Few fine roots. Large boulder stone present in south-west corner of pit – 200 x 200mm	2
			4	40	Dark yellowish-brown silty sand, very damp and slightly compact in texture. Few fine roots	1
			5	50	Dark yellowish brown silty clay. Very high gravel content. Increasing quantity of large natural quartz pebble and cobble stones. Hit water table at 500mm depth. Stopped excavation	0

Pit 5 Spit 5

Pit 5 Spit 5 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 6	1	-	1	5	Dark greyish-brown sandy loam. Very soft compaction, dry soil. Frequent grass roots. No other inclusions present.	0
			2	10	Pale creamish-brown sandy silt, dry soil and soft in compaction. Frequent grass roots. Very clean deposit. No other inclusions except roots.	0
			3	15	Mottled pale brownish-cream sandy silt. Dry soil and very soft in compaction. Few fine roots present. No other inclusions present.	1
			4	20	Mottled pale creamish-brown sandy silt. Slightly compact and slightly damp in texture. Few fine roots. Few small natural quartz pebbles within matrix 2-20mm in length.	0
			5	25	Mottled pale brownish-cream sandy silt, very fine-grained particles. Few fine roots present. Frequent small quartz pebble stones ranging between 5-30mm in length. No other inclusions.	0
			6	30	Mottled pale brownish-cream coloured silt. Few fine roots still present. Frequent small quartz pebble stone present, ranging between 5-30mm in length. Few small manganese flecks present.	0
			7	35	Pale brownish-cream silt, slightly damp and slightly compact in texture. Fine roots present. Increasing quantity of small quartz pebble stones present ranging between 5-20mm in length.	0
			8	40	Pale brownish cream coloured sandy silt, few small, fine roots. Soil is slightly damp and compact in texture. Frequent small quartz pebble stones ranging between 30-50mm in length.	0
			9	45	Slightly damp and compact dark yellowish-brown silt. Few fine roots present. Frequent small natural quartz pebble stones present. Manganese flecks present.	0
			10	50	Pale yellowish-brown silt, damp and increasing compaction. High gravel content within matrix. Frequent natural quartz pebbles also within matrix.	1
			11	55	Pale yellowish-brown silt, increasing water content. Increase in compaction. High gravel content (10-20%). Frequent small quartz pebble	1

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
					stones ranging between 5-20mm in length.	
			12	60		
			13	65	Mottled pale creamish-brown silty clay, very damp and slightly compact. Few fine roots. Increase in gravel content (15-25%). Increase in quartz pebble stones also present.	0
			14	70	Mottled yellowish-brown silty clay, very damp and compact. No roots. Very high gravel content. Very high quantity of small quartz pebble stones (10-30 mm) in length. Manganese flecks present.	0
			15	75	Mottled yellowish-brown silty clay, very damp and compact. High gravel content (15-20%). High quantity of natural quartz pebbles. Manganese flecks also present.	0
			16	80	Mottled yellowish-brown clay B-horizon. Very compact and damp. No roots. Occasional small ironstone fragments present.	0

Pit 6 Spit 16

Pit 6 Spit 16 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 6	2	-	1	10	Fine brownish grey loamy sand. No moisture, very few rootlet, very little compaction. At base of spit begins to transition to a very light brown fine silty sand.	0
			2	20	Very light brown fine silty sand. Very little moisture, very few rootlets, very little compaction. Very minor speck of slightly coarser orange sand. Transitions to a fine yellowish white sand at ~18cm.	0
			3	30	As above. Increasing in moisture. Gravels beginning to appear (<7mm, <1%).	0
			4	40	As above. Increasing moisture. Gravels similar to above.	0
			5	50	As above. Increasing moisture. Gravels similar to above.	0
			6	60	As above. Colour of sand is changing very slightly. Increasing mottling of reddish orange sands.	1
			7	70	As above. At base transitions to a reddish orange slightly coarse silty sand.	0
			8	80	Reddish orange slightly coarse silty sand. Significant gravels (<15mm, <10%). Increasing moisture.	0
	 Pit 2 Spit 8				 Pit 2 Spit 8 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 6	3	-	1	10	Dark brown greyish fine silty sand. Little compaction, no moisture. Few roots from loose vegetation above. No gravels	0
			2	20	As above. Transitions to a very very lightly brown fine silty sand. Very little moisture. Very few roots. Very few gravels (<5mm, <1%). Some very minor darker brown mottling with occasional fleks of orange.	3
			3	30	As above. Moisture increasing, Gravels similar. Transition to a	0

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
					yellowish brown slightly coarse silty sand at base	
			4	40	Slightly coarse yellowish brown silty sand. Similar mottling (darker brown). Some orange sand inclusions. Increasing moisture. Gravels increasing slightly (<5mm, <1%). Large rock in northern wall at base.	0
			5	50	As above. Similar mottling, similar gravels, increasing moisture, increasing compaction.	0
			6	60	As above.	0
			7	70	As above.	
			8	80	As above	0
			9	90	As above.	0

Pit 3 Spit 9

Pit 3 Spit 9 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 6	4	-	1	10	Dark greyish-brown sandy loam topsoil (A1 horizon). Dry and loosely compacted. Frequent grass roots present. No other inclusions.	0
			2	20	Transition into a pale yellowish-brown silty sand (A2 horizon). Soil is dry and very soft in compaction. Few fine roots. No other inclusions.	0
			3	30	Pale brownish-cream coloured silty sand, loosely compacted and dry in texture. Few fine roots present. Few small pebble stone inclusions present.	0
			4	40	Pale brownish-cream coloured silty sand, dry and loose in texture. Few fine roots. Occasional small charcoal fragments present. High quantity of small pebble stones.	1
			5	50	Dark yellowish-brown silty sand, slightly compact and slightly damp. Few fine roots present. High gravel content 10-20%.	0

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
					Frequent small natural quartz pebble stone inclusions present.	
			6	60	Dark yellowish-brown sandy silt, slightly damp and compact in texture, no roots. Few small charcoal fragments present. High quantity of small pebble stone inclusions present.	0
			7			0
			8	80	Dark yellowish-brown silty clay, very compact and slightly damp. High quantity of gravel and small quartz pebble stones present. Ironstone fragments also present.	0
			9	90	Dark yellowish-brown clay (B horizon). Very compact, very sterile. High quantity of ironstone fragments. Frequent small natural quartz pebble stones present. Stopped excavation.	0


Pit 4 Spit 9

Pit 4 Spit 9 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
Transect 6	5	-	1	10	Dark greyish-brown sandy loam topsoil (A1 horizon). Frequent grass roots. No other inclusions present.	0
			2	20	Pale greyish-brown sandy silt (A2 horizon). Very dry and loose compaction. Few fine roots present. No other inclusions.	3
			3	30	Pale brownish-cream coloured sandy silt, loose compaction, slightly damp. Few fine roots. Few small charcoal fragments.	0
			4	40	Pale brownish-cream coloured sandy silt, very soft and loose compaction. No roots. High gravel content (10-20%).	0
			5	50	Dark yellowish brown silty sand, slightly compact and slightly damp. Frequent small quartz pebble stones. Small charcoal fragments present.	0
			6	60	Dark yellowish-brown silty clay, Few fine roots. High gravel content.	0
			7	70	Dark yellowish-brown clay (B horizon). Ver damp and compact. Few small river pebble inclusions. Stopped excavation	0

Pit 5 Spit 7

Pit 5 Spit 7 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Transect 7	1	Easting 723706 Northing 6105823	1	5	Medium to dark greyish brown humic sand with occasional pebbles.	0
			2	10	As above; transitioning to pale grey sand with few gravel and pebbles.	0
			3	15	Pale grey sand with few gravel and pebbles.	0
			4	20	As above.	0
			5	25	As above.	0
			6	30	As above; transitioning to 'clean' pale grey fine sand.	0
			7	35	'Clean' pale grey fine sand.	0
			8	40	As above.	0
			9	45	As above.	0
			10	50	As above.	0
			11	55	As above; transitioning to orange and pale grey mottled sandy clay.	0
			12	60	Orange and pale grey mottled sandy clay.	0


Pit 1 Spit 12


Pit 1 Spit 12 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Transect 7	2	Easting 723707 Northing 6105832	1	10	Grey brown humic sand with occasional gravel and pebbles.	0
			2	20	As above; transitioning to pale yellow to grey coarse sand with few gravel.	0
			3	30	Pale yellow to grey coarse sand with few gravel; transitioning to 'clean' pale grey fine sand.	0
			4	40	Grey and orange mottled sandy clay.	0
	 Pit 2 Surface				 Pit 2 Spit 4 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Transect 7	3	Easting 723709 Northing 6105842	1	10	Medium to pale greyish brown humic sand (paling with depth) with some pebbles.	0
			2	20	As above; transitioning to pale grey sand with few pebbles.	0
			3	30	Pale grey sand with few pebbles; transitioning to 'clean' pale grey fine sand.	0
			4	40	'Clean' pale grey fine sand; transitioning to orange and grey mottled sandy clay.	0
	 Pit 3 Surface				 Pit 3 Spit 4 Northern wall profile	

<table>
<tr><th>Site</th><th>Pit no</th><th>Grid Reference</th><th>Spit number</th><th>Depth (cm)</th><th>Soil Description</th><th>Artefacts</th></tr>
<tr><td rowspan="5">BCT Transect 7</td><td rowspan="4">4</td><td rowspan="4">Easting 723712

Northing 6105854</td><td>1</td><td>10</td><td>Pale to medium greyish brown humic sand with pale mottling at base.</td><td>0</td></tr>
<tr><td>2</td><td>20</td><td>As above; transitioning to pale grey sand with few gravel and pebbles.</td><td>0</td></tr>
<tr><td>3</td><td>30</td><td>Pale grey sand with few gravel and pebbles.</td><td>0</td></tr>
<tr><td>4</td><td>35</td><td>As above; transitioning to orange and grey mottled sandy clay.</td><td>0</td></tr>
<tr><td colspan="4">
Pit 4 Surface</td><td colspan="2">
Pit 4 Spit 4 Northern wall profile</td></tr>
</table>

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT Transect 7	5	Easting 723712 Northing 6105861	1	10	Mixed layer containing lenses of greyish brown, pale grey and yellowish brown sand with pebbles.	1
			2	20	As above.	0
			3	30	As above; transitioning to 'clean' slightly pale grey fine sand (compacted) with few pebbles.	0
			4	40	'Clean' slightly pale grey fine sand (compacted) with few pebbles; transitioning to coarser pale grey sand with frequent gravel and pebbles.	0
			5	50	Coarser pale grey sand with frequent gravel and pebbles; transitioning to pale yellowish grey fine sand (compacted).	0
			6	60	Pale yellowish grey fine sand (compacted); transitioning to orange and grey mottled sandy clay.	0

Pit 5 Spit 6

Pit 5 Spit 6 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT IP	1	-	1	5	Light brown fine humic sand.	0
			2	10	As above; transitioning to a stained black sand layer with large pieces of charcoal at base.	0
			3	15	Stained black sand layer with large pieces of charcoal at base.	0
			4	20	As above.	0
			5	25	As above; transitioning to fine brown sand at base.	0
			6	30	As above.	0
			7	35	As above.	0
			8	40	As above.	0
			9	45	As above.	0
			10	50	As above.	0
			11	55	As above; transitioning to a very thin coffee rock layer before returning to fine brown sand.	0


?

Pit 1 Spit 11

Pit 1 Spit 11 Northern wall profile

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT IP	2	Easting 727139 Northing 6101322	1	10	Yellowish brown fine sandy loam; transitioning to medium greyish brown fine sandy loam.	0
			2	20	Medium greyish brown fine sandy loam; transitioning to ‘clean’ pale grey silty fine sand.	0
			3	30	‘Clean’ pale grey silty fine sand.	0
			4	40	‘Clean’ pale grey silty fine sand; transitioning to mottled grey and yellow fine silty sand.	0
			5	50	Mottled grey and yellow fine silty sand; transitioning to silty fine sand with pale mottling with dark brown and black flecking.	0
			6	60	As above.	0
			7	70	As above; transitioning to pale grey and yellow mottled fine sand with common brown flecking.	0
			8	80	As above.	0

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
	 Pit 2 Spit 7				 Pit 2 Spit 7 Northern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT IP	3 (a, b and c)	-	1	10	Light brown fine sand.	1
			2	20	As above; transitioning to black loamy coarse sand, with light brown find sand continuing up to 25 cm in depth.	1
			3	30	As above; transitioning to brown coarse sand.	5
			4	40	Brown coarse sand; transitioning to yellow coarse sand.	0
			5	50	Yellow coarse sand, with brown coarse sand intruding into spit.	0
			6	60	As above.	0
			7	70	Yellow coarse sand.	1
	 Pit 3 (a, b and c) Northern Wall Profile				 Pit 3 (a, b and c) Eastern wall profile	

Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
BCT IP	4	-	1	10	Yellow coarse sand with white quartz inclusions.	6
			2	20	As above.	0
			3	30	As above.	0
			4	40	As above.	0
			5	50	As above.	0

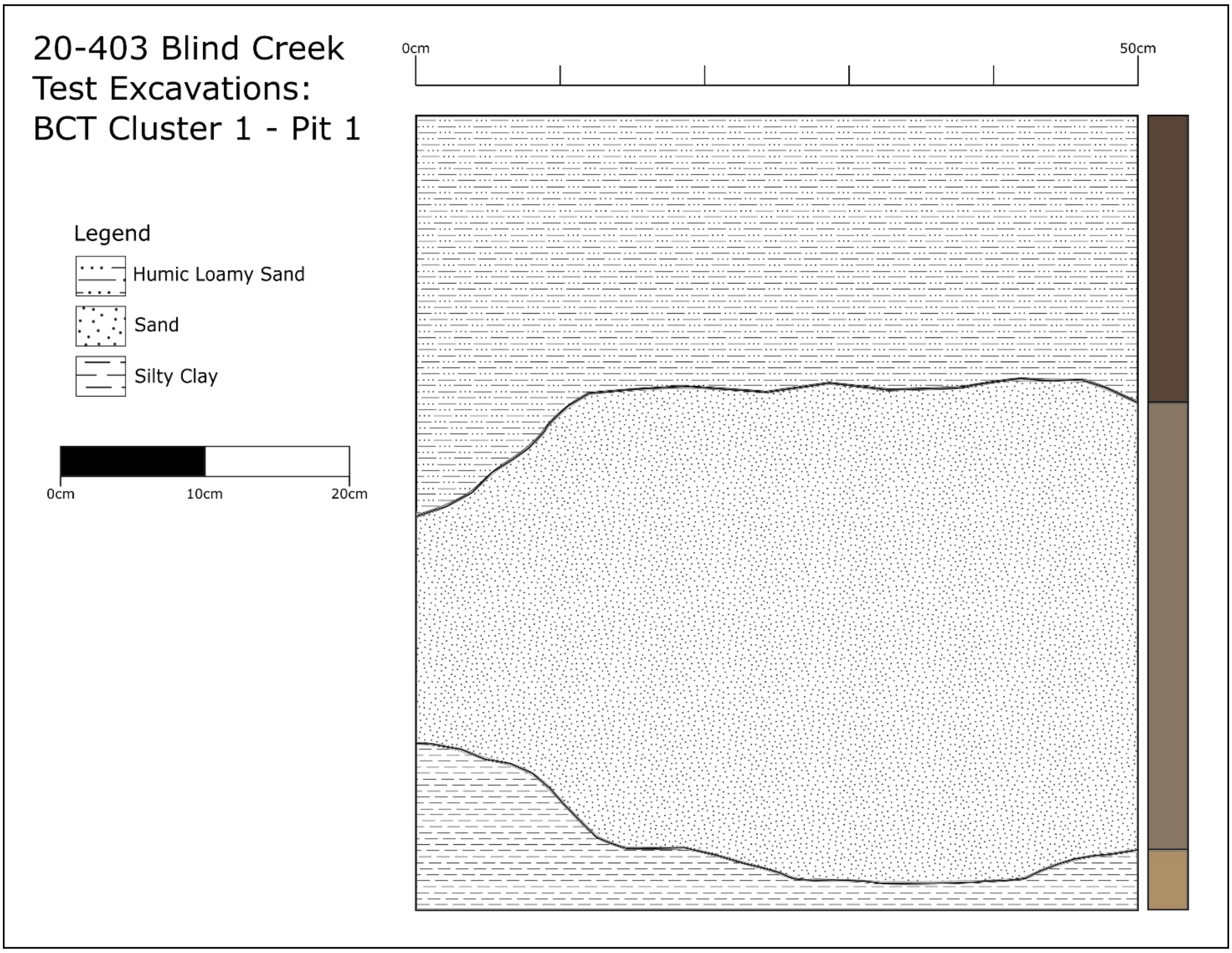
Site	Pit no	Grid Reference	Spit number	Depth (cm)	Soil Description	Artefacts
			6	58	Slightly darker yellow sand (possibly due to moisture).	0

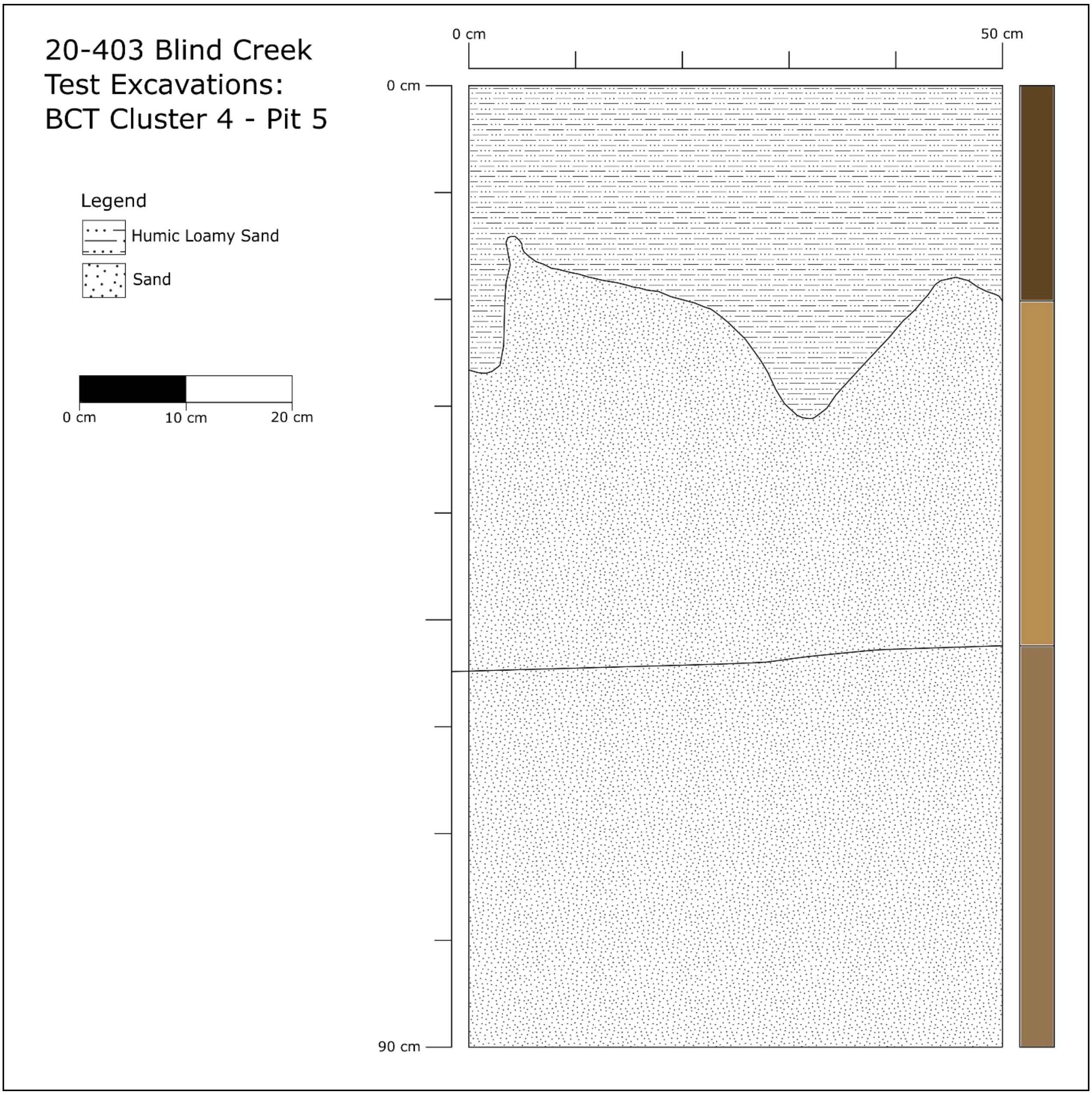
Pit 4 Spit 6

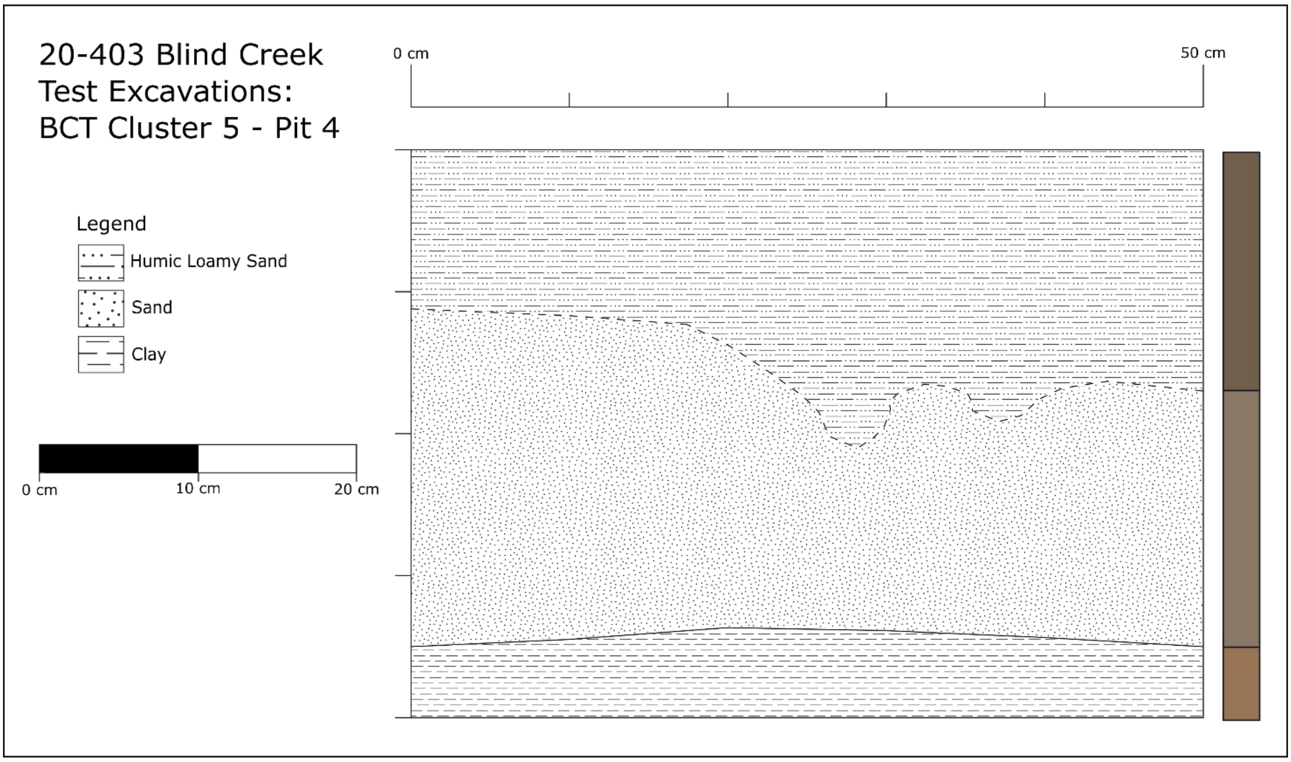
Pit 4 Spit 6 Northern wall profile

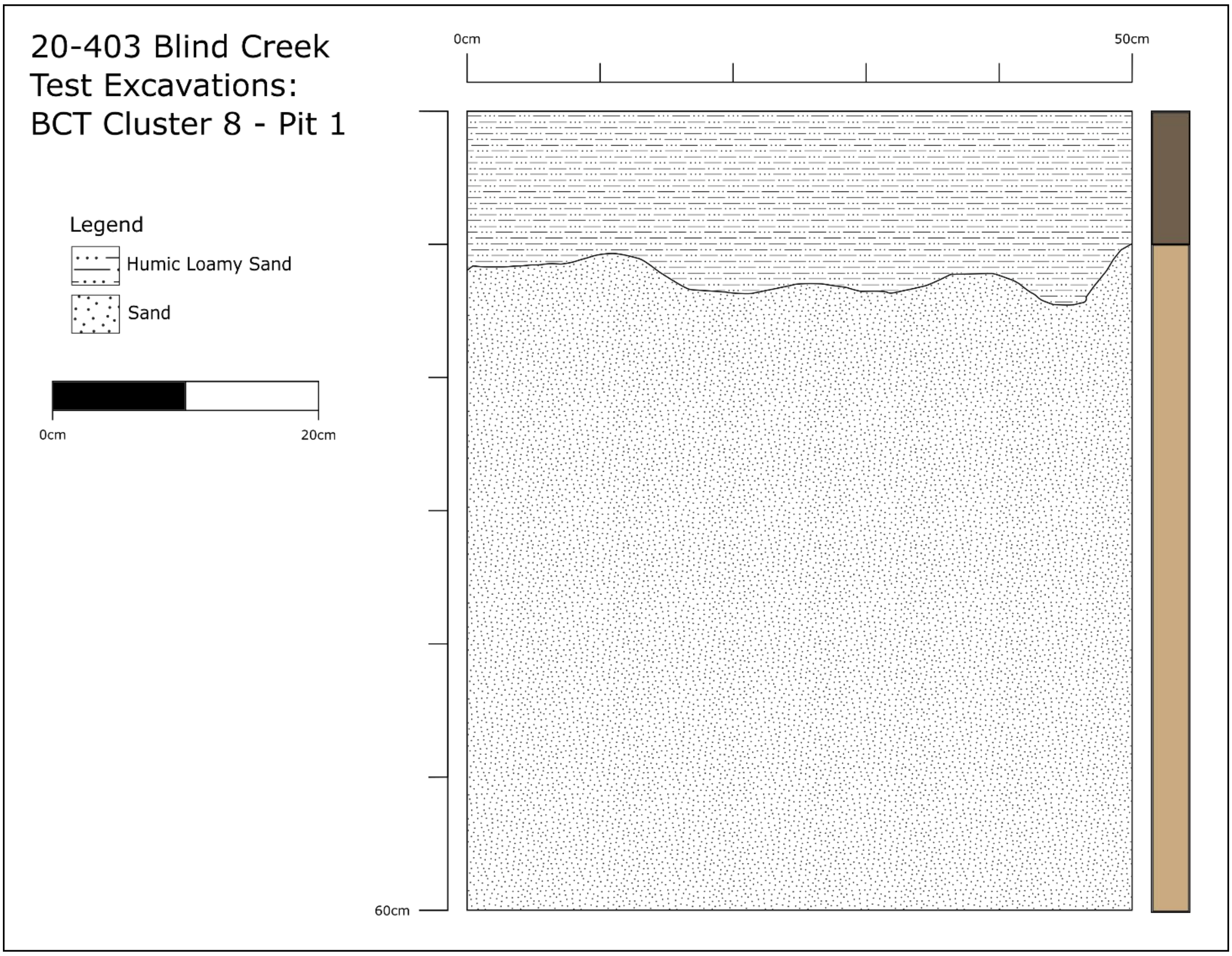
Appendix D NGH (2021) Stratigraphic Profiles

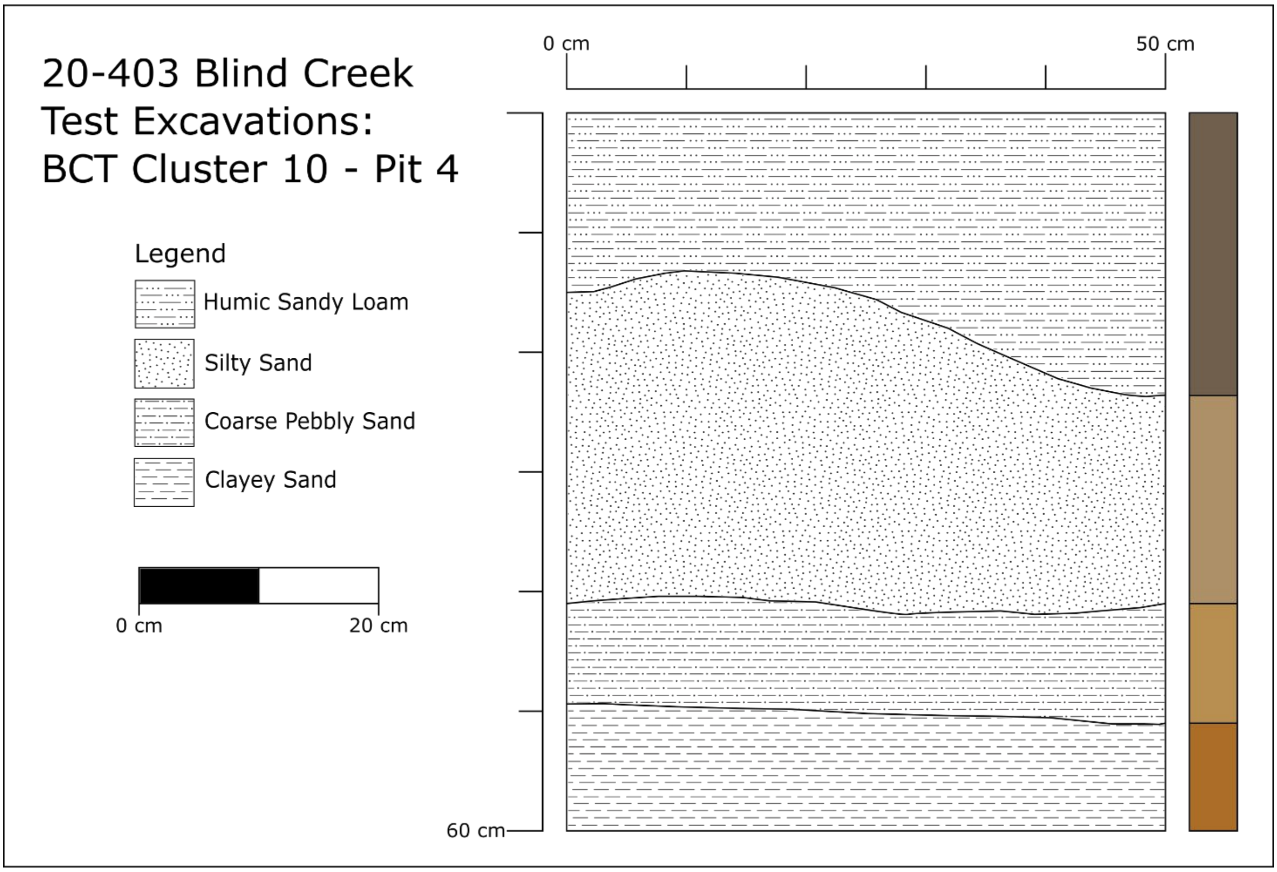
Appendix D NGH (2021) Stratigraphic Profiles

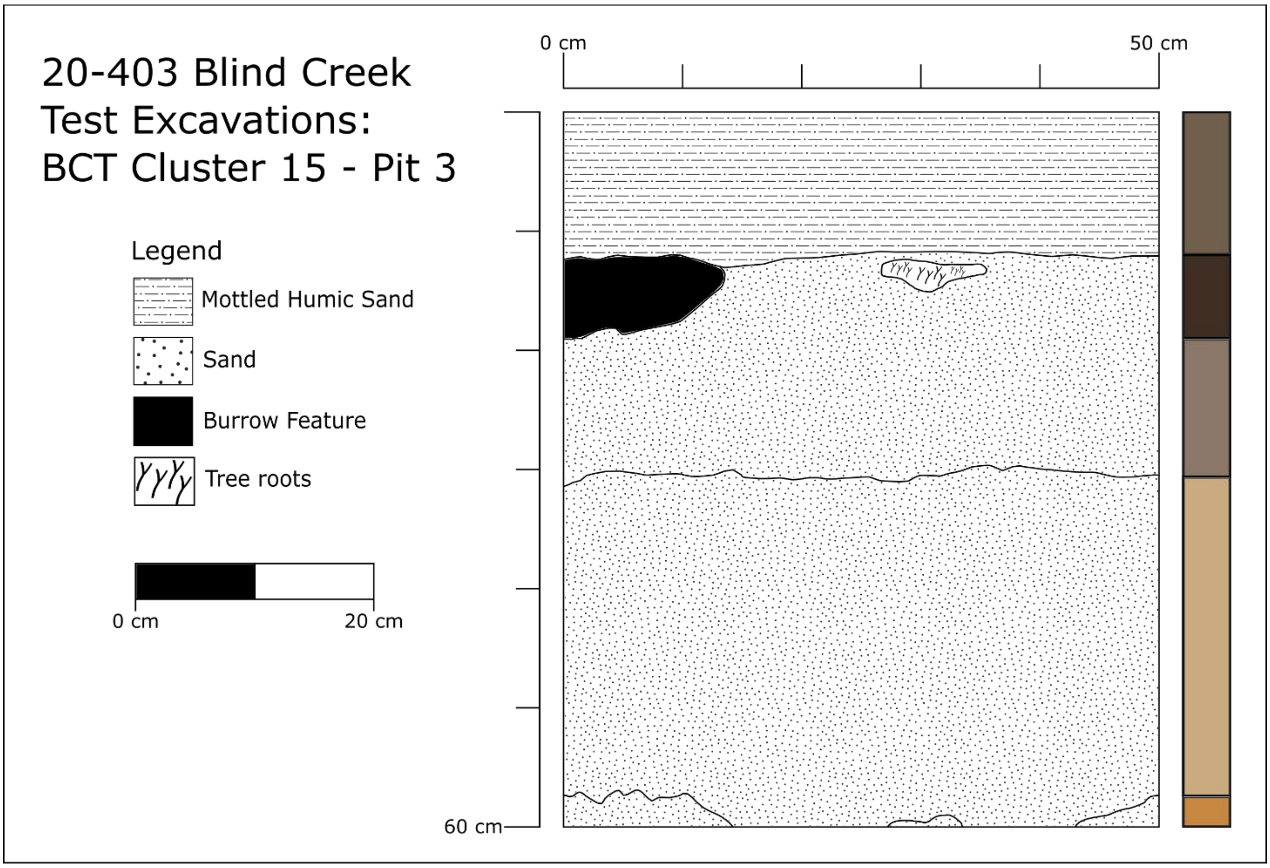


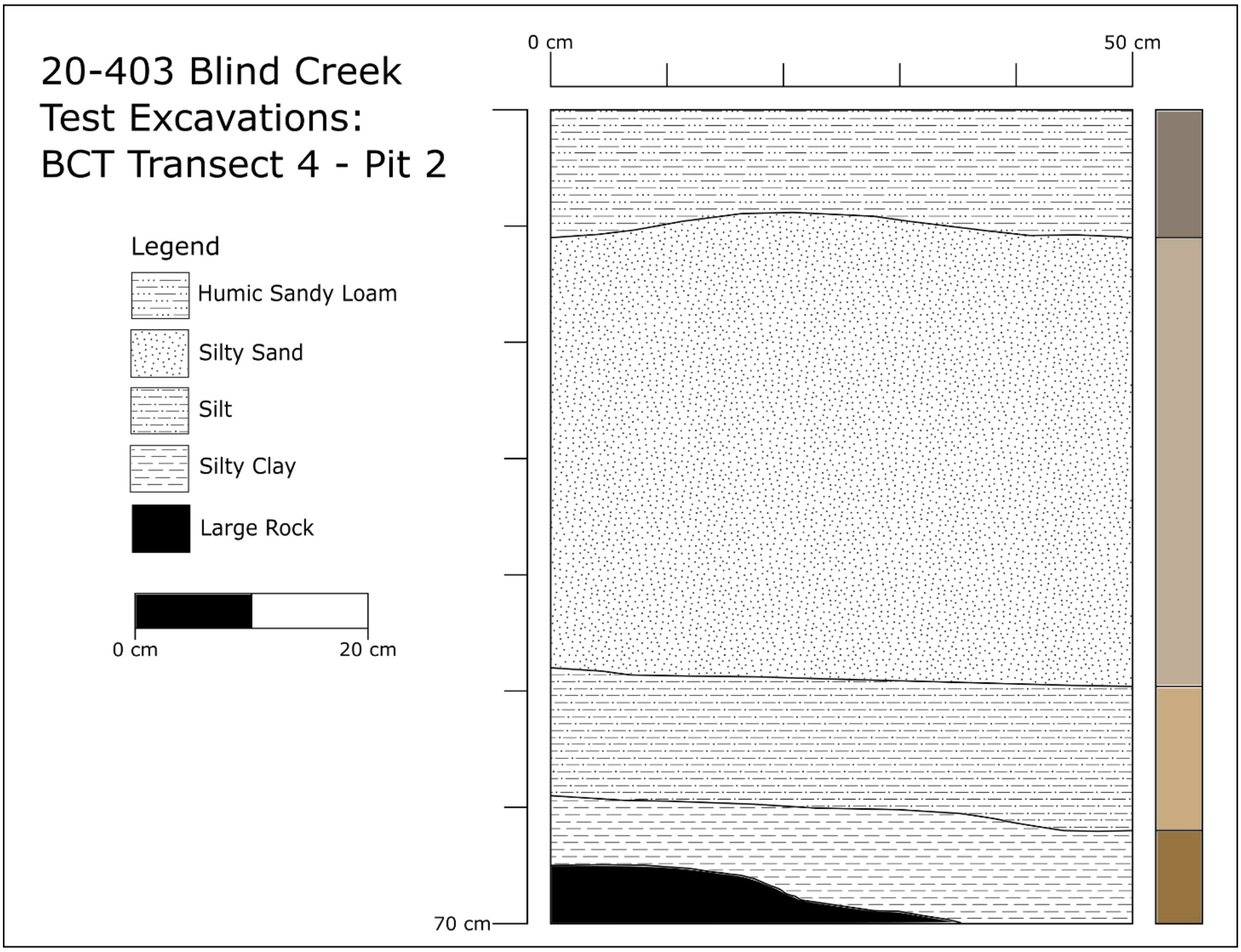

20-403 Blind Creek
Test Excavations:
BCT Cluster 4 - Pit 5
Legend
Humic Loamy Sand
Sand
0 cm
10 cm
20 cm
0 cm
50 cm
0 cm
90 cm


20-403 Blind Creek
Test Excavations:
BCT Cluster 5 - Pit 4
Legend
Humic Loamy Sand
Sand
Clay
0 cm
10 cm
20 cm
0 cm
50 cm

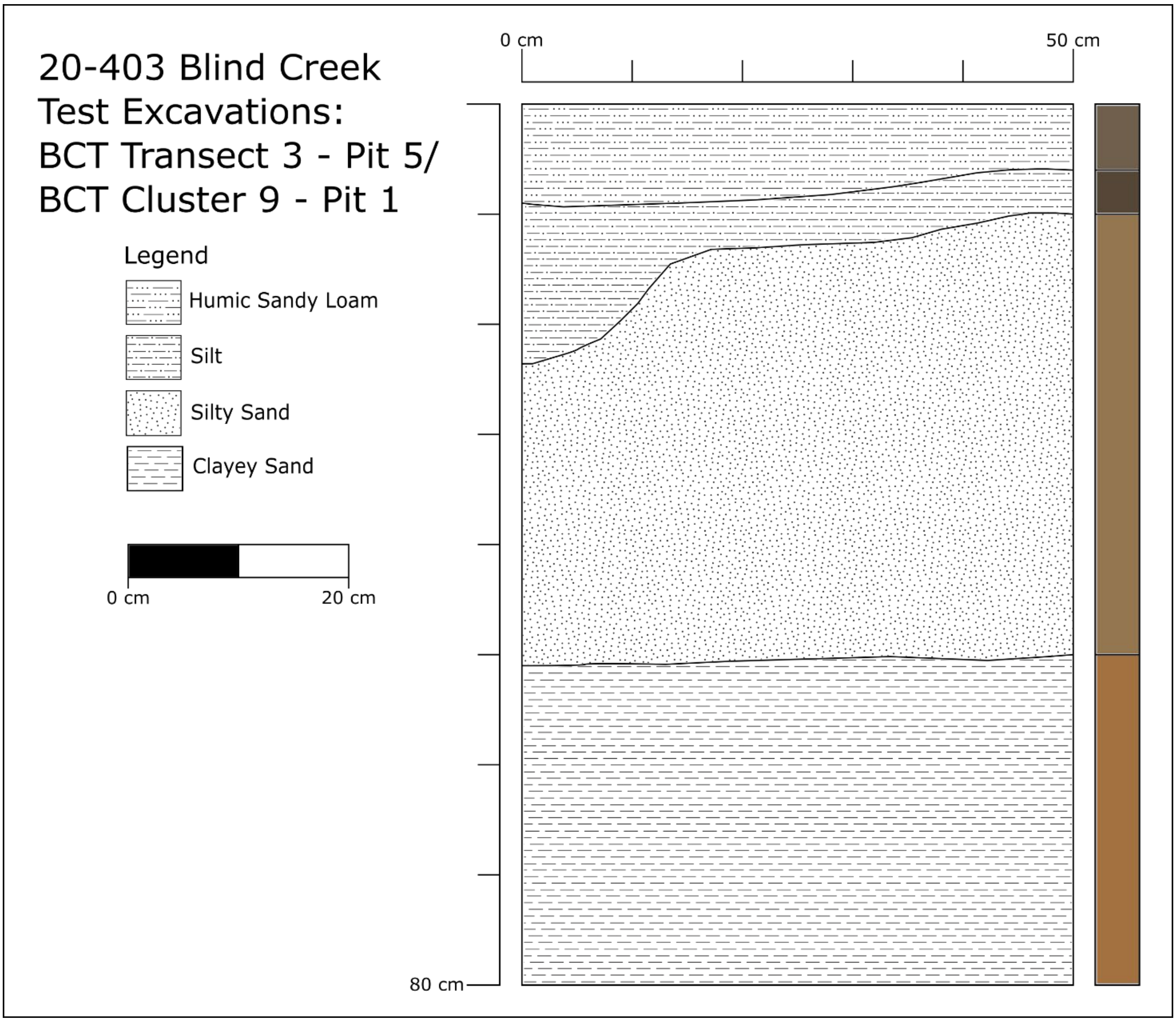

20-403 Blind Creek
Test Excavations:
BCT Cluster 8 - Pit 1
Legend
Humic Loamy Sand
Sand
0cm
20cm
0cm
50cm
60cm

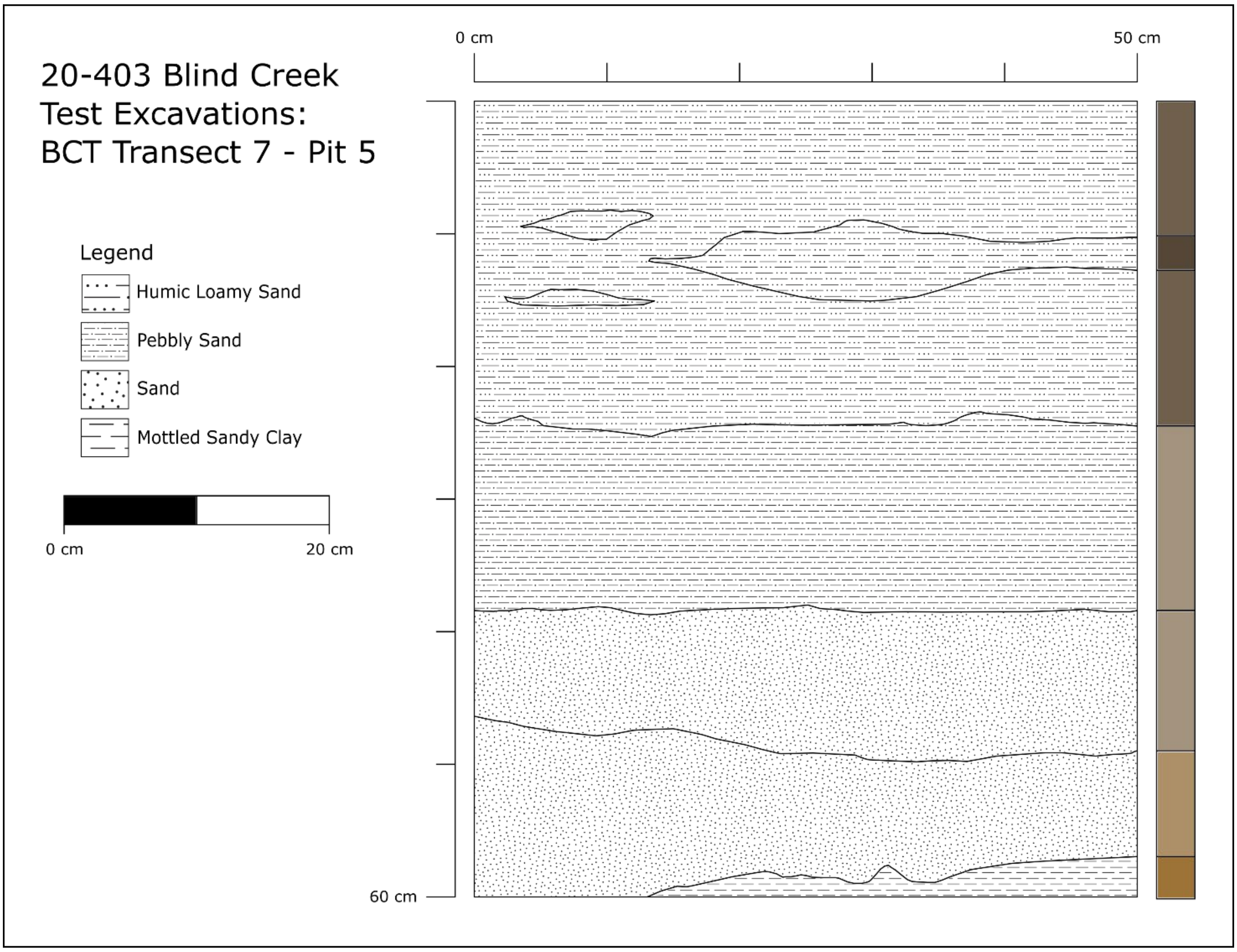

20-403 Blind Creek
Test Excavations:
BCT Cluster 10 - Pit 4
Legend
Humic Sandy Loam
Silty Sand
Coarse Pebbly Sand
Clayey Sand
0 cm
20 cm
0 cm
50 cm
60 cm


20-403 Blind Creek
Test Excavations:
BCT Cluster 15 - Pit 3
Legend
Mottled Humic Sand
Sand
Burrow Feature
Tree roots
0 cm
20 cm
0 cm
50 cm
60 cm



20-403 Blind Creek
Test Excavations:
BCT Transect 4 - Pit 2
Legend
Humic Sandy Loam
Silty Sand
Silt
Silty Clay
Large Rock
0 cm
20 cm
0 cm
50 cm
70 cm


20-403 Blind Creek
Test Excavations:
BCT Transect 3 - Pit 5/
BCT Cluster 9 - Pit 1
Legend
Humic Sandy Loam
Silt
Silty Sand
Clayey Sand
0 cm
20 cm
0 cm
50 cm
80 cm


20-403 Blind Creek
Test Excavations:
BCT Transect 7 - Pit 5
Legend
Humic Loamy Sand
Pebbly Sand
Sand
Mottled Sandy Clay
0 cm
20 cm
0 cm
50 cm
60 cm

Appendix E NGH (2021) BCSF Subsurface Artefact Records

Appendix E NGH (2021) BCSF Subsurface Artefact Records

Spit		1 (0-10 cm)	2 (10-20 cm)	3(20-30 cm)	4 (30-40 cm)	5 (40-50cm)	6 (50-60 cm)	7 (60-70cm)	8 (70-80 cm)	9 (80-90 cm)	10 (90-100 cm)	TOTAL
Cluster 1	**Pit 2**		1									**1**
	Pit 5			1								**1**
Cluster 2	**Pit 1**						1					**1**
Cluster 3	**Pit 1**	6	7	2								**15**
	Pit 2		1	2								**3**
	Pit 3		1									**1**
	Pit 4			2	1							**3**
	Pit 5		3									**3**
Cluster 4	**Pit 1**		2	4								**6**
	Pit 3	1	2	6								**9**
	Pit 4				1							**1**
	Pit 5		1		2							**3**
Cluster 6	**Pit 1**		1			3	2		1	1	1	**9**
	Pit 2				1	1						**2**
	Pit 3	4				7						**11**
	Pit 4		2									**2**
	Pit 5			1	1	1		3				**6**
Cluster 7	**Pit 2**			1								**1**
	Pit 3	1		5	2							**8**
Cluster 8	**Pit 1**	16	37	4								**57**
	Pit 2					2	1		4			**7**
	Pit 3			8	4	3						**15**

	Pit 4	6	7	4	15	1	2					**35**
	Pit 5	1	5	1	1	1	1					**10**
Cluster 9	**Pit 1**				1							**1**
	Pit 2			2								**2**
	Pit 4				1	1						**2**
Cluster 10	**Pit 1**	3	3									**6**
	Pit 2			3								**3**
	Pit 3		2	2	4	1						**9**
	Pit 4		3	14	6	1						**24**
	Pit 5			2	2							**4**
Cluster 11	**Pit 1**		5	6	2							**13**
	Pit 3			6								**6**
Cluster 12	**Pit 3**	1										**1**
	Pit 5	1	1	1								**3**
Cluster 15	**Pit 2**		3	3	1	3						**10**
	Pit 3	1		27	1	1						**30**
	Pit 4				1							**1**
	Pit 5		2	1								**3**
Cluster 16	**Pit 1**		2									**2**
	Pit 3	1		1								**2**
	Pit 4			1		1						**2**
	Pit 5			1	3	7	2	1				**14**
Transect 1	**Pit 1**			4	2							**6**
Transect 2	**Pit 1**	1	2									**3**
	Pit 2				1							**1**
	Pit 3					2						**2**

Transect 3/Cluster 9	**T3 Pit 5/C9 Pit 1**					3	3	3				**9**
Transect 4	**Pit 2**			3	2							**5**
Transect 5	**Pit 3**	1										**1**
	Pit 4		3				1	2				**6**
	Pit 5	2		2	1							**5**
Transect 6	**Pit 1**		1			1	1					**3**
	Pit 2						1					**1**
	Pit 3		3									**3**
	Pit 4				1							**1**
Transect 7	**Pit 5**	1										**1**
Isolated Pit	**Pit 3A**		1		1							**2**
	Pit 3B		1	2								**3**
	Pit 3C	1		2								**3**
	Pit 4	6										**6**
TOTAL		**54**	**102**	**124**	**58**	**40**	**15**	**9**	**5**	**1**	**1**	**409**

Appendix F NGH (2021) Blind Creek ACHA – Methodology

ABORIGINAL CULTURAL HERITAGE ASSESSMENT METHODOLOGY

Blind Creek Solar Farm

June 2021

Project Number: 20-403

NSW • ACT • QLD • VIC
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DOCUMENT VERIFICATION

Project Title:	Blind Creek Solar Farm
Project Number:	20-403
Project File Name:	20-403 Blind Creek ACHA Methodology_For RAP Review_20210611

Revision	Date	Prepared by	Reviewed by	Approved by
Final Draft	11/06/2021	Jorge Fuenzalida Miralles, Jakob Ruhl, Bronwyn Partell	Matthew Barber	Jakob Ruhl

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ACRONYMS AND ABBREVIATIONS

ACHA	Aboriginal Cultural Heritage Assessment
ACHCRP	*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*
ACT	Australian Capital Territory
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
BCSF	Blind Creek Solar Farm Pty Ltd
BP	Before Present
CIV	Capital Investment Value
CoC	Conditions of Consent
DECCW	Department of Environment, Climate Change, and Water
DP	Deposited Plan
DPIE	Department of Planning, Industry, and Environment
EIS	Environmental Impact Statement
ha	Hectares
Heritage Act	*Heritage Act 1977* (NSW)
Heritage NSW	Heritage NSW of the NSW Department of Premier & Cabinet
IBRA	Interim Biogeographic Regionalisation for Australia
km	Kilometres
kV	Kilovolt
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metres
MW	Megawatt
MWh	Megawatt-Hour

NGH	NGH Pty Ltd
Ngungara/Weereewa	These are two of the traditional names for Lake George
NPWS	National Parks and Wildlife Services
NPW Act	*National Parks And Wildlife Act 1974* (NSW)
NSW	New South Wales
NSW Archaeology	New South Wales Archaeology Pty Ltd
PAD	Potential Archaeological Deposit
PV	Photovoltaic
RAPs	Registered Aboriginal Parties
RFS	Rural Fire Service
SEH	South Eastern Highlands
SHR	State Heritage Register
SSD	State Significant Development

EXECUTIVE SUMMARY

INTRODUCTION

NGH Pty Ltd (NGH) has been engaged by Blind Creek Solar Farm Pty Ltd (BCSF) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to inform an Environmental Impact Statement (EIS) for the State Significant Development referred to as the *Blind Creek Solar Farm*.

The proposed Blind Creek Solar Farm site is located along Tarago Road, approximately 8 km north of Bungendore, NSW, and 50 km east of Canberra, Australian Capital Territory (ACT), refer to Figure 1-5 and Figure 1-6, and within the Queanbeyan-Palerang Local Government Area (LGA) (Parishes of Currandooly and Ellende, County of Murray).

PROJECT BACKGROUND

The proposed development footprint design will be finalised upon completion of the heritage assessment. The Proponent will investigate opportunities to minimise potential impact to heritage, for eg. through excising areas of archaeological sensitivity, following results of the heritage assessment and consultation with Aboriginal stakeholders.

The proposal site would combine rows of solar panels laid out approximately in north to south axis, separated by approximately seven metres to allow grass for grazing. Solar panels are likely to be mounted on a single-axis tracking system, enabling the panels to track the sun throughout the day in an east-west direction. Figures 1-1 to 1-4 below provide examples of typical solar farm infrastructure and machinery used during the construction.

The proposed ground disturbance for a solar farm development is considered relatively low in comparison to other developments such as sand mining or road and building construction.

Disturbances will largely be in the preparation of the ground for the solar farm. Piles would be driven 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 mounted 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. Internal access tracks will be constructed with mostly imported material, building up the roads rather than excavating down into the deposits.

ARCHAEOLOGICAL BACKGROUND

There are 17 archaeological sites currently recorded on AHIMS within the proposal area. These sites are summarised in Table 4 2 below and can be seen in Figure 4 2 below.

There have been at least nine archaeological investigations within the immediate surrounds of the project area. Table 4-3 below lists the previous archaeological studies undertaken within or immediately adjacent to the Blind Creek proposal area.

The proposed development for the Blind Creek Solar Farm lies within an extensively researched area. While it is known that there is a high archaeological potential across many landforms within the proposal area (notably these are predominantly the elevated landforms), there are also a number of landforms that the previous research and archaeological modelling for the region would indicate hold a low archaeological potential. The proposal area has been categorised into 16 landforms, as highlighted in Figure 4-3. Table 4-4 provides a description of each landform, along with the archaeological potential and an indication of the previous archaeological excavations that have occurred.

The Aboriginal site modelling for the region to date suggests that Aboriginal sites are highly common within proximity to waterways and any associated elevated landforms, in particular within the sand bodies. These studies also suggest that the overwhelming majority of site types in the region are comprised of isolated artefacts and artefact scatters, with potential for subsurface archaeological deposits on unmodified landforms. The previously recorded AHIMS sites in the region support this conclusion. While the historical land use of the proposal area has caused surface and subsurface disturbances at some locations, this has largely served to bring subsurface deposits of archaeological material to the surface.

ASSESSMENT METHODOLOGY

The purpose of archaeological fieldwork would be to identify surface archaeology and the potential for subsurface archaeology in order to guide the design of the proposed solar farm development footprint and to assess the potential impact of the proposed development upon Aboriginal heritage.

The objectives of the assessment are therefore to:

- Conduct Aboriginal consultation as specified in clause 60 of the *National Parks and Wildlife Regulation 2019*, using the consultation process outlined in the (ACHCRP);
- Undertake survey and subsurface testing (if required) to identify any archaeological material;
- Undertake an assessment of the archaeological and cultural values of the proposal area and any Aboriginal sites therein; and
- Record all Aboriginal cultural heritage objects and places within the proposal area and submit these sites to the AHIMS.
- Provide management recommendations for any Aboriginal cultural heritage objects found.

Broadly, the archaeological aims of the project would be to:

- Identify the presence or absence of Aboriginal cultural material within the impact areas.
- Assess the likely extent and nature of any such cultural material.
- Assess the archaeological significance of any cultural material.
- Provide an opportunity for Aboriginal stakeholders to assess the cultural significance of any material.
- Assess the management requirements for any cultural material.

Although no site survey has been completed for this project yet, we do have a robust predictive model based on extensive archaeological assessments within the broader landscape, which identifies that the project area is very likely to contain both surface and subsurface stone artefacts. In order to confirm this predictive model, we would need to survey the project area for surface archaeology and to confirm the presence of sensitive landforms, followed by test excavation to identify the presence of subsurface archaeology.

Survey Strategy

The project area is currently covered by vegetation (mostly grass) due to good seasonal rains. Visibility is generally poor with few areas of exposure present, which would inhibit the ability to find surface sites.

The proposed approach to the survey is therefore to sample the proposal area, rather than conduct a full pedestrian survey of the entire area. The landowners have recognised the issue with visibility and have offered to assist through use of a harvesting type machine that would be able to cut strips of grass and windrow the material to the side. The machine is pulled by a tractor and would only be about 3-4 m wide so this approach would result in long but narrow strips of slightly increased visibility compared to surrounding areas. These survey transects would concentrate on areas of possible infrastructure where they intersect areas of elevated archaeological potential, where possible.

Testing Strategy

Test excavation would target landforms which are unmodified and assessed to be archaeologically sensitive based on the model provided in this document. Testing would be undertaken in line with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW NSW 2010a). Note that the number and location of pits may vary. The number and extent of test pits if required would be determined in the field. Any Aboriginal cultural heritage objects recovered from this testing program would be temporarily stored at the relevant NGH Office in a locked cabinet until such a time as these objects can be returned to site or a care agreement sought.

Due to the amount of data available from previous archaeological excavations within the region, and more specifically within and surrounding the proposal area, a targeted approach to testing has been proposed.

Testing may be undertaken in clusters, with groups of five test pits placed 5-10 m apart or in transects with pits located 10-20 m apart, depending on the terrain and sensitivity. Some flexibility in the approach is desired to accommodate differences in the project area.

REPORTING

A report detailing the results of the assessment will be prepared that will be provided to all RAPs for review and comment.

The report will include descriptions of sites, artefact attributes and photographs. A draft copy of the report will be provided to the RAPs for comment. The report will then be finalised and used as supporting documentation for an SSD application.

CULTURAL KNOWLEDGE

As part of assessing the potential impact of the development on Aboriginal cultural values, NGH is seeking any information from the local Aboriginal community that will assist in this process. The significance of any archaeological sites identified within the proposal area will be assessed for their scientific values. We would also seek the input from the Aboriginal community on the cultural values of any sites found.

In addition, we also seek information about any other values that may be attributed to the land identified for development. If there are known cultural sites or places of value within the proposal area, we request that this information be provided to be incorporated into the assessment. Information can be held confidentially if that is required, although such information would be used in providing an assessment of any impacts to Aboriginal values by the project. We are happy to discuss this in more detail with individuals or groups if required.

1. INTRODUCTION

1.1. THE PROJECT

NGH Pty Ltd (NGH) has been engaged by Blind Creek Solar Farm Pty Ltd (BCSF) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) to inform an Environmental Impact Statement (EIS) for the State Significant Development referred to as the *Blind Creek Solar Farm*.

1.2. BLIND CREEK SOLAR FARM LOCATION

The proposed Blind Creek Solar Farm site is located along Tarago Road, approximately 8 km north of Bungendore, NSW, and 50 km east of Canberra, Australian Capital Territory (ACT), refer to Figure 1-5 and Figure 1-6, and within the Queanbeyan-Palerang Local Government Area (LGA) (Parishes of Currandooly and Ellende, County of Murray).

The proposal area comprises of 1191.414 hectares (ha) within the following Lot and Deposited Plans (DPs):

- Lot 1 DP237079,
- Lot 1 DP456698,
- Lot 1 DP1154765,
- Lot 2 DP1154765,
- Lot 2 DP1167699,
- Lot 2 DP237079,
- Lot 3 DP237079,
- Lot 4 DP237079,
- Lot 9 DP237079,
- Lot 10 DP237079,
- Lot 11 DP237079,
- Lot 17 DP535180, and
- Lot 3 DP38379.

1.3. ABORIGINAL HERITAGE AND THE PROJECT

Lake George has been the focus of numerous previous archaeological studies, with a number adjacent or overlapping the proposed Blind Creek Solar Farm project area. These studies have resulted in the identification of 17 Aboriginal heritage sites, listed on the Aboriginal Heritage Information Management System (AHIMS), located within the proposed Blind Creek Solar Farm project area.

Lake George is a harsh environment in which the only remaining evidence of Aboriginal habitation and use of the area are stone artefacts. Organic materials are not likely to have survived and archaeological excavations have found that even recent organic depositions such as animal bone are absent from the archaeological record. Scarred trees are uncommon due to the historical clearing of land for use for grazing.

1.3.1. Secretary’s Environmental Assessment Requirements - Heritage

The proposed works to construct the proposed solar farm have the potential to impact on Aboriginal heritage sites and objects which are protected under the *NSW National Parks and Wildlife Act* 1974 (NPW Act). An Aboriginal Cultural Heritage Assessment (ACHA) is required to undertake a thorough assessment of the Aboriginal heritage and possible impacts of the proposal. The requirements for the assessment are provided in the Secretary’s Environmental Assessment Requirements (SEARs) which state:

Heritage – including an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development and consultation with the local Aboriginal community in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents*

The ACHA report is to provide the Department of Planning, Industry and Environment (DPIE) and Heritage NSW with information about the nature, extent and significance of any Aboriginal objects and/or Aboriginal places and their values.

This investigation methodology outlines the proposed approach to conducting the assessment. The project will be conducted in line with the following requirements outlined in:

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

1.3.2. Heritage NSW – Government Agency Advice to inform the SEARs

The approach undertaken by NGH for this assessment will be consistent with these documents and other heritage assessments undertaken in NSW. Heritage NSW also noted that:

"*The area of the Lake George sand deposits has already been identified in the South East and Tablelands Regional Plan 2036 as an important cultural landscape. Heritage NSW advises that a full archaeological assessment, including test excavations, will be required because Aboriginal sites with subsurface potential have already been identified within the project area. Test excavations need to be undertaken as part of the upfront EIS assessment to inform the design and approvals process for the whole area that will be affected by the development. Cumulative impact to the archaeological resource of the Lake George area will also need to be considered. Any assessment that will be undertaken to inform the EIS, such as geotechnical investigations, must also consider impacts on Aboriginal cultural heritage."* (Heritage NSW, SEARs for SSD-13166280, 21 February 2021).

1.4. PROJECT BACKGROUND

The proposal area covers approximately 1191.414 hectares (ha). The area is largely undeveloped farming land and has several ephemeral drainage lines associated with Butmaroo Creek, Wrights Creek, Dry Creek, and Bridge Creek. The proposed development footprint design will be finalised upon completion of the heritage assessment. The Proponent will investigate opportunities to minimise potential impact to heritage, for eg. through excising areas of archaeological sensitivity, following results of the heritage assessment and consultation with Aboriginal stakeholders.

The proposal area extends approximately 6.5 km east of Lake George and is bordered by Tarrago Road to the south and Lake George to the west; there are several unnamed farm roads within the proposal area. Lake George is also traditionally known by two names – Ngungara and Weereewa. The proposal area is approximately 8 km north of Bungendore, NSW, and 50 km east of Canberra, ACT in the Queanbeyan-Palerang LGA, Parishes of Currandooly and Ellende, County of Murray.

1.4.1. Solar Farm Development and Proposed Ground Disturbance

The Blind Creek Solar Farm would involve the construction, operation and decommission of a photovoltaic (PV) solar array with a capacity to generate approximately 350-400MW that would supply electricity into the national electricity grid. When built, the solar farm will produce up to 900,000 Mega Watt hours (MWh) per year. The project is likely to include:

- Up to 130 inverters.
- Up to 1 million PV modules.
- Single axis tracking with a preferred 7m spacing between panels and a 4m height.

- Onsite substation with a 300MW and 300MWh inertial or electrochemical storage Battery Energy Storage System (300MW, 900MWh).
- Cabling network (preferably underground) between panels and substation.
- Internal laneways for maintenance and for movement of stock.
- Fencing for rotational grazing.
- Internal gravel roads and carparking.
- Possible control centre/small office.
- On site water storage, inclusive of hydrant points for the RFS.

The proposal site would combine rows of solar panels laid out approximately in north to south axis, separated by approximately seven metres to allow grass for grazing. Solar panels are likely to be mounted on a single-axis tracking system, enabling the panels to track the sun throughout the day in an east-west direction. Figures 1-1 to 1-4 below provide examples of typical solar farm infrastructure and machinery used during the construction.

The proposed connection to the grid would be via construction of a new onsite substation and battery storage located adjacent to the existing TransGrid 330 kV transmission line. The proposal currently has two site access options including:

1. Existing site access off Tarago Road, which is a sealed public road linking Bungendore Road and Braidwood Road.
2. Currandooley Road, an unsealed private road that forms part of the southern section of the project boundary.

As the project has a capital investment value (CIV) greater than $30 million, it will be submitted as a State Significant Development for approval to the NSW Department of Planning, Infrastructure and Environment (DPIE).

Figure 1-1 Example of machinery typically used to drive poles into the ground for the solar array supports. (source: NGH stock image).

Figure 1-2 Example of typical distances between array support poles (source: NGH stock image).

Figure 1-3 Example of typical solar panel support infrastructure (source: NGH stock image).

Figure 1-4 Example solar panel array (source: NGH stock image).

1.4.2. Proposed Ground Disturbance

The proposed ground disturbance for a solar farm development is considered relatively low in comparison to other developments such as mining or road and building construction.

Disturbances will largely be in the preparation of the ground for the solar farm. Piles would be driven 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 mounted 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. Access and internal access tracks would also be required, and typically these would comprise compacted layers 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. PCU inverters and storage units will be required in association with the array layout. These are generally within modified shipping containers, which will require a levelled concrete foundation.

Electrical transmission infrastructure will be required to connect the solar arrays and substation to the existing transmission line that runs through the Proposal Area. The substation itself will require significant ground disturbances to clear and level the ground prior to construction, and also to facilitate connections to the solar network.

The construction phase is anticipated to take between 12-18 months. It is anticipated that the Blind Creek Solar Farm would operate for 35 years, after which time the solar farm would be decommissioned or repowered subject to landowner and planning consents. The decommissioning phase would involve removal of all above ground infrastructure and return of the site to its existing land capability.

When the site is to be decommissioned, it would involve removal of all above ground infrastructure except the sub-station and return of the site to its existing land capability. The use of piles to support the solar arrays makes de-commissioning and land rehabilitation simple to complete.

The development activity will therefore involve disturbance of the ground during the construction of the solar farm. Once established there would be minimal ongoing disturbance of the ground surface.

The proposed ground disturbance will involve:

- Driving solar panel poles into the ground. No excavation is required so the ground disturbance is limited to the width of the pole and depth the pole is driven into the ground.
- The underground trenching of high voltage transmission lines.
- Access roads.

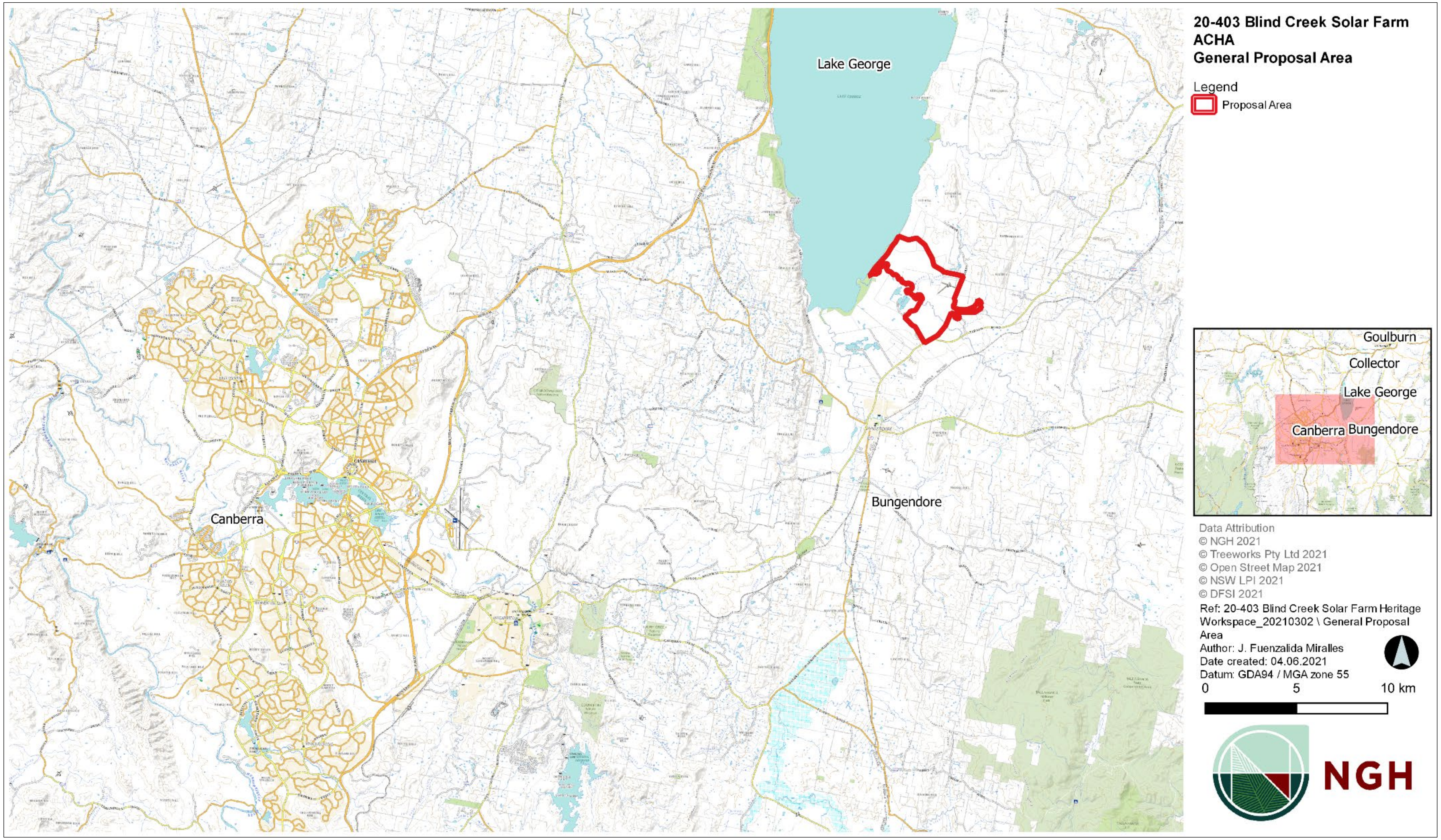

Figure 1-5 Blind Creek Solar Farm: General Proposal Area.

Figure 1-6 Blind Creek Solar Farm: Proposal Area.

2. ABORIGINAL CONSULTATION

In accordance with the requirements outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRP) (*DECCW NSW 2010b), NGH will consult with the Aboriginal community throughout the project. To date this has included the following steps:

- Advertising for interested parties by placing a public notice advertisement in the *Canberra Times* on 24th February 2021;
- Writing to required agencies, including Heritage NSW, advising of the project, and seeking potential interested parties; and
- Writing to any additional identified parties from Heritage NSW and/or other organisations seeking their interest.

This methodology is now being provided for comment to those parties who have registered their interest in the project.

The following steps will subsequently take place for this assessment:

- Registration of parties.
- Following the 28-day review period for the methodology, the fieldwork component will proceed with assistance from the Aboriginal community with representatives selected by the proponent and in line with the ACHCR guidelines.
- Once fieldwork is completed, an ACHA report will be drafted, and provided to the registered Aboriginal parties (RAPs) for review and comment.
- The final report will incorporate information provided by the Aboriginal community and a copy will be provided to each party for their records.
- The final ACHA document will be used as supporting documentation for the State Significant Development application.

3. ENVIRONMENTAL BACKGROUND

Understanding the landscape context of the proposal area may assist us to better understand the archaeological modelling of the area and assist to identify local resources which may have been utilised by Aboriginal people. This landscape assessment is based on a number of classifications that have been made at national and regional levels for Australia.

3.1.1. General Description

The proposal area is located within close proximity to the significant hydrological landscape of Lake George. The lake is believed to be more than a million years old and has no outflow to rivers or oceans (endorheic) (Abell 1985:2). The Lake George Escarpment on the western side of the lake was formed along a fault line blocking creeks and rivers that previously drained into the Yass River, forming the Lake, which extends for approximately 25 km in length and 10 km in width (Abell 1985:4).

The proposed solar development consists predominantly of near-level paddocks, with a maximum local relief of approximately 12 m. The project area includes undulations and rises, with increasing slope gradients to the northeast, east, and southeast.

The paddocks are typically covered with moderate to dense natural and exotic grassy vegetation.

The national Interim Biogeographic Regionalisation for Australia (IBRA) identifies the proposal area as being located within the South Eastern Highlands Bioregion (SEH) (NSW DPIE n.d.). The SEH Bioregion comprises of ten subregions: Hill End, Orange, Bathurst, Kanangra, Oberon, Crookwell, Bungonia, Murrumbateman, Western Fall, and Monaro. The proposal area is within the Monaro subregion which is described in Table 3-1 below.

Further landscape mapping conducted by Mitchell (DECCW 2002) identifies two landscape types within the proposal area. These are the Lake George Complex, which covers the majority of the proposal area, and the Gundary Plains, which covers a small portion of the eastern proposal area. These landscapes are described in Table 3-2 below.

Table 3-1 IBRA Subregion Monaro Description.

Subregion	Geology	Landforms
Monaro	Block faulted ranges and closed lake basins in Silurian and Devonian acid fine grained sedimentary and metamorphic rocks with some granites. Extensive areas of thin Tertiary basalt flows over lake and river sediments.	Sloping plateau rising from 600 to 1300 m north to south. Structural ridges of more resistant rock. Stepped plains on basalt with intervening low areas of granite or sedimentary rocks. Numerous shallow lakes and swamps, a few permanent many are closed basins and periodically dry. Area is in rain-shadow with rainfall 450-700mm.

Table 3-2 Mitchell Soil Landscape Descriptions.

Soil Landscape	Description
Lake George Complex	Closed drainage basins of Quaternary lakes and swamps set within block faulted ranges. Extensive Tertiary quartz gravel, sand, and mud overlying Silurian-Devonian gneissic granite and Silurian quartz sandstone and mudstone. General elevation 700m, local relief of lake beds <50m, rounded hills stand above the plain to 900m. Eastern margins with well-developed sandy lunettes. Maximum lake depths about 7m, may be dry for periods of years or vary in water level over decades. Evidence of much greater extent and depth during the Pleistocene ice ages. Self-mulching grey clays on the lakebeds,

Soil Landscape	Description
	yellow earths on the lunettes. Wet tussock grasslands of spear grass (Austrostipa sp.) and Poa sp. with kangaroo grass (*Themeda triandra*) on lake margins, now extensively altered by exotics. Clumps of sparse stunted snow gums (*Eucalyptus pauciflora*) on low hills and sandy lunettes. Common reed (*Phragmites australis*) around freshwater seepage areas on lake margins.
Gundary Plains	Wide open valleys with abandoned terraces and Quaternary lakebeds on lower Devonian siltstone, sandstone, andesite and quartz felspar porphyry. General elevation 75m, local relief <30m. Yellow, hard setting texture-contrast soils with distinct bleached A2 horizons. Grasslands of spear grass (Austrostipa sp.) and kangaroo grass (*Themeda triandra*) with small clumps of sparse snow gum (*Eucalyptus pauciflora*) on rounded rocky hills and sandy lunettes of former lakes.

3.1.2. Geology

Due to the proximity of the proposal area to the Lake George fault line, and the age of the lake formation, there are several geological formations found within the proposal area. These are described in detail in Table 3-3 below.

Table 3-3 Geological formation present throughout the proposal area (Colquhoun et al. 2020).

Geological Formation	Description
Lake Strandlines	Part of the Cenozoic Sedimentary Province. Characterised by unconsolidated poorly to well sorted rounded gravel interbedded with varying amounts of well sorted medium to coarse grained sand. Deposits form low rises with asymmetric cross-sections marking prior lake levels. Some may be relict lunettes. Formed within a transitional depositional environment during the Quaternary period of the Cenozoic.
Abercrombie Formation	Part of the Lachlan Orogen supergroup. Characterised by brown and buff to grey, thin-to thick-bedded, fine to coarse grained mica quartz (+/- feldspar) sandstone, interbedded with laminated siltstone and mudstone. Sporadic chert-rich units. Formed within a deep marine – siliciclastic and biochemical depositional environment during the early to mid-Ordovician.
Alluvium	Part of the Cenozoic Sedimentary Province. Characterised by unconsolidated grey to brown to beige humic (+/-) micaceous silty clay, quartz (+/-) lithic silt, fine to medium grain quartz rich to quartz lithic sand, polymictic pebble to gravel (as sporadic lenses); sporadic paleosol horizons. Formed within a terrestrial-fluvial depositional environment during the Quaternary period of the Cenozoic.
Lockhart Igneous Complex – Gabbro – Dolerite Phase	Part of the Thurralilly Suite. Characterised by green to black, medium to coarse grained, equigranular to intensely foliated, commonly ophitic, hornblende (+/-) pyroxene olivine dolerite to gabbro; the dominant lithology is granite. Formed within a shallow crustal (continental I-type) depositional environment during the Lower Devonian.
Elleden Granite	Part of the Thurralilly Suite. Characterised by leucocratic, medium grained, equigranular, biotite (+/-) muscovite granite with a marginal phase of fine to medium grained, leucocratic, porphyritic, granite and microgranite. Formed within a shallow crustal (continental I-type) depositional environment during the Lower Devonian.

Geological Formation	Description
Colluvium	Characterised by poorly sorted, weakly cemented to unconsolidated colluvial lenses of polymictic conglomerate with medium to very coarse-grained sand matrix; interspersed with unconsolidated clayey and silty red-brown (aeolian) sand layer, modified by pedogenesis. Formed during a transitional (marine to terrestrial) depositional environment during the Quaternary.
Residual Deposits	Characterised by a weakly-consolidated regolithic residuum such as soil or saprolite mostly developed in-situ as a result of advanced weathering and/or pedogenesis. Formed within a terrestrial (fluvial) depositional environment during the Quaternary.

The geological formations found within and in close proximity to the proposal area suggest that raw stone material for the manufacture of stone tools, specifically quartz and mudstone, was locally available. It should also be noted that the presence of different geological formations does not exclude the possibility that superior raw material types were traded from other regions.

Archaeological studies undertaken in proximity to the proposed Blind Creek Solar Farm indicate that there are no rock outcrops in the proposal area and that artefacts were made from blocks of stone brought from elsewhere. The source of the lithic material recovered during archaeological excavations within and near to the proposal area is unknown.

3.1.3. Soils

Geotechnical investigations were undertaken across the proposed project area by Douglas Partners in 2021. The subsurface conditions are relatively consistent across the site, with deep sand profiles across the site interspersed with layers of clays and clayey sands with varying (low to medium) plasticity (Douglas Partners; 2021).

Douglas Partners (2021) dug 13 test pits and recorded pH levels for five test pits with levels ranging between 5.8-8.1, indicating that the soils are slightly acidic to neutral at those locations. It is difficult to extrapolate the results of the pH testing to across the site due to the limited testing.

The proposal area is comprised of two soil landscapes as mapped within eSpade; these are described in Table 3-4 below.

Table 3-4 Soil landscapes present within the proposal area (DPIE 2020).

Soil Profile	Description
Coopers	Characterised by old lake beaches, dunes and sandsheet on Quaternary alluvium with deep to very deep (>100 cm), very poorly drained Hydrosols and Stratic Rudosols (Alluvial Soils) on Ngungara/Weereewa. Moderately deep to very deep (>90 cm), imperfectly drained Brown Chromosol (Yellow Podzolic Soils) on old beaches. Well-drained Stratic Rudosols (Siliceous Sands) on beach dunes. Moderately deep to very deep, poorly drained Stratic Rudosols (Alluvial Soils) on swales. Soil acidity ranges from slightly acidic to neutral (pH 5.5 – 6.5) in the topsoil to neutral to slightly alkaline (pH 6.5 - 8.5) in the subsurface soils. Local limitation includes highly erodible non-cohesive soils, localised seasonal waterlogging, and wind erosion hazards.

Taylors Creek	Characterised by extremely shallow (<40 cm), well-drained Rudosols (Lithosols) and Tenosols (Earthy Sands) on crest or adjacent to outcrops. Moderately deep to shallow (<80 cm), moderately well-drained Red Kandosols (Red Earths) and Red Chromosols (Red Podzolic Soils) on upper and midslopes. Moderately deep (<10 cm), poorly drained Kurosols (Soloths) and Sodosols (Solodic Soils) on lower slopes and drainage lines. Soil acidity ranges from slightly acidic to neutral (pH 5.5 – 6.5) in the topsoil to neutral to slightly alkaline (pH 6.0 – 7.5) in the subsurface soil. Local limitations include seasonal waterlogging, gully erosion risks, localised sheet erosion risks, localised shallow soils, localised non-cohesive soil, and localised rock outcrops.

The varying acidity of the soils suggests that there is a possibility for organic archaeological material to remain within the topsoil in areas that contain a neutral pH. Furthermore, the numerous erosion hazards indicate that durable archaeological material, such as stone artefacts, will have likely been displaced from their original position. The presence of shallow soils within the Taylors Creek landscape suggests that there may be a reduced potential for intact subsurface archaeological remains in those areas, although the geotechnical results suggests that the deposits within the proposal area are relatively deep (greater than 2m in depth).

Geotechnical Testing

Geotechnical testing was undertaken for the Blind Creek Solar Farm proposal (Douglass Partners 2021). The purpose of these investigations was to assess the subsurface soil and groundwater conditions of the proposal site. The geotechnical investigations included the excavation of two test pits, drilling of eleven boreholes, two electrical resistivity tests and also the testing of select samples within a laboratory.

The results of the geotechnical testing have provided an indication of the subsurface soil deposits throughout the proposal area:

- The western portion of the site is underlain with Quaternary deposits of alluvium, colluvium, aeolian and strandline units.
  - Alluvium soils are characterised by gravels, sand, silty clay and black organic clay.
  - Strandline deposits are paleo-beach deposits that have formed in sandy spits along the shoreline of Lake George. The strandline formation is generally characterised by a higher portion of sand and gravels than is seen in the alluvium deposits. These deposits relate to the changing or receding shoreline of the lake.
  - Colluvium deposits are comprised of fanglomerate and poorly formed conglomerates, gravel and sand.
  - Aeolian deposits are comprised of a fine quartz sand.
- The eastern portion of the proposal site is underlain by the Devonian Ellenden Granite of the Bega Batholith Group.

The results of the geotechnical investigations highlighted three consistent units across all testing locations:

- Topsoil – a sandy deposit varying from loose to medium densities, ranging from 15cm to 20cm in all borehole locations, while the topsoil characteristics of the two test pits excavated highlighted a more loose and fine to medium grained silty sand, reaching depths between 25cm and 30cm.
- Sand – the deposit underlying the topsoil in all geotechnical investigation locations consisted of sand, with highly variable densities from loose to compact. The sand was typically fine grained with some medium grained sands occurring at depth. Within the eleven boreholes, the deposits reached a minimum depth of 90cm to a maximum depth of 3m. Within the two test pits excavated, the sand deposits reached 1m and 2m in depth.
- Silty Clay – Sandy Clay – Clayey Sand. The underlying stratigraphy present within the geotechnical results identifies more of a ranging difference throughout the proposal area. This deposit is characterised by clay of a low to high plasticity that is dense to very dense terminating at depths between 3m and 5m. Within the eleven boreholes, the stratigraphy varied from a silty clay to a clayey

sand. This deposit had ranging plasticity and density from low to high, with the deposit terminating between 2.05m and 3.2m in depth.

There were no colluvial or strandline deposits recorded at any geotechnical testing locations. The results of the laboratory testing also highlight the varied pH across the proposal site, with the majority of tested soils being moderately acidic with a pH between 5.8 and 8.1.

The results of the geotechnical testing highlight three main deposits present across the proposal site. The testing has identified deep sandy deposits across the site with the potential to contain archaeological material. The characteristics of the soils described in the geotechnical results indicate that while there is some changes evident in the stratigraphy of the proposal area, the characteristics of the soil across the site is similar.

3.1.4. Flora and Fauna

The majority of the proposal site consists of exotic pasture and cropland on flats. These areas have a long history of cultivation, cropping, pasture improvement and grazing. Furthermore, there is an ephemeral rainfall-dependent wetland on cultivated land sown to pasture on flats in the west of the site. While pasture grasses persist, native wetland herbs including Grass-poly and Austral Mudwort have colonised and dominate the groundcover in some areas. During a site inspection performed by NGH, it was noted that flocks of waterbirds were using the wetlands within the project area.

Snow Gum and Manna Gum woodland occupy the flats and lower slopes in the east of the site, particularly around the airstrip. The trees in the forest patch are mature (0.2-1.0 metres dbh) and hollow-bearing. The forest provides habitat for arboreal fauna, foraging woodland birds and hollow-nesting birds and microbats. The Koala may utilise the Manna Gum as a feed tree, while the microbat Eastern False Pipistrelle may use small hollows in forest patches for roosting and breeding. The Proponent intends to completely avoid any areas of remnant snow gum woodland.

Serrated Tussock is widespread across the property, as is Scotch Thistle, particularly in the exotic pasture paddocks. African Lovegrass was seen beside the access road. Great Brome and Red Sorrel, which are widespread in woodland on the property, and African Boxthorn observed near the airstrip, are considered High Threat Exotics for the NSW Monaro Cool Temperate Grassy Woodland CEEC (DPIE, 2019).

3.1.5. Historic Land Use

Exploration of inland NSW followed the crossing of the Blue Mountains in 1813. In October 1820 Charles Throsby led an expedition for Governor Lachlan Macquarie to inspect the country around Lake Bathurst and Lake George, some 50 or so kilometres north-east. A number of pastoral properties had been established in the region prior to the lodging of an application by John Lanyon and James Wright on Lanyon in 1834.

The proposed Blind Creek Solar Farm project area has been used for pastoral grazing practices for a significant period of time and was cleared of its native vegetation. The removal of native vegetation appears to have caused erosion events along the stream banks and caused sand blowouts within the proposal area. Furthermore, it should be noted that the ruins of a historic structure can be seen towards the south of the project area.

The historic imagery shows that pre-1967, the current proposal area had not been used for its sand resources. By 1976, historical imagery appears to show the appearance of three new sand extraction areas within the project area (see Figure 3-1), the largest of which was close to the shores of Lake George along a Holocene beach ridge; the remaining two areas are smaller and located closer to Currandooley Road. Imagery from that year also shows a small runway for aircraft in the east of the proposal area, close to Currandooley Road; its exact date of construction is unknown.

By 1985 the three sand mining quarries that were active appear to have been decommissioned and it appears that three new quarries had been opened near the mouth of Butmaroo Creek in the 9-year interlude, only one of these areas appeared to have been used recently when the 1985 images were taken. It is also during this time that the Bungendore Sands began its mining operation adjacent to the proposal area on the south western side of Butmaroo Creek.

By 1992 all sand mining activities within the current proposal area had ceased. The termination of these activities within the proposal area coincides with the expansion of sand mining activities at Bungendore Sands to the west and other sand mining quarries in the region.

In their investigation of the Bungendore Sands Quarry to the west, Hughes et al. (1984:3) provided a detailed description of the sand quarrying activities that took place within that quarry. These activities are likely to represent some of those undertaken within the sand quarries in the current proposal area. Within Bungendore Sands, quarry operators mined for 'clean' sands (no topsoils) from the centre of the beach-ridge. In the process of accessing this sand, the topsoils were removed by a bulldozer and piled in heaps around the margins of the quarry pit (which Hughes et al. termed 'scaped heaps'). Hughes et al. also recorded that when the quarrying activities extended further outwards, these 'scraped heaps' were moved to the new margin of the quarry or were re-spread over the ground surface in order to stabilise some areas of the mine and encourage the regrowth of grass. Due to this process, in the areas where sand mining activities have taken place, there is very little topsoil that remains in situ. Furthermore, Hughes et al. reported that the ‘clean’ sand that was recovered from the centre of the beach-ridges was loaded onto trucks through a conveyor belt system that removed any gravels or unwanted material (including Aboriginal stone artefacts) before the sand was removed from the site. The remaining gravel material was placed back on the floor of the quarry in what Hughes et al. termed ‘gravel heaps’. While the sand mining activities recorded by Hughes et al. (1984) are relevant to the Bungendore Sands Quarry to the west, it is likely that these processes were similar to the smaller sand quarries that are present within the current proposal area. As a result, it is likely that these areas were heavily disturbed by these practices and moved a significant amount of previously unknown Aboriginal heritage deposits to the surface. Therefore, any surface artefacts recorded in association with ‘scraped’ or ‘gravel’ heaps are likely to instead characterise the material present in the subsurface deposits of former sand quarry areas and their associated landforms.

At present, the proposal area is privately owned and solely used for grazing. No new sand quarries appear to have been opened within the proposal area since 1985. It should be noted that since 1992, the Bungendore Sands quarry had expanded slowly until it hit the western banks of Butmaroo Creek, reaching its current extent.

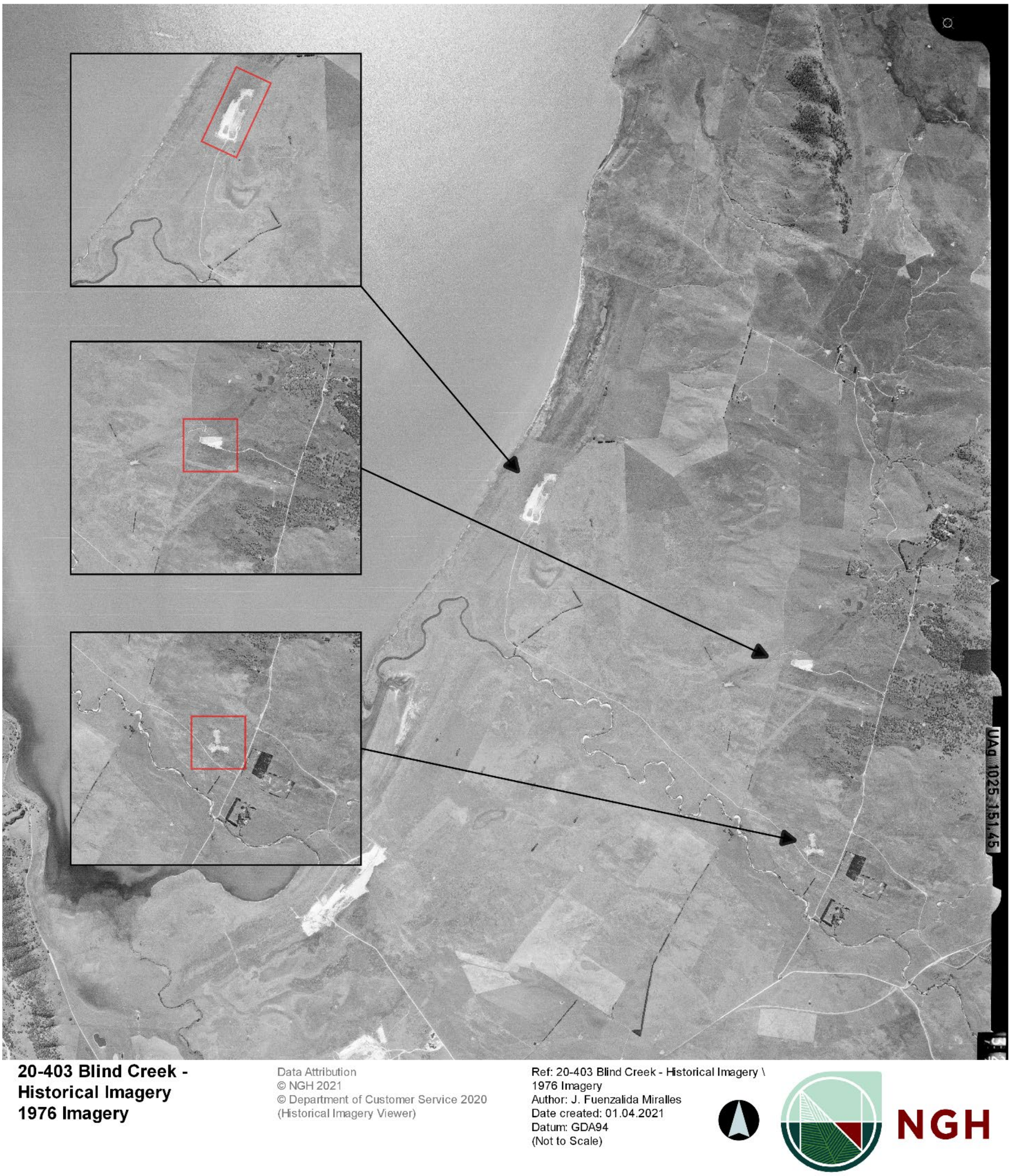

Figure 3-1 1976 Historical Imagery over the entire proposal area.

It is clearly visible that by 1976 three separate, small, sand quarrying operations had been set up within the proposal area. A small airfield is also visible to the south of the middle sand quarry.

4. ARCHAEOLOGICAL BACKGROUND

4.1. ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM

The purpose of the ACHA is to investigate the presence and extent of any Aboriginal sites within or adjacent to the proposal area and to assess their significance and any possible impacts resulting from the proposed works. As part of the desktop assessment for this project, an extensive search was undertaken of the Aboriginal Heritage Information Management System (AHIMS).

The AHIMS register is maintained by Heritage NSW and provides a database of previously recorded Aboriginal heritage sites. An extensive search provides basic information about any sites previously identified within a search area. However, an AHIMS 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 Heritage NSW to add to the database. 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 during a map search over the general Lake George area. The parameters for this search were as follows:

- Client Service ID: 547771
- Date:05/11/2020
- From: -35.2482 (Latitude), 149.4097 (Longitude)
- To: -35.1457 (Longitude), 149.5724 (Longitude)
- Buffer: 50 metres
- Number of Aboriginal sites and Aboriginal objects found: 103
- Number of declared Aboriginal Places found: 0.

Table 4-1 outlines the site types previously recorded in the region.

Table 4-1 Breakdown of previously recorded Aboriginal sites in the region.

Site Type	Number
Artefact	86
Potential Archaeological Deposit (PAD)	14
Art (pigment or engraved)	2
Potential Archaeological Deposit (PAD), Artefact	1
TOTAL	**103**

There are 17 archaeological sites currently recorded on AHIMS within the proposal area. These sites are summarised in Table 4 2 below and can be seen in Figure 4 2 below.

Figure 4-1 AHIMS Extensive Search Results.

Figure 4-2 AHIMS sites located within the proposal area.

Table 4-2 AHIMS sites within the proposal area.

Site Number	Site Name	Site Type	Distance to Project (m)	Site Status on AHIMS
57-2-0059	Lakelands;	Artefact	Within the proposal area	Valid
57-2-0020	Currandooly 2; Lake George;	Artefact	Within the proposal area	Valid
57-2-0588	Grantham Park 2	Artefact	Within the proposal area	Valid
57-2-0701	CWF2-IF-01	Artefact	Within the proposal area	Valid
57-2-0702	CWF2-IF-02	Artefact	Within the proposal area	Valid
57-2-0703	CWF2-IF-03	Artefact	Within the proposal area	Valid
57-2-0704	CWF2-IF-04	Artefact	Within the proposal area	Valid
57-2-0707	CWF2-IF-07	Artefact	Within the proposal area	Valid
57-2-0708	CWF2-IF-08	Artefact	Within the proposal area	Valid
57-2-0790	West Creek Dairy PAD 1	PAD	Within the proposal area	Valid
57-2-0917	Willow Sands	Artefact, PAD	Within the proposal area	Valid
57-2-0642	Grantham Park 3	Artefact	Within the proposal area	Valid
57-2-0732	CWF2-S-01	Artefact	Within the proposal area	Valid
57-2-0733	CWF2-S-02	Artefact	Within the proposal area	Valid
57-2-0734	CWF2-S-03	Artefact	Within the proposal area	Valid
57-2-0735	CWF2-S-04	Artefact	Within the proposal area	Valid
57-2-0736	CWF2-S-05	Artefact	Within the proposal area	Valid

4.2. OTHER HERITAGE REGISTER SEARCHES

4.2.1. Australian Heritage Database

A search of the Australian Heritage Database identified no registered Aboriginal Places located within the proposal area.

4.2.2. State Heritage Inventory

The State Heritage Inventory includes a database of heritage items in New South Wales which include:

- Declared Aboriginal Places
- Items listed on the State Heritage Register (SHR)

- Listed Interim Heritage Orders items on State Agency Heritage Registers, and,
- Items of local heritage significance listed on a local council's Local Environmental Plan (LEP).

A search of the NSW Heritage register identified no Aboriginal Places or NSW Heritage Items registered within 1 km of the proposal area.

4.2.3. Palerang Local Environmental Plan 2014

The proposal area is located within the area covered by the Palerang LEP 2015. Schedule 5 of the LEP 2015 details the environmental heritage items encompassed by the plan. No Aboriginal sites or places are identified within the proposal area in the Palerang LEP. However, the locally listed Currandooley Homestead (ID: I175) is located partially within the north eastern corner of the proposal area. The heritage impacts on this listing will need to be subject to a separate assessment.

The Lake George sand deposits in the Palerang LGA are specifically mentioned as containing heritage significance to the Aboriginal community in the South East and Tablelands Regional Plan (DPIE 2016:36).

4.3. PREVIOUS ARCHAEOLOGICAL STUDIES

A significant number of studies have been undertaken in the areas surrounding Lake George and Bungendore which provide a sound archaeological context for the proposal area which are summarised below.

A large portion of the archaeological investigations conducted within the region are a result of the high demand for aggregates and sand around the Canberra region from the 1970's into the late 1990's. Other extensive research conducted in the area has been academically focused, including detailed PhD research. As such, the results identify a large extent of research throughout the region, with archaeological investigations occurring across differing landforms allowing a detailed understanding of the archaeological potential within the proposal area.

Table 4-3 below lists the previous archaeological studies undertaken within or immediately adjacent to the Blind Creek proposal area.

Table 4-3 Summary of previous archaeological work undertaken within the region.

Name of Study	Proximity to Blind Creek	Surface Artefacts	Subsurface Artefacts	Other Aboriginal Sites	Landforms	General Observations
Bungendore Sand Quarry; Hughes, Hiscock, Barz (1984)	1.75 km south west	427	No excavations	nil	Relict beach ridge, which extend into the Blind Creek project area	The area is located within aeolian sand deposits and would have in the past been on the shoreline of Ngungara/Weereewa.
Bungendore Sand Quarry; Haglund (1984)	3 km west	Nil	Nil	Nil	Relict lacustrine beaches and sand bars that were composed of medium to coarse textured sands and gravels and a prominent beach ridge bisecting the area.	While no Aboriginal artefacts were located during the survey, Haglund and Associates identified that it is highly likely that artefacts are located within subsurface deposits in the beach ridges due to the subsurface investigations that had been conducted in nearby sand mining leases. Haglund and Associates recommended that further subsurface investigations be carried out, however it is unknown as to whether these took place.
Sand quarry on the 'Currandooley Lease'; ANUTECH (1985) – Survey and test excavation	Partially within the southern portion of the current proposal area that is associated with Bridge Creek.	Nil	38 (only 1 x1 m test pit was excavated)	Nil	Elevated creek flat, creek terrace, elevated sand body.	It was found that the sand body reached a maximum depth of 2.5 m in some areas. Artefactual material was retrieved from between 20 – 80 cm beneath the surface, with concentrations at 30 – 40 cm and 50 – 60 cm.
Sand quarry extension on the 'Currandooley Lease' (Lot 31 Potion 8); Packard (1992) – Survey and test excavations	Adjacent to the current proposal area on the western banks of Butmaroo Creek.	Nil	799 artefacts were recovered within the 8 excavated trenches		Elevated, sandy ground near creek lines, ridgelines, subdued drainage areas.	The site survey conducted found few ground exposures which would allow for potential site detection. Packard stated that the subsurface artefact material present suggested that the raised sandy ground closest to the creek lines were highly sensitive. Other areas within the ridgelines further away from the creek were of a lower sensitivity. Packard found that the subdued drainage areas were archaeologically sterile.

Name of Study	Proximity to Blind Creek	Surface Artefacts	Subsurface Artefacts	Other Aboriginal Sites	Landforms	General Observations
Capital Wind Farm; Austral Archaeology (2005) - Survey	Surveys took place over an area approximately 1 to 4 km north.	2 x artefact scatters; 3 x isolated artefacts; 5 x PADs	n/a	Nil	Gently sloping topography surrounding creek tributaries and moderately sloping ridgelines.	All ten survey units were conducted along the hills, ridgelines, and gullies north of the project area.
Lot 32, DP634213, Grantham Park; Cultural Heritage Management Australia (2008)	Adjacent to and overlapping the proposal area on the western banks of Butmaroo Creek.	1 x isolated artefact and PAD; 1 x artefact scatter and PAD	n/a	Nil	Slightly elevated terraces.	Both PADs were assessed to have high potential for subsurface archaeological deposits. The site GP2/Pad2 is within the current proposal area.
Capital Wind Farm; Austral Archaeology (2009) – Test excavations	Excavations took place approximately 1 km north.	n/a	348	Nil	Gently sloping topography surrounding creek tributaries and moderately sloping ridgelines.	A total of 348 artefacts were recovered from these excavations, with the majority (n=210) retrieved from the proposed wind turbine location in the closest proximity to Ngungara/Weereewa. The subsurface assemblage comprised of quartz, quartzite, silcrete and chert, with the former representing the dominant lithology. The excavations took place within the hill and gully landforms located to the north of the current project area. The results of the subsurface investigations confirmed the higher slopes and crests as areas of use whilst travelling through the landscape but not as foci of industry or occupation.
Capital Wind Farm II; Austral Archaeology (2010) – Survey	Adjacent and partially located within the current proposal area	30 x artefact scatters;			Gently sloping topography surrounding creek	Only one of the study areas was performed within the current project area.

Name of Study	Proximity to Blind Creek	Surface Artefacts	Subsurface Artefacts	Other Aboriginal Sites	Landforms	General Observations
		31 x isolated finds; 2 x PADs			tributaries and moderately sloping ridgelines.	Within the sites identified by Austral Archaeology, 158 flakes were identified along with 39 cores and 21 tools. Of the eleven sites identified within the current proposal area only two, CWF2-IF-07 (4.5.10) and CWF2-S-04 (4.5.15), were identified as containing a moderate potential for new information as well as a moderate representativeness, rarity, and research potential. The remaining nine sites were assessed as representing low potential for new information as well as low representativeness, rarity, and research potential. While Austral Archaeology did not recommend any further investigations for the sites recorded within the project area, they noted that these sites should be salvaged through collection and relocation should there be any potential impacts on them.
Willow Sands (#57-2-0917), PhD research; Amy Mosig Way (2014)	Within the current proposal area	1	199 were recovered from 17 test pits.		Elevated sand body associated with a creek line approximately 50 m away.	Site Willow Sands (#57-2-0917) was first recorded by Amy Mosig Way in 2014 as an artefact and PAD site measuring 270 m x 100 m. 17 test pits were excavated at the north-eastern end of the site as a part of this research, all of which were excavated in 50 cm x 50 cm pits and in 10 cm spits. All 17 of the test pits were brought down to approximately 70 cm to 90 cm deep, at which point a culturally sterile layer was reached; only one test pit reached a clay layer, while the remainder finished on a sandy layer. A total of 132 quartz artefacts were recovered, with a further 67 artefacts comprised of different material.

4.3.1. Discussion

The proposed development for the Blind Creek Solar Farm lies within a highly sensitive, but extensively researched area. While it is known that there is a high archaeological potential across many landforms within the proposal area (notably these are predominantly the elevated landforms), there are also a number of landforms that the previous research and archaeological modelling for the region would indicate hold a low archaeological potential. The proposal area has been categorised into 16 landforms, as highlighted in Figure 4-3. Table 4-4 provides a description of each landform, along with the archaeological potential and an indication of the previous archaeological excavations that have occurred.

It is clear from the previous archaeological studies, and landform mapping of the proposal area that there are archaeologically sensitive landforms contained within. While this is the case, it is also clear that certain landforms are known to contain higher densities of stone artefacts and overall archaeological potential. The proposal is to construct and operate a solar farm across the area described as the development footprint in Figure 4-3. It must be noted that the construction of the solar farm will result in relatively small ground surface disturbances, with an estimated 10% of the development area to be subject to disturbances.

Table 4-4 Archaeological potential of landforms within the proposal area.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
Strandline	Defined as a short, low, very wide slope, gently or moderately inclined, built up or eroded by waves, forming the shore of a lake or sea.	High	Portions of this landform was surveyed as a part of the Capitol II Wind Farm (Austral Archaeology 2010). This landform was also excavated by Packard (1992) who found a high density of 799 artefacts across 8 test pits.	No geotechnical investigations on this landform.
Beach	Define as an ancient shoreline. This area represents the receding waterline of Lake George.	High	Portions of this landform was surveyed as a part of the Capitol II Wind Farm (Austral Archaeology 2010). Packard's (1992) results indicate a lower subsurface potential than the strandline landform, however this area is still considered to hold a high archaeological sensitivity.	Bore Hole 9: 0-15cm: Top soil/sand; fine grained, grey, poorly graded, trace silt, medium dense. 15cm-90cm: Sand; fine grained, pale grey, poorly graded, trace silt, medium dense. Aeolian.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				90cm-1.7m: Sand; fine to coarse grained, brown, trace low to medium plasticity clay, very stiff. Alluvial. 1.7m-2.4m: clay; medium plasticity, brown, with silt and fine to coarse grained sand, hard. Alluvial 2.4m-2.9m: clay; medium plasticity, brown with mottled orange, with silt and fine to medium grained sand, firm. Alluvial 2.9m-3.1m: sand' fine grained, orange/yellow brown, poorly graded, loose. Alluvial.
Holocene Beach Ridge	Defined as a very long, nearly straight, low ridge, built up by waves and usually modified by wind during the Holocene. A beach ridge is often a relict feature remote from the beach.	High	This landform has one registered AHIMS site that describes the elevated area as a holocene beach ridge and identifies a potential artefact scatter across the entire landform. Due to the moving nature of sands it is considered that there is a high potential for subsurface archaeological deposits.	No geotechnical investigations on this landform.
Elevated Sand Body	Elongated, gently curved, low ridge built up by wind on the margin of a playa, typically with a moderate, wave-modified slope towards the playa	High	These landforms have been subject to previous archaeological excavations (Way, 2014; Packard, 1992; CHMA 2008; ANUTECH 1985). All results indicate a high archaeological potential across elevated sand bodies within the Lake George region.	No geotechnical investigations on this landform.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
	and a gentle outer slope			
Elevated Creek Flat	Defined as a landform pattern including one or more terraces and often a flood plain. Relief is low or very low. Terrace plains or elevated creek flats occur at stated heights above the top of the stream bank.	High	These landforms have been subject to previous archaeological excavations (Way, 2014; Packard, 1992; CHMA 2008; ANUTECH 1985). All results indicate a high archaeological potential across elevated creek flats within the immediate region.	No geotechnical investigations on this landform.
Waterway (Creekline)	The course (or way) occupied by a creek running through a landscape including the immediate habitat on both sides.	High	These landforms have been subject to previous archaeological excavations (Way, 2014; Packard, 1992; CHMA 2008; ANUTECH 1985). All previous research indicates a strong link between archaeological sites and waterways.	No geotechnical investigations on this landform.
Creek Terrace	Defined as a small flat aggraded or eroded by channelled or overbank stream flow, standing above a scarp and no longer frequently	Moderate	These landforms have been subject to previous archaeological excavations (Austral Archaeology 2009; Packard, 1992; CHMA 2008; ANUTECH 1985). All results indicate a moderate archaeological potential for creek terrace landforms within the immediate region.	No geotechnical investigations on this landform.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
	inundated; a former valley flat or part of a former flood plain			
Flat	Defined as a level to undulating or, rarely, rolling landform pattern of extremely low reliefs.	Moderate	Packard (1992) conducted test excavations across flat landforms, however notably more associated with water sources. There have been no excavations within the immediate region that have produced results from flats that are not associated with water sources.	No geotechnical investigations on this landform.
Low Spurs	Defined as a low lateral ridge of land descending from a hill, mountain or main crest of a ridge.	Moderate	No archaeological investigations across a low spur landform in the immediate region, however archaeological modelling would indicate a moderate potential.	Bore Hole 3: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, loose, trace low plasticity with rootlets. 20cm-90cm: Sand; fine to medium grained, orange/grey brown, poorly graded, trace silt, medium dense. Aeolian. 90cm-1.9m: Sand; fine to medium grained, orange/grey brown, poorly graded, trace silt, dense. Alluvial. 1.9m-2.05m: clay; medium to high plasticity, red/grey brown, with fine to coarse grained sand, very stiff. Alluvial 2.05m-2.7m: clayey sand; fine grained, red/grey brown, medium to high plasticity clay, dense to very dense. Alluvial. Bore Hole 7: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, loose, trace low plasticity with rootlets.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				20cm-1m: Sand; fine grained, pale grey, poorly graded, trace silt, loose then dense from 60cm. Aeolian. 1m-1.9m: clay; medium plasticity, brown, trace fine to coarse grained sand, trace silt, very stiff. Alluvial. 1.9m-2.55m: clay; medium plasticity, grey brown, trace fine to coarse grained sand, silt and gravel inclusions (<6mm), stiff to hard. Alluvial 2.55m-2.85m: sandy clay; low to medium plasticity, brown, fine to coarse grained sand, trace gravel (<5m), stiff to very stiff. Alluvial. 2.85m-3.1m: sand; fine to medium grained, gery/brown, poorly graded, trace silt, loose. Alluvial. Bore Hole 5: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, loose, trace low plasticity with rootlets. 20cm-1m: Sand; fine to medium grained, pale grey brown, poorly graded, trace silt, loose to medium dense. Aeolian. 1m-3m: Sand; fine to medium grained, pale yellow then yellow brown from 2.3m, poorly graded, trace silt, medium dense. Aeolian.
Saddle	Defined as the lowest area between two highlands but has two wins which span the divide by crossing	Moderate	No archaeological investigations across a saddle landform in the immediate region, however archaeological modelling would indicate a moderate potential.	Bore Hole 2: 0-20cm: Top soil/sand; fine to medium grained, grey brown, poorly graded, medium density, trace low plasticity with rootlets.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
	the divide at an angle.			20cm-1.2m: Sand; fine grained, pale yellow grey, poorly graded, trace silt, loose to medium dense, dense to very dense from 95cm. Aeolian. 1.2m-1.6m: silty sand; fine grained, grey brown, poorly graded, non plastic silt, dense to very dense, alluvial. 1.6m-2.3m: clayey sand; fine to coarse grained, grey brown, low plasticity, trace gravel (<60mm) and cobble (<120mm), dense. Alluvial. 2.3m-2.7m: clay; low to moderate plasticity, brown, with silt and fine grained sand, trace very high strength cobbles (<75mm), very stiff to hard. Alluvial.
Undulating Plain	Defined as an undulating, large, very gently inclined or level element, of unspecified geomorphological agent or mode of activity.	Low	Packard's (1992) results indicate the low-lying landforms, including the undulating plain, have a low potential for subsurface archaeological deposit.	Bore Hole 4: 0-20cm: Topsoil/sand; fine to medium grained, grey brown, poorly graded, trace low plasticity, very loose, rootlets. 20cm-1.8m: sand; fine grained, pale grey brown transitioning to orange brown at 1.1m, poorly graded, trace silt, very loose to loose but medium dense from 75cm. Aeolian. 1.8m-2.8m: sand; fine to coarse grained, dark grey brown, well graded, trace silt and low plasticity clay, medium dense but loose to medium dense from 2.2m. Alluvial. 2.8m-3.1m: Sand; fine grained quartz sand, orange brown, mottled grey, poorly graded, trace silt, loose to medium dense. Alluvial. Bore Hole 6:

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				0-20cm: Top soil/sand; fine grained, grey, poorly graded, medium density, trace siltwith rootlets. 20cm-1.4m: Sand; fine grained, pale grey then orange brown from 70cm, poorly graded, medium dense. Aeolian. 1.4m-2.3m: clay; medium plasticity, grey/orange brown, with some fine to coarse grained sands and trace silt, dense. alluvial. 2.3m-2.7m: clayey sand; fine to coarse grained, grey brown, well graded, low to medium plasticity, medium dense to dense. Alluvial. 2.7m-3.2m: clay; moderate plasticity, grey with mottled orange brown, with silt and trace fine to coarse grained sand. Alluvial.
Floodplain	Alluvial plain characterised by frequently active erosion and aggradation by channelled or overbank stream flow.	Low	The results of Packard's (1992) investigations at Currandooley indicate that there are some artefacts within the floodplain landform, however these are found in extremely low densities and are unlikely to be *in situ*, the result of the depositional nature of a floodplain environment.	Bore Hole 8: 0-20cm: Top soil/sand; fine grained, grey, poorly graded, medium density, trace silt, with rootlets. 20cm-1.2m: Sand; fine grained, pale grey brown, poorly graded, low plasticity silt, medium dense then dense to very dense from 75cm. Aeolian. 1.2m-2.1m: clayey sand; fine grained, grey brown with mottled orange, low plasticity with trace medium to high plasticity clay seams, dense to very dense. Aeolian. 2.1m-3m: clay; low to moderate plasticity, pale grey brown with mottled orange, with silt and trace fine to coarse grained sand, firm to stiff. Alluvial. Bore Hole 10:

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
				0-20cm: Top soil/sand; fine grained, grey, poorly graded, medium density, trace silt. 20cm-80cm: Sand; fine to medium grained, brown, poorly graded, low plasticity silt, medium dense then dense to very dense from 75cm. Aeolian. 80cm-1.7m: clay; low plasticity, brown, with silt and fine to medium grained sand, hard. Alluvial. 1.7m-2.3m: Sand; fine to coarse grained, brown, trace silt, loose. Alluvial. 2.3m-3m: silty clay; medium plasticity, with fine grained sand, soft to firm. Alluvial. Bore Hole 11: 0-20cm: topsoil/sand; fine grained, grey, poorly graded, trace silt, very loose. 20cm-90cm: sand; fine grained, pale grey brown, poorly graded, trace silt, loose to medium dense. Aeolian. 90cm-1.9m: clayey sand; fine to medium grained, orange brown/brown, poorly graded, low plasticity clay, dense to very dense. Alluvial. 1.9m-3m: clay; medium plasticity, dark grey brown, with silt and fine grained sand inclusions, hard then very stiff from 2.6m. Alluvial.
Hillslope	Gently inclined to precipitous slope, commonly simple and maximal, eroded	Low	The results of the Austral Archaeology (2009) subsurface investigations confirmed the higher slopes and crests as areas of use whilst travelling through the landscape but not as foci of industry or	Pit1: Topsoil/silty sand: fine to medium grained, grey brown, poorly graded, with rootlets (bioturbation), very loose. Depth 30cm.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
	by sheet wash, creep or water-aided mass movement. A typical element of mountains, hills, low hills and rises.		occupation. The predictive models widely accepted for Aboriginal occupation habits indicate that there is low potential for permanent or semi-permanent sites on landforms with moderate to high degrees of slope. While these landforms were likely traversed at some point, land use is believed to have been sporadic.	Sand: Fine grained, pale grey/brown, poorly graded, very loose to loose, trace silt, aeolian. Depth: 30cm to 1m. Clay: Medium to high plasticity, red/grey brown, with some fine grained sand, stiff to very stiff, alluvial. Depth: 1m to 1.1m. Clayey sand: fine grained, yellow to brown, poorly graded, low plasticity, dense to very dense to 3m then loose to medium dense, alluvial. Depth: 1.1m to 3.5m Pit13: Topsoil/silty sand: fine to medium grained sand, grey brown, poorly graded, with rootlets (bioturbation), very loose. Depth 25cm. Sand: Fine grained, pale yellow/grey, poorly graded, very loose to loose but medium dense from 1.05m and dense to very dense from 1.2m, trace silt, alluvial. Depth: 25cm to 2m. Clayey sand: fine grained, yellow brown, poorly graded, low plasticity, dense to very dense, alluvial. Depth: 2m to 3m.
Drainage / Erosion Depression	Defined as a level to gently inclined, long, narrow, shallow open depression with smoothly concave cross-section, rsing to moderately inclined side slopes, eroded or aggraded by sheet wash.	Low	Packard (1992) conducted archaeological testing across subdued drainage areas and found them to be archaeologically sterile.	No geotechnical investigations on this landform.

Landform	Description	Archaeological Potential	Previous archaeological excavations across landform type	Details of geotechnical testing completed on this landform
Basal Slopes	Defined as a moderately to very gently inclined waning lower slope resulting from aggradation or erosion by sheet flow, earth flow or creep.	Low	The results of the Austral Archaeology (2009) subsurface investigations confirmed the slopes as areas of use whilst travelling through the landscape but not as focus of industry or occupation. The predictive models widely accepted for Aboriginal occupation habits indicate that there is low potential for permanent or semi-permanent sites on landforms with moderate to high degrees of slope. While these landforms were likely traversed at some point, land use is believed to have been sporadic.	Bore Hole 12: 0-20cm: topsoil/sand; fine grained, grey, poorly graded, trace silt, medium dense. 20cm-1.25m: sand; fine grained, pale grey brown, poorly graded, with silt inclusions, loose. Aeolian. 1.25m-2.1m: clay; low to medium plasticity, grey brown, with silt and trace sand (fine grained) inclusions, very stiff. Alluvial. 2.1m-3m: clay; medium plasticity, grey brown, with silt and trace sand (fine grained) inclusions, very stiff. Alluvial.
Wetland Depression / Lagoon	Defined as a closed depression filled with water that is typically salt or brackish, bounded at least in part by forms aggraded or built up by waves or reef-building organisms.	Low	No archaeological investigations within a lagoon environment in the immediate region, however one registered AHIMS site, an isolated stone artefact, is located immediately adjacent to a lagoon landform (on the elevated strandline to the west).	No geotechnical investigations on this landform.

Figure 4-3 Landforms within the proposal area. The Development Footprint is indicative only but shows what the proposal would look like with highly sensitive areas excised from the development footprint.

4.4. AHIMS SITES WITHIN THE PROJECT AREA

A total of 17 AHIMS sites have been recorded within the project area previously; the site cards for #57-2-0790 and #57-2-0642 were unavailable. Furthermore, while site #57-2-0587 is not within the proposal area, it was added due to its association with #57-2-0642 and #57-2-0588. The sites are individually discussed in detail below. All sites listed on AHIMS within the proposal area are currently listed as valid and are described in Table 4-5.

Table 4-5 Site description of the previously recorded AHIMS sites that are found within the proposal area.

AHIMS ID:	Name	Description
57-2-0020	Currandooly 2;Lake George;	First recorded by NPWS in 1983 as a large exposure over 3 km x 3 km along an old Holocene beach ridge. Artefacts were recorded as being common in spoil heaps from sieving and were spread across the rehabilitation area. It was noted that the condition of the site had been disturbed by sand mining activities that had taken place in the area and that there was a strong likelihood that artefacts had been removed from the site unintentionally during this process. The site is recorded as being located within woodland/grassland vegetation and approximately 300 m from the closest freshwater source.
57-2-0059	Lakelands;	First recorded by Paul Packard in 1987 as part of a research program investigating the archaeology of the Southern Tablelands. The site is listed as an artefact site on an ancient lakebed landform and Quaternary sediments, within a low lying aeolian sand deposit blown out of the Lake George lakebed. It was noted that the site was difficult to define due to the fact that artefacts were found in most of the surface exposures in the area and towards the shoreline of Lake George (over an area approximately 2 km x 4 km). . In the areas the sand deposits reached approximately 1.5 m deep before reaching the silty/clayey lakebed. Packard recorded that the site consisted almost entirely of flaked stone artefacts ranging in densities from 5/m^2 to 1/m^2 in areas with exposures. The dominant raw material recorded was quartz, with significant amounts of silcrete and other fine grained material present in the areas furthest away from the shoreline of the lake. The artefact types recorded included micro-blades, backed-blades, unretouched quartz flakes, bipolar cores, ground-edge axes, and hammerstones. Packard also noted that there were several possible hearths exposed in the track cutting in one of the areas far from the lake; however, it was concluded that it is likely that these were the remains of burnt tree roots. It was also noted that the site had been disturbed by sand mining activities, the cutting of a track through the deposit, and as a result of stock movements.
57-2-0587	Grantham Park 1	First recorded by Rob Paton in 2008 as an isolated artefact. The site is located approximately 400 m from Butmaroo creek on a terrace flat and within a cleared area used for intensive farming. While only one artefact was recovered, Paton noted that the site contained potential for sub-surface archaeological deposits and recommended that the site be the focus of a program of sub-surface archaeological investigations in the future.
57-2-0588	Grantham Park 2	First recorded by Rob Paton in 2008 as a small artefact scatter containing approximately 20 artefacts over an area 70 m x 30 m in size. The site is located approximately 50 m from Butmaroo Creek on a terrace flat and in a cleared area of land used for intensive farming. Paton noted that the site contained

AHIMS ID:	Name	Description
		potential for sub-surface archaeological deposits and recommended that the site be the focus of a program of sub-surface archaeological investigations in the future.
57-2-0642	Grantham Park 3	Site Card is unavailable
57-2-0701	CWF2-IF-01	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed, isolated quartz core artefact (measuring 59.01 mm x 41.74 mm x 24.96 mm). The site was located on the bank of Wrights Creek within a stream bank and plain landform and within an area of land comprised of grasslands used for pastoral/grazing practices. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefacts was recommended if it was directly impacted.
57-2-0702	CWF2-IF-02	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed, isolated quartz core artefact (measuring 38.39 mm x 22.35 mm x 20.54 mm). While the site was located on a flat plain with grassland vegetation, it was noted that the site was located on a sand embarkment wall that was likely the result of historic sand mining in the area; it was also noted that the area was used for intensive farming practices. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0703	CWF2-IF-03	First recorded by Austral Archaeology Pty Ltd in 2010 as an isolated silcrete flaked artefact (measuring 23.96 mm x 14.36 mm x 9.82 mm). The site was located within a flat plain landform, 350 m from Wrights Creek. The site was cleared of its vegetation and used for intensive farming. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0704	CWF2-IF-04	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed, isolated quartz flake artefact (measuring 17.69 mm x 14.85 mm x 3.59 mm). The site was located within a flat plain landform 300 m from Wrights Creek. The site was cleared of its vegetation and used for intensive farming. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0707	CWF2-IF-07	First recorded by Austral Archaeology Pty Ltd in 2010 as an isolated silcrete backed blade artefact (measuring 22.66 mm x 10.59 mm x 6.08 mm). The site was located within a flat plain landform 500 m from Wrights Creek. The site was cleared of its vegetation and used for pastoral/grazing practices. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.

AHIMS ID:	Name	Description
57-2-0708	CWF2-IF-08	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed, isolated quartz flake artefact (measuring 17.88 mm x 13.5 mm x 5.7 mm). The site was located within a plain landform 100 m from Wrights Creek. The site had been cleared of its vegetation and used for intensive farming. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0732	CWF2-S-01	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed artefact scatter over an area measuring 150 m x 200 m. The site was located within a flat plain landform 50 m from Wrights Creek. The site was partially cleared of its vegetation, with the remaining area comprised of grasslands; it had been used for pastoral/grazing practices and mining. The artefact scatter contained 14 artefacts, 3 of these were silcrete while the remainder were quartz. The artefact types included blade cores, cores, flakes, medial flakes, and distal flakes. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0733	CWF2-S-02	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed artefact scatter over an area measuring 2 m x 3 m. The site was located within a flat plain landform 25 m from Wrights Creek. The site was partially cleared of its vegetation, within the remaining area comprised of grasslands; it had been used for pastoral/grazing practices. The artefact scatter contained 3 artefacts, 2 of them silcrete flakes and the final being a quartz flake. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0734	CWF2-S-03	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed artefact scatter over an area measuring 20 m x 4 m. The site was located within a flat plain landform 10 m from Wrights Creek. The site was partially cleared of its vegetation, with the remaining area comprised of grasslands; it had been used for pastoral/grazing practices and mining. The artefact scatter contained 4 artefacts, 2 of them quartz flakes, 1 silcrete flake, and 1 chert core. It was noted that the site contained a significant level of disturbance in the form of the displacement of soil and sand into embarkments. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0735	CWF2-S-04	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed artefact scatter over an area measuring 30 m x 5 m. The site was located within an undulating plain landform and partially within a flat and terrace landform unit; the closest freshwater source, Wrights Creek, is located 50 m away. The site was cleared of its vegetation and was used for pastoral/grazing practices and mining. The artefact scatter contained 3 artefacts, a silcrete core, a river stone hammerstone, and a chert flake. Compared with the artefacts found in other parts of the current proposal area, the artefacts found within this site comprise the largest size class that has been recorded within the proposal area at between 70 mm – 85 mm in length. It was noted that the site was located on and along a sand embankment wall that was likely created during the historic sand mining events that took place in the area. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.

AHIMS ID:	Name	Description
57-2-0736	CWF2-S-05	First recorded by Austral Archaeology Pty Ltd in 2010 as an exposed artefact scatter measuring 50 m x 7 m. The site was located across plain crest and plain terrace landforms, 100 m from Wrights Creek. The site was cleared of its vegetation and was used for pastoral/grazing practices. The artefact scatter contained 5 artefacts, 1 silcrete core, 1 silcrete proximal fragment, 1 silcrete flake, and 2 quartz flakes. It was noted that the site was located on and along a sand embarkments that was likely created during the historic sand mining events that took place in the area. Austral Archaeology determined that no further archaeological investigation of the site was necessary but salvage through the collection and relocation of the surface artefact was recommended if it was directly impacted.
57-2-0790	West Creek Dairy PAD 1	Site Card is unavailable
57-2-0917	Willow Sands	First recorded by Amy Mosig Way in 2014 as an artefact and PAD site measuring 270 m x 100 m. The site is located within a plain and undulating plain landform and within a ridge, stream bank, and terrace flat landform units; the closest potential water source was located 50 m away. Mosig Way noted that the portion of the site located on the southern extent of the ridgeline had been extensively quarried during the historic sand mining that took place in the area. The site was cleared of its vegetation and was used for pastoral/grazing practices. This site was recorded during the excavation undertaken by Mosig Way (2014) in the sand bodies around Lake George. A total of 17 test pits were excavated at the north-eastern end of the site as a part of this research, all of which were excavated in 50 cm x 50 cm pits and in 10 cm spits. All deposits were dry sieved using a 3 mm sieve. All 17 of the test pits were brought down to approximately 70 cm to 90 cm deep, at which point a sterile cultural layer was reached; only one test pit reached a clay layer, while the remainder finished on a sandy layer. Of the 17 test pits a total of 132 quartz artefacts were recovered, with a further 67 artefacts comprised of different material.

4.5. ABORIGINAL SITE PREDICTION

The Aboriginal site modelling for the region to date suggests that Aboriginal sites are highly common within proximity to waterways and any associated elevated landforms, in particular within the sand bodies. These studies also suggest that the overwhelming majority of site types in the region are comprised of isolated artefacts and artefact scatters, with significant potential for subsurface archaeological deposits on unmodified landforms. The previously recorded AHIMS sites in the region support this conclusion. While the historical land use of the proposal area has caused surface and subsurface disturbances at some locations, this has largely served to bring subsurface deposits of archaeological material to the surface. The presence of Butmaroo Creek, Wrights Creek, and associated elevated sand landforms within the current proposal area – as well as the proximity to the shores of Ngungara/Weereewa and Bridge Creek to the south – significantly increases likelihood of encountering Aboriginal heritage sites within the current proposal area.

The likely archaeological site types for the local area, and the potential for their presence within the project area, is outlined in Table 4-6 below.

Table 4-6 Aboriginal Site Prediction Statements.

Site Type	Site Description	Potential
Stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations over a large area to isolated finds within discrete landforms	High potential to occur as either isolated finds or in high or low-density scatters in association with waterways or elevated sand landforms within the proposal area.
Potential Archaeological Deposits (PADs)	Potential subsurface deposits of archaeological material	High potential to occur within the proposal area in proximity to waterways or within elevated sand landforms.
Hearths	Concentrated charcoal associated with cultural features (not to be confused with tree clearing or bushfires)	Potential to occur within proposal area but only in association with other occupation evidence.
Modified Trees	Trees that have undergone cultural modification	Low potential to occur due to the historical clearing of vegetation to allow for grazing.
Burials	Internments.	Burial practices differ from region to region. In the Yass district, Aboriginal people traditionally buried their dead in graves in rocky soils on the tops of stony hills (White and Cane 1986 referred to by Dibden; 2013: 21). NGH are not aware of any burials related to Lake George.

5. ASSESSMENT METHODOLOGY

The purpose of archaeological fieldwork would be to identify surface archaeology and the potential for subsurface archaeology in order to guide the design of the proposed solar farm development footprint and to assess the potential impact of the proposed development upon Aboriginal heritage.

The objectives of the assessment are therefore to:

- Conduct Aboriginal consultation as specified in clause 60 of the *National Parks and Wildlife Regulation 2019*, using the consultation process outlined in the (ACHCRP);
- Undertake survey and subsurface testing (if required) to identify any archaeological material;
- Undertake an assessment of the archaeological and cultural values of the proposal area and any Aboriginal sites therein; and
- Record all Aboriginal cultural heritage objects and places within the proposal area and submit these sites to the AHIMS.
- Provide management recommendations for any Aboriginal cultural heritage objects found.

Broadly, the archaeological aims of the project would be to:

- Identify the presence or absence of Aboriginal cultural material within the impact areas.
- Assess the likely extent and nature of any such cultural material.
- Assess the archaeological significance of any cultural material.
- Provide an opportunity for Aboriginal stakeholders to assess the cultural significance of any material.
- Assess the management requirements for any cultural material.

Although no site survey has been completed for this project yet, we do have a robust predictive model based on extensive archaeological assessments within the broader landscape, which identifies that the project area is very likely to contain both surface and subsurface stone artefacts. In order to confirm this predictive model, we would need to survey the project area for surface archaeology and to confirm the presence of sensitive landforms, followed by test excavation to identify the presence of subsurface archaeology.

5.1. ARCHAEOLOGICAL SURVEY AND TESTING METHODOLOGY

Methods used for the assessment will be as per the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW NSW 2010a) and employed as relevant to the proposal area, and aims of the assessment and project requirements.

The following is an outline of the steps that would be involved in completing the ACHA for the proposal area. This forms the methodology of the assessment.

- Consultation with Aboriginal parties.
    - Notification of the project and registration of interest – obtain names of people who may hold cultural knowledge through written requests to relevant bodies and authorities and advertising in the local paper. **Completed**.
    - Provide details of the project and the heritage assessment methodology to registered parties for comment. **This document.**
    - Seek any information on whether there are any known places or objects of cultural significance to the Aboriginal people. **This document and ongoing until finalisation of report**.
    - Involvement of selected representatives of the registered parties in fieldwork.

- Provide opportunity for the registered parties to review and comment on the draft cultural heritage assessment.
- Incorporate any comments from Aboriginal parties into the cultural heritage assessment.

- Review of background information relevant to the proposal area. Request an AHIMS register search to identify the location of previously recorded sites and review any archaeological reports or site records of the immediate area. **Completed.**
- Undertake field assessment. All fieldwork would be undertaken in line with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW NSW 2010a).
    - Field survey would include:
        - Walking across the proposal area in a systematic way focusing on the proposed development footprint to identify Aboriginal heritage objects. The survey would aim to provide enough surface coverage to be confident of assessing the proposed development areas for the presence of Aboriginal objects. This will include sampling all landforms that will potentially be impacted by the proposal.
        - Recording all Aboriginal heritage objects using standard archaeological techniques including: location, environmental context, extent, content, disturbance level.
        - Photograph sites.
        - Record stone artefacts with standard techniques including: type, raw material, dimensions, note of technical attributes. The GPS location of individual stone artefacts would be recorded up to a point but for higher density sites or clusters of artefacts, we would record them as a polygon. If large sites were identified, we would record samples of artefacts.
    - Test excavation may be required. This would be determined based on the results of the survey and background research.
- Undertake a significance assessment of any Aboriginal cultural objects, sites or places.
- To the extent possible with information available, assess the impact of the proposed development on the archaeological objects and devise ways to avoid or mitigate any impact, if possible.
- Prepare a draft ACHA. The report will be a cultural heritage assessment of the proposal area and include the results of the steps outlined above. The draft ACHA will be provided to RAPs for comment.
- Provide opportunity for the registered parties to review and comment on the draft cultural heritage assessment.
- Incorporate any comments from Aboriginal parties into the cultural heritage assessment.
- Prepare final report. Consider all comments and finalise report.

5.1.1. Assessment aims and research questions

Lake George is known to be socially, culturally and scientifically significant. The Lake George sand deposits is identified in the South East and Tablelands Regional Plan 2036 as an important cultural landscape.

The purpose of Aboriginal Cultural Heritage Assessment is to consult with Aboriginal stakeholders and to assess the potential impact of proposed works upon Aboriginal heritage. Whilst NGH archaeologists aim to understand the extent, nature, character and scientific significance of archaeology present within the project area, only Aboriginal people can comment on the social and cultural significance of an area.

The ongoing consultation process undertaken by the Proponent and NGH with registered Aboriginal parties to this project is collating information about the significance of the project area and Lake George to Aboriginal people. The project area is located within the Lake George catchment and would have provided Aboriginal people with ample opportunities to hunt, gather, and camp. NGH will continue to investigate the ethnographic information available and consult with Aboriginal knowledge holders to understand any cultural practices that may be linked with the project area and the wider region.

Previous archaeological research indicates that the whilst the entire project area may have some archaeological sensitivity, the highest sensitivity is associated with drainage lines, creeks and strandlines. Of particular research interest is the questions of whether the strandline occupation patterns are continuous across various landforms as the distance increases from creeklines. Archaeological excavations could investigate whether the lake itself is the focus for occupation (which should see continuous occupation along the strandline), or whether the creeklines are the focus (with decreasing occupation as distance from the creek along the strandline increases).

5.1.2. Survey Strategy

The project area is currently covered by vegetation (mostly grass) due to good seasonal rains. Visibility is generally poor with few areas of exposure present, which would inhibit the ability to find surface sites. However, survey could be undertaken to identify whether surface archaeology is present at those locations of ground exposure and to verify archaeologically sensitive landforms.

The proposed approach to the survey is therefore to sample the proposal area, rather than conduct a full pedestrian survey of the entire area. The landowners have recognised the issue with visibility and have offered to assist through use of a harvesting type machine that would be able to cut strips of grass and windrow the material to the side. The machine is pulled by a tractor and would only be about 3-4 m wide so this approach would result in long but narrow strips of slightly increased visibility compared to surrounding areas. The benefits would be that at least some increase in ground visibility could be provided and these areas could be placed at relevant sample areas across different landscapes, where the machine was able to be utilised, considering slope and ground surface constraints.

Wherever pedestrian survey was undertaken, notes would be taken about visibility, landforms and coverage to comply with the requirements for documenting survey coverage under the Code of Practice.

Our intention for the surface survey would be to provide opportunity to detect surface archaeological sites but equally to confirm desktop mapping of topography, linking to possible archaeological potential. This would be achieved through targeted inspection of landforms, via vehicle access and then short pedestrian transects.

The target areas for the survey would include those areas identified as likely being within the footprint of the solar farm infrastructure but would be more targeted to areas where there is less information about site location, there is higher potential for sites to occur.

We estimate that the surface survey would take 3-5 days and therefore recognise that not all ground will be assessed but the approach would allow a generalised assessment of current level of disturbance as well as confirming the presence and general extent of archaeologically sensitive landforms.

The mapping of these landforms would be used to confirm the proposed targeted subsurface testing programme.

5.1.3. Testing Strategy

Test excavation would target landforms which are unmodified and assessed to be archaeologically sensitive based on the model provided in this document. Testing would be undertaken in line with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW NSW 2010a). Note that the number and location of pits may vary. The number and extent of test pits if required would be determined in the field. Any Aboriginal cultural heritage objects recovered from this testing program would be temporarily stored at the relevant NGH Office in a locked cabinet until such a time as these objects can be returned to site or a care agreement sought.

Due to the amount of data available from previous archaeological excavations within the region, and more specifically within and surrounding the proposal area, a targeted approach to testing has been proposed.

Test pit clusters and transects

The proposed excavation approach will involve the positioning of 'clusters' of test pits and transects of test pits.

Clusters:

representing 5 test pits at 5m intervals (creating a cross or + formation). These clusters will be positioned across the differing landforms with the intention of confirming the assessed archaeological sensitivity of each landform (low, moderate, high) that will be subject to impacts as a result of the proposed development. This approach has been determined based upon the data and results available from other archaeological investigations, the landforms present within the proposal area, and the footprint of potential impact for the proposal. The proposed methodology will include the excavation of twenty clusters, each of which includes 5 test pits situated at 5m intervals in a plus (+) shape. Clusters of test-pits are essential as the sites in this landscape are normally discrete, 3-5m diameter knapping floors, with no-to-minimal evidence in between.

This method has been decided largely based upon the results and advice of Amy Mosig-Way, who conducted extensive research for a PhD thesis within the proposal area in 2014. The results of Way's (2014) investigation indicated that the archaeological deposits in the area are characterised by small knapping floors averaging 3-5m in size. In association with this clustered approach, NGH would propose to also conduct testing transects at four locations in an attempt to understand the archaeological potential of these landforms further. The transects will involve the placement of test pits at 50m intervals. This will total a minimum of 90 test pits excavated across the proposal area. The proposed archaeological testing locations are highlighted in Figure 5-1.

Transects:

Across landforms of predicted low archaeological sensitivity, NGH would place transects of test pits spacing test pits 50 m apart. This is considered appropriate as small archaeological deposits such as knapping floors are most likely to occur within elevated, sandy deposits. Therefore, the use of transects of test pits will enable a larger area to be covered, ie. 8 x test pits (50 m apart) = 350 m long transect of test pits.

Excavations:

would be undertaken as follows:

- Hand excavation using shovels and trowels, pits to be a minimum of 50cm x 50cm in area. Triggers to expand the pits will be in place, allowing flexibility to increase the area excavated based on excavated material, including structural features, and high densities (>100/m2) of artefacts recovered;
- Removal of deposit in the initial excavation unit across each landform type in 5cm levels or 'spits' with subsequent excavation units at 10cm unless features found requiring a different strategy;
- Sieving of deposits (dry sieving);
- Proceed with excavation until completed (reaching base clay, bedrock or other reason for termination;
- Photography of site prior, during and post excavation as well as photos of all finished pits; and
- At completion of excavation, backfill test pits (with sieved material is possible or clean fill if required).

Following the completion of the fieldwork, the material retrieved from the sieving process will be sorted and all Aboriginal objects will be recorded and analysed. Temporary storage of the artefacts will be at NGH Sydney Office, Unit 17, 21 Mary Street Surry Hills NSW 2010 or the NGH Canberra Office, Unit 8, 27 Yallourn Street Fyshwick ACT 2609. The report will then be prepared.

Figure 5-1 Proposed archaeological testing locations for the Blind Creek Solar Farm.

5.1.4. Recording Requirements

Stone Artefact Analysis

Any artefacts recovered will be recorded in accordance with Holdaway and Stern (2004) and OEH (2010) Requirement 19. The artefact recording will include artefact type, pit location, stratigraphic layer, spit number, artefact count, raw material type, weight and dimensions. Additional attributes will be recorded as relevant to the artefact type but may also be added if patterning of a consistent attribute is identified (Table 5-1). Diagnostic or other selected artefacts will also be photographed using graded metric scales.

Table 5-1 Sample Categories for Stone Artefact Recording.

Attributes for all artefacts		
Record identification (ID)		
Pit identification/location		
Artefact Count		
Raw Material Type		
Weight		
Sample Categories by Artefact Type		
Tools	**Flakes**	**Cores**
Completeness	Completeness	Completeness
Length (nearest mm)	Length (size class, nearest 5mm)	Length (nearest mm)
Width (nearest mm)	Width (size class, nearest 5mm)	Width (nearest mm)
Thickness (nearest mm)	Thickness (size class, nearest 5mm)	Thickness (nearest mm)
Platform type	Platform	Number of scars
Termination type	Termination	Core rotation

Analysis of artefact records will examine characteristics of the assemblage as relevant for the interpretation of the site. This is likely to include, but not limited to: raw material type; core-flake ratio; utilisation; secondary flaking characteristics; reduction sequence; cortex percentage; formal tool/technological identification; tabulation of artefacts by landform unit, pit location/salvage unit location, by spit depth, raw material distribution (vertical and/or horizontal). Additional analysis such as conjoining may be undertaken if there is indication that this will add important interpretative information.

Conjoin Analysis

A programme of conjoin analysis (re-fitting) on a sample of artefacts may be undertaken if higher density concentrations (greater than 30 artefacts per square metre) are found during the excavation. Concentrations of artefacts suspected to be discrete knapping events would be analysed.

5.2. REPORTING

A report detailing the results of the assessment will be prepared. The report will be structured to provide the following information:

- Introduction
- Aboriginal consultation
- Project setting
- Archaeological setting
- Archaeological methods
- Results
- Analysis/Discussion
- Significance assessment
- Impact assessment
- Recommendations

The report will include descriptions of sites, artefact attributes and photographs. A draft copy of the report will be provided to the RAPs for comment. The report will then be finalised and used as supporting documentation for an SSD application.

6. CULTURAL KNOWLEDGE

As part of assessing the potential impact of the development on Aboriginal cultural values, NGH is seeking any information from the local Aboriginal community that will assist in this process. The significance of any archaeological sites identified within the proposal area will be assessed for their scientific values. We would also seek the input from the Aboriginal community on the cultural values of any sites found.

In addition, we also seek information about any other values that may be attributed to the land identified for development. If there are known cultural sites or places of value within the proposal area, we request that this information be provided to be incorporated into the assessment. Information can be held confidentially if that is required, although such information would be used in providing an assessment of any impacts to Aboriginal values by the project. We are happy to discuss this in more detail with individuals or groups if required.

Information should be forwarded to Heritage Consultant Jorge Fuenzalida Miralles or NGH Principal Heritage Consultant Jakob Ruhl (details in section 7 below), either prior to the field survey, at the time of the field survey, or prior to the finalisation of the report.

7. PERSONNEL

The cultural heritage assessment will be managed by NGH Principal Heritage Consultant Jakob Ruhl and Heritage Consultant Jorge Fuenzalida Miralles. Contact details for both are as follows:

Jakob Ruhl
Email: Jakob.r@nghconsulting.com.au
Phone: (02) 8202 8341

Jorge Fuenzalida Miralles
Email: Jorge.f@nghconsulting.com.au
Phone: (02) 8202 8313

Postal: Unit 17, Level 3, 21 Mary Street Surry Hills NSW 2010

8. NEXT STEPS

As part of the consultation program, set out in the Consultation Requirements (DECCW 2010b), this methodology is provided to the RAPs. There is a 28-day period for comment on the assessment methodology. If any member of the organisation has any comments about the project, the cultural heritage assessment or has information that may be of assistance, please forward them to Jakob or Jorge (details included above in Section 7).

We are also seeking information on the experience your representatives may have in the field, and your association or knowledge of the proposal area, in order to put together the field team. It would be appreciated if you could provide the following information via email:

- Insurance cover certificates of currency (Workers Compensation/Injury Insurance);
- Fee rates for fieldwork,
- Field experience and information about cultural connections to the area, and
- Any other relevant information.

The closing date for comments for this methodology is **COB Friday 9th of July 2021.**

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Appendix G NGH (2021) Blind Creek ACHA Update Letter and Revised Methodology

16 September 2021

Via email to:

Dear …

Re: 20-403 Blind Creek Solar Farm ACHA

The Proponent and NGH wish to thank all of the registered Aboriginal parties (RAPs) for their contributions to the proposed Blind Creek Solar Farm project to-date. Having completed fieldwork (July/August 2021) consisting of survey and test excavation, NGH wishes to advise all RAPs that the Proponent is proposing to modify the Project Site and Development Footprint boundaries. This letter therefore provides:

- A project summary and status;
- A summary review of the preliminary fieldwork results (survey and test excavation);
- Proposes modifications to the project and revises the Aboriginal Cultural Heritage Assessment methodology (Version 1.0. NGH; June 2021) for review and comment of all registered Aboriginal parties (28-day period of review); and
- Consultation steps moving forward.

On behalf of the Proponent, NGH request that all RAPs review the proposed modifications to the proposal and the revised ACHA methodology (v2.0). Any comments, requests for clarification and or issues are requested to be provided to NGH in writing within the next 28-days and by **14 October 2021.** It is proposed to undertake the additional fieldwork as soon as possible after this date.

Please find appended to this letter:

Appendix A NGH Aboriginal Cultural Heritage Assessment Methodology, V1.0 (June, 2021)

SYDNEY
Unit 17, 21 Mary Street, Surry Hills NSW 2010
T. (02) 8202 8333 **E.** ngh@nghconsulting.com.au **W.** www.nghconsulting.com.au
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Project Summary and Status

The proponent has modified the original proposal, provided to all RAPs in June this year, to include additional areas to the proposed Project Site as well as the proposed Development Footprint for the Blind Creek Solar Farm.

The original proposal was provided for RAP and Heritage NSW review prior to undertaking fieldwork (the original methodology is appended to this letter, *NGH; June 2021*).

Archaeological survey and fieldwork was conducted over approximately two weeks:

- Survey: 22 – 23 July, 2021
- Test Excavation: 26 July – 6 August, 2021

The following is a summary of the preliminary fieldwork results.

Summary of preliminary fieldwork results

A total of 101 test pits were excavated and 330 subsurface artefacts were located, the majority of which were located on landforms which were predicted to contain moderate to high archaeological sensitivity.

A total of 21 surface artefacts were recorded during the survey. However, it should be noted that due to the low surface visibility and limited survey coverage, more surface artefacts are likely to be present across the site.

The location and density of surface and subsurface artefacts can be seen in Figure 1 below.

Impacts to subsurface and surface artefacts will either be avoided entirely or mitigated by sample salvage.

Proposed changes to the project and revision of the Aboriginal Cultural Heritage Assessment methodology (NGH; June 2021)

The Proponent wishes to modify the proposed Project Site and Development Footprint boundaries. These modifications are the result of a number of factors that the Proponent is required to consider as part of the *Environmental Impact Statement* as part of the State Significant Development approval pathway, whilst ensuring that the proposed project remains viable.

As a result of the addition of new areas to the project site, NGH wishes to conduct further assessment and will not finalise the draft ACHA until these areas have been investigated.

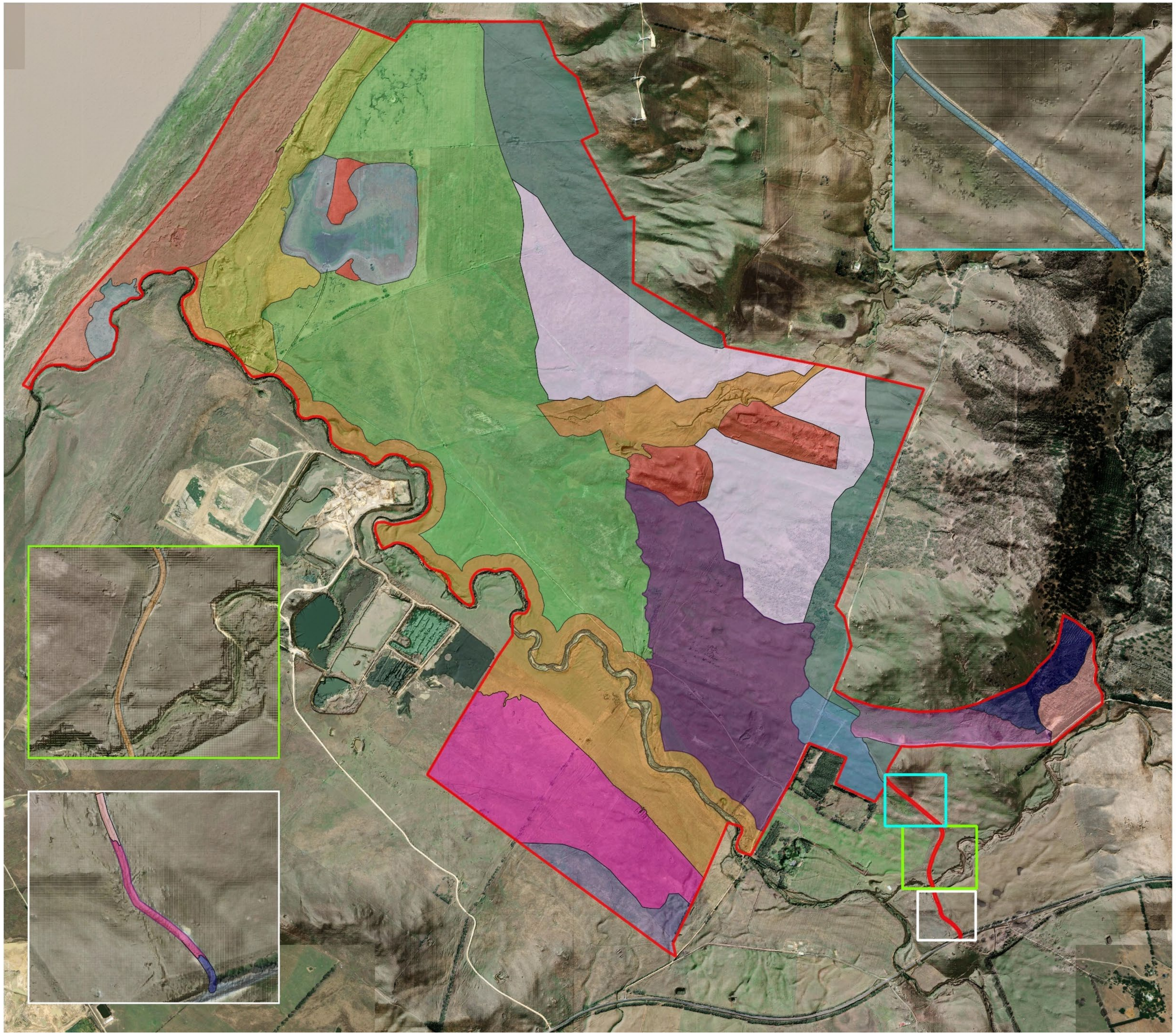
The proposed modifications are presented in Figure 2 below and listed within Table 1. Figure 3 below also presents the updated landform mapping within the Project Site.

[redacted]

Figure 1 Location of the subsurface artefacts located during the test excavations.

[redacted]

Figure 2 Modifications to the proposal at the Blind Creek Solar Farm.



20-403 Blind Creek Solar Farm ACHA
Updated Landform Mapping

Legend

- Project Site

High Landforms
- Beach
- Elevated Creek Flat
- Elevated Sand Body
- Holocene Beachridge
- Waterway (Creekline)
- Strandline

Moderate Landforms
- Creek Terrace
- Flat
- Low Spurs
- Saddle
- Undulating Plain
- Spur

Low Landforms
- Basal Slope
- Basal Slopes
- Drainage/Erosion Depressions
- Floodplain
- Hillslope
- Undulating Plain
- Wetland Depression
- Gentle Slopes

0 0.5 1 km

Data Attribution
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© Heritage NSW 2021
© NSW LPI 2021

Ref: 20-403 Blind Creek Solar Farm Heritage Workspace_20210302 \ Updated Landform Mapping
Author: J. Fuenzalida Miralles
Date created: 10.09.2021
Datum: GDA94 / MGA zone 55

NGH

Figure 3 Updated landform mapping within the project site at the Blind Creek Solar Farm.

Table 1 Description of new areas added to the proposed development footprint.

Area	Area (m^2)	Landform	Predicted Archaeological Sensitivity	Historical Land use	Proposal modification	Proposed Archaeological Work (NGH methodology V 2.0)
1	172723	Strandline	High	Former Sand mining, stock grazing	Installation of solar arrays only within the disturbed quarry footprint	Survey Testing: Two clusters of 5 pits
2	150238	Floodplain/ Basal Slopes	Low	Stock grazing	Installation of solar arrays	Survey only *(Included with Area 1)*
3	6179	Basal Slopes	Low	Stock grazing	Installation of solar arrays	Survey only
4	10585	Floodplain	Low	Stock grazing	Installation of solar arrays	Survey only (Included with Area 1)
5	12765	Floodplain	Low	Stock grazing	Installation of solar arrays	***None*** Survey already conducted during previous fieldwork
6	203237	Floodplain	Low	Stock grazing	Installation of solar arrays, upgrades to existing road	***None*** Survey already conducted during previous fieldwork
7	2212	Floodplain	Low	Stock grazing	Installation of solar arrays, upgrades to existing road	***None*** Survey already conducted during previous fieldwork
8	76062	Floodplain	Low	Stock grazing	Installation of solar arrays	Survey only
9	283	Floodplain	Low	Stock grazing	Installation of solar arrays	***None*** Survey already conducted during previous fieldwork
10	75327	Floodplain	Low	Stock grazing	Installation of solar arrays, upgrades to existing road	Survey only *(Included with Area 8)*
11	108146	Low Spurs	Low	Stock grazing	Installation of solar arrays	Survey only
12	72690	Low Spurs	Low	Stock grazing	Installation of solar arrays	Survey only
13	37892	Elevated Sand Body/Historical Quarry	High (ESB), Low (Quarry)	Stock grazing	Installation of solar arrays	Survey only
14	8320	Unsealed Roadway	Low	Roadway	Potential roadway	Survey only
15	5219	Unsealed Roadway	Low	Roadway	Potential roadway	Survey only
16	34677	Creek Terrace	High	Paved and Unpaved Roadway	Associated with the substation works. Upgrades to existing tracks to service the substation.	Survey Testing: 1 cluster of 5 pits
17	864	Hillslopes	Moderate	Plantation Forestry	Associated with the substation works.	Survey only
18	10584	Flat, Spur, Hillslope	Moderate	Unsealed existing quarry road	Upgrades to the existing road to enable its use as the main construction route.	Survey only
19	69916	Basal Slopes/Roadway	Low	Roadway	Associated with the substation works	Survey only
20	44071	Low Spurs	Low	Airfield infrastructure, stock grazing	Infrastructure associated with the installation and maintenance of the solar farm	Survey only
21	5.2km length	Strandline, Creek Flat, Undulating Plain, Floodplain.	High, moderate and low.	Roadway, unsealed road, stock grazing	Access tracks.	***Inspection*** Survey already conducted during previous fieldwork. Will return to see if original access track can be identified.

Consultation steps moving forward

As part of the consultation program, set out in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010b), this update to the methodology is provided to all RAPs. There is a 28-day period for review and comment on the modifications to the ACHA methodology, outlined in this letter. We request that all comments be provided in writing to NGH by **14 October 2021**. The additional fieldwork is likely to proceed the following week commencing ***18 October 2021***.

If any member of the organisation has any comments or questions about the changes to the project, the cultural heritage assessment or has information that may be of assistance, please forward them to Jakob Ruhl at Jakob.r@nghconsulting.com.au and Jorge Fuenzalida Miralles at Jorge.f@nghconsulting.com.au. We would be happy to discuss the modifications to the proposal with you further.

Yours sincerely,

Jakob Ruhl
Principal Heritage Consultant
0488 448 017

Appendix A NGH Aboriginal Cultural Heritage Assessment Methodology, V1.0 (June, 2021)

Appendix H BCSF Site Cards