

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT FOR CROOKWELL 2 WIND FARM MODIFICATION 2

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- Pejar Local Aboriginal Land Council
- Buru Ngunawal Aboriginal Corporation
- Koomurri Ngunawal Aboriginal Corporation
- Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation
- Gundungurra Aboriginal Heritage Association
- Onerwal Local Aboriginal Land Council

ABBREVIATIONS

ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Impact Permit
AHIP	Aboriginal Heritage Impact Permit
AR	Archaeological Report
BHM	Bowen Heritage Management Pty Ltd
CDPL	Crookwell Development Pty Ltd
DECCW	NSW Department of Environment, Climate Change and Water now OEH
LALC	Local Aboriginal Land Council
OEH	NSW Office of Environment and Heritage
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party

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EXECUTIVE SUMMARY

Bowen Heritage Management Pty Ltd (BHM) has been commissioned by Crookwell Development Pty Ltd (CDPL) (the Proponent) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) to assess the implications for Aboriginal cultural heritage associated with modifications to the approved Crookwell 2 Wind Farm development. The Crookwell 2 Wind Farm project is located on Crookwell Road, approximately 14 km south-east of Crookwell, 30 km north-west of Goulburn in New South Wales and covers an area of approximately 2,088 hectares (5,160 acres) (the study area).

The Crookwell 2 Wind Farm project received its original Development Consent (DA-176-8-2004-i) on 10 June 2005 for 46 wind turbines and associated infrastructure. The development consent was modified in 2009 (Mod-1) to change the size of the turbines and relocate 20 of 46 turbine locations and associated access tracks. The Proponent is now seeking a modification (Mod-2) to remove 14 of the 46 turbine locations. For the Mod-2 alterations, recorded sites near approved turbine and access roads required to be re-assessed and current condition assessments completed.

The original development and Mod-1 were approved under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act), and the Mod-2 application will be assessed in accordance with section 75W of the EP&A Act. Provision 75W allows existing consents granted by the Minister to be modified.

A search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken over the project area resulting in 55 heritage sites being present within the study boundaries (Figure 2). The Archaeological Report (AR) undertaken for the project and attached at Appendix F located another twelve heritage sites and shows that 21 sites of the 67 will be impacted under Mod-2. Field survey was undertaken with the participation of the Pejar Local Aboriginal Land Council (LALC) in March 2017.

Past Traces is assisting Crookwell Development Pty Ltd with consultation with the Aboriginal Community and the Aboriginal Cultural Heritage Assessment to support a possible AHIP application. Consultation with the Aboriginal community will follow the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a). The purpose of the community consultation will be to assist the heritage team in assessing significance of any identified sites, appropriate management strategies and if required to assist Office of Environment and Heritage (OEH) in determination of an AHIP application. The consultation log for the project is attached at Appendix A.

As a result of the ACHAR and consultation with the Registered Aboriginal Parties (RAPs), the following management recommendations apply:

- No impacts can occur to any of the recorded heritage sites until an AHIP has been approved by the NSW OEH.
- Impacts to the identified heritage sites should be avoided if possible. Where possible in the road and cable alignments design should be undertaken to avoid impacts to identified heritage sites.
- The recommendations of the Archaeological Report (Appendix F) should be followed and implemented in full.

- All Aboriginal objects are protected under the NSW *National Parks and Wildlife Act 1974*. It is an offence to disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.
- In the unlikely event that human remains are discovered during the construction, all work must cease. OEHL, the local police and the appropriate LALC should be notified. Further assessment would be undertaken to determine if the remains are Aboriginal or non-Aboriginal.
- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs for the project and may include further field survey.
- Continued consultation with the RAPs for the project should be undertaken. RAPs should be informed of any major changes in project design or scope, further investigations or finds.

1 INTRODUCTION

1.1 PROJECT BRIEF

Bowen Heritage Management Pty Ltd (BHM) has been commissioned by Crookwell Development Pty Ltd (CDPL) (the Proponent) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) to assess the implications for Aboriginal cultural heritage associated with modifications to the approved Crookwell 2 Wind Farm development. The Crookwell 2 Wind Farm project (the study area) is located on Crookwell Road, approximately 14 km south-east of Crookwell, 30 km north-west of Goulburn in New South Wales and covers an area of approximately 2,088 hectares (5,160 acres). The study area in a regional context is shown in Figure 1, with study area boundaries shown in Figure 2.

The Crookwell 2 Wind Farm project received its original Development Consent (DA-176-8-2004-i) on 10 June 2005 for 46 wind turbines and associated infrastructure. The development consent was modified in 2009 (Mod-1) to change the size of the turbines and relocate 20 of 46 turbine locations and associated access tracks. The Proponent is now seeking a modification (Mod-2) to remove 14 of the 46 turbine locations. For the Mod-2 application, recorded Aboriginal sites near the approved turbines and access roads required to be re-assessed and current condition assessments completed.

The original development and Mod-1 were approved under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act), and the Mod-2 application will be assessed in accordance with section 75W of the EP&A Act. Provision 75W allows existing consents granted by the Minister to be modified.

Consultation with the Aboriginal community will follow the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). The purpose of the community consultation will be to assist the heritage team in assessing significance of any identified sites, appropriate management strategies and if required to assist OEHL in determination of an AHIP application.

The ACHAR will detail the consultation process, identified cultural values and outcomes of the consultation with RAPs for the project.

Archaeological assessment of the project area was undertaken in March 2017 and the results of the assessment are located at Appendix F in the AR.

1.2 RESTRICTED AND CONFIDENTIAL INFORMATION

Information in this report is restricted due to cultural sensitivities. Any figures or text within the report which show the location of AHIMS sites is restricted and not to be made available to the general public.

1.3 ABORIGINAL CULTURAL HERITAGE

Currently Aboriginal cultural heritage is defined by the *National Parks and Wildlife Act 1974* as consisting of objects and places. These objects or places may hold physical values or cultural values with no physical remains.

Aboriginal objects are defined as:

“any deposit, object or material evidence...relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains”

Aboriginal places are defined as a place of special Aboriginal cultural significance. Places are declared under section 84 of the *NPW Act 1974*.

Aboriginal cultural heritage is broadly valued by Aboriginal people for the following reasons:

- Provides a connection and sense of belonging to Aboriginal community
- Provides a link between the present and the past (DECCW 2010: iii)
- As a learning tool to teach Aboriginal culture to younger Aboriginal generations and the general public
- As evidence of Aboriginal occupation prior to European settlement
- As continuation of Aboriginal traditions

1.4 REPORT FORMAT

This Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared in line with the following:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011); and
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (OEH 2010) produced by the NSW Office of Environment and Heritage (OEH).

The purpose of this ACHAR is therefore to provide an assessment of the Aboriginal cultural values associated with the project area and to assess the cultural significance of any Aboriginal heritage sites. These assessments can only be undertaken by the Aboriginal community and have been provided by the RAPs for the project and incorporated into this report.

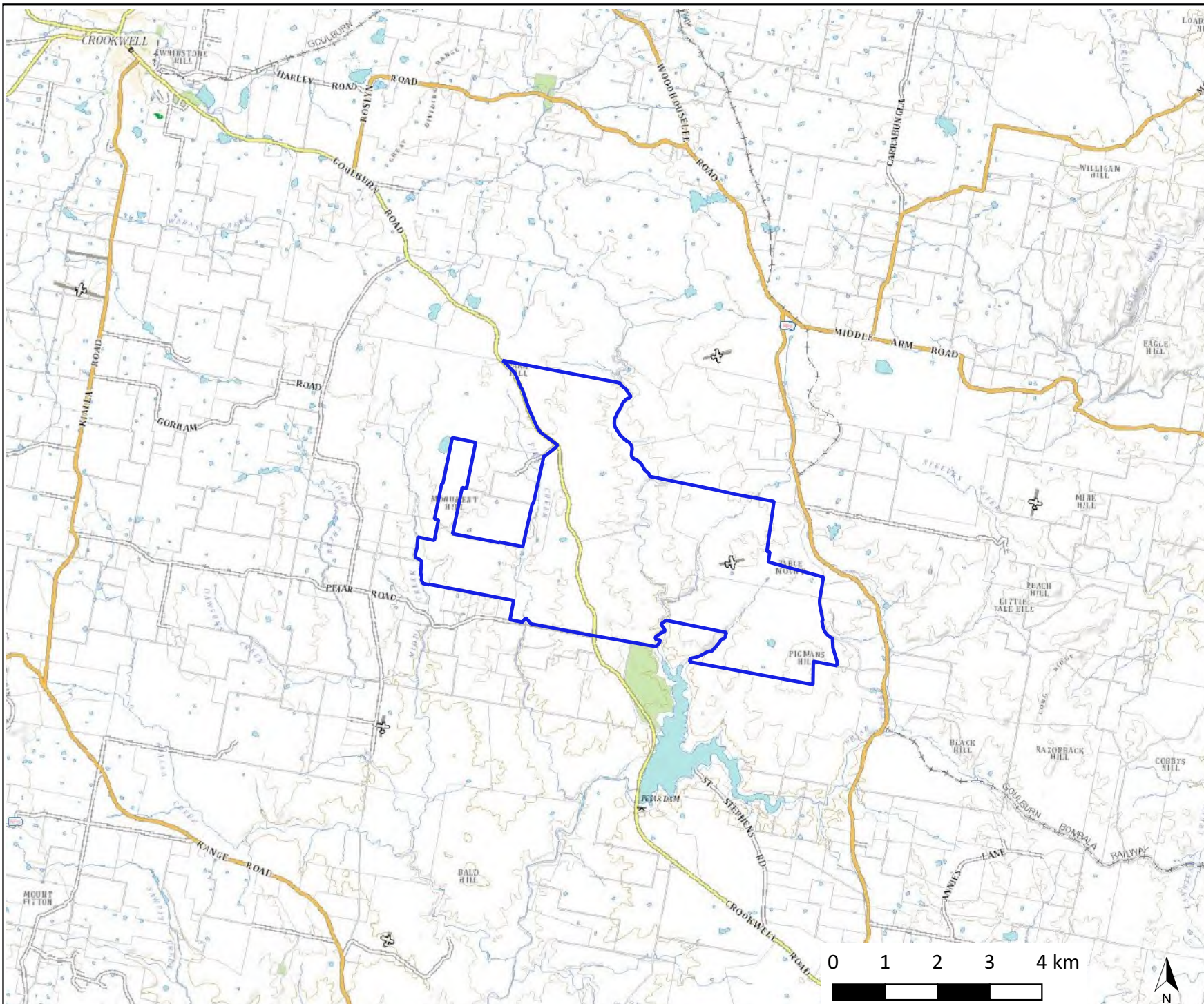
The objectives of the assessment were to:

- Conduct Aboriginal consultation as specified in clause 80c of the *National Parks and Wildlife Regulation*, using the consultation process outlined in the *Aboriginal cultural heritage consultation requirements for proponents 2010*;
- Assess the cultural significance of any archaeological material, and
- Provide management recommendations for any objects found.

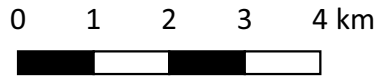
Figure 1. Location of study area in regional context

Legend

— Site Boundary - Crookwell 2



Acknowledgement: Basemap (c) NSW LPI 2017



Scale 1:100,000 @ A4, GDA 1994, MGA Zone 55



Capital Ecology Project No: 2740

Drawn by: R. Speirs

Date: 26 April 2017



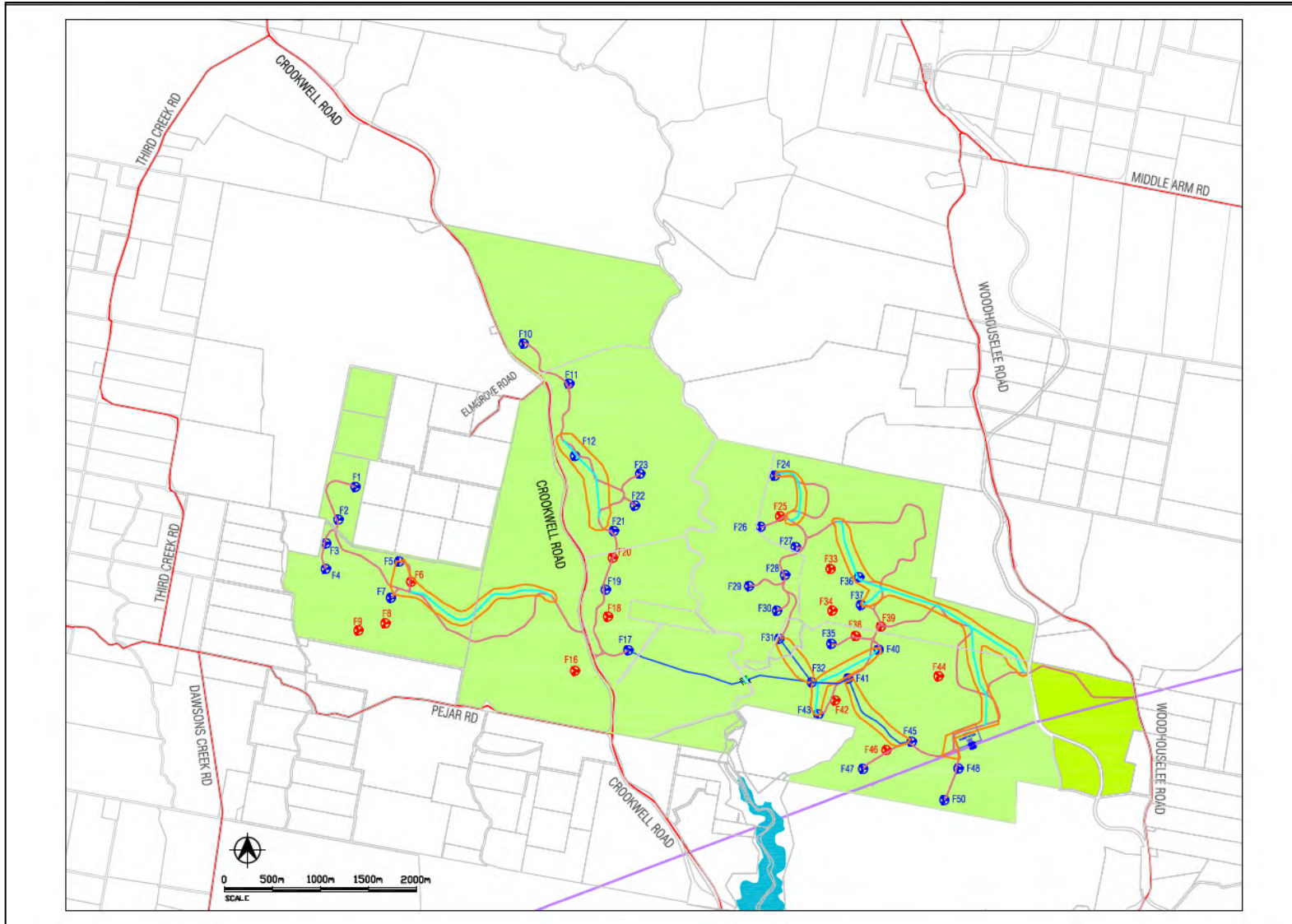


Figure 2 Turbine Locations showing Mod-2 removals and track realignment

2 ABORIGINAL CONSULTATION PROCESS

The consultation with Aboriginal stakeholders was undertaken in accordance with clause 80C of the *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* following the consultation steps outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* guide provided by OEH. The guide outlines a four stage process of consultation as follows:

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

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

Stage 1. Letters outlining the development proposal and the need to carry out an ACHA were sent to the Pejar Local Aboriginal Land Council (LALC), and various statutory authorities including OEH, as identified under the OEH guidelines. A further series of letters was sent to organisations identified by these agencies in response to the request. Responses are provided in Appendix B. In each instance, the closing date for submission was 14 days from receipt of the letter.

An advertisement was placed in the local newspaper the Goulburn Times on 21st December 2016 and the Crookwell Gazette on the 20th December 2016 seeking registrations of interest from Aboriginal people and organisations. The advertisement is provided in Appendix C.

As a result of this process, six groups contacted the consultant to register their interest in the proposal. The Registered Aboriginal Groups (RAPs) who registered interest were:

- Buru Ngunawal Aboriginal Corporation
- Pejar LALC
- Koomurri Ngunawal Aboriginal Corporation
- Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation
- Gundungurra Aboriginal Heritage Association
- Onerwal LALC

Stage 2. A Project Pack document was sent to the RAPs providing details of the background to the proposal, a summary of previous archaeological surveys and results of previous assessments. This project pack is attached at Appendix D.

Stage 3. A Methodology Pack with the proposed heritage assessment methodology for the proposal was sent to all RAPs. The document invited comments regarding the proposed methodology and also sought any information regarding known Aboriginal cultural significance values associated with the subject area and/or any Aboriginal objects contained therein. One

response was received within the 28 day review period, expressing concerns with the project. This document is attached at Appendix E.

Stage 4 In April 2017 a draft version of this *Aboriginal Cultural Heritage Assessment Report* for the project (this document) was forwarded to the RAPs informing them of the results of the field surveys. An invitation to visit the sites and discuss management options within the review period was extended to all RAPs. A timeframe of 28 days has been provided to allow for responses to the document, informed by the field visits.

2.1 ABORIGINAL COMMUNITY FEEDBACK

Aboriginal community feedback has been sought during the design of methodology and cultural assessment. No information in respect of the project area holding specific cultural values or known heritage sites that have not been recorded within the project boundaries has been provided.

Representatives of the Aboriginal community (Pejar LALC) were present during the assessment fieldwork and provided feedback on the project with no objections being recorded. All other RAPs have been invited to a field site inspection to provide an opportunity to view the sites and discuss culturally appropriate management options.

A draft of this report (completed prior to the site visits with RAPs) was forwarded on its completion to the RAPs. Following the site visit, and input from RAOs all responses received will be included at Appendix A and the management recommendations incorporated into the final document. Objections to the project have been recorded to date, which have hopefully been addressed by the inclusion of a site visit during the review period and further discussions with the RAPs in regards to management.

3 REVIEW OF LANDSCAPE CONTEXT

The following section is a brief summary of the landscape context. An examination of the landforms and landscape context of the project area is provided in full in the attached AR.

3.1 GEOLOGY AND TOPOGRAPHY

The Crookwell region and the current study area are located in predominantly Tertiary basalt overlaying the Silurian and Ordovician Wologorang and Wyangala granite formations. Deposits of Quaternary alluvium are confined to a narrow floodplain development adjacent to the major river systems (Hird 1991: 9). The study area is located at the boundary between the basalt country in the north and granitic country in the south.

Soils in the study area are generally formed from the deposition of weathered sediment material. Within the proposal area, two main soil types are present. The Taralga soil landscape covers the majority of the study area running through the northern section and central sections. The Taralga landscape consists of highly fertile chocolate soils derived in-situ from the underlying basalt flows with pockets of alluvial soils in drainage lines (Hird 1991:163). These soils are friable and moderately well drained. The broad ridgelines (plateau) and valleys of undulating rises is indicative of this soil landscape. Stream channels are mainly broad plains rather than incised stream channels (Hird 1991). The Garland soil landscape is present in the southern central and western sections. This soil landscape is located on undulating rises and valleys from the underlying granitic material. Red Podzolic soils on upper slopes and yellow duplex soils on the mid and lower slopes. Sandy Red and Yellow earths are also found on side slopes. Siliceous sands are present in some drainage lines. Slope gradients are usually less than 15% with erosional stream channels (Hird 1991:82).

From this review the landscape is best characterised as consisting of plateaus and valleys of gently undulating to undulating rises. The study area also contains level to gently sloping creek flats, long gentle side slopes to steep slopes running from the creek flats to the broad flat ridgelines. These broad, flat almost level ridgelines predominant across the study area.

The majority of the project area consists of simple slopes, rising to the broad ridgelines which predominant (after Speight 1990). In addition to these main land forms the study area also contains small sections of creek flats and low crest landforms.

3.2 FLORA AND FAUNA

The natural vegetation across the proposal area has been almost totally cleared and is now considered as a modified environment. Grass coverage appears to have been subject to pasture improvement agricultural cropping over an extended period of time. Prior to these European impacts the natural vegetation of the area would most likely have consisted of the following vegetation communities:

Brown Barrel-ribbon gum community - this is typical of basaltic soils. This community is an intermediate sclerophyll forest with well-developed sub stratum of small trees and shrubs (Hird 1991:164). Occurring on the more fertile chocolate soils this community was well forested with a variety of resources and small game present.

Yellow Box –Blakely’s Red Gum community – this community extended over the granitic soils. Now endangered this community was once extensive and highly utilised by the Aboriginal communities. This community consisted of a grassy woodland prior to clearing with native grasses under an understory of Eucalypts (Hird 1991). The grassy woodland environment supported a wide range of edible plant and fauna species. Fauna present would range from small marsupials (i.e. possums), to avian species and macropods. A range of lizards also inhabit this environment that would have been utilised by Aboriginal groups. The NSW OEH lists over 200 flora and fauna species as present within these woodlands, the majority of which had some utilisation in traditional Aboriginal lifeways.

3.3 HISTORIC LANDUSE

Crookwell was first mentioned in 1818 in the exploratory records of Hume, Meehan, Wild and Throsby on their discoveries of the Goulburn Plains, who camped south of Grabben Gullen (12 kms to the southwest of Crookwell). After confirmation of the agricultural potential of the area by Meehan in 1820 settlement commenced with large pastoral holdings. Binda, 19kms to the north was the initial centre of the district.

The study area has been used historically for sheep grazing, cattle grazing and production of crops. The Parish of Crookwell 2nd edition map dated 1897 already shows the study area divided into numerous small allotments with an average size of 50 acres. These small holders would have commenced tree clearing and commenced agricultural impacts within the project area.

3.4 LANDSCAPE CONTEXT AND REGIONAL CHARACTER

Most archaeological surveys are conducted in a situation where there is topographic variation and this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal archaeological sites. The study area ranges over creek flats/floodplains across undulating hills to broad flat crest on ridgelines that dominate landforms across the survey area.

The landforms for the survey were determined to be stable landforms, with moderately erodible soils and an aggrading landscape on the creek flats and floodplains. Soils were moderately disturbed in areas subject to ploughing, but confined to the surface soils. The open aspect of the broad ridgelines would have made travel through this landscape attractive as both a pathway and resource area.

The previous assessments undertaken in the region indicate that the landscape of the study area was traversed and utilised by Aboriginal people with a major focus on the ridgelines. Large scale resources were available along the Wollondilly River making it possible for long term occupation of camping and gathering sites, although to date no large scale sites have been found within the study area along the Wollondilly River.

The broad ridgelines at the time of past occupation would have been covered by woodlands, either of Ribbon-Bark communities or Box woodland, both environments that contained a wide variety of resources and in denser areas provided shelter from bad weather and ideal camping environments.

4 REVIEW OF ABORIGINAL ARCHAEOLOGICAL CONTEXT

4.1 ETHNOHISTORICAL SETTING

The study area is within a region identified as part of the Gundungara language group. This language group is an assemblage of many small clans and bands speaking a number of similar dialects (Howitt 1996, Tindale 1974, Horton 1996). The language group's borders were most likely fluid, expanding and contracting over time to the movements of smaller family groups, the seasons and periods of drought or abundance.

Small family groups were the core of Aboriginal society, the basis for their hunting and gathering life. The immediate family camped, sourced food, made shelter and performed daily activities together. The archaeological remains of these activities are likely to be campsites, characterised by small artefact scatters across the landscape. Places that were visited frequently would develop into large site complexes with higher numbers of artefacts and a more diverse range of archaeological evidence.

The small family units were components in larger bands which comprised a number of families. Such groups came together for special occasions such as ceremonies or rituals. They also joined together at particular times of year at places where resources were known to be abundant. The archaeological legacies of these gatherings are larger sites than a small family camp.

Prior to European settlement, the tablelands and adjacent areas supported dense woodlands, which provided habitat for a broad range of plant and animal species that formed the core of Aboriginal dietary items. Groups are documented as having exploited a broad range of plant species for food and material resources. Major water courses such as the Wollondilly River, which bisects the study area, and perennial creeks (such as First and Middle Creeks) were also a valuable source of plant and animal resources.

4.1.1 Aboriginal Groups within the Study Area

Two major language groups were identified in the Goulburn region by Norman Tindale in his seminal work on Aboriginal tribal boundaries. There were the Gundungurra (Gandangara) to the north of Goulburn, and the Ngunawal (Ngunnawal) also known as the Yass tribe, Lake George Blacks or Molonglo tribe to the south. This distribution of tribal boundaries was still accepted in the 1990s when (Horton 1996) reviewed linguistic divisions. The study area is close to the boundary between the Gandangara and Ngunnawal groups, both of who have current connections to the area.

One of the best sources for observations of the Indigenous inhabitants of the Goulburn region is Charles MacAlister, who lived in the district from the 1830s and noted many features and traditions of Aboriginal life. His observations must be viewed as from a white persons perspective and filtered through European cultural traditions, still, his work is a valuable reference for the region. MacAlister notes that the impact of white settlement was a general adoption of words and phrases to enable communication between the groups (MacAlister 1907:89). He records that the three tribes residing in the district were the Cookmai or Mulwarrie (Mulwaree), the Tarlo, and the

Burra (MacAlister 1907:82). MacAlister notes that Aboriginal people travelled from the Lachlan River to visit Goulburn (1907:82).

The flat, rolling topography of the Goulburn/Crookwell region and the lack of natural physical barriers would have facilitated contact and movement through the region for Aboriginal people. Lhotsky, in 1834, crossed the Breadalbane Plains meeting a party of approximately 60 Aboriginal people at Fish River. The group told Lhotsky they often travelled as far as Goulburn and the Yass Plains but not so far as the Limestone Plains (Lhotsky 1979:104-105). At a large gathering at Bathurst in c.1837 Aboriginal people were present from Goulburn, the Monaro and as far away as the Hunter Region (Boswell 1890:7-8).

Smith (1992) states that Goulburn was an Aboriginal cross roads with six or more different bands within a day's travel from the town site. Some of these bands included the Cookmai, Parramarrago, Tarlo, Burra, Pajong and Wollondilly.

Disease followed European settlement in the area including the smallpox epidemic that had originated in Sydney in 1789 (Flood 1980:32). This disease decimated the Aboriginal population and was followed by Influenza in 1846. The notable decline of the number of Aboriginal people was noted in 1845 at Bungonia and in 1848 at Goulburn by the Bench of Magistrates (Tazewell 1991:244).

4.1.2 Aboriginal customs

The earliest documented evidence for the lifestyles of Aboriginal people in the County of Argyle (Goulburn) comes from William Govett who in 1836 published a series of articles in *The Saturday Magazine*. According to Govett, the Wollondilly River was a focus of activity for Aboriginal people with eels, swans, ducks and other water birds being staples along with kangaroos, wallabies, possums, bandicoots, and emus (Govett 1977:29, 32, 34-35, 37). Govett also described the practice of fire stick farming to herd the kangaroos for hunting – this also has the benefit of encouraging new growth and attracting kangaroos to specific areas. (Govett 1977:23). These observations on Aboriginal life are consistent with the later writings of MacAlister (1907:88).

Govett recalls the impact of white settlement on the traditional hunting and gathering practices of the Aboriginal people:

The kangaroos have either been killed, or have fled in search of more retired forests, Sheep and cattle have taken their place, the emu and turkey are seldom seen, the millions of parrots have even become scarce...(Govett 1977:26)

Govett, Bennett (1834) and Boswell (1890) also describe the clothing of the Mulwaree tribe which consisted of long possum cloaks, worn with the fur turned in for warmth and the tanned skins on the outside for waterproofing, and string belts made from possum or kangaroo hair (Govett 1977:8, Bennett 1834:175, Boswell 1890:9). The process of making possum cloaks is described in detail by Boswell with the interesting note that Aboriginal people, being highly adaptive, had changed their traditional tool kit to incorporate glass for scraping the skins and iron needles and thread rather than traditional bone needles and kangaroo hair thread (Boswell 1890:9).

Personal adornment were worn in the manner of head dresses that consisted of kangaroo incisors, possum tails, head bands and necklaces, along with white and red ochre paint to decorate the upper body and face (Bennett 1834:323-326).

Weapons consisted of spears, fashioned from reeds or hard wood between 2 - 4m long (Govett 1977:36, MacAlister 1907:87,) and were used as part of the traditional hunting kit (Flood 1980:50-51). Specialised fishing spears and boomerangs were present. Woomerahs (spear throwers) approximately 1m long had a flat handle and a hook at the end. Boys practices throwing reed spears and blocking them) from an early age (Govett 1977:11, 36). Hatchets or axes had a ground stone head fastened to a wooden shaft by fibre binding. Iron axes replaced ground stone axe heads were valued by Aboriginal people (Govett 1977:11).

Women traditionally constructed nets from plant fibres which were used to carry items slung over their body - this could also include babies and infants. Govett recalls this practise of 'slinging' babies behind a mothers shoulders (1977:8). Digging sticks consisting of hard wood approximately 1.5m long, burnt at one end to create a hardened point, and were carried by the women who gathered foods as they passed through the country (Govett 1977:23, Lhotsky 1979:41).

4.2 ARCHAEOLOGICAL CONTEXT

4.2.1 *Previous Studies and Site Predictive Model*

Aboriginal people have occupied what we now know as the Australian continent for at least 40,000 years and perhaps 60,000 years and beyond. A review of the previous studies which have been undertaken within the region is provided in the AR attached at Appendix F. Within the current study area extensive previous studies have been undertaken for the Crookwell 2 Wind Farm development (Biosis 2004, 2005, 2008, 2011). These studies have resulted in the development of a site prediction model for the region.

The spatial distribution of Aboriginal sites in the local area recorded by previous heritage assessments, suggests that higher artefact distributions around broad ridgelines and high points were the focus of repeated visits and most likely used as travelling routes by Aboriginal people. Major waterways provided access to food and material resources, but no major sites have been recorded along the Wollondilly River within the study area. The lower densities of sites and artefacts present on creek flats and low hills away from watercourses is most likely a result of Aboriginal people moving through these areas for travel and food gathering, but not returning frequently or on a long term basis.

More than 50% of the sites identified within the study area have been recorded as a result of sub surface testing of landforms, with no surface expression of archaeological deposits.

Based on this body of previous work a site prediction model has been developed for the project (Table 1). This site prediction model is based on:

- Site distribution in relation to landscape features within the project area
- Consideration of site type and densities likely to be present within the project area
- Potential Aboriginal use of natural resources present or once present within the project area
- Consideration of the proximity of heritage sites in the region.

Table 1. Site Prediction Model

Site Type	Definition	Potential to occur
Isolated finds and surface scatters of stone artefacts	Artefact sites can range from high density concentrations to sparse, low density 'background' scatters and single finds	High – small to large scatters and isolated finds have been previously recorded within the project area. Larger sites are associated with broad ridgelines.
Rock Engravings	Motifs scratched or painted onto rock surfaces, usually within a rock shelter or overhang.	Nil: No such rock features are present within the agricultural project area.
Stone arrangements	Stone arrangements can include circles, lines and other patterns and usually mark ceremonial areas.	Moderate: An overlooked site type, stone arrangements are present across a range of environments.
Stone quarries/Ochre sources	Raw materials for lithic artefacts and ochre are gathered from these sites. They are highly valued by the community.	Nil: There are no known ochre or stone quarries identified by previous studies.
Potential Archaeological Deposits (PADS)	Sub surface deposit of cultural material	High: Previous assessments have shown that the broad ridgeline landform has high potential to contain deposits. Creek flats are also considered to hold high potential.
Scarred Trees	Trees with cultural modifications over 150 year old.	Low: Remnant trees remain within the project area, but the majority are too young to be considered.
Axe grinding grooves	Grooves in stone platforms created through grinding of stone implements such as axe heads	Nil: no stone platforms occur within the project area
Burials	Burials of Aboriginal persons	Extremely low: no deep sand deposits or soil types are present within the project area to indicate the potential for burials to occur.
Aboriginal places	Aboriginal places may not have any archaeological remains present, but are important to Aboriginal people due to their cultural, spiritual or historical associations.	Extremely Low: There are no recorded associations for the project area.

4.2.1 AHIMS Heritage Register Search

The Aboriginal Heritage Information Management System (AHIMS) is maintained by OEHS and provides a database of previously recorded Aboriginal heritage sites. Searches of the AHIMS database can be made providing information about any sites previously identified within a designated search area. The results of the search are able to be relied upon for 12 months.

An extensive search of the AHIMS database (Client service number 268932) was undertaken on 01/03/2017, resulting in 55 sites within the study area. All of these sites were recorded as a result of the Biosis (2004 and 2005) investigations and consist of open sites, either as surface scatters or as low density artefacts in dispersed sub surface contexts (i.e. 4 artefacts over 240m linear transect). These sites were identified as the result of the sub surface testing program and considered to form 'background scatter'. The majority of these sites were located on the broad ridgelines and considered to be the result of knapping activity (see Section 2.2.3). The site search results are attached at Appendix 1 of the AR and the location of recorded Aboriginal heritage sites within the study area is shown on Figure 3. The proposed impacts under the development of the Crookwell 2 Wind Farm do not extend across the entirety of the study area, and only a small proportion of these recorded sites are at risk of potential impact from the project. Of the 55 sites previously recorded, 20 (primarily consisting of low density sub surface deposits with no surface expressions) will be impacted. These sites have been previously excavated as part of the testing program (Biosis 2005) and representative sample of artefacts recovered.

It is clear from these results that the dominant site type in the region are occurrences of stone artefacts, either as isolated finds or in clusters as artefact scatters. The AHIMS recorded sites are discussed in detail in the attached AR at Appendix F. A further three sites were identified during the field survey for the project of which one will be impacted by the proposed road alignment.

The current field survey for the project (as detailed in the AR at Appendix F) resulted in the recording of an additional 12 heritage sites. All of these except one (PJ56) can be avoided by design or placement of the road. The total impact from the modification 2 Crookwell 2 Wind Farm consists of impacts to 21 heritage sites.

4.2.2 Summary of Aboriginal Land Use

The results of previous archaeological surveys in the region serve to show that there are sites present in a range of landforms but mainly concentrated on broad ridgelines and gently sloping upper slopes. Where creek lines have been investigated due to crossings, sites have been located indicating a pattern of site location that relates to the presence of potential resources for Aboriginal use.

The Aboriginal land use of the region is in reality little understood as few in-depth studies have been completed, except for those undertaken for the project. Findings from Crookwell I and Crookwell II do not tend to confirm the wider predictive model for the Goulburn/Crookwell region developed by Fuller (1989) with larger sites being located on the broad ridgelines and not on waterways. It is possible, however, to ascertain that proximity to resources was a key factor in the location of Aboriginal sites. It is also reasonable to expect that Aboriginal people ventured away from these resources to utilise the broader landscape but the current archaeological record of that activity is currently limited.

In summary, the topographic, environmental or landscape features within the proposal area means that there are few areas that would concentrate activity and therefore have a better chance of leaving archaeological traces. Nonetheless, given that Aboriginal people have lived in the region for tens of thousands of years, there is some potential for archaeological evidence to occur. Based on previous assessments this archaeological material is most likely to be in the form of stone artefacts and located in larger sites along the broad ridgelines, which may have been utilised for travel through this country.

5 ABORIGINAL CULTURAL HERITAGE SIGNIFICANCE ASSESSMENT

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess the cultural values of Aboriginal sites in the Project Area (as communicated by RAPs). Details of the scientific significance assessment of Aboriginal sites in the Project Area are provided in the AR (Appendix F).

5.1 CULTURAL SIGNIFICANCE VALUES

Cultural or social significance refers to the values attached to a place or objects by Aboriginal people. Aboriginal cultural heritage is used to define Aboriginal identity as both individuals and as part of a wider community group.

It is broadly acknowledged that Aboriginal people are the primary determiners of the cultural significance of Aboriginal cultural heritage. During consultation the following information was provided by RAPs in regards to the cultural values of the study area.

- The study area on the outskirts of Crookwell is of high cultural value but is not known to hold any specific areas of known importance. The identified Aboriginal Cultural Heritage sites located within its boundaries possess low to high cultural value due to their range of artefact numbers. Although these sites are of common occurrence in the region and most are sub surface and only have been detected by archaeological survey, these sites are important in providing evidence of the past occupation of the area by Aboriginal people and in mapping the importance of different areas of the landscape.

5.2 STATEMENT OF CULTURAL SIGNIFICANCE

Consultation with the Aboriginal Community (field based discussions) has resulted in the following statement of significance for the recorded sites.

Sub surface sites - the 15 sub-surface low density sites that will be impacted by the development are not considered to hold high value as they are hidden and part of the country. They are not available for educational usage. Cultural monitoring should be undertaken at known areas of higher density and areas of potential archaeological deposit (PAD).

The small surface sites are of common types through the country and show the previous use of the region. These sites are considered to hold low values as they confirm to the community information that is already widely known. They are important for continuing contact with past lifeways and the land.

The larger artefact scatters (PJ56 and 67) show the utilisation of the country and holds a variety of artefact types and materials. Impacts should be avoided as they contain educational and cultural connections.

6 IMPACT ASSESSMENT

6.1 DEVELOPMENT IMPACTS

Originally the Crookwell 2 Windfarm was approved for 46 turbine locations and access roads. Modification 2 reduces the number to 32 wind turbines, each with a concrete hardstand and a crane laydown area of 50 x 50 metres. This modification removes impact from 14 locations. These turbine locations have been subject to a high level of investigation and assessment, including sub-surface testing in areas considered to hold high to moderate potential for deposits. From the sub-surface testing program two sites were identified as required salvage excavation (PJ37 and PJ55) which has been completed under AHIPS 1101268 and 1122895.

The types of activities that will impact the ground surface and sub-soils include:

- the excavation for turbine infrastructure;
- construction of access roads;
- electricity cables and substation connections.

Design of the development has been undertaken to try to avoid impact to the heritage sites, avoiding a large number, through modification of the original proposal. Due to the nature of the development, impacts will occur but be limited to the 6m of road width or turbine locations. Of the 67 heritage sites located within the project boundary, 38 are in proximity to works and 21 will be impacted by Mod - 2 as discussed in the archaeological report. Most of these impacts are only partial to each of the recorded sites, which extend beyond the area of impact.

A review of these previously assessed sites, their current condition and their classification was undertaken as a component of this report and can be seen in the AR. The majority of these sites consist of subsurface artefacts (sometimes isolated artefacts) identified during subsurface testing (Biosis 2005). No surface indications of the sites are present. The current assessment of these sites confirmed the findings of the previous assessment, which is that they hold low significance except for larger artefact scatters, considered to be of high significance (discussed in Section 5). The assessed statement of impact for the Aboriginal archaeological sites in the study area has been summarised in Table 2.

Table 2. Site Impact Assessment

No	Site number	AHIMS No	Contents	Scientific Significance	Impacts under Mod 2
1	PJ10	51-6-0218	Isolated surface find	Low	Direct and Total
2	PJ21	51-6-0229	84 Subsurface artefacts along ridgeline,	High	Direct and Partial
3	PJ23	51-6-0231	8 artefacts on dam edge	Low	Nil impact - outside alignment
4	PJ26	51-6-0348	subsurface isolated find	Low	Nil impact - outside alignment
5	PJ27	51-6-0322	subsurface isolated find	Low	Nil impact - outside alignment

No	Site number	AHIMS No	Contents	Scientific Significance	Impacts under Mod 2
6	PJ28	51-6-0323	subsurface isolated find	Low	Direct and Total
7	PJ29	51-6-0324	Isolated surface find	Low	Direct and Total
8	PJ35	51-6-0330	23 subsurface artefacts in 50 x 50m area	Medium	Direct and Partial
9	PJ36	51-6-0331	subsurface isolated find	Low	Direct and Total
10	PJ37	51-6-0349	1002 subsurface artefacts in single square	High	Nil - salvaged by excavation (AHIP 1101268)
11	PJ38	51-6-0332	38 subsurface artefacts on 230 m linear length	Medium	Direct and Partial – extends beyond impact area. Recorded area of site to be avoided – nil impacts. Area of PAD to be built up rather than impacted.
12	PJ39	51-6-0333	19 subsurface artefacts in 50 x 50 m area	Medium	Direct and Total
13	PJ40	51-6-0331	3 subsurface artefacts in 50 x 50m area	Low	Direct and Total
14	PJ41	51-6-0335	6 subsurface artefacts in 50 x 50m area	Low	Direct and Partial – extends beyond impact area
15	PJ42	51-6-0336	10 subsurface artefacts along 300m linear length	Medium	Direct and Partial - extends beyond impact area.
16	PJ44	51-6-0338	2 subsurface artefacts	Low	Direct and Total
17	PJ45	51-6-0339	24 subsurface artefacts in 250 x 250m area	Medium	Direct and Partial – extends beyond impact area
18	PJ46	51-6-0340	3 subsurface artefacts in 50 x 50m area	Low	Direct and Total
19	PJ48	51-6-0342	2 subsurface artefacts	Low	Nil impacts
20	PJ49	51-6-0343	16 subsurface artefacts along 200m transect	Medium	Direct and partial as site extends out of impact area.
21	PJ50	51-6-0344	subsurface isolated find	Low	Direct and Total
22	PJ51	51-6-0345	323 artefacts in one test pit only	High	Nil impacts
23	PJ52	51-6-0346	2 subsurface artefacts	Low	Direct and Total

No	Site number	AHIMS No	Contents	Scientific Significance	Impacts under Mod 2
24	PJ53	51-6-0347	2 subsurface artefacts in 42m transect	Low	Direct and Total
25	PJ54	51-6-0682	4 subsurface artefacts	Low	Direct and Total
26	PJ55	51-6-0683	76 artefacts in one test pit	High	Nil - salvaged by excavation (AHIP 1122895)
27	PJ56	pending	50+ artefacts and PAD	High	Direct and Partial
28	PJ57	pending	2 artefacts	Low	Nil - On edge of road alignment
29	PJ58	pending	3 artefacts	Low	Nil Outside of impact area. Avoid impacts.
30	PJ59	pending	5 artefacts and PAD	Medium	Nil - On edge of road corridor
31	PJ60	pending	30+ artefacts and PAD	High	Nil- can be avoided by placement.
32	PJ61	pending	30+ artefacts and PAD	High	Nil - On edge of cable alignment.
33	PJ62	pending	Isolated find	Low	Nil - can be avoided by placement of road alignment.
34	PJ63	pending	5+ artefacts and Pad	Medium	Nil - On edge of road alignment.
35	PJ64	pending	2 artefacts	Low	Nil - On edge of Dam - this is outside of road impacts. Nil impact to site
36	PJ65	pending	3 artefacts	Low	Nil - On southern edge of road corridor.
37	PJ66	pending	3 artefacts	Low	Nil - On southern edge of road corridor.
38	PJ67	pending	30+ artefacts and PAD	High	Nil. Outside of alignment and proposed work.

6.2 MITIGATION STRATEGY

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable. This has been undertaken, resulting in current Mod-2 for assessment which avoids a larger number of sites, than the original layout and decreases heritage impacts. In cases where avoidance and conservation is not practical, the salvage excavation of artefacts, gathering of information through surface collections and interpretation are management options.

Management options for the study area are (in order of preference):

- Conservation of sites through avoidance - this removes impact.
- Impacts mitigated through surface collection, excavation salvage or build-up of PAD areas.

- Unmitigated Impact – this occurs when small surface sites cannot be relocated or surface collection or small dispersed sites have been located through subsurface testing which cannot be salvaged.

As a mitigation strategy for sites where impacts cannot be avoided, collection of the surface artefacts, recording of their attributes and curation by the Aboriginal community is the most appropriate option. This collection should only occur in the area of impact (6m wide corridor) to allow the majority of the site to remain in-situ. A mitigation strategy of surface collection would ensure preservation of the identified artefacts and provide an educational resource for the Aboriginal community. A care and control agreement with the Pejar LALC is in place to provide for the long term curation and management of recovered materials. Artefacts recovered from previous investigations are in the curation of the Pejar LALC and it is appropriate that any further collected artefacts should be added to this collection.

As a mitigation strategy for the subsurface sites of low importance, a representative sample of their contents has resulted from the 2005 subsurface testing. No further mitigation measures are required for these sites, however cultural monitoring with collection of any recovered artefacts should be considered for the larger sites considered to hold moderate potential.

As a mitigation strategy for the subsurface sites of moderate importance, cultural monitoring of topsoil removals with collection of any recovered artefacts should be undertaken. If any areas of high density are identified, work will cease in that area and OEHL contacted for guidance. The Unanticipated Finds Protocol in the AHMP will be followed.

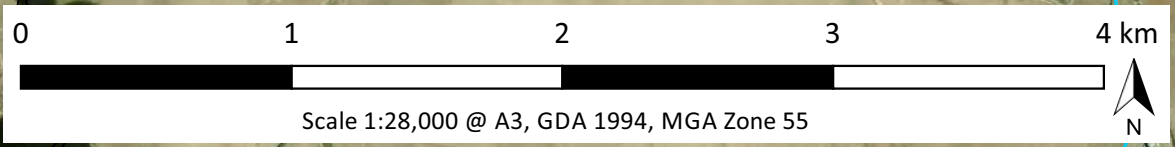
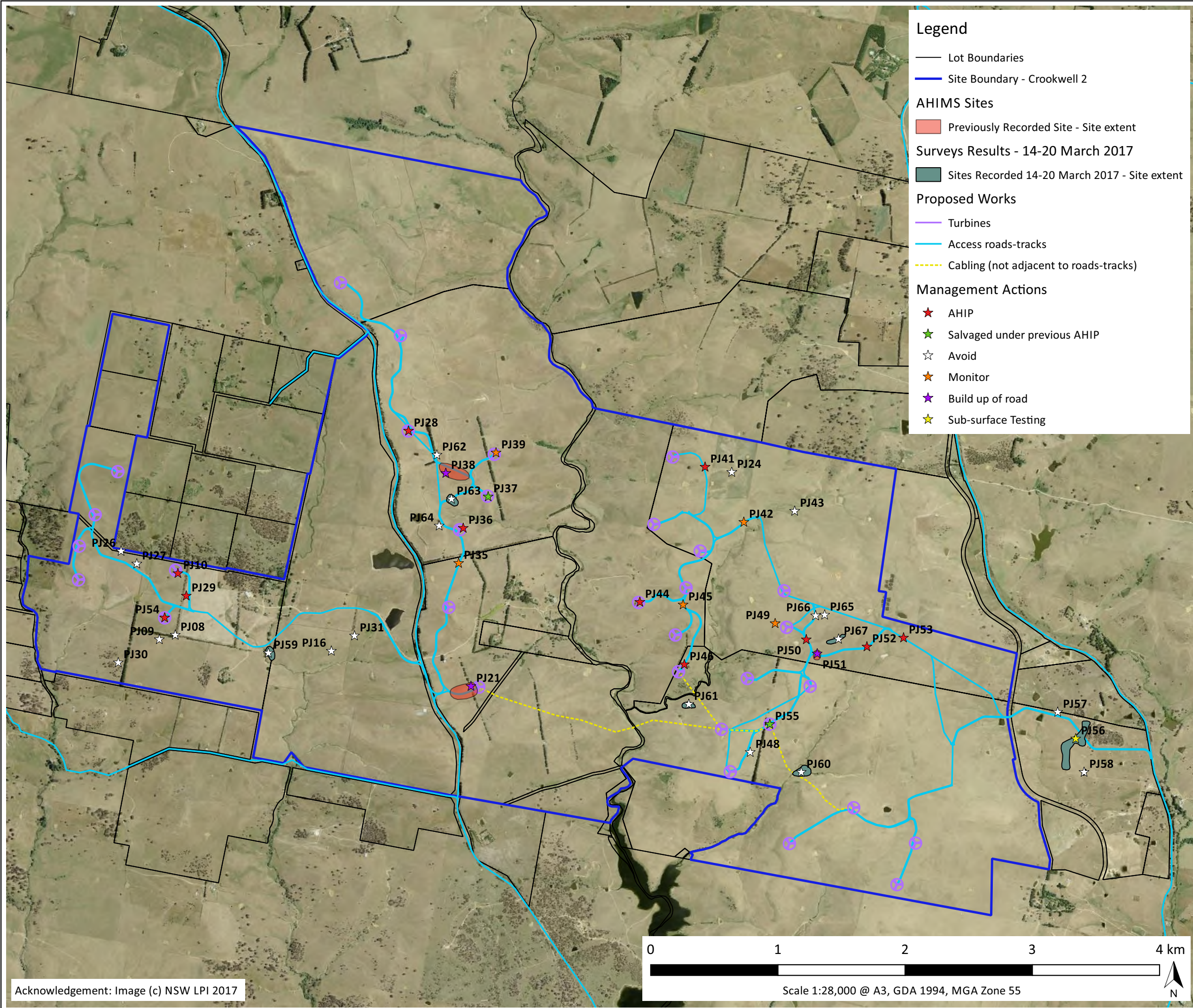
As a mitigation strategy for the subsurface sites of high importance, a strategy of conservation of the PAD areas, by removing impacts to the sub soils by building up of the road base on the current ground surface is the most appropriate option. This covering of the PAD should be confined to the direct area of the 6m wide road alignment.

As a result, it is proposed that an AHIP be applied to cover impacts to sites, with the discussed main mitigation measures, applied to the relevant sites as follows:

- For surface sites impact with no further measures.
- for low values sub surface sites, impact with no further measures, following the 2005 subsurface testing and collection of a representative sample;
- for moderate value subsurface sites, impact with cultural monitoring and collection of any recovered artefacts;
- for high value subsurface sites, removal of impacts from PADs by build-up of road surface applied to the relevant sites.

The sites to be impacted under each measure are detailed in the Recommendations section and the AR in Appendix F. The site locations and their management action are shown in Figure 3.

Figure 3. Management Actions



Acknowledgement: Image (c) NSW LPI 2017

6.3 SUSTAINABLE DEVELOPMENT PRINCIPLES

Sustainable development should aim to result in the same degree of accessibility of cultural knowledge and archaeological integrity as currently exists. Any development that results in a negative effect on these principles should be justified and minimised in any manner possible.

Intergenerational equity is maintained by the continued dissemination of cultural knowledge and ability to visit cultural sites into the future. It is considered detrimental to future generations if cultural knowledge is lost by the current generation. Any destruction of cultural heritage sites runs the risk of negatively impacting in the future. This issue has been addressed by discussion of the significance of the sites and whether they would play any part in teaching the next generation about cultural traditions. Responses to this question were that the sites were common, that the use of the area was well known (as was that it was shared country) and this would continue to be passed on. The impact of their destruction would be negligible, though the destruction of any site should be avoided where possible. No further mitigation or options could be suggested by the community apart from those contained in the recommendations in the following section.

Protection of the archaeological record for future research and conservation requirements are primary concerns. Cumulative impacts by the continued destruction of sites is of concern to the Aboriginal and archaeological communities and should be addressed by continued assessments and focus on preserving sites that are either intact, contain many artefacts, or are significant to the community.

The Crookwell 2 Wind Farm development has been undertaken in accordance with these principles by completion of the following actions:

- Avoidance of sites whenever possible
- Collection of sites by the Aboriginal community to preserve artefacts for teaching and research purposes
- Consultation with the Aboriginal community
- Assessment of impacts and conservation wherever possible.

7 RECOMMENDATIONS

Based on results of the archaeological program and consultation with the Registered Aboriginal Parties the following recommendations have been developed in regards to Aboriginal Cultural Heritage values and sites located within the Project Area. Management recommendations are:

As a result of the ACHAR and consultation with the Registered Aboriginal Parties (RAPs), the following management recommendations apply:

- No impacts can occur to any of the recorded heritage sites until an AHIP has been approved by the NSW OEH.
- Impacts to the identified heritage sites should be avoided if possible. Where possible in the road and cable alignments design should be undertaken to avoid impacts to identified heritage sites.
- The recommendations of the Archaeological Report (Appendix F) should be followed and implemented in full.
- All Aboriginal objects are protected under the NSW *National Parks and Wildlife Act 1974*. It is an offence to disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.
- In the unlikely event that human remains are discovered during the construction, all work must cease. OEH, the local police and the appropriate LALC should be notified. Further assessment would be undertaken to determine if the remains are Aboriginal or non-Aboriginal.
- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs for the project and may include further field survey.
- Continued consultation with the RAPs for the project should be undertaken. RAPs should be informed of any major changes in project design or scope, further investigations or finds.

8 REFERENCES

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APPENDIX A CONSULTATION LOG

Organisation	Type of consultation	Date/Time	Response
Public Advertisement	Call for registrations	Crookwell Gazette Goulburn Post	13/01/2017
Letter to Regulators requesting stakeholders			
NNTT	Letter	16/12/2016	
NTSCorp	Letter	16/12/2016	
OEH	Email	16/12/2016	List of stakeholders supplied 16/12/2016
Local Land Services	Letter	16/12/2016	
Local Council	Email	16/12/2016	List of stakeholders supplied 16/1/2017
Registrar ALR	Letter	16/12/2016	
LALC	Email/Letter	16/12/2016	
Consultation notification to identified stakeholders from Regulators			
OEH Listing	Email to identified stakeholders Letter to stakeholders with no email address	21/12/2016	
Upper Lachlan Shire Council Listing	Email and phone call to Onerwal LALC	23/01/2017	Registered for project
List of Registrations			
Buru Ngunawal Aboriginal Corporation	Wally Bell	wallbell@bigpond.net.au	Email 29/12/2016
Thunderstone Cultural and Land Management Services Aboriginal Corporation	Tyronne Bell	thunderstone@gmail.com	Email 05/01/2017
Gundungurra Aboriginal Heritage Association	Sharyn Hall	PO BOX 31 Lawson NSW	Phone call 06/01/2017
Koomurri Ngungawal Aboriginal Corporation	Glen Freeman	KoomurriNAC@hotmail.com	Email 22/12/2016
Onerwal LALC	Bradley Bell	onerwal@gmail.com	Email 23/01/2017
Project Pack			
To all RAPS	Email Letter to Gundungurra Email to Onerwal LALC	18/01/2017 23/01/2017	Responses
List of RAPS to OEH and LALC by 13/02/2017	Email		
Methodology Pack	25/1/2017	Email to all RAPS, Mailed to Gungundurra	Koomurri respond in regards to management of recovered artefacts from Mod 1 works.

Organisation	Type of consultation	Date/Time	Response
Variation to Methodology	1/3/2017	Email to all RAPS, Mailed to Gungundurra	
Field work	14/3/2017	Undertaken by Pejar LALC	
Draft Reports	28/4/2017	Email to all RAPS, Mailed to Gungundurra	Koomurri respond agree with recommendations. Thunderstone verbally agree with recommendations. Pejar LALC verbally agree with recommendations.
Final Reports		To be mailed out following review by OEH.	

Past Traces

From: Koomurri Ngunawal Aboriginal Corporation <KoomurriNAC@hotmail.com>
Sent: Tuesday, 23 May 2017 4:17 PM
To: pasttraces@ozemail.com.au
Subject: Re: further subsurface testing at Crookwell

Hi Lyn,

I would like to thank you for your considerate efforts in view of our previous concerns in regards to this project and as it would seem that our protest against the Care and Control permit has been too late to stop it, we of course fully support the Salvage and Reburial recommendations proposed, it is to be hoped that the LALC respectfully understands our Cultural beliefs and work with us to come to an amicable solution particularly that we are the recognized Custodians of our ancestral lands through our Oral History and as proven by the fact that we the Ngunawal are the only people to have passed the Native Title Tribunal not once but twice, surely if this isn't proof enough of our Rights to speak on Heritage matters on our Country, I don't know what more we have to prove.

Perhaps in the future some prior notice should be given to all RAP'S as a matter of respect of any other party's intentions to apply for Care and Control permits, this then would be seen as a transparent process by all RAP'S involved.

As I have said we are willing to negotiate, in regards to all other recommendations and the methodology proposed in this report we at KNAC would like to be considered for the next phase of the works for this project and in the spirit of good will we endorse it.

Regards,

Glen Freeman,
Director/Public Officer/Contact
Koomurri Ngunawal Aboriginal Corporation ICN: 7812
KoomurriNAC@hotmail.com
PH: 0434 790 215

From: Past Traces <pasttraces@ozemail.com.au>
Sent: Tuesday, 23 May 2017 12:40 PM
To: Koomurri Ngunawal Aboriginal Corporation
Subject: further subsurface testing at Crookwell

Hello Glen

Thanks again for your assistance with the test pits at the Woodhouselee Road Access.

APPENDIX B – RESPONSE FROM REGULATORS



Lyn O'Brien
c/o Bowen Heritage Management
GPO Box 1584
Canberra City ACT 2600

via email: pastraces@ozemail.com.au

Dear Lyn,

**WRITTEN NOTIFICATION OF PROPOSAL AS REQUIRED UNDER DECCW ABORIGINAL
CULTURAL HERITAGE CONSULTATION REQUIREMENTS FOR PROPONENTS 2010**

Re: Crookwell Wind Farm 2 – Modification 2 and 3 Goulburn-Crookwell Road, Crookwell, NSW

I refer to your emailed letter to the Office of Environment and Heritage (OEH) received today regarding the above matter.

Attached is a list of known Aboriginal parties for the Upper Lachlan local government area that OEH feels is likely to have an interest in the development. Please note this list is not necessarily an exhaustive list of all interested Aboriginal parties and receipt of this list does not remove the requirement of a proponent/consultant to advertise in local print media and contact other bodies seeking interested Aboriginal parties, in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (April 2010).

Under Section 4.1.6. of the *Consultation Requirements* you must also provide a copy of the names of each Aboriginal person who registered an interest to the relevant OEH regional office and Local Aboriginal Land Council (LALC) within 28 days from the closing date for registering an interest.

Please note: the contact details in the list provided by OEH may be out of date as it relies on Aboriginal parties advising OEH when their details need changing. If individuals/ companies undertaking consultation are aware that any groups contact details are out of date, or letters are returned unopened, please contact either the relevant stakeholder group (if you know their more current details) and/ or OEH. AHIP applicants should make a note of any group they are unable to contact as part of their consultation record.

If you wish to discuss any of the above matters further please feel free to contact me on (02) 6229 7089.

Yours sincerely

Jackie Taylor
Team Leader, Aboriginal Heritage - South East
Regional Operations Group
Office of Environment and Heritage

Enclosure: Attachment 1 – Upper Lachlan LGA

ATTACHMENT 1: Upper Lachlan local government area

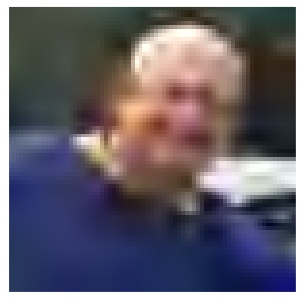
Organisation/Individual Name	Address	Contact Details
Cowra Local Aboriginal Land Council	PO Box 769 Cowra NSW 2704	phone: (02) 6342 4808
Gundungurra Aboriginal Heritage Association Inc. Secretary: Sharyn Halls	PO Box 31 Lawson NSW 2783	
Peter Falk Consultancy	PO Box 1018 Mittagong NSW 2575	mobile: 0401938060 Ph: 4872 1909 email: kanga26@live.com.au
Pejar Local Aboriginal Land Council Primary Contact: Delise Freeman	80 Combermere St, PO Box 289 Goulburn NSW 2580	Ph: (02) 4822 3552 Fax: (02) 4822 3551 email: pejar1@goulburn.net.au
Buru Ngunawal Aboriginal Corporation Primary contact: Wally Bell	PO Box 6900 Charnwood ACT 2615	Mobile: 0419425347 email: walbell@bigpond.net.au
Alice Williams	7 Attunga Place Orange NSW 2800	mobile: 0431190127
Koomurri Ngunawal Aboriginal Corporation Contact/Director: Glen Freeman	16A Progress Street Goulburn NSW 2580	mobile: 0451 790 215 email: koomurrinac@hotmail.com
Gundungurra Tribal Council Aboriginal Corporation. Contact - Mr Eddy Neumann, Solicitor	c/- Eddy Neumann Lawyers DX 11501 Sydney Downtown NSW 2000	phone: (02) 92649933 email: en@eddyneumann.com.au
Gundungurra Aboriginal Heritage Association Inc. Contact - Mr Andrew White, Partner	c/- Benetatos White Solicitors & Attorneys DX 8307 Katoomba NSW 2780	phone: (02) 47822199 email: awhite@benetatoswhite.com
Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation. Contact Person - Tyrone Bell	PO Box 6900 Charnwood ACT 2615	mobile: 0407517844 email: thunderstonemg@gmail.com

APPENDIX C – PUBLIC NOTICE



In Memoriam

In Loving Memory of
RODGER JOHN DOYLE
20/01/1931 - 20/12/2015



Always Remembered by
**Brian, Sharon, Kim,
Mark, Sean & Beth**

RM2672876

NAN JOHNS

12.11.1938 ~ 20.12.2015

A Nan is a special friend whose love is always there, who always takes an interest in each hope and dream we share. A Nan is a special friend whose hope is always near, who offers understanding, care and comfort, year by year. Nan, that is why you're cherished more with every day, for you will always be a special friend in every way. Thank you for the memories
Never forgotten
Rachael, Katherine, Toby, Maddison, Ella & Jaxon
XXXXXX

**Patricia Anne Johns
Mum**

12.11.1938 ~ 20.12.2015

A mother's care is precious, a mother's care is warm, a mother's care helps quieten down every single storm. Thank you for your smile mum, thank you for your care, thank you for all the love you never failed to share. Missing you & forever in our hearts
Graham & Janelle

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Public Notices

Staff at the Crookwell Gazette office wish all their loyal advertisers & readers a very merry christmas and happy new year.

The office will close on Thursday 22nd December and re-open on 6th January 2017.

We can be contacted through the holidays on 0423 692 646

Public Notices

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ABERCROMBIE HILL ROADWORKS NOTICE TO MOTORISTS

Oberon Council is currently undertaking roadworks on Abercrombie Road for a length of approximately 2.5 km through Abercrombie Hill, located approximately 70 km from Oberon south of Porters Retreat.

Works will recommence in mid January 2017 to replace the existing seal on Abercrombie Hill. Once the existing seal is removed and until work to replace the new seal is completed in March 2017, the road surface will be unsuitable for the safe movement of trucks, caravans and trailers. Advance warning signs will be in place from mid December 2016.

If you require any further information in relation to the project, please contact Councils Project Engineer, Mr Prasanna Kariyawasam on 6329 8100.



UPPER LACHLAN SHIRE COUNCIL PUBLIC EXHIBITION REGIONAL COMMUNITY STRATEGIC PLAN

Notice is hereby given that in accordance with the provisions of Section 402, of the Local Government Act 1993, Council has prepared the following documentation which meets the requirements of the Integrated Planning and Reporting legislation with respect to Council's strategic planning activities.

The Councils of Upper Lachlan, Goulburn Mulwaree and Yass Valley are working together to prepare a Regional Community Strategic Plan with a shared vision and clear strategic direction for the long term to identify the main priorities and aspirations of the communities of the Southern Tablelands region.

Upper Lachlan Shire Council places the following draft documents on public exhibition for a five week period:-

- Southern Tablelands Regional Community Strategic Plan 2016-2036;
- Regional Community Engagement Strategy and Communications Plan; and
- Community Engagement Outcomes Report on the Southern Tablelands Regional Community Strategic Plan December 2016.

The draft documents are intended to set the strategic direction of the Councils covering a twenty year timeframe. All enquiries should be directed to Council's Director of Finance and Administration, Mr. Andrew Croke on (02) 4830 1000.

The public exhibition period commences Monday, 19 December 2016 to Friday, 27 January 2017 inclusive, with copies of each plan available for inspection on Council's website: www.upperlachlan.nsw.gov.au, Council's Facebook Page, available to view at the three Council Administration Offices at Crookwell, Taralga and Gunning, and at the Crookwell and Gunning Libraries.

Public submissions in writing will be received by Council during the public exhibition period until 4.00pm, on Friday, 27 January 2017, and must be addressed to the General Manager, PO Box 42, GUNNING NSW 2581. Before adopting the final plans Council will take into consideration all public submissions that have been received.

JK Bell PO Box 42
GENERAL MANAGER GUNNING NSW 2581

Public Notices

Crookwell Junior Green Devils are calling for 1st Aid & League Safe, Managers and Coaches for the 2017 season. Email expressions of interest to: **cjgdevils@gmail.com**

Crookwell Junior Green Devils Nomination for club secretary are open for the 2017 season. Nominations must be received before the next committee, 20th Jan. Email: **cjgdevils@gmail.com**

Top Pub Social Club Raffle Results
1st - Glen Collins (Blue Y44)
2nd - Gunda (White N24)
3rd - Mr Wazza (White N42)
4th Chris Hewett (Pink W64)
5th - Jim Johns (Pink W85)
Thank you to everyone who purchased tickets. Proceeds to the Hospital.

The Crookwell & District Historical Society wishes you a Merry Christmas and a Happy New Year. This office will close Tuesday 20th December at 4.00pm and re-open Tuesday 24th January 2017 at 11.00am

Positions Vacant

Apprentice wanted
Heavy vehicle/agricultural mechanic apprenticeship for local truck repair and farm machinery workshop. We are looking for an enthusiastic and self-motivated self-starter who is well presented and most of all reliable. Located in Crookwell NSW. Good variety of work and would suit school leaver wanting to be a mechanic. The position will involve extensive workplace and TAFE training. **SERIOUS APPLICANTS ONLY** who would like stable long term employment. Please email resume and cover letter to **completetruckandag@outlook.com** or post to PO Box 262, Crookwell NSW 2583. Any questions please call 0428 588 834. Get your applications in quick as position may be filled fast.

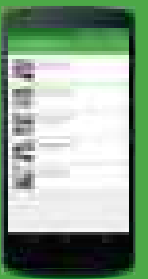
OFFICE CLERK NICHOLSON FARM MACHINERY
Preferably a full time position available in our office. Experience in Reckon Accounts and Microsoft Office Suite an advantage. This local position would suit a person looking for long-term employment commencing early January 2017. Further information contact John Nicholson 4832 1073. Resume to **johnnicho54@outlook.com.au** by 29th December 2016.

Public Notices

Work Wanted

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Working in all areas, fully insured and licenced, No job too small. Contact **Adrian 0420 215 577**
Lucas 0401 956 320

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NOTIFICATION AND REGISTRATION OF ABORIGINAL INTERESTS CROOKWELL 2 WIND FARM, GOULBURN-CROOKWELL ROAD, NSW

Crookwell Development Pty Ltd have engaged Bowen Heritage Management Pty Ltd to undertake an Aboriginal Cultural Heritage Assessment for variations for the Crookwell 2 Wind Farm, located 17km south east of Crookwell Township along the Goulburn-Crookwell Road. The site is located entirely within the Upper Lachlan Shire Council.



Bowen Heritage Management Pty Ltd invites Aboriginal people who hold cultural knowledge in determining the significance of Aboriginal objects and or places in the area of the Crookwell 2 Wind Farm to register their interest in a process of stakeholder consultation. The purpose of the consultation is to assist in the assessment and management of heritage sites.

The proposal may result in Crookwell Developments:

- Undertaking investigations in accordance with the *Code of Practice for Archaeological Investigation in NSW 2010* and/or
- Undertaking an environmental impact assessment under the *Environmental Planning and Assessment Act 1979*.

For more information or to register in writing please contact:

Lyn O'Brien/Alister Bowen
Bowen Heritage Management
P.O. Box 793, Jamison Centre, ACT, 2614
Ph: 0403 021296

REGISTRATIONS MUST BE RECEIVED BEFORE 5.00PM 13th January 2017



RM2676020

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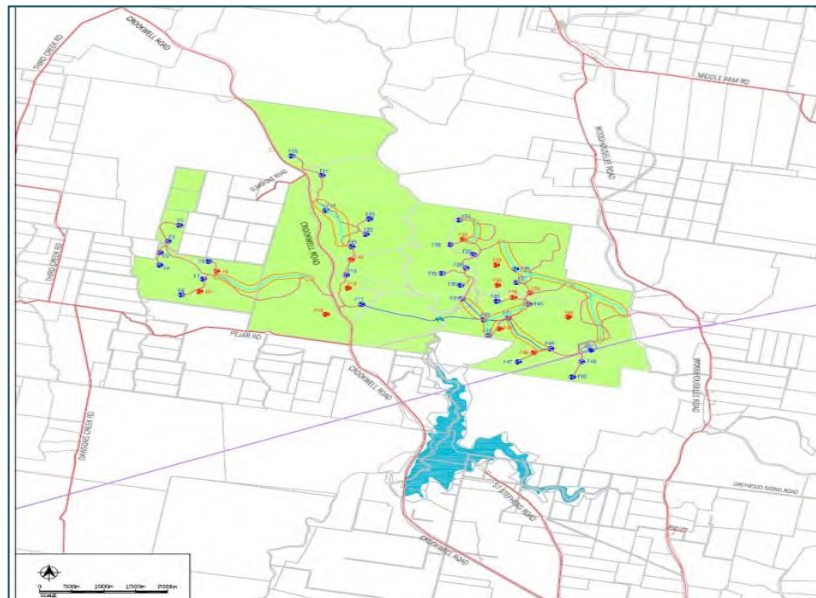
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APPENDIX D - PROJECT INFORMATION PACK

Project Information Pack for Aboriginal Cultural Heritage Consultation

CROOKWELL 2 WIND FARM – MODIFICATION-3



Prepared for Registered Aboriginal Parties



Abbreviations

AHIP	Aboriginal Heritage Impact Permit
AHMP	Aboriginal Heritage Management Plan
CDPL	Crookwell Development Pty Ltd
CHA	Cultural Heritage Assessment
DECCW	Department of Environment, Climate Change and Water (now OEH)
EP&A Act	NSW Environmental Planning and Assessment Act 1979
LALC	Local Aboriginal Land Council
LGA	Local Government Area
OEH	NSW Office of Environment and Heritage
RAPs	Registered Aboriginal Parties

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1 INTRODUCTION

Crookwell Development Pty Ltd (CDPL) is the owner of the Crookwell 2 Wind Farm project (the Project). The Project site is located within the NSW southern tablelands forming part of the Great Dividing Range, and is located entirely within the Upper Lachlan Shire Council LGA. The Project site is in close proximity to the existing operational Crookwell 1 Wind farm and is approximately:

- 17km south-east of Crookwell township
- 25km north-west of Goulburn
- 90km north-east of Canberra.

The Project's approved site boundary consists of approximately 2,088 Hectares of land situated along Goulburn-Crookwell Road, just north of Pejar Dam. The Project consists of a number of elements including:

- Up to 46 individual wind turbines;
- Internal unsealed (compacted gravel) tracks for turbine access;
- Crane hardstand platforms (compacted gravel) adjacent to each turbine tower; and
- An underground electrical and communication cable network linking turbines to each other and the proposed 33/330kV Crookwell switchyard and substation (terminal station) within the site boundary.

The Project has commenced following receipt of the Development Consent in 2005, and subsequent modification in 2009 (Mod-1), with the construction of a site compound (2009), three site access entrances and one intersection upgrade (2012-2013). CDPL has lodged a new modification application (Mod-2) with NSW Department of Planning and Environment to amend the current Mod-1 permit.

Under the Mod-2 application the number of turbines will be reduced to 33 and all existing approved access tracks and underground cabling remain unchanged. A further modification application (Mod-3) will be applied for later this year which removes a number of access tracks and modifies the placement of some access tracks and underground cabling for the access to the reduced number of turbines.

For the approvals of Mod-3 the following is required:

- A Cultural Heritage Assessment covering the area of the modified access tracks and underground cabling.
- An Aboriginal Heritage Management Plan – outlining the impacts and ongoing management of heritage sites.

For these requirements, consultation with the Aboriginal community will be undertaken.

Construction of the approved Project is planned to commence in March-April 2017.

Bowen Heritage Management (BHM) is assisting CDPL with consultation of the Aboriginal Community, development of the AHMP and the Aboriginal Cultural Heritage Assessment for the re-alignment of the access tracks and underground cabling. Consultation with the Aboriginal community will follow the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 guidelines (DECCW 2010). The purpose of the community consultation will be to assist the heritage team in assessing significance of any identified sites and appropriate management strategies.

This project information pack is provided to Registered Aboriginal Parties (RAPs) to inform them of the proposed development, the assessment process, timelines and define roles, functions and responsibility of each party.

1.1 PROJECT DETAILS

The Crookwell 2 Wind Farm is an approved State Significant Development under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Impacts to heritage sites has previously been approved under the original Development Consent in 2005 and Mod-1 in 2009, and also under the AHIPs granted by OEH for the development. Section 89J of the EP&A Act switches off the requirements for AHIPs, and impacts can occur when approval has been granted by the Department of Planning and Environment.

The consultation for the Project, AHMP and CHA will be developed in line with the requirements of the following codes and guidelines to Part 6 of the *National Parks and Wildlife Act 1974* provided by OEH:

- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010)
- Aboriginal Cultural Heritage Consultation requirements for Proponents 2010 (DECCW 2010)
- Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH 2011)

Aboriginal Heritage Management Plan (AHMP)

An AHMP will be developed based on the results of previous surveys, development footprint and current status of works. Management strategies will be developed to minimise impacts to heritage sites. Following development, a draft of this AHMP will be circulated to RAPs for their review and comments.

Cultural Heritage Assessment (CHA)

The archaeological assessment will consist of background research, mapping of known sites, development impacts and a Due Diligence field survey of the access tracks and underground cabling corridors. From this data management recommendations will be developed. RAPs will be asked to comment on the outcomes of the assessment, cultural significance of any identified sites, and the suitability of the management recommendations. RAPs will be selected for participation in the field survey at client's discretion.

1.2 CONSULTATION PROCESS

Consultation with RAPs will follow the process outlined in Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010).

1.2.1 Stage 1 – presentation of information about the project

This project information pack has been supplied to all RAPs on registration and is intended to provide RAPs with information on the scope of the project to determine their interest and if they hold cultural knowledge relevant to the Project.

1.2.2 Stage 2 – gathering information about cultural significance.

The aim of this stage is to provide RAPs an opportunity to:

- Provide cultural information on the project area
- Contribute to the development of culturally appropriate assessment methodology and
- Provide feedback on the development of Aboriginal Heritage Management recommendations.

A draft methodology pack detailing the proposed methodology will be sent to all RAPs with a 28 day review period to incorporate any comments. Any cultural information provided will be recorded in a consultation log and discussed in the report. If the information is regarded as sensitive, then recording will be undertaken in an appropriate manner and only provided to OEH. This information will not be detailed in the main report.

1.2.3 Stage 3 – Field Survey of Access Tracks

Alterations to the access tracks and underground cabling under Mod-3 has resulted in some sections of the access tracks and underground cabling not having previously surveyed. A field survey of these access tracks and underground cabling will be undertaken with the participation of the RAPs. Selection of field team members will be at the discretion of the proponent.

1.2.4 Stage 4 - Review of draft AHMP and CHA

Once the assessment has been completed the draft AHMP and CHA will be sent to all the RAPs for their review and comments. RAPs will have a period of 28 days to review the Drafts and provide comments. RAPs feedback and comments will be addressed in the Final versions, which will be submitted as part of the approvals process. The review period may be shortened if all responses have been received prior to the end date.

1.3 RESPONSIBILITIES AND ROLES

As part of the consultation process RAPs are expected to respond to requests for cultural information and comment on draft reporting. BHM will consult with the Aboriginal community by supplying project information and the opportunity for Aboriginal stakeholders to provide input in to the heritage management process.

1.4 TIMELINES

Table 1. Proposed timelines - these will vary depending on project outcomes.

Task	Timeline
Project Information pack	Provided on 18/01/2017
Methodology pack	Provided on 19/01/2017 – 28 day review ends 16/2/2017
Due Diligence Access Track Fieldwork (CHA)	Will be undertaken asap following review of methodology (20-21 February)
Draft AHMP	As soon as completed, a draft of the AHMP will be sent to all RAPs for their comments – 28 day review period applies
Draft CHA	Provided asap (27 February) – 28 day review end 27/3/2017
Final Reports	A copy of the final reports will be provided to RAPs for their records

** All timelines indicative only

Thank you for participating and registering for the Project. Your help is greatly appreciated.

Details of the RAPs for the project will be sent to OEH and the LALC as directed in the consultation guidelines. If you have requested for your details to be withheld only your organisations name will be supplied as required.

If you have any comments, questions or issues in regards to the Project please contact me on 0403 021296 or by email pasttraces@ozemail.com.au.

The methodology pack will be sent out shortly providing more details on each stage of the Project.

1.5 FIGURES

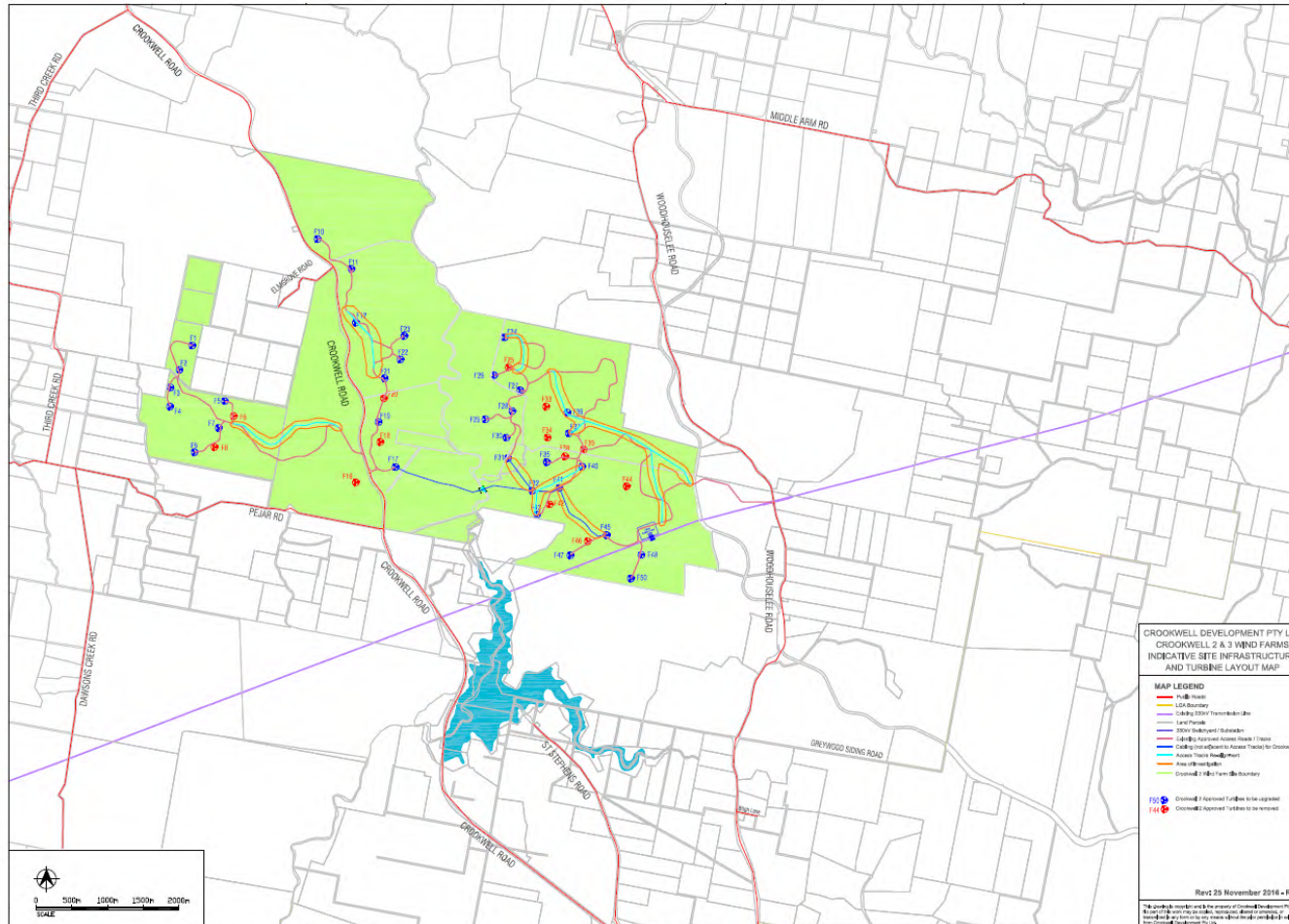


Figure 1 Turbine and Access Road locations

APPENDIX E – METHODOLOGY PACK

Methodology Pack for Aboriginal Cultural Heritage Assessment

CROOKWELL 2 WIND FARM MODIFICATION 3



Prepared for Registered Aboriginal Parties



1 INTRODUCTION

Crookwell Development Pty Ltd (CDPL) is the owner of the Crookwell 2 Wind Farm project (the Project). The Project site is located within the NSW southern tablelands forming part of the Great Dividing Range, and is located entirely within the Upper Lachlan Shire Council LGA. The Project site is in close proximity to the existing operational Crookwell 1 Wind farm and is approximately:

- 17km south-east of Crookwell township
- 25km north-west of Goulburn
- 90km north-east of Canberra.

The Project's approved site boundary consists of approximately 2,088 Hectares of land situated along Goulburn-Crookwell Road, just north of Pejar Dam. The Project consists of a number of elements including:

- Up to 46 individual wind turbines;
- Internal unsealed (compacted gravel) tracks for turbine access;
- Crane hardstand platforms (compacted gravel) adjacent to each turbine tower; and
- An underground electrical and communication cable network linking turbines to each other and the proposed 33/330kV Crookwell switchyard and substation (terminal station) within the site boundary.

The Project has commenced following receipt of the Development Consent in 2005 (DA 176-8-2004i), and subsequent modification in 2009 (Mod-1), with the construction of a site compound (2009), three site access entrances and one intersection upgrade (2012-2013). CDPL has lodged a new modification application (Mod-2) with NSW Department of Planning and Environment to amend the current Mod-1 permit.

Under the Mod-2 application the number of turbines will be reduced to 33 and all existing approved access tracks and underground cabling remain unchanged. A further modification application (Mod-3) will be applied for later this year. This modification removes a number of access tracks and modifies the location of other tracks and underground cabling for access to the reduced number of turbines.

For the approvals of Mod-3 the following is required:

- A Cultural Heritage Assessment covering the area of the modified access tracks and underground cabling.
- An Aboriginal Heritage Management Plan – outlining the impacts and ongoing management of heritage sites.

For these requirements, consultation with the Aboriginal community will be undertaken.

Construction of the approved Project is planned to commence in March-April 2017.

Bowen Heritage Management (BHM) is assisting CDPL with consultation of the Aboriginal Community, development of the AHMP and the Aboriginal Cultural Heritage Assessment for the re-alignment of the access tracks and underground cabling. Consultation with the Aboriginal community will follow the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* guidelines (DECCW 2010). The purpose of the community consultation will be to assist the heritage team in assessing the significance of any identified sites and appropriate management strategies.

1.1 PROJECT DETAILS

The Crookwell 2 Wind Farm is an approved State Significant Development under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Impacts to heritage sites has previously been approved under the original Development Consent in 2005 and Mod-1 in 2009, and also under the AHIPs granted by OEH for the development. Section 89J of the EP&A Act switches off the requirements for AHIPs, and impacts can occur when approval has been granted by the Department of Planning and Environment.

The consultation for the Project, AHMP and CHA will be developed in line with the requirements of the following codes and guidelines to Part 6 of the *National Parks and Wildlife Act 1974* provided by OEH:

- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010)
- Aboriginal Cultural Heritage Consultation requirements for Proponents 2010 (DECCW 2010)
- Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH 2011)

Aboriginal Heritage Management Plan (AHMP)

An AHMP will be developed based on the results of previous surveys, development footprint and current status of works. Management strategies will be developed to minimise impacts to heritage sites. Following development, a draft of this AHMP will be circulated to the Registered Aboriginal Parties (RAPs) for their review and comments.

Cultural Heritage Assessment (CHA)

The archaeological assessment will consist of background research, mapping of known sites, development impacts and a Due Diligence field survey of the access tracks and underground cabling corridors. From this data management recommendations will be developed. RAPs will be asked to comment on the outcomes of the assessment, cultural significance of any identified sites, and the suitability of the management recommendations. Field survey will be undertaken with the participation of the Pejar LALC and the heritage team.

1.2 CONSULTATION PROCESS

Consultation with RAPs will follow the process outlined in *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010).

1.2.1 Stage 1 – presentation of information about the project

This project information pack has been supplied to all RAPs on registration and is intended to provide RAPs with information on the scope of the project to determine their interest and if they hold cultural knowledge relevant to the Project.

1.2.2 Stage 2 – gathering information about cultural significance

The aim of this stage of the project is to provide RAPs an opportunity to:

- Provide cultural information on the project area
- Contribute to the development of culturally appropriate assessment methodology and
- Provide feedback on the development of Aboriginal Heritage Management recommendations.

This document details the proposed methodology and will be sent to all RAPs. RAPs then have a 28 day review period to make any comments. Any cultural information provided will be recorded in a consultation log and discussed in the report. If the information is regarded as sensitive, then recording will be undertaken in an appropriate manner and only provided to OEH. This information will not be detailed in the main report.

1.2.3 Stage 3 – Field Survey of Access Tracks

Alterations to the access tracks and underground cabling under Mod-3 has resulted in some sections of the access tracks and underground cabling not having previously surveyed. A field survey of these access tracks and underground cabling will be undertaken. Selection of field team members will be at the discretion of the proponent, but at this time it is proposed that the field survey be conducted by the archaeological field team and the Pejar LALC, based on their participation in previous surveys and their knowledge of the development and registered sites.

1.2.4 Stage 4 - Review of draft AHMP and CHA

Once the assessment has been completed the draft AHMP and CHA will be sent to all the RAPs for their review and comments. RAPs will have a period of 28 days to review the Drafts and provide comments. RAPs feedback and comments will be addressed in the Final versions of the reports, which will be submitted as part of the approval process. The review period may be shortened if all responses have been received prior to the review end date.

1.3 ARCHAEOLOGICAL CONTEXT

Numerous archaeological studies have been undertaken for the Crookwell 2 Wind Farm. These studies included, field surveys, sub surface testing, salvage excavations and monitoring of initial impacts. These studies indicate that larger sites could be located in the vicinity of water bodies, such as creek line frontages or along spur lines and crests.

Past studies over the project area have resulted in the identification of numerous sites within the project area (Biosis 2004 and 2005) a proportion of which will be impacted by the proposed development. Approvals for impacting these sites have been granted under DA176-8-2004i. The location of these sites is shown in Figure 2.

Mod-3 involves the relocation of a number of access tracks and underground cabling. These areas will be subject to a field survey and are shown in Figure 3. Mod-3 is the subject of this CHA.

The results of previous studies will be summarised and discussed in the CHA along with an overview of the regional and local archaeological context. The site prediction model which applies for Mod-3 is provided in Table 1. This site prediction model is based on:

- Site distribution in relation to landscape features within the project area
- Consideration of site type and densities likely to be present within the project area
- Potential Aboriginal use of natural resources present or once present within the project area
- Consideration of the proximity of heritage sites in the region.

Table 1. Site Prediction Model

Site Type	Definition	Potential to occur
Isolated finds and surface scatters of stone artefacts	Artefact sites can range from high density concentrations to sparse, low density 'background' scatters and single finds.	High – small scatters and isolated finds have been previously recorded within the project area.
Rock Engravings	Motifs scratched or painted onto rock surfaces, usually within a rock shelter or overhang.	Nil: No such rock features are present.
Stone arrangements	Stone arrangements can include circles, lines and other patterns and usually mark ceremonial areas.	Nil: No features present.
Stone quarries/Ochre sources	Raw materials for lithic artefacts and ochre are gathered from these sites.	Nil: There are no known ochre or stone quarries identified by previous studies.
Potential Archaeological Deposits (PADS)	Sub surface deposit of cultural material.	Moderate the majority of the project area has been subject to assessment and the remaining land forms are not considered to hold high potential for sites.
Scarred Trees	Trees with cultural modifications over 150 year old.	Low: Remnant trees remain within the project area, but the majority are too young to be considered.
Axe grinding grooves	Grooves in stone platforms created through grinding of stone implements such as axe heads.	Nil: no stone platforms occur within the project area.
Burials	Burials of Aboriginal persons.	Nil: no deep sand deposits or soil types are present within the project area to indicate the potential for burials to occur.
Aboriginal places	Aboriginal places may not have any archaeological remains present, but are important to Aboriginal people due to their cultural, spiritual or historical associations.	Extremely Low: There are no recorded associations for the project area.

1.4 CHA ASSESSMENT PROCESS

1.4.1 Field Survey

Field survey over the project area is planned to be undertaken by the heritage field team and the Pejar LALC. Results of the field survey will be reported in the CHA and RAPs will be asked to confirm the significance values and appropriate management strategies for these sites as part of the review process of the Draft CHA.

1.4.2 Aboriginal Cultural Heritage Assessment Report

The main aims of the report will be to assess potential impacts to Aboriginal cultural heritage sites resulting from the proposed development and to develop strategies to manage the impacts. Reporting will follow the guidelines of NSW OEH, in particular the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010b).

The report will contain:

- Aboriginal Consultation Process
- Aboriginal Archaeological Context
- Field survey results
- Site significance Assessment and Impact Assessment
- Management strategies, which may include recommendation of AHIP application
- Maps

The RAPs will be provided with a draft of the reports and invited to provide comments. Any comments will be documented in the final report.

1.5 ABORIGINAL HERITAGE MANAGEMENT PLAN

A draft Aboriginal Heritage Management Plan (AHMP) will be developed for Mod-3. This draft will be circulated to RAPs for their review following the end of the registration period. The final AHMP will replace / integrate into the existing approved Crookwell 2 Wind Farm management plans.

Following completion of the Mod-3 CHA, results of the CHA will be incorporated into the AHMP and an updated AHMP submitted to RAPs for their review and comments.

1.6 TIMELINES

Table 1. Proposed timelines - these will vary depending on project outcomes.

Task	Timeline
Project Information pack	Provided on 18/01/2017
Methodology pack	Provided on 25/01/2017 – 28 day review ends 22/2/2017

Task	Timeline
Due Diligence Access Track Fieldwork (CHA)	Will be undertaken asap following review of methodology (22 February)
Draft AHMP	As soon as completed, a draft of the AHMP will be sent to all RAPs for their comments – 28 day review period applies
Draft CHA	Provided asap (27 February) – 28 day review end 27/3/2017
Final Reports	A copy of the final reports will be provided to RAPs for their records

All timelines indicative only

Thank you for your assistance. If you have any comments, questions or issues in regards to the project please contact me on 0403 021296 or by email pasttraces@ozemail.com.au.

Regards ‘



Lyn O'Brien

Director

Past Traces Pty Ltd

1.7 FIGURES

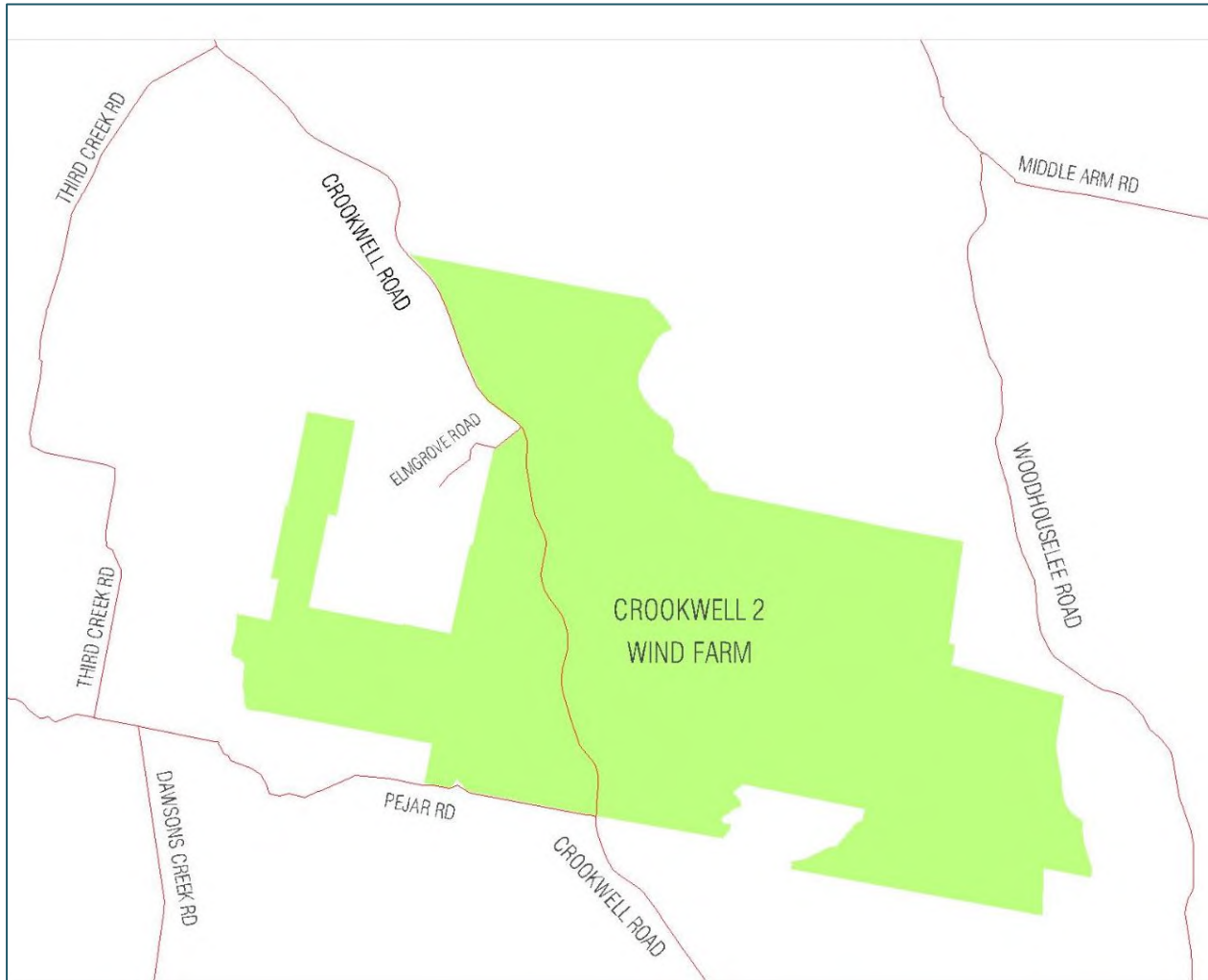


Figure 1 Project Location.

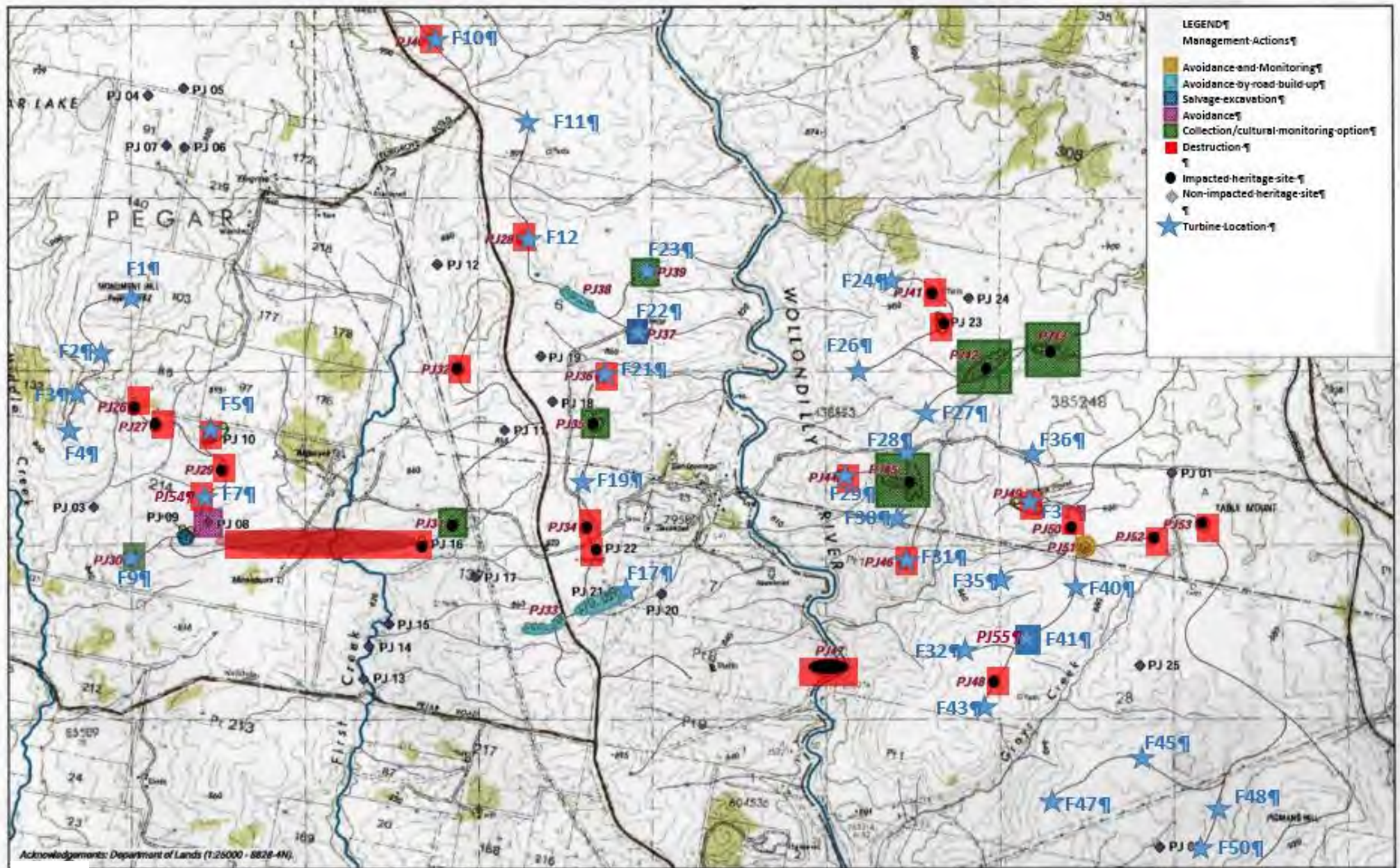


Figure 2 Overview-of-heritage-sites-and-impacts

Acknowledgments: Biosis-Research-2011-Figure-9-(Base-map)

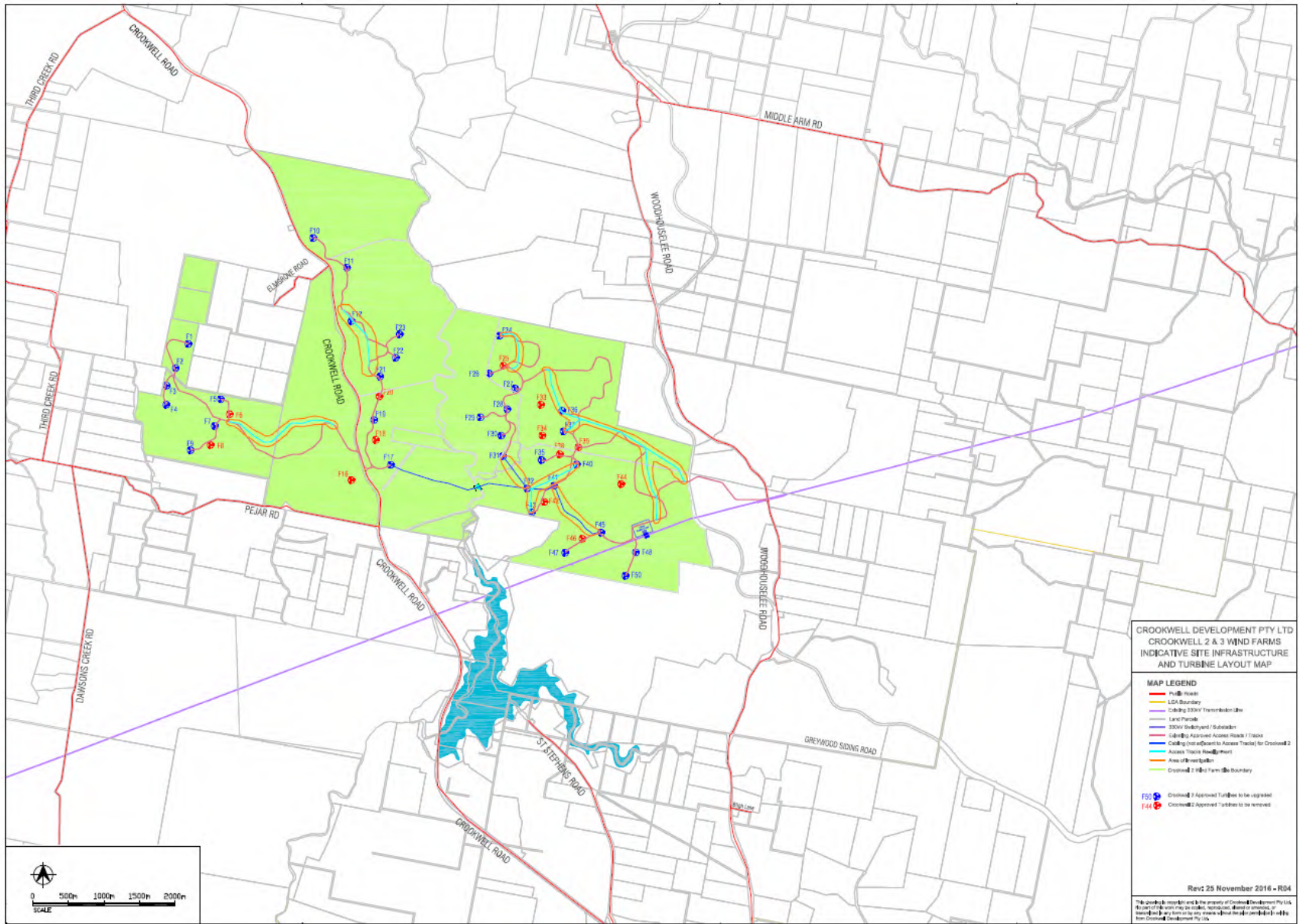


Figure 3 – Modification 3 layout of access roads and turbines

APPENDIX F - ARCHAEOLOGICAL REPORT

ABORIGINAL HERITAGE ARCHAEOLOGICAL REPORT FOR CROOKWELL 2 WIND FARM MODIFICATION 2

By: Lyn O'Brien

26 May 2017

Prepared for the proponent: Crookwell Development Pty Ltd
LGA: Upper Lachlan Shire Council



Bowen Heritage Management
ABN: 93697530366



P.O. Box 793, Jamison Centre, ACT, 2614
Tel: (02) 62517994
Mob: 0418210755

Document Verification

Crookwell 2 Wind Farm Modification 2

Project Number: 20171012

Project File Name: Crookwell 2 Wind Farm Modification to DA

Revision	Date	Prepared by (name)	Reviewed by (name)	Approved by
Draft	26/4/2017	Lyn O'Brien	Alister Bowen	<i>Alister M. Bowen</i>
Final	24/5/2017	Lyn O'Brien		

Bowen Heritage Management

This document is and shall remain the property of Bowen Heritage Management. The document may only be used for the purposes for which it was commissioned. Unauthorised use of this document in any form whatsoever is prohibited.

Disclaimer:

Bowen Heritage Management has completed this assessment in accordance with the relevant federal, state and local Legislation. Bowen Heritage Management accepts no liability for any damages or loss incurred as a result of reliance placed upon the report content or for any purpose other than that for which it was intended.

ACKNOWLEDGEMENTS

BHM acknowledges the assistance of the following people and organisations in the preparation of this report:

- Crookwell Development Pty Ltd
- Pejar Local Aboriginal Land Council
- Capital Ecology – GIS Services and Figure production

ABBREVIATIONS

ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AR	Archaeological Report
DECCW	NSW Department of Environment, Climate Change and Water now OEH
DP	Deposited Plan
GPS	Global Positioning System
GSV	Ground Surface Visibility
LALC	Local Aboriginal Land Council
MGA	Map Grid of Australia
MW	Mega Watt
OEH	NSW Office of Environment and Heritage
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party
SSD	State Significant Development
SU	Survey Unit

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EXECUTIVE SUMMARY

Bowen Heritage Management Pty Ltd (BHM) has been commissioned by Crookwell Development Pty Ltd (CDPL) (the Proponent) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR). The report assesses the implications for Aboriginal cultural heritage associated with modifications to the approved Crookwell 2 Wind Farm development. The Crookwell 2 Wind Farm project is located on Crookwell Road, approximately 14 km south-east of Crookwell, 30 km north-west of Goulburn in New South Wales and covers an area of approximately 2,088 hectares (5,160 acres) (the study area).

The Crookwell 2 Wind Farm project received its original Development Consent (DA-176-8-2004-i) on 10 June 2005 for 46 wind turbines and associated infrastructure. The development consent was modified in 2009 (Mod-1) to change the size of the turbines and relocate 20 of 46 turbine locations and associated access tracks. The Proponent is now seeking a modification (Mod-2) to remove 14 of the 46 turbine locations and re-align sections of access road and electrical cabling. For this Mod 2 alteration, recorded sites near approved turbines and access roads are required to be re-assessed and a current condition assessment completed. Re-aligned sections of access roads required survey and assessment to determine impacts.

The original development and Mod-1 were approved under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act), and the Mod-2 application will be assessed in accordance with section 75W of the EP&A Act. Provision 75W allows existing consents granted by the Minister to be modified.

Consultation with the Aboriginal community has been undertaken in accordance with the *Consultation Guidelines for Proponents NSW* (DECCW 2010a). The field survey was completed in March 2017 in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). The consultation log for the project is attached in the ACHAR. This Archaeological Report (AR) has been forwarded for the Registered Aboriginal Parties (RAPs) for the project to review, the results of which are contained in the ACHAR report.

The field survey results show that 20 of the 55 previously recorded sites will be impacted by the proposed modification. All of the works in the vicinity of the AHIMS sites are approved currently under the Modification 1 approval. Mod-2 results in a significant reduction in impacts from the original layout. Three additional sites were identified along the access road which runs west from Woodhouselee Road of which one will be impacted by the project. Nine new heritage sites were recorded as a result of the field survey, none of which will be impacted. A total of 21 heritage sites will be impacted overall for the total construction of Mod-2.

To mitigate impacts the following management recommendations have been developed:

- No impacts can occur to any of the recorded heritage sites until an AHIP has been approved by the NSW OEH. This should be under the Mod-1 approvals whilst awaiting confirmation of approval of Mod-2.
- Impacts to the identified heritage sites should be avoided if possible. Where possible in the road and cable alignments design should be undertaken to avoid impacts to identified heritage sites.
- Surface site at PJ38 should be collected prior to works commencing and an updated Site Impact Recording Card submitted to OEH.
- Detailed recording of site PJ56, PJ60 and PJ61 should be undertaken.

- If following review of the wind farm design, impacts will occur to Aboriginal heritage sites, then an AHIP must be applied for prior to undertaking the works. This AHIP should cover the following management and mitigation actions.
 - Surface sites along the road alignments will be impacted. This cannot be mitigated by collection of surface sites along the road access alignments as no artefacts were located during the 2017 site visits. This affects two sites PJ10 and PJ29.
 - Impacts to the small subsurface sites along the turbine and road alignments is unavoidable due to their highly dispersed nature. Impacts have been previously mitigated at these sites by subsurface testing and collection of recovered artefacts. These sites cannot be salvaged by further excavation and an AHIP should be sought to cover their impacts. The affected sites are PJ28, PJ36, PJ40, PJ41, PJ44, PJ46, PJ50, PJ52, PJ53 and PJ54.
 - Impacts to the medium sized subsurface sites along the turbine and road alignments is unavoidable due to their dispersed nature throughout landforms. Impacts have been previously mitigated at these sites by subsurface testing. These sites cannot be salvaged by further excavation and an AHIP should be sought to cover their impacts. Cultural monitoring of topsoil removal is requested by RAPs with collection of any recovered artefacts. If high density concentrations are identified, then work will cease and OEH contacted for guidance. The Unanticipated Finds Protocol in the AHMP will be followed. The affected sites are PJ35, PJ39, PJ42, PJ45 and PJ49.
 - Mitigation of impacts at high significance subsurface sites PJ21, PJ38 and PJ51. Subsurface soils cannot be impacted and an AHIP applied for to allow the road surface to be built up over the areas of PAD in these locations. PAD areas must not be impacted. This applies to sites PJ21, PJ38 and PJ51.
 - Site PJ56 requires detailed recording and subsurface testing under the Code of Practice. This has been completed and the review period for this site is underway prior to an application for a separate AHIP. No impacts can occur to this site until this time. The site should be fenced to avoid impacts from construction.
- Impacts should be avoided to all other recorded heritage sites. If at risk of impact by construction traffic these sites should be fenced to ensure their protection. If impacts cannot be avoided by road placement, then mitigation measures consisting of surface collection of artefacts, subsurface testing or salvage should be undertaken following approval of an AHIP.
- Salvaged artefacts should be deposited with the Pejar LALC for curation. A care and control application is currently in place for the long term curation of these artefacts.
- All Aboriginal objects are protected under the NSW National Parks and Wildlife Act 1974. It is an offence to disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage. Should any Aboriginal

objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.

- In the unlikely event that human remains are discovered during the construction, all work must cease. OEH, the local police and the appropriate LALC should be notified. Further assessment would be undertaken to determine if the remains are Aboriginal or non-Aboriginal.
- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs for the project and may include further field survey.
- Continued consultation with the RAPs for the project should be undertaken. RAPs should be informed of any major changes in project design or scope, further investigations or finds.
- No further investigations are required should the AHIP be approved, except in the event that unanticipated Aboriginal Objects and/or human remains are unearthed during any phase of the Project. In these events the Unanticipated finds protocol in the Aboriginal Heritage Management Plan should be followed.
- A copy of this report and the completed AHIP application should be provided to OEH for approval and each of the RAPs for the project for their information.

1 INTRODUCTION

1.1 PROJECT BRIEF

Bowen Heritage Management Pty Ltd (BHM) has been commissioned by Crookwell Development Pty Ltd (CDPL) (the Proponent) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) to assess the implications for Aboriginal cultural heritage associated with modifications to the approved Crookwell 2 Wind Farm development. The Crookwell 2 Wind Farm project is located on Crookwell Road, approximately 14 km south-east of Crookwell, 30 km north-west of Goulburn in New South Wales and covers an area of approximately 2,088 hectares (5,160 acres) (the study area). The study area in a regional context is shown in Figure 1, with the local study area boundaries shown in Figure 2.

The Crookwell 2 Wind Farm project received its original Development Consent (DA-176-8-2004-i) on 10 June 2005 for 46 wind turbines and associated infrastructure. The development consent was modified in 2009 (Mod-1) to change the size of the turbines and relocate 20 of 46 turbine locations and associated access tracks. The Proponent is now seeking a modification (Mod-2) to remove 14 of the 46 turbine locations and realign sections of access road and electrical cabling. For the Mod 2 application, recorded Aboriginal sites near the approved turbines and access roads are required to be re-assessed and current condition assessments completed. Re-aligned sections of access roads required field survey and assessment of impacts.

The original development and Mod-1 were approved under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Mod-2 application will be assessed in accordance with section 75W of the EP&A Act. Provision 75W allows existing consents granted by the Minister to be modified.

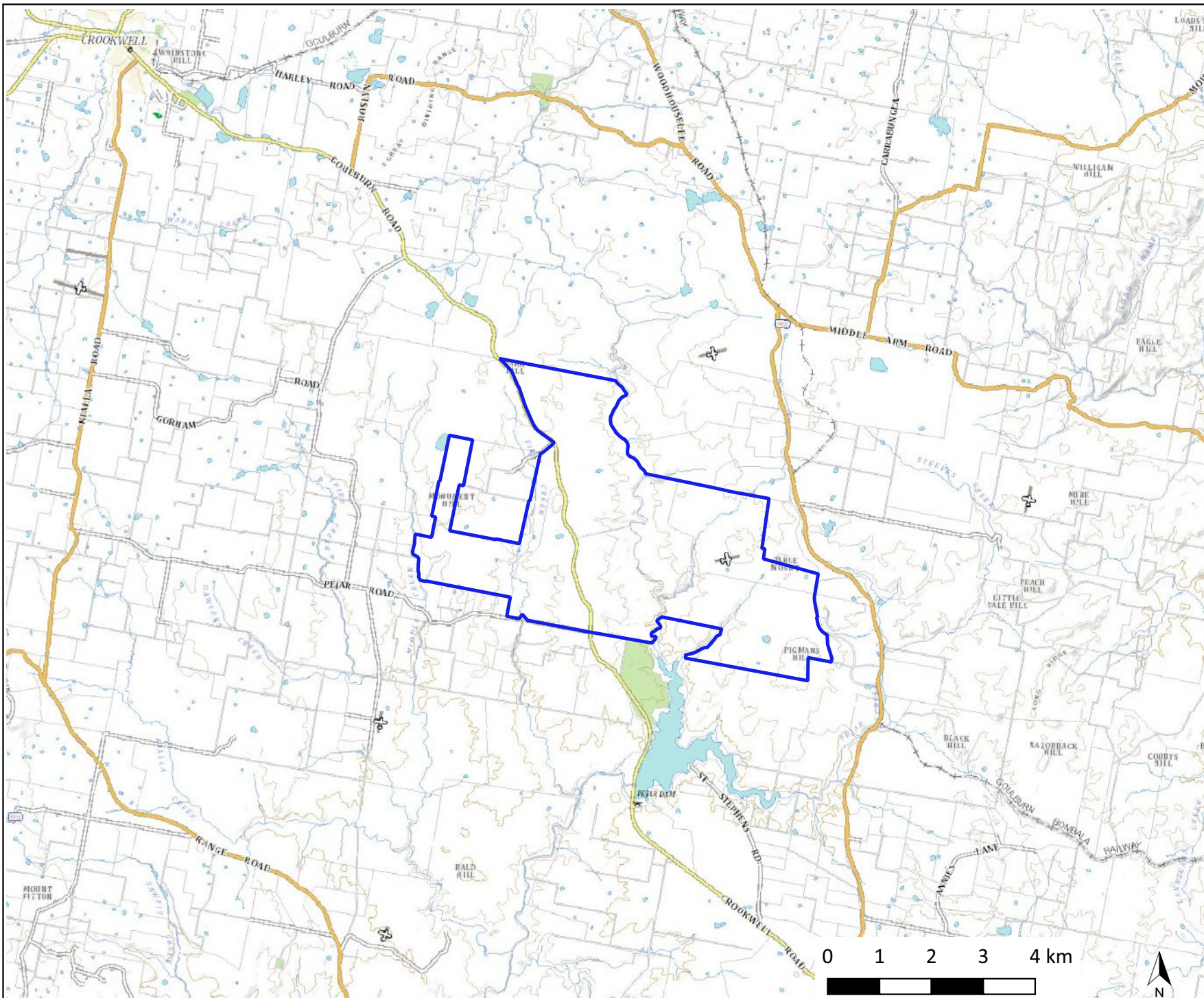
The aim of this assessment is to inform Crookwell Development of their responsibilities in regards to Aboriginal cultural heritage sites that exist within the study area and allow for design to minimise or avoid impacts. The report will provide supporting documentation if an AHIP is required. This Archaeological Report (AR) details the archaeological investigation and assessment undertaken for the project, whilst the consultation process with the Aboriginal community is detailed in the main ACHAR. This AR will be appended to the main ACHAR for the project.

Reporting will follow the guidelines of NSW OEH, in particular the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a), and consultation with the Aboriginal community will follow the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). The purpose of the community consultation will be to assist the heritage team in assessing significance of any identified sites, appropriate management strategies and if required to assist OEH in determination of an AHIP application.

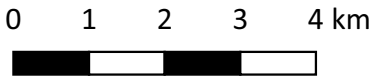
Figure 1. Location of study area in regional context

Legend

— Site Boundary - Crookwell 2



Acknowledgement: Basemap (c) NSW LPI 2017



Scale 1:100,000 @ A4, GDA 1994, MGA Zone 55

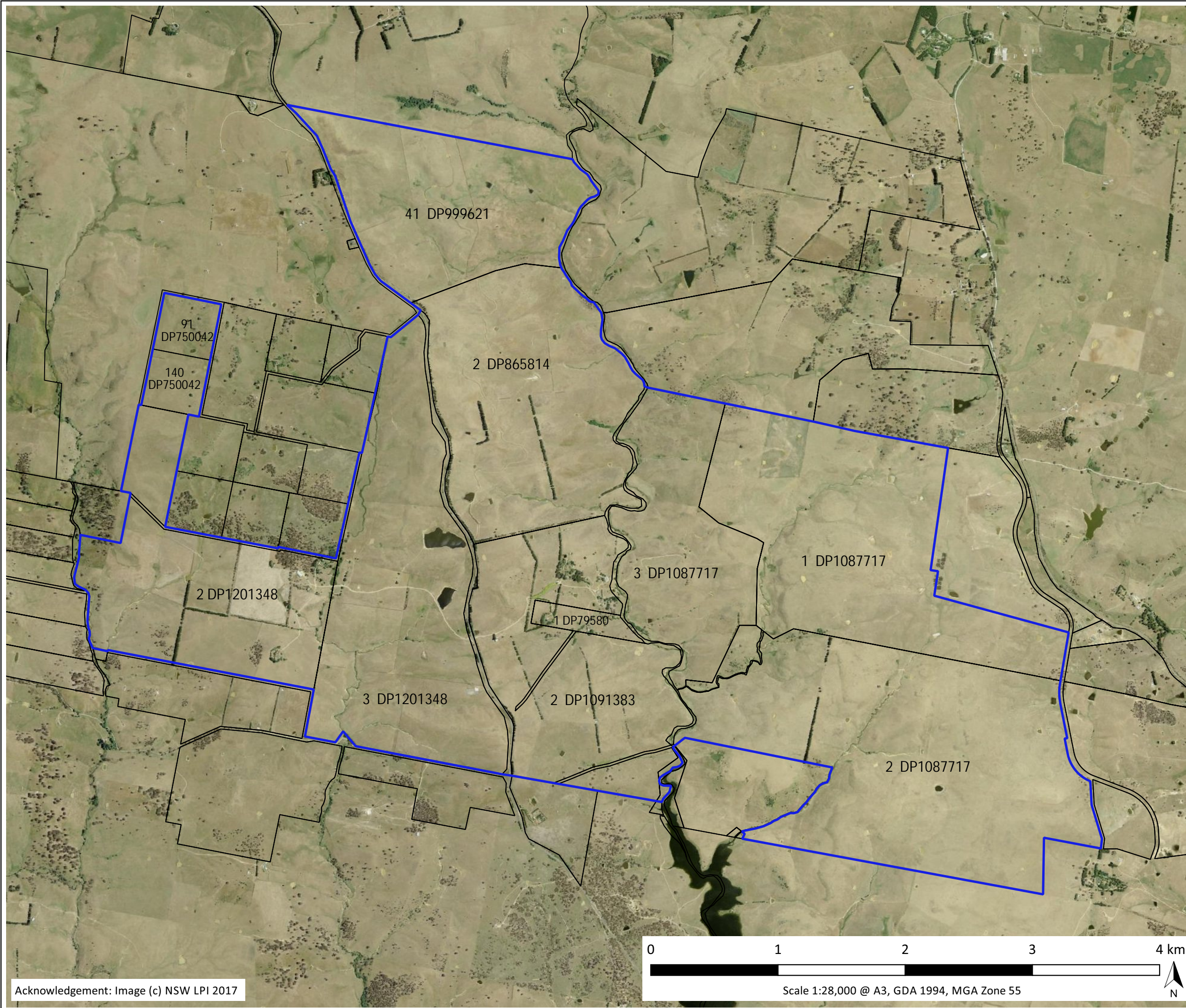
Capital Ecology Project No: 2740
Drawn by: R. Speirs
Date: 26 April 2017



Figure 2. Study area boundaries

Legend

- Lot Boundaries
- Site Boundary - Crookwell 2



Acknowledgement: Image (c) NSW LPI 2017

Scale 1:28,000 @ A3, GDA 1994, MGA Zone 55

Capital Ecology Project No: 2740
Drawn by: R. Speirs
Date: 26 April 2017



1.2 RESTRICTED AND CONFIDENTIAL INFORMATION

Information in this report is restricted due to cultural sensitivities. Appendix 1 in the AR contains information which is confidential and not to be made public. This is clearly marked on the title page for the Appendix.

Any figures within the report which show the location of heritage sites is restricted and not to be made available to the general public. Map grid references detailing the location of each site is also not to be made public.

1.3 ASSESSMENT OBJECTIVES

The following is a summary of the major objectives of this assessment:

- Identify and consult with Registered Aboriginal Stakeholders (RAPs);
- Conduct additional background research in order to recognise any identifiable trends in site distribution and location;
- Search statutory and non-statutory registers and planning instruments to identify listed Aboriginal cultural heritage sites within the study area;
- Summarise past Aboriginal occupation in the locality of the study area using the archaeological record to broadly predict the types and locations of Aboriginal sites likely to exist within the study area;
- Conduct a field survey of the study area to locate unrecorded or previously recorded Aboriginal sites and to further assess the archaeological potential;
- Assess the significance of any known Aboriginal sites in consultation with the Aboriginal community;
- Identify the impacts of the proposed development on any known Aboriginal sites or potential archaeological deposits (PADs) within the study area; and
- Develop strategies for the management of Aboriginal cultural heritage within the context of the proposed development.

1.4 INVESTIGATORS AND CONTRIBUTORS

1.4.1 Dr Alister Bowen - Quality Management, Peer review

Dr Alister Bowen is the Managing Director of Bowen Heritage Management. He has been consulting in the heritage industry for over 18 years and operating as a registered company since 2005. He completed an Honours degree in archaeology in 1999 at the Australian National University and a PhD in archaeology in 2007 at La Trobe University. With over 18 years' experience in the industry, Alister has established himself as a specialist in historical and pre-historical Australian archaeology. A background in the Trades has equipped Alister with strong practical experience to complement his academic and analytical skills, all essential requirements for good archaeology. Alister has undertaken a wide range of historical and pre-historical archaeological projects in Queensland, South Australia, Victoria, the Australian Capital Territory

and New South Wales and is proficient in Aboriginal and European archaeological project research, survey work, site recording, site assessments, subsurface test excavation, archaeological excavation, artefact analysis, graphics and report writing. His current research interests include appropriate management procedures for historical and pre-historical archaeological sites, issues of site and artefact conservation and the archaeology of culture contact.

1.4.2 Lyn O'Brien – Aboriginal Consultation, Field survey, Report Preparation

Lyn works for Bowen Heritage Management on a sub-contract basis. With over 15 years' experience in the heritage profession, Lyn O'Brien has developed effective solutions to heritage issues that ensure successful outcomes for each project she works on. Since completing her BA (Hons) in Archaeology at the Australian National University (ANU) in 1996, Lyn has held a variety of consulting positions, from field assistant through to regional manager/senior archaeologist, accumulating skills and experience in field techniques, project management and liaison, negotiation and consultation. As a senior archaeologist Lyn has extensive experience managing major and small scale projects, conducting numerous field surveys and excavations and authoring reports across both Aboriginal and Historical archaeology

1.4.3 Tom Knight - Field survey, site interpretation

Tom works for Bowen Heritage Management on a sub-contract basis. He has been working full-time as an archaeologist since 1992 and has conducted archaeological projects throughout New South Wales, ACT, Victoria, arid South Australia, Northern Territory, Western Australia and Peru. He has been the leading archaeologist on over 190 projects and authored over 80 Cultural Heritage Management reports. Tom's areas of expertise include all aspects of Australian Aboriginal and European archaeology. He has extensive experience in archaeological field survey work, excavation (manual and mechanical, wet and dry sieving), landscape interpretation, identifying areas of archaeological potential, and site mapping. As well this extensive field experience, Tom has taught advanced archaeology Units at University level. Tom is comfortable working alone, with Aboriginal representatives, within a team, or managing a team. He has outstanding archaeological surveying skills, is capable of working in challenging and/or remote terrain, and in all weather conditions. Tom's reports are of an excellent professional and academic standard and he is comfortable and experienced in working with Australian Aboriginal individuals and groups.

1.5 DEVELOPMENT PROPOSAL

The Modification 2 (Mod-2) proposal will comprise a number of elements, including:

- 32 turbine locations standing up to 160 metres at top of blade tip with up to 3.45 Mega Watt (MW) capacity each;
- Internal unsealed (compacted gravel) tracks for turbine access;
- Crane hardstand platforms (compacted gravel), adjacent to each turbine tower measuring 35 x 57m. This hardstand will be located in the previously assessed position with a 50m micro-siting boundary;
- Potential upgrades to existing local road infrastructure;

- An underground electrical and communication cable network linking turbines and the proposed 33/330kV Crookwell switchyard and substation [terminal station] within the site boundary. However, this facility will be built, owned, operated and maintained by TransGrid;
- A wind farm 33kV switchboard and the control room and facilities building will be collocated within the substation area;
- Access to the Crookwell 2 Wind Farm site will be via 3 different access points, 2 will be via the Goulburn-Crookwell road and 1 will be via Woodhouselee road);
- The TransGrid Gullen Range - Bannaby 330kV Transmission Line passes through the site. The Crookwell 2 Grid connection will be achieved by connecting directly to this transmission line through the proposed 33/330kV Terminal Station via underground 33kV reticulation network; and

All of the turbine locations and access roads for the original layout have been previously subject to detailed archaeological investigation (Biosis 2004, 2005, 2008 and 2011) and have been approved and granted Aboriginal heritage impact permits (AHIPS) for the heritage sites impacted by the development. Due to the lapse in time since these approvals, a new AHIP must now be applied for prior to construction occurring in the vicinity of the heritage sites in accordance with Development approval. To assess this AHIP application the NSW Office of Environment and Heritage (OEH) will require a heritage report on the sites, including their current condition, assessment of degree of disturbance since recording and updated significance assessments. Figure 3 shows the approved turbine and access road locations under Modification 1 and the turbines and sections of road to be removed under Modification 2. The turbines to be removed are F6, F8, F9, F16, F18, F20, F25, F33, F34, F38, F39, F42, F44 and F46. This reduces impact in fourteen locations and the associated impacts to recorded heritage sites (Section 2.3).

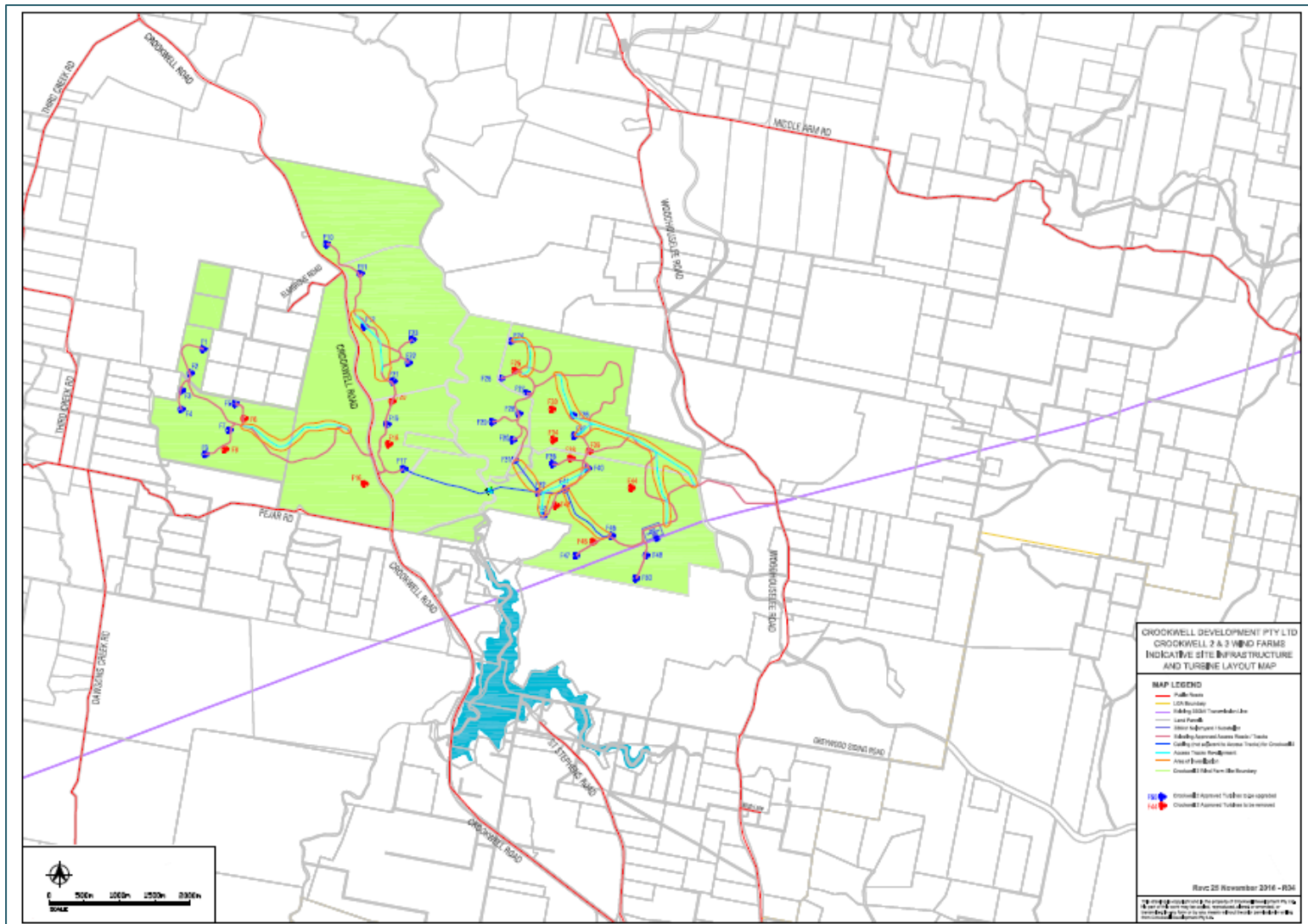


Figure 3. Turbine locations showing Mod-2 removals.

2 ABORIGINAL ARCHAEOLOGICAL CONTEXT

A desktop assessment has been undertaken to review existing archaeological studies in the study area, and the wider Goulburn/Crookwell region. This information has been synthesised to develop an Aboriginal site prediction model for the study area and identify known Aboriginal sites and/or places recorded in the study area. This review has been prepared in accordance with requirements 1 to 4 of the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).

2.1 PREVIOUS ARCHAEOLOGICAL WORK

A large number of cultural heritage surveys and subsurface excavations have been conducted throughout the Goulburn/Crookwell region of New South Wales in the past 30 years. There has been an increasing focus on cultural heritage assessments in NSW due to ever increasing developments, legislative requirements and a greater level of cultural awareness for Aboriginal cultural heritage. This allows for the development of regional settlement models; landscape usage; the use of resources; group movements; and site locations for the Goulburn/Crookwell Region.

The study area is located along Goulburn Road, approximately 30mins drive from Goulburn and 14min from Crookwell.

2.1.1 Goulburn Regional Overview

The Study area is located in the Goulburn Plains within the Southern Tablelands. Regional models of Aboriginal landscape and resource use, along with models of intensity of utilization and number of Aboriginal occupants have been developed for the Goulburn region (Koettig and Lance 1986, Fuller 1989). Due to the large number of surveys completed for the region, the most relevant work for the wider Goulburn region is summarized below.

Koettig and Lance (1986) undertook an Aboriginal Resources Planning Study for the City of Goulburn. Based on the available data they developed an Aboriginal site location model for the area. Four landscape zones based on topography (major watercourse, undulating hills and plains, hills and residential areas) were assigned archaeological sensitivity ratings. A review of previously identified sites within the Goulburn region found stone artefact scatters were the dominant site class within undulating hills and plain zones. The majority of the sites were located on basal slopes close to major waterways. Under this system the current Study area would be classified as Zone 1, 2 - undulating hills and plains and 3 - Hillslopes both containing high to moderate potential.

Fuller (1989) was engaged by Goulburn City Council to test Lance and Koettig's 1986 model by undertaking subsurface testing at areas designated as having a high sensitivity by the model. The results of the excavation program, although supporting the overall model, concluded that all areas apart from major watercourses were of low potential and that further subdivisions were necessary in the undulating hills category if the model it was to be useful for predicting site locations. Fuller's refined model is shown in Table 1. Under this system, the majority of the current study area would be classified as holding low potential for archaeological sites.

Table 1: Fullers 1989 Site Distribution Model

Zone	Landform	Sensitivity	Significance
1	Major Watercourses	High	High
2a	Lower slopes adjacent to major watercourses	High	Moderate
2b	Gently undulating land, or plains	Low	Low
2c	Hills - Low (<700 metres AGD)	Medium	Low
2d	Hills - Moderate (700-750 metres AGD)	Low	Low
2e	Hills - High (>750 metres AGD)	Low	High
3	Hill Tops	Low	High
4	Built up areas	Medium	Low

Fuller's 'sensitivity' refers to the likelihood of a site occurring, and 'significance' refers to the importance of the site when identified.

Stuart (1995) completed an assessment for a proposed effluent irrigation area to the east of Goulburn, located on low slopes near the Wollondilly River. The Wollondilly River runs through the centre of the study area. Despite the time since its formulation the model developed by Fuller in 1989 was found to be applicable and the area was classified as Zone 1 under Fullers scheme as holding high potential. However, only two small artefact scatters and 2 isolated finds all holding low significance were identified during the assessment by Stuart.

Navin Officer Heritage Consultants (2000) conducted an archaeological assessment for the raising of the Sooley Dam 5.5 kms west of Goulburn. The survey covered the gently rolling hills along creek lines which were subsequently flooded by the construction of the Dam. These lower slopes within undulating terrain directly adjacent to creek lines were classified as holding low potential for archaeological sites based on the field surveys.

AMBS (2012) undertook an Aboriginal Heritage Study for the entire Goulburn Mulwaree LGA for the Goulburn Mulwaree Council. This study followed on from the work of Lance and Koettig (1986) and Fuller (1989) and assessed the general importance of different landforms to the Aboriginal community and their sensitivity for archaeological potential. Previous work undertaken within the Goulburn region was found to be supportive of Fuller's predictive model and the model was assessed as still applicable. Fuller's findings were used as the basis for classification of landform potential for predictive archaeological sensitivity mapping within the boundaries of the LGA under this AMBS study.

Numerous other development based assessments have been completed for the Goulburn area (Paton 1990, AASC 1995, Mills 2009, NSW Archaeology 2007, NOHC 2005a and b, Williams 2004, and Bosis 2014) to name a sample. These numerous studies have provided a body of work that tests and supports Fuller's 1989 model for the Goulburn Plains.

2.1.2 Crookwell Region

A number of heritage assessments have been completed in the Crookwell region, mainly due to the number of proposed wind farm developments. These wind farm developments have involved large scale surveys which have resulted in the accumulation of much data regarding site location and occupation patterns in the immediate Crookwell area.

Silcox (1993) completed an archaeological survey for a pipeline route along the Kialla Road in Crookwell. This assessment located no archaeological sites or areas of potential, due mainly to the steep slopes that were considered unsuitable for sites.

Bell and White (1996) completed the first assessment for the Crookwell 1 Wind Farm. This preliminary report identified only one surface artefact scatter consisting of 20 quartz flakes and interpreted as a single knapping event. They recommended subsurface testing due to low visibility and further detailed assessment, which was undertaken by MacDonald in 1997.

Jo MacDonald (1997) undertook further assessment of the proposed Crookwell 1 Wind Farm as recommended by Bell and White. This study included subsurface testing of sites identified by Bell and White at the proposed 8 turbine locations. They found 52 artefacts concentrated on the ridgeline locations of the turbines and they recommended further salvage work be undertaken at one location (McDonald and Garling 1997).

Bobbie Oakley (1998) completed an archaeological survey and assessment for the proposed upgrade of Crookwell Road, adjacent to the study area. No sites were recorded from this survey and Oakley concluded that the road reserves have a high degree of disturbance.

Jo MacDonald completed further subsurface testing and salvage excavations at Crookwell 1 Wind Farm in 1998. These studies concluded that Aboriginal land usage focused on the ridgelines as travel routes and represented single periods of occupation. They found that the site locational data did not support Fuller's theory of site placement with larger sites located on broad ridgelines away from water resources. They theorised that these landforms allowed access and travel through the country.

MacDonald's subsurface program recovered 2154 artefacts from 25 test pits. Each test pit was 1m x 1m in size. Most of the artefacts were recovered within the top 10cm of deposit. Two new artefact types were identified including a Pejar Point and a backed artefact not previously classified.

Jo MacDonald completed in 2002 a survey for the crown reserve site on Harley Road Crookwell. This site is located within the township of Crookwell and identified no archaeological sites or areas of potential.

2.1.3 Crookwell 2 Wind Farm previous studies

The Crookwell 2 Wind Farm has been subject to a number of heritage studies, prior to and since its approval in 2005. These studies have identified a number of Aboriginal heritage sites within the study area and developed models of landscape usage and site location. Overall, the wider regional models formulated for the Goulburn/Crookwell region apply to the study area. The previous studies undertaken for the study area are summarised below.

Heritage assessments for the Crookwell 2 wind farm began in 2004 with the commissioning of Biosis Research to undertake field survey over the study area (Biosis 2004). Biosis identified a total of twenty-five surface Aboriginal heritage sites during this assessment ranging in significance

from low to moderate and five sites of high significance. These sites were designated PJ1-PJ25 and were mainly located on high ridge lines, spur lines and crests across the project area. The report recommended that a program of subsurface testing be undertaken in areas of sites, the turbine locations and proposed access roads. Following this report a research design and methodology was developed and approval granted under Research Permit no 2094 and 2095.

The subsurface testing program was undertaken in 2005 by Biosis (2005) and identified a further 28 sites within the project area. Eight initial 50 x 50cm test pits were excavated at each site turbine over the 50 x 50m area with 20m spaced shovel probes completed along the access road alignment. The sites identified by the subsurface testing program were designated J26 - PJ53. The development would impact 33 of these sites and a variety of mitigation measures were proposed. These mitigation measures consisted of salvage excavation at 2 sites (PJ 9 and PJ37), monitoring and collection of artefacts at 9 sites and unmitigated destruction of 22 sites (Biosis Research 2005). These measures were approved under AHIP 1101268 granted in 2005.

Modification 1 for the Crookwell 2 Wind Farm was applied for in 2008 which increased the turbines size and required relocation of some turbines and access tracks. These new locations had not been previously assessed and a new heritage assessment of these locations was undertaken by Biosis in 2008. The desktop assessment showed that where the relocation was less than 50 metres, the investigations completed in 2005 were adequate to assess heritage impacts. Where the relocation distance was greater than 50 metres, the new location required archaeological investigation. Five of the turbine locations were considered to require further subsurface testing to determine the extent of subsurface deposits.

The results of the subsurface testing was reported in an interim report in 2010, which identified two new sites (PJ54 and PJ55). It was recommended that an AHIP be applied for to salvage PJ55 and destruction of PJ54. Salvage excavation of PJ55 was subsequently undertaken under AHIP 1122895 (Biosis 2011).

Modification 1 was approved with ongoing mitigation measures to be completed under AHIP 1101268 and 1122895 during the construction phase. These mitigation measures consisted of the unmitigated destruction of 22 sites, monitoring and collection of 9 sites, build-up of access roads to avoid impacts to area of PAD and salvage excavations of 2 sites (PJ37 and PJ55).

The full results of the additional subsurface testing program at the five turbine locations and salvage excavations at PJ37 and PJ55 were presented in the Biosis 2011 report. This report concluded all aspects of the previous assessments except for those mitigation measures that could only be undertaken during the construction phase - namely the unmitigated destruction of 22 sites, and the surface collection, monitoring and building up of access roads across areas of PADs. These measures were approved under AHIP 1101268 which has now expired due to time since the project inception.

The Biosis studies found that the study area contains a rich archaeological resource, showing utilisation of ridge lines and low level spur lines and gradual slopes. These sites are not always in conjunction with water sources and appear to relate to a division of soil types and underlying geology (granite v basalt) across the study area. Several sites are limited to single knapping events with high concentrations of artefacts in a small area. Other sites were on ridgelines, dispersed over the landforms and holding high sub surface concentrations. The sites of high artefacts frequencies and densities were interpreted as representing single, short term occupation sites with an emphasis on stone knapping or regular occupation over an extended period of time (Biosis 2011).

In 2016, a second Modification (Mod 2) was applied for reducing the number of turbines. A supplementary heritage report was commissioned from Bowen Heritage Management (BHM) to assess if the proposed turbine reduction would have any effect on the heritage impacts. BHM concluded that the turbine locations had all been adequately assessed by the Biosis investigations though road realignments would require survey. Further to the submission of this application, the NSW OEH requested an updated site condition assessment to inform their assessment of the Mod - 2 application and that the expired AHIPs would need to be re-applied for. As a direct result of this advice from OEH, the Mod - 2 components of this report were commissioned.

2.2 AHIMS SEARCH AND SITE ANALYSIS

The Aboriginal Heritage Information Management System (AHIMS) is maintained by OEH and provides a database of previously recorded Aboriginal heritage sites. Searches of the AHIMS database can be made providing information about any sites previously identified within a designated search area. The results of the search are able to be relied upon for 12 months.

An extensive search of the AHIMS database (Client service number 268932) was undertaken on 01/03/2017, resulting in 55 known sites existing within the study area (Figure 4). All of these sites were recorded as a result of the Biosis (2004 and 2005) investigations and consist of open sites, either as surface scatters or as low density artefacts in dispersed subsurface contexts (i.e. 4 artefacts over 240m linear transect). These sites were identified as the result of the sub surface testing program and considered to form 'background scatter'. The majority of these sites were located on the broad ridgelines and considered to be the result of knapping activity (see Section 2.2.3).

Artefacts consisted mainly of cores and flakes and the materials present were silcrete, tuff, chert and quartz. No rare materials or artefact types were identified. No other site types were recorded within the study area.

The AHIMS site search results are attached at Appendix 1. The proposed impacts under the development of the Crookwell 2 Wind Farm do not extend across the entire study area, and only a small proportion of the recorded sites are at risk of impact from the project (26 sites). The sites that may be impacted under the modification applications are shown on Figure 4 and listed in Table 2. These sites are mainly located on ridge lines, on broad flat crests, at over 100m from water. The majority of these sites were classified by Biosis of being low density in dispersed sub surface contexts and representing 'background scatter' of discarded artefacts.

The recorded sites by Biosis 2004 and 2005 are stated as being on the AGD 66 grid. On converting these co-ordinates to MGA and mapping, the locations of a number of the sites (PJ26-55) did not match mapping in the Biosis reports. These are the sites recorded in 2005. When the 2005 sites were entered as being in MGA 55 without conversion, their locations matched the mapped locations in reports. It appears that the 2005 sites were recorded in MGA originally but in the report the incorrect datum has been given. During the site visits (detailed in section 4.2) the site locations were checked against site card descriptions and the mapping provided in the 2005 reports which confirmed this view. OEH has been informed of this change in datum. This does not affect any of the project operational mapping which was based on the 2005 figures provided in the report which shows the correct site locations.

Table 2. AHIMS Sites in location of Modification 2 works.

No	Site number	AHIMS No	Contents
1	PJ10	51-6-0218	Isolated surface find
2	PJ21	51-6-0229	84 Subsurface artefacts along ridgeline, decreasing to low density and then ceasing at turbine location.
3	PJ23	51-6-0231	8 artefacts on dam edge
4	PJ26	51-6-0348	subsurface isolated find
5	PJ27	51-6-0322	subsurface isolated find
6	PJ28	51-6-0323	subsurface isolated find
7	PJ29	51-6-0324	Isolated surface find
8	PJ35	51-6-0330	23 subsurface artefacts in 50 x 50m area
9	PJ36	51-6-0331	subsurface isolated find
10	PJ37	51-6-0349	1002 subsurface artefacts in single square
11	PJ38	51-6-0332	38 subsurface artefacts on 230 m linear length
12	PJ39	51-6-0333	19 subsurface artefacts in 50 x 50 m area
13	PJ40	51-6-0331	3 subsurface artefacts in 50 x 50m area
14	PJ41	51-6-0335	6 subsurface artefacts in 50 x 50m area
15	PJ42	51-6-0336	10 subsurface artefacts along 300m linear length
16	PJ44	51-6-0338	2 subsurface artefacts
17	PJ45	51-6-0339	24 subsurface artefacts in 250 x 250m area
18	PJ46	51-6-0340	3 subsurface artefacts in 50 x 50m area
19	PJ48	51-6-0342	2 subsurface artefacts
20	PJ49	51-6-0343	16 subsurface artefacts along 200m linear length
21	PJ50	51-6-0344	subsurface isolated find
22	PJ51	51-6-0345	323 artefacts in one test pit only
23	PJ52	51-6-0346	2 subsurface artefacts
24	PJ53	51-6-0347	2 subsurface artefacts in 42 m long transact
25	PJ54	51-6-0682	4 subsurface artefacts
26	PJ55	51-6-0683	76 artefacts in one test pit

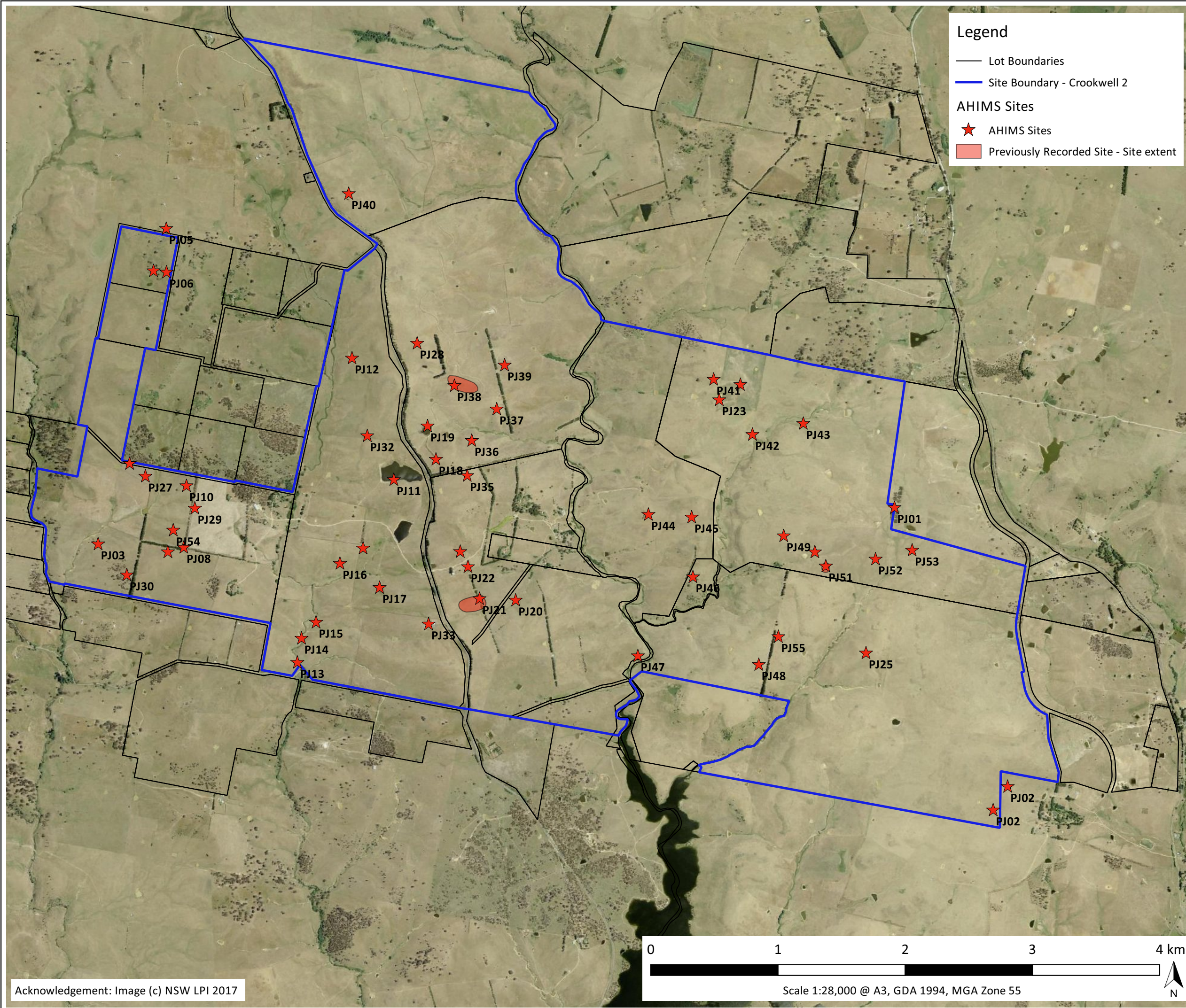
2.2.1 Site Locational Summary.

In analysing these 55 previously recorded site locations, it should be remembered that large sections of the proposed wind farm have not been subject to archaeological survey. The previous surveys have concentrated on areas of potential impacts and associated planned works. The locations of the recorded sites indicates the following model of landscape utilisation:

- Sites occur on ridge lines, open high slopes and saddles, representing travel ways through the rolling landscape.
- Sites can range from single knapping events in one limited location to widely dispersed large sites which are normally situated along ridgelines.
- Sites are not easily identifiable by surface indications with many of the recorded sites having no surface expression for identification.
- Artefacts occur on materials commonly available in the local area, mainly quartz and silcrete.
- Sites will most likely consist of stone (lithic) artefacts, with no recorded scarred trees, quarries or art sites within the project area.

Hardy and Thomson (Biosis 2004:42) concluded that archaeological material was most likely to be present on creek lines, in the vicinity of the confluence of drainage lines, on broad, flat ridgelines and sloping areas. They concluded that the dominant character of the area consisted of 'background scatter' with higher density sites, which were the focus of knapping events.

Figure 4. AHIMS site data – sites within the study area



3 LANDSCAPE CONTEXT

In the development of field survey methodologies and predictive models of site location and landscape utilisation it is important to understand the relationship between the different aspects of a landscape. The underlying geology defines the types of soils present and their locations, each soil has a differing degree of fertility and erodibility. Soil fertility relates to the types of vegetation communities that would have been present in the landscape prior to clearing, which in turn indicates the potential resources available to Aboriginal people. The erodibility and acidity of the soils are factors in site visibility and preservation within the landscape. The presence of resources (in the vegetation communities and rock resources) indicates the potential for the area to be utilised by Aboriginal people and areas where they may have focused their attention.

3.1 GEOLOGY AND SOILS

The Crookwell region and the current study area are located in predominantly Tertiary basalt overlaying the Silurian and Ordovician Wologorang and Wyangala granite formations. Deposits of Quaternary alluvium are confined to a narrow floodplain development adjacent to the major river systems (Hird 1991: 9). The study area is located at the boundary between the basalt country in the north and granitic country in the south.

Basalt is the predominant formation across the study area and is composed of residual basalt that consists of clay, silty clay and clayey gravel soils. These clay soils are predominantly compact and often contain numerous basalt cobbles and boulders. In the area of Crookwell, the irregular surface of the basalts suggest they are valley fills (Hird 1991:63). Associated soils consist of the Taralga and MacAlister landscapes. These fertile soils are most suitable for cattle grazing and fodder cropping.

The Granite formation is present in the southwestern and central portion of the study areas. Large granite boulders and rock outcrops are present. The granitic soils comprise sands, silty sands, clayey sand and silty clays. Associated soils consist of the Wyangala and Garland landscapes. These soils are less fertile and are most suitable for sheep grazing and wool production.

3.2 SOIL LANDSCAPES

Four soil landscapes are present across the study area. Each soil landscape relates to the underlying geology, terrain and past vegetation that would have been present prior to European clearing.

The Taralga soil landscape covers a majority of the study area and runs through the northern and central sections. This landscape consists of highly fertile chocolate coloured soils derived in-situ from the underlying basalt flows with pockets of alluvial soils in the drainage lines (Hird 1991:163). These soils are friable and moderately well drained. The broad ridgelines (plateau) and valleys of undulating rises is indicative of this soil landscape. Stream channels are mainly broad plains rather than incised.

The MacAlister soil landscape is present in the north eastern section of the study area. This soil landscape is also derived from the basaltic flows where basalt has been incised to expose the underlying granite batholiths. Chocolate soils also predominate, but with Red and Yellow Podzolic soils on side slopes (Hird 1991:115). The Macalister soil landscape is an incised plateau.

Undulating to rolling low hills are typical patterns. Slope gradients are between 5-15%. Incised stream channels are present rather than broad flats.

The Wyangala soil landscape is a minor component of the study area and is present in a confined section of the south east section. This soil landscape occurs on the Wyangala granite. Siliceous sands, red earths and red duplex soils are present on side slopes with Yellow Podzolic soils on the foot slopes and drainage lines. Large granite boulders and outcrops are a feature. These soils have formed in-situ from parent rock and are well drained with moderate erodibility. Rolling low hills to rolling hills are typical landform patterns (Hird 1991:179)

The Garland soil landscape is present in the southern central and western sections. This soil landscape is located on undulating rises and valleys and is a result of the underlying granitic material. Red Podzolic soils on upper slopes and yellow duplex soils on the mid and lower slopes. Sandy Red and Yellow earths are also found on side slopes. Siliceous sands are present in some drainage lines. Slope gradients are usually less than 15% with erosional stream channels (Hird 1991:82).

Previous studies undertaken for the original EIS (URS 2004) concluded that the topography in the Crookwell area has an equal influence on the nature of the soils as the underlying geology. Rugged terrain with side slopes of 25-70% incline are likely to contain shallow soil deposits and frequent rock outcropping. The rolling terrain of side slopes between 5-25% shallow earths and Podzolic soils dominate and the in the gently undulating terrain (0-5%) much deeper soils are likely to be present (Biosis 2004: 11). The distribution of soil landscapes across the study area is shown in Figure 5.

3.3 TOPOGRAPHY AND LANDFORM ELEMENTS

The topography of the study area was examined using topographic maps and satellite imagery. From this review the landscape is best characterised as consisting of plateaus and valleys of gently undulating to undulating rises. The study area also contains level to gently sloping creek flats, long gentle side slopes to steep slopes running from the creek flats to the broad flat ridgelines. These broad, flat to almost level ridgelines are predominant across the study area.

The majority of the study area consists of simple slopes, rising to the broad ridgelines which predominant (after Speight 1990). In addition to these main land forms the study area also contains small sections of creek flats and low crest landforms.

3.4 FLORA AND FAUNA

The natural vegetation across the study area has been almost totally cleared and is now considered to be a modified environment. Grass coverage has been subject to pasture improvement and fodder cropping over an extended period of time. Prior to these European impacts the natural vegetation of the area would most likely have consisted of the following vegetation communities:

Brown Barrel-ribbon gum – this is typical of basaltic soils. This is an intermediate sclerophyll forest with well-developed sub stratum of small trees and shrubs (Hird 1991:164). Occurring on the more fertile chocolate soils this area would have been well forested with a variety of resources and small game present.

Yellow Box –Blakely’s Red Gum – this extended over the granitic soils. Now endangered this community was once extensive and highly utilised by the Aboriginal communities. This area consisted of grassy woodland prior to clearing with native grasses under Eucalypts (Hird 1991). The grassy woodland environment would have supported a wide range of edible plant and fauna species. Fauna present would range from small marsupials (i.e. possums), to avian species and macropods. A range of lizards also inhabit this environment that would have been utilised by Aboriginal groups. The NSW OEH lists over 200 flora and fauna species as present within these woodlands, the majority of which had some utilisation in traditional Aboriginal lifeways.

The proximity of these two vegetation communities within the study area would have created ecotones – areas where the edges of both were present with the resources of both. These areas would have been a focus of subsistence activities and may have allowed for longer periods of occupation.

The Wollondilly River and other major tributaries would also have provided food resources in the form of fish, eels, water birds and platypus. Platypus hunting on the Wollondilly River was observed by Bennett along with possums, kangaroos and wallabies (Bennett 1834:323-326).

3.5 HISTORIC LANDUSE

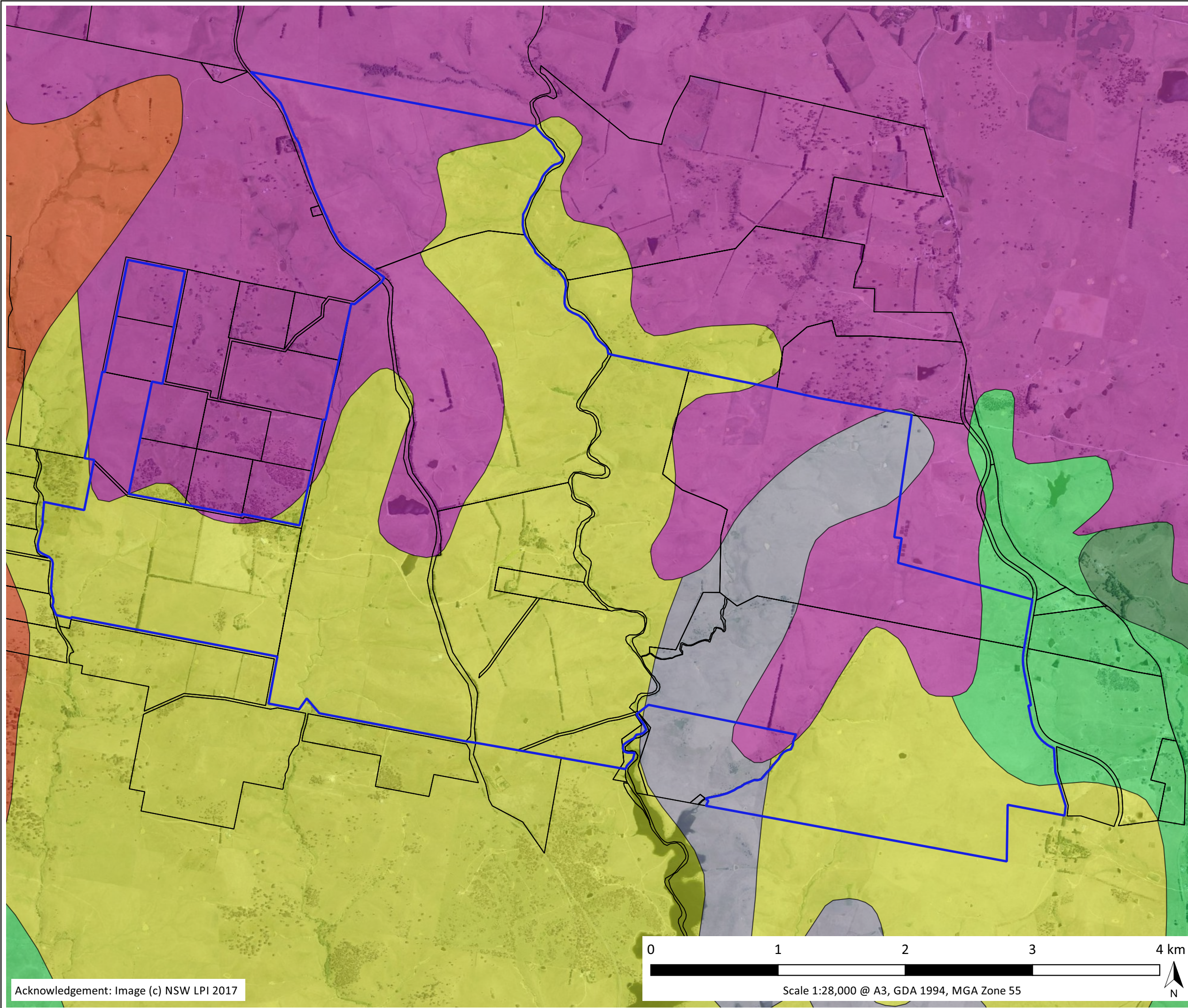
Marulan was first mentioned in 1818 in the exploratory records of Hume, Meehan, Wild and Throsby on their discoveries of the Goulburn Plains, who camped south of Grabben Gullen (12 kms to the southwest of Crookwell). After confirmation of the agricultural potential of the area by Meehan in 1820 settlement commenced with large pastoral holdings. Binda, 19kms to the north was the initial centre of the district.

The township of Crookwell was originally called Kiama. The town was gazetted in 1860 and renamed after the River. The town grew to become a centre of wheat growing and wool production. The Royal Hotel was built in 1862 and the first school opened in 1864. By the 1880s the town also contained brickworks, flourmills, the bank and police station and two hotels. (NSW Heritage Office 1996).

Between 1860 and 1870, selection of blocks took place following the Selection Act of 1861. Goulburn Street was laid out in 1869 and the first 28 Crookwell town allotments were sold in 1869 to Warne and Stephenson at Yass, and in 1870, half-acre blocks were sold in Crookwell for 20 pound each. By 1872 the town plan was in operation and the population was over 1,000. It took four days to reach Goulburn by dray, until 1875, when the first passenger coach was introduced, taking only one day each way. Goulburn Street (and Road) was often a quagmire as bullock wagons trundled through carrying wool, wheat and flour to Goulburn (Upper Lachlan Shire Website).

The study area has been used historically for sheep grazing, cattle grazing and production of crops. The Parish of Crookwell 2nd edition map dated 1897 already shows the study area divided into numerous small allotments with an average size of 50 acres.

Figure 5. Soil landscapes

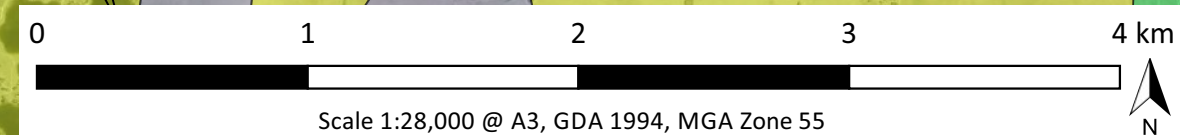


Legend

- Lot Boundaries
- Site Boundary - Crookwell 2

NSW Soils

- Macalister
- Wyangala
- Midgee
- Garland
- Taralga
- Blakney Creek



Acknowledgement: Image (c) NSW LPI 2017

Scale 1:28,000 @ A3, GDA 1994, MGA Zone 55

Capital Ecology Project No: 2740
Drawn by: R. Speirs
Date: 26 April 2017



3.6 LANDSCAPE CONTEXT AND REGIONAL CHARACTER

Most archaeological surveys are conducted in a situation where there is topographic variation and this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal archaeological sites. The study area ranges over creek flats/floodplains across undulating hills to broad flat crest on ridgelines that dominate landforms across the survey area.

The landforms for the survey were determined to be stable landforms, with moderately erodible soils and an aggrading landscape on the creek flats and floodplains. Soils were moderately disturbed in areas subject to ploughing, but confined to the surface soils. The open aspect of the broad ridgelines would have made travel through this landscape attractive as both a pathway and resource area.

The previous assessments undertaken in the region indicate that the landscape of the study area was traversed and utilised by Aboriginal people with a major focus on the ridgelines. Large scale resources were available along the Wollondilly River making it possible for long term occupation of camping and gathering sites, although to date no large scale sites have been found within the study area along the Wollondilly River.

The broad ridgelines at the time of past occupation would have been covered by woodlands, either of Ribbon-Bark communities or Box woodland, both environments that contained a wide variety of resources and in denser areas provided shelter from bad weather and ideal camping environments.

3.7 PREDICTIVE MODEL

The spatial distribution of Aboriginal sites recorded by previous heritage assessments, suggests that higher artefact distributions around broad ridgelines and high points were the focus of repeated visits and most likely used as travelling routes by Aboriginal people. Major waterways provided access to food and material resources, but no major sites have been recorded along the Wollondilly River within the study area. The lower densities of sites and artefacts present on creek flats and low hills away from watercourses is most likely a result of Aboriginal people moving through these areas for travel and food gathering, but not returning frequently or on a long term basis.

More than 50% of the sites identified within the study area have been recorded as a result of subsurface testing of landforms, with no surface expression of archaeological deposits.

Based on this body of previous heritage work, the landscape context and previous disturbance to the area a site prediction model has been developed for the project (Table 3). This site prediction model is based on:

- Site distribution in relation to landscape features within the study area
- Consideration of site type and densities likely to be present within the study area
- Potential Aboriginal use of natural resources present or once present within the study area
- Consideration of the proximity of heritage sites in the region

Table 3. Site Prediction Model

Site Type	Definition	Potential to occur
Isolated finds and surface scatters of stone artefacts	Artefact sites can range from high density concentrations to sparse, low density 'background' scatters and single finds	High – small to large scatters and isolated finds have been previously recorded within the project area. Larger sites are associated with broad ridgelines.
Rock Engravings	Motifs scratched or painted onto rock surfaces, usually within a rock shelter or overhang.	Nil: No such rock features are present within the agricultural project area.
Stone arrangements	Stone arrangements can include circles, lines and other patterns and usually mark ceremonial areas.	Moderate: An overlooked site type, stone arrangements are present across a range of environments.
Stone quarries/Ochre sources	Raw materials for lithic artefacts and ochre are gathered from these sites. They are highly valued by the community.	Nil: There are no known ochre or stone quarries identified by previous studies.
Potential Archaeological Deposits (PADS)	Subsurface deposit of cultural material	High: Previous assessments have shown that the broad ridgeline landform has high potential to contain deposits. Creek flats are also considered to hold high potential.
Scarred Trees	Trees with cultural modifications over 150 year old.	Low: Remnant trees remain within the project area, but the majority are too young to be considered.
Axe grinding grooves	Grooves in stone platforms created through grinding of stone implements such as axe heads	Nil: no stone platforms occur within the study area
Burials	Burials of Aboriginal persons	Extremely low: no deep sand deposits or soil types are present within the study area to indicate the potential for burials to occur.
Aboriginal places	Aboriginal places may not have any archaeological remains present, but are important to Aboriginal people due to their cultural, spiritual or historical associations.	Extremely Low: There are no recorded associations for the project area.

4 ARCHAEOLOGICAL SITE INSPECTIONS

A site inspection of each of the previously recorded sites was undertaken in March 2017 with representatives of the Pejar Local Aboriginal Land Council (LALC).

The principle aims of the site inspections were to:

- Provide the LALC an opportunity to view the study area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the study area.
- To attempt to relocate the previously recorded Aboriginal archaeological sites within the study area in close proximity to proposed works and provide current condition assessment.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of potential archaeological deposits (PADs).

4.1.1 Site inspection methodology

The recorded location of sites as recorded on the site card was visited, with surface inspection of the ground surface undertaken by the field team. Landform, Ground Surface Visibility (GSV) and Levels of Disturbance were recorded at each site location. The site locations of each recorded sites was examined to determine their current condition and if any impacts had occurred to each sites since the time of their original recording. The details of each of the previously recorded sites is taken from the AHIMS site card. If in the field the recorded location did not match the site card description, both locations and an area of surrounding 20m was inspected for any surface artefacts. The great majority of the previously recorded sites consisted of subsurface deposits with no surface expression. In these locations the area was checked for any impacts that may have disturbed these deposits. The location of these recorded sites is shown on Figure 4 in section 2.

Soils and landforms within the study area were examined to assess the presence of erosion within the Study area and whether soil structures were stable, aggrading or eroding across the project area. No large areas of active erosion were present, despite areas having been impacted in isolated scours on crests, slopes and in particular creek banks. This would concur with Hird's (1991) description of the soils of the area as being stable and only moderately erodible. It is concluded that the soils within the landforms surveyed appear to have not been stripped away with natural soil deposits still present within the project area. However, due to past ploughing practices across much of the study area, these soil deposits are likely to be inverted and disturbed in their upper profiles.

4.2 PREVIOUSLY RECORDED SITES

A number of heritage sites were located within the study area by Biosis in their 2004 and 2005 investigations, which are located in the vicinity of the proposed Mod-2 works. These sites required a site inspection to determine their current condition and the extent of any impacts since the time of their original recording.

51-6-0218 (PJ10) - 733458.6174324 Zone 55 AGD

PJ10 consists of an isolated surface find in location of turbine F5. Subsurface testing when undertaken in 2005 at this location did not reveal any subsurface deposits. No impacts have

occurred to this area. Grass coverage was extensive with no areas of exposure at the turbine location which is situated on a low crest on mid slopes. Despite a search of the area no surface artefacts were identified.

51-6-0231 (PJ23) - 737648.6175300 Zone 55 AGD

This site is located on a dam edge and is associated with stock impact trails. The area was examined at the time of field survey. GSV was high along the bank and stock trails, but no surface artefacts were re-located. The dam is located on the edge of the proposed access road corridor to TF23 but is not within the planned road alignment. The road will deviate to avoid any impacts to the dam and surrounding low lying areas. As a result, no impacts are anticipated to this site from the proposed works.

51-6-0330 (PJ35) - 735780.6174889 Zone 55 MGA

Located along the access track to F21 this site consisted of 23 subsurface artefacts in a 50 x 50m testing area. This location has not been subject to any impacts since the time of testing. No surface artefacts were located, in accordance with previous assessments. This site was awarded a ranking of moderate significance (Biosis 2005) and monitoring of top soil removals recommended.

51-6-0342 (PJ48) - 738073.6173402 Zone 55 MGA

This site consists of 2 subsurface artefacts within the 50 x 50m testing area and is located on the midslopes of a rise. No surface artefacts were present and the area has suffered from no impacts since the completion of subsurface testing.

51-6-0682 (PJ54) - 733468.6174460 Zone 55 MGA

The site consists of four quartz angular fragments excavated during subsurface testing at the location of a proposed wind turbine F7. The assemblage is considered to hold low significance, to be representative of the area and no further archaeological work at the site was considered necessary.

The area was examined and no surface artefacts were located, consistent with previous assessments. The turbine location has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0334 (PJ40) - 734848.6177107 Zone 55 MGA

This site is located on the crest in turbine location F10. Three quartz artefacts were located at a depth of 0-5cm. The area was examined and no surface artefacts were located, consistent with previous assessments. The turbine location has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0323 (PJ28) - 733420.6174818 Zone 55 MGA

This site is located on a crest in turbine location F12. A single quartz flake was recovered at a depth of 5-10cm. The area was examined and no surface artefacts were located, consistent with previous assessments. The turbine location has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0229 (PJ21) - 735763.6173736 Zone 55 AGD

Eighty four subsurface artefacts were recovered along a 200m linear transect from along the ridge line through a gateway to turbine location F17. Artefact densities decrease toward the turbine

location, where only low density of single artefacts were located. A recommendation of avoidance of the main artefact density, by building up of road across the PAD with destruction at area of turbine location F17 was made by Biosis (2005). This area is heavily grassed (though short due to sheep grazing) and the area of erosion at the entrance gate has contracted. The area was examined and no surface artefacts were located, consistent with previous assessments. The turbine location and proposed access road along the ridgeline has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0331 (PJ36) - 735816.6175165 Zone 55 MGA

Isolated artefact was recorded at the turbine location F21 on the broad hill crest. The area was examined and no surface artefacts were located, consistent with previous assessments. GSV at the time of survey was low with grass coverage across the turbine location. The turbine location has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0349 (PJ37) - 735898.6175227 Zone 55 MGA

Isolated find located at Turbine F22, subsurface testing recovered 50 artefacts in 1m x 1m square. The site was subsequently excavated under AHIP 1101268 (Biosis 2011) which resulted in the recovery of an additional 1002 artefacts from 33 test pits within the 50 x 50m area excavated. This area has suffered no further impacts since the time of the test excavations.

51-6-0333 (PJ39) - 736074.6175758 Zone 55 MGA

This site is located on the broad hill crest along the ridgeline at the location of turbine F23. No surface artefacts were identified, however 19 subsurface artefacts in 50 x 50m area were recovered by the 2005 test pitting program. The area was examined and no surface artefacts were located, consistent with previous assessments. GSV at the time of survey was low with grass coverage across the turbine location. The turbine location has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0338 (PJ44) - 737205.6174583 Zone 55 MGA

The site is located on the broad ridgeline at the location of turbine location F29. No surface artefacts were identified at this location, however 2 subsurface artefacts were recovered by the 2005 test pitting program. The area was examined and no surface artefacts were located, consistent with previous assessments. GSV at the time of survey was low with grass coverage across the turbine location. The turbine location has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0340 (PJ46) - 737555.6174092 Zone 55 MGA

The site is located on the broad ridgeline at the location of turbine F29. No surface artefacts were identified at this location, however 3 subsurface artefacts were recovered by the 2005 test pitting program. The area was examined and no surface artefacts were located, consistent with previous assessments. GSV at the time of survey was low with grass coverage across the turbine location. The turbine location has suffered no impacts since the time of recording and the site remains in its original condition.

51-6-0343 (PJ49) - 738269.6174415 Zone 55 MGA

This site is located at turbine position F37 along the broad flat ridgeline. No surface artefacts were identified at this location however 16 subsurface artefacts were recovered along a 200m linear alignment during the 2005 subsurface testing program. GSV was moderate at this level, with fair

grass coverage but cropped to a short length due to sheep grazing. Many stock trails crossed over this ridgeline leading to a gate at the eastern end. A search was made of the vicinity, no surface artefacts were identified consistent with previous assessments. No impacts have occurred to this landform since the time of recording.

51-6-0683 (PJ55) - 738227.6173622 Zone 55 MGA

This site was located at the F41 turbine location across the broad flat ridgeline. Seventy five artefacts were recovered in a single 1m x 1m square as part of the test pitting program (Biosis 2005). This site was subsequently excavated with 12 test pits recovering one additional quartz artefact under AHIP 1122895. The excavation square was relocated during the field survey. The turbine location is strewn with rock outcrops with mid length grass coverage. Many stock impact trails cross this landform resulting in a moderate degree of GSV. No surface artefacts were identified at this location and following the salvage excavations no further heritage constraints apply to this location. No impacts have occurred within this area since the completion of the test excavations. The current site location is shown in Plate 1.



Plate 1: PJ55 on crest showing test pit location

51-6-0336 (PJ42) - 738023.6175212 Zone 55 MGA

Proposed access road running from F27 to F31. No surface artefacts were identified however, 10 subsurface artefacts along linear transect of 300m were recovered from the subsurface testing program along a broad ridgeline above a creek line tributary to the Wollondilly River. This site will be impacted by the proposed access road and no impacts have occurred to this locality since the time of recording.

51-6-0339 (PJ45) - 737545.6174562 Zone 55 MGA

This site is located mid-slope on the edge of a vehicle impact track (grassed) leading from F28-31. 24 subsurface artefacts within 250 x 250m area were recovered during the 2005 testing program. This area was heavily grassed with nil GSV at the time of field survey. No impacts have occurred at this location.

51-6-0348 (PJ26) - 733125.6174984 Zone 55 MGA

A single isolated find was at this location during the 2005 surveys. Grass coverage was high across this area with low GSV as a result. The area was examined and no surface artefacts were located. The paddock has suffered no impacts since the time of recording and the site location remains in

its original condition. The site location is outside of the proposed road alignment, through within the 50m micro siting corridor, no impacts are anticipated at this site location.

51-6-0322 (PJ27) - 733249.6174884 Zone 55 MGA

A single isolated find was at this location during the 2005 surveys. Grass coverage was high across this area with low GSV as a result. The area was examined and no surface artefacts were located. The paddock has suffered no impacts since the time of recording and the site remains in its original condition. The site location is outside of the proposed road alignment, through within the 50m micro siting corridor, no impacts are anticipated at this site location.

51-6-0335 (PJ41) - 737718.6175646 Zone 55 MGA

This site is located along the broad ridgeline leading to turbine F25. No surface artefacts were recorded, but subsurface testing in 2005 recovered 19 artefacts. This area was heavily grassed at the time of field survey with saffron thistles also heavily present. No GSV was present at this location and no artefacts were identified by the visual inspection. No impacts have occurred to this area since the time of recording.

51-6-0344 (PJ50) - 738514.6174288 Zone 55 MGA

This site is located on lower slopes close to a dam to the south west of PJ49. The site was originally located within an area of stock exposure and consisted of an isolated find of a quartz flake. The site location was inspected, with no surface artefacts identified. No impacts have occurred in the vicinity of this site. A number of removed stumps have been placed in the area as part of the process of clearing land for pasture ploughing.

51-6-0346 (PJ52) - 738991.6174232 Zone 55 MGA

This site is located on the mid slopes to a broad ridge line. No surface artefacts were identified, however 2 subsurface artefacts were recovered from the 2005 test pitting program. Grass length was long at the time of the field survey with a general GSV of <5%. Small linear exposures (Sheep impact trails) cross the landform but no surface artefacts were identified. No impacts have occurred at this location or in vicinity.

51-6-0332 (PJ38) - 735679.6175597 Zone 55 MGA

This site and associated PAD is located on the broad ridgeline extending from a planted row of pine trees in south west. No surface artefacts were identified at this location, but subsurface testing undertaken in 2005 recovered 38 artefacts along the length of the ridgeline.

This site has now been disturbed by the construction of a large machinery shed on the ridgeline, erected by the owners of the property. The shed has impacted on the sub soils and numerous artefacts (50+) are visible on the surface, around the shed on all sides. This site and PAD location is considered to hold high potential for further subsurface deposits and all impacts should be avoided. Previous recommendations (Biosis 2005, 2011) that the road should be constructed using a method that builds on the current ground surface rather than cutting into deposits should be followed in this locality. A sample of the artefacts are provided in Table 4 with photos of the site location and contents in the following plates.

Impacts to the area of PAD should be avoided either by redesign of road placement or by building up of the road alignment, removing impacts to sub soils.

Table 4. Artefact details Site PJ38

Grid Location	Material	Artefact Type	Dimensions (mm)	Comments
735605.6175625	Quartz	Flake	19x11x7	
735599.6175618	Quartz	Flake	11x5x3	Geometric microlith
735596.6175615	Silcrete	Flake	28x10x7	Flaked platform, hinge termination
735590.6175618	Silcrete	Flake	12x16x17	Flaked platform, feather termination - additional 6 artefacts at location
735589.6175634	Silcrete	Proximal flake	17x18x10	Retouch on left lateral margin.



Plate 2: PJ38 and shed



Plate 3: Selection of artefacts in shed impact zone

51-6-0347 (PJ53) - 739279.6174302 Zone 55 MGA

This site consists of 2 subsurface artefacts across a mid-slope on the planned access road from F40 to F45. GSV at this location at the time of field survey was nil due to waist high Phalaris grass across the paddock. Transects were walked by the field team, but no exposures were identified. No impacts have occurred in the vicinity of the recorded subsurface site.

51-6-0345 (PJ51) - 738600.6174177 Zone 55 MGA

Three hundred and twenty three artefacts were recovered from one test pit in this location. The surrounding 50m² was subject to test excavations with no further artefacts identified. The site is considered to represent a single knapping event and not to extend beyond recorded boundaries of the one test pit. The landform consists of a broad ridgeline where turbine F39 was to be placed. This turbine has now been removed from this location and the road deviates to the east away from the site location.

As a precautionary measure, build-up of the road surface in the section of road that runs near to the recorded sites, rather than cutting into subsurface deposits was recommended for this location, despite no other subsurface deposits identified by the 2005 test pitting program. No known impacts will occur at this site location but precautionary measures should be undertaken. No impacts have occurred to this location since the time of recording and subsurface testing.

51-6-0324 (PJ29) - 733638.6174632 Zone 55 MGA

PJ29 is located on the broad ridge line leading to a turbine location and consists of a single subsurface artefact. Grass coverage was extensive over this area at the time of field survey with no surface exposures. No impacts have occurred at this location.

4.3 SUMMARY OF SITE INSPECTION RESULTS

The study area is situated on a series of gently undulating low crests and rises, broad flat ridgelines and gentle slopes to tributary creek lines. It is thought that prior to European settlement the area would have supported temperate grassland community on lower slopes with scattered woodlands on the mid and upper slopes (Hird 1991). A Ribbon Gum forest community would have been present on the northern half of the study area.

The route alignments and turbine locations are placed across landforms considered to hold high potential for subsurface artefacts (i.e. the broad flat ridgelines). These landforms were tested at these turbine locations and access tracks during the 2005 program (Biosis 2005 and 2011) with subsurface sites being identified. As extensive testing in these locations have been completed, it is not considered necessary to undertake further testing in these locations. This is because the potential for these areas has been adequately investigated and it is considered unlikely that any significant large subsurface deposits would have escaped detection during this subsurface testing program.

No surface expressions of the subsurface sites were identified at any of the site locations except for PJ38 which has been disturbed due to shed construction. A site impact recording form should be submitted for this site. All of the other sites have not been impacted in any way or manner since the completion of the subsurface testing program.

A number of the site locations are placed at the turbine locations. Site placement at these locations allowed for any anomalies between site cards and mapping provided in previous reports to be resolved and the datum updated for these sites.

5 UNANTICIPATED FINDS – WOODHOUSELEE ROAD ACCESS ALIGNMENT

On accessing the study area through the approved access road running west from Woodhouselee Road to the study area, surface artefacts were noted along the alignment. To ensure that no further sites were located along the access alignment this section of the road network was then surveyed. Three additional sites (PJ56, P57 and PJ58) were recorded and the provisions of the Unanticipated Find Protocol under the HMP activated.

Under the UFP the following steps have been taken:

- All work in the vicinity of the site has ceased until the site can be fenced off.
- OEH and project manager informed of site find.
- Consultation with the RAPs has commenced.
- The sites will be subject to further investigation as the sites include area of PAD that is planned to be impacted.
- Following investigation, results will be reported in an ACHAR for this section of road.
- If impacts cannot be avoided, then an AHIP including surface collection and subsurface impacts will be submitted to OEH for approval under the current Mod-1 approval, or if the Mod-2 application has progressed by this time under the Mod-2 approval.

As construction is due to commence shortly on this section of the access alignment the results of this survey and archaeological assessment for this section of the access alignment are reported in a separate supplementary heritage report. This step has been taken so that consultation (and report review period) in regards to the site, subsurface testing and then assessment for an AHIP can be completed for this road section and submitted to OEH for approvals when completed. This AHIP application will be under the approved DA, concurrently with the assessment of the Mod-2 application by the Department of Planning. By the separation of this process the AHIP application for this road section can be progressed and construction commence earlier within this section, rather than being constrained by the process of the approval of Mod-2.

As this section of the access alignment will be covered by the Mod -2 application when approved, the details of these sites, the impact of the development upon them and the relevant management recommendations are also included in this AR for completeness. Details of the archaeological assessment (transects, landforms) are provided in Section 6.

The supplementary heritage report with the subsurface methodology has been sent to the RAPs for their review following completion of subsurface testing.

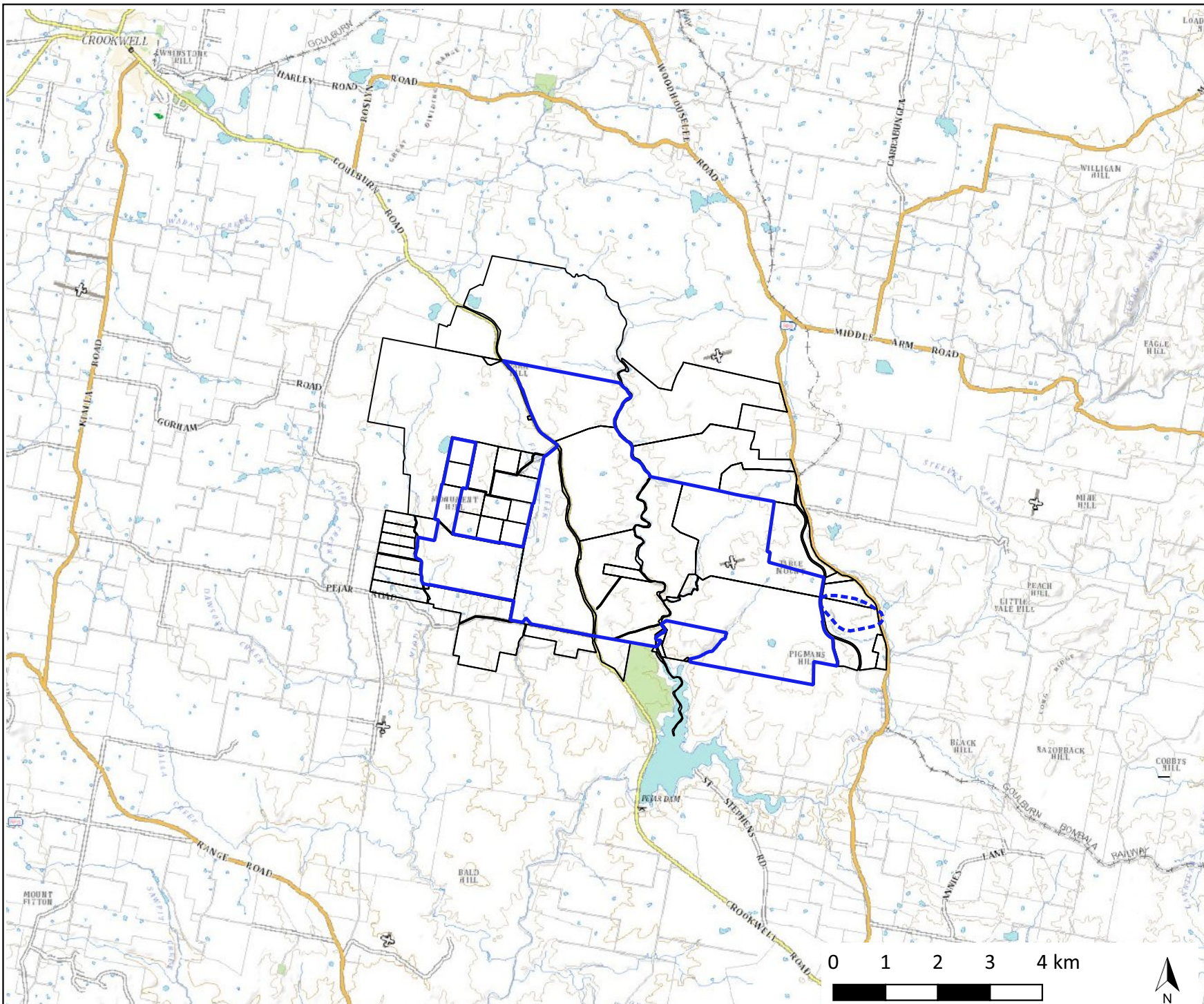
The location of the access road within the Mod-2 application are shown in Figure 6. The location of the three sites is shown in Figure 7.

The details of these sites has been added to the survey results in Section 6, to the Development Impacts and recommendations section of this ACHAR, as they occur within the Modification 2 project area, and require assessment as part of cumulative impacts.

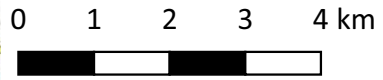
Figure 6. Locality Plan

Legend

- Lot Boundaries
- Site Boundary - Crookwell 2
- - - Access Alignment



Acknowledgement: Basemap (c) NSW LPI 2017



Scale 1:100,000 @ A4, GDA 1994, MGA Zone 55

Capital Ecology Project No: 2740
Drawn by: R. Speirs
Date: 10 April 2017



6 ARCHAEOLOGICAL FIELD SURVEY

A field survey of the study area was undertaken in March 2017 with representatives of the Pejar Local Aboriginal Land Council (LALC). The field survey aims and sampling strategy are provided below.

6.1 ARCHAEOLOGICAL SURVEY AIMS

The principle aims of the survey were to:

- Provide the LALC an opportunity to view the study area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the study area.
- To attempt to relocate the previously recorded Aboriginal archaeological sites within the study area in close proximity to proposed works and provide current condition assessment.
- To undertake a systematic survey of the proposed areas of impact within the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of potential archaeological deposits (PADs).

6.2 FIELD SURVEY SAMPLING STRATEGY

The survey aim is to cover the area of the revised proposed road access and cable connections as part of the Mod-2 application process (Figure 3). These are the sections that differ from the approved Modification 1 project. These alignments run linearly for a width of 50m and allowed for the survey of all landforms within this alignment. Mapping of the proposed routes identified major landforms as: broad ridgelines, low crests, gently undulating hills (simple slopes) and creek flats. The study area was divided into a series of field maps, at a high scale, to allow for assessment and recording of landform, transect placement and the identification of heritage sites.

The survey aimed to achieve the greatest coverage possible of all landforms, and all landforms were sampled during the field survey, though ground surface visibility (GSV) varied due to grass length in some paddocks at the time of survey. When survey transects crossed into a differing landform, a new survey unit was commenced, with starting and ending points of transects recorded. All survey units were sampled with spaced pedestrian transects. A detailed discussion of survey coverage and results of the pedestrian survey is provided in Section 6.4. Detailed field maps of the survey area were generated, showing AHIMS recorded sites and areas of turbines and impacts. These detailed field maps are provided in section 6.4.

6.3 FIELD SURVEY METHODS

The archaeological survey was conducted on foot with a field team of two archaeologists and one to two members of the Pejar LALC. Approximate spacing between team members was 5 – 10m depending on landform. Recording during the survey followed the archaeological survey requirements set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). Information recorded during the survey included:

- Start and End points of each transect.
- Survey Units along landforms.
- Aboriginal objects or sites present in the Study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform.
- Photographs of the site indicating landform.
- Evidence of disturbance.

Photographs and archaeological recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, and ground surface visibility. Any Aboriginal artefactual objects or items observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Global Positioning System (GPS) and the Map Grid of Australia (MGA 94) coordinate system.

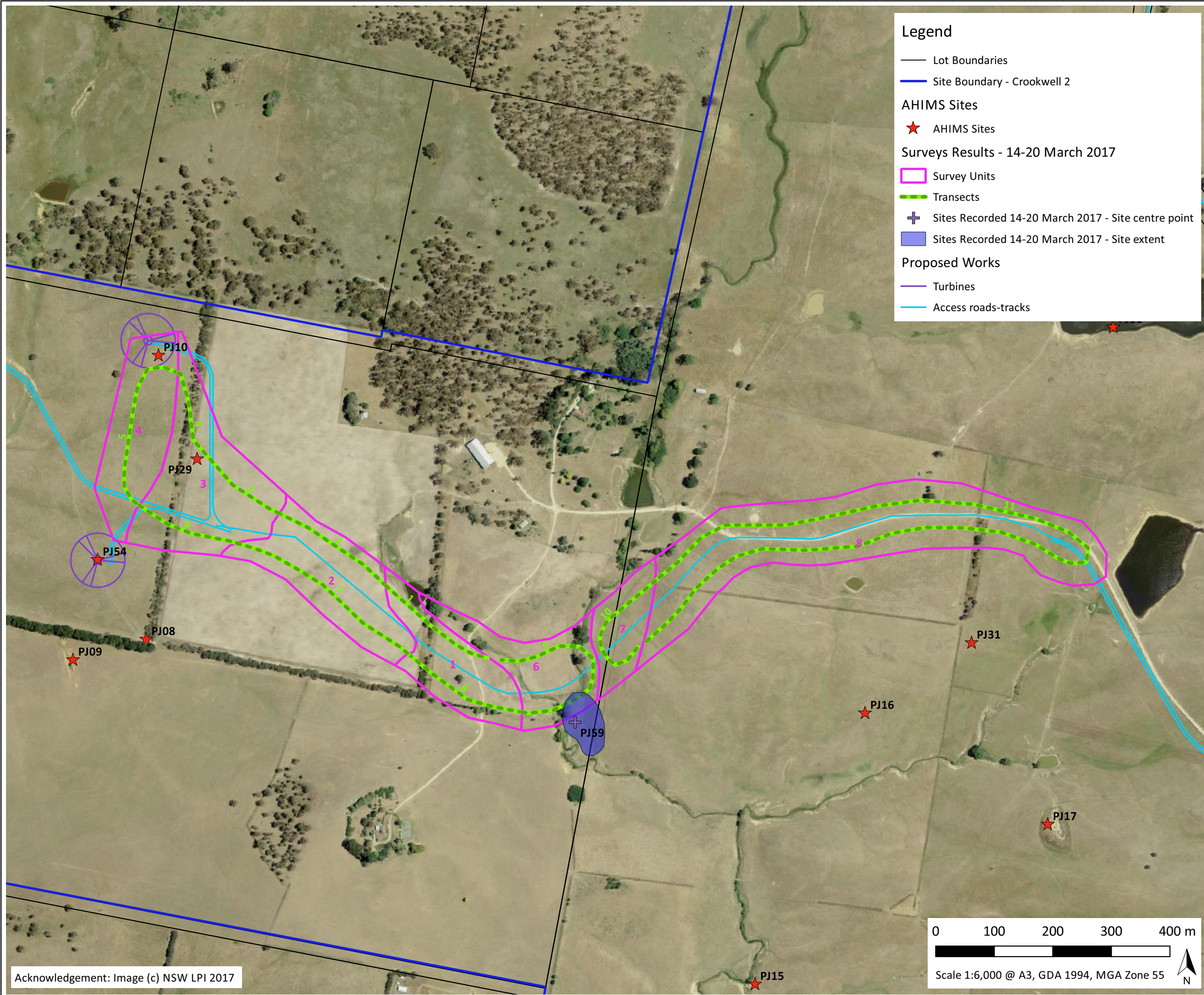
6.4 ARCHAEOLOGICAL SURVEY RESULTS

Field survey was conducted over a 5 day period in March 2017 with three and sometimes four team members (BHM team members and Pejar LALC) walking parallel transects at an average spacing of 10m. Visibility varied across the study area due to vegetation coverage which consisted of grass pasturage. Despite the vegetation coverage, regular exposures were present across the study area and consisted of the following:

- Vehicle access tracks –vehicle access tracks were present across the study area providing long areas of linear exposure across all the main landforms.
- Stock tracks – various confined stock impact tracks across all landforms. These areas of visibility increased on certain landforms such as broad ridgelines, creek flats close to stock crossings and edges of dams and gateways.
- Creek lines – creek line exposures were present along both banks in most sections of creek lines. These exposures were a combination of stock impacts and erosion processes.
- Erosion – areas of erosion and sparser grass coverage were present throughout the Study area particularly on crests and middle slopes.

Transects were positioned to cover all landforms present within the study area. Landforms consisted of wide level crests, simple slopes (upper, middle and lower) and open creek flats in the vicinity of drainage lines. Small confined spur lines and low crests with clearly defined break in slope were also present in some sections. The linear nature of the proposed impacts within the study area allowed for pedestrian transects to be completed across all landforms. Transects were confined to within the alignment corridors for the proposed new access roads and cable crossing. These pedestrian transects and the landforms within the Study area are shown on Figure 7. Transect details are provided in Appendix 3.

Figure 7a. Landforms and survey transects

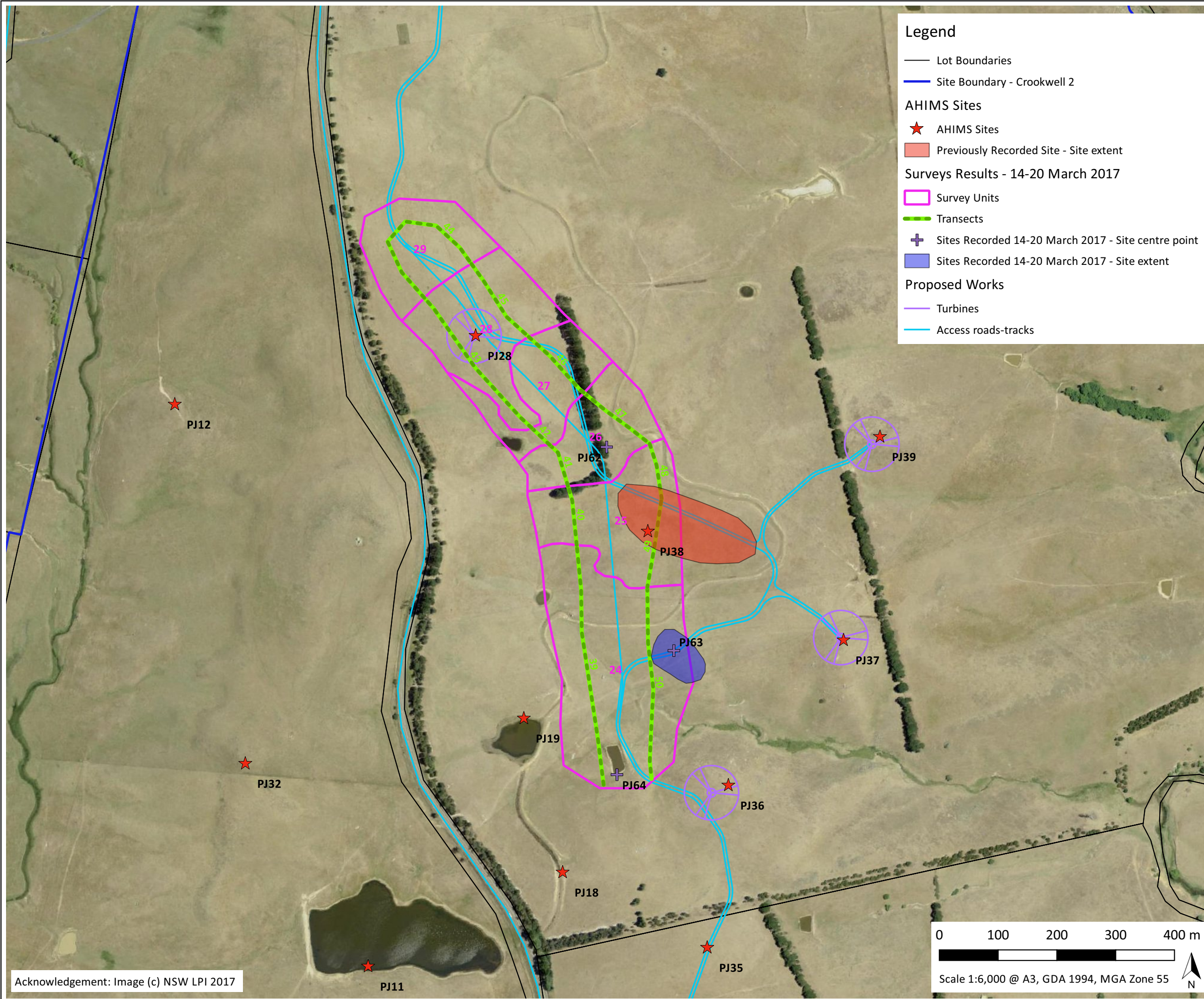


Acknowledgement: Image (c) NSW LPI 2017

Capital Ecology Project No: 2740
Drawn by: R. Speirs
Date: 26 April 2017



Figure 7b March 2017
Survey Results - Detail



Legend

- Lot Boundaries
- Site Boundary - Crookwell 2
- AHIMS Sites**
- ★ AHIMS Sites
- Previously Recorded Site - Site extent
- Surveys Results - 14-20 March 2017**
- Survey Units
- Transects
- ⊕ Sites Recorded 14-20 March 2017 - Site centre point
- Sites Recorded 14-20 March 2017 - Site extent
- Proposed Works**
- Turbines
- Access roads-tracks

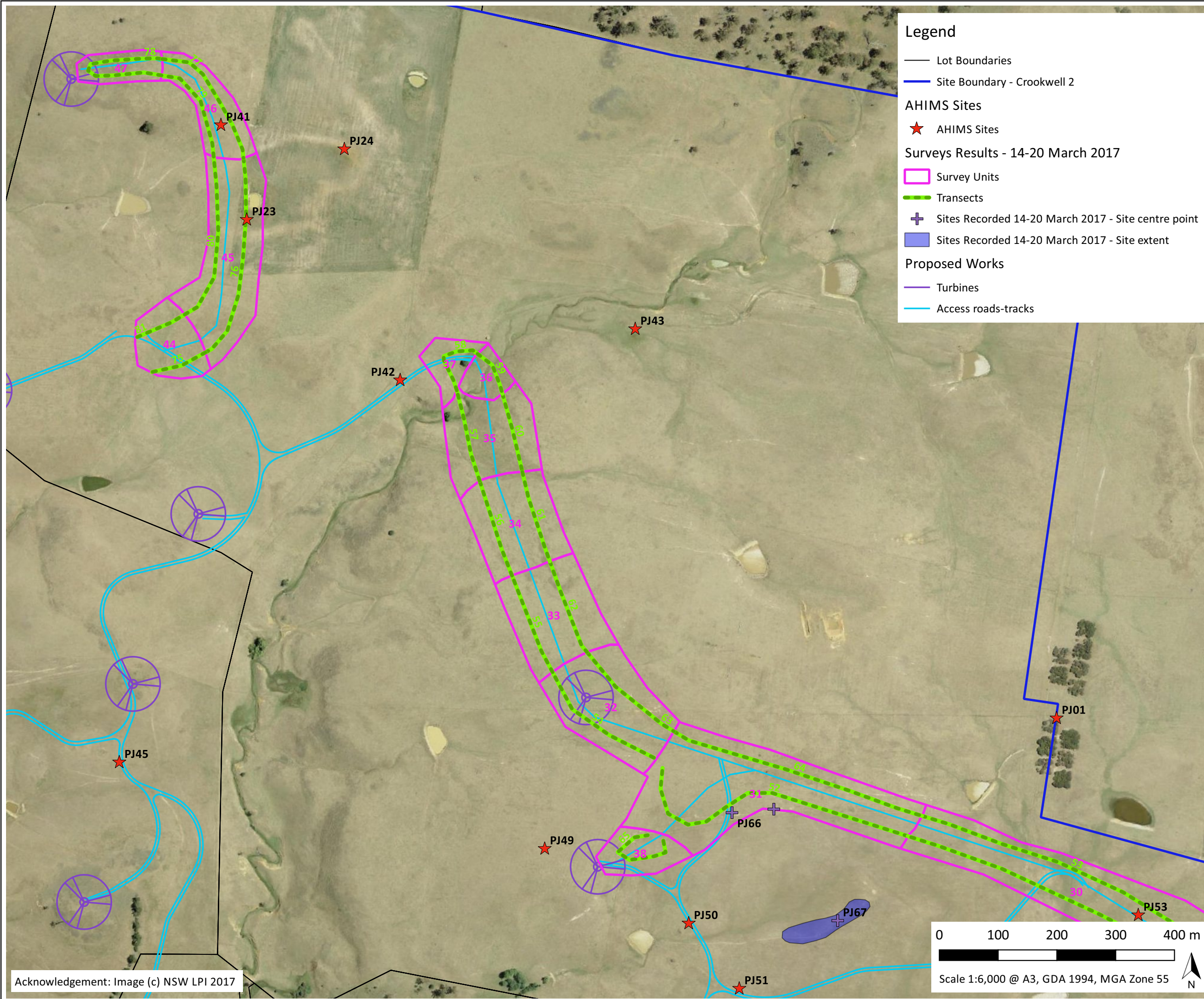
Acknowledgement: Image (c) NSW LPI 2017

0 100 200 300 400 m

Scale 1:6,000 @ A3, GDA 1994, MGA Zone 55

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Figure 7c. Landforms and survey transects



Acknowledgement: Image (c) NSW LPI 2017

Figure 7d. Landforms and survey transects

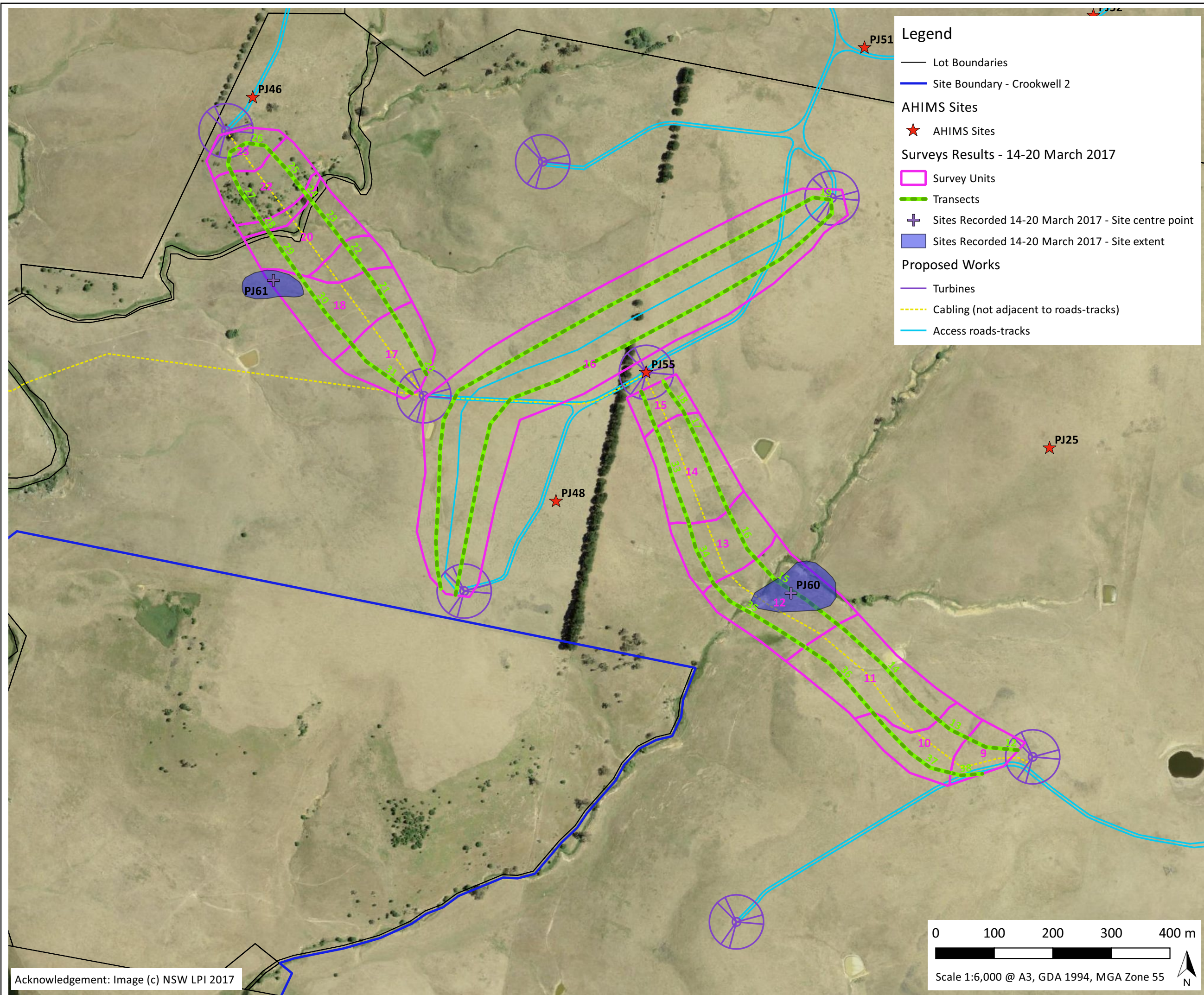
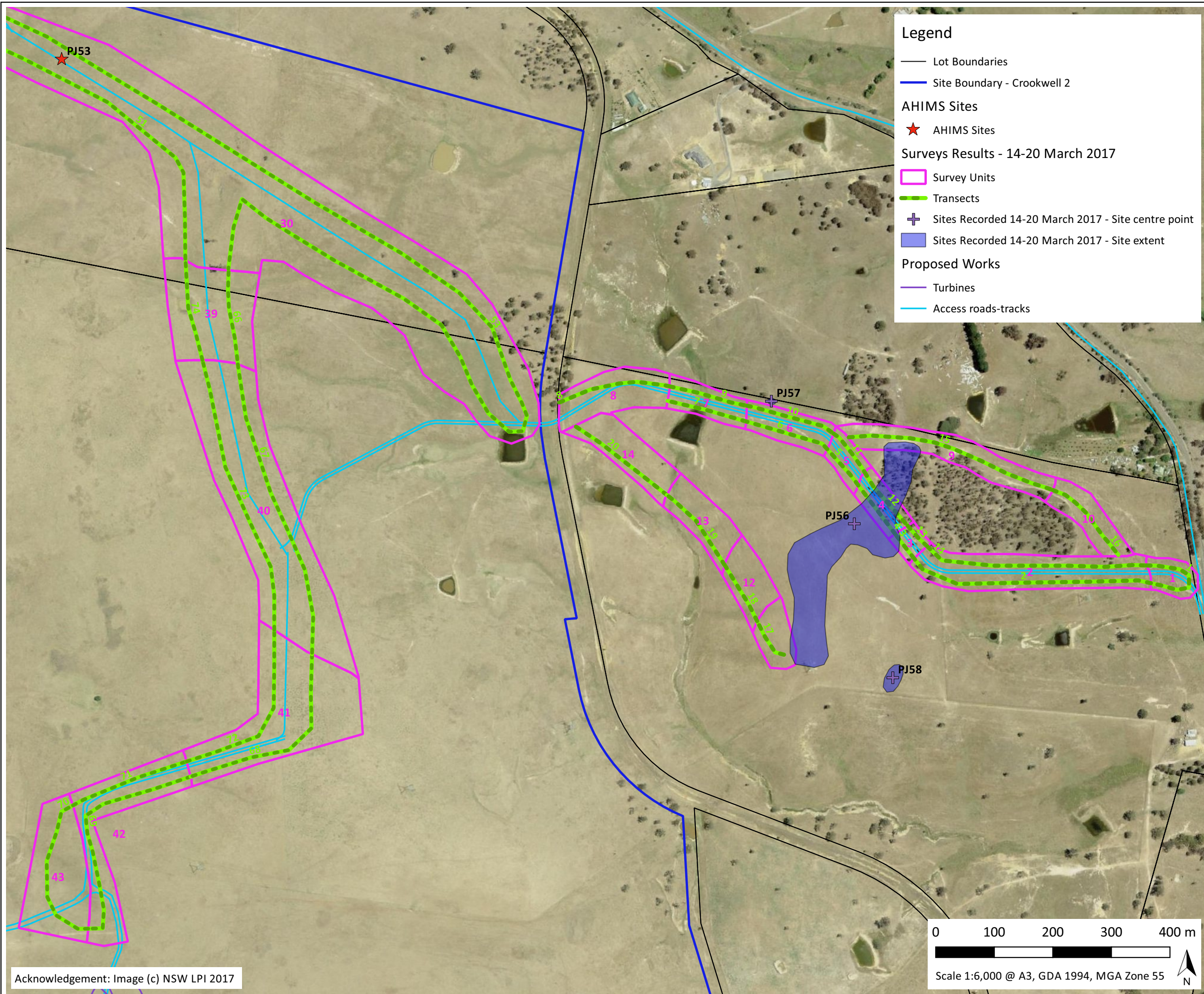


Figure 17e. Landforms and survey transects



6.4.1 Ground Surface Visibility (GSV) and Levels of Disturbance

GSV varied across the project area, not as a result of landform, but of livestock rates. Paddocks on the western and eastern sections of Goulburn Road were currently being grazed by sheep and provided clear GSV. Areas to the east along Woodhouselee Road and the central section had lower stocking rates, which results in longer grass coverage. Nevertheless, these landforms had several areas of exposure. Stock also changed from sheep to cattle in some sections of the project area, which resulted in increased grass coverage and larger areas of stock impact exposures.

Over much of the project area, based on field observations during the survey, ploughing for pasture improvement appears to have been undertaken, with numerous piles of collected rocks from the paddocks occurring through all sections of the study area. Collections of removed stumps are also present in some locations across the study area. Previous use of the area for ploughing characterises the study area as holding high levels of disturbance in the surface layers.

Overall, GSV was higher on the broad ridgelines, which often contained stock impact tracks and/or vehicle access tracks across these landforms. Areas of sparser vegetation and minor sheet erosion were also present in some locations. A general background GSV of 20% is present on crests. Areas of impact such as vehicle tracks or stock impact trails held a GSV of 60-80%.

Simple slopes (Upper, Middle and Lower) generally held the lowest GSV rates. These areas were well grassed with a lower occurrence of exposures. An overall low level of less than 5% background visibility is present across these landforms. Areas of confined exposure held a GSV rate of 60-80%. This changed if the slopes led towards a creek crossing, where high levels of exposure occurred due to stock impacts.

Creek flats generally held high rates of ground visibility with levels of erosion present on most creek banks and high levels of stock impact. A background level of 5% consistent with the slopes due to grass coverage continues to apply, but with exposure rates of 70%. GSV within these exposures is considered to be high at 80-90%.

These differing levels of exposure rate and GSV determine the effectiveness of any ground survey and are discussed in the following section for each survey unit. Indicative landforms with GSV levels are shown in Plates 4 to 9.



Plate 4. Survey Unit - Lower Slopes



Plate 5. Survey Unit - Middle Slopes



Plate 6. Survey Unit - Upper Slopes



Plate 7. Survey Unit - Crest



Plate 8. Survey Unit - Creek Flats



Plate 9. Area of exposure - Creek line

Soils and landforms within the study area were examined to assess the presence of erosion within the Study area and whether soil structures were stable, aggrading or eroding across the project area. No large areas of active erosion were present, despite areas having been impacted in isolated scours on crests, slopes and in particular creek banks. This result agrees with Hird's (1991) description of the soils of the area as being stable and only moderately erodible. It is concluded that the soils within the landforms surveyed appear to have not been stripped away with natural soil deposits still present within the project area. However, due to past ploughing practices across much of the study area, these soil deposits are likely to be inverted and disturbed in their upper profiles.

6.4.2 Survey Coverage

The factors of GSV, level of disturbance, the number of survey participants and the spacing of transects all combine to provide estimates of survey coverage and effectiveness.

Three, sometimes four participants completed surveys at approximately 10m spacing, with each participant effectively inspecting an area of 2m on each side of them (Burke and Smith 2004). The physical area inspected, with the GSV and exposure rate for each Survey Unit and Landform taken into account, provides the survey coverage.

The landform information and a summary of effective survey coverage for the study area is provided in Appendix 3. These calculations are based on the formula provided in Requirement 10 of the Code of Practice. The division of the study area into landforms and survey units is shown in Figure 7.

6.5 NEW SITE RECORDINGS - WOODHOUSELEE ROAD

During the site inspections, three Aboriginal heritage sites were identified and recorded along the access alignment from Woodhouselee Road. The site locations conform to the site prediction model and the site types previously located within the study area by Biosis (2004 and 2005). Site record numbering commenced at PJ56 to continue the previous sequence for the labelling of heritage sites within the study area. Details of each identified site are provided below. Completed AHIMS site cards for the newly identified heritage sites are attached at Appendix 2.

PJ56 and PAD – Woodhouselee Road access 740668.6173526 Zone 55 MGA

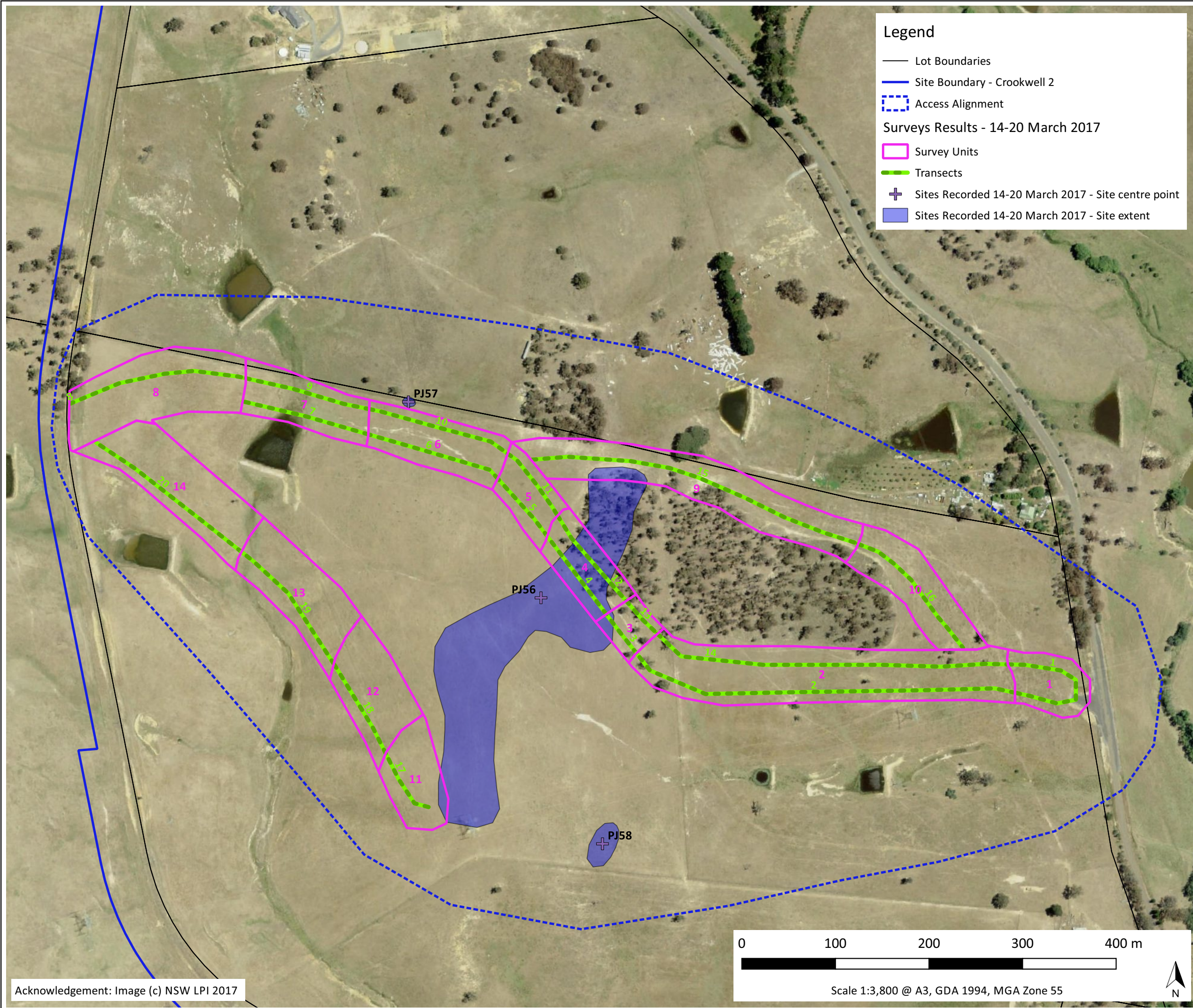
PJ56 consists of a large surface scatter on a section of the proposed road access from Woodhouselee Rd to the Wind Farm site. The site is located across a broad level ridgeline running from the edge of a tree stand, southwest to the transmission line tower. The artefacts are confined to this landform. In excess of 50 artefacts were noted at this location, but were not subject to detailed recording, with the focus instead on defining the extent of surface artefacts and edge of the associated PAD. The location of the site and the boundary of the associated PAD is shown on Figure 8, 9 and 10.

This area has suffered impacts from past ploughing across the landform. The state of the area as shown by aerial photography is presented in Figure 9. This degree of disturbance would indicate that the primary locations of the artefacts are not in-situ, but in close association. There is sparse vegetation coverage with a high GSV of 60% overall, with frequent exposures in the form of erosion scours and animal impact trails.



Figure 8. Aerial Photo 2017 of PJ56 site area within ploughed paddock

Figure 9. March 2017
Survey Results



The main access road from Woodhouselee Road follows this alignment and impacts to this site cannot be avoided, although they can be minimised by confining impacts to a 6m road corridor. A collection of surface artefacts within that 6m corridor and subsurface testing of the underlying deposits is proposed for this location. Details of identified artefacts are provided in Table 5.

Table 5. PJ56 artefact details

Material	Artefact Type	Dimensions (mm)	Comments
Silcrete	Flake	12x8x5	Flaked platform, feather termination
Silcrete	Proximal Flake	10x5x4	Flaked platform, snapped?
Quartz	Flake	20x10x3	Flat platform, feather termination
Quartz	Flake	11x4x2	Flat platform, feather termination
Quartz	Flake	6x4x2	Flat platform, feather termination
Quartz	Flake	17x13x5	Flat platform, feather termination
Quartz	Core	15x10x8	Multifacial, unidirectional 4 faces
Silcrete	Flake	19x11x8	Flaked platform, feather termination
Quartz	Flake	18x8x3	Flat platform, feather termination
Tuff?	Proximal Flake	10x8x3	Flat platform, snapped?
Silcrete	Flake	12x14x3	Flat platform, feather termination
Silcrete	Core Fragment	22x10x11	Unifacial, unidirectional
Quartz	Flake	10x10x4	Flat platform, feather termination
Quartz	Flake	6x6x3	Flat platform, feather termination
Silcrete	Flake	16x8x5	Flat platform, feather termination
Quartz	Flake	8x8x5	Flat platform, feather termination
Chalcedony	Flake	8x15x3	Flat platform, feather termination
Quartz	Distal Flake	12x11x7	NA, feather termination
Quartz	Flake	10x7x3	Flat platform, feather termination
Silcrete	Flake	12x16x6	Flaked platform, feather termination
Silcrete	Proximal Flake	17x18x10	Flat platform, NA
Silcrete	Flake	20x9x7	Flat platform, feather termination

The site location is shown in Plate 10- 12 and a selection of artefacts in Plate 13.



Plate 10. Location of PJ56 – south extent



Plate 11: Location of PJ56 – north extent



Plate 12: PAD surface with artefacts looking south



Plate 13: selection of artefacts

PJ57 – 740491.6173718 MGA Zone 55 MGA

This site is located within a small area of exposure along the fence line, approximately 20 m to the north of the proposed road alignment. The site consists of three flakes located in the mid to lower slopes area close to the fence line. Visibility in this area is still high (60%) due to ploughing impacts and its location within an erosion scour. This can be seen in Plate 14. The details of the identified artefacts are provided in Table 6 with site photos and artefacts in Plates 14 and 15.

The site is not located within a planned area of impact and impacts should be avoided. Fencing of the site with a buffer zone of 10m may be required to prevent impacts.

Table 6. Artefact details Site PJ57

Material	Artefact Type	Dimensions (mm)	Comments
Quartz	Core	35 x 42 x 31	5 removals, multidirectional and multifacial – cortex present 40%.
Quartz	Flake	15x11x6	Flaked platform, feather termination
Quartz	Flake	17 x 19 x 6	Retouched on edges, rough microlith form



Plate 14: PJ57 site location



Plate 15: Artefacts PJ57

PJ58 - 740693.6173230 Zone 55 MGA

This site consists of a small surface scatter of 3 flakes located on the mid-slope of a crest heading west to the creek line. An electricity transmission tower is located on the top of this crest. The site is located in a linear exposure measuring 10cm x 10m of a sheep impact trail. GSV within the exposure is high at 90%. Away from the exposure created by this trail GSV was low at <5%. Details of the identified artefacts are provided in Table 7. Site location and the identified artefacts are shown in Plates 16 and 17.

No impacts are planned in this location and the site is distant to any of the proposed construction work. The site should not be impacted by any of the proposed works in the area, and does not require barrier fencing. Details of identified artefacts are provided in Table 7.

Table 7. Details of artefacts Site PJ58

Material	Artefact Type	Dimensions (mm)	Comments
Silcrete	Proximal Flake	12x14x6	Distal margin removed by retouch
Quartz	Distal Flake	17x13x5	Feather termination
Quartz	Flake	84x45x26	Flaked platform, feather termination



Plate 16: Site location PJ58



Plate 17: Artefacts PJ58

The recorded site locations are shown on Figure 8.

6.6 NEW SITE RECORDINGS -MOD-2

During the field survey of the amended road and cable alignments, 9 Aboriginal heritage sites were identified and recorded. The site locations conform to the site prediction model and the site types previously located within the study area by Bosis (2004 and 2005). Site record numbering commenced at PJ59 to continue the previous sequence for the labelling of heritage sites within the study area. Details of each identified site are provided below. Site locations are shown on Figure 7. Completed AHIMS site cards for the newly identified heritage sites are attached at Appendix 2. All of these sites may be avoided by placement of the road and cable alignments within the wider impact corridor away from these site locations.

PJ59 and PAD - 734286.6174220 GMA Zone 55

Located at the confluence of First Creek with a minor tributary. The site consists of a surface scatter of 6 artefacts extending across a 3m length along a stock trail on the eroded creek edge. This feature is located on a level terrace between two tributaries which is considered to hold moderate subsurface potential. The site probably extends further than recorded, but identification was limited by GSV. GSV in this area was estimated at 0-<5% due to grass coverage with exposures limited to the stock trails along the creek bank. Within these stock trails GSV was high at 90% only obscured by naturally occurring gravels and quartz.

This site location is to the south of the proposed road alignment and should not be impacted by the proposed works. The management strategy of avoiding impacts to this site should be followed. Details of recorded artefacts at PJ59 are presented in Table 8 with the site location and a representative sample of artefacts in Plates 18 and 19.

Table 8. Artefact details Site PJ59

Material	Artefact Type	Dimensions (mm)	Comments
Silcrete	Flake	16x7x3	Flaked platform, feather termination, retouch along the right lateral margin

Material	Artefact Type	Dimensions (mm)	Comments
Silcrete	Core	22x10x12	8 unidirectional removal
Silcrete	Core	10x10x6	7 Bi-directional removals
Quartz	Flake	14x12x4	Flat platform and feather termination, backing retouch along left lateral margin, use wear on right lateral margin
Quartz	Flake	6x6x3	Flat platform and feather termination
Silcrete	Flake	16x8x2	Flaked platform and feather termination



Plate 18. PJ59 site location



Plate 19: Sample artefacts.

PJ60 and PAD - 738490.6173282 - 737591.6173700 Zone 55 MGA

Site PJ60 consists of a large dispersed scatter (50+ artefacts) along the deeply incised Gray's creek bank, near the confluence with a minor drainage line. The central section has been subject to high levels of stock impact and erosion as it funnels all stock across the natural crossing. At this point, the water is shallow with bedrock present allowing easy access to each bank. A continuous exposure runs along the creek bank for this length with a GSV of 95%. The site is associated with an area of PAD on the level terrace above the creek line and extends for 20m from the creek line. Artefacts are eroding from the exposed cuttings underlying this area of PAD. A sample of artefacts were recorded from various loci within the site. These artefact details are provided in Table 9 and the site location and artefacts photographs can be seen in Plate 20 and 21. Detailed recording of this site should be undertaken.

Table 9. Artefact details Site PJ60.

Grid Location	Material	Artefact Type	Dimensions (mm)	Comments
738532.6173243	Quartz	Flake	34x21x11	Flat platform, feather termination retouch flakes along all edges

Grid Location	Material	Artefact Type	Dimensions (mm)	Comments
	Silcrete	Distal Flake	26x21x12	Feather termination
738417.6173234	Quartz	Flake	25x13x8	Flat platform, feather termination
	Quartz	Flake	15 x25x5	Flat platform, feather termination
	Quartz	Flake	8x4x2	Flaked platform, feather termination, use wear on lateral margin



Plate 20: Site PJ60



Plate 21: Sample artefacts

This site and associated area of PAD are within the proposed cable alignment and a program of re-design to avoid impacts or mitigation measures will need to be undertaken.

PJ61 and PAD - 737626.6173765 Zone 55 MGA

This site consists of a dispersed surface scatter across the gently sloping mid-slopes leading to a creek line. The artefact scatter extends in an area of exposure approximately 10-15m visible on stock impact trails leading to a dam. GSV within the stock impact exposures and vehicle impacts was high at 95% with less than 5% overall visibility due to grass coverage.

A selection of artefacts was recorded, with total numbers estimated at 30+. This site location can be avoided by the cable alignment and a program of avoidance should be undertaken. Detailed recording of this site should be undertaken.

The artefact details are provided in Table 10 with the site location and representative sample of artefacts shown in Plates 22 and 23.

Table 10. Artefact details Site PJ61

Grid Location	Material	Artefact Type	Dimensions (mm)	Comments
737626.6173765	Silcrete	Proximal Flake	22x15x4	Faceted platform, use wear along both lateral margins
	Silcrete	Flake	18x10x4	Flaked platform and feather termination

Grid Location	Material	Artefact Type	Dimensions (mm)	Comments
	Silcrete	Flake	22x17x3	Flaked platform, feather termination
	Core	Quartz	35x22x22	12 unifacial and unidirectional removals.
	Chert	Flake	15x9x5	Flat platform and stepped platform
	Quartz	Flake	25x16x8	Flaked platform and feather termination



Plate 22: PJ61 site location



Plate 23: Sample artefacts

PJ62 - 735608.6175740 Zone 55 MGA

This site consists of a single quartz flake located to the north of the machinery shed (at PJ38) close a row of mature pine trees which have been planted in a wind break. The site is located on a stock impact track leading from the shed to a drainage line on the lower slopes. GSV was low at this location (<5%) with GSV of 60% on the limited exposure of the stock impact trail.

The site location and identified artefact are shown in plates 24 and 25.



Plate 24: PJ62 site location



Plate 25: PJ62 artefact

PJ63 and PAD – 735723.6175394 Zone 55 MGA

This site is located on a broad ridgeline extending from the base of site PJ38 in an area of stock impact trails. The site extends for a length of 20m along the sheep impact trail and consists of 6 quartz flakes. The area of visibility is confined to a 30cm wide impact trail and background visibility in this location was estimated at 10%.

A PAD is associated with this site as the landform is considered to hold high potential for subsurface artefacts based on the previous sub surface testing undertaken for the area. The PAD extends for 30m along the landform to a width of 15m with the site location at its centre. This area will be crossed by the proposed road alignment, but can be avoided by building the road to the west of the corridor. If the road cannot be realigned, then mitigation consisting of surface collection and build up of road base in this areas will need to be undertaken under an AHIP. Details of the recorded artefacts are provided in Table 11. Site location and artefacts are shown in plates 26 and 27.

Table 11. Artefact Details Site PJ63

Material	Artefact Type	Dimensions (mm)	Comments
Quartz	Flake	23x18x5	Flat platform. Step termination
Quartz	Flake	26x12x8	Flaked platform, feather termination
Quartz	Flake	19x11x8	Flaked platform, feather termination
Quartz	Flake	21x17x5	Flaked platform, feather termination
Quartz	Flake	18x8x3	Flat platform, feather termination
Quartz	Flake	23x18x8	Flat platform. Step termination



Plate 26: PJ63 site location



Plate 27: PJ63 artefacts

PJ 64 – 735627.6175183 Zone 55 MGA

This site consists of 2 quartz flakes identified on the edge of a dam within the exposed water line. GSV in this location was high at over 95%. Background visibility in the grassed surroundings is estimated at 10% which is relatively good due to the close cropping of the grass. This area has been impacted by the dam construction and the artefacts are not considered to be in-situ. This site location on the dam edge will not be impacted by the proposed works. Details of the artefacts are provided in Table 12 and photos of the artefacts and site location are provided in Plates 28 and 29.

Table 12. Artefact details site PJ64

Material	Artefact Type	Dimensions (mm)	Comments
Quartz	Flake	12x6x1	Flaked platform, feather termination
Quartz	Flake	22x10x8	Flaked platform, feather termination



Plate 28: Location of site PJ64



Plate 29: Artefacts PJ64

PJ 65: 738589.6174477 Zone 55 MGA

This site consists of three flakes and is located on an animal access track on the upper slopes of a broad rise leading to the turbine location F36, in an area of erosion due to water runoff. The exposure measures approximately 3m wide by 10m long. Despite this large area of exposure and high visibility, only three flakes were located. Details of the identified artefacts are provided in Table 13. Photos of site location and the artefacts are provided in Plates 30 and 31.

Table 13. Artefact details PJ65

Material	Artefact Type	Dimensions (mm)	Comments
Quartz	Flake	28 x32x9	Distal margin removed by retouch
Quartz	Distal Flake	20x13x5	Feather termination

Material	Artefact Type	Dimensions (mm)	Comments
Quartz	Flake	8x12x8	Flaked platform, feather termination



Plate 30: Site location PJ65



Plate 31: Artefacts PJ65

PJ 66: 738658.6174482 Zone 55 MGA

This site consists of two artefacts is located in an area of erosion across a stock impact trail, measuring 5 x 3m. The site is located on the upper slopes rising to the broad ridgeline where turbine F36 will be located.

Details of the identified artefacts are provided in Table 14 and photos of the site location and artefacts are provided in Plates 32 and 33.

Table 14. Artefact details Site PJ66

Material	Artefact Type	Dimensions (mm)	Comments
Quartz	Flake	15 x7x9	Flat platform, step termination.
Quartz	Flake	20x18x8	Flaked platform, feather termination.



Plate 32: PJ66 site location



Plate 33: identified artefacts

PJ67 and PAD – 738787.6174303 Zone 55 MGA

Located on a series of intersecting animal trails on a broad ridgeline this site extends for a length of 30m x 5m wide. This site will probably extend further than recorded. GSV in the animal trails was high at 95% with visibility in the general area also high at 80% due to close cropping of grass in this location and sparsity of grass coverage. Sheet erosion is also active at this location. More than thirty artefacts are estimated to exist at this location, of which 10 were recorded as a sample. This site is interesting in that workable cores were present (5+) implying re-use of the site may have been intended. Two hatchets at differing stages of production were also located – the first to be recorded from any of the surveys in this study area. A distinctive red silcrete, not found in any of the other study area sites was also recorded at this location. The rarity of this material would imply it was a highly valued resource and/or not locally available. Further detailed recording of this site is required.

Details of the identified artefacts are provided in Table 15 and photos of the site location and artefacts are provided in Plates 34 to 41.

Table 15. Artefact details PJ67

Grid Location	Material	Artefact Type	Dimensions (mm)	Comments
738809.6174321	Quartz	Microlith	8x12x3	Backing retouch to form triangular microlith on edges
738809.6174321	Quartz	Manuport	82x60x35	Large cobble flaked and left
738802.6174320	Quartz	Flake	25x17x10	Flaked platform, step termination
738802.6174316	Quartz	Medial Flake	12x11x4	Snapped portion
738805.6174317	Quartz	Flake	18 x 8 x 6	Two sections, medial and proximal conjoin

Grid Location	Material	Artefact Type	Dimensions (mm)	Comments
738681.6174266	Greenstone	Hatchet blank	125x71x32	Bifacial flaking along margins to shape, edge grinding has commenced on the distal margin and along small sections of laterals
738730.6174272	Quartz	Flake	10 x 8x3	Flat platform and feather termination
738730.6174275	Basalt	Hatchet blank	132 x 82 x 46	Two sections broken, hatchet then abandoned at early stage of production
738730.6174275	Red Silcrete	Flake	33x28x8	Flaked platform, scalar retouch on distal margin, stepped retouch on proximal lateral margins
738730.6174275	Quartz	Core	15 x 12 x 10	8 Unifacial and Unidirectional removals



Plate 34: PJ67 site location



Plate 35: PJ67 site location



Plate 36: Hatchet 1



Plate 37: Detail of ground edge

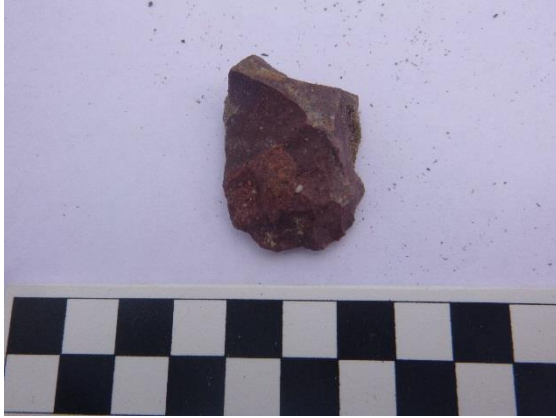


Plate 38: Red silcrete flake



Plate 39: broken hatchet blank



Plate 40: Selection of artefacts



Plate 41: example of left usable material

6.7 SUBSURFACE TESTING REQUIREMENTS

A substantial sub surface investigation program of landforms was undertaken by Biosis in 2005 as infrastructure, thus concentrating on the broad ridgelines with turbine locations, but also targeting access roads and cable alignments, thus crossing simple slopes and creek flats. This resulted in an understanding that the areas with the highest potential for sites were on ridge lines, high to moderate potential on the upper slopes and creek flats, low a potential on mid and lower slopes. (Biosis 2005: 23)

Five new section of road alignments and two new cable alignments were surveyed for the current assessment. These alignments cross all landforms. However, as they are designed to connect the turbine locations they concentrate on the ridge lines and upper slope land formations. The broad flat ridgelines are considered to hold high potential for sub surface sites based on the results of the test pitting program undertaken by Biosis in 2005. The upper slopes are considered as holding moderate potential.

The two cable crossings descend from these ridgelines and upper slopes to the lower slopes and creek line before continuing to the next turbine location. Lower and mid slopes are considered to hold low potential, but in the vicinity of creek lines they are considered to hold high potential based on regional modelling. The results of the Biosis studies did not confirm the high potential

for the creek lines as the focus was away from these features on the locations of the proposed infrastructure (i.e. ridgelines and broad slopes).

Biosis in their 2005 sub-surface test pitting program completed a large number of test pits and shovel probes at each turbine location and along most of the access roads. As a result, in the majority of cases, the realigned sections of road are still located in close proximity to previously tested areas and the subsurface potential in these areas is considered to have been adequately investigated.

Based on the 2005 extensive test pitting program the following has been developed for the Mod-2 alignments:

- In areas where these test pitting investigations showed low density and low potential or only moderate potential, it is considered that test pitting of the realigned sections is not warranted.
- On areas of realignment close to areas found to contain high artefact density or have high archaeological potential, it is considered appropriate that test pitting along the realigned sections should be undertaken.
- On areas of realignment that are not close to any of the previous test pitting programs but the landform is considered to hold low or moderate potential, it is not considered necessary to undertake further test pitting. However, if these areas are located on landforms of high potential, then test pitting will be required to determine the presence and extent of any subsurface deposits along the alignment.

Based on this locational model of subsurface potential (developed by Biosis 2005) and the locations of the previous test pitting program, the following test pitting requirements have been developed for the project. The proposed realignments have been numbered as shown below and are shown on Figure 10. Figure 10 also shows the approximate sections of road on which locations of test pits were completed in 2005 (Biosis 2005).

Alignment 1 - Ahgunyah access road. This alignment runs along the existing graded farm entry road, to Turbine F6. This alignment was subject to test pitting at the turbine locations and along the mid and lower slope landforms to the original alignment. Isolated artefacts were located and the area is considered to hold a low potential for subsurface deposits within these landforms. No further investigations are required for this alignment.

Alignment 2 - Turbine F12 to F20 - this alignment has been subject to test pitting at the turbine locations and along the northern half of the alignment. Approximately 100m of this alignment is considered to hold moderate potential around the location of the PAD associated with PJ63. Impacts should be avoided by redesign. This is also close to site PJ38. If areas of PAD are avoided then test pitting is not required.

Alignment 3 - Turbine F24 to turbine F25 - both turbine locations, and the area of crest leading to them, have been subject to test pitting with low archaeological potential resulting. The section of alignment not tested crosses the lower slopes which are considered on landform to hold low potential. Test pitting is not required along this realignment.

Alignment 4 - From a tributary creek line to turbine F36. Both ends of the alignment have been subject to test pitting with no results. The alignment runs up the simple slopes to the crest. These

slopes are considered to hold low potential due to their gradients and results of the previous investigations. No further investigations are required.

Alignment 5 - Running from turbine F36 across the upper slopes and down to the lower slopes west of the Railway easement. Subsurface testing has occurred at Turbine locations and along the crest section. Testing has also been undertaken on the mid-slope section where site PJ53 is located. This area was found to contain low potential. The section located between these two groups of subsurface testing crosses the mid to upper slopes and is located directly north of the large site PJ67. As a result, this area is considered to hold high potential and should be subject to a program of test pitting.

Alignment 6 - runs from Alignment 5 to the proposed electricity substation. This alignment has been test pitted along its northern and southern extent. Fifty percent of the crest section has been investigated, to the west along the original alignment, which runs across the same landform. Despite being located on a broad ridgeline considered to hold high potential no subsurface deposits were located in any of these locations. As only a section (approximately 400m) has not been tested, it is considered that further testing is not required along this alignment.

Alignment 7 - runs from turbine F40 to F32 to F43. This alignment is located within the broad ridgelines and upper slopes, considered, based on modelling, to contain high potential. However, testing undertaken for the turbine locations resulted in the identification of no artefacts at any of these turbine locations. This alignment runs to the north of Turbine F41 which is located on the same landform. Only a single artefact was located at F41 (PJ55). Based on these results it is considered that the landform hold low potential for subsurface sites.

Cable alignment 1 - running from turbine F45 to F41 this alignment crosses simple slopes and Gray's creek to the next turbine location. The high potential crest landforms have been tested in the turbine locations with only a single artefact identified (PJ55). An area of PAD in association with site PJ 57 is located in the centre section of the alignment and while require testing if any impacts are to occur. The remaining, approximately 440m, of alignment is located on simple slopes considered to hold low potential. Impacts can be avoided at this PAD location by redesign of works or engineering solutions.

Cable alignment 2 - running from turbine F32 to F31 this alignment runs down simple slopes to the creek line and then up a steep slope to F31. The steepness of this slope removes all potential from this section of the alignment. The creek bank and flats contained high visibility at the time of survey with no identifiable artefacts. The area of the upper slopes is close (50m east) to site PJ60 where a large scatter and area of PAD were identified during the current field surveys. It is considered that this section of the alignment over the upper slopes, progressing to F32, holds potential and should be subject to a program of test pitting. An approximate length of 100m should be tested.

In summary, 4 of the proposed alignments (A2, A5, CA1 and CA2) contain sections that require further subsurface testing to determine the presence and extent of any subsurface deposits if impacts are to occur. Of these 4 locations, 2 (A2 and CA1) can avoid all impacts through placement of the road or cable alignment. This leaves two sections (A5 and CA2) which should be subject to test pitting. The area to be investigated is shown on Figure 10.

The methodology to be undertaken for the subsurface testing program is provided below and follows the Code of Practice (DECCW 2010) and as a result does not require an AHIP prior to commencement.

6.7.1 Subsurface Testing Methodology

The principle aims of the subsurface test excavations are to identify and understand the nature, extent and associated significance of any archaeological sub surface deposits located within the identified areas of archaeological potential along the proposed alignments as shown in Figure 10.

The aims of the testing programme are to:

Determine whether sub surface deposits exist which may be impacted by the development.

- If so, to determine the extent and nature of the deposits.
- Identify if the cultural material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy.
- Analyse any cultural material recovered (such as stone artefacts or faunal material).
- Assess with RAPs the significance of any deposits.
- Inform current knowledge of Aboriginal occupation and land use models of the region by sampling the sub surface deposits across the study area.
- Provide management and mitigation measures for Aboriginal archaeological objects located during the subsurface testing program.

6.7.2 Area of Potential Archaeological Deposit

Four sections along the proposed road alignments for Mod-2 have not been tested for subsurface deposits and are considered to hold moderate potential for deposits. Of these 4 sections, two (A5 and CA2) will be impacted by the development. These sections of alignment are shown on Figure 10. These areas extends for approximately 150m and 200m respectively.

A series of test pits across the area of PADs along the proposed alignment is suggested for the project at 10m intervals. This spacing of test pits has been determined based the need to locate areas of foci. The exact placing of test pits will be confirmed with the RAPs whilst on site at the beginning of the excavation program.

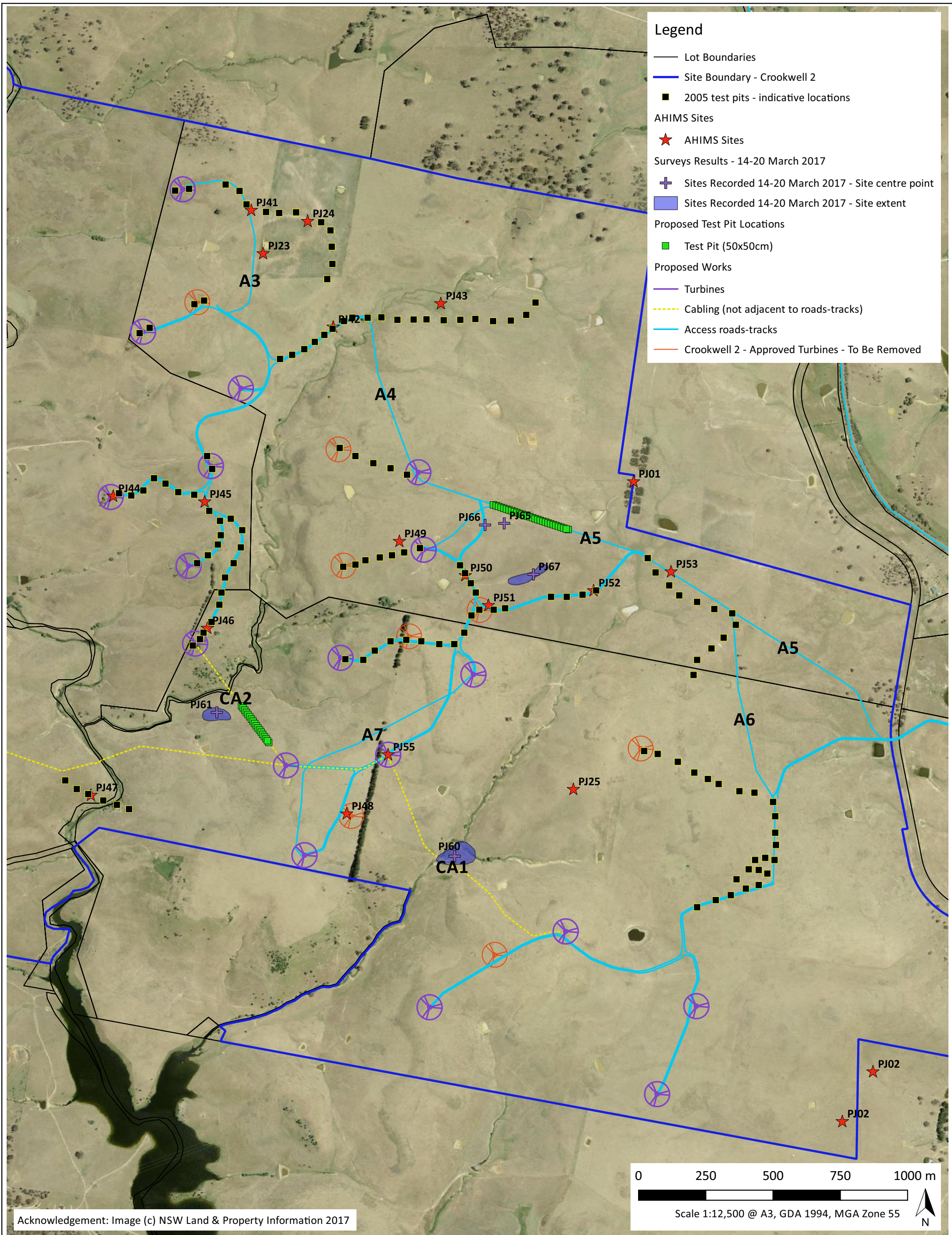


Figure 10a. Location of area for further subsurface investigation

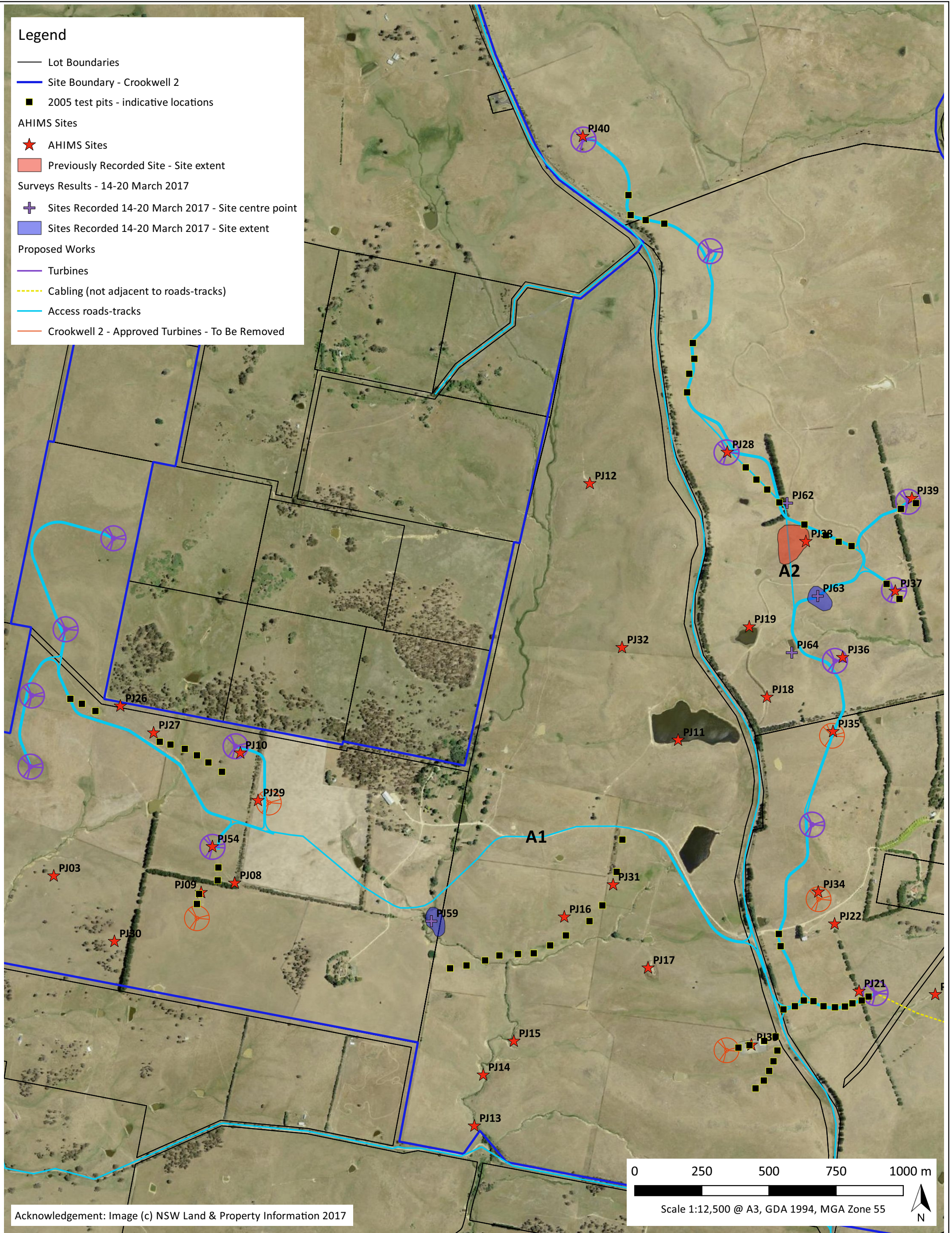


Figure 10b. Location of area for further subsurface investigation

6.7.3 Excavation Methodology

It is proposed to undertake a series of test pits measuring 50 x 50cm across the identified area of sensitivity, sampling the different landforms to determine the presence of subsurface deposits and to locate any areas of differing density of artefacts.

The following methodology will be followed:

- Mark out and record the location of each excavation test pit. Test pits will measure 50cm x 50cm.
- Transect lines of test pits spaced evenly across the PAD areas and crossing the different land form elements of crest and upper slopes will be marked out and excavated. The test pits within these lines would be spaced approximately 10m apart and would be excavated to a maximum of 50cm or if cultural material is located to culturally sterile layers. Excavation would cease if no material has been discovered at 50cm as previous research in the area indicates that materials are most likely to occur in the upper layers (Biosis 2005).
- Pits will be excavated by shovel and trowel using standard archaeological methodology including recording of spit levels and sedimentary, cultural and stratigraphic features. Section drawings and photographs of each test pit will be taken and pH measurements for representative soil samples taken.
- Spit intervals will be 50mm for the first spit then 100mm unless cultural or stratigraphic features require this interval to be varied.
- All excavated material would be wet or dry sieved through a 5mm mesh. The excavation and sieving stations would be under the direction of heritage staff assisted by representatives of the RAPs.
- Any cultural material recovered would be labelled with its location and depth, removed for temporary storage and analysis, recorded, analysed and reburied in accordance with the Code of Practice in each excavated square.
- In the event that any of the following are found then excavation will cease:
 - In situ bone material relating to Aboriginal occupation is identified;
 - A lithic flaking floor or dense cultural layer is identified requiring detailed salvage;
or
 - Bedrock or massive clay substrate is encountered.
- Excavation pits will be backfilled with sieved material and then topped up with clean imported fill if required.

1.3 Analysis of Cultural material

Any faunal material recovered will be sorted to species and minimum number of individuals. All lithic items will be examined in detail using a low-power hand lens.

A basic analysis of lithic variables such as raw material, size, primary and secondary flaking characteristics (platform and termination type, degree of retouch) will be undertaken on recovered lithics from subsurface contexts whilst on site. If large quantities of artefacts are identified, then

excavation will cease as the aim is to determine the potential and extent of any deposits and the recovered artefacts either analysed on site or removed temporarily to the Canberra office of Past Traces.

On completion of the lithic analysis the items will be stored individually in resealable plastic bags marked with their identification number and provenance. Artefacts will then be reburied at the bottom of each excavation square in accordance with the requirements of the Code of Practice (OEH 2010). If this area is then to be impacted by the proposed works an AHIP for their recovery will be applied for and artefacts deposited with the Pejar LALC under the current care and control permit for the project.

6.8 SUMMARY OF ARCHAEOLOGICAL SURVEY RESULTS

Archaeological survey was undertaken across the study area in March 2017, which resulted in the identification of twelve (12) Aboriginal cultural heritage sites. Of these, impacts to eleven sites can be avoided by placement of the road alignment within the corridor or by alternative methods at the cable crossings. These 12 sites range from small area specific surface scatters to large dispersed surface scatters along broad flat ridgeline locations. The locations of previously recorded Aboriginal sites were inspected with no signs of impacts having occurred to, or in the vicinity of, any of these sites. No surface artefacts were relocated at the previously recorded site location.

The study area is situated on a series of gently undulating low crests and rises, broad flat ridgelines and gentle slopes to tributary creek lines. It is thought that prior to European settlement the area would have supported temperate grassland community on lower slopes with scattered woodlands on the mid and upper slopes (Hird 1991). A Ribbon Gum forest community would have been present on the northern half of the study area.

Based on the field survey findings, the model developed by Biosis as a result of the 2004 and 2005 studies is correct in its general description of the archaeological potential of the differing landforms within the study area. Unlike other predictive models for the Goulburn /Crookwell region (i.e. Fuller 1989) the large surface sites identified by this assessment have been located at a distance to water along broad flat ridgelines. It should be noted however, that intensive survey has been confined to areas of potential wind turbine impact. This has resulted in a concentration of survey effort on these landforms and not along the waterways where other studies would predict site locations.

As a result of the field survey it is concluded that it is unlikely for any unidentified cultural heritage sites to be located within the proposed route alignments. Several large artefact scatters with associated PADs were located on the broad ridge lines in areas previously not investigated. The locations and extent of these PADs has been detailed in the preceding section. The location of these sites conforms to the model developed by Biosis: that sites will most likely be located either on the broad ridge lines or at the edge of creek lines. These surface site locations will require further investigation and mitigation measures if impacts cannot be avoided by placement of the proposed new access roads and cable locations.

The route alignments cross landforms considered to hold high potential for subsurface artefacts (i.e. the broad flat ridgelines). These landforms were tested at these turbine locations and access tracks during the 2005 program (Biosis 2005 and 2011) with subsurface sites being identified. As extensive testing in these locations have been completed, it is not considered necessary to

undertake further testing across most of the areas of impact for the proposed new access routes. This is because the potential for these areas has been adequately investigated and it is considered unlikely that any significant large subsurface deposits would have escaped detection during this subsurface testing program. A section as shown on Figure 10 is located in areas not subject to previous testing and would benefit from limited subsurface testing to determine the presence and extent of any archaeological deposits.

7 SCIENTIFIC VALUES AND SIGNIFICANCE ASSESSMENT

7.1 SIGNIFICANCE CRITERIA

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community, and archaeological (scientific) values (ICOMOS 2013). This report will assess the scientific values, while the Aboriginal Cultural Heritage Assessment Report will detail the cultural values of Aboriginal sites in the study area.

There are two criteria generally used in assessing the scientific significance of Aboriginal heritage sites:

- Research potential – the potential of a site to provide information which is of value in the scientific analysis of research questions.
- Representativeness – an assessment of whether the artefact or place is a good representative of its type. The regional type of site is a factor in this assessment. For example, in an area where the average site is over 50 artefacts then this site type would be considered common, in areas where the average site is 10 artefacts then a site with over 50 artefacts would be considered rare.

7.2 SIGNIFICANCE ASSESSMENT

The following archaeological significance assessment is based on Requirement 11 of the *Code of practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). Using the assessment criteria detailed in Scientific Values and Significance Assessment, and outlined above, an assessment of significance was determined. The previously recorded sites were assessed by Biosis (2004, 2005) as holding low significance in most cases with some sites (PJ21 for instance) holding high significance. Since these sites are subsurface and not visible, for this assessment the findings are based on the results of the Biosis 2005 subsurface testing. The review of the significance assessment as set out in Table 16 concur with the findings of previous assessments as no event has occurred to change this assessment.

The twelve additional sites identified by the field survey have also been assessed against the criteria set out above in Section 7.1. The results of the assessment have also been included in Table 16.

For the Crookwell sites the following can be summarised as criteria for significance:

- High significance – These site are likely to contain a high density and diversity of materials or artefacts. They will be in good condition, holding the potential to provide further information on past Aboriginal occupation of the area.
- Moderate or low significance – these sites are not notable in themselves consisting of low numbers to isolated finds of common materials and artefact types. As a suite of sites they provide information on landscape usage, resource utilisation and focus areas.

Table 16: Scientific significance assessment of archaeological sites within impact areas.

No	Site number	AHIMS No	Contents	Research Potential	Representativeness	Scientific Significance
1	PJ10	51-6-0218	Isolated surface find	Low	Common	Low
2	PJ21	51-6-0229	84 Subsurface artefacts along ridgeline,	High	Uncommon	High
3	PJ23	51-6-0231	8 artefacts on dam edge	Low	Common	Low
4	PJ26	51-6-0348	subsurface isolated find	Low	Common	Low
5	PJ27	51-6-0322	subsurface isolated find	Low	Common	Low
6	PJ28	51-6-0323	subsurface isolated find	Low	Common	Low
7	PJ29	51-6-0324	Isolated surface find	Low	Common	Low
8	PJ35	51-6-0330	23 subsurface artefacts in 50 x 50m area	Moderate	Common	Medium
9	PJ36	51-6-0331	subsurface isolated find	Low	Common	Low
10	PJ37	51-6-0349	1002 subsurface artefacts in single square	High	Rare	High
11	PJ38	51-6-0332	38 subsurface artefacts on 230 m linear length	High	Common	Medium
12	PJ39	51-6-0333	19 subsurface artefacts in 50 x 50 m area	Moderate	Common	Medium
13	PJ40	51-6-0331	3 subsurface artefacts in 50 x 50m area	Low	Common	Low

No	Site number	AHIMS No	Contents	Research Potential	Representativeness	Scientific Significance
14	PJ41	51-6-0335	6 subsurface artefacts in 50 x 50m area	Low	Common	Low
15	PJ42	51-6-0336	10 subsurface artefacts along 300m linear length	Moderate	Common	Medium
16	PJ44	51-6-0338	2 subsurface artefacts	Low	Common	Low
17	PJ45	51-6-0339	24 subsurface artefacts in 250 x 250m area	Moderate	Common	Medium
18	PJ46	51-6-0340	3 subsurface artefacts in 50 x 50m area	Low	Common	Low
19	PJ48	51-6-0342	2 subsurface artefacts	Low	Common	Low
20	PJ49	51-6-0343	16 subsurface artefacts along 200m transect	Moderate	Common	Medium
21	PJ50	51-6-0344	subsurface isolated find	Low	Common	Low
22	PJ51	51-6-0345	323 artefacts in one test pit only	High	Rare	High
23	PJ52	51-6-0346	2 subsurface artefacts	Low	Common	Low
24	PJ53	51-6-0347	2 subsurface artefacts in 42m transect	Low	Common	Low
25	PJ54	51-6-0682	4 subsurface artefacts	Low	Common	Low

No	Site number	AHIMS No	Contents	Research Potential	Representativeness	Scientific Significance
26	PJ55	51-6-0683	76 artefacts in one test pit	High	Rare	High
27	PJ56	pending	50+ artefacts and PAD	High	Uncommon	High
28	PJ57	pending	2 artefacts	Low	Common	Low
29	PJ58	pending	3 artefacts	Low	Common	Low
30	PJ59	pending	5 artefacts and PAD	Moderate	common	Medium
31	PJ60	pending	30+ artefacts and PAD	High	Uncommon	High
32	PJ61	pending	30+ artefacts and PAD	High	Uncommon	High
33	PJ62	pending	Isolated find	Low	Common	Low
34	PJ63	pending	5+ artefacts and Pad	Moderate	Common	Medium
35	PJ64	pending	2 artefacts	Low	Common	Low
36	PJ65	pending	3 artefacts	Low	Common	Low
37	PJ66	pending	3 artefacts	Low	Common	Low
38	PJ67	pending	30+ artefacts and PAD	High	Uncommon	High

7.3 STATEMENT OF ARCHAEOLOGICAL (SCIENTIFIC) SIGNIFICANCE

The Crookwell 2 Wind Farm study area has 55 previously recorded Aboriginal heritage sites within its boundaries and twelve sites recorded as part of this assessment. Thirty-eight of these sites are located in close vicinity to the project impact areas. Of these 38 sites, 15 consist of surface sites and 23 were identified through subsurface testing of landforms. Of the subsurface sites 17 consist of low density, or single occurrences, with 4 representing large dispersed scatters and two containing high artefact density but confined to a single test pit. These are considered to represent single knapping events. Of the 15 surface sites, 4 are isolated finds, 7 are small scatters and 4 consist of dispersed large scatters of artefacts. Based on landform and site condition, these large sites are considered to possess high potential for providing further information on the past Aboriginal usage of the study area.

The majority of the stone artefact sites located within the study area represent common site types found throughout the Crookwell region and consist of common materials and artefact types. Only one site (PJ67) was noted to contain rare materials. None of the rare artefact types recorded from the Crookwell 1 wind farm (Pejar Points) were evident in any of the scatters.

The recorded sites range in scientific values and are considered to hold predominantly low, but in some cases, moderate to high scientific values. As a suite of sites, the location recording will assist in regional studies aimed at assessing Aboriginal usage of the landscape. Individual components of the larger sites will assist lithic studies of trade, utilisation and raw material procurement and curation.

8 IMPACT ASSESSMENT

8.1 DEVELOPMENT IMPACTS

8.1.1 *Modification 2 – Turbine placement*

The approved Crookwell 2 Windfarm allows for the construction of 46 wind turbines, each with a concrete hardstand crane lay down area of 50 x 50 metres, access tracks and access roads, underground cabling, substation and control room. The 46 turbine locations have been subject to a high level of investigation, including subsurface testing in areas considered to hold high to moderate potential for deposits. From the subsurface testing program, a representative sample of artefacts from sites was recovered, and two sites were identified as requiring salvage excavation (PJ37 and PJ55). This salvage work and sub surface testing was completed under AHIPS 1101268 and 1122895.

Under Modification 2 the turbines are to be reduced from 46 to 32 in number, with construction still to be undertaken at the previously assessed turbine locations, with micro-siting within the 50m area. This removes 14 locations that will no longer be subject to ground disturbance. These removed turbines are: F6, F8, F9, F16, F18, F20, F25, F33, F34, F38, F39, F42, F44 and F46. Previous assessments have been undertaken at the remaining 32 turbine locations, including mitigation measures, which have identified heritage sites as being subject to future impacts at twelve of the turbine sites. The 13 heritage sites at turbine locations were assessed by Biosis in 2004 and 2005, with 11 assessed to be of low archaeological and cultural significance and two of moderate significance and requiring salvage. These measures were approved by OEH under a consent to destroy (AHIP 1101268 and 1122895) in 2004 and 2005. Salvage excavations have been successfully undertaken at these two locations. Impacts at the area of the remaining 11 sites was to occur during the construction stage, which has not yet commenced.

A review of these previously assessed sites, their current condition and their classification was undertaken as a component of this report and can be seen in section 5. Each of these sites consist of subsurface artefacts (sometimes isolated artefacts) identified during subsurface testing (Biosis 2005). No surface indications of the sites are present. The current assessment of these sites confirmed the findings of the previous assessment, which is that they hold low scientific significance except for two sites (PJ21 and PJ38) considered to be of high significance (discussed in Section 5). Cultural significance is to be judged by the Aboriginal community and is detailed in the main ACHAR. Discussions with the RAP representatives indicates that these small subsurface sites are not considered to hold high cultural significance. As these sites are low density and dispersed over a large area, attempts to recover them though additional sub surface excavations would not be feasible. Two additional sites are located within the turbine locations which have already been salvaged under previous AHIPs and no longer pose a heritage constraint.

The road access and cable network impacts 16 heritage sites with a further 5 in close proximity. These 16 sites were recommended and approved to be either impacted during construction (14 sites), or subject to monitoring and protected from subsurface impacts by building up the roads surface across the area of PAD, rather than cutting into potential deposits (2 sites). The actual area of impact for road construction is to be confined to a width of 6m. A number of the recorded sites to be impacted extend over a greater area than this impact zone. Therefore, sites will only be

partially impacted by the proposed works. Impacts to some of these sites have been removed through re-alignment of the road due to turbine removals.

The sites to be impacted by the Mod-2 application (Turbine and access roads) and their degree of impact are provided in Table 17.

Table 17. Impact Assessment

No	Site number	AHIMS No	Contents	Scientific Significance	Impacts under Mod 2
1	PJ10	51-6-0218	Isolated surface find	Low	Direct and Total
2	PJ21	51-6-0229	84 Subsurface artefacts along ridgeline,	High	Direct and Partial
3	PJ23	51-6-0231	8 artefacts on dam edge	Low	Nil impact - outside alignment
4	PJ26	51-6-0348	subsurface isolated find	Low	Nil impact - outside alignment
5	PJ27	51-6-0322	subsurface isolated find	Low	Nil impact - outside alignment
6	PJ28	51-6-0323	subsurface isolated find	Low	Direct and Total
7	PJ29	51-6-0324	Isolated surface find	Low	Direct and Total
8	PJ35	51-6-0330	23 subsurface artefacts in 50 x 50m area	Medium	Direct and Partial
9	PJ36	51-6-0331	subsurface isolated find	Low	Direct and Total
10	PJ37	51-6-0349	1002 subsurface artefacts in single square	High	Nil - salvaged by excavation (AHIP 1101268)
11	PJ38	51-6-0332	38 subsurface artefacts on 230 m linear length	Medium	Direct and Partial - extends beyond impact area. Recorded area of site to be avoided - nil impacts. Area of PAD to be built up rather than impacted.
12	PJ39	51-6-0333	19 subsurface artefacts in 50 x 50 m area	Medium	Direct and Total
13	PJ40	51-6-0331	3 subsurface artefacts in 50 x 50m area	Low	Direct and Total
14	PJ41	51-6-0335	6 subsurface artefacts in 50 x 50m area	Low	Direct and Partial - extends beyond impact area
15	PJ42	51-6-0336	10 subsurface artefacts along 300m linear length	Medium	Direct and Partial - extends beyond impact area.

No	Site number	AHIMS No	Contents	Scientific Significance	Impacts under Mod 2
16	PJ44	51-6-0338	2 subsurface artefacts	Low	Direct and Total
17	PJ45	51-6-0339	24 subsurface artefacts in 250 x 250m area	Medium	Direct and Partial – extends beyond impact area
18	PJ46	51-6-0340	3 subsurface artefacts in 50 x 50m area	Low	Direct and Total
19	PJ48	51-6-0342	2 subsurface artefacts	Low	Nil impacts
20	PJ49	51-6-0343	16 subsurface artefacts along 200m transect	Medium	Direct and partial as site extends out of impact area.
21	PJ50	51-6-0344	subsurface isolated find	Low	Direct and Total
22	PJ51	51-6-0345	323 artefacts in one test pit only	High	Nil impacts
23	PJ52	51-6-0346	2 subsurface artefacts	Low	Direct and Total
24	PJ53	51-6-0347	2 subsurface artefacts in 42m transect	Low	Direct and Total
25	PJ54	51-6-0682	4 subsurface artefacts	Low	Direct and Total
26	PJ55	51-6-0683	76 artefacts in one test pit	High	Nil – salvaged by excavation (AHIP 1122895)
27	PJ56	pending	50+ artefacts and PAD	High	Direct and Partial
28	PJ57	pending	2 artefacts	Low	Nil - On edge of road alignment
29	PJ58	pending	3 artefacts	Low	Nil Outside of impact area. Avoid impacts.
30	PJ59	pending	5 artefacts and PAD	Medium	Nil - On edge of road corridor
31	PJ60	pending	30+ artefacts and PAD	High	Nil- can be avoided by placement.
32	PJ61	pending	30+ artefacts and PAD	High	Nil - On edge of cable alignment.
33	PJ62	pending	Isolated find	Low	Nil - can be avoided by placement of road alignment.
34	PJ63	pending	5+ artefacts and Pad	Medium	Nil - On edge of road alignment.
35	PJ64	pending	2 artefacts	Low	Nil - On edge of Dam – this is outside of road impacts. Nil impact to site
36	PJ65	pending	3 artefacts	Low	Nil - On southern edge of road corridor.

No	Site number	AHIMS No	Contents	Scientific Significance	Impacts under Mod 2
37	PJ66	pending	3 artefacts	Low	Nil - On southern edge of road corridor.
38	PJ67	pending	30+ artefacts and PAD	High	Nil. Outside of alignment and proposed work.

8.1.2 Summary of Impacts

In summary, a total of 38 sites are within the vicinity of and potentially impacted by the current Modification 2 application. Of these 38 sites, 15 can be avoided by the works, and 2 have been salvaged under AHIPs, leaving 21 sites to be impacted. Of these 21 sites, 20 have been tested in the 2005 program with a representative sample collected.

In summary, of these 38 sites, 21 (as shown in Table 17) are proposed for impact under an AHIP. 12 have no further mitigation measure, due to their small, subsurface nature. Five are considered to hold moderate significance and should be subject to cultural monitoring of topsoil removals and collection of any artefacts. The remaining three areas of PAD are considered to be high in scientific values should be subject to cultural monitoring and build-up of the road construction area (limited to 6m in width) as they have been subject to subsurface investigation previously.

One new site (PJ56) required subsurface investigation to determine the degree of impact. This work is under completion and will be reported separately. Until an AHIP has been granted, no impacts can occur.

These proposed mitigation measures and their application to each site are discussed in Section 9.

9 MANAGEMENT AND MITIGATION STRATEGY

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable. Re-design to lessen impacts, has been undertaken for the Crookwell 2 Wind Farm project, resulting in current Mod-2 for assessment, and a significant decrease in heritage impacts from the original development layout.

In cases where avoidance and conservation is not practical, the gathering of information through surface collection, subsurface testing and excavation are management options.

Management options for the study area are (in order of preference):

- Conservation of sites through avoidance – this removes impact.
- Impacts mitigated through surface collection, excavation salvage or build-up of PAD areas.
- Unmitigated Impact – this occurs when small surface sites cannot be relocated or surface collection or small dispersed sites have been located through subsurface testing which cannot be salvaged.

As a mitigation strategy for sites where impacts cannot be avoided, collection of the surface artefacts, recording of their attributes and curation by the Aboriginal community is the most appropriate option. This collection should only occur in the area of impact (6m wide corridor) to allow the majority of the site to remain in-situ. A mitigation strategy of surface collection would ensure preservation of the identified artefacts and provide an educational resource for the Aboriginal community. A care and control agreement with the Pejar LALC is in place to provide for the long term curation and management of recovered materials. Artefacts recovered from previous investigations are in the curation of the Pejar LALC and it is appropriate that any further collected artefacts should be added to this collection.

As a mitigation strategy for the subsurface sites of low importance, a representative sample of their contents has resulted from the 2005 subsurface testing. No further mitigation measures are required for these sites.

As a mitigation strategy for the subsurface sites of moderate importance, cultural monitoring of topsoil removals by RAPS, with collection of any recovered artefacts should be undertaken. If any areas of high density are identified, work will cease in that area and OEH contacted for guidance. The Unanticipated Finds Protocol in the AHMP will be followed.

As a mitigation strategy for the subsurface sites of high importance, a strategy of conservation of the PAD areas, by removing impacts to the sub soils by building up of the road base on the current ground surface is the most appropriate option. This covering of the PAD should be confined to the direct area of the 6m wide road alignment.

As a result, it is proposed that an AHIP be applied to cover impacts to sites, with the discussed main mitigation measures, applied to the relevant sites:

- for isolated surface sites and small scatters, no further measures as the 2017 site visits failed to locate any artefacts;
- for low values sub surface sites, impact with no further measures, following the 2005 subsurface testing and collection of a representative sample;
- for moderate value subsurface sites, impact with cultural monitoring and collection of any recovered artefacts;
- for high value subsurface sites, removal of impacts from PADs by build-up of road surface applied to the relevant sites. Cultural monitoring is requested for these works.
- For newly recorded site PJ56 following a program of subsurface excavation application for an AHIP to impact the site should be submitted.
- Avoidance of all other sites.

These mitigation measures as applied to each site are provided in Table 18.

Table 18. Mitigation Measures

No	Site number	AHIMS No	Impacts under Mod 2	Mitigation Measure
1	PJ10	51-6-0218	Direct and Total	None possible - AHIP required
2	PJ21	51-6-0229	Direct and Partial	Sample recovered through subsurface testing. Monitoring of works, and build-up of road surface to avoid impacts. AHIP required.
3	PJ23	51-6-0231	Nil impact - outside alignment	Avoidance
4	PJ26	51-6-0348	Nil impact - outside alignment	Avoidance
5	PJ27	51-6-0322	Nil impact - outside alignment	Avoidance
6	PJ28	51-6-0323	Direct and Total	Sample recovered through subsurface testing. AHIP required.
7	PJ29	51-6-0324	Direct and Total	Sample recovered through subsurface testing. AHIP required
8	PJ35	51-6-0330	Direct and Partial	Sample recovered through subsurface testing. Cultural monitoring would be appropriate. AHIP required
9	PJ36	51-6-0331	Direct and Total	Sample recovered through subsurface testing. AHIP required
10	PJ37	51-6-0349	Nil - salvaged by excavation (AHIP 1101268)	Not required
11	PJ38	51-6-0332	Direct and Partial - extends beyond impact area. Recorded	Monitoring and Avoidance by building up of road surface

No	Site number	AHIMS No	Impacts under Mod 2	Mitigation Measure
			area of site to be avoided - nil impacts. Area of PAD to be built up rather than impacted.	
12	PJ39	51-6-0333	Direct and Total	Sample recovered through subsurface testing. Cultural Monitoring would be appropriate. AHIP required
13	PJ40	51-6-0331	Direct and Total	Sample recovered through subsurface testing. AHIP required.
14	PJ41	51-6-0335	Direct and Partial - extends beyond impact area	Sample recovered through subsurface testing. AHIP required
15	PJ42	51-6-0336	Direct and Partial - extends beyond impact area.	Sample recovered through subsurface testing. Cultural monitoring would be appropriate. AHIP required
16	PJ44	51-6-0338	Direct and Total	Sample recovered through subsurface testing. AHIP required
17	PJ45	51-6-0339	Direct and Partial - extends beyond impact area	Sample recovered through subsurface testing. Cultural monitoring would be appropriate. AHIP required
18	PJ46	51-6-0340	Direct and Total	Sample recovered through subsurface testing. AHIP required
19	PJ48	51-6-0342	Nil impacts	Avoidance
20	PJ49	51-6-0343	Direct and partial as site extends out of impact area.	Sample recovered through subsurface testing. Cultural Monitoring would be appropriate. AHIP required
21	PJ50	51-6-0344	Direct and Total	Sample recovered through subsurface testing. AHIP required
22	PJ51	51-6-0345	Nil impacts	Avoid high artefact density site, monitor, no impact allowed. Area of PAD to be built up rather than impacted. AHIP required.
23	PJ52	51-6-0346	Direct and Total	Sample recovered through subsurface testing. AHIP required
24	PJ53	51-6-0347	Direct and Total	Sample recovered through subsurface testing. AHIP required
25	PJ54	51-6-0682	Direct and Total	Sample recovered through subsurface testing. AHIP required.
26	PJ55	51-6-0683	Nil - salvaged by excavation (AHIP 1122895)	Not required
27	PJ56	pending	Direct and Partial	On road alignment. AHIP required following subsurface investigation. Mitigation measure of monitoring, collection of surface artefacts in 6m impact corridor.

No	Site number	AHIMS No	Impacts under Mod 2	Mitigation Measure
28	PJ57	pending	Nil - On edge of road alignment	Avoidance - Avoid impacts through placement of road to the south. Fence to avoid impacts. If impacts to occur mitigate through surface collection. If undertaken AHIP required.
29	PJ58	pending	Nil Outside of impact area. Avoid impacts.	Avoidance
30	PJ59	pending	Nil - On edge of road corridor	Avoidance - Remove impacts by placement of road to avoid site
31	PJ60	pending	Nil- can be avoided by placement.	Avoidance - Remove impacts by engineering solution to avoid area of PAD. If impacts are to occur, sub surface testing and collection of affected surface sites. AHIP required.
32	PJ61	pending	Nil - On edge of cable alignment.	Avoidance - Remove impacts by placement of cable route to avoid site.
33	PJ62	pending	Nil - can be avoided by placement of road alignment.	Avoidance. If impacts must occur then surface collection prior to any works commencing - AHIP required
34	PJ63	pending	Nil - On edge of road alignment.	Avoidance - Avoid impacts through placement of road to the west of PAD and site. If impacts are to occur, sub surface testing or build up of road base with collection of affected surface sites. AHIP required.
35	PJ64	pending	Nil - On edge of Dam - this is outside of road impacts. Nil impact to site	Avoidance.
36	PJ65	pending	Nil - On southern edge of road corridor.	Avoidance - Avoid impacts through placement of road north of the site. Fence to avoid impacts
37	PJ66	pending	Nil - On southern edge of road corridor.	Avoidance - Avoid impacts through placement of road north of the site. Fence to avoid impacts
38	PJ67	pending	Nil. Outside of alignment and proposed work.	Avoidance - Avoid impacts to site

9.1 MANAGEMENT RECOMMENDATIONS

Based on results of the archaeological program and on site consultation with the Aboriginal representatives, the following recommendations have been developed in regards to Aboriginal Cultural Heritage values and sites located within the study area. These recommendations have been sent to the Registered Aboriginal Parties for their comment and input.

Management recommendations are:

- No impacts can occur to any of the recorded heritage sites until an AHIP has been approved by the NSW OEH.
- Impacts to the identified heritage sites should be avoided if possible. Where possible in the road and cable alignments design should be undertaken to avoid impacts to identified heritage sites.
- Surface site at PJ38 should be collected prior to works commencing in proximity of this location and an updated Site Impact Recording Card submitted to OEH. This collection will require AHIP approval.
- Detailed recording of site PJ56, PJ60 and PJ61 should be undertaken.
- If following review of the wind farm design, impacts will occur to Aboriginal heritage sites, then an AHIP must be applied for prior to undertaking the works. This AHIP should cover the following management and mitigation actions.
 - Surface sites along the road alignments will be impacted. This cannot be mitigated by collection of surface sites along the road access alignments as no artefacts were located during the 2017 site visits. These sites were considered to hold low potential for any subsurface deposits as a result of subsurface testing. This affects two sites PJ10 and PJ29.
 - Impacts to the small subsurface sites along the turbine and road alignments is unavoidable due to their highly dispersed nature. Impacts have been previously mitigated at these sites by subsurface testing and collection of recovered artefacts. These sites cannot be salvaged by further excavation and an AHIP should be sought to cover their impacts. These sites are considered to hold low significance. The affected sites are PJ28, PJ36, PJ40, PJ41, PJ44, PJ46, PJ50, PJ52, PJ53 and PJ54.
 - Impacts to the medium sized subsurface sites along the turbine and road alignments is unavoidable due to their dispersed nature throughout landforms. Impacts have been previously mitigated at these sites by subsurface testing. These sites cannot be salvaged by further excavation and an AHIP should be sought to cover their impacts. These sites are considered to hold moderate significance. Cultural monitoring of topsoil removal is requested by RAPs with collection of any recovered artefacts. If high density concentrations are identified, then work will cease and OEH contacted for guidance. The Unanticipated Finds Protocol in the AHMP will be followed. The affected sites are PJ35, PJ39, PJ42, PJ45 and PJ49.
 - Mitigation of impacts at high significance subsurface sites PJ21, PJ38 and PJ51. Subsurface soils cannot be impacted and an AHIP applied for to allow the road surface to be built up over the areas of PAD in these

locations. PAD areas must not be impacted. This applies to sites PJ21, P38 and PJ51.

- Site PJ56 requires detailed recording and subsurface testing under the Code of Practice. This has been completed and the review period for this site is underway prior to an application for a separate AHIP. No impacts can occur to this site until this time. The site should be fenced to avoid impacts from construction.
- Impacts should be avoided to all other recorded heritage sites. If at risk of impact by construction traffic these sites should be fenced to ensure their protection. If impacts cannot be avoided by road placement, then mitigation measures consisting of surface collection of artefacts, subsurface testing or salvage should be undertaken following approval of an AHIP. This applies to 15 sites which are listed in Table 19.

Table 19. Sites to be avoided

Site number	AHIMS No	Impacts under Mod 2	Mitigation Measure
PJ23	51-6-0231	Nil impact - outside alignment	Avoidance
PJ26	51-6-0348	Nil impact - outside alignment	Avoidance
PJ27	51-6-0322	Nil impact - outside alignment	Avoidance
PJ48	51-6-0342	Nil impacts	Avoidance
PJ57	pending	Nil - On edge of road alignment	Avoidance - Avoid impacts through placement of road to the south. Fence to avoid impacts. If impacts to occur mitigate through surface collection. If undertaken AHIP required.
PJ58	pending	Nil Outside of impact area. Avoid impacts.	Avoidance
PJ59	pending	Nil - On edge of road corridor	Avoidance - Remove impacts by placement of road to avoid site
PJ60	pending	Nil- can be avoided by placement.	Avoidance - Remove impacts by engineering solution to avoid area of PAD. If impacts are to occur, sub surface testing and collection of affected surface sites. AHIP required.
PJ61	pending	Nil - On edge of cable alignment.	Avoidance - Remove impacts by placement of cable route to avoid site.
PJ62	pending	Nil - can be avoided by placement of road alignment.	Avoidance. If impacts must occur then surface collection prior to any works commencing - AHIP required
PJ63	pending	Nil - On edge of road alignment.	Avoidance - Avoid impacts through placement of road to the west of PAD and site. If impacts are to occur, sub surface testing or build up of road base with collection of affected surface sites. AHIP required.
PJ64	pending	Nil - On edge of Dam - this is outside of road impacts. Nil impact to site	Avoidance.

Site number	AHIMS No	Impacts under Mod 2	Mitigation Measure
PJ65	pending	Nil - On southern edge of road corridor.	Avoidance - Avoid impacts through placement of road north of the site. Fence to avoid impacts
PJ66	pending	Nil - On southern edge of road corridor.	Avoidance - Avoid impacts through placement of road north of the site. Fence to avoid impacts
PJ67	pending	Nil. Outside of alignment and proposed work.	Avoidance - Avoid impacts to site

- Sites previously salvaged by excavation under AHIP 1101268 have no further heritage constraints and no further mitigation measures are required. These sites are listed in Table 20.

Table 20. Salvaged Sites.

Turbine	Site name and contents	Management Action
F22	PJ 37 (AHIMS 51-6-0349) 1002 subsurface artefact	Not required Nil - salvaged by excavation (AHIP 1101268)
F41	PJ 55 (AHIMS 51-6-0683)	Not required

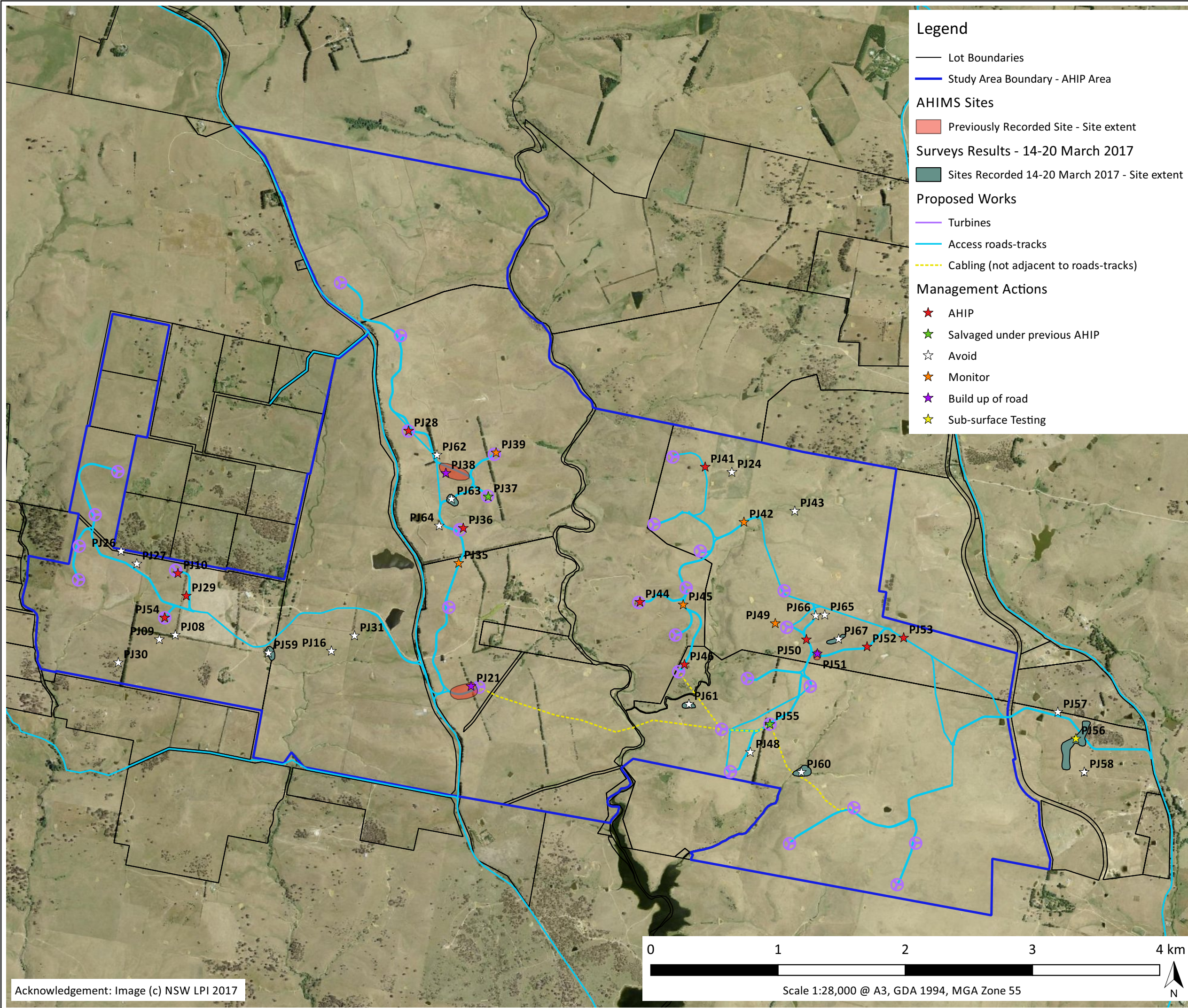
- Salvaged artefacts should be deposited with the Pejar LALC for curation. A care and control application is currently in place for the long term curation of these artefacts.
- All Aboriginal objects are protected under the NSW National Parks and Wildlife Act 1974. It is an offence to disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.
- In the unlikely event that human remains are discovered during the construction, all work must cease. OEHL, the local police and the appropriate LALC should be notified. Further assessment would be undertaken to determine if the remains are Aboriginal or non-Aboriginal.
- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the RAPs for the project and may include further field survey.
- Continued consultation with the RAPs for the project should be undertaken. RAPs should be informed of any major changes in project design or scope, further investigations or finds.
- No further investigations are required should the AHIP be approved, except in the event that unanticipated Aboriginal Objects and/or human remains are

unearthed during any phase of the Project. In these events the Unanticipated finds protocol in the Aboriginal Heritage Management Plan should be followed.

- A copy of this report and the completed AHIP application should be provided to OEHL for approval and each of the RAPs for the project for their information.

The Aboriginal sites and their management recommendations, including area of AHIP application are shown on Figure 11.

Figure 11. Management Actions



Legend

- Lot Boundaries
- Study Area Boundary - AHIP Area

AHIMS Sites

- Previously Recorded Site - Site extent
- Sites Recorded 14-20 March 2017 - Site extent

Surveys Results - 14-20 March 2017

- Sites Recorded 14-20 March 2017 - Site extent

Proposed Works

- Turbines
- Access roads-tracks
- - - Cabling (not adjacent to roads-tracks)

Management Actions

- ★ AHIP
- ★ Salvaged under previous AHIP
- ☆ Avoid
- ★ Monitor
- ★ Build up of road
- ★ Sub-surface Testing



Acknowledgement: Image (c) NSW LPI 2017

Capital Ecology Project No: 2740
 Drawn by: R. Speirs
 Date: 16 May 2017



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A.1 AHIMS SITE SEARCH



SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
51-6-0682	PJ 54	GDA	55	733468	6174460	Open site	Valid	Artefact : 4		102037
	Contact								Permits 2339,2340,3358,3476	
51-6-0683	PJ 55	GDA	55	738227	6173622	Open site	Destroyed	Artefact : 75		102037
	Contact								Permits 2339,2340,3358,3476	
51-6-0085	CWF1	AGD	55	733200	6177520	Open site	Valid	Artefact : -	Open Camp Site	
	Contact								Permits 1534	
51-6-0319	PJ 09	AGD	55	733312	6174104	Open site	Valid	Artefact : 74		99732
	Contact Searle								Permits	
51-6-0320	PJ 10	AGD	55	733458	6174624	Open site	Valid	Artefact : 9		99732
	Contact Searle								Permits	
51-6-0321	PJ 16	AGD	55	734665	6174013	Open site	Valid	Artefact : 3		99732
	Contact Searle								Permits	
51-6-0322	PJ27	AGD	55	733249	6174884	Open site	Valid	Artefact : 1		99732
	Contact Searle								Permits 2339,2340,3476	
51-6-0323	PJ28	AGD	55	733420	6174818	Open site	Valid	Artefact : 1		99732
	Contact Searle								Permits 2339,3476	
51-6-0324	PJ29	AGD	55	733638	6174632	Open site	Valid	Artefact : 1		99732
	Contact Searle								Permits 2339,3476	
51-6-0325	PJ30	AGD	55	733103	6174107	Open site	Valid	Artefact : 9		99732
	Contact Searle								Permits 2339,3476	
51-6-0326	PJ31	AGD	55	734961	6174318	Open site	Valid	Artefact : 14		99732
	Contact Searle								Permits 2339,3476	
51-6-0327	PJ32	AGD	55	734994	6175202	Open site	Valid	Artefact : 1		99732
	Contact Searle								Permits 2339,3476	
51-6-0328	PJ33	AGD	55	735476	6173721	Open site	Valid	Artefact : 38		99732
	Contact Searle								Permits 2339,3476	
51-6-0329	PJ34	AGD	55	735725	6174291	Open site	Valid	Artefact : 1		99732
	Contact Searle								Permits 2339,3476	
51-6-0330	PJ35	AGD	55	735780	6174889	Open site	Valid	Artefact : 23		99732
	Contact Searle								Permits 2339,3476	
51-6-0331	PJ36	AGD	55	735816	6175165	Open site	Valid	Artefact : 1		99732
	Contact Searle								Permits 3476	
51-6-0332	PJ38	AGD	55	735679	6175597	Open site	Valid	Artefact : 33		99732
	Contact Searle								Permits 3476	

Report generated by AHIMS Web Service on 01/03/2017 for Lyn O'Brien for the following area at Datum :GDA, Zone : 55, Eastings : 733137 - 742469, Northings : 6171227 - 6178896 with a Buffer of 200 meters. Additional Info : impact assessment. Number of Aboriginal sites and Aboriginal objects found is 59

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
51-6-0333	PJ39	AGD	55	736074	6175758	Open site	Valid	Artefact : 19		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2340,3476	
51-6-0334	PJ40	AGD	55	734848	6177107	Open site	Valid	Artefact : 3		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0335	PJ41	AGD	55	737718	6175646	Open site	Valid	Artefact : 6		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0336	PJ42	AGD	55	738023	6175212	Open site	Valid	Artefact : 10		99732
	Contact Searle	Recorders				Mr.Lee Thompson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0337	PJ43	AGD	55	738423	6175299	Open site	Valid	Artefact : 18		99732
	Contact Searle	Recorders				Miss.Melanie Thomson		Permits	2339,2340,3476	
51-6-0338	PJ44	AGD	55	737205	6174583	Open site	Valid	Artefact : 2		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0339	PJ45	AGD	55	737545	6174562	Open site	Valid	Artefact : 24		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0340	PJ46	AGD	55	737555	6174092	Open site	Valid	Artefact : 3		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0341	PJ47	AGD	55	737122	6173471	Open site	Valid	Artefact : 8		99732
	Contact Searle	Recorders				Thomas Kenyon & Kenyon & Son,Niamh Coulter		Permits	2339,2340,3476	
51-6-0342	PJ48	AGD	55	738073	6173402	Open site	Valid	Artefact : 2		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0343	PJ49	AGD	55	738269	6174415	Open site	Valid	Artefact : 16		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0344	PJ50	AGD	55	738514	6174288	Open site	Valid	Artefact : 1		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0345	PJ51	AGD	55	738600	6174177	Open site	Valid	Artefact : 323		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits		
51-6-0346	PJ52	AGD	55	738991	6174232	Open site	Valid	Artefact : 2		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0347	PJ53	AGD	55	739279	6174302	Open site	Valid	Artefact : 2		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0348	PJ26	AGD	55	733125	6174984	Open site	Valid	Artefact : 1		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	
51-6-0349	PJ37	AGD	55	735898	6175227	Open site	Valid	Artefact : 50		99732
	Contact Searle	Recorders				Miss.Melanie Thomson,Niamh Coulter		Permits	2339,2340,3476	

Report generated by AHIMS Web Service on 01/03/2017 for Lyn O'Brien for the following area at Datum :GDA, Zone : 55, Eastings : 733137 - 742469, Northings : 6171227 - 6178896 with a Buffer of 200 meters. Additional Info : impact assessment. Number of Aboriginal sites and Aboriginal objects found is 59

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
51-6-0209	PJ01	AGD	55	739026	6174452	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0210	PJ02	AGD	55	739916	6172258	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0211	PJ03	AGD	55	732877	6174351	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0213	PJ05	AGD	55	733299	6176647	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0214	PJ06	AGD	55	733301	6176304	Open site	Valid	Modified Tree (Carved or Scarred) : 1, Artefact : 1		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy				Permits		
51-6-0215	PJ07	AGD	55	733199	6176315	Open site	Valid	Modified Tree (Carved or Scarred) : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy				Permits		
51-6-0216	PJ08	AGD	55	733437	6174139	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits	2094,2095	
51-6-0217	PJ09	AGD	55	733312	6174104	Open site	Valid	Artefact : -		99732,102037
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits	2094,2095,2339,2340,3476	
51-6-0218	PJ10	AGD	55	733458	6174624	Open site	Valid	Artefact : -		99732,102037
	Contact	Searle	Recorders	Ms.Vanessa Hardy				Permits	2094,2095,2339,2340,3476	
51-6-0219	PJ11	AGD	55	735089	6174672	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0220	PJ12	AGD	55	734760	6175628	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy				Permits		
51-6-0221	PJ13	AGD	55	734330	6173234	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0222	PJ14	AGD	55	734363	6173424	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0223	PJ15	AGD	55	734477	6173550	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits		
51-6-0224	PJ16	AGD	55	734665	6174013	Open site	Valid	Artefact : -		99732
	Contact	Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson				Permits	2094,2095,2339,2340,3476	

Report generated by AHIMS Web Service on 01/03/2017 for Lyn O'Brien for the following area at Datum :GDA, Zone : 55, Eastings : 733137 - 742469, Northings : 6171227 - 6178896 with a Buffer of 200 meters. Additional Info : impact assessment. Number of Aboriginal sites and Aboriginal objects found is 59

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
51-6-0225	PJ17	AGD	55	734977	6173823	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits		
51-6-0226	PJ18	AGD	55	735420	6174832	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits		
51-6-0227	PJ19	AGD	55	735354	6175094	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits		
51-6-0228	PJ20	AGD	55	736047	6173724	Open site	Valid	Artefact : 11, Stone Quarry : 1		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits		
51-6-0229	PJ21	AGD	55	735763	6173736	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits	2094,2095,2339,2340,3476	
51-6-0230	PJ22	AGD	55	735672	6173987	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits	2094,2095,2339,2340,3476	
51-6-0231	PJ23	AGD	55	737648	6175300	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits	2094,2095,2339,2340,3476	
51-6-0232	PJ24	AGD	55	737814	6175420	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits	3476	
51-6-0233	PJ25	AGD	55	738802	6173308	Open site	Valid	Artefact : -		99732
	Contact Searle	Recorders	Ms.Vanessa Hardy, Miss.Melanie Thomson					Permits	3476	
51-6-0722	Wollondilly Farm	GDA	55	733951	6171398	Open site	Valid	Artefact : 1		102791
	Contact	Recorders	Mr.Jason Anderson					Permits		

Report generated by AHIMS Web Service on 01/03/2017 for Lyn O'Brien for the following area at Datum :GDA, Zone : 55, Eastings : 733137 - 742469, Northings : 6171227 - 6178896 with a Buffer of 200 meters. Additional Info : impact assessment. Number of Aboriginal sites and Aboriginal objects found is 59

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A.2 AHIMS SITE CARDS

A.3 SURVEY COVERAGE TABLES

Mod-1 Woodhouselee Road Access Track.

Table A.1. Woodhouselee Road transect details.

Transect	Start		end		Length (m)	Landform elements
	Easting	Northing	Easting	Northing		
1	741132	6173437	741140	6173407	164	Lower
2	741140	6173407	740735	6173449	419	Mid
3	740735	6173449	740703	6173491	53	Upper
4	740703	6173491	740640	6173574	105	Crest
5	740640	6173574	740587	6173636	81	Upper
6	740587	6173636	740449	6173683	148	Mid
7	740449	6173683	740314	6173718	139	Lower
8	740129	6173716	740318	6173743	194	Mid
9	740318	6173743	740449	6173710	136	Lower
10	740449	6173710	740597	6173662	157	Mid
11	740597	6173662	740651	6173596	86	Upper
12	740651	6173596	740724	6173505	117	Crest
13	740724	6173505	740758	6173470	49	Upper
14	740758	6173470	741132	6173437	385	Mid
15	740772	6173656	740972	6173566	220	Upper
16	740972	6173566	741084	6173455	161	Mid
17	740513	6173284	740467	6173342	77	Upper
18	740467	6173342	740412	6173438	111	Mid
19	740412	6173438	740313	6173557	157	Lower
20	740313	6173557	740158	6173674	194	Mid

Table A2. Woodhouselee Road - survey coverage

Survey Unit	Landform	SU Area (m2)	GSV%	Exposure %	Effective Coverage Area (SU area x GSV% x Exp%)	Effective coverage (Eff coverage area/SU Area x 100)
1	LOWER	4738	10%	20%	94.76	2.00%
2	MID	23170	20%	25%	1158.5	5.00%
3	UPPER	23170	60%	20%	2780.4	12.00%
4	CREST	2638	60%	20%	316.56	12.00%
5	UPPER	2638	60%	20%	316.56	12.00%
6	MID	5882	60%	10%	352.92	6.00%
7	LOWER	5882	10%	10%	58.82	1.00%
8	MID	4408	10%	50%	220.4	5.00%
9	UPPER	4408	60%	35%	925.68	21.00%
10	MID	8126	40%	25%	812.6	10.00%
11	MID	8126	20%	15%	243.78	3.00%
12	LOWER	7244	20%	10%	144.88	2.00%
13	LOWER	7244	10%	5%	36.22	0.50%
14	LOWER	12784	20%	5%	127.84	1.00%

Table A3. Woodhouselee Road -landform summary

Landform	Area (m2)	effective coverage area (m2)	% of landform surveyed	no of sites	No of artefacts
CREST	2638	316.56	12%	1	50+
UPPER	30216	4022.65	13.31%	0	
MID	49712	2788.2	5.61%	2	5
LOWER	37892	462.52	1.22%	0	

Modification 2 alignments

Table A4 Mod -2 transect details.

Transect Number	Start Point		End Point		Length (m)	Landform
	Easting	Northing	Easting	Northing		
1	733960	6174416	734135	6174292	216	LOWER
2	733960	6174416	733778	6174539	221	MID
3	733778	6174539	733677	6174613	127	UPPER
4	733677	6174613	733605	6174779	188	UPPER
5	733605	6174779	733539	6174553	303	CREST
6	733539	6174553	733706	6174488	181	UPPER
7	733706	6174488	733999	6174299	353	MID
8	733999	6174299	734193	6174200	223	LOWER
9	734193	6174200	734158	6174289	348	CREEK FLAT
10	734421	6174424	734391	6174311	245	LOWER
11	734406	6174321	734421	6174424	1649	MID
12	738862	6172977	738776	6172997	90	CREST
13	738776	6172997	738726	6173028	59	UPPER
14	738726	6173028	738555	6173191	237	MID
15	738555	6173191	738415	6173303	180	LOWER
16	738415	6173303	738367	6173387	97	MID
16	737587	6173998	737518	6173965	116	UPPER
17	738367	6173387	738293	6173551	179	UPPER
18	738293	6173551	738256	6173607	67	CREST
18	737569	6173881	737581	6173864	21	LOWER
19	737901	6173242	737876	6173253	2080	CREST
20	737852	6173619	737793	6173726	123	UPPER
21	737793	6173726	737747	6173795	83	MID
22	737747	6173795	737710	6173844	62	LOWER
23	737710	6173844	737652	6173919	94	CREEK FLAT

Transect Number	Start Point		End Point		Length (m)	Landform
	Easting	Northing	Easting	Northing		
24	737652	6173919	737643	6173930	14	LOWER
25	737643	6173930	737587	6173998	88	MID
27	737518	6173965	737569	6173881	99	MID
29	737581	6173864	737634	6173789	91	CREEK FLAT
30	737634	6173789	737724	6173670	150	MID
31	737724	6173670	737827	6173586	134	UPPER
32	738219	6173590	738243	6173527	67	CREST
33	738243	6173527	738300	6173365	172	UPPER
34	738300	6173365	738343	6173261	113	MID
35	738343	6173261	738498	6173153	190	LOWER
36	738498	6173153	738615	6173041	163	MID
37	738615	6173041	738747	6172938	172	UPPER
38	738747	6172938	738801	6172936	55	CREST
39	735604	6175166	735558	6175573	411	MID
40	735558	6175573	735543	6175674	102	CREST
41	735543	6175674	735512	6175744	79	MID
42	735512	6175744	735481	6175773	42	UPPER
43	735481	6175773	735299	6175994	287	CREST
44	735299	6175994	735379	6176052	303	UPPER
45	735379	6176052	735476	6175928	159	CREST
46	735476	6175928	735571	6175832	134	UPPER
47	735571	6175832	735682	6175746	141	MID
48	735682	6175746	735702	6175649	100	CREST
49	735702	6175649	735678	6175502	149	CREST
50	735678	6175502	735685	6175176	327	MID
51	739490	6173961	738887	6174436	841	MID

Transect Number	Start Point		End Point		Length (m)	Landform
	Easting	Northing	Easting	Northing		
52	738887	6174436	738470	6174552	519	UPPER
53	738911	6174471	739564	6173944	2235	MID
54	738455	6174570	738282	6174715	233	CREST
55	738282	6174715	738213	6174879	178	UPPER
56	738213	6174879	738158	6175041	171	MID
57	738158	6175041	738119	6175194	159	LOWER
58	738119	6175194	738155	6175257	124	LOWER
59	738155	6175257	738197	6175189	83	CREEK FLAT
60	738197	6175189	738231	6175056	137	LOWER
61	738231	6175056	738278	6174904	159	MID
62	738278	6174904	738341	6174749	168	UPPER
63	738341	6174749	738489	6174615	201	CREST
64	738489	6174615	738911	6174471	447	UPPER
65	738471	6174428	738444	6174438	168	CREST
66	739564	6173939	739580	6173781	160	UPPER
67	739580	6173781	739707	6173285	517	CREST
68	739707	6173285	739499	6173076	354	UPPER
69	739499	6173076	739325	6172816	413	MID
70	739325	6172816	739298	6173027	268	LOWER
71	739298	6173027	739492	6173102	208	MID
72	739492	6173102	739642	6173327	318	UPPER
73	739642	6173327	739520	6173788	483	CREST
74	739520	6173788	739491	6173957	173	UPPER
75	737692	6175259	737601	6175226	98	UPPER
76	737756	6175590	737692	6175259	351	MID
77	737618	6175758	737756	6175590	237	UPPER

Transect Number	Start Point		End Point		Length (m)	Landform
	Easting	Northing	Easting	Northing		
78	737617	6175730	737618	6175758	263	CREST
79	737706	6175592	737617	6175730	181	UPPER
80	737656	6175324	737706	6175592	289	MID
81	737576	6175285	737656	6175324	90	CREST

Table A5. Mod 2 survey coverage

Survey Unit	Landform	SU Area (m2)	GSV%	Exposure %	Effective Coverage Area (SU area x GSV% x Exp%)	Effective coverage (Eff coverage area/SU Area x 100)
1	LOWER	26069	20%	5%	260.69	1%
2	MID	35834	20%	5%	358.34	1%
3	UPPER	45990	70%	15%	4828.95	10.50%
4	CREST	31222	20%	5%	312.22	1%
6	CREEK FLAT	27102	50%	5%	677.55	2.50%
7	LOWER	15241	30%	15%	685.845	4.50%
8	MID	91369	50%	70%	31979.15	35%
9	CREST	7511	70%	10%	525.77	7%
10	UPPER	13876	30%	5%	208.14	1.50%
11	MID	28551	30%	5%	428.265	1.50%
12	LOWER	27672	30%	35%	2905.56	10.50%
13	MID	16250	20%	5%	162.5	1%
14	UPPER	20880	60%	10%	1252.8	6%
15	CREST	6718	60%	10%	403.08	6%

Survey Unit	Landform	SU Area (m2)	GSV%	Exposure %	Effective Coverage Area (SU area x GSV% x Exp%)	Effective coverage (Eff coverage area/SU Area x 100)
16	CREST	135050	40%	10%	5402	4%
17	UPPER	16752	30%	10%	502.56	3%
18	MID	20960	20%	10%	419.2	2%
19	LOWER	6353	20%	20%	254.12	4%
20	CREEK FLAT	16202	10%	35%	567.07	3.50%
21	LOWER	3253	20%	10%	65.06	2%
22	MID	14284	30%	15%	642.78	4.50%
23	UPPER	7491	50%	10%	374.55	5%
24	MID	78687	40%	35%	11016.18	14%
25	CREST	40703	40%	20%	3256.24	8%
26	MID	27444	10%	25%	686.1	2.50%
27	UPPER	26044	20%	10%	520.88	2%
28	CREST	40572	30%	20%	2434.32	6%
29	UPPER	28874	30%	20%	1732.44	6%
30	MID	191153	40%	35%	26761.42	14%
31	UPPER	57695	30%	40%	6923.4	12%
32	CREST	28987	40%	20%	2318.96	8%
33	UPPER	25436	10%	10%	254.36	1%
34	MID	23607	10%	5%	118.035	0.50%
35	LOWER	21969	10%	10%	219.69	1%
36	CREEK FLAT	5457	10%	40%	218.28	4%

Survey Unit	Landform	SU Area (m2)	GSV ^o %	Exposure %	Effective Coverage Area (SU area x GSV% x Exp%)	Effective coverage (Eff coverage area/SU Area x 100)
37	LOWER	6575	10%	5%	32.875	0.50%
38	CREST	9383	60%	30%	1688.94	18%
39	UPPER	24091	60%	15%	2168.19	9%
40	CREST	60640	60%	15%	5457.6	9%
41	UPPER	38176	40%	25%	3817.6	10%
42	MID	21725	30%	10%	651.75	3%
43	LOWER	21716	20%	10%	434.32	2%
44	UPPER	12347	20%	30%	740.82	6%
45	MID	33567	10%	10%	335.67	1%
46	UPPER	13752	10%	5%	68.76	0.50%
47	CREST	7197	10%	5%	35.985	0.50%

Table A6. Mod 2 - Landform summary

Landform	Area (m2)	effective coverage area (m2)	% of landform surveyed	no of sites	No of artefacts
creek flat	48761	1462.9	3%	1	5
crest	367983	21835.12	6%	6	106
lower	128848	4858.16	4%	1	30+
middle	583431	73559.39	13%	6	50+
upper	331404	23393.45	7%	4	10

