Environmental Impact Statement

Uungula Wind Farm

Appendix J: Aboriginal Cultural Heritage Assessment (NSW Archaeology Pty Ltd, 2018)

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CWP Renewables Pty Ltd
(02) 4013 4640

P.O. Box 1708 Newcasltle NSW 2300
cwprenewables.com

New South Wales
ARCHAEOLOGY

Final
Revised Report
Uungula Wind Farm
Aboriginal Cultural Heritage Assessment Report

Date: 25 January 2019
Author: Dr Julie Dibden
Proponent: Uungula Wind Farm Pty Ltd
Local Government Area: Dubbo Regional Council area

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SUMMARY

New South Wales Archaeology Pty Ltd has been commissioned by CWP Renewables Pty Ltd, on behalf of Uungula Wind Farm Pty Ltd (the Proponent) to undertake an Aboriginal cultural and archaeological heritage assessment in relation to the proposed Uungula Wind Farm (the Project). The assessment commenced in 2012 and a report dated 2013 documented the original assessment.

Since 2013, changes have been made to the layout of the proposed Uungula Wind Farm. The entire eastern area of the original proposal has been removed from the Project. Some slight changes have been made to the Development Footprint in the western area. This revised report updates the project description and documents the assessment of the Project including the current Development Footprint.

The assessment has been conducted in accordance with the *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (NSW DEC 2005), the NSW Office of Environment and Heritage's *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW DECCW 2010a).

A process of Aboriginal community consultation has been undertaken in accordance with the *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (NSW DEC 2005) and the NSW OEH's *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW DECCW 2010b).

The study has sought to identify and record Aboriginal cultural areas, objects or places, assess the archaeological potential of the study area, and to formulate management recommendations based on the results of the community consultation, background research, field survey and significance assessment.

The Department of Planning and Environment (DP&E) Secretary's Environmental Assessment Requirements (SSD 6687) issued on 21 December 2016 identifies *Heritage* to be a key issue to be addressed in the Environmental Impact Statement (EIS). This Aboriginal Cultural Heritage Assessment Report (ACHAR) has been prepared to address the SEARs.

The objective of the cultural heritage assessment is to assess the impacts of the Project on Aboriginal and cultural heritage values. The assessment of historic impacts is also presented in this document. The management and mitigation measures outlined in this report in respect of the cultural heritage should inform the Statements of Commitments (SoCs) which would condition the approval process.

The majority of the assessment has been undertaken on ridge crests on which wind turbine generators (and associated infrastructure such as access tracks and electrical connections) are proposed. These survey units are highly eroded landforms which have been found to be of very low cultural and archaeological sensitivity and significance. While site recordings were very sparse, Aboriginal object locales (stone artefact sites) were recorded on ridge or spur crests and upper valley slope contexts. They are either isolated finds or very low density, highly disturbed stone artefact occurrences. Without exception, all crest landforms are eroded to such a degree as to have has no subsurface archaeological potential.

Other impacts such as tracks and electrical connections would occur on more muted topography such as simple slopes and flats in lower order stream valleys. These landforms also were found to be eroded and highly disturbed (by prior agriculture, road works and so on), and have been assessed to be of generally low cultural and archaeological significance. Landforms in valley contexts usually had some subsurface archaeological potential (albeit often disturbed) because of their aggrading geomorphological situation.

A complex of European mining activity and an old stockyard has been recorded in the northeast of the study area. Neither site warrants heritage listing, and this area is now outside the current project Development Footprint (see Appendix 4).

The Aboriginal object locales (and any undetected and/or subsurface artefacts) and heritage values do not surpass archaeological and cultural significance thresholds which would act to preclude the construction of the proposed wind farm.

Based on a consideration of the predictive model applicable to the environmental context in which impacts are proposed, the results of the study, and the nature of proposed impacts, the following conclusions are provided in summary form (see Section 9):

- There are no identified Aboriginal cultural and archaeological heritage constraints relating to the proposal.

- The majority of Aboriginal object sites recorded are outside areas of proposed impact.

- The proposed impacts to the archaeological resource can be considered to be of low. It is also relevant to take into consideration that impacts will be discrete in nature and will occupy a relatively small footprint. The archaeological resource in the broader area (those areas which lie outside actual proposed impacts) will not sustain any impacts as a result of the proposal.

- Based on a consideration of the small and discrete nature of proposed impacts and the identified archaeological and cultural values, the study area does not warrant subsurface test excavation.

  The level of assessment achieved during the field survey is considered to have been adequate for the purposes of determining the cultural and archaeological status of the proposal area. Furthermore, the majority of impact areas are eroded to bedrock and do not possess soil profiles which might host subsurface archaeological deposits.

- As a result of preliminary discussions with the Registered Aboriginal Parties for this project, a program of salvage excavation in one Survey Unit adjacent to Uungula Creek should be given consideration as an appropriate form of impact mitigation.

Acknowledgments

Julie Dibden, NSW Archaeology Pty Ltd, acknowledges the participation and assistance in this project provided by:

Joyce Williams, Violet Carr, Bren Doherty and Brad Bliss, Wellington Valley Wiradjuri Aboriginal Corporation (WVWAC);
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The many property owners who kindly assisted in various ways with information, access and logistics

Archaeological evidence confirms that Aboriginal people have had a long and continuous association with the region for thousands of years. We would in particular like to acknowledge and pay our respects to the traditional owners of the country which is encompassed by the proposal.

1. INTRODUCTION

Uungula Wind Farm is a proposed wind farm in the central western ranges approximately 14 km east of Wellington, NSW. The Project would comprise up to 125 wind turbines and associated infrastructure with a generating capacity of approximately 400 MW.

Uungula Wind Farm was first publicly announced in 2011 and an Environmental Assessment was prepared in 2013 for the Project which then consisted of 249 turbines within the Wellington Council and Mid-western Regional Council areas. Due to changes in the energy market at the time, the Project Development Application was not formally lodged, and the Project was transitioned to the State Significant Development process.

Following a detailed review of the grid network and extensive consultation with landowners and neighbours to the Project, a decision to focus on the western half of the Project and to remove proposed infrastructure from the Piambong and Yarrabin areas was made. The Project is located wholly within the Dubbo Regional Council area.

NSW Archaeology Pty Ltd conducted the initial Aboriginal and European heritage assessment, as documented in the 2013 report. This is a revised report, prepared in respect of the changes to the Project.

The proposal is comprised of the installation, construction, operation and decommissioning of the following infrastructure (see Figures in Appendix 2):

- Up to 125 wind turbine generators;
- Electrical connections between wind turbines using a combination of underground cabling and overhead power lines;
- Underground communications cabling;
- Collector substations, switching stations and transmission connections linking the wind turbines;
- Temporary construction facilities, site compounds, storage areas and batching plants;
- Wind monitoring masts;
- Access roads for the installation and maintenance of wind turbines; and
- Onsite control rooms and equipment storage facilities.

In December 2016, Secretary's Environmental Assessment Requirements (SEARs) were issued. The Commonwealth Government also issued

Environmental Assessment Requirements for the Project to be assessed as a controlled action under the Environment Protection and Biodiversity Conservation Act 1999, using the Accredited Assessment approach.

The Department of Planning and Environment (DP&E) Secretary's Environmental Assessment Requirements (SSD 6687) issued on 21 December 2016 identifies *Heritage* to be a key issue to be addressed in the Environmental Impact Statement (EIS). This ACHAR has been prepared to address the SEARs. In respect of heritage, the EIS must address the following as set out in Table 1.

Table 1 The SEARs (SSD 6687).

Requirement	Where in this report
Assess the impact on Aboriginal cultural heritage (including archaeological and cultural) in accordance with the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW and Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales	This entire report
Provide evidence of consultation with Aboriginal community in determining and assessing impacts, developing options and selecting option and mitigation measures (including the final proposed measures) having regard to the Aboriginal cultural heritage consultation requirements for proponents 2010	Chapter 3; Chapter 7.
Assess the impact on historical heritage having regard to the NSW Heritage Manual	Appendix 3
The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the Uungula Wind Farm and describe these in an ACHAR. This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales and guided by the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW and consultation with OEH regional officers.	Chapter 2
Where Aboriginal cultural heritage values are identified consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010. The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the Uungula Wind Farm	Chapter 3
Impact on Aboriginal cultural heritage values are to be assessed and documented in an ACHAR. The ACHAR must	Chapter 7

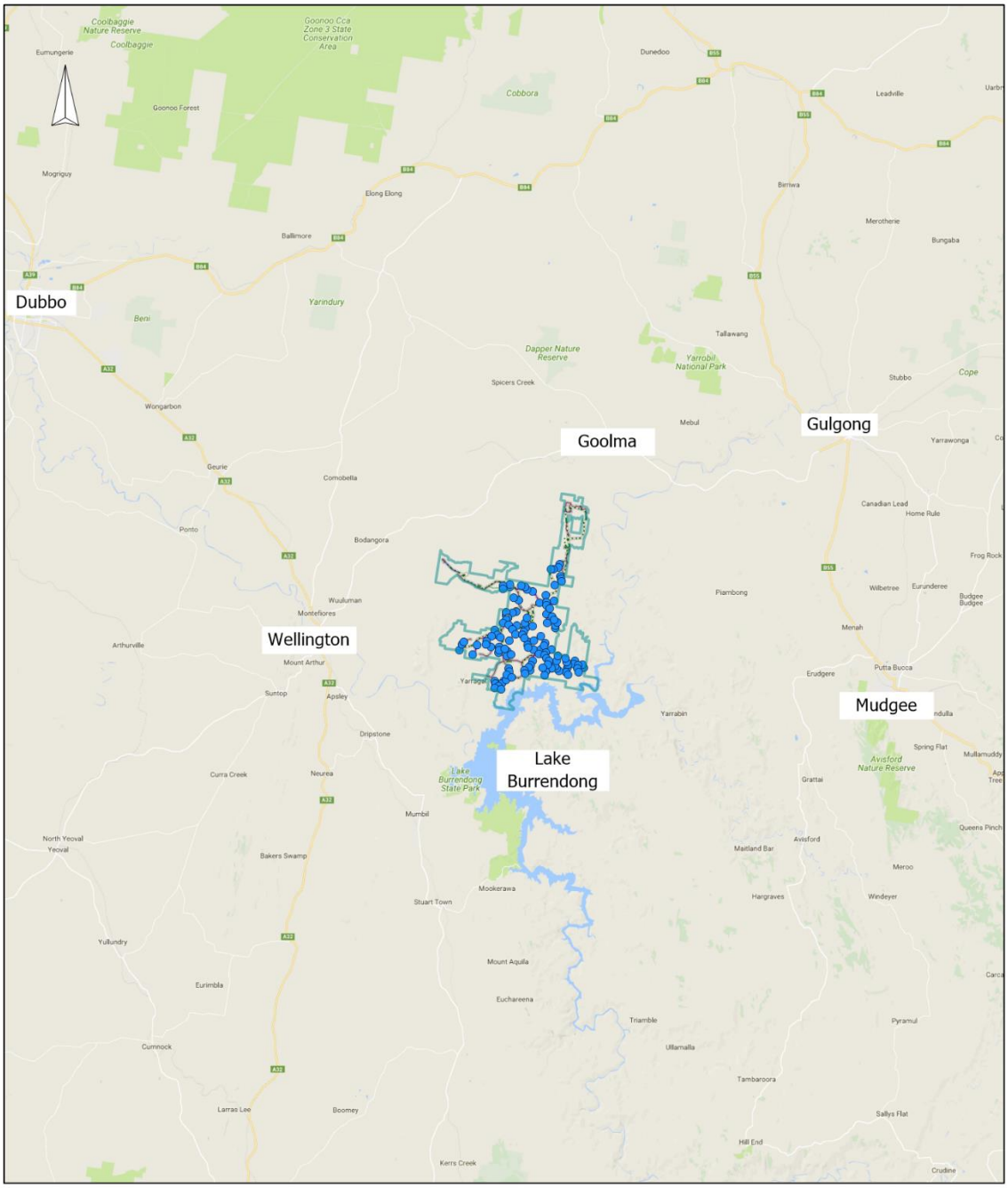
Requirement	Where in this report
demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcome. Where impacts are unavoidable the ACHAR must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.	
Project Specific Requirement: D. Where the Project's footprint occurs in areas identified by the EIS as sensitive ACH areas, surface surveys must be undertaken by a qualified archaeologist to determine the presence or absence of Aboriginal objects and the significance of those objects. The result of the surface survey is to inform the need for targeted subsurface test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record. The results of surface surveys and test excavations undertaken at this stage are to be documented in the EIS.	Chapter 2
E. Where the Project's footprint is unknown at the submission of the EIS, point D above applies if the future footprint occurs in areas identified by the EIS as sensitive ACH areas.	Chapter 9
F. The EIS must outline procedures to be followed if Aboriginal objects are found at any stage of the life of the Uungula Wind Farm to formulate appropriate measures to manage unforeseen impacts.	Chapter 9
G. The EIS must outline procedures to be followed in the event Aboriginal burials or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material.	Chapter 9

The content and format of this report is set out in accordance with the NSW OEH (2011) *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*. The report aims to document:

- The Aboriginal objects and declared Aboriginal places (as relevant) located within the area of the proposed activity;
- The cultural heritage values, including the significance of the Aboriginal objects and declared Aboriginal places that exist across the whole area that will be affected by the proposed activity, and the significance of these values for the Aboriginal people who have a cultural association with the land;
- How the requirements for consultation with Aboriginal people have been met (as specified in clause 80C of the *National Parks and Wildlife Regulation 2009* (NPW Regulation));

- The views of those Aboriginal people regarding the likely impact of the proposed activity on their cultural heritage (if any submissions have been received as a part of the consultation requirements, these would be included, and our response outlined);
- The actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified;
- Any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places; *and*
- Any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm, or, if this is not possible, to manage (minimise) harm.

The cultural heritage assessment has been managed by Dr Julie Dibden, NSW Archaeology Pty Ltd. The field work component has been conducted by Julie Dibden and Andrew Pearce, NSW Archaeology Pty Ltd, and representatives of the Registered Aboriginal Parties as acknowledged on page 3.



LEGEND

- Turbine Layout (up to 125 WTG)
- Project Site
- 100m Development Corridor
- Site Access Track
- **Indicative Electrical Layout**
- Overhead cables
- Underground cables
- Collector Substation Option
- Battery optoin
- Switching Station Option
- Site Compound
- Rock Crushing/Batching Plant

SCALE BAR: 0 — 10 km

COMPANY				
UUNGULA WIND FARM PTY LTD				
TITLE				
Figure 3.1: Project Location				
DATE	SCALE	DWG NO	REV	VER
12/10/2018	1:460000	UWF-04	C	1
DRAWN BY	CHECKED BY	SHEET	JOB NO	SIZE
J PETERSEN	M BRANSON	1 OF 1	110247	A3

Figure 1 The location of the proposed Wind Farm (map supplied by the proponent).

2. DESCRIPTION OF THE AREA – BACKGROUND INFORMATION

In this section, background and relevant contextual information is compiled, analysed and synthesised. The purpose of presenting this material is to gain an initial understanding of the cultural landscape. The following topics are addressed (*cf*. OEH 2011: 5):

- The physical setting or landscape;
- History of peoples living on that land; *and*
- Material evidence of Aboriginal land use.

2.1 The Physical Setting or Landscape

Aboriginal people have occupied NSW for more than 42,000 years (Bowler *et al*. 2003); evidence and cultural meanings relating to occupation are present throughout the landscape (OEH 2011: iii).

A consideration of landscape is particularly valuable in archaeological modelling for the purposes of characterising and predicting the nature of Aboriginal occupation across the land. In Aboriginal society, landscape could be both the embodiment of Ancestral Beings and the basis of a social geography and economic and technological endeavour. The various features and elements of the landscape are/were physical places that are known and understood within the context of social and cultural practice.

Given that the natural resources that Aboriginal people harvested and utilised were not evenly distributed across landscapes, Aboriginal occupation and the archaeological manifestations of that occupation will not be uniform across space. Therefore, the examination of environmental context is valuable for predicting the type and nature of archaeological sites which might be expected to occur. Factors that typically inform the archaeological potential of landscape include the presence or absence of water, animal and plant foods, stone and other resources, the nature of the terrain and the cultural meaning associated with a place.

Additionally, geomorphological and humanly activated processes need to be defined as these will influence the degree to which archaeological sites may be visible and/or conserved. Land which is heavily grassed and geomorphologically stable will prevent the detection of archaeological material, while places which have suffered disturbance may no longer retain artefacts or stratified deposits. A consideration of such factors is necessary in

assessing site significance and formulating mitigation and management recommendations.

The following information describes the geographic, environmental and landscape context of the study area.

The proposed wind farm would be located approximately 14 kilometres east of Wellington.

The study area is on the Burrendong 8732-N 1:50,000 (1st ed.) and Goolma 8733-S 1:50,000 (1st ed.) topographic maps. For mapping purposes, the wind farm is located in Zone 55.

The site has been selected for its windy ridges and cleared grazing land (for example, see Plate 1). The proposal would be located on a number of privately owned properties currently used for sheep and cattle grazing.

Plate 1 Typical vista of the landscape in which turbines are proposed; looking 10° from midway along SU54. Note SU24 in distance.

The wind farm is located in an elevated, heavily dissected landform of undulating ridges and spurs which are separated by moderate gradient or

steep slopes. The landform elements present fall into the following morphological types:

- Crest (see, for example Plate 2)
- Simple slope (Plate 3)
- Lower slope (Plate 4)
- Flat (Plate 5); and
- Open depression (Plates 6 and 7)

Plate 2 Typical crest landform element; looking 330° along SU8 from south end.

Plate 3 Example of steep simple slopes which fall away from crests; taken on SU22 looking 20°.

Plate 4 Lower simple slope landform; looking 190° in SU44. Note also Aboriginal site: SU44/L1.

Plate 5 A flat landform element: SU37 looking east.

Plate 6 Typical first order open depression – Golden Gully, a tributary of Uungula Creek; looking 150° from SU31.

Plate 7 The open depression occupied by the Cudgegong River; looking 10° from north end of SU72.

The ridge and spur crests on which wind turbine generators are proposed are typically gently undulating, reasonably narrow and frequently very rocky (Plate 8). The geology is primarily the Palaeozoic Crudine Group sedimentary sequence comprised of siltstone, shale, slate, sandstone and tuff. Low outcrops are common, particularly on crests and hillslopes; bedrock is frequently present at greater than 50 per cent which is technically rockland. The excessively rocky nature of much of the ridge crests is likely to have made these landforms unfavourable camp locations for Aboriginal people. Granite is present in the northwest where it outcrops as large boulders (SU50).

Crests and simple slopes are, without exception, highly eroded and, generally, soils are skeletal, possessing negligible topsoil or A horizon (Plate 9). However, on occasional knolls which have been used as 'sheep camps', manure has accumulated, and weeds act as sediment traps creating organic rich 'new' soils (Plate 10).

Plate 8 Typical rocky crest; SU41 looking 150°.

Plate 9 Typical view of eroded ground illustrating skeletal soil; SU14.

Plate 10 'New' soils at a sheep camp site on a knoll; south end of SU31.

The wind farm area can be characterised as a woodland resource zone. The ridge crests would have possessed limited biodiversity and a general lack of water. The ridges are likely to have been utilised by Aboriginal people for a limited range of activities which may have included hunting and gathering, and travel through country. Larry Foley (MGATIC) believes that the Cudgegong River would have been the main thoroughfare in the local area, and that 'there would not have been much walking through the hills'. As such, it is likely that artefact discard would have been low. The nature of stone artefacts discarded can be expected to have been correspondingly limited in terms of artefact diversity and complexity.

By comparison, the wider valleys between the ridges and hills are likely to have possessed greater levels of biodiversity given the likely presence of chains of ponds and, possibly also, occasional swamp features along drainage lines. In addition, a more reliable source of water is likely to have been present in valleys for much of the year. Such areas are likely to have been utilised more frequently and possibly by greater numbers of individuals at any one time; certainly, the valleys are likely to have been the favoured camp locations while people occupied the broader local area. Accordingly, the levels of artefact discard in valleys can be predicted to be correspondingly higher; artefact diversity and complexity is also likely to be greater.

2.2 History of Peoples Living on the Land

Aboriginal people have occupied Australia for at least 40,000 years and possibly as long as 60,000 (Mulvaney and Kamminga 1999: 2). By 35,000 years before present (BP), all major environmental zones in Australia, including periglacial environments of Tasmania, were occupied (Mulvaney and Kamminga 1999: 114). At the time of early occupation, Australia experienced moderate temperatures. However, between 25,000 and 12,000 years BP (the Last Glacial Maximum), dry and either intensely hot or cold temperatures prevailed over the continent (Mulvaney and Kamminga 1999: 114). At this time, the mean monthly temperatures on land were 6 - 10ºC lower; in southern Australia coldness, drought and winds acted to change the vegetation structure from forests to grass and shrublands (Mulvaney and Kamminga 1999: 115-116).

During the Last Glacial Maximum at about 24 - 22,000 years ago, sea levels fell to about 130 metres below present and, accordingly, the continent was correspondingly larger. With the cessation of glacial conditions, temperatures rose with a concomitant rise in sea levels. By c. 6,000 BP, sea levels had more or less stabilised to their current position. With the changes in climate during the Holocene, Aboriginal occupants had to deal not only with reduced landmass but changing hydrological systems and vegetation; forests again inhabited the grass and shrublands of the Late Glacial Maximum. As Mulvaney and Kamminga (1999: 120) have remarked:

> *When humans arrived on Sahul's[1] shores and dispersed across the continent, they faced a continual series of environmental challenges that persisted throughout the Pleistocene. The adaptability and endurance in colonising Sahul is one of humankinds' inspiring epics.*

As far as possible, an ethnographic and historical review of Aboriginal life in the region will be outlined below. However, our ethnographic understanding of Aboriginal people in this area and the historical dimension of the colonial encounter has been reconstructed from scant historical records produced during a context of death and dispossession (Swain 1993: 115) and is sketchy and severely limited. Stanner (1977) has described the colonial and post-colonial past as a 'history of indifference', and this portrays both the substantive situation which prevailed and the general lack of regard for this history. For a considerable period of time after Europeans arrived in Australia no concerted ethnographic investigations were undertaken to learn

[1] Sahul is the name given to the single Pleistocene era continent which combined Australia with New Guinea and Tasmania.

about the culture and society of Aboriginal peoples. As a result, in trying to reconstruct the complex traditional cultures of varying Aboriginal groups, investigators of today are necessarily required to piece together, as best as possible, fragmentary information derived from the incidental annotations of disparate early observers. As elsewhere, this applies also to the Wiradjuri Aboriginal peoples who occupied the country that included the study area.

The traditional country of the Wiradjuri speaking peoples encompassed a broad area of inland New South Wales, extending between the Macquarie, Lachlan, Murrumbidgee and Murray Rivers. Michael O'Rourke (2009) has investigated in depth the cultural and language boundaries between Aboriginal networks in this northeast region of the broader Wiradjuri lands, and indicates that Wiradjuri groups occupied an area extending from the Warrumbungle Mountains to lands encompassing present-day Dubbo, Wellington and Mudgee. In broad reconstruction, O'Rourke (2009) delineates the boundary between the Wiradjuri and the neighbouring Gamilaraay language group, whose country is to the northeast, along an approximate line extending from Coolah to Coonabarabran. To the northwest, the linguistic group that spoke the Wailwan language occupied lands beyond present-day Gilgandra.

It is difficult to place an approximate number on the population size of Aboriginal groups at the time of European colonisation of the continent, but some estimates place the total number of Wiradjuri speaking peoples at some 10,000 individuals (O'Rourke 2009). Those Wiradjuri who lived on country in reasonable proximity to the study area resided on land within the Macquarie River system. It is understood that upstream of present-day Wellington, three differing Wiradjuri groups lived on the Macquarie River, a waterway which they traditionally called 'Wambool'. They were the Bathurst 'tribe', who occupied lands on the upper reaches of the Macquarie in and around present-day Bathurst; the Mudgee 'tribe', who lived on the Cudgegong in the vicinity of Mudgee; and the Wellington 'tribe' who lived on the Bell River and the Macquarie River downstream from Bathurst (Connor 2002: 55).

Similarly, there is limited information with regard to the patterns of movement of the Wiradjuri over the course of the year. It is suggested, however, that land use varied according to the season. Major watercourses are understood to have formed the core of a group's territory (Macdonald 2011). O'Rourke (2009: 13) proposes a model wherein each community's land may have encompassed an area of some 4-5,000 square kilometres, taking in some 60 km of reliable watercourses and abutted on either side with a

hinterland extending for 30 km. From various sources he determined that in an environment such as the northern extent of the South Western Slopes bioregion, a group's territory could conceivably be between 50 by 50 kilometres and ranging up to 85 by 85 kilometres.

The early explorers and settlers noted considerable variation in the numbers of Aborigines that would gather for food procurement in the area during the different months of the year (Haglund 1985). The major rivers and associated tributaries were the focus of livelihood and supplied a variety of reliable and plentiful food including fish, water fowl and shellfish. On August 22, 1817, John Oxley, the first European to travel up the Macquarie River from the Wellington Valley, observed 'an abundance of fish and emus … swans and ducks', as well as very large mussels growing among the reeds in many stretches of the river (Oxley 1820).

In the late 1830s, Lawrence Struilby noted the fishing activities of the local Wiradjuri Aborigines he had observed while on a canoe trip he took down the Macquarie River to witness a Corroboree. He wrote:

> We found the blacks in high preparation to catch "munge" – fish. They were on the bank beneath a great stringy bark tree, not mending, but making their nets...We were interested in the process. One with his "wammerah" raised off a strip of bark, which he pulled upwards till he brought down its fibre twenty or thirty feet long. He handed it to another, who twisted it along his thigh with a roll of his palm; and gave it to the next, who finished the twisting; and the others looped it into a strong and close net. When finished, it was put on a hoop of wattle sapling, and formed a crescent drag-net. This again was tied on a long pole of "currywang" wattle, and with it they dragged several little bays and nooks in the river, and pulled out lots of small fresh-water cod, or Peel's perch, for breakfast. They also got a kind of fresh-water muscle which they eat; but we did not fancy it (Graham 1863).

Riverine resources were supplemented with kangaroos and emus. According to Thomas Mitchell, Surveyor-General of the Colony of NSW, possums formed a significant part of people's diet, as well as being used for making warm winter cloaks, arm bands and other items of clothing. Mitchell, who conducted several expeditions into the area in the 1830s and 1840s, wrote that possums were found in the hollow trunks of upper branches of tall trees which were climbed by cutting notches into the trunks.

Vegetable foods formed a significant part of the Wiradjuri diet. The daisy yams (*Microseis scapigera*) and a range of other roots and tubers, including lily and orchid tubers and Kurrajong roots (*Brachychiton populneum*) were

important foods (Gott 1983, White 1986: 57-58). Kurrajong and Acacia seeds would be ground for flour, as would certain grass seeds, such as oat grass or kangaroo grass (*Themeda australis*). Kurrajong trees, while not abundant, are ubiquitous across the study area (Plate 11). With short hunting forays away from the base camp, foods such as honey and possum could be readily obtained, while predominantly it was the women who would spend their time gathering plant foods. Grass seed from "native millet", *Panicum* species, was a major staple food source in inland NSW. *Panicum* and other seeds were gathered and threshed in a communal effort, before then being ground on grindstones and cooked in the form of tiny loaves (O'Rourke 1993: 13).

In the warmer part of the year, it is understood that aligned Aboriginal groups totalling several hundred people would congregate beside major watercourses to conduct ceremonial business and to exploit the fish, yabbies and mussels that were available. Fish net-traps, often very large, were fashioned from the fibre obtained from the bark of the Kurrajong tree. Bucknell (in O'Rourke 1993:13), an early settler, observed that at times a single net-haul caught enough fish to feed 40 people for a day.

In the autumn and winter, the large congregations separated into small 'hearth-groups' comprised of one or two families only, some ten people or less, and went their own way. Travelling into the 'back-country', the men would hunt land mammals and the bigger birds, while women collected reptiles and small animals, as well as harvesting plant foods, including roots and yams (O'Rourke 1993: 13-14).

Given the estimates of the Wiradjuri pre-European population possibly being in the vicinity of 10,000 individuals (O'Rourke 2009:4), and thereafter, at the time of the establishment of the Bathurst settlement, a total population of between 500 to 600 people making up the combined Bathurst, Mudgee and Wellington Wiradjuri 'tribes' (Connor 2002: 55), the question arises as to how these numbers could be so swiftly reduced following the arrival of European people. The scant number of Aboriginal people encountered also puzzled early settlers. John Oxley was one of many explorers who wondered why regions of rich abundance appeared to only support a very sparse Aboriginal population. Both he and botanist and explorer Allan Cunningham were moved to comment on the scant numbers of Aboriginal people they encountered in their travels north from Bathurst and to the Liverpool Plains. Cunningham wrote 'It is curious that I should have met with only one small group of native women and children and seven males who were prowling about in quest of the scanty subsistence in grubs and kangaroos or opossums afforded by the

surrounding country and from the boundary heights only perceived two distinct smokes of the fires of the Aborigines' (Lee 1925).

Various causes may be attributed for the apparent sparseness of the Aboriginal population throughout the district at this time. Cunningham believed it may have been due, at least in part, to the activities of parties of soldiers and settlers from the Bathurst and Mudgee regions, who had made 'sweeps' on the Indigenous population in 1824. These sorties were conducted by four separate posses (O'Rourke 2009: 12).

O'Rourke (2009: 12) suggests that smallpox first impacted the local population with an outbreak in 1830-32, and as such, only after Oxley and Cunningham had made their tours of the Liverpool Plains. However, this occurrence was at least the third epidemic to sweep through Indigenous groups, and it is most probable that the sparseness of the Aboriginal population throughout the district when these explorers arrived may to a large degree be attributed to an earlier spread of smallpox which had severely depleted the population by that time. By the 1830s, explorers Charles Sturt and Sir Thomas Mitchell found evidence of large-scale mortality on the Darling and Murray River systems. Indeed, Sturt and Beveridge came across large numbers of skeletons. Both Mitchell and Sturt held the same opinion as to the enormity of the mortality rate which smallpox had wreaked amongst the tribes when it '... absolutely raged through the whole of them', with Mitchell also declaring that its effect was '... almost depopulating the Darling' (Mear 2008).

As indicated by Edward M. Curr, who wrote as early as 1877 in the Argus, Captain Collins of the First Fleet had observed in April 1788 that the Aborigines in the Sydney area were being swept away by smallpox. 'It may be noticed that in addition to Collins, Hunter, Barrington and Wentworth give more or less full accounts of the horrors which occurred on the occasion and of how such of the Aboriginals as had not yet been stricken down fled to the interior to escape the destroyer, bearing about them inevitably the seeds of a wider destruction. With the flight of the survivors, however, we lose for the time all traces both of them and the disease, our countrymen at the period not having yet left the margin of Sydney Bay' (The Argus 1877 p.7).

Curr's recollections and conclusions, in combination with the accounts given by Mitchell, Sturt and Beveridge, add to the evidence that smallpox had travelled down the Murray in the period just after the First Fleet arrived, causing massive depopulation and disruption to the surviving inhabitants.

From this, it is reasonable to assume that the disease had also significantly depleted the Wiradjuri populations, spread by fleeing survivors of the Sydney outbreak even before Europeans had set foot in their country. There is, however, no indication that smallpox was deliberately imported by the British into Sydney. Neither was it introduced by the French, who Captain Phillip nevertheless chose to blame for causing the outbreak, even though such an allegation has no foundation. Meanwhile, Tench and other First Fleet journal writers were either apologetic, or incredulous that the disease could have possibly been introduced by their party. Nevertheless, it is apparent that by some means the British brought smallpox with them on the First Fleet and that it was introduced into the Aboriginal community in 1788, wreaking havoc and initiating destruction and dislocation throughout the Aboriginal societies of Australia (Mear 2008).

With their population drastically reduced, both the domestic and spiritual functioning of Aboriginal groups would have been placed under immense stress. It was at this time that settlers first moved into Wiradjuri country following Wentworth, Blaxland and Lawson's discovery of a route across the rugged mountains into the unexplored interior. The first recorded contact between the Wiradjuri and Europeans took place in December 1813, when following the directive of Governor Macquarie, surveyor George Evans made his way over the mountains to the site of present-day Bathurst. A road was built across the Blue Mountains in 1814, and the settlement of Bathurst was established the following year. However, unlike some previous settlements, the township of Bathurst was strictly controlled. Governor Macquarie decided to use this settlement to run government sheep and cattle, and in turn the small introduced European population consisted of convicts employed as shepherds and stockman, with a few officials and soldiers to oversee them. On August 22, 1817, explorer John Oxley was the first European to travel further west, heading up the Macquarie River from the Wellington Valley.

Initially the relations between the newcomers and the Wiradjuri is indicated to have been relatively amicable and, as such, the frontier settlement was relatively calm from the time of its inception up until 1822, chiefly because the limited land used for running stock and the small population greatly limited the chance of conflict with the Wiradjuri. However, this peaceful period was short lived, and from 1821 the newly appointed Governor Brisbane expanded the limits of inland settlement. Between 1821 and 1825 the number of cattle and sheep in the Bathurst district increased from 33,733 to 113,973. At the same time, the total area of alienated land increased from 1010 ha to 36,650 ha. Similarly, there was a surge in the human population. While in

1822 the settlement of Bathurst did not have a single public house, by 1827 the population had increased so remarkably that not only could it support eleven public houses (ten of which were unlicensed), but also even its own brewery. As a result of this growth, with both stock numbers and the human population escalating so dramatically, traditional Wiradjuri land-use practices were suddenly placed under intense pressure (Connor 2002: 55), and, even more importantly, this colonial expansion increasingly interfered with Wiradjuri access to social and sacred sites.

In response, the Wiradjuri chose to fight back. In 1822 there were attacks on settlers at both Mudgee and to the west of Bathurst at the government station at Swallow Creek. In a letter to Governor Brisbane written on 7 February 1822, William Cox the road maker and grazier wrote in relation to land situated near present-day Mudgee:

> *My son, Mr Henry Cox is this instant returned from Bathurst (and so ill from the heat that he cannot proceed further) with information that the natives have driven away the persons who were in charge of the stock at the River Cudgegong with the exception of one man who it is supposed is killed; it also appears that the natives let the horned cattle out of the yards and got possession of the sheep that my sons kept there for rations, which they were killing when the men came away.*

While Henry Cox had ridden to Windsor to inform his father of their misfortune, his brother George had headed to Bathurst to gather a party of men before returning to their stations to retrieve their cattle and take revenge on the Aborigines.

These actions were the start of what became known as the 'Wiradjuri Wars' - a series of violent clashes between various Wiradjuri groups and the advancing European settlers, as the Wiradjuri fought to regain control of their land and its resources. The tactics most often adopted by the Wiradjuri were guerrilla-style actions, attacking outlying, under-defended stations, dispersing stock and the ambushing of isolated stockmen. Briefly for a time, these offensives were able to halt the European pastoral advancement. However, as Connor (2002: 3) emphasises, the traditional Aboriginal concept of war differed significantly to the Europeans' notion of such engagements. Aboriginal conflict was of necessity limited in nature. One reason for this was that Aboriginal groups were relatively small, thus limiting the number of combatants. In addition, warriors were very soon impelled to cease hostilities in order to resume the paramount task of gathering food. Another reason conflict was limited in scale was that the loss of lives in the smaller Aboriginal groups had a significant impact on the group as a whole and would swiftly

become unsustainable. Therefore, in order to limit casualties, traditional formal Aboriginal warfare often took a stylised form that aided to curb losses (Connor 2002: 3).

The mountainous country at the edge of the Bathurst Plains and surrounding Mudgee served as a protective refuge for the Wiradjuri warriors, from where they could launch attacks, and which provided, as the *Sydney Gazette* described, 'an interminable extent of country on which to retire back upon' (Connor 2002: 56). The best known of the Wiradjuri leaders from this time was Windradyne. Windradyne was accredited with the murder of two stockmen at Kings Plains, just north of present-day Blayney. On hearing of the incident settlers were outraged and insisted that the military should become involved to provide protection for the pastoralists and to punish the perpetrators. In reaction, Governor Brisbane instated martial law over the Western District in August 1824 and entrusted a detachment of troopers to track and capture Windradyne, who was arrested and imprisoned at Bathurst for a month in leg irons. It was reported that to arrest him, six men and a severe beating with a musket were required to bring the prisoner to task (Roberts 2005).

Upon his release, hostilities between the settlers and the Wiradjuri only increased. Settlers began to take the law into their own hands and injustices against the Wiradjuri were becoming commonplace. The Sydney Gazette reported at the time: 'Advices from Bathurst say the natives have been very troublesome in that country. Numbers of cattle have been killed. In justification of their conduct the natives urge that the white men have driven away all the kangaroos and opossums, and the black men must now have beef!' (Munro 2012).

As hostilities continued the Wiradjuri suffered increasing losses, with an estimation that one third of their total population was killed during the resistance (Munro 2012). The crisis eventually subsided, although the failure to capture Windradyne delayed the repeal of martial law until 11 December. Two weeks later he and a large number of his people crossed the mountains to attend the annual feast at Parramatta, where Windradyne was formally pardoned by Brisbane (Roberts 2005).

When Governor Darling took up his post in 1825, he saw the two main challenges to British law as being the threat from escaped convicts called 'bushrangers', and also from hostile Aborigines. Shortly before he arrived in the colony, Acting Governor Stewart had set up two mounted police patrols,

recruited from among veteran soldiers. Called police, they were in reality mounted infantry, armed with short-barrel muskets. One patrol was posted to Bathurst, and the other was sent to the Hunter Valley (O'Rourke 2009: 42).

In his work, O'Rourke (2009) documents the conflicts that hereafter took place between the colonists and the Aboriginal groups of the Mudgee/Merriwa/Muswellbrook area. As British law and order was imposed over this district, Reverend Threlkeld was at one point provoked to decry '... war has commenced and still continues against the Aboriginals of this land' (O'Rourke 2009: 52). However, while the historical record holds relatively clear detail on the raids and attacks mounted by the Indigenous population, the responses and reprisals enacted by official and unofficial parties appear less well documented.

From a population of just 114 Europeans in 1822, the 1846 Census registered the Bathurst District (which included Carcoar, Wellington, Mudgee and Hartley) as having a population expanded to almost 12,000 people. Two thirds of these were convicts or ex-convicts. Local Wiradjuri were severely impacted by the colonial settlers and their military attendants, and by the 1840s there was widespread dislocation of Aboriginal culture. The gathering for a handing out of blankets and supplies at Hartley and Mudgee in the 1840s, and the holding of Corroborees in the hills around Mudgee until the 1850s, were some of the last recorded expressions of a traditional Aboriginal presence in the region (Kass 2003).

However, although Aboriginal people became more and more dependent on and enmeshed in the colonial system, they were nevertheless regarded as less than equals with their white counterparts. Jimmy Governor was born on the Talbragar River in 1875, the son of a bullock-driver father, and his wife Annie, née Fitzgerald. Short, good-looking, of Aboriginal appearance but with red hair, Jimmy attended the mission school at Gulgong before starting work as a police tracker at Cassilis in 1896. He then tried jobs as a woodcutter and a wool-roller, before marrying Ethel Page, a 16-year-old European woman, in 1898 at Gulgong (Walsh 1983).

After a variety of jobs, Jimmy got a fencing contract for John Mawbey at Breelong, near Gilgandra, while Ethel did housework for Mrs Mawbey. Jimmy was conscientious and concerned to prove himself in white society, at the same time being touchy about his colour. When he learned that Mrs Mawbey and schoolteacher Helen Kerz had taunted his wife Ethel for having married a 'blackfellow', Jimmy and friend Jacky Underwood confronted the

women who on the night of 20 July 1900 were alone in the house with seven children. When the women laughed at him and Helen Kerz taunted: 'Pooh, you black rubbish, you want shooting for marrying a white woman', Jimmy flew into a rage. Losing all control, he and Underwood killed the two women and three of the children with nulla-nullas and a tomahawk (Walsh 1983).

Underwood was quickly caught, but Jimmy and his brother Joe Governor, calling themselves 'bushrangers', went on a rampage for fourteen weeks. Covering 3,000 km, they terrorised a wide area of north-central New South Wales. Seeking revenge on persons who had wronged them, they killed Alexander McKay near Ulan, Elizabeth O'Brien and her baby son at Poggie, near Merriwa, and Keiran Fitzpatrick near Wollar. Pursued by Queensland black trackers, bloodhounds and hundreds of police and civilians, they moved into the rugged headwater country of the Manning and Hastings rivers. After several close escapes, Jimmy was shot in the mouth near Wingham, and Joe was shot dead at a place just north of Singleton. Jimmy stood trial in Sydney for the murder of Helen Kerz and was convicted and hanged. His story was retold in the context of Aboriginal dispossession and white racism in Thomas Keneally's 1972 novel, 'The Chant of Jimmy Blacksmith', later made into a film in 1978 (Walsh 1983).

The Board for the Protection of Aborigines was established on 2 June 1883 and was comprised of six members who, appointed by the Governor, held weekly meetings at which recommendations concerning the NSW State's Aboriginal population were considered. The Board functioned without any statutory power until the introduction of the *Aborigines Protection Act 1909*. Under this Act the board was expanded and given the power 'to exercise a general supervision and care over all matters affecting the interests and welfare of Aborigines and to protect them against injustice, imposition and fraud.' The Board wrote regulations that established local boards for the management of Aboriginal Stations and its principal expenditure was in relation to the distribution of rations, clothing and huts for accommodation. Thereafter, the *Aborigines Protection Amending Act 1915* gave the Board the power to assume control and custody of Aboriginal children if it believed this action to be in the moral or physical interest of the child, and to remove the child to "such care and control as it thinks best" (New South Wales State Government Records 1883-1969).

Arising from this official legislated overseeing of Aboriginal affairs, from the 1890s, Aboriginal reserves and missions began to be set up throughout the region for the purposes of managing and controlling Wiradjuri refugees, while

at the same time creating a reliable labour pool which could be drawn from. Then, when the *Aborigines Protection Amending Act 1915* was enacted, the removal of children of Aboriginal and non-Aboriginal parents came into practice and many Wiradjuri children were taken and relocated to homes outside the region. Reserves became established on the outskirts of towns which in many districts created a gulf between cultures and a landscape of segregation. Controlled by unsympathetic authorities, with limited public services and a general lack of opportunities for change, empowerment or advancement, for the Wiradjuri, life on many of the reserves was one of harsh and distressing abject poverty (Kass 2003).

Plate 11 Kurrajongs typically occupy rocky knolls.

2.3 Material Evidence

A search of the NSW OEH Aboriginal Heritage Management Information System (AHIMS) was conducted for this Project on 9 July 2012 (Client Service ID: 74520). The search area measured 756 km² and encompassed the area between eastings 692000 – 731000, and northings 6385000 – 6415000. A total of 104 Aboriginal object sites were recorded on AHIMS as present in the search area. Two revised searches were conducted on 1 November 2018 (Tables 2 and 3, and see Appendix 1):

- (Client Service ID: 380119) for eastings 721000 – 731000, and northings 6385000 – 6415000. A total of 89 Aboriginal object sites were recorded on AHIMS as present in the search area;
- (Client Service ID: 380118) for eastings 692000 – 722000, and northings 6385000 – 6415000. A total of 83 Aboriginal object sites were recorded on AHIMS as present in the search area.

The AHIMS register only includes sites which have been reported to NSW OEH. Generally, sites are only recorded during targeted surveys undertaken in either development or research contexts. Accordingly, this search cannot be considered to be an actual or exhaustive inventory of Aboriginal objects situated within the local area or indeed within the study area itself.

The majority of the AHIMS sites are sites on roads or were recorded during the 2013 Uungula Wind Farm field survey. The location of AHIMS sites are shown on the figures in Appendix 2. It is noted that two sites are identified as Restricted (#36-2-0331 & #36-5-0081). Both are located well outside the proposed wind farm area.

The most common Aboriginal object recordings in the region are distributions of stone artefacts. Rare site types include rock shelters, scarred trees, quarry and procurement sites, burials, stone arrangements, contact sites and traditional story or other ceremonial places. The distribution of each site type is related, at least in part, to variance in topography and ground surface geology.

Searches have been conducted of the NSW State Heritage Inventory and the Australian Heritage database. No Aboriginal heritage sites are listed on these as being in the study area.

Table 2 AHIMS Search #380119.

Site ID	Site name	Datum	Easting	Northing	Recorders
36-2-0097	Stony Creek 5 SC5	AGD	726540	6413650	Mr.David Maynard
36-2-0098	Stony Creek 4 SC4	AGD	726580	6414080	Mr.David Maynard
36-5-0082	LOC 5A and 6A	AGD	721310	6387759	Mr.David Maynard
36-5-0084	Leaning Oak Creek 3A	AGD	723100	6387700	Murong Gialinga Aboriginal and Torres Strait Islander Corporation
36-5-0081	Restriction applied.				Mr.David Maynard
36-2-0102	Stoney Creek 1	AGD	725840	6413200	Mr.David Maynard
36-2-0103	Stoney Creek 2	AGD	725840	6413200	Mr.David Maynard

Site ID	Site name	Datum	Easting	Northing	Recorders
36-2-0294	Lower Piambong Rd (LP1A)	GDA	726884	6402068	Mr.David Maynard, Miss.Christine Maynard
36-5-0134	Lower Piambong Rd (LP1B)	GDA	726570	6401680	Mr.David Maynard, Miss.Christine Maynard
36-5-0135	Lower Piambong Rd (LP2)	GDA	726490	6401570	Mr.David Maynard
36-5-0136	Lower Piambong Rd (LP3)	GDA	726417	6401523	Mr.David Maynard, Miss.Christine Maynard
36-5-0137	Lower Piambong Rd (LP4)	GDA	726259	6401421	Mr.David Maynard
36-5-0138	Lower Piambong Rd (LP5)	GDA	726105	6401370	Mr.David Maynard, Miss.Christine Maynard
36-2-0295	Lower Piambong Rd (LP6)	GDA	725970	6401281	Mr.David Maynard
36-5-0139	Lower Piambong Rd (LP7)	GDA	725573	6401005	Mr.David Maynard, Miss.Christine Maynard
36-5-0140	Lower Piambong Rd (LP8)	GDA	725354	6400984	Mr.David Maynard, Miss.Christine Maynard
36-5-0141	Lower Piambong Rd (LP9)	GDA	725284	6401028	Mr.David Maynard, Miss.Christine Maynard
36-5-0142	Lower Piambong Rd (LP10)	GDA	725204	6401031	Mr.David Maynard
36-5-0143	Lower Piambong Rd (LP11)	GDA	725001	6401061	Mr.David Maynard, Miss.Christine Maynard
36-5-0144	Lower Piambong Rd (LP12)	GDA	724911	6401025	Mr.David Maynard
36-5-0145	Lower Piambong Rd (LP13)	GDA	724864	6401042	Mr.David Maynard, Miss.Christine Maynard
36-5-0146	Lower Piambong Rd (LP14)	GDA	724732	6400977	Mr.David Maynard
36-5-0147	Lower Piambong Rd (LP15)	GDA	724633	6400900	Mr.David Maynard, Miss.Christine Maynard
36-5-0148	Lower Piambong Rd (LP16)	GDA	724164	6400936	Mr.David Maynard
36-5-0149	Lower Piambong Rd (LP17)	GDA	724239	6400834	Mr.David Maynard, Miss.Christine Maynard
36-5-0150	Lower Piambong Rd (LP18)	GDA	724061	6400998	Mr.David Maynard
36-5-0151	Lower Piambong Rd (LP19)	GDA	723773	6401608	Mr.David Maynard, Miss.Christine Maynard
36-5-0152	Lower Piambong Rd (LP20)	GDA	723773	6401608	Mr.David Maynard
36-5-0153	Lower Piambong Rd (LP21)	GDA	723568	6401641	Mr.David Maynard, Miss.Christine Maynard
36-5-0154	Lower Piambong Rd (LP22)	GDA	723421	6401780	Mr.David Maynard
36-2-0296	Lower Piambong Rd (LP23)	GDA	723054	6402770	Mr.David Maynard, Miss.Christine Maynard
36-2-0297	Lower Piambong Rd (LP24)	GDA	722734	6403228	Mr.David Maynard
36-2-0298	Lower Piambong Rd (LP25)	GDA	722496	6403814	Mr.David Maynard, Miss.Christine Maynard
36-2-0299	Lower Piambong Rd (LP26)	GDA	722479	6404431	Mr.David Maynard

Site ID	Site name	Datum	Easting	Northing	Recorders
36-2-0300	Lower Piambong Rd (LP27)	GDA	722629	6404879	Mr.David Maynard, Miss.Christine Maynard
36-2-0301	Lower Piambong Rd (LP28)	GDA	722611	6405017	Mr.David Maynard
36-2-0302	Lower Piambong Rd (LP29)	GDA	722745	6406284	Mr.David Maynard, Miss.Christine Maynard
36-2-0303	Lower Piambong Rd (LP30)	GDA	722810	6406490	Mr.David Maynard
36-2-0304	Lower Piambong Rd (LP31)	GDA	722615	6407200	Mr.David Maynard, Miss.Christine Maynard
36-2-0305	Lower Piambong Rd (LP32)	GDA	722615	6407200	Mr.David Maynard
36-2-0306	Lower Piambong Rd (LP33)	GDA	722355	6407905	Mr.David Maynard, Miss.Christine Maynard
36-2-0307	Lower Piambong Rd (LP34)	GDA	722408	6408580	Mr.David Maynard
36-2-0308	Lower Piambong Rd (LP35)	GDA	723071	6409118	Mr.David Maynard, Miss.Christine Maynard
36-2-0309	Lower Piambong Rd (LP36)	GDA	723184	6409165	Mr.David Maynard
36-2-0310	Lower Piambong Rd (LP37)	GDA	723289	6409406	Mr.David Maynard, Miss.Christine Maynard
36-2-0311	Lower Piambong Rd (LP38)	GDA	723335	6409529	Mr.David Maynard
36-2-0312	Lower Piambong Rd (LP39)	GDA	723357	6410334	Mr.David Maynard, Miss.Christine Maynard
36-2-0313	Lower Piambong Rd (LP40)	GDA	723482	6410757	Mr.David Maynard
36-2-0314	Lower Piambong Rd (LP41)	GDA	723304	6411232	Mr.David Maynard, Miss.Christine Maynard
36-2-0328	Lower Piambong Road LPRE2	AGD	727327	6402142	Mudgee Local Aboriginal Land Council , Mr.David Maynard
36-2-0329	Lower Piambong East 1 LPR East1	AGD	726949	6402089	Mudgee Local Aboriginal Land Council ,Mr.David Maynard
36-2-0330	Lower Paimbong Road East 3	AGD	727863	6401918	Mr.David Maynard, Metropolitan Local Aboriginal Land Council
36-2-0320	Hughes Road Lower Piambong Road IA	AGD	723738	6410500	Miss.Christine Maynard, Metropolitan Local Aboriginal Land Council
36-2-0321	Hughes Road Piambong 1	AGD	723926	6409811	Miss.Christine Maynard, Metropolitan Local Aboriginal Land Council
36-2-0322	Hughes Road-Lower Piambong 2	AGD	724109	6409339	Miss.Christine Maynard,Metropolitan Local Aboriginal Land Council

Site ID	Site name	Datum	Easting	Northing	Recorders
36-2-0323	Hughes Road-Lower Paimbong 3	AGD	724160	6408440	Miss.Christine Maynard,Metropolitan Local Aboriginal Land Council
36-5-0163	Lower Piambong 1	AGD	727435	6401610	Paul Houston,Mr.David Maynard
36-2-0324	Lower Piambong 2	AGD	727360	6401751	Mr.David Maynard
36-2-0325	Lower Piambong 3	AGD	727396	6401783	Mr.David Maynard
36-2-0326	Lower Piambong 4	AGD	727405	6401811	Mr.David Maynard
36-2-0327	Lower Piambong 5	AGD	727415	6401875	Mr.David Maynard
36-5-0165	LPR 6 Lower Piambong Road (re-buried objects related to 36-2-0295)	GDA	725972	6401304	Mudgee Local Aboriginal Land Council ,Mr.David Maynard
36-2-0390	CBR - OS - 24	GDA	721400	6414920	Mr.Neville Baker
36-2-0391	CBR - OS - 23	GDA	721220	6414610	Mr.Neville Baker
36-2-0392	CBR - OS - 22	GDA	721134	6414455	Mr.Neville Baker
36-2-0331	Restriction applied.				Miss.Christine Maynard
36-2-0332	GRG-2	GDA	724088	6412963	Miss.Christine Maynard
36-2-0333	GRG-3	GDA	724296	6413664	Miss.Christine Maynard
36-2-0334	GRG-4	GDA	725154	6413927	Miss.Christine Maynard
36-2-0483	833 Goolma Rd OS	GDA	730400	6413315	Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard
36-2-0484	1435 Goolma Rd OS	GDA	726566	6413193	Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard
36-2-0485	Burraboo Goolma Rd OS1	GDA	724912	6412527	Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard
36-2-0486	Burraboo Goolma Rd OS2	GDA	724973	6412587	Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard
36-2-0496	Goolma Road Ring Tree	GDA	729857	6413297	Mr.Bradley Bliss, Wellington Valley Wiradjuri Aboriginal Corporation
36-5-0086	Leaning Oak Creek 2A	AGD	723083	6387818	Arthur Lee
36-5-0089	Leaning Oak Creek Loc 3B	AGD	721250	6388022	Mr.David Maynard
36-5-0090	Leaning Oak Creek Loc 4B	AGD	723151	6388031	Mr.David Maynard
36-5-0091	Leaning Oak Creek Loc 5B	AGD	723030	6387820	Mr.David Maynard
36-5-0092	Leaning Oak Tree 1A	AGD	723046	6387657	Arthur Lee
36-5-0093	Leaning Oak Creek 4A	AGD	723000	6387703	Arthur Lee
36-2-0431	UWF SU1/L1	GDA	728330	6409696	Doctor.Julie Dibden

Site ID	Site name	Datum	Easting	Northing	Recorders
36-2-0432	UWF SU1/L2	GDA	727090	6408123	Doctor.Julie Dibden
36-2-0433	UWF SU1/L3	GDA	727060	6408046	Doctor.Julie Dibden
36-2-0434	UWF SU1/L4	GDA	727012	6407431	Doctor.Julie Dibden
36-2-0435	UWF SU1/L5	GDA	726553	6406915	Doctor.Julie Dibden
36-2-0436	UWF SU1/L6	GDA	725555	6405705	Doctor.Julie Dibden
36-2-0437	UWF SU4/L1	GDA	727380	6406855	Doctor.Julie Dibden
36-2-0439	UWF SU14/L1	GDA	724638	6403813	Doctor.Julie Dibden
36-2-0440	UWF SU15/L1	GDA	726208	6403301	Doctor.Julie Dibden

Table 3 AHIMS search # 380118.

Site ID	Site name	Datum	Easting	Northing	Recorders
36-5-0080	(refer to 36-5-0055) Open site 1/12 mile	AGD	714490	6396480	NPWS - Bulga
36-5-0082	LOC 5A and 6A	AGD	721310	6387759	Mr.David Maynard
36-5-0083	Yarrabin Rd Grattai	AGD	720520	6387102	Mr.Giles Hamm
36-2-0104	YBCR-ST1	AGD	719670	6411642	Doctor.Jodie Benton
36-2-0105	YBCR-PAD1	AGD	719560	6412130	Doctor.Jodie Benton
36-2-0106	YBCR-OS2 with PAD	AGD	719669	6411920	Doctor.Jodie Benton
36-2-0107	YBCR-OS1 with Pad	AGD	719449	6411791	Doctor.Jodie Benton
36-2-0317	Goolma Creek 1 GC1	GDA	715348	6412819	Mudgee Local Aboriginal Land Council
36-2-0315	UR 3 (Uamby Rd)	GDA	713760	6411566	Miss.Christine Maynard
36-2-0316	UR 4(Uamby Rd)	GDA	713830	6411582	Miss.Christine Maynard
36-2-0318	UR 1 (Uamby rd)	GDA	713944	6411690	Miss.Christine Maynard
36-2-0319	UR 2 (Uamby rd)	GDA	713876	6411655	Miss.Christine Maynard
36-5-0009	Macquarie River; Gigmalarie Creek;	AGD	694457	6387889	G.W. Althofer,Michael Pearson
36-5-0011	Ilgingerry Creek;	AGD	702555	6389003	Mr.Warwick Pearson
36-2-0019	Goolma;	AGD	714375	6411431	G.W. Althofer
36-2-0036	GOOLMA;	AGD	718690	6413320	Warren Bluff
36-5-0040	CM 1;	AGD	692189	6391834	Mary Dallas Consulting Archaeologists, Miss.Lisa Smith
36-5-0041	CM 2;	AGD	692350	6392650	Mary Dallas Consulting Archaeologists, Miss.Lisa Smith
36-5-0001	Burganbungie; Gigmalarie;	AGD	694445	6387728	Robert "Ben" Gunn
36-2-0001	Mt Bodangora;	AGD	697863	6410220	Glen Morris
36-2-0108	YBCR-OS3	AGD	719329	6412034	Doctor.Jodie Benton
36-2-0109	YBCR-OS4	AGD	719355	6412267	Doctor.Jodie Benton
36-2-0155	GC OS 20 with PAD	GDA	717258	6412904	OzArk Environmental and Heritage Management
36-2-0390	CBR - OS - 24	GDA	721400	6414920	Mr.Neville Baker
36-2-0391	CBR - OS - 23	GDA	721220	6414610	Mr.Neville Baker
36-2-0392	CBR - OS - 22	GDA	721134	6414455	Mr.Neville Baker
36-2-0482	194 Hill End Rd Menah Quarry	GDA	717546	6410579	Mudgee Local Aboriginal Land Council , Miss.Christine Maynard

Site ID	Site name	Datum	Easting	Northing	Recorders
36-2-0488	4789 Twelve Mile Rd OS1	GDA	718539	6410679	Mudgee Local Aboriginal Land Council , Miss.Christine Maynard
36-2-0489	4789 Twelve Mile Rd OS2	GDA	718521	6410665	Mudgee Local Aboriginal Land Council , Miss.Christine Maynard
36-5-0191	Restriction applied. Please contact ahims@environment. nsw.gov.au.				Mr.Bradley Bliss,Wellington Valley Wiradjuri Aboriginal Corporation
36-2-0481	Restriction applied. Please contact ahims@environment. nsw.gov.au.				Mr.Bradley Bliss,Wellington Valley Wiradjuri Aboriginal Corporation
36-5-0087	Leaning Oak Creek 1B Loc 1B	AGD	720633	6387730	Mr.David Maynard
36-5-0088	Leaning Oak Creek Loc 2B	AGD	720656	6387794	Mr.Warren Mayers
36-5-0089	Leaning Oak Creek Loc 3B	AGD	721250	6388022	Mr.David Maynard
36-2-0143	UC OS 2	AGD	710270	6409577	Mr.David Maynard,Murong Gialinga
36-2-0144	UC OS 1 with PAD	AGD	710371	6408520	Aboriginal and Torres Strait Islander Corporation,Doctor. Jodie Benton,
36-2-0145	GC OS 5 with PAD	AGD	716819	6412701	Warrabinga Native Title Claimants
36-2-0146	CT OS 7	AGD	717231	6412758	Aboriginal Corporation, Mr. Phillip
36-2-0139	GC OS 6	AGD	717231	6412758	Cameron
36-2-0141	UC OS 3 with PAD	AGD	709935	6409813	Mr.David Maynard,Murong Gialinga
36-2-0142	CR OS 4 with PAD	AGD	713405	6411246	Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporation,Doctor. Jodie Benton, Warrabinga Native Title Claimants Aboriginal Corporation, Mr. Phillip Cameron
36-2-0270	Private Rd-Gorries Lane Goolma AS	GDA	714665	6413356	Doctor.Maria Cotter
36-2-0438	UWF SU13/L1	GDA	720773	6409698	Doctor.Julie Dibden
36-5-0167	UWF SU20/L1	GDA	720538	6399589	Doctor.Julie Dibden
36-5-0168	UWF SU20/L2	GDA	720549	6399657	Doctor.Julie Dibden
36-5-0169	UWF SU20/L3	GDA	720747	6399837	Doctor.Julie Dibden
36-5-0170	UWF SU22/L1	GDA	702596	6396808	Doctor.Julie Dibden

Site ID	Site name	Datum	Easting	Northing	Recorders
36-5-0171	UWF SU24/L1	GDA	706049	6394103	Doctor.Julie Dibden
36-5-0172	UWF SU26/L1	GDA	704363	6395945	Doctor.Julie Dibden
36-5-0173	UWF SU30/L1	GDA	705972	6400713	Doctor.Julie Dibden
36-5-0174	UWF SU32/L1	GDA	706660	6398830	Doctor.Julie Dibden
36-5-0175	UWF SU34/L1	GDA	705929	6392887	Doctor.Julie Dibden
36-2-0441	UWF SU38/L1	GDA	718764	6408904	Doctor.Julie Dibden
36-2-0442	UWF SU39/L2	GDA	716945	6405936	Doctor.Julie Dibden
36-2-0443	UWF SU40/L1	GDA	718232	6404202	Doctor.Julie Dibden
36-2-0444	UWF SU41/L1	GDA	717425	6403616	Doctor.Julie Dibden
36-2-0445	UWF SU42/L1	GDA	717996	6402834	Doctor.Julie Dibden
36-2-0446	UWF SU43/L1	GDA	718486	6402006	Doctor.Julie Dibden
36-5-0176	UWF SU43/L2	GDA	718567	6400794	Doctor.Julie Dibden
36-5-0177	UWF SU43/L3	GDA	718860	6400418	Doctor.Julie Dibden
36-5-0178	UWF SU43/L4	GDA	719068	6399951	Doctor.Julie Dibden
36-5-0179	UWF SU44/L1	GDA	700681	6393326	Doctor.Julie Dibden
36-5-0180	UWF SU44/L2	GDA	700738	6393527	Doctor.Julie Dibden
36-5-0181	UWF SU44/L3	GDA	700901	6393784	Doctor.Julie Dibden
36-5-0182	UWF SU44/L4	GDA	701428	6394094	Doctor.Julie Dibden
36-5-0183	UWF SU46/L1	GDA	699686	6396742	Doctor.Julie Dibden
36-5-0184	UWF SU49/L1	GDA	700987	6401383	Doctor.Julie Dibden
36-2-0447	UWF SU51/L1	GDA	708023	6406046	Doctor.Julie Dibden
36-2-0448	UWF SU51/L2	GDA	708117	6406053	Doctor.Julie Dibden
36-2-0449	UWF SU51/L3	GDA	708128	6406151	Doctor.Julie Dibden
36-2-0450	UWF SU52/L1	GDA	708122	6406768	Doctor.Julie Dibden
36-2-0451	UWF SU52/L2	GDA	706960	6407385	Doctor.Julie Dibden
36-2-0452	UWF SU53/L1	GDA	708221	6406748	Doctor.Julie Dibden
36-2-0453	UWF SU65/L1	GDA	710434	6408805	Doctor.Julie Dibden
36-2-0454	UWF SU65/L2	GDA	710449	6409452	Doctor.Julie Dibden
36-2-0455	UWF SU65/L3	GDA	710211	6409679	Doctor.Julie Dibden
36-2-0456	UWF SU68/L1	GDA	708180	6409986	Doctor.Julie Dibden
36-2-0457	UWF SU71/L1	GDA	712811	6405320	Doctor.Julie Dibden
36-2-0458	UWF SU72/L1	GDA	712066	6404020	Doctor.Julie Dibden
36-2-0459	UWF SU73/L1	GDA	711941	6403782	Doctor.Julie Dibden
36-2-0460	UWF SU73/L2	GDA	711873	6403601	Doctor.Julie Dibden
36-2-0474	Bodangora SU3/L1	GDA	696852	6411952	Doctor.Julie Dibden
36-2-0475	Bondangora SU18/L1	GDA	692880	6411849	Doctor.Julie Dibden

2.3.1 Previous Archaeological Research

The primary focus of archaeological research in Australia throughout the 1960s, 1970s and 1980s was the examination of the relationship between Aboriginal people and their environment, and the mechanisms of adaptation in what was apparently a land of harsh conditions and scanty, or at best, seasonal resources. The bulk of archaeological research that has been

undertaken in the region has been focused on examining these issues. Prior to the 1960s, most archaeological research was aimed at defining change in the archaeological record. This was before direct dating techniques became available and, accordingly, the issue of time was handled by identifying differences in materials in archaeological deposit – specific artefacts in different layers of deposits were used to define different cultural periods (for example, McCarthy 1964, see below). With the application of direct dating techniques in the 1960s, research shifted away from the use of artefacts for defining different time periods, towards seeking to explain the nature of different artefacts and assemblages of artefacts and food remains, in terms of adaptation to the environment. The 1960s also saw a shift towards the use of explicit scientific methods of reasoning in archaeological practice. This impetus influenced archaeologists to focus on research topics which were believed to be answerable within a scientific methodology. Topics dealing with site locational models, subsistence, technology and environmental adaptation were addressed. The following section outlines research conducted within the region.

A basic chronological sequence of human occupation in south-east Australia is the Eastern Regional Sequence, proposed by McCarthy (1964), and more recently refined by Lampert (1971: 68), Stockton and Holland (1974: 53), Attenbrow (2004: 72) and McDonald (1994; 2008). McCarthy's (1964) three-phased sequence extends from the Pleistocene through to the late Holocene and is based on observed changes over time in stone artefact assemblages. The phases identified by McCarthy were the Capertian, the Bondaian and Eloueran (the latter being the most recent). Later researchers such as Lampert (1971: 64), and others, have found a general agreement with McCarthy's sequence. However, the sequence has undergone revision (Lampert 1971: 68). At the Upper Mangrove Creek Catchment (UMCC), Attenbrow (2004: 72) identified four cultural phases based on changes in artefact typology and raw material in the stone artefact assemblages from four radiocarbon dated sites. These changes were considered with reference to other studies conducted in the south-east in defining the phases and assigning dates to them.

Attenbrow (2004: 72-75) identified the following broad sequence of change in the Upper Mangrove Creek catchment:

- Phase 1 (Capertian): ca. 11,200 – ca. 5,000 years BP: Assemblages consist primarily of flakes, cores and flakes pieces. Implements include amorphous flakes with retouch/usewear, dentated saws and small

numbers of backed artefacts. Fine grained siliceous stone and quartz dominate assemblages.

- Phase 2 (Early Bondaian): ca. 5,000 – ca. 2,800 years BP: Backed artefacts become more archaeologically visible and ground-edge implements appear at ca. 4,000 years BP. Fine grained siliceous stone and quartz dominate assemblages.
- Phase 3 (Middle Bondaian): ca. 2,800 - ca. 1,600 years BP: Backed artefacts reach a peak in abundance. During this time quartz dominates assemblages.
- Phase 4 (Late Bondaian): ca. 1,600 years BP through to just after European occupation: Backed artefacts are rare, bipolar artefacts and ground-edge implements continue to increase in abundance; quartz continues to dominate raw material categories.

Regional and sometimes local variations in the assemblages of each phase of the regional sequence have been identified and, furthermore, each phase has been found to begin at slightly different times in different regions (Attenbrow 2004: 219). Attenbrow argues that these differences are possibly due to local environmental conditions and local responses to climatic change, as well as to regional variations in social organisation, territoriality and subsistence patterns. In consideration of the absence of detailed archaeological investigation of the study area, extrapolating the evidence from elsewhere for use in this assessment necessarily requires caution.

While supporting the general temporal sequence, archaeological enquiry undertaken since McCarthy now considers the behavioural and demographic implications of observed change. Much attention has also been given to explaining phenomena such as the timing of initial site occupation and other indicators, such as changes in artefact numbers in sites. A picture of apparent intensity of site occupation during the mid to late Holocene has been explained in terms of a corresponding population increase (Hughes and Lampert 1982), and this notion gained currency in the literature (see, however, Hiscock 1981, 1986; Attenbrow 1987, 2004; Boot 1994, 1996, 2002). Attenbrow (2002: 21; 2004) has devoted considerable attention to this issue and concludes that distinguishing between behavioural (such as changes in technology or mobility patterns), and geomorphological and demographic change to account for observed changes in the archaeological record, is not straightforward. She argues that answers to these questions are still unresolved, and that at this time it is not known how populations may have grown or changed from the time of initial occupation.

A new adaptive model, based on analyses of backed artefacts, has also been proposed which has implications for behavioural change during the late Holocene. Backed artefacts have been made and deposited in south-east Australia for 9,500 years (Hiscock and Attenbrow 1998). They dramatically peaked in abundance after 3,500 years ago, which was maintained until 2,000 years ago when their number began to decline. Hiscock (2008: 156, 158) has hypothesised that the backed artefact proliferation was a response to economic risk associated with the onset of drier and more variable climatic conditions in southern Australia related to the intensification of the El Niño system. Additional factors, which may have triggered higher foraging risk, have been posited, including landscape colonisation, redefinition of social space, landscape change, reduction of resources and greater foraging mobility (Hiscock 2008: 158). It is noted also that ground-edge hatchets were adopted as a new technology in south-eastern Australia at c. 3,500 years ago at the same time as the backed artefact proliferation (Dibden 1996; 2011). This technology is also likely to have helped deal with foraging risk.

The following discussion includes a review of archaeological work and its results conducted within the broader local area.

Isabel McBryde conducted an archaeological survey in the Dunedoo, Gulgong, Wollar and Coolah region which sampled portions of a 5000 km² area as part of research into rock art located within the western slopes of the New England region (*cf*. Haglund 1981a.) A total of 30 aboriginal heritage sites were located during the investigation, half of which were rock shelters with art, while the remainder comprised shelters with deposit, grinding grooves and quarries.

At this early time, surveys were also conducted in the region by the Australian Museum between 1965 - 1967. The rock shelter BOB/1, situated on Bobadeen Creek and to the north of where that watercourse joins the Goulburn River, was excavated in 1967. The results of the excavation, reported by Moore (1970), indicated that a total of 16,609 artefacts were retrieved from this relatively small shelter which measured some 5 x 3 metres in size. The deposit was excavated to a depth of some 1.2 metres, with radiocarbon dating of the basal layers furnishing a date of 7,750±120 BP. Subsequent dating (Moore 1981) provided additional dating results of 5,150±170 BP and 4,120±175 BP, so that Moore (1981) concluded that occupation of the shelter had begun at about 6,000 years BP.

The retrieved assemblage was comprised of 13,552 small waste flakes, 1,900 large waste flakes, 175 small cores, 75 large cores and, in addition, a variety

of implements. Stone tools retrieved were 249 Bondi points, 166 side and end scrapers, 47 eloueras, 223 other microliths/backed artefacts, 48 points, 72 utilised flakes, 22 utilised cores, 2 ground-edged 'axes', 3 utilised pebbles and other items (Moore 1970: 49). The dominant raw material type was quartz (55%), with fine-grained grey chert forming the next largest component of the assemblage (Moore 1970).

In addition to stone artefacts, a total of 69 bone implements were recovered. Moore (1970) attributed their function as possibly being scribers for incising marsupial skin cloaks. Wallaby, possum, bandicoot and bettong bones were also retrieved, as well as emu eggshell and freshwater shells (Moore 1970). In all, an area of some 140 cubic feet was excavated, with artefact density being some 118 artefacts per cubic foot, or some 4,189 artefacts per cubic metre.

Moore (1970) compared the retrieved BOB/1 stone assemblage with two other sites excavated in the upper Hunter Valley - Milbrodale 1 and Sandy Hollow 1. He determined that because the Bondi point tool type did not make up as high a proportion of the artefactual material at BOB/1, backed artefact production was more generalised there than in the upper Hunter Valley sites. In addition, he concluded that artefact production at the BOB/1 site had conspicuously higher levels of microlithic stone working, though acknowledging that a higher percentage of quartz in the BOB/1 shelter assemblage may have influenced this result.

Pearson (1981) completed a regionally based investigation of Aboriginal and early European settlement patterns in the Upper Macquarie River region. He excavated three rock shelters (one of which is discussed further below) which revealed Aboriginal occupation of the area dating from 7,000 years BP. Pearson (1981) also conducted sample surface surveys for Aboriginal sites at a number of locations including the Mudgee/Cooyal areas. Pearson (1981) paid particular attention to the factors which influenced occupation as reflected by means of site location and site distribution. He observed that across all regions it was apparent that accessibility to water, good drainage, level ground for sleeping, elevation above areas of winter cold air pooling, sufficient exposure to cooling summer breezes, a sunlit leeward aspect and access to adequate fuel were significant influencing factors in the choice of campsite locations. In the sample survey, areas which afforded such conditions were noted as being located on gentle hillslopes and undulating ground, flat sections on ridges particularly at lower elevations and, thereafter, creek banks and river flats which, although they had ready access to water, possessed no other discernible advantageous features. In relation to

preferred vegetation zones, Pearson's (1981) investigation identified open woodland as being favoured for occupation. Pearson characterised Aboriginal site patterning as follows:

- Aboriginal sites were strongly related to water sources. Distance to water varied from 10 to 500 m and generally the average distance to water decreased as site size increased;
- Sites were located on hilly and undulating landforms rather than on river flats or the banks of waterways. However, the regional incidence of landform variation biased this sample;
- Site location was influenced by good drainage and views over water courses and river flats;
- Most sites were located in open woodland contexts with smaller numbers being present in grassland or forest contexts;
- Burial sites and grinding grooves were situated close to habitation areas;
- Ceremonial sites were located away from habitation areas;
- Stone arrangements were located away from campsites in isolated places; they are associated with small hills and knolls or flat land;
- Quarry sites were located where suitable sources were present and reasonably accessible.

Based on an examination of early historical material, Pearson (1981) argued that the region was inhabited by a small number of clan groups each of which were comprised of 80 to 150 people. These groups were divided into smaller 'daily' units of up to 20 people. Pearson (1981) suggests that the 'daily' units made short moves between camp sites which resulted in elongated site formation such as continuous artefact scatters along creeks. Pearson presented ethnographic evidence which suggested that camp sites were not used for longer than three nights and that large sites therefore probably represented accumulations of short-term visits.

Pearson (1981) also considered the issue of the reliance upon food staples. He argued that rather than a reliance on a singular food type, a wider based economy was practised with the implication that such a non-specialised economy would probably not have been affected by periodic shortfalls in certain foods and that human movement would have been similarly unaffected. In addition to surface surveys, Pearson (1981) also undertook subsurface investigation, excavating the Botobolar 5 rock shelter, near to Bara Creek and some 15 kilometres east of Mudgee. This shelter is located about 40 metres from Bara Creek and about 100 metres from an extensive grinding groove site on that creek. It is 12 metres long, 5 metres high and 4 metres deep, with an easterly aspect. The shelter itself has extensive art in

the form of a large frieze of engravings across a 12 x 1.5 metre panel on the wall, which includes over 123 pecked motifs, primarily of 'animal track' design. In addition, there are four white and one red hand stencils plus, immediately to the south of the main shelter, a rock slab which features more engravings and grinding grooves. Extending across the widest section of the shelter, Pearson (1981) excavated a 3 x 1 metre trench. Cultural material was found to a depth of 0.55 metres, with one excavation unit extending to a depth of 0.7 metres. Radiocarbon dating obtained by Pearson (1981) gave dates of 5,590±190 BP and 5,770±100 BP.

A total of some 2,975 stone artefacts were retrieved in the excavation, which Pearson (1981) subdivided into Bondaian and pre-Bondaian assemblages. The assemblage, characterised as Bondaian as it contained microliths, was located in the uppermost 0 - 0.15 or 0.2 metres of deposit, with the pre-Bondaian assemblage, lacking microliths, located below. The 5,590 BP date was obtained from the pre-Bondaian deposit, while the only date acquired from the Bondaian deposit was 1,170±60 BP. Quartz dominated the assemblage, making up in excess of 50% of the items. A high proportion of the retrieved material was small flaking debitage, while implements comprised a low proportion, but included Bondi points, an elouera, geometric microliths, thumbnail scrapers, utilised cores, utilised flakes and pieces, a ground edged flake and a grinding slab. Other material recovered from the excavation included kangaroo, wallaby, possum, bandicoot and reptile bone in the upper levels, as well as macrozamia pods, gum nuts, geebung and some mussel shell fragments. Emu egg shell was also present, and from this Pearson (1981) believed there was the inference that occupation of the shelter, at least at the time this material was laid down, was in late winter and/or early spring.

Koettig (1985) undertook a comprehensive study relating to Aboriginal occupation of the Dubbo area. Following a desktop review, Koettig (1985) commenced a systematic survey of a variety of landform units and stream orders so as to ascertain the relationship of site type and site location to specific environmental settings within three principal physiographic zones. As a result of this study Koettig (1985) proposed that:

- Aboriginal sites will be distributed throughout all landscape units;
- Open artefact scatters, scarred or carved trees and grinding grooves are the most common site types;
- The location and comparative size of sites is principally determined by environmental and social influences. While site location dictated by social determinants cannot be predicted, some modelling of site type and

site location in relation to environmental factors may be made. Those factors include:

- Proximity to water: - although sites were found in all landscape settings including hills and ridges distant from water, the largest campsites were located close to permanent watercourses.
- Availability of food resources: - While the widest range of foods was found along major watercourses in association with the available permanent water, some foods were seasonal and located away from permanent watercourses.
- Geological formation: - Certain site types occur in particular settings. Grinding grooves are located where there are suitable sandstone outcrops, while quarries are found where there is a useable and accessible stone resource. Burials are most likely to be found in sandy deposits such as those that exist on alluvial flats.

Haglund (1985) conducted a desktop study of the Aboriginal heritage resources of the Mudgee shire, collating information from previous archaeological assessments, as well as information available in the OEH sites register. While noting the limited number of investigations which had been carried out to that date, Haglund (1985) indicated that some 70 sites were recorded on the register as being located within the Mudgee Shire. Of these, 29 were listed as open sites, 20 were identified as being rock shelters, including two which contained both art and deposit, and 15 which had art only. Other sites included two quarries, two wells, 11 grinding groove sites, three stone arrangements, four scarred trees, two bora grounds and one burial.

A desktop study was conducted by Navin (1990) in relation to three prospective sites selected for the purpose of power generation, located at Broke, Gunnedah and Ulan. Navin (1990) collated information available from previous archaeological assessments, combined this with information available from the OEH sites register, and constructed a predictive model of site location for each of the three areas. Navin (1990) found that 580 Aboriginal sites had been identified within a 50 km radius of Ulan, of which 47% were rock shelters with archaeological deposit. Thereafter, 30% of sites were artefact scatters, 11% rock shelters with art, 9% grinding grooves, and 3% scarred trees. Those site types which formed the least common (less than 1%) of those recorded were bora grounds, rock engravings, burial sites, carved trees, quarries, fish traps, stone arrangements and waterhole/well sites. Navin's (1990) predictive model for the region identified as high, the likelihood for artefact scatters to occur on flats associated with valley

corridors and adjacent sandstone slopes that occur within sandstone ranges, as well as along adjoining watercourses - particularly alongside those which are reliable water sources. Thereafter, Navin (1990) predicted the potential for artefact scatters to exist along ridge crests as moderate, with shelter sites expected to potentially occur in the same landform element. Navin (1990) proposed that the comparatively high quantity of rock art sites in the Ulan/Gulgong area was maybe the product of a regionally specific art site tradition. Also observed, was the chance for ceremonial sites and carved trees to occur.

OzArk (2005) surveyed the proposed route for the Transgrid 330 kV transmission line between Wellington and Wollar. A section of this route crosses the study area (discussed further below). OzArk (2005) inspected proposed access tracks and tower sites, although some were unable to be surveyed because of restricted property access. A total of 19 artefact scatters and seven isolated finds were recorded.

Hamm (2006a) conducted an archaeological survey in relation to Stage One operations at the proposed Moolarben Coal Mine at Ulan. Covering an area of approximately 34.8 km² (3,480 hectares), Hamm (2006a) recorded 222 Aboriginal heritage sites, comprised of 156 isolated finds and 47 artefact scatters. The number of stone artefacts recorded totalled 1,298, with quartz (81.6%) being the dominant raw material, and thereafter tuff (10.6%). Silcrete, siltstone, quartzite, chert, mudstone, chalcedony and porcellanite were represented in low frequencies. The stone artefact types recorded were dominated by flakes, flake portions and flaked pieces, with cores, hammerstones and backed artefacts also found to be present. In addition to stone artefacts, 17 rock shelters with artefacts and/or rock art were recorded, as well as one scarred tree, one grinding groove site and 12 areas of potential archaeological deposit.

Hamm (2008) thereafter conducted an assessment in relation to the 2nd Stage of the Moolarben Coal Project. In this subsequent assessment, which was a sample survey, Hamm (2008) identified a total of 258 Aboriginal sites in addition to a re-recording a number of previously identified sites. Stone artefact sites were comprised of 102 isolated finds and 150 artefact scatters. A total of 4,825 stone artefacts were recorded, with quartz being the most common material (76%), followed by tuff (19%). Thereafter, silcrete, quartzite, chert, sandstone and fine grained volcanics were also represented, but in low frequencies. The stone artefact types which made up this assemblage were dominated by flakes, flake portions and flaked pieces, with cores,

hammerstones, axes, anvils, grindstones and backed artefacts also found. In addition to stone artefact sites, Hamm (2008) recorded five rock shelters with artefacts, one grinding groove site, and 33 areas of potential archaeological deposit.

Since 1980, a number of surveys have been carried out at the Ulan coal mine site. These have been comprehensively reviewed by Peter Kuskie (2009), and here will be summarised briefly. Laila Haglund has undertaken the bulk of this work until South East Archaeology Pty Ltd took over the project in approximately 2000. Prior to 2000 numerous surveys were conducted, as well as the excavation of a number of rock shelters (see Kuskie 2009). Details are apparently scant for most of these excavations (*cf*. Kuskie 2009: 38). However, one (AHIMS #36-3-177) was subject to a salvage excavation and has been reported in more detail. A total area of 20 m² was excavated both in and out of the shelter. Artefacts were retrieved at a relatively low density of 139 artefacts per cubic metre (*cf*. Kuskie 2009: 39). As appears to be typical for the region, quartz was the most common raw material (68%), with chert (fine grained siliceous) being the next most abundant. The assemblage was comprised predominantly of flakes and flake fragments. Witter (1994) proposed an occupation model for a rock shelter at Ulan (ID# 116) which involved one or more of three possible functions:

- Transient overnight camp – for small groups of people; such a site function would result in an artefact assemblage of debitage with a wide range of sizes, mostly resharpening flakes and possibly some flake tool production.
- Day camp/foraging station – utilised as a daytime base for operations away from the domestic camp; this function would entail casual maintenance of equipment and would result in the production of abundant resharpening flakes and implements with little reduction and the production of medium and light duty flakes for brief use.
- Vantage points/crafts stations – for monitoring game movements and in addition the repair or maintenance of equipment; this function would entail casual to intensive manufacturing of artefacts including microblade core reduction, resharpening and reduction of nuclear tools to produce large amounts of small debitage.

Accordingly, Haglund (1996) suggested that the evidence conformed to a vantage point/crafts station site, but that in reality it possessed attributes indicative of all three models. To be frank, like many archaeological models, as an explanatory tool, it was overly simplistic and somewhat less than useful.

Haglund (cited in Kuskie 2009) conducted another salvage excavation of a shelter (AHIMS #36-3-1488) in 1998. A total area of 37 m² was excavated. Age determination by radiocarbon dated varied between recent to c. 4,000 years BP. A total of 10,002 artefacts were retrieved. Quartz and chert dominated the assemblage which was comprised predominantly of debitage. The site was initially interpreted as a domestic base camp, but subsequent analysis revealed temporal variability in site use. Usewear observed on artefacts indicated women's and men's activities and from this family occupation was inferred.

Kuskie (2009) conducted a comprehensive assessment of the then proposed Ulan Coal – Continued Operations. This assessment provides a significant contribution to the understanding of the local heritage context. Kuskie surveyed approximately 88% of an overall study area measuring 5,431 hectares. Some 709 Aboriginal heritage sites were recorded including:

- 558 open artefact sites;
- 9 grinding groove sites;
- 128 rock shelters with artefacts, art and/or grinding grooves;
- 5 scarred trees;
- 5 stone arrangements;
- 2 ochre quarries;
- 1 waterhole/well;
- 1 combined grinding groove and artefact site.

Kuskie (2009) produced a detailed occupation model of site location for Ulan. He argues that artefacts occur at the very low mean density of 0.0176 artefacts per square metre of effective survey coverage, which is consistent with background discard, and interspersed by occasional focalised areas of higher artefact density where activities or repeated activities occurred. This indicates that Aboriginal use of the area was generally of low intensity which, Kuskie argues, is probably the product of a lack of higher order water courses.

Dibden (2011a) conducted an assessment of the proposed Bodangora Wind Farm, located to the north-west of the current study area. High levels of ground cover severely hampered the detection of Aboriginal sites. However, based on environmental grounds the area was assessed to be of low archaeological potential.

Dibden (2012) conducted the assessment of the Crudine Ridge Wind Farm located to the southeast of Mudgee. A development corridor measuring 52 kilometres long by approximately 200 metres wide (c. 1040.96 ha) was

inspected during the field survey. At the time ground exposure was reasonably high. Forty four Aboriginal object locales with stone artefacts were recorded. All artefact locales were calculated to be very low density artefact distributions (taking into consideration ground exposure and archaeological visibility). Generally, the artefact locales were considered to be representative of the artefact distribution and density within the entire Survey Unit in which they are situated. That is, they did not appear to be representative of discrete artefact locales but instead, they form part of the very low density 'background scatter' which is present across the landscape. The behavioural context of their deposition (or discard) was interpreted to be spatially unfocused. However, some locales did seem to be more discrete and, furthermore, these are tethered to particular areas. There is some tendency for these locales to be on the eastern side of the plateau and, also, to be associated with springs.

Based on the above review and a consideration of the topography, geomorphology and hydrology of the study area, the type of sites known to occur in the region and the potential for their presence within the study area are described in Section 2.3.2 below.

2.3.2 Predictive Model of Aboriginal Site Distribution

The type of sites known to occur in the region and the potential for their presence within the study area are listed as follows:

Stone Artefacts

Stone artefacts will be widely distributed across the landscape in a virtual continuum, with significant variations in density in relation to different environmental factors. As a general rule, artefact density and site complexity can be expected to be greater near reliable water and the confluence of a number of different resource zones.

The detection of artefact scatters depends on ground surface factors and whether or not the potential archaeological bearing soil profile is visible. Prior ground disturbance, vegetation cover and surface wash can act to obscure artefact scatter presence.

Given the different environmental contexts present within the study area, stone artefacts are predicted to be present in variable densities across the landscape. On ridge crests artefacts are likely to be present in very low densities only. It is predicted that on crests, artefact discard is likely to have

occurred as a result of discrete events such as knapping activity and implement repair, or otherwise, simply random loss or disposal. On simple slopes between valleys and ridge crests, the majority of which are of moderate or steep gradient, artefact density is predicted to be negligible. Because of the nature of the steep, high ridge landforms, camping areas are most likely to have been focused on flats or basal slopes within valleys of higher order streams. Accordingly, in open valleys on elevated lower slopes or flats near to creeks, it is predicted that artefact density is likely to be higher and also, artefacts can be expected to be distributed as continuous occurrences across discrete landform elements.

Grinding Grooves

Grinding groove sites contain grooves in rock surfaces that are produced through the shaping and/or sharpening of ground-edge stone hatchet heads or other tools (Attenbrow 2004). Groove size and morphology is known to be variable in the broader Sydney Basin which suggests that they can result from the sharpening of a variety of different tools, and the preparation of food (Attenbrow 2004: 43). Generally, groove dimensions indicate that grinding grooves result for the sharpening of stone hatchet heads.

A broad temporal framework for the age of grinding groove sites can be inferred on the basis of the age of ground-edge hatchet heads found within archaeological deposits. Across Australia, there is significant variation in the timing of the introduction of ground-edge hatchet technology, and in the south-east, the earliest hatchet heads date to the fourth millennium BP (Dibden 1996: 35; Attenbrow 2004: 241), and no earlier than 3,500 years ago (Hiscock 2008: 155). Grinding groove sites in the local area can be no older than 3,500 years. Given that hatchets were used at the time of European occupation, the use of some grinding groove sites may have spanned this temporal range.

Grinding hatchet heads on stone creates indelible marks on the rock surface and land. Grinding groove sites may have become significant and meaningful locales over time given their reference to an important item of material culture and their strong material presence in the landscape. Sites containing high groove counts are now visually significant marked locales. While the original motivation which led people to choose to grind hatchet heads at a specific place is now not well understood, it is possible over time and as a place became increasingly embellished with grooves, that the meaning and significance of that locale was changed correspondingly. Grinding groove sites may have provided a physical and conceptual reference to the ancestral past

and activities of previous generations (Dibden 2011b). Because of the enduring materiality of grinding groove sites, they may have been meaningfully constituted expressions of place and mnemonic of past events and personal and group history (*cf*. Peterson 1972: 16).

Grinding grooves are only found on abrasive sedimentary rocks such as sandstone. Given the absence of suitable rock exposures in the study area, grinding groove sites are unlikely to be present.

Burials Sites

The potential for burials to be present is always possible, especially in deep sandy soils, including deposits in rock shelters. Because of the eroded nature of the country in which the majority of impacts are proposed, burials are unlikely to be present. The exception would by deep sedimentary deposits adjacent to higher stream order creeks and rivers.

Rock Shelter Sites

Rock shelters sites are unlikely to be present in the study area given the absence of large vertical stone outcrops.

Scarred and Carved Trees

Scarred and Carved trees result from either domestic or ceremonial bark removal. Carved trees associated with burial grounds and other ceremonial places have been recorded in the wider region. In an Aboriginal land use context this site type would most likely have been situated on flat or low gradient landform units in areas suitable for either habitation and/or ceremonial purposes.

Bark removal by European people through the entire historic period and by natural processes such as fire blistering and branch fall make the identification of scarring from a causal point of view very difficult. Accordingly, given the propensity for trees to bear scarring from natural causes their positive identification is impossible unless culturally specific variables such as stone hatchet cut marks or incised designs are evident and rigorous criteria in regard to tree species/age/size and its specific characteristics in regard to regrowth is adopted.

Nevertheless, the likelihood of trees bearing cultural scarring remaining extant and *in situ* is low given events such as land clearance and bushfires. Generally scarred trees will only survive if they have been carefully protected

(such as the trees associated with Yuranigh's grave at Molong where successive generations of European landholders have actively cared for them).

The study area has been extensively cleared and the vast majority of live trees are young. While not impossible this site type is unlikely to have survived and therefore be present.

Stone Quarry and Procurement Sites

A lithic quarry is the location of an exploited stone source (Hiscock & Mitchell 1993:32). Sites will only be located where exposures of a stone type suitable for use in artefact manufacture occur. Both quartz and tuff are ubiquitous and abundant across the proposal area and, accordingly, are highly likely to have been locally acquired.

Ceremonial Places and Sacred Geography

Bora and ceremonial sites are places which were used for ritual and ceremonial purposes. Possibly the most significant ceremonial practices known were those which were concerned with initiation and other rites of passage such as those associated with death. Sites associated with these ceremonies are bora grounds and burial sites. Additionally, secret rituals were undertaken by individuals such as clever men. These rituals were commonly undertaken in 'natural' locations such as water holes. Pearson (1981) made the following predictions in regard to ceremonial site patterning in the region:

- Burial sites were situated close to habitation areas;
- Ceremonial sites were located away from habitation areas;
- Stone arrangements were located away from campsites in isolated places; they are associated with small hills and knolls or flat land.

In addition to site specific types and locales, Aboriginal people invested the landscape with meaning and significance; this is commonly referred to as a sacred geography. Natural features are those physical places which are intimately associated with spirits or the dwelling/activity places of certain mythical beings.

Given the potential for natural features to have been important places within an Aboriginal cosmological frame of reference, the survey has sought to identify outstanding natural features present in the study area. It is, however, noted that the landscape of the entire Project site is expressed as an

abundance of hills and ridges and that, therefore, high places are unlikely to standout as unusual or particularly significant.

Contact Sites

These sites are those which contain evidence of Aboriginal occupation during the period of early European settlement in a local area. Evidence of this period of 'contact' could potentially be Aboriginal flaked glass, burials with historic grave goods or markers, and debris from 'fringe camps' where Aborigines who were employed by, or traded with, the white community may have lived or camped. The most likely location for contact period occupation sites would be camp sites adjacent to permanent water and located in relative proximity to centres of European habitation such as towns and homesteads. The potential for such sites to be present in the proposal area is possible, however, considered to be unlikely given the location of impacts away from towns or homesteads.

2.3.3 Field Inspection – Methodology

The methodological approach adopted in this assessment attends particularly to location and relationality as a means of contextualising the material evidence of cultural practice across space. Given the nature of the physiography, different places within the region are likely to have been utilised for different purposes, and also by different categories of people. Landscape is more than a set of 'objective' topographic features. Landscapes are constructed out of cultural and social engagement; they are '... topographies of the social and cultural as much as they are physical contours' (David & Thomas 2008: 35). The conceptual approach to understanding landscape in this assessment is based on a concern with experience, occupation and bodily practice (*cf*. Thomas 2008: 305). The location of material evidence in different environmental and topographic contexts across the study area has the potential to be informative of different activities and social contexts. Landform and environmental elements, as measurable empirical space, will be employed methodologically to explore land use, occupation and the nature of both recorded and unseen (ie subsurface) material evidence. Given the vast space encompassed by the study area, this methodology allows for the identification, at a fine level of spatial resolution, of elements representative of the patterns of social life and how these may vary over space.

The practical methodology for the field survey entailed a pedestrian traverse of a representative sample of the proposed activity areas. The field survey

was aimed at locating Aboriginal objects. An assessment was also made of prior land disturbance, survey coverage variables (ground exposure and archaeological visibility) and the potential archaeological sensitivity of the land.

The approach to recording in the current study has been a 'nonsite' methodology (*cf.* Dunnell 1993; Shott 1995). The density and nature of the artefact distribution will vary across the landscape in accordance with a number of behavioural factors which resulted in artefact discard. While cultural factors will have informed the nature of land use, and the resultant artefact discard, environmental variables are those which can be utilised archaeologically in order to analyse the variability in artefact density and nature across the landscape. Accordingly, in this study, while the artefact is the elementary unit recorded, Landform Units are utilised as a framework of recording, analysis (*cf.* Wandsnider and Camilli 1992) and ultimately, the formulation of recommendations. The Landform Units variables recorded are described below.

Landform Unit Variables

Landscape variables utilised are conventional categories taken from the *Australian Soil and Land Survey Field Handbook* (McDonald *et al.* 1998): Landforms form the primary basis for defining survey unit boundaries.

The following landform variables were recorded:

Morphological type:

- Crest: - element that stands above all or almost all points in the adjacent terrain – smoothly convex upwards in downslope profile. The margin is at the limit of observed curvature.
- Simple slope: - element adjacent below crest or flat and adjacent above a flat or depression.
- Flat: - planar element, neither crest or depression and is level or very gently inclined.
- Open depression: - extends at same elevation or lower beyond locality where it is observed.

Slope class and value:

- Level: 0 - 1%.
- Very gentle: 1 - 3%.
- Gentle: 3 - 10%.

- Moderate: 10 - 32%.
- Steep: 32 - 56%.

Geology

The type of geology was recorded and as well the abundance of rock outcrop – *as defined below*. The level of visual interference from background quartz shatter was noted.

- No rock outcrop: - no bedrock exposed.
- Very slightly rocky: - <2% bedrock exposed.
- Slightly rocky: - 2-10% bedrock exposed.
- Rocky: - 10-20 % bedrock exposed.
- Very rocky: - 20-50% bedrock exposed.
- Rockland: - >50% bedrock exposed.

Soil

Soil type and depth was recorded. The potential for soil to contain subsurface archaeological deposit (based on depth) was recorded as Low, Moderate or High. This observation is based solely on the potential for soil to contain artefacts; it does not imply that artefacts will be present or absent.

Geomorphological processes

The following gradational categories were recorded:

- eroded
- eroded or aggraded
- aggraded

Geomorphological agents

The following geomorphological agents were recorded:

- gravity: *collapse or particle fall*
- precipitation: *creep; landslide; sheet flow*
- stream flow: *channelled or unchannelled*
- wind
- biological: *human; nonhuman*

Survey coverage variables were also recorded; these are described further below.

Aboriginal Object Recording

For the purposes of defining the artefact distribution in space it has been labelled as a locale (eg. Survey Unit 1/Locale 1). The measurable area in which artefacts are observed has been noted and if relevant, a broader area encompassing both visible and predicted subsurface artefacts has been defined. In addition, locale specific assessments of survey coverage variables have been made. The prior disturbance to the locale has been noted. Artefact numbers in each locale have been recorded and a prediction of artefact density noted, based on observed density taking into consideration Effective Survey Coverage, and a consideration of environmental context.

Survey Coverage Variables

Survey Coverage Variables are a measure of ground surveyed during the study and the type of archaeological visibility present within that surveyed area. Survey coverage variables provide a measure with which to assess the effectiveness of the survey so as to provide an informed basis for the formulation of management strategies.

Specifically, an analysis of survey coverage is necessary in order to determine whether or not the opportunity to observe stone artefacts in or on the ground was achieved during the survey. In the event that it is determined that ground exposures provided a minimal opportunity to record stone artefacts, it may be necessary to undertake archaeological test excavation for determining whether or not stone artefacts are present. Conversely, if ground exposures encountered provided an ideal opportunity to record the presence of stone artefacts, the survey results may be considered to be adequate and, accordingly, no further archaeological work may be required.

Two variables were used to measure ground surface visibility during the study; the area of ground exposure encountered, and the quality and type of ground visibility (archaeological visibility) within those exposures. The survey coverage variables estimated during the survey are defined as follows:

Ground Exposure (GE) – an estimate of the total area inspected which contained exposures of bare ground; and

Archaeology Visibility (AV) – an estimate of the average levels of potential archaeological surface visibility within those exposures of bare ground. Archaeological visibility is generally less than ground exposure as it is dependent on adequate breaching of the bare ground surface which provides

a view of the subsurface soil context. Based on subsurface test excavation results conducted in a range of different soil types across New South Wales it is understood that artefacts are primarily situated within 10 - 30 cm of the ground profile; reasonable archaeological visibility therefore requires breaching of the ground surface to at least a depth of 10 cm.

Based on the two visibility variables as defined above, an estimate (Net Effective Exposure - NEE) of the archaeological potential of exposure area within a survey unit has been calculated. The Effective Survey Coverage (ESC) calculation is a percentage estimate of the proportion of the Survey Unit which provided the potential to view archaeological material.

The data collected forms the basis for the documentation of survey results outlined in the section below.

2.3.4 Field Inspection – Results

The survey results are described below. The location of Survey Unit (SU) areas and Aboriginal object and historic item site recordings are shown on mapping in Appendix 3.

Survey Coverage

The study area was found to have undergone relatively high levels of prior disturbance. Original land clearance and subsequent farming practices have impacted the entire Project site. Graded tracks for providing access within properties are common and frequently traverse the length of entire crest landforms. The majority of impact areas are eroded to bedrock.

A total of 200 kilometres of linear impact areas were surveyed during the field work; the area actually inspected measures c. 1605 hectares (Tables 4 and 5). Ground exposures inspected are estimated to measure 83 hectares in area. Of that ground exposure area, archaeological visibility (the potential artefact bearing soil profile) is estimated to have been 59 hectares. Effective Survey Coverage is calculated to have been 3.6%.

Generally, ground exposure was uniformly low across the study area. As a result of two previous years of good rain, ground surfaces were well covered with pasture, albeit much of which was heavily grazed and/or dead or dying. Ground exposures included grader scrapes, animal and vehicle tracks, bare earth patches, pig rootings, and so on. Archaeological visibility within the

majority of ground exposures was high because the ground surface was highly eroded. Nevertheless, in many instances, while isolated, numerous large areas of exposure with good archaeological visibility were inspected and normally found to be totally devoid of artefacts. When artefacts were recorded, their numbers also indicated a very low density distribution.

In summary, while Effective Survey Coverage was low, it is nevertheless concluded that the areas of exposure and visibility which were inspected were adequate in size to allow for a reasonably accurate assessment and prediction of artefact presence and density in areas with low exposure.

The trees in the proposal area and its surrounds are predominately regrowth, likely to be around 50 years old (or less). All trees located within areas of direct impact were inspected during the survey. While scars were infrequently encountered, there was no evidence of Aboriginal scarring on any trees, and given their estimated age, none were expected.

While an extensive area of land has been surveyed, including the majority of the study area, not all impact areas were subject to visual inspection. Given the paucity of site recordings made despite surveying enormous areas of land, the predictions of generally low archaeological and cultural sensitivity, a total survey was not considered to be warranted. However, the survey results can be reasonably confidently extrapolated to any unsurveyed areas, and it is concluded that the study area is generally of low archaeological and cultural potential and sensitivity.

Table 4 Survey coverage and results; 2012 survey.

SU	Landform	Predicted artefact density	Length	Area	GE %	GE sq m	AV %	NEE	ESC	Aboriginal site recordings
SU1	ridge crest	low	6707	335325	2	6707	60	4024	1.2	SU1/L1, SU1/L2, SU1/L3, SU1/L4, SU1/L5, SU1/L6
SU2	ridge crest	negligible	717	35843	5	1792	60	1075	3	
SU3	spur crest	very low	633	31626	2	633	60	380	1.2	
SU4	spur crest	very low	1102	55090	1	551	70	386	0.7	SU4/L1
SU5	spur crest	very low	2111	105535	2	2111	60	1266	1.2	
SU6	ridge crest	negligible	927	46343	5	2317	60	1390	3	
SU7	ridge crest	very low	939	46974	10	4697	60	2818	6	
SU8	ridge crest	very low	4078	203880	2	4078	70	2854	1.4	
SU9	ridge crest	very low	973	48651	0	0	0	0	0	
SU10	ridge crest	very low	4051	202574	1	2026	60	1215	0.6	
SU11	spur crest	negligible	563	28151	5	1408	60	845	3	
SU12	spur crest	very low	756	37817	5	1891	60	1135	3	
SU13	simple slopes	very low	3078	153917	5	7696	60	4618	3	SU13/L1
SU14	spur crest	very low	1846	92288	5	4614	60	2769	3	SU14/L1
SU15	upper simple slope	low	420	21010	10	2101	90	1891	9	SU15/L1
SU16	ridge crest	very low	2661	133058	5	6653	90	5988	4.5	
SU17	ridge crest	very low	1741	87073	5	4354	90	3918	4.5	
SU18	simple slopes	very low	520	25992	1	260	50	130	0.5	
SU19	ridge crest	very low	1095	54730	2	1095	90	985	1.8	
SU20	ridge crest	very low	4594	229688	1	2297	90	2067	0.9	SU20/L1, SU20/L2, SU20/L3
SU21	ridge crest	very low	1715	85727	20	17145	90	15431	18	
SU22	spur crest	very low	1022	51113	5	2556	90	2300	4.5	SU22/L1
SU23	spur crest	very low	1043	52156	1	522	60	313	0.6	
SU24	ridge crest	very low	10010	500523	1	5005	60	3003	0.6	SU24/L1

SU	Landform	Predicted artefact density	Length	Area	GE %	GE sq m	AV %	NEE	ESC	Aboriginal site recordings
SU25	spur crest	very low	2564	128212	1	1282	60	769	0.6	
SU26	spur crest	very low	1543	77144	2	1543	90	1389	1.8	SU26/L1
SU27	spur crest	very low	1322	66096	5	3305	90	2974	4.5	
SU28	spur crest	very low	1076	53806	2	1076	90	969	1.8	
SU29	ridge crest	very low	3025	151271	1	1513	90	1361	0.9	
SU30	spur crest	very low	1066	53306	1	533	90	480	0.9	SU30/L1
SU31	spur crest	very low	1632	81603	1	816	90	734	0.9	
SU32	spur crest	very low	2372	118591	1	1186	90	1067	0.9	SU32/L1
SU33	spur crest	negligible	521	26064	1	261	90	235	0.9	
SU34	spur crest	very low	1038	51877	1	519	90	467	0.9	SU34/L1
SU35	spur crest	very low	1343	67153	1	672	90	604	0.9	
SU36	spur crest	very low	974	48681	2	974	90	876	1.8	
SU37	flat	low	368	18423	0	0	0	0	0	
SU38	simple slopes	very low	642	32119	20	6424	60	3854	12	SU38/L1
SU39	ridge crest	very low	7351	367546	1	3675	90	3308	0.9	SU39/L1, SU39/L2
SU40	spur crest	very low	3074	153723	2	3074	90	2767	1.8	SU40/L1
SU41	ridge crest	very low	1091	54569	1	546	90	491	0.9	SU41/L1
SU42	ridge crest	very low	781	39025	2	781	60	468	1.2	SU42/L1
SU43	ridge crest	very low	6223	311165	1	3112	90	2800	0.9	SU43/L1, SU43/L2, SU43/L3, SU43/L4
SU44	lower simple slopes	very low/low	2460	122999	10	12300	80	9840	8	SU44/L1, SU44/L2, SU44/L3, SU44/L4
SU45	ridge crest	very low	2577	128854	1	1289	90	1160	0.9	
SU46	ridge crest	very low	5162	258099	1	2581	90	2323	0.9	SU46/L1
SU47	ridge crest	very low	1417	70873	1	709	90	638	0.9	
SU48	simple slopes	very low	1298	64911	1	649	90	584	0.9	
SU49	ridge crest	very low	4454	222700	1	2227	90	2004	0.9	SU49/L1
SU50	ridge crest	very low	3846	192324	5	9616	60	5770	3	

SU	Landform	Predicted artefact density	Length	Area	GE %	GE sq m	AV %	NEE	ESC	Aboriginal site recordings
SU51	lower simple slopes	low	902	45097	1	451	90	406	0.9	SU51/L1, SU51/L2, SU51/L3
SU52	ridge crest	very low	5703	285172	5	14259	80	11407	4	SU52/L1, SU52/L2
SU53	ridge crest	very low	2289	114441	1	1144	70	801	0.7	SU53/L1
SU54	ridge crest	very low	2261	113055	3	3392	80	2713	2.4	
SU55	ridge crest	very low	2572	128625	2	2572	60	1543	1.2	
SU56	spur crest	very low	849	42451	0	0	0	0	0	
SU57	ridge crest	very low	3786	189276	10	18928	50	9464	5	
SU58	lower simple slopes	low	328	16399	5	820	20	164	1	
SU59	spur crest	very low/negligible	847	42346	2	847	9	76	0.18	
SU60	ridge crest	very low	4259	212965	3	6389	90	5750	2.7	
SU61	spur crest	very low	739	36967	3	1109	90	998	2.7	
SU62	ridge crest	very low	1363	68126	5	3406	90	3066	4.5	
SU63	spur crest	very low	2132	106602	3	3198	90	2878	2.7	
SU64	flat	low	502	25088	5	1254	50	627	2.5	
SU65	lower simple slopes	low	1683	84152	5	4208	90	3787	4.5	AHIMS #36-2-0144, SU65/L1, AHIMS #36-2-0143, SU65/L2, SU65/L3
SU66	ridge crest	very low	2292	114609	1	1146	90	1031	0.9	
SU67	ridge crest	very low	1103	55137	1	551	90	496	0.9	
SU68	ridge crest	very low	1422	71123	1	711	90	640	0.9	SU68/L1
SU69	lower simple slopes	very low	507	25328	5	1266	70	886	3.5	
SU70	lower simple slopes	very low	2185	109268	2	2185	90	1967	1.8	
SU71	flat	moderate	376	18814	10	1881	20	376	2	SU71/L1
SU72	lower simple slopes	low	1436	71799	5	3590	90	3231	4.5	SU72/L1, SU72/L2

SU	Landform	Predicted artefact density	Length	Area	GE %	GE sq m	AV %	NEE	ESC	Aboriginal site recordings
SU73	flat	low	554	27704	1	277	60	166	0.6	SU73/L1
SU74	lower simple slopes	very low/low	951	47575	1	476	90	428	0.9	
Total			153567	7678340		217228		161638	2.105111	

Table 5 Survey coverage and results; 2018 survey.

SU	Landform	Predicted artefact density	Length	Area	GE %	GE sq m	AV %	NEE	ESC	Aboriginal site recordings
SU75	spur crest	very low	2575	474409	15	71161	30	21348	4.5	
SU76	crest	negligible	1508	256945	20	51389	80	41111	16	SU76/L1; SU76/L2
SU77	simple slope	negligible	926	142498	10	14250	80	11400	8	
SU78	crest	negligible	2189	413014	5	20651	60	12390	3	
SU79	simple slope	negligible	577	69566	2	1391	70	974	1.4	
SU80	creek flat; drainage depression	low/moderate	723	102974	4	4119	80	3295	3.2	SU80/L1; SU80/L2
SU81	simple slope	very low/low	1360	230157	5	11508	80	9206	4	SU 81/L1; SU81/L2; SU81/L3
SU82	crest	very low	1783	311688	15	46753	80	37403	12	
SU83	plateau crests; upper slopes	negligible	2196	394957	15	59244	80	47395	12	
SU84	crest	negligible	1763	322163	15	48324	80	38660	12	
SU85	crest	negligible	2838	541219	2	10824	50	5412	1	SU5/L1
SU86	lower slope/drainage lines	negligible on steeper slopes; very low/low near creek	1011	161210	6	9673	60	5804	3.6	SU86/L1
SU87	crest	negligible	1705	312453	1	3125	40	1250	0.4	
SU88	simple slope	very low	1656	279838	1	2798	50	1399	0.5	SU88/L1

SU	Landform	Predicted artefact density	Length	Area	GE %	GE sq m	AV %	NEE	ESC	Aboriginal site recordings
SU89	crest	negligible; very low	3877	750061	5	37503	70	26252	3.5	SU89/L1; SU89/L2; SU89/L3; SU89/L4; SU89/L5
SU90	simple slope	negligible	510	61491	5	3075	70	2152	3.5	
SU91	flat; drainage depression	low	665	92887	5	4644	30	1393	1.5	SU91/L1
SU92	simple slope	negligible	433	46252	4	1850	70	1295	2.8	
SU93	crest	negligible; very low	1562	277566	10	27757	80	22205	8	SU93/L1
SU94	simple slope	negligible	1613	290081	5	14504	80	11603	4	
SU95	crest	negligible	958	132993	5	6650	80	5320	4	
SU96	simple slope; flats [series of valley bottoms]	very low	4853	931940	10	93194	70	65236	7	SU96/L1; SU96/L2; SU96/L3; SU96/L4; SU96/L5; SU96/L6
SU97	simple slope/flat	low/moderate	808	124135	5	6207	80	4965	4	
SU98	simple slope	negligible	1364	232918	5	11646	80	9317	4	SU98/L1; SU98/L2
SU99	simple slope	negligible	1862	399552	4	15982	70	11187	2.8	
SU100	simple slope	negligible	630	91926	10	9193	60	5516	6	
SU101	simple slope	negligible	889	141903	5	7095	80	5676	4	
SU102	simple slope	negligible	1872	344530	5	17227	80	13781	4	
SU103	simple slope	negligible	1358	223182	5	11159	80	8927	4	
SU104	simple slope	negligible	1297	226473	0	0	0	0	0	
SU105	crest	negligible	2575	474409	15	71161	30	21348	4.5	
Total			47362	8380981		622894		431873	5.2	

Aboriginal Object Recordings

The Aboriginal object locales recorded during the surveys are summarised in Tables 6 and 7 and described in further detail below. Artefacts are listed in Table 8.

Table 6 Aboriginal object locales recorded during the 2012 survey (Datum: GDA).

Name	Comments	Easting	Northing
UWF SU1/L1	1 artefact in a bare earth patch in SU1	728330	6409696
UWF SU1/L2	6 artefacts on an existing farm track in SU1	727090	6408123
UWF SU1/L3	6 artefacts in animal track exposure in SU1	727060	6408046
UWF SU1/L4	38 artefacts in an area of erosion in SU1	727012	6407431
UWF SU1/L5	4 artefacts in an animal track exposure in SU1	726553	6406915
UWF SU1/L6	13 artefacts in a vehicle track erosion scour in SU1	725555	6405705
UWF SU4/L1	8 artefacts in animal track exposure in SU4	727380	6406855
UWF SU13/L1	1 artefact in an area of graded track in SU13	720773	6409698
UWF SU14/L1	8 artefacts in a bare earth exposure in SU14	724638	6403813
UWF SU15/L1	10 artefacts in a vehicle track exposure in SU15	726208	6403301
UWF SU20/L1	2 artefacts in a bare earth exposure in SU20	720538	6399589
UWF SU20/L2	6 artefacts in a graded vehicle track exposure in SU20	720549	6399657
UWF SU20/L3	2 artefacts in bare earth exposure in SU20	720747	6399837
UWF SU22/L1	1 artefact in an unformed vehicle track exposure in SU22	702596	6396808
UWF SU24/L1	1 artefact in a vehicle track exposure in SU24	706049	6394103
UWF SU26/L1	5 artefacts in a graded vehicle track exposure in SU26	704363	6395945
UWF SU30/L1	1 artefact on grass in SU30	705972	6400713
UWF SU32/L1	7 artefacts in a sheep track exposure in SU32	706660	6398830
UWF SU34/L1	1 artefact in a sheep track exposure in SU34	705929	6392887
UWF SU38/L1	3 artefacts in bare earth exposure in SU38	718764	6408904
UWF SU39/L1	1 artefact in a sheep track exposure in SU39	716737	6406402

Name	Comments	Easting	Northing
UWF SU39/L2	3 artefacts in an erosion scour exposure in SU39	716945	6405936
UWF SU40/L1	1 artefact in a sheep track exposure in SU40	718232	6404202
UWF SU41/L1	6 artefacts in a sheep track exposure in SU41	717425	6403616
UWF SU42/L1	2 artefacts in an eroded exposure in SU42	717996	6402834
UWF SU43/L1	9 artefacts in a graded vehicle track exposure in SU43	718486	6402006
UWF SU43/L2	1 artefact in a sheep track exposure in SU43	718567	6400794
UWF SU43/L3	3 artefacts in an exposure in sheep tracks in SU43	718860	6400418
UWF SU43/L4	1 artefact in an exposure in sheep tracks in SU43	719068	6399951
UWF SU44/L1	4 artefacts in a graded vehicle track exposure in SU44	700681	6393326
UWF SU44/L2	5 artefacts in a graded vehicle track exposure in SU44	700738	6393527
UWF SU44/L3	1 artefact in a graded vehicle track exposure in SU44	700901	6393784
UWF SU44/L4	28 artefacts in a graded vehicle track exposure in SU44	701428	6394094
UWF SU46/L1	1 artefact in a sheep track exposure in SU46	699686	6396742
UWF SU49/L1	8 artefacts in a vehicle track exposure in SU49	700987	6401383
UWF SU51/L1	2 artefacts in a vehicle track exposure in SU51	708023	6406046
UWF SU51/L2	5 artefacts in a vehicle track exposure in SU51	708117	6406053
UWF SU51/L3	1 artefact in a vehicle track exposure in SU51	708128	6406151
UWF SU52/L1	1 artefact in dozer and sheep track exposures in SU52	708122	6406768
UWF SU52/L2	Over 34 artefacts in eroded sheep track exposures in SU52	706960	6407385
UWF SU53/L1	1 artefact in a dozer track exposure in SU52	708221	6406748
UWF SU65/L1	8 or more artefacts located on casual vehicle track SU65	710434	6408805
UWF SU65/L2	1 artefact in a vehicle track exposure in SU65	710449	6409452
AHIMS 36-2-0143	Artefact scatter	710383	6409760
UWF SU65/L3	1 artefact in a vehicle track exposure in SU65	710211	6409679
AHIMS 36-2-0144	Artefact scatter	710484	6408703

Name	Comments	Easting	Northing
UWF SU68/L1	6 artefacts in drainage depression erosion scour in SU68	708180	6409986
UWF SU71/L1	4 artefacts in pig digging exposure in SU71	712811	6405320
UWF SU72/L1	Over 11 artefacts in a vehicle track exposure in SU72	712066	6404020
UWF SU73/L1	3 artefacts in a vehicle track exposure in SU73	711941	6403782
UWF SU73/L2	4 artefacts in a large area of erosion in SU73	711873	6403601

UWF Survey Unit 1/Locale 1

One stone artefact was recorded in an area of bare earth exposure in this locale within Survey Unit 1 (Plate 12). The landform is a crest of gentle gradient and an aspect to 150°. The broader crest area has ground exposure of 10%, of which 60% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact only was recorded, artefact density is assessed to be very low. The locale may contain additional artefacts, but these would be present in very low density. Because of the skeletal nature of the lithosol soil, the site has no subsurface potential.

Plate 12 UWF SU1/L1 looking 30˚.

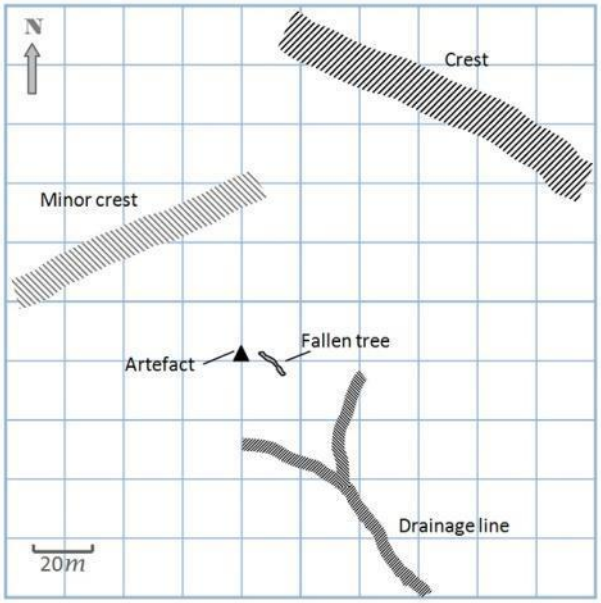


Figure 2 Sketch map showing location of UWF SU1/L1.

UWF Survey Unit 1/Locale 2

Six stone artefacts were recorded in a vehicle track exposure at this locale within Survey Unit 1 (Plate 13). The landform element is a flat broad crest measuring c. 50m wide, with a very gentle gradient and an aspect to 80°. The site area measures 20m x 2m of which 80% was ground exposure, possessing 60% archaeological visibility. The effective survey coverage at this site is relatively high, and given that only six artefacts were recorded, artefact density is assessed to be low. It is noted that background quartz is sparse. The site has subsurface potential given some depth to the soils, but artefact density is predicted to be low.

Plate 13 UWF SU1/L2 looking south.

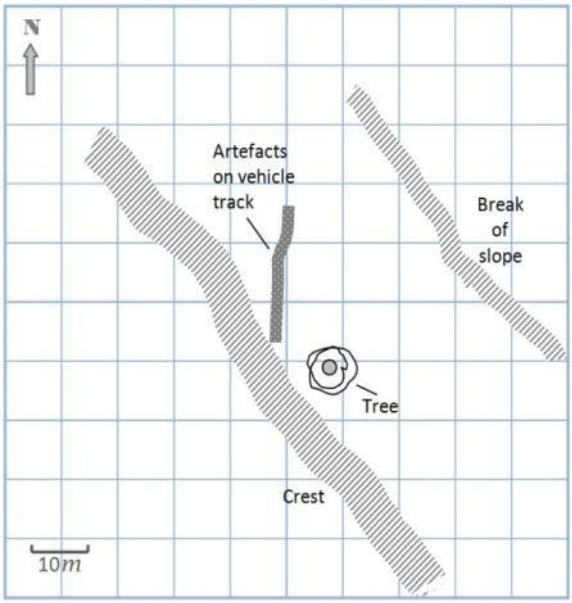


Figure 3 Sketch map showing location of UWF SU1/L2.

UWF Survey Unit 1/Locale 3

Six stone artefacts were recorded in an animal track exposure (20 m) at this locale within Survey Unit 1 (Plate 14). The landform is a broad crest measuring c. 50m wide, with a very gentle gradient and open aspect. The track area measures >40m x c. 1m of which 60% was ground exposure, possessing 60% archaeological visibility. Off track, ground exposure is negligible. The effective survey coverage at this point is reasonable and the low number of artefacts suggests relatively low density; artefact density is predicted to be low/moderate. The site has subsurface potential given some depth to the soils.

Plate 14 UWF SU1/L3 looking south.

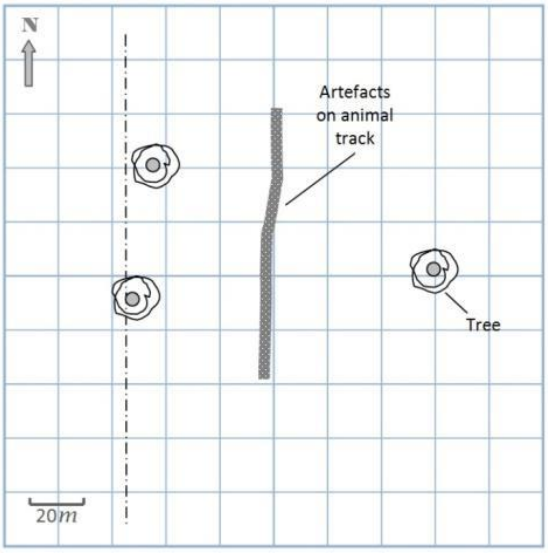


Figure 4 Sketch map showing location of UWF SU1/L3.

UWF Survey Unit 1/Locale 4

Thirty-eight stone artefacts (a sample listed in Table 5) were recorded in exposures within a broader area of erosion caused by animal activity at this locale in Survey Unit 1 (Plate 15). The landform element is a broad crest with gentle gradient and southerly aspect. The overall erosion area measures 30m x 20m of which 10% was ground exposure, possessing 60% archaeological visibility. Almost all the artefacts were recorded within one discrete cluster (perhaps a single knapping/activity event) with only two artefacts in the remainder of the exposure. The effective survey coverage at this site is moderate and over a reasonably broad area. The pattern suggests a patchy artefact distribution across the broader landscape element. Artefact density is predicted to be low/moderate. The site has subsurface potential given some depth to the soils.

Plate 15 UWF SU1/L4 looking south.

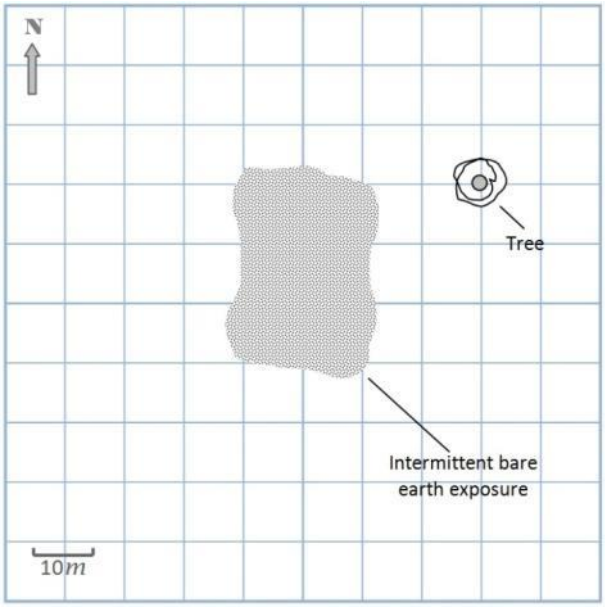


Figure 5 Sketch map showing location of UWF SU1/L4.

UWF Survey Unit 1/Locale 5

Four stone artefacts were recorded in an animal track exposure (8 m) at this locale within Survey Unit 1 (Plate 16). The landform element is a broad, flat crest with very gentle gradient and easterly aspect. The site area measures 8m x 3m of which 60% was ground exposure, possessing 60% archaeological visibility. The effective survey coverage at this point is reasonable; artefact density is assessed to be low/moderate. The site has some subsurface potential although the soils are very shallow, and artefact density is predicted to be low/moderate. Background quartz is present in low/moderate density.

Plate 16 UWF SU1/L5 looking south.

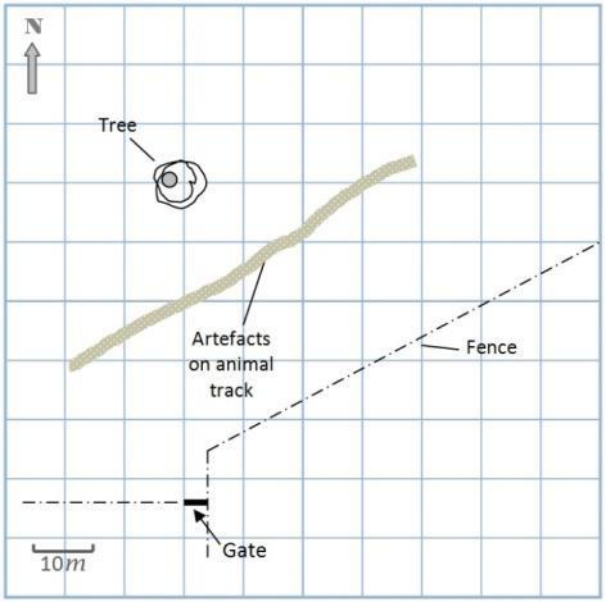


Figure 6 Sketch map showing location of UWF SU1/L5.

UWF Survey Unit 1/Locale 6

Thirteen stone artefacts were recorded in an erosion scour exposure associated with a vehicle track at this locale within Survey Unit 1 (Plate 17). The landform element is a saddle with a gentle gradient and an aspect to 50˚. The area measures 20m x 5m of which 60% was ground exposure, possessing 60% archaeological visibility. The effective survey coverage at this site is reasonable, and given that 13 artefacts were recorded, artefact density is assessed to be low/moderate. The site has some subsurface potential although the soils are very shallow. There is a sparse distribution of milky quartz at the site, some of which could be artefactual.

Plate 17 UWF SU1/L6 looking southwest.

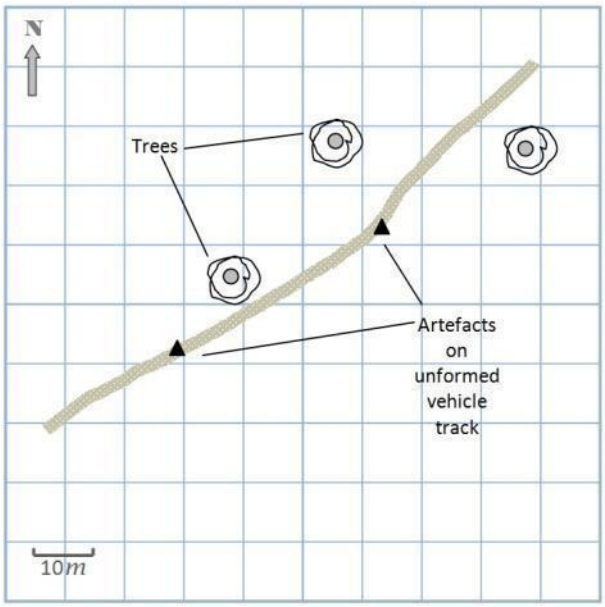


Figure 7 Sketch map showing location of UWF SU1/L6.

UWF Survey Unit 4/Locale 1

Eight stone artefacts were recorded in a sheep track exposure (10 m) at this locale within Survey Unit 4 (Plate 18). In addition, two embedded 'probable artefact' stone pieces are also present. The landform is a crest with very gentle gradient and northerly aspect. The area measures 20m x 1m of which 60% was ground exposure, possessing 60% archaeological visibility. The effective survey coverage at this site is reasonable. Eight tuff items were in a 30 x 30 cm cluster, suggesting a single knapping event. The site has some subsurface potential although the soils are shallow.

Plate 18 UWF SU4/L1 looking 130°.

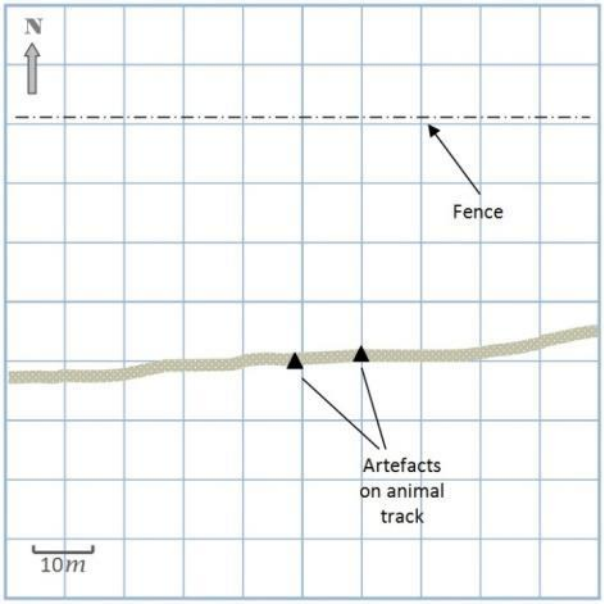


Figure 8 Sketch map showing location of UWF SU4/L1.

UWF Survey Unit 13/Locale 1

One stone artefact was recorded in an area of graded track exposure at c. c 70m south of Dirt Hole Creek within Survey Unit 13 (Plate 19). The landform is a simple slope with gentle gradient and aspect to the north. The area measures c. 50m x 3m of which 80% was ground exposure, possessing 60% archaeological visibility. The effective survey coverage at this point is high, and given that one artefact was recorded, artefact density is assessed to be very low. The site is eroded and disturbed and, because of this, and the skeletal nature of the lithosol soil, it has low subsurface potential. Artefact density is predicted to be very low.

Plate 19 UWF SU13/L1 looking 150˚.

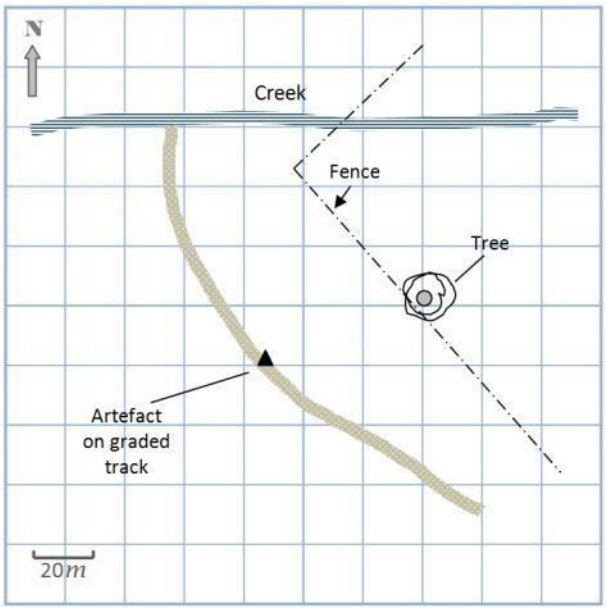


Figure 9 Sketch map showing location of UWF SU13/L1.

UWF Survey Unit 14/Locale 1

Eight milky quartz stone artefacts, probably produced in a discrete knapping event, were recorded in a 2m x 2m area of bare earth exposure at this locale within Survey Unit 14 (Plate 20). The landform element is a crest of very gentle gradient and open aspect. The broader crest area is very rocky with negligible ground exposure, while in the area of exposure itself, 30% was ground exposure, and archaeological visibility 70%. The effective survey area was correspondingly negligible. Because of the rocky nature of the landform artefact density is predicted to be very low. The locale may contain additional artefacts, but these would be present in very low density. Because of the shallow nature of the lithosol soil at the site and the quantity of rock outcropping, the locale has no subsurface potential.

Plate 20 UWF SU14/L1 looking 290˚.

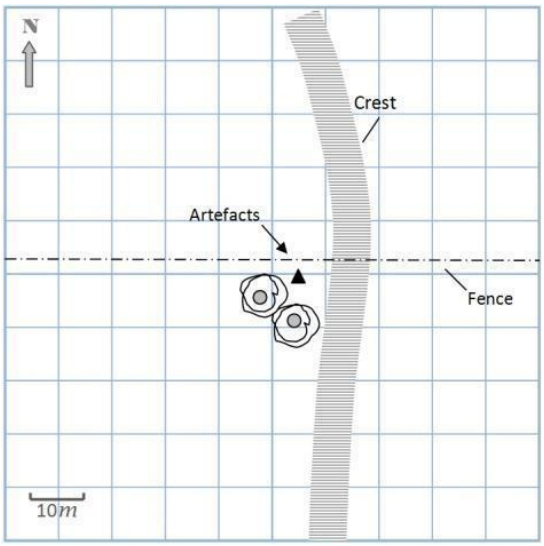


Figure 10 Sketch map showing location of UWF SU14/L1.

UWF Survey Unit 15/Locale 1

Ten stone artefacts were recorded in a 10m x 10m section of bare earth exposure along an unformed vehicle track at this locale within Survey Unit 15 (Plate 21). The landform is a crest of very gentle gradient and a north-westerly aspect. The broader crest area has ground exposure of 10%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is predicted to be moderate. Because of the skeletal nature of the lithosol soil the site has no subsurface potential. The locale probably contains additional artefacts distributed at moderate density.

Plate 21 UWF SU15/L1 looking 180˚.

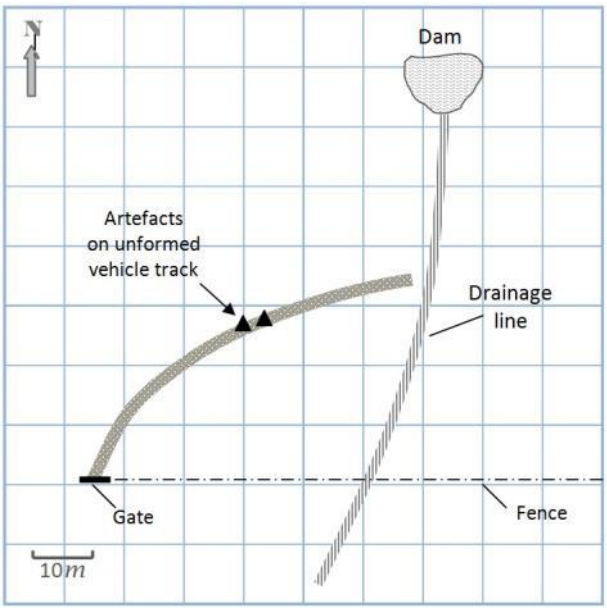


Figure 11 Sketch map showing location of UWF SU15/L1.

UWF Survey Unit 20/Locale 1

Two stone artefacts were recorded in a patch of bare earth exposure within this locale in Survey Unit 20 (Plate 22). The exposure measures approximately 2m x 0.5m and is comprised of shale bedrock. The landform is at the break of slope off a crest, with gentle gradient and an easterly aspect. The broader crest area has negligible ground exposure. The effective survey coverage is very low and the artefact density is assessed to be low. Because of the skeletal nature of the lithosol soil, the locale has no subsurface potential. The area probably contains additional artefacts, distributed at low density.

Plate 22 UWF SU20/L1 looking 30˚.

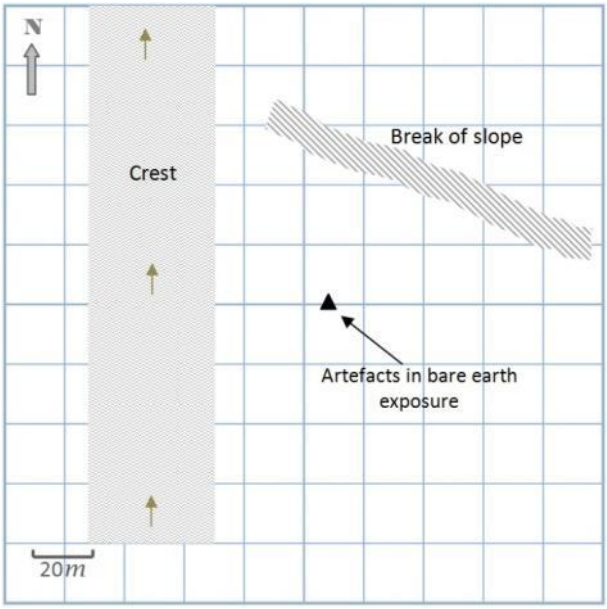


Figure 12 Sketch map showing location of UWF SU20/L1.

UWF Survey Unit 20/Locale 2

Six stone artefacts were recorded in a 20m x 6m section of bare earth exposure along a graded track at this locale within Survey Unit 20 (Plate 23). The landform is a crest of gentle gradient and a northerly aspect. The site area has ground exposure of 40%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and given that six artefacts were recorded, artefact density is assessed to be low. Because of the skeletal nature of the lithosol soil, the locale has no subsurface potential. The area probably contains additional artefacts distributed at low density.

Plate 23 UWF SU20/L2 looking 30˚.

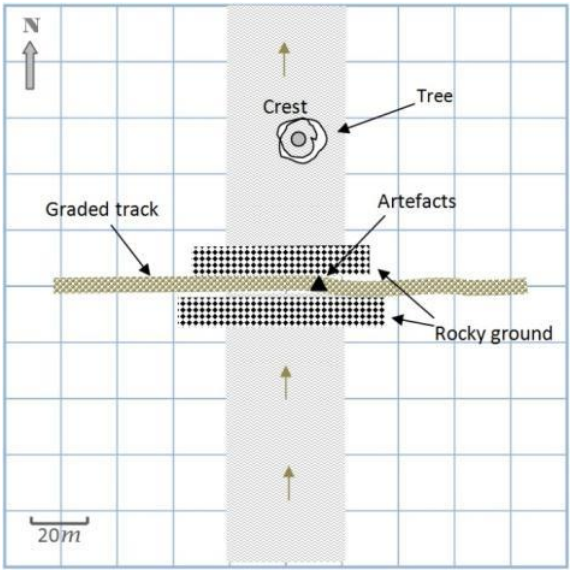


Figure 13 Sketch map showing location of UWF SU20/L2.

UWF Survey Unit 20/Locale 3

Two stone artefacts were recorded in a 8m x 1m area of bare earth exposure at this locale within Survey Unit 20 (Plate 24). The landform element is a crest/saddle of gentle gradient and open aspect. The broader exposure area measuring 30 x 30 metres has ground exposure of 30%, of which 80% was archaeological visibility. The effective survey coverage is reasonable, and given that two artefacts were recorded, artefact density is assessed to be low. Because of the general rockiness and the skeletal nature of the lithosol soil, this locale has no subsurface potential. The area probably contains additional artefacts distributed at low density.

Plate 24 UWF SU20/L3 looking north.

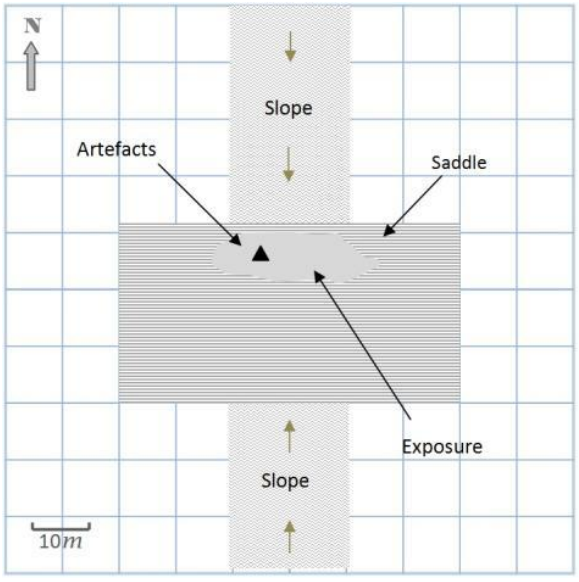


Figure 14 Sketch map showing location of UWF SU20/L3.

UWF Survey Unit 22/Locale 1

One stone artefact was recorded in a 5m x 5m area of bare earth exposure along an unformed vehicle track within Survey Unit 22 (Plate 25). The landform is a crest of gentle gradient and a southerly aspect. The broader crest area has ground exposure of 10%, of which 80% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be very low. Because of the skeletal nature of the lithosol soil, the locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 25 UWF SU22/L1 looking 150˚.

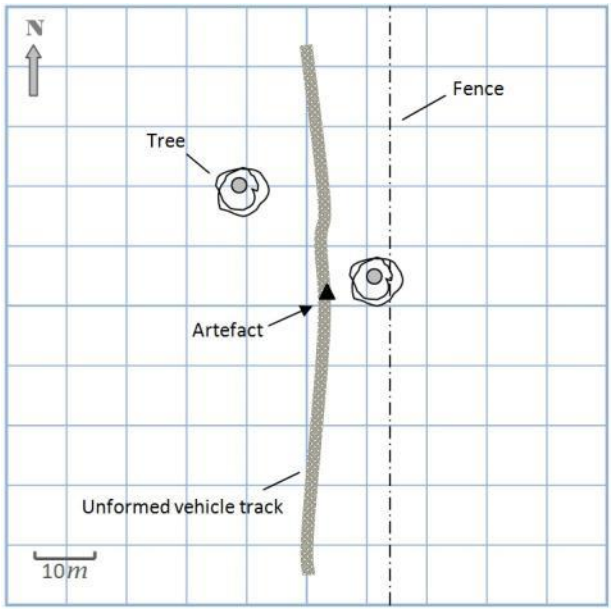


Figure 15 Sketch map showing location of UWF SU22/L1.

UWF Survey Unit 24/Locale 1

One stone artefact was recorded in a 20m x 10m section of bare earth exposure along an unformed vehicle track at this locale within Survey Unit 24 (Plate 26). The landform is a saddle on a crest, with very gentle gradient and open aspect. The broader saddle area has ground exposure of 60%, of which 80% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be very low. Because of the skeletal nature of the lithosol soil, the locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density. The area has very sparse background quartz.

Plate 26 UWF SU24/L1 beyond gate; looking 260˚.

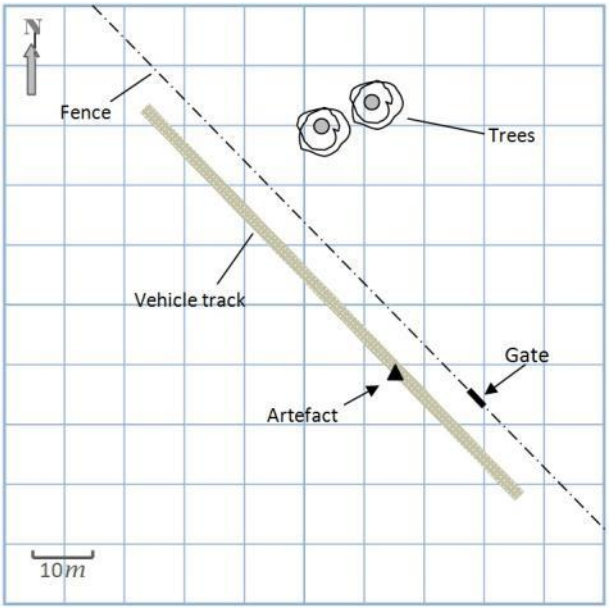


Figure 16 Sketch map showing location of UWF SU24/L1.

UWF Survey Unit 26/Locale 1

Five stone artefacts were recorded in a 20m x 3m area of eroded graded vehicle track exposure at this locale within Survey Unit 26 (Plate 27). The landform is a very narrow saddle on a spur crest with gentle gradient and open aspect. The broader saddle area has ground exposure of 80%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and given that five artefacts were recorded, artefact density is assessed to be very low. Because of the eroded and skeletal nature of the lithosol soil, the locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density. Background quartz is present in moderate density.

Plate 27 UWF SU26/L1 looking 240˚.

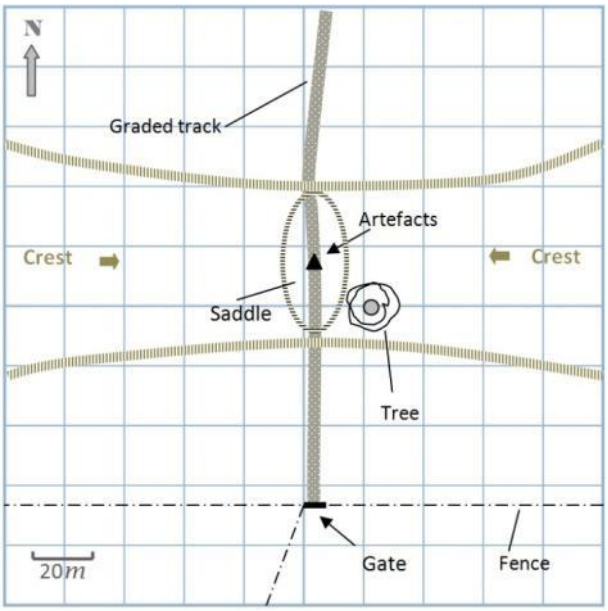


Figure 17 Sketch map showing location of UWF SU26/L1.

UWF Survey Unit 30/Locale 1

One stone artefact was recorded on grass beside some ground exposure adjacent to a tree at this locale within Survey Unit 30 (Plate 28). The landform is a crest of very gentle gradient and open aspect. The broader crest area is very rocky and has negligible ground exposure. The effective survey coverage is negligible, however, artefact density at this locale is predicted to be very low. Because of the skeletal lithosol soil and very rocky nature of the locale, it has no subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 28 UWF SU30/L1 looking 180˚.

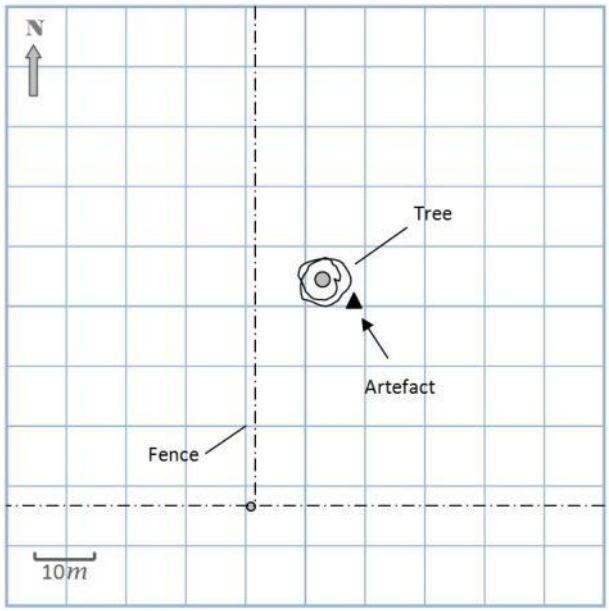


Figure 18 Sketch map showing location of UWF SU30/L1.

UWF Survey Unit 32/Locale 1

Seven stone artefacts, probably produced in a single knapping event, were recorded in a 4m section of a >25m x 1m bare earth exposure along sheep tracks at this locale within Survey Unit 32 (Plate 29). The landform is a crest of very gentle gradient and open aspect. The sheep track area has ground exposure of 80%, of which 70% was archaeological visibility. Off track, ground exposure was very low. Because of the skeletal nature of the lithosol soil, the site has no or at best, limited subsurface potential. The locale probably contains additional artefacts distributed at very low density.

Plate 29 UWF SU32/L1 looking 120˚.

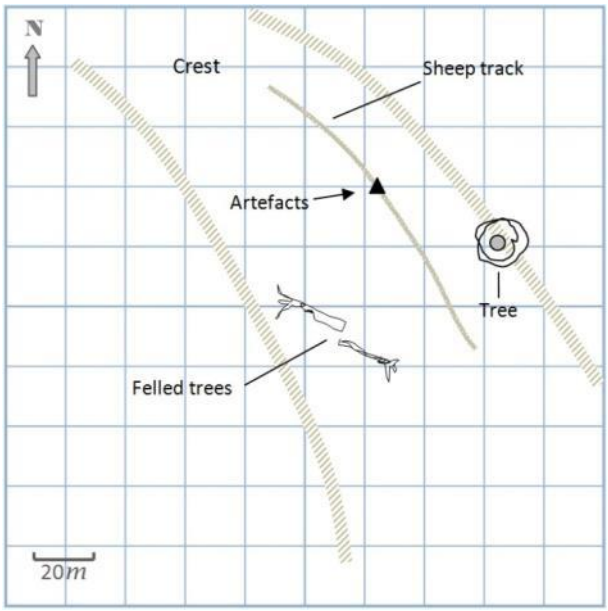


Figure 19 Sketch map showing location of UWF SU32/L1.

UWF Survey Unit 34/Locale 1

One stone artefact was recorded in a section of bare earth exposure along a sheep track at this locale within Survey Unit 34 (Plate 30). The landform is a spur crest of gentle gradient and an aspect to 30˚. The broader crest area has ground exposure of 10%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be very low. Because of the skeletal nature of the lithosol soil, the site has no subsurface potential. The locale probably contains additional artefacts distributed at very low density.

Plate 30 UWF SU34/L1 looking 200˚.

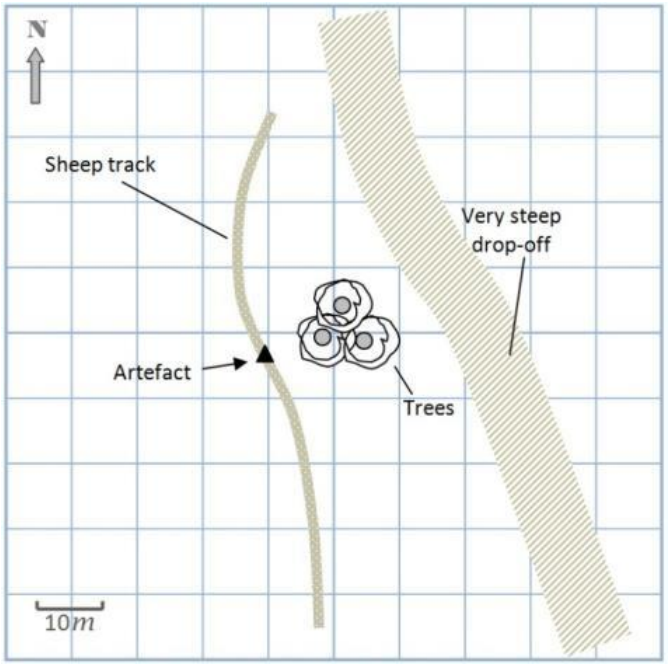


Figure 20 Sketch map showing location of UWF SU34/L1.

UWF Survey Unit 38/Locale 1

Three stone artefacts were recorded in a 20m x 5m section of exposure between two rocky outcrops within Survey Unit 38 (Plate 31). The landform is a very rocky simple slope of gentle gradient and an aspect to 30°, overlooking a flat. The broader area has ground exposure of 20%, of which 60% was archaeological visibility. The effective survey coverage is reasonable, and given that three artefacts were recorded, artefact density is assessed to be low. There is some subsurface potential, and the locale probably contains additional artefacts distributed at low density. Tuff is present as background shatter.

Plate 31 UWF SU38/L1 looking 300˚.

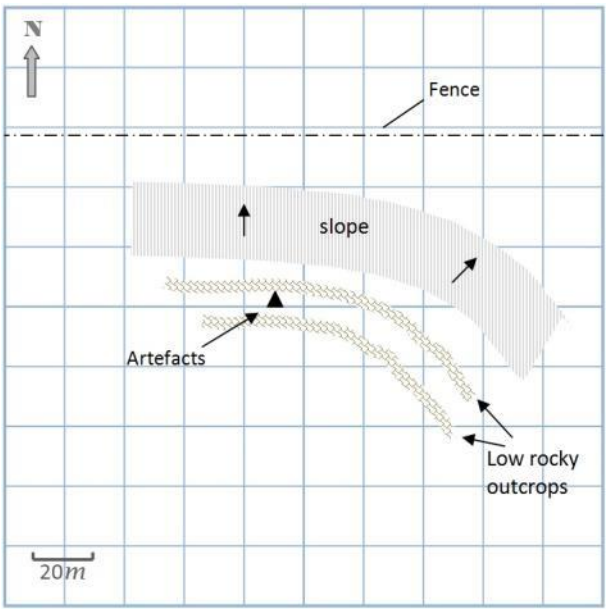


Figure 21 Sketch map showing location of UWF SU38/L1.

UWF Survey Unit 39/Locale 1

One stone artefact was recorded in a section of exposure along a sheep track within Survey Unit 39 (Plate 32). The landform is a crest with gentle gradient and northerly aspect. The ground exposure within the broader area is very low to negligible, due to the presence of thick grass. The effective survey coverage is correspondingly very low. However, the artefact density is predicted to be very low. There is no subsurface potential as the locale has been eroded to bedrock.

Plate 32 UWF SU39/L1 looking 150˚.

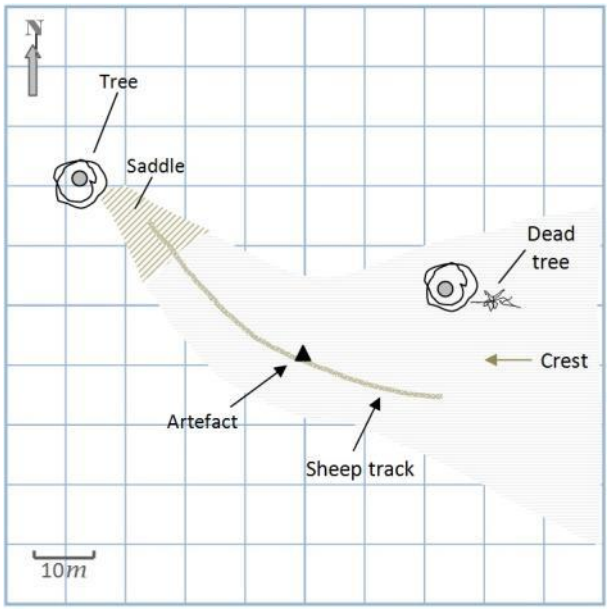


Figure 22 Sketch map showing location of UWF SU39/L1.

UWF Survey Unit 39/Locale 2

Three stone artefacts were recorded in a 30m x 30m section of exposure between within a highly eroded area in Survey Unit 39 (Plate 33). The landform is a 30 m long saddle situated on a 50 m wide crest, and has a gentle gradient and open aspect. The broader area has ground exposure of 30%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and given that three artefacts only were recorded, artefact density is assessed to be very low. The locale is highly eroded and has no subsurface potential. Background quartz is present in low/moderate density.

Plate 33 UWF SU39/L2 looking 180˚.

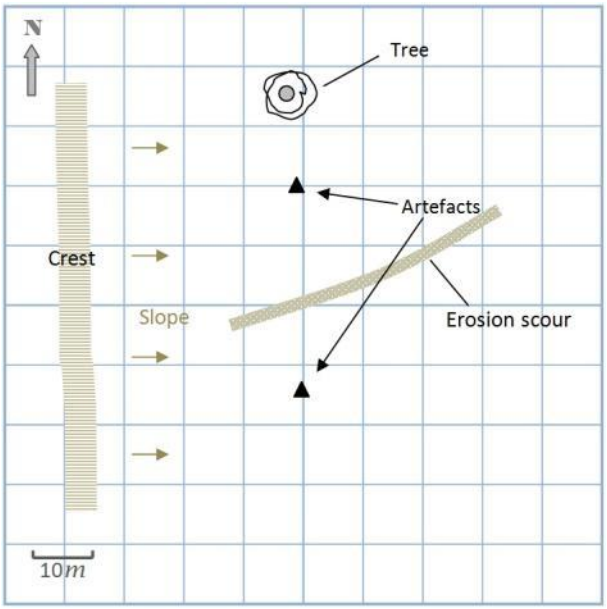


Figure 23 Sketch map showing location of UWF SU39/L2.

UWF Survey Unit 40/Locale 1

One stone artefact was recorded in an area of exposure associated with a sheep track in Survey Unit 40 (Plate 34). The landform is a very rocky 50m x 50m eroded saddle, situated on a crest, and has a gentle gradient and open aspect. The broader area has ground exposure of 10%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact only were recorded, artefact density is assessed to be very low. The locale is highly eroded with skeletal lithosol soil and has no subsurface potential.

Plate 34 UWF SU40/L1 looking 50˚.

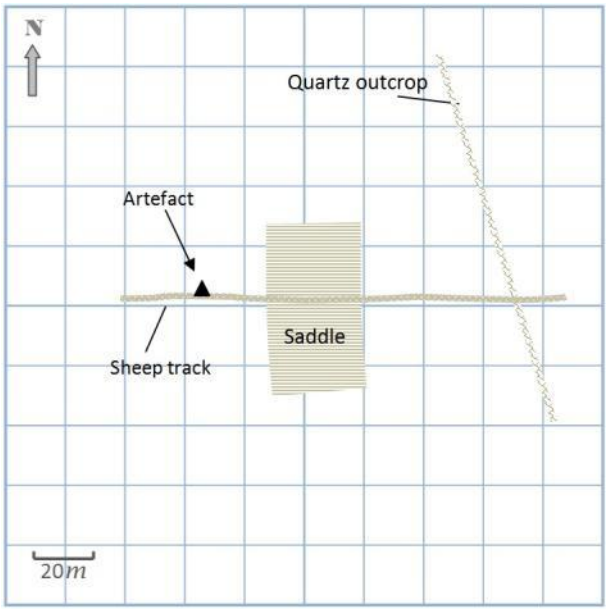


Figure 24 Sketch map showing location of UWF SU40/L1.

UWF Survey Unit 41/Locale 1

Six stone artefacts were recorded in an area of exposure associated with a sheep track in Survey Unit 41 (Plate 35). Two additional probable artefacts were identified embedded in the ground. The landform is a very rocky 50m x 50m eroded saddle, situated on a crest, and has a gentle gradient and open aspect. The broader area has ground exposure of 10%, of which 70% was archaeological visibility. The effective survey coverage is reasonable. The locale is highly eroded with very shallow soil deposits only, and accordingly has minimal subsurface potential. The predicted artefact density for this locale is low, and probably extends the length of the saddle. The incidence of background quartz is low.

Plate 35 UWF SU41/L1 looking 140˚.

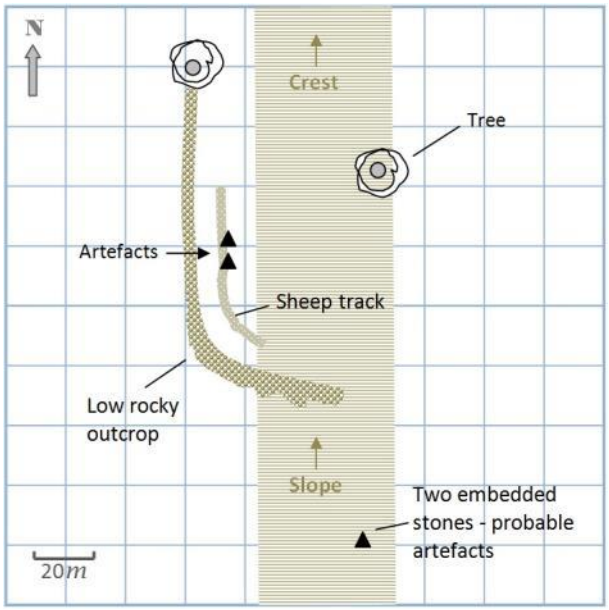


Figure 25 Sketch map showing location of UWF SU41/L1.

UWF Survey Unit 42/Locale 1

Two stone artefacts were recorded in this locale in Survey Unit 42 (Plate 36). The landform is a very rocky eroded saddle, situated on a crest, and has a very gentle gradient and open aspect. The site area measures 30 x 30 m and has ground exposure of 30%, of which 50% was archaeological visibility. The effective survey coverage is reasonable, and given that two artefacts only were recorded, artefact density is assessed to be very low. The locale is highly eroded, being silt wash over shale bedrock and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 36 UWF SU42/L1 looking 150˚.

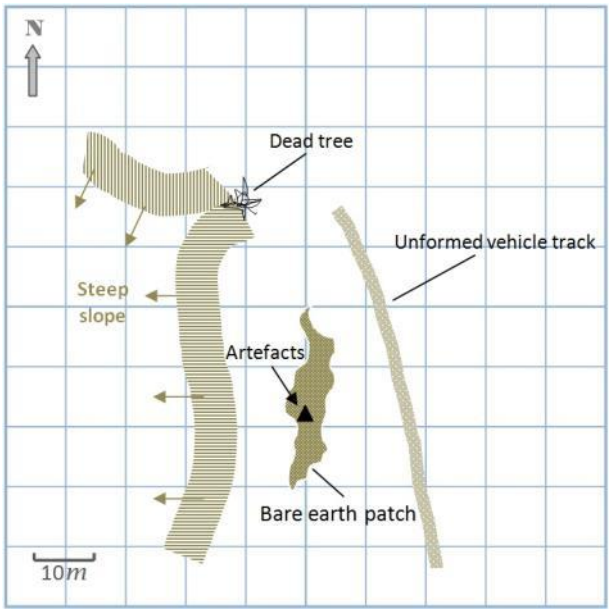


Figure 26 Sketch map showing location of UWF SU42/L1.

UWF Survey Unit 43/Locale 1

Nine stone artefacts were recorded in a 20m x 20m area of bare earth exposure and an adjacent graded track in this locale in Survey Unit 43 (Plate 37). The landform is a very rocky, highly eroded saddle, situated on a crest, and has a very gentle gradient and north-easterly aspect. The site area has ground exposure of 30%, of which 80% was archaeological visibility. The effective survey coverage is reasonable, and given that nine artefacts were recorded, artefact density is assessed to be very low. The locale is highly eroded, in many places to shaly bedrock and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low. The incidence of background quartz is low. The bending initiation on some artefacts hint at machine caused fracture and there is, therefore, some doubt as to the status of some artefacts.

Plate 37 UWF SU43/L1 looking 150˚.

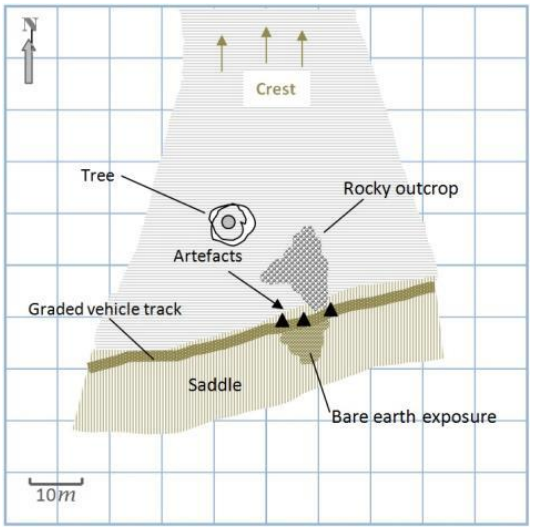


Figure 27 Sketch map showing location of UWF SU43/L1.

UWF Survey Unit 43/Locale 2

One stone artefact was recorded along an exposure of bare earth associated with a sheep track in this locale in Survey Unit 43 (Plate 38). The landform is a very rocky crest with gentle gradient and northerly aspect. The broader area has ground exposure of 10%, of which 60% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be very low. The locale is highly eroded, with a high proportion of exposed bedrock and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 38 UWF SU43/L2 looking 160˚.

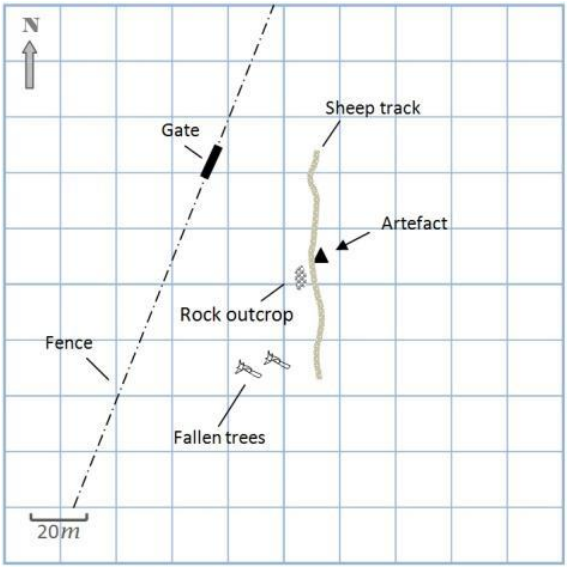


Figure 28 Sketch map showing location of UWF SU43/L2.

UWF Survey Unit 43/Locale 3

Three stone artefacts were recorded in a 20m x 10m section of an overall 20m x 20m exposure of bare earth associated with sheep tracks in this locale in Survey Unit 43 (Plate 39). The landform is a flat open crest with gentle gradient and westerly aspect. The broader area has ground exposure of 10%, of which 60% was archaeological visibility. The effective survey coverage is reasonable, and given that three artefacts were recorded, artefact density is assessed to be very low. The locale is highly eroded and soils shallow, so that subsurface potential is limited. The predicted artefact density for this locale is very low. The incidence of background quartz is high.

Plate 39 UWF SU43/L3 looking 70˚.

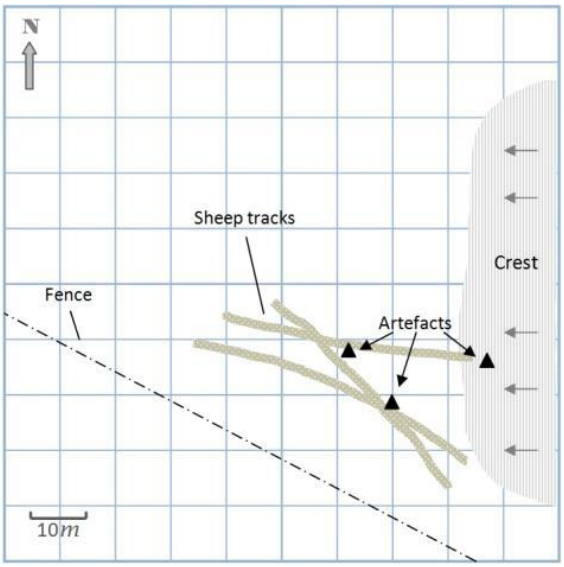


Figure 29 Sketch map showing location of UWF SU43/L3.

UWF Survey Unit 43/Locale 4

One stone artefact was recorded in a 20m x 20m area of exposure associated with sheep tracks in this locale in Survey Unit 43 (Plate 40). The landform is an eroded 30m wide crest with gentle gradient and northerly aspect. The broader area has ground exposure of 20%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be very low. The locale is highly eroded and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 40 UWF SU43/L4 looking 150˚.

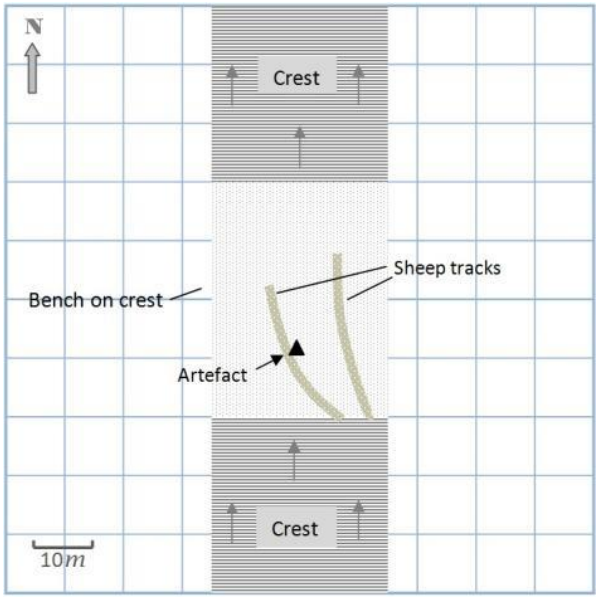


Figure 30 Sketch map showing location of UWF SU43/L4.

UWF Survey Unit 44/Locale 1

Four stone artefacts were recorded in a 70m x 40m section of exposure associated with a graded vehicle track at this locale in Survey Unit 44 (Plate 41). The landform is a spur crest eroded to bedrock, with a very gentle gradient and an aspect to 270˚. The site area has ground exposure of 90%, of which 90% was archaeological visibility. The effective survey coverage is high, and given that four artefacts only were recorded, artefact density is assessed to be very low. The locale is highly eroded with skeletal lithosol soil only and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 41 UWF SU44/L1 looking 190˚.

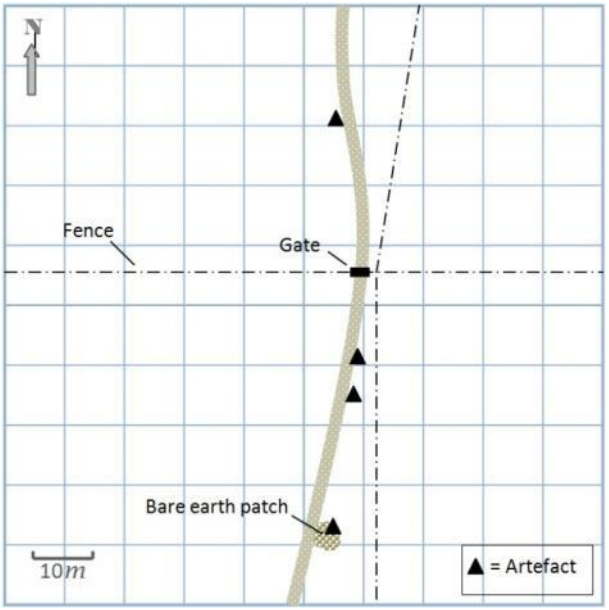


Figure 31 Sketch map showing location of UWF SU44/L1.

UWF Survey Unit 44/Locale 2

Five stone artefacts were recorded in a 5m x 10m section of exposure associated with a graded vehicle track at this locale in Survey Unit 44 (Plate 42). The landform is a spur crest eroded to bedrock, with a very gentle gradient and an aspect to 270˚. The broader area has ground exposure of 90%, of which 90% was archaeological visibility. The effective survey coverage is high, and given that five artefacts were recorded, artefact density is assessed to be very low. The locale is highly disturbed and eroded with bedrock exposed and skeletal lithosol soil only and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 42 UWF SU44/L2 looking 180˚.

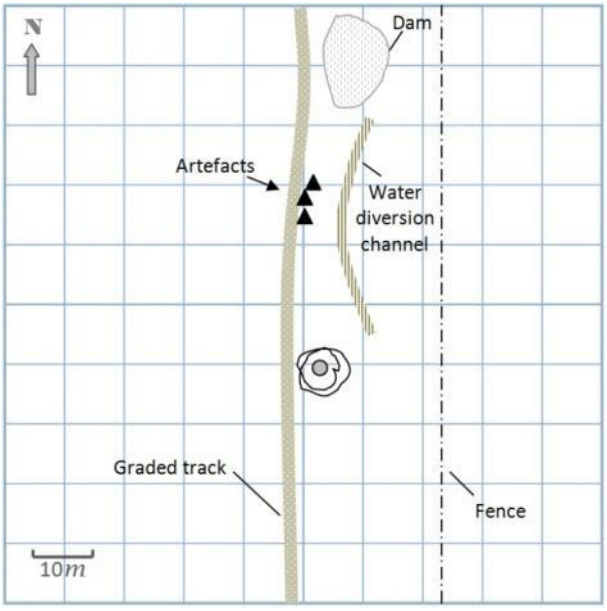


Figure 32 Sketch map showing location of UWF SU44/L2.

UWF Survey Unit 44/Locale 3

One stone artefact was recorded on a graded vehicle track at this locale in Survey Unit 44 (Plate 43). The landform is a basal slope/flat, very rocky and eroded to bedrock, with a very gentle gradient and an open aspect. The broader area has ground exposure of 90%, of which 90% was archaeological visibility. The effective survey coverage is high, and given that one artefact only was recorded, artefact density is assessed to be very low. The locale is highly disturbed and eroded with bedrock exposed and skeletal lithosol soil only and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 43 UWF SU44/L3 looking 210˚.

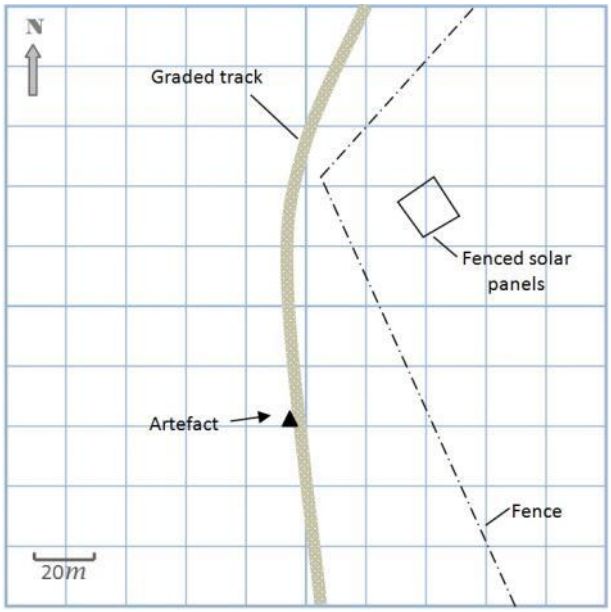


Figure 33 Sketch map showing location of UWF SU44/L3.

UWF Survey Unit 44/Locale 4

Some 28 stone artefacts were recorded in a 4m x 70m section of exposure associated with a graded vehicle track at this locale in Survey Unit 44 (Plate 44). A discrete cluster of chert artefacts is interpreted to be part of a single knapping event. The landform is a simple slope eroded to shaly bedrock, with a very gentle gradient and an aspect to 220˚. The broader site area has ground exposure of 40%, of which 90% was archaeological visibility. The effective survey coverage is reasonable. Artefact density is assessed to be very low. The locale is highly disturbed and eroded to bedrock with skeletal lithosol soil only and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 44 UWF SU44/L4 looking 250˚.

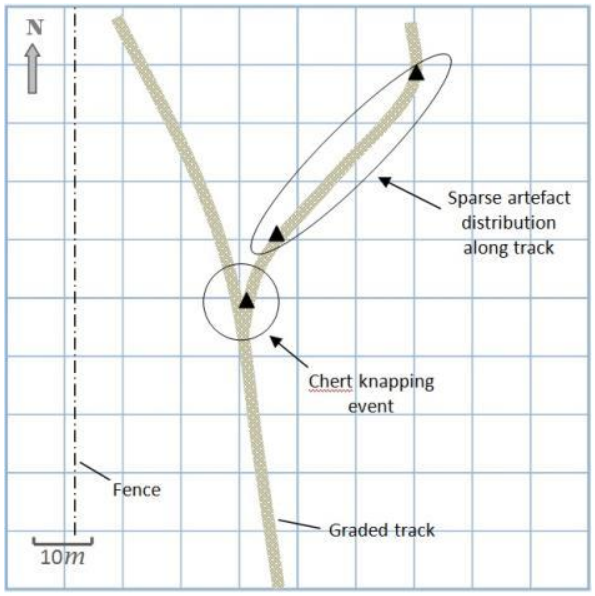


Figure 34 Sketch map showing location of UWF SU44/L4.

UWF Survey Unit 46/Locale 1

One stone artefact was recorded in a 20m x 50m section of exposure at this locale in Survey Unit 46 (Plate 45). The landform is a very rocky saddle on a crest with a gentle gradient and an open aspect. The broader area has ground exposure of 10%, of which 7% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be very low. The locale is eroded to shaly bedrock with skeletal lithosol soil only and, accordingly, has no subsurface potential. The incidence of background quartz is low.

Plate 45 UWF SU46/L1 looking 260˚.

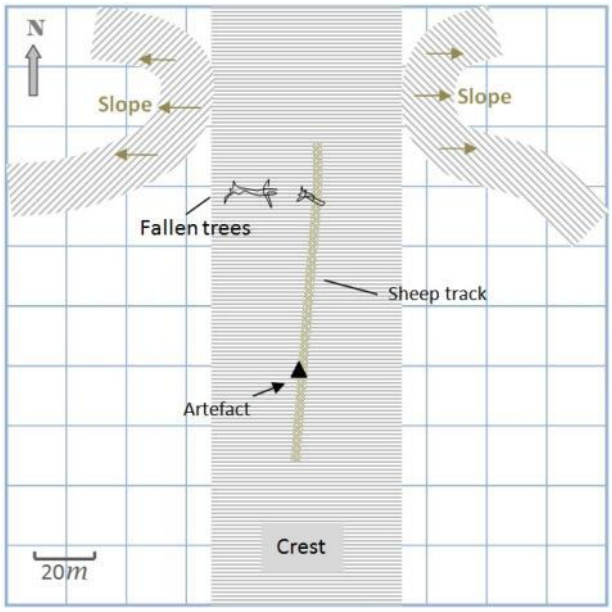


Figure 35 Sketch map showing location of UWF SU46/L1.

UWF Survey Unit 49/Locale 1

Eight stone artefacts were recorded in a 4m x 60m area of exposure associated with a vehicle track at this locale in Survey Unit 49 (Plate 46). The landform is a saddle with gentle gradient and an open aspect. The broader area has ground exposure of 5%, of which 90% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be low. The locale has some subsurface potential given some depth to the soils, and artefact density is predicted to be low.

Plate 46 UWF SU49/L1 looking 230˚.

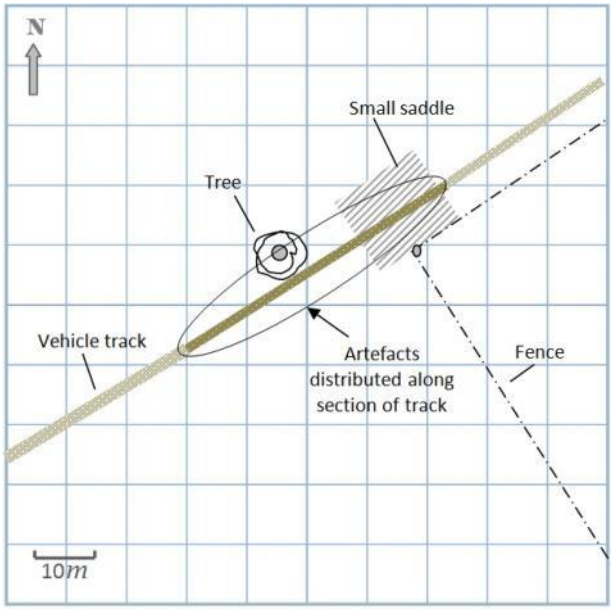


Figure 36 Sketch map showing location of UWF SU49/L1.

UWF Survey Unit 51/Locale 1

Two stone artefacts were recorded in a 5m x 4m area on a vehicle track at this locale in Survey Unit 51 (Plate 47). The landform is a simple slope with very gentle gradient and southerly aspect. The broader track area has ground exposure of 80%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be very low. The locale has subsurface potential given some depth to the soils, but artefact density is predicted to be very low.

Plate 47 UWF SU51/L1 looking 270˚.

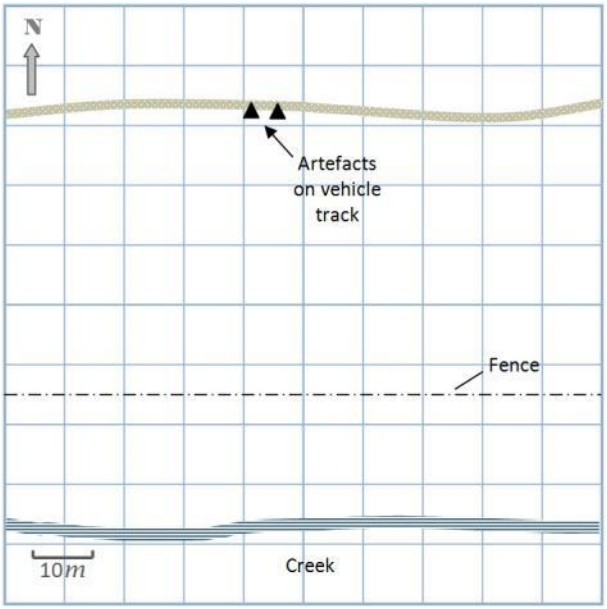


Figure 37 Sketch map showing location of UWF SU51/L1.

UWF Survey Unit 51/Locale 2

Five stone artefacts were recorded in a 40m x 40m area of exposure associated with vehicle tracks at this locale in Survey Unit 51 (Plate 48). The landform is a basal spur crest with very gentle gradient and southerly aspect. The track area has ground exposure of 80%, of which 70% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be very low. The area is eroded to bedrock. The locale has minimal to negligible subsurface potential given the shallow nature of the soils, but artefact density is predicted to be very low. The incidence of quartz background is moderate.

Plate 48 UWF SU51/L2 looking 60˚.

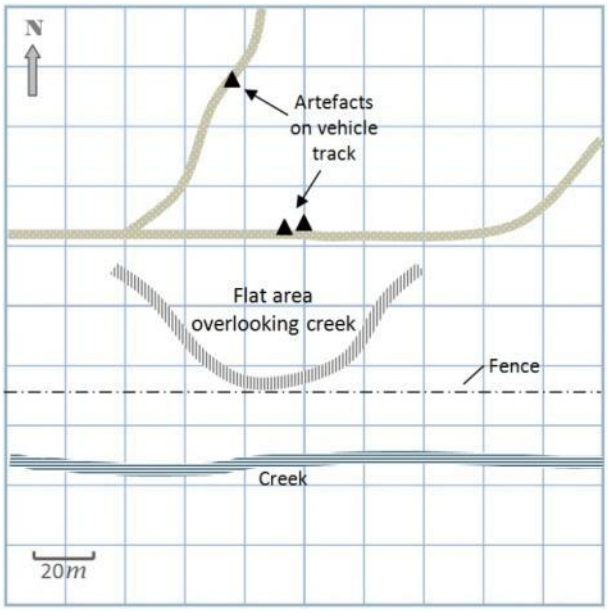


Figure 38 Sketch map showing location of UWF SU51/L2.

UWF Survey Unit 51/Locale 3

One stone artefact was recorded on a vehicle track at this locale in Survey Unit 51 (Plate 49). The landform is a simple basal slope in a sheltered valley with very gentle gradient and easterly aspect. The broader site area has ground exposure of 20%, of which 10% was archaeological visibility. The effective survey coverage is low, and artefact density is assessed to be low. The locale has subsurface potential given the silty colluvium present, but artefact density is predicted to be low. The incidence of background quartz is low.

Plate 49 UWF SU51/L3 looking north.

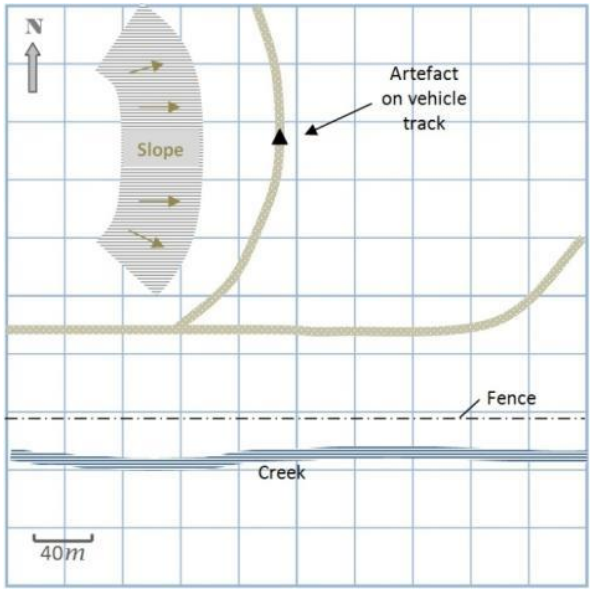


Figure 39 Sketch map showing location of UWF SU51/L3.

UWF Survey Unit 52/Locale 1

One stone artefact was recorded in a 10m x 20m area of exposure associated with a combination of dozer, vehicle and animal tracks at this locale in Survey Unit 52 (Plate 50). The landform is a saddle with very gentle gradient and open aspect. The broader area has ground exposure of 10%, of which 40% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be very low. The locale has subsurface potential, although artefact density is predicted to be very low.

Plate 50 UWF SU52/L1 looking 30˚.

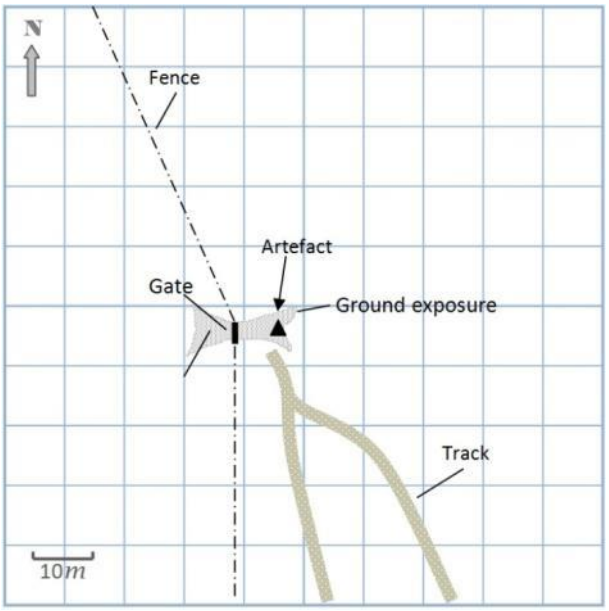


Figure 40 Sketch map showing location of UWF SU52/L1.

UWF Survey Unit 52/Locale 2

Nine stone artefacts were recorded in a 40m x 10m area of exposure in eroded animal tracks at this locale in Survey Unit 52 (Plate 51). In addition, at c. 50m north of this exposure, a probable knapping event comprised of some 35 quartz artefacts was located in a 2m x 1m bare earth exposure. The landform is a rocky basal spur crest with gentle gradient and northerly aspect. The site area has ground exposure of 10%, of which 50% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be low/moderate. Subsurface potential is minimal in the southern section of the locale due to its rockiness and high levels of erosion. However, the north section contains deeper soils. The predicted artefact density for this locale is low/moderate to moderate.

Plate 51 UWF SU52/L2 looking 30˚.

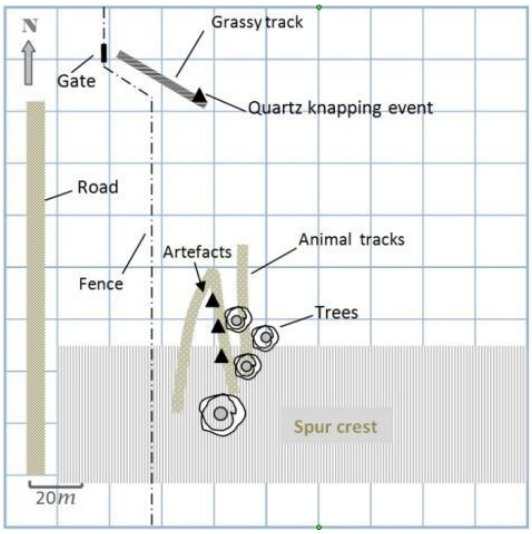


Figure 41 Sketch map showing location of UWF SU52/L2.

UWF Survey Unit 53/Locale 1

One stone artefact was recorded on a dozer track at this locale in Survey Unit 53 (Plate 52). The landform is a simple slope with gentle gradient and aspect to 280˚. The site area has ground exposure of 40%, of which 80% was archaeological visibility, given that it occurs within a dozer scrape. The effective survey coverage is reasonable, and artefact density is assessed to be very low. The locale is highly disturbed, very rocky, with skeletal lithosol soil and, accordingly, has no subsurface potential. The predicted artefact density for this locale is very low.

Plate 52 UWF SU53/L1 looking 30˚.

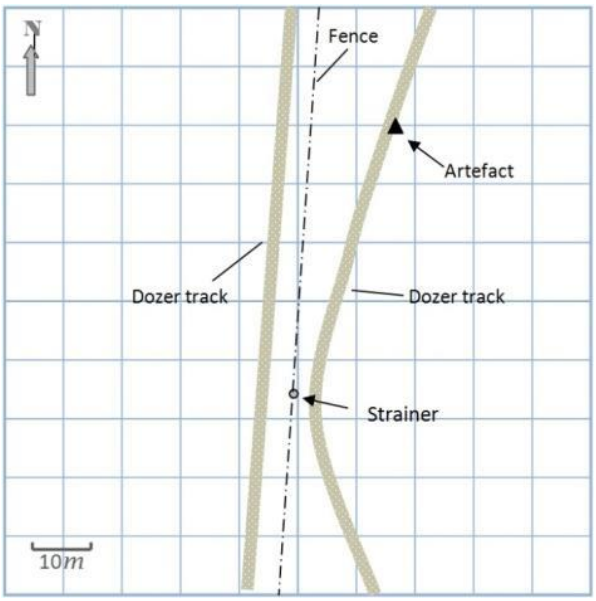


Figure 42 Sketch map showing location of UWF SU53/L1.

AHIMS site 36-2-0144 - UC OS 1

AHIMS site 36-2-0144 is a previously recorded artefact locale and area of PAD (Plate 53). At the time of its original recording c. 20 artefacts were located in ground exposures associated with a cutting on the southern side of a creek crossing, 70 % of which were formed from good quality quartz possessing *no diagnostic features* and accompanied by several hornfels flakes which suggested that much of the associated quartz material was artefactual. Roadwork has since taken place in the area, and at the time of the subject survey no artefacts were located at this locale in exposures on either side of the creek. The predicted artefact density for this locale is low.

Plate 53 *AHIMS site 36-2-0144 -UC OS 1* looking 45˚.

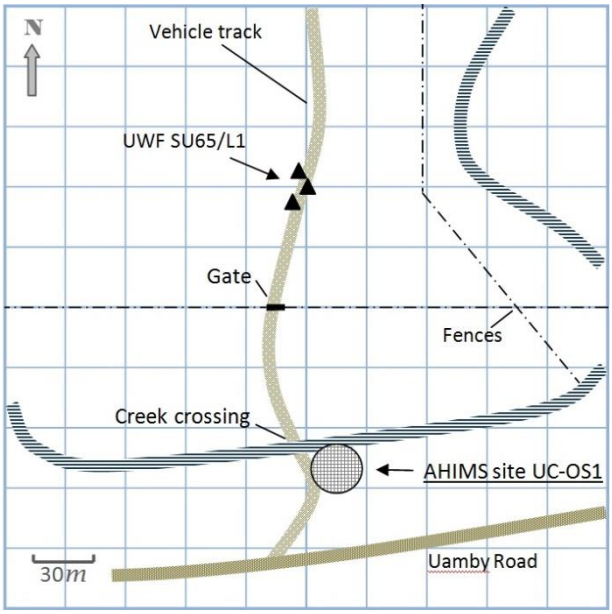


Figure 43 Sketch map showing location of *AHIMS site UC-OS 1 (36-2-0144).*

UWF Survey Unit 65/Locale 1

Eight stone artefacts were recorded along a 20 metre section of a vehicle track at this locale in Survey Unit 65 (Plate 54). In addition, there are some quartz pieces present that are likely to be artefactual. The landform is a lower simple slope with very gentle gradient and aspect to 90˚, located about 70 metres to the west of a creek. The site area has ground exposure of 70%, of which 90% was archaeological visibility. While the track itself has no subsurface potential, with bedrock exposed on the road, there is some potential for PAD to be present to both the east and west of this locale. The effective survey coverage is high, and the predicted artefact density for this locale is low.

Plate 54 UWF SU65/L1 looking north.

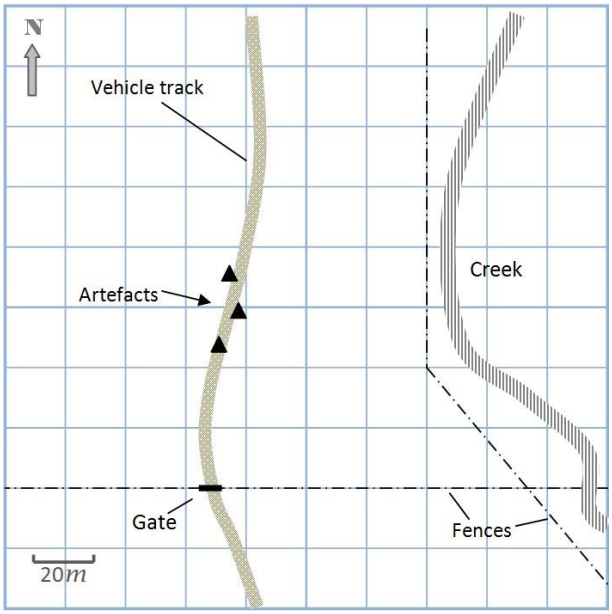


Figure 44 Sketch map showing location of UWF SU65/L1.

UWF Survey Unit 65/Locale 2

One stone artefact was recorded in an area of exposure associated with a casual vehicle track at this locale in Survey Unit 65 (Plate 55). The landform is a slight rise which slopes very gently to the south. There are rocky outcrops and pushed up piles of rock immediately to the east of the locale, rising to a height of c. 1 metre, with numerous tuff pieces created by bulldozer activity present. The site area has ground exposure of 20%, of which 80% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be low. There is subsurface potential in the broader area, with the predicted artefact density for this locale being low.

Plate 55 UWF SU65/L2 looking north.

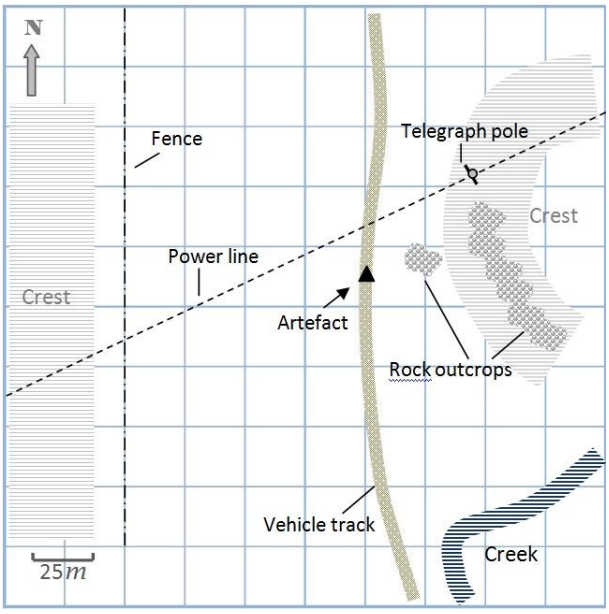


Figure 45 Sketch map showing location of UWF SU65/L2.

AHIMS site 36-2-0143 - UC OS 2

AHIMS site 36-2-0143 is a previously recorded artefact locale (Plate 56). At the time of its original recording c. four artefacts were located in ground exposures associated with a farm gate on the southern side of a creek crossing. The area was described as being highly disturbed at the time of the original recording, with low potential for undisturbed archaeological deposit to be present. At the time of the subject survey no artefacts were located at this locale in exposures associated with the farm gate and vehicle track. The predicted artefact density for this locale is predicted to be low.

Plate 56 *AHIMS site 36-2-0143 -UC OS 2* looking 45˚.

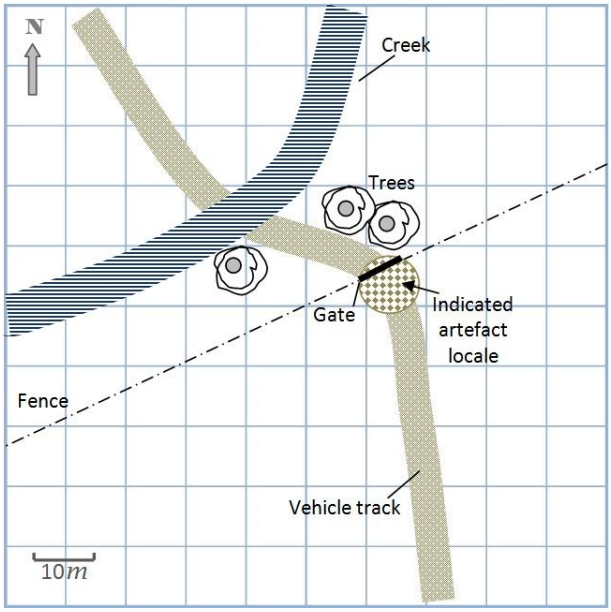


Figure 46 Sketch map showing location of *AHIMS site UC-OS 2 (36-2-0143).*

UWF Survey Unit 65/Locale 3

One stone artefact was recorded on a vehicle track at this locale in Survey Unit 65 (Plate 57). In addition, there are some accompanying quartz pieces present which are possibly artefactual. The landform is a lower slope with gentle gradient and northerly aspect, located about 20 metres to the south of a creek. The site area has ground exposure of 40%, of which 80% was archaeological visibility. The effective survey coverage is moderate, and the predicted artefact density for this locale is low.

Plate 57 UWF SU65/L3 looking 280˚.

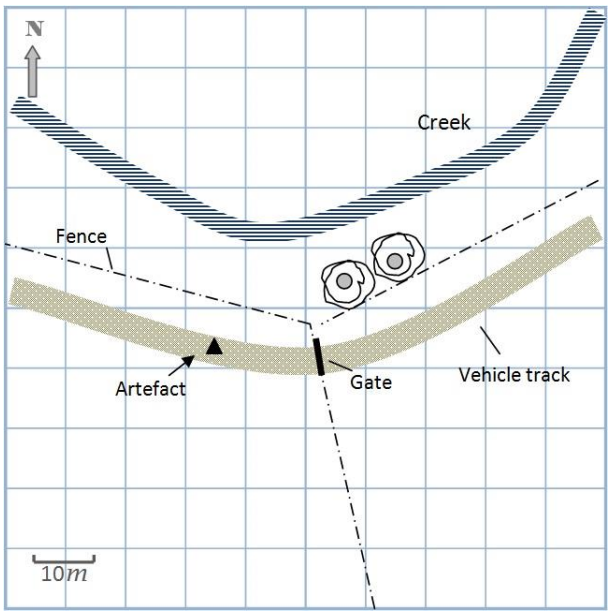


Figure 47 Sketch map showing location of UWF SU65/L3.

UWF Survey Unit 68/Locale 1

Six stone artefacts were recorded in an area of erosion scour exposure at this locale within Survey Unit 68 (Plate 58). The locale is situated adjacent to a crossing on a drainage depression, which at the time of survey had a small water pool which is possibly spring fed. The area measures 10m x 5m of which 60% was ground exposure, possessing 60% archaeological visibility. The effective survey coverage at this locale is reasonable. The area has some subsurface potential and the predicted artefact density for this locale is low.

Plate 58 UWF SU68/L1 looking 170°.

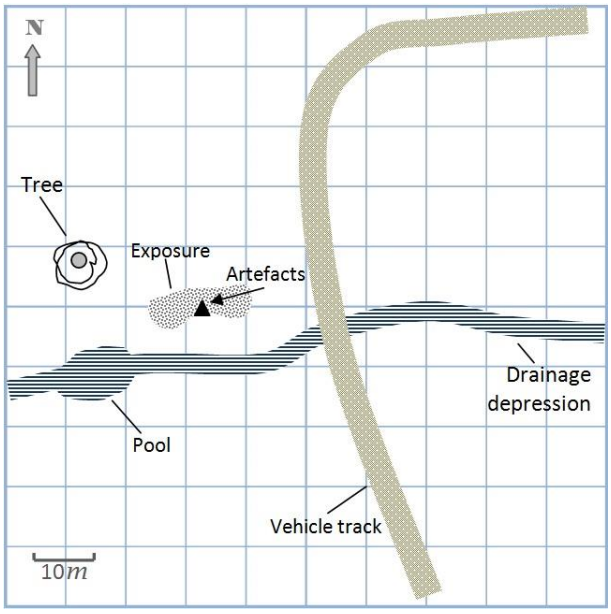


Figure 48 Sketch map showing location of UWF SU68/L1.

UWF Survey Unit 71/Locale 1

Four stone artefacts were recorded in an area of ground disturbance exposure associated with pig activity at this locale within Survey Unit 71 (Plate 59). The locale is situated on a levee bank on a floodplain c. 100 m to the west of the Cudgegong River. The levee landform is between 50 - 75 metres wide and extends c. 1 kilometre along the margin of the river. The locale area measures 100m x 50m of which 30% was ground exposure, possessing 20% archaeological visibility. The effective survey coverage at this locale is moderate. The area has subsurface potential and the potential to contain archaeological deposit in moderate density.

Plate 59 UWF SU71/L1 looking 30°.

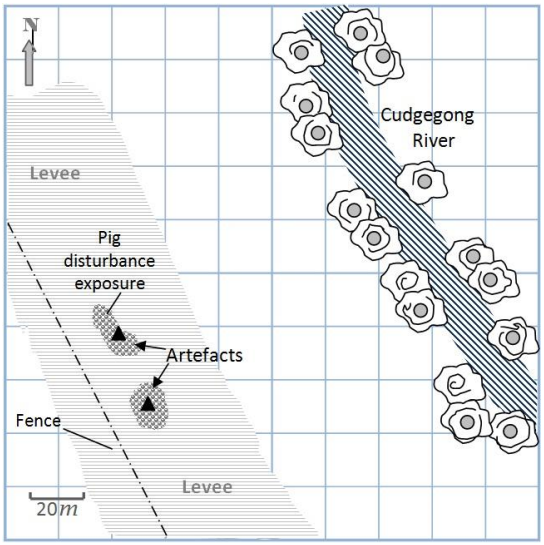


Figure 49 Sketch map showing location of UWF SU71/L1.

UWF Survey Unit 72/Locale 1

More than eleven stone artefacts were recorded in an area of exposure associated with a graded vehicle track at this locale in Survey Unit 72 (Plate 60). The landform is a saddle on a crest with very gentle slope and open aspect. The locale encompasses an area 40 m by 6 m and is highly disturbed and very rocky, with quartz and shale shatter present, as well as slate outcrops on either side of the track. The site area has ground exposure of 80%, of which 90% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be low. There is subsurface potential in the broader area, with the predicted artefact density for this locale being low.

Plate 60 UWF SU72/L1 looking 180˚.

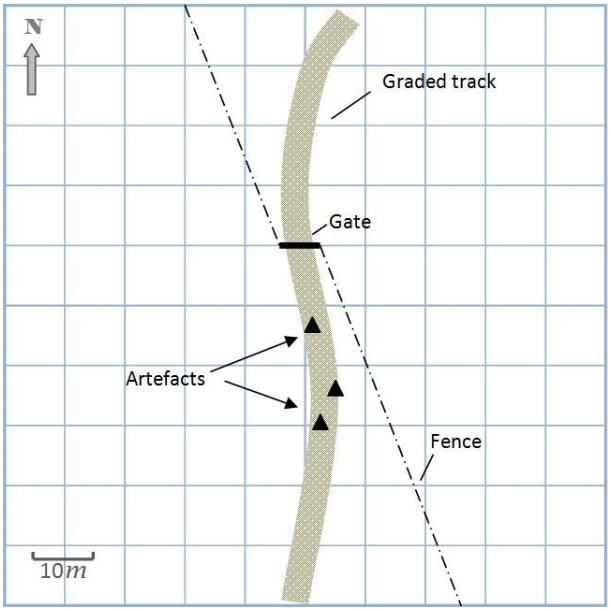


Figure 50 Sketch map showing location of UWF SU72/L1.

UWF Survey Unit 73/Locale 1

Three stone artefacts were recorded in an area of exposure associated with a graded vehicle track at this locale in Survey Unit 73 (Plate 61). The landform lower simple slope with very gentle slope and southerly aspect. The locale encompasses an area 20 m by 4 m and is highly disturbed and very rocky, with quartz and tuff background shatter present. The site area has ground exposure of 10%, of which 90% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be low. There is subsurface potential in the broader area, with the predicted artefact density for this locale being low.

Plate 61 UWF SU73/L1 looking north.

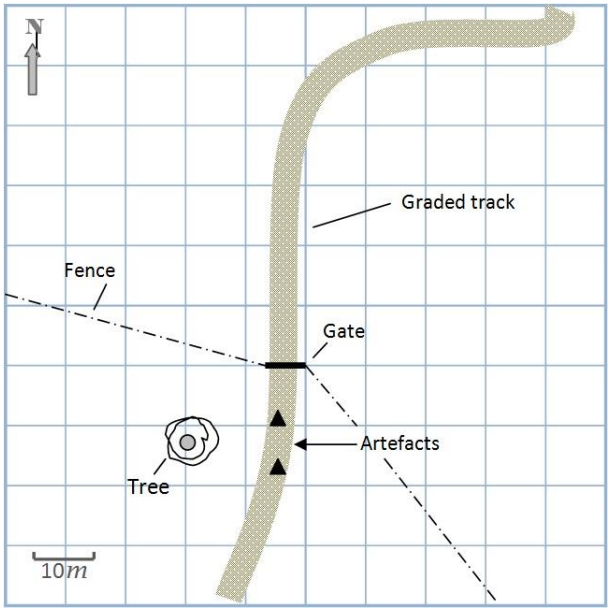


Figure 51 Sketch map showing location of UWF SU73/L1.

UWF Survey Unit 73/Locale 2

Four stone artefacts were recorded in an area of exposure associated with erosion at the southern edge of a creek at this locale in Survey Unit 73 (Plate 62). The landform is a flat with an open aspect. The locale encompasses an area 20 m by 4 m and is situated at the edge of a cultivated paddock. The site area has ground exposure of 40%, of which 90% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be moderate. There is subsurface potential in the broader area, with the predicted artefact density for this locale being moderate.

Plate 62 UWF SU73/L2 looking 230˚.

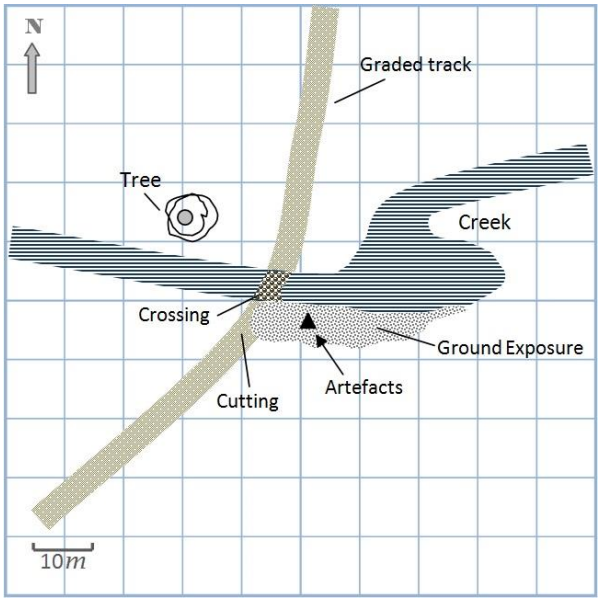


Figure 52 Sketch map showing location of UWF SU73/L2.

Table 7 Aboriginal object locales recorded during the 2018 field survey.

Name	Comments	Easting	Northing
UWF SU76/L1	1 artefact in a bare earth exposure in SU76	706670	6401003
UWF SU76/L2	7 artefacts in an area of erosion in SU76; sample recorded	707155	6401185
UWF SU88/L1	6 artefacts in a bare earth exposure in SU88	703125	6399361
UWF SU80/L1	2 artefacts in a track exposure in SU80	708023	6403656
UWF SU80/L2	3 artefacts in a track exposure in SU80	708105	6403692
UWF SU81/L1	7 artefacts in a vehicle track exposure in SU81; sample recorded	708124	6403809
UWF SU81/L2	5 artefacts in a graded vehicle track exposure in SU81; sample recorded	708211 708219	6403933 6403973
UWF SU81/L3	1 artefact in an erosional patch exposure within a vehicle track in SU81	708393	6404126
UWF SU85/L1	1 artefact in a bare earth exposure in SU85	697531	6396335
UWF SU86/L1	11 artefacts in a bare earth exposure in SU86	698097	6395705
UWF SU89/L1	1 artefact in an erosional scour exposure in SU89	703079	6399420
UWF SU89/L2	1 artefact in an erosional scour exposure in SU89	702938	6399413
UWF SU89/L3	1 artefact in a bare earth exposure in SU89	702427	6399030
UWF SU89/L4	1 artefact in a bare earth exposure in SU89	701563	6398191
UWF SU89/L5	1 artefact in a vehicle track exposure in SU89	701724	6397889
UWF SU91/L1	4 artefacts in an erosional scoured gully exposure in SU91	703357	6397476
UWF SU93/L1	1 artefact in a bare earth exposure in SU93	704520	6397593
UWF SU96/L1	2 artefacts in a bare earth exposure in SU96	702044	6394090
UWF SU96/L2	7 artefacts in a bare earth exposure in SU96	702134	6394154
UWF SU96/L3	2 artefacts in a bare earth exposure in SU96	702219	6394106
UWF SU96/L4	3 artefacts in track exposure in SU96	702347	6394155
UWF SU96/L5	6 artefacts in a erosional scour and vehicle track exposure in SU96; sample recorded	702425 702478	6394109 6394098
UWF SU96/L6	3 artefacts in vehicle track exposure in SU96	702769	6394046

Name	Comments	Easting	Northing
UWF SU98/L1	3 artefacts in a sheep track exposure in SU98	703271	6399676
UWF SU98/L2	5 artefacts in a sheep and vehicle track exposure in SU98	703398	6399481

UWF Survey Unit 76/Locale 1
One stone artefact was recorded in a bare earth exposure at this locale within Survey Unit 76 (Plate 63). The landform element is a crest of moderate gradient and north easterly aspect.

The site exposure area has ground exposure of 15%, of which 80% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be very low. Because of the general rockiness and the skeletal nature of the lithosol, this locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density.


Plate 63 *UWF Survey Unit 76/Locale 1* looking 210°.

UWF Survey Unit 76/Locale 2

A sample of seven stone artefacts were recorded in a 10m x 10m area of bare earth exposure at this locale within Survey Unit 76 (Plate 64). The landform element is a small bench 15m (l) x 20m (w) on a crest of gentle gradient and north-easterly aspect. A graded road crosses the northeast end of site.

The site exposure area has ground exposure of 40%, of which 60% was archaeological visibility. The broader area away from site exposure has ground exposure of 30%, of which 60% was archaeological visibility. The effective survey coverage is reasonable, and artefact density is assessed to be low/moderate. Because of the general rockiness and the skeletal nature of the lithosol soil, this locale has limited subsurface potential. The area contains additional artefacts distributed at low density/moderate and in a disturbed context.

Plate 64 *UWF Survey Unit 76/Locale 2* looking 260°.

UWF Survey Unit 80/Locale 1

Two stone artefacts were recorded in a 15m x 4m area of bare earth exposure on a farm track at this locale within Survey Unit 80 (Plate 65). The landform element is a creek terrace of a very gentle gradient and easterly aspect.

The site exposure area has ground exposure of 80%, of which 60% was archaeological visibility. There is nil exposure away from track. Artefact density is assessed to be moderate. Away from the vehicle track, this locale has limited subsurface potential. The area is predicted to have additional artefacts distributed at moderate density.

Plate 65 *UWF Survey Unit 80/Locale 1* looking 0°.

UWF Survey Unit 80/Locale 2
Three stone artefacts were recorded in a 20m x 4m area of bare earth exposure on a farm track at this locale within Survey Unit 80 (Plate 66). The landform element is a creek terrace of a very gentle gradient and easterly aspect.

The site exposure area has ground exposure of 80%, of which 60% was archaeological visibility. There is nil exposure away from track. Artefact density is assessed to be moderate. Away from the vehicle track, this locale has limited subsurface potential. The area probably contains additional artefacts distributed at moderate density.

Plate 66 *UWF Survey Unit 80/Locale 2* looking 180°.

UWF Survey Unit 81/Locale 1
A sample of seven stone artefacts were recorded in a 40m x 4m area of bare earth exposure on a vehicle track at this locale within Survey Unit 81 (Plate 67). The landform element is a simple slope of a 5° gradient and SSW aspect.

The site exposure area has ground exposure of 80%, of which 60% was archaeological visibility. There is nil exposure away from vehicle track. Artefact density is assessed to be low to moderate. Away from the vehicle track, this locale has some limited subsurface potential. The area probably contains additional artefacts distributed at low to moderate density.

Plate 67 *UWF Survey Unit 81/Locale 1* looking 180°.

UWF Survey Unit 81/Locale 2

A sample of five stone artefacts were recorded in a 40m x 4m area of bare earth exposure on graded track at this locale within Survey Unit 81 (Plate 68). The landform element is a minor crest of a flat to very gentle gradient and open aspect.

The site exposure area has ground exposure of 80%, of which 60% was archaeological visibility. There is nil exposure away from vehicle track. Artefact density is assessed to be low. Away from the vehicle track, this locale has some subsurface potential. The area is likely to contain additional artefacts distributed at low density.

Plate 68 *UWF Survey Unit 81/Locale 2.*

UWF Survey Unit 81/Locale 3

One stone artefact was recorded in a 4m x 4m area of bare earth exposure on a track at this locale within Survey Unit 81 (Plate 69). The landform element is a simple slope, adjacent to a minor drainage line, 3° gradient and 330° aspect. Artefact density is assessed to be very low. The area probably contains additional artefacts distributed at very low density.

Plate 69 *UWF Survey Unit 81/Locale 3.*

UWF Survey Unit 85/Locale 1
One stone artefact was recorded in a 4m x 4m area of bare earth exposure at this locale within Survey Unit 85 (Plate 70). The landform element is a simple slope of a 6° gradient and 150° aspect.

The site exposure area has ground exposure of 20%, of which 40% was archaeological visibility. The effective survey coverage is reasonable, and given that one artefact was recorded, artefact density is assessed to be negligible. Because of the general nature of the soil, this locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density.

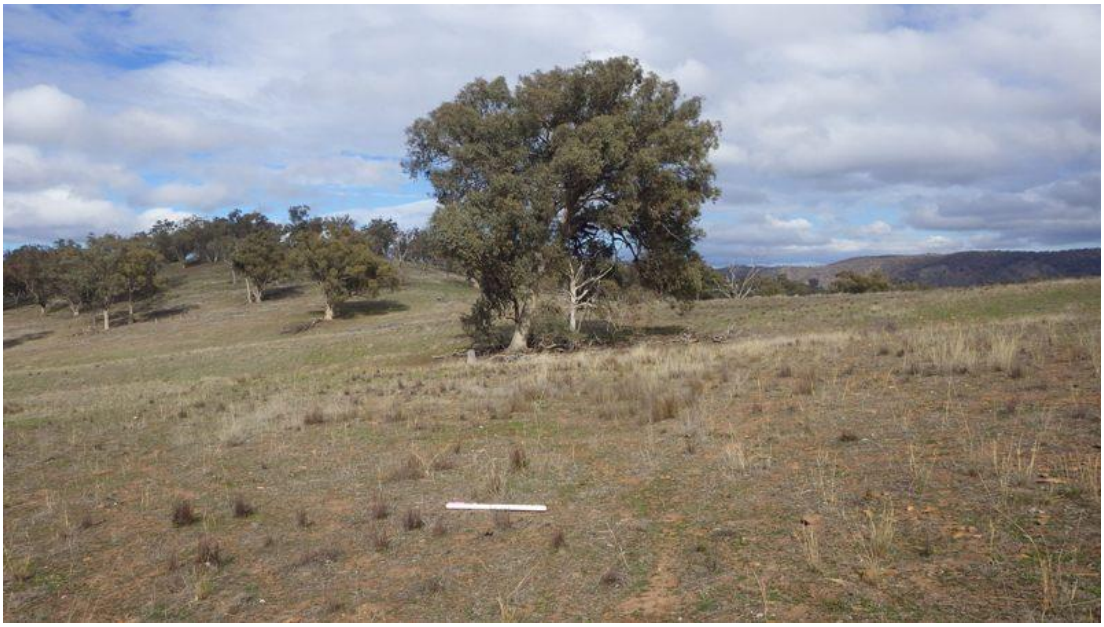


Plate 70 *UWF Survey Unit 85/Locale 1.*

UWF Survey Unit 86/Locale 1
A sample of 11 stone artefacts were recorded in a 10m x 10m area of bare earth exposure on graded contour bank at this locale within Survey Unit 86 (Plate 71). The landform element is a simple slope of a 4° gradient and 280° aspect.

The site exposure area has ground exposure of 50%, of which 60% was archaeological visibility. The broader exposure area has ground exposure of 50%, of which 60% was archaeological visibility. The site is highly disturbed from grading, ploughing and contouring. Artefact density is assessed to be very low. Because of the shallow nature of the soil, this locale has limited subsurface potential. The area probably contains additional artefacts distributed at very low density.


Plate 71 *UWF Survey Unit 86/Locale 1;* looking 30°.

UWF Survey Unit 88/Locale 1

Six stone artefacts were recorded in a 30m x 10m area of bare earth exposure at this locale within Survey Unit 88 (Plate 72). The landform element is a simple slope of gentle gradient and northerly aspect. The area is a cultivated paddock of silty gravelly loam eroded to shale bedrock of low outcrops in places.

The site exposure area has ground exposure of 30%, of which 70% was archaeological visibility. Artefact density is assessed to be very low. Because of the general rockiness and the skeletal nature of the lithosol soil, this locale has limited subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 72 *UWF Survey Unit 88/Locale 1;* looking 120°.

UWF Survey Unit 89/Locale 1

One stone artefact was recorded in a 10m x 3m area of erosional scour exposure at this locale within Survey Unit 89 (Plate 73). The landform element is a crest of gentle gradient and northerly aspect.

The site exposure area has ground exposure of 40%, of which 60% was archaeological visibility. Artefact density is assessed to be very low. Because of the general nature of the soil, this locale has limited subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 73 *UWF Survey Unit 89/Locale 1;* looking 310°.

UWF Survey Unit 89/Locale 2
One stone artefact was recorded in a 10m x 10m area of bare earth exposure at this locale within Survey Unit (Plate 74). The landform element is a crest of gentle gradient and northerly aspect.

The site exposure area has ground exposure of 40%, of which 80% was archaeological visibility. The broader exposure area has ground exposure of 5%, of which 70% was archaeological visibility. Artefact density is assessed to be very low. Because of the general rockiness and the skeletal nature of the soil, this locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density.


Plate 74 *UWF Survey Unit 89/Locale 2;* looking 270°.

UWF Survey Unit 89/Locale 3
One stone artefact was recorded in an area of bare earth exposure at this locale within Survey Unit 15 (Plate 75). The landform element is a crest of gentle gradient and open aspect.

The site exposure area has ground exposure of 5%, of which 80% was archaeological visibility. Artefact density is assessed to be very low. Because of the general rockiness and the skeletal nature of the soil, this locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 75 *UWF Survey Unit 89/Locale 3;* looking 250°.

UWF Survey Unit 89/Locale 4
One stone artefact was recorded in a 20m x 10m area of bare earth exposure at this locale within Survey Unit 89 (Plate 76). The landform element is a crest/saddle of gentle gradient and open aspect.

The site exposure area has ground exposure of 20%, of which 80% was archaeological visibility. Artefact density is assessed to be low. Because of the general rockiness and the skeletal nature of the lithosol soil, this locale has no subsurface potential. The area probably contains additional artefacts distributed at low density.

Plate 76 *UWF Survey Unit 89/Locale 4;* looking 10°.

UWF Survey Unit 89/Locale 5

One stone artefact was recorded in a 20m x 4m area of bare earth exposure in a vehicle track at this locale within Survey Unit 89 (Plate 77). The landform element is a crest of gentle gradient and open aspect.

The site exposure area has ground exposure of 20%, of which 80% was archaeological visibility. Artefact density is assessed to be very low. Because of the general rockiness and the skeletal nature of the lithosol soil, this locale has no subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 77 *UWF Survey Unit 89/Locale 5;* looking 240°.

UWF Survey Unit 91/Locale 1
Four stone artefacts were recorded in a 50m x 10m area of erosional scour exposure at this locale within Survey Unit 91 (Plate 78). The landform element is a creek bank of very gentle gradient and northerly aspect.

The site exposure area has ground exposure of 80%, of which 80% was archaeological visibility. Artefact density is assessed to be low. This locale has some subsurface potential to the east, away from the eroded gully. The area probably contains additional artefacts distributed at low density.


Plate 78 *UWF Survey Unit 91/Locale 1;* looking 190°.

UWF Survey Unit 93/Locale 1

One stone artefact was recorded in an erosional scour exposure at this locale within Survey Unit 93 (Plate 79). The landform element is a knoll on crest of steep gradient and westerly aspect.

The site exposure area has ground exposure of 20%, of which 70% was archaeological visibility. Artefact density is assessed to be negligible. Because of the steepness of the discrete landform, this locale has no subsurface potential. The area probably does not contain additional artefacts.

Plate 79 *UWF Survey Unit 93/Locale 1;* looking 90°.

UWF Survey Unit 96/Locale 1

Two stone artefacts were recorded in a 1m x 1m area of bare earth exposure at this locale within Survey Unit 96 (Plate 80). The landform element is a simple slope of gentle gradient and northerly aspect.

The site exposure area has ground exposure of 10%, of which 70% was archaeological visibility. Artefact density is assessed to be very low. Because of the general nature of the soil, this locale has limited subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 80 *UWF Survey Unit 96/Locale 1;* looking 190°.

UWF Survey Unit 96/Locale 2

Seven stone artefacts were recorded in a 20m x 5m area of bare earth exposure at this locale within Survey Unit 96 (Plate 81). The landform element is a simple slope of gentle gradient and northerly aspect.

The site exposure area has ground exposure of 10%, of which 70% was archaeological visibility. Artefact density is assessed to be low. Because of the general nature of the soil, this locale has some subsurface potential. The area probably contains additional artefacts distributed at low density.

Plate 81 *UWF Survey Unit 96/Locale 2;* looking 330°.

UWF Survey Unit 96/Locale 3

Seven stone artefacts were recorded in a 20m x 1m area of bare earth exposure at this locale within Survey Unit 96 (Plate 82). The landform element is a simple slope of very gentle gradient and northerly aspect.

The site exposure area has ground exposure of 10%, of which 70% was archaeological visibility. Artefact density is assessed to be very low. Because of the general nature of the soil, this locale has some subsurface potential. The area probably contains additional artefacts distributed at very low density.

Plate 82 *UWF Survey Unit 96/Locale 3;* looking 330°.

UWF Survey Unit 96/Locale 4

Three stone artefacts were recorded in a 2m x 1m area of bare earth exposure at this locale within Survey Unit 96 (Plate 83). The landform element is a simple slope of gentle gradient and southerly aspect.

The site exposure area has ground exposure of 10%, of which 70% was archaeological visibility. Artefact density is assessed to be low. Because of the general nature of the soil, this locale has some subsurface potential, however, disturbance is high on vehicle track. The area probably contains additional artefacts distributed at low density.

Plate 83 *UWF Survey Unit 96/Locale 5;* looking 270°.

UWF Survey Unit 96/Locale 5

A sample of six stone artefacts were recorded in a 20m x 20m area of bare earth exposure on graded track at this locale within Survey Unit 96 (Plate 84). The landform element is a simple slope of gentle gradient and southerly aspect.

The site exposure area has ground exposure of 40%, of which 80% was archaeological visibility. Artefact density is assessed to be low. Because of the general rockiness and the skeletal nature of the lithosol soil, this locale has no subsurface potential. The area contains additional artefacts distributed at low density.

Plate 84 *UWF Survey Unit 96/Locale 5;* looking 100°.

UWF Survey Unit 22/Locale 6

Three stone artefacts were recorded in a 2m x 1m area of bare earth exposure along a vehicle track at this locale within Survey Unit 96 (Plate 85). The landform element is a simple slope of gentle gradient and southerly aspect.

The site exposure area has ground exposure of 30%, of which 80% was archaeological visibility. Artefact density is assessed to be low. Because of the general nature of the soil, this locale has some subsurface potential away from vehicle track. The area probably contains additional artefacts distributed at low density.

Plate 85 *UWF Survey Unit 96/Locale 6;* looking 260°.

UWF Survey Unit 98/Locale 1

A sample of three stone artefacts were recorded in a 20m x 0.5m area of sheep track exposure at this locale within Survey Unit 98 (Plate 86). The landform element is a crest of gentle gradient and southerly aspect.

The site exposure area has ground exposure of 80%, of which 80% was archaeological visibility. Artefact density is assessed to be low to moderate. Because of the general rockiness and the shallow nature of the soil, this locale has some subsurface potential. The area probably contains additional artefacts distributed at low to moderate density.

Plate 86 *UWF Survey Unit 98/Locale 1;* looking 120°.

UWF Survey Unit 98/Locale 2

A sample of five stone artefacts were recorded in a 20m x 0.5m area of sheep track and vehicle track exposure at this locale within Survey Unit 98 (Plate 87). The landform element is a flat of very gentle gradient and open aspect.

The site exposure area has ground exposure of 20%, of which 80% was archaeological visibility. Artefact density is assessed to be low to moderate. Because of the general nature of the soil, this locale has subsurface potential. The area probably contains additional artefacts distributed at low to moderate density.

Plate 87 *UWF Survey Unit 98/Locale 2;* looking 90°.

Table 8 Stone artefacts recorded.

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU1/L1	Milky	Quartz	Proximal flake portion	Broad	Flake scar		20	18	5	Hertzian
SU1/L2	Grey	Tuff	Flake	Broad	Flake scar	Feather	52	44	11	
SU1/L2	Milky	Quartz	Flake	Broad	Flake scar	Step	23	21	5	Hertzian
SU1/L2	Milky	Quartz	Flake	Broad	Flake scar	Step	15	7	4	
SU1/L2	Milky	Quartz	Proximal flake portion	Broad	Flake scar		33	28	8	Hertzian
SU1/L2	Milky	Quartz	Proximal flake portion	Broad	Flake scar		14	11	5	Hertzian
SU1/L2	Grey	Tuff	Flake	Focal	Flake scar	Step	30	20	7	Hertzian
SU1/L3	Grey	Chert	Flake	Broad	Flake scar	Feather	18	20	6	
SU1/L3	Milky	Quartz	Medial flake portion				15	18	4	
SU1/L3	Grey	Tuff	Flaked piece				44	33	20	
SU1/L3	Grey	Tuff	Flake fragment				15	7	3	
SU1/L3	Grey	Tuff	Flake fragment				27	20	7	
SU1/L3	Grey	Tuff	Distal flake portion			Feather	15	15	6	
SU1/L4	Grey	Tuff	Core				75	65	35	5 negative fake scars; 2 rotations
SU1/L4	Grey	Chert	Medial flake portion				25	36	15	
SU1/L4	Grey	Tuff	Flake fragment				24	36	17	
SU1/L4	Grey	Tuff	Flake	Shattered		Feather	47	29	16	
SU1/L4	Grey	Chert	Distal flake portion			Step	58	19	9	
SU1/L4	Grey	Chert	Flake fragment				27	17	8	
SU1/L4	Grey	Tuff	Flake	Shattered		Feather	87	18	20	
SU1/L4	Grey	Tuff	Flake fragment				53	24	15	
SU1/L4	Grey	Chert	Flake	Broad	Flake scar	Step	29	29	8	

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU1/L4	Grey	Tuff	Distal flake portion			Feather	12	5	8	
SU1/L4	Grey	Chert	Medial flake portion				21	5	5	
SU1/L4	Grey	Chert	Medial flake portion				36	7	7	
SU1/L4	Grey	Chert	Flake	Broad	Flake scar	Feather	37	27	18	
SU1/L4	Grey	Chert	Proximal flake portion	Broad	Flake scar		31	23	11	
SU1/L4	Grey	Chert	Medial flake portion				18	8	4	
SU1/L4	Grey	Chert	Flake	Broad	Flake scar	Feather	33	14	7	
SU1/L5	Grey	Chert	Flake	Broad	Flake scar	Feather	50	30	9	
SU1/L5	Grey	Chert	Medial flake portion				23	12	5	
SU1/L5	Milky	Quartz	Flake	Broad	Flake scar	Feather	26	16	5	Hertzian
SU1/L5	Milky	Quartz	Flake	Broad	Flake scar	Feather	26	23	8	
SU1/L6	Grey	Tuff	Distal flake portion			Feather	17	19	3	
SU1/L6	Grey	Tuff	Flake	Broad	Flake scar	Feather	30	33	12	
SU1/L6	Grey	Tuff	Flake	Broad	Flake scar	Feather	61	84	24	Hertzian
SU1/L6	Grey	Tuff	Flake	Broad	Flake scar	Feather	46	33	10	Hertzian
SU1/L6	Grey	Tuff	Distal flake portion			Feather	24	16	5	
SU1/L6	Grey	Tuff	Distal flake portion			Feather	25	9	5	
SU1/L6	Grey	Tuff	Proximal flake portion	Broad	Flake scar		28	40	8	
SU1/L6	Grey	Chert	Medial flake portion				21	17	7	
SU1/L6	Grey	Tuff	Flake	Broad	Flake scar	Feather	22	39	7	
SU1/L6	Crystal	Quartz	Flake	Broad	Flake scar	Feather	15	15	6	

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU1/L6	Grey	Tuff	Flake	Broad	Flake scar	outre passe	32	60	13	
SU1/L6	Grey	Tuff	Flake	Broad	Flake scar	Feather	27	38	11	
SU1/L6	Crystal	Quartz	Flake	Broad	Flake scar	Feather	12	10	2	
SU4/L1	Grey	Chert	Flake	Broad	Flake scar	Step	46	25	10	
SU4/L1	Brown	Chert	Flake	Broad	Flake scar	Feather	22	28	6	
SU4/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	32	48	5	
SU4/L1	Grey	Tuff	Flaked piece				36	15	8	
SU4/L1	Grey	Tuff	Flake fragment				29	20	7	
SU4/L1	Grey	Tuff	Flake fragment				16	15	4	
SU4/L1	Grey	Tuff	Flake	Broad	Flake scar	Outré passé	75	39	18	20% terrestrial cortex
SU4/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	52	41	13	10% terrestrial cortex
SU13/L1	Grey	Tuff	Core				65	45	35	7 negative flake scars; 1 rotation
SU14/L1	Milky	Quartz	Distal flake portion			Hinge	9	15	5	
SU14/L1	Milky	Quartz	Proximal flake portion	Broad	Flake scar		9	18	5	Hertzian
SU14/L1	Milky	Quartz	Flake	Focal		Feather	7	7	3	Hertzian; longitudinally split
SU14/L1	Milky	Quartz	Distal flake portion			Feather	6	6	1	
SU14/L1	Milky	Quartz	Medial flake portion				18	12	8	
SU14/L1	Milky	Quartz	Flake fragment				19	15	6	
SU14/L1	Milky	Quartz	Flake fragment				20	16	6	
SU14/L1	Milky	Quartz	Proximal flake portion	Broad	Flake scar		16	16	6	
SU15/L1	Grey	Chert	Flake	Broad	Flake scar	Hinge	19	10	5	
SU15/L1	Milky	Quartz	Medial flake portion				7	10	4	

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU15/L1	Milky	Quartz	Distal flake portion			Feather	18	12	4	
SU15/L1	Grey	Chert	Flake	Broad	Flake scar	Feather	18	14	4	Hertzian
SU15/L1	Grey	Tuff	Proximal flake portion	Broad	Flake scar		22	38	8	Hertzian; 20% terrestrial cortex
SU15/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	28	23	5	
SU15/L1	Grey	Tuff	Flake	Broad	Flake scar	Step	16	19	9	
SU15/L1	Grey	Tuff	Flake fragment				22	12	6	
SU15/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	27	24	6	
SU15/L1	Grey	Tuff	Flake	Focal		Feather	33	32	6	
SU20/L1	Milky	Quartz	Proximal flake portion	Broad	Flake scar		18	13	4	Hertzian
SU20/L1	Milky	Quartz	Proximal flake portion	Broad	Flake scar		14	15	5	Hertzian
SU20/L2	Milky	Quartz	Distal flake portion			Feather	28	24	6	
SU20/L2	Milky	Quartz	Flake	Crushed		Feather	35	18	11	
SU20/L2	Milky	Quartz	Medial flake portion				20	14	5	
SU20/L2	Milky	Quartz	Medial flake portion				17	18	7	
SU20/L2	Milky	Quartz	Flake fragment				10	26	5	
SU20/L2	Milky	Quartz	Proximal flake portion	Broad	Flake scar		20	15	4	Hertzian
SU20/L3	Grey	Tuff	Flake	Focal		outré passé	19	18	5	Hertzian
SU20/L3	Milky	Quartz	Flake	Broad	Flake scar	Feather	28	21	7	Hertzian
SU22/L1	Milky	Quartz	Flake	Broad	Flake scar	Feather	28	12	4	Hertzian
SU24/L1	Milky	Quartz	Proximal flake portion	Broad			20	20	6	
SU26/L1	Grey	Tuff	Flake fragment				10	14	4	
SU26/L1	Milky	Quartz	Flake	Focal		outré passé	19	8	5	Hertzian
SU26/L1	Grey	Tuff	Flake	Focal		Feather	27	13	6	20% terrestrial cortex

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU26/L1	Grey	Tuff	Core				41	38	35	Bifacial core; 40% terrestrial cortex; 8 negative flake scars
SU26/L1	Grey	Tuff	Proximal flake portion	Focal			16	19	3	
SU30/L1	Milky	Quartz	Flake fragment				21	16	6	
SU32/L1	Grey	Tuff	Medial flake portion				6	15	3	
SU32/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	37	33	10	
SU32/L1	Grey	Tuff	Flake fragment				30	36	7	
SU32/L1	Grey	Tuff	Proximal flake portion	Broad	Flake scar		23	39	6	
SU32/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	21	35	4	
SU32/L1	Grey	Tuff	Flake fragment				10	10	2	
SU32/L1	Grey	Tuff	Flake fragment				12	10	5	
SU34/L1	Milky	Quartz	Flake	Broad	Flake scar	Feather	22	24	7	
SU38/L1	Grey	Tuff	Proximal flake portion	Broad	Flake scar		20	13	7	Hertzian; 25% terrestrial cortex
SU38/L1	Grey	Tuff	Possible flake fragment				46	28	10	
SU38/L1	Brown	Quartzite	Flake	Broad	Flake scar	Feather	29	30	7	
SU39/L1	Grey	Tuff	Flake	Broad	Flake scar	Step	25	34	9	
SU39/L2	Grey	Tuff	Flake	Focal		Feather	58	13	6	Transversely broken
SU39/L2	Grey	Tuff	Proximal flake portion	Focal			20	15	7	
SU39/L2	Grey	Tuff	Flake fragment				32	29	9	On proximal edge damage consistent with scraper use
SU40/L1	Grey	Tuff	Proximal flake portion	Broad	Flake scar		32	22	9	
SU41/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	21	24	6	Hertzian
SU41/L1	Grey	Tuff	Flake	Broad	Flake scar	Hinge	25	41	5	
SU41/L1	Grey	Tuff	Flake	Focal		Hinge	25	10	3	

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU41/L1	Grey	Tuff	Flake	Focal		Feather	7	10	2	
SU41/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	50	38	10	Weathered patina on dorsal; possible micro edge damage along one margin
SU41/L1	Grey	Tuff	Flake	Focal			15	22	4	30% terrestrial cortex
SU42/L1	Milky	Quartz	Proximal flake portion	Broad	Flake scar		16	12	4	
SU42/L1	Grey	Tuff	Possible core				85	70	16	20% terrestrial cortex; flake scarring present
SU43/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	25	17	11	Bending initiation
SU43/L1	Grey	Tuff	Flake	Broad	Flake scar	Hinge	16	30	6	
SU43/L1	Grey	Tuff	Flake	Broad	Flake scar	Hinge	36	32	8	
SU43/L1	Grey	Tuff	Flake fragment				55	41	20	
SU43/L1	Grey	Tuff	Flake	Broad	Flake scar	Hinge	11	20	5	Bending initiation
SU43/L1	Grey	Tuff	Flake	Broad	Flake scar		21	28	6	Longitudinal snap
SU43/L1	Grey	Tuff	Flake fragment				49	43	11	
SU43/L1	Grey	Tuff	Flake	Broad	Flake scar	Hinge	14	13	2	
SU43/L1	Milky	Quartz	Possible medial flake portion				16	25	6	
SU43/L2	Purple	Quartzite	Hammerstone				115	90	36	Flake scarring on one margin from one face, one flake scar on opposite margin. On one face a small 1cm x 1cm depression consistent with anvil use. Pitting on one end of one face consistent with hammer use. One lateral corner has flattened round surface consistent with abrasive wear and use

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU43/L3	Grey	Tuff	Proximal flake portion	Focal			23	20	5	
SU43/L3	Grey	Tuff	Flake	Focal		Feather	36	36	8	Hertzian
SU43/L3	Grey	Tuff	Flake	Crushed		Feather	42	21	10	5% terrestrial cortex
SU43/L4	Grey	Tuff	Flake	Broad	Flake scar	Feather	43	63	15	
SU44/L1	Grey	Tuff	Flake	Broad	Flake scar	Hinge	53	39	7	
SU44/L1	Grey	Tuff	Flake	Broad	Flake scar	Hinge	31	18	3	Bending initiation
SU44/L1	Grey	Tuff	Flake	Focal		Feather	40	44	8	
SU44/L1	Grey	Chert	Core				60	45	27	7 negative scars; 30% terrestrial cortex
SU44/L2	Grey	Tuff	Flake	Broad	Flake scar	Feather	39	21	8	Blade flake; parallel arises; 30% terrestrial cortex
SU44/L2	Grey	Tuff	Possible medial flake portion				24	14	6	
SU44/L2	Grey	Tuff	Possible distal flake portion			Step	28	11	6	
SU44/L2	Grey	Chert	Medial flake portion				15	10	4	
SU44/L2	Grey	Tuff	Flake	Broad	Flake scar	Feather	28	27	11	Hertzian
SU44/L3			Hatchet head				110	65	33	Irregular shaped river pebble with flat area on butt consistent with hammer wear, minor negative scars on one face on lateral margin, chopping and edge bifacially flaked and minimally ground. Raw material uncertain due to weathered patina
SU44/L4	Grey	Chert	Flake	Broad	Flake scar	Feather	27	28	9	
SU44/L4	Grey	Chert	Flake	Broad	Flake scar	Feather	33	26	9	

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU44/L4	Grey	Chert	Proximal flake portion	Focal			24	24	9	
SU44/L4	Grey	Chert	Proximal flake portion	Focal			21	21	4	
SU44/L4	Grey	Chert	Flake fragment				18	21	6	
SU44/L4	Grey	Chert	Medial flake portion				14	15	4	
SU44/L4	Grey	Chert	Flake	Broad	Flake scar	Feather	47	19	3	Parallel arises
SU44/L4	Grey	Tuff	Flake	Broad	Flake scar	Feather	32	21	4	
SU44/L4	Grey	Chert	Flake fragment				15	15	4	
SU44/L4	Grey	Chert	Proximal flake portion	Broad	Flake scar		22	28	8	
SU44/L4	Grey	Chert	Flake	Crushed		Feather	37	26	6	
SU44/L4	Grey	Chert	Proximal flake portion	Broad	Flake scar		18	19	5	
SU44/L4	Grey	Chert	Flake	Broad	Flake scar	Feather	11	12	3	
SU44/L4	Grey	Chert	Flake fragment				21	15	4	
SU44/L4	Grey	Tuff	Flake fragment				64	33	18	
SU44/L4	Milky	Quartz	Flake	Focal		Feather	22	18	6	
SU44/L4	Grey	Tuff	Flake	Broad	Flake scar	Feather	62	26	12	Blade flake; micro scarring on both margins consistent with the use from ventral
SU44/L4	Milky	Quartz	Possible distal flake portion			Feather	15	14	4	
SU46/L1	Grey	Tuff	Proximal flake portion	Crushed			18	10	4	Artefact retouched from ventral, possible Bondi point
SU49/L1	White	Chert	Flake	Focal		Feather	14	13	2	
SU49/L1	White	Chert	Proximal flake portion	Focal			10	12	2	
SU49/L1	Milky	Quartz	Proximal flake portion	Broad			30	27	15	Hertzian

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU49/L1	Grey	Chert	Scraper				31	25	10	Macro and micro edge damage on one marginal, like thumbnail scraper
SU49/L1	Grey	Tuff	Proximal flake portion	Focal			20	13	5	
SU49/L1	Grey	Tuff	Flaked piece				27	20	4	
SU49/L1	Grey	Tuff	Possible flake			Feather	50	70	14	Hertzian
SU49/L1	Milky	Quartz	Flake	Crushed			35	24	15	Compression flake, bipolar
SU51/L1	Milky	Quartz	Flake	Crushed			33	30	13	
SU51/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	38	28	8	
SU51/L2	Grey	Tuff	Core				51	42	25	Bifacial core; 11 scars, 1 rotation
SU51/L2	Grey	Tuff	Flake	Focal		Feather	34	34	8	Broken, in two pieces
SU51/L2	Milky	Quartz	Distal flake portion				6	9	6	
SU51/L2	Milky	Quartz	Proximal flake portion	Broad	Flake scar		21	23	9	
SU51/L2	Milky	Quartz	Proximal flake portion	Broad	Flake scar		13	11	3	Bending initiation
SU51/L3	Milky	Quartz	Flake	Broad	Flake scar	Feather	18	25	6	
SU52/L1	Grey	Chert	Flake	Broad	Flake scar	Feather	26	24	4	
SU52/L2	Milky	Quartz	Retouched artefact				23	15	7	Classic Bondi point shape
SU52/L2	Milky	Quartz	Flake	Focal		Feather	28	24	6	
SU52/L2	Grey	Tuff	Flake	Broad	Flake scar	Feather	30	27	7	
SU52/L2	Grey	Tuff	Flake	Broad	Flake scar	Outré passé	55	33	10	Whether patina on ventral
SU52/L2	Grey	Tuff	Flake	Broad	Flake scar	Feather	35	35	8	
SU52/L2	Milky	Quartz	Core				52	45	30	High quality quartz Bipolar core
SU52/L2	Grey	Tuff	Core				63	20	12	Blade core; 1 crushed platform, 7 scars

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU52/L2	Milky	Quartz	Core				53	36	30	1 platform. Possibly anvil rested, but no indication of bipolar reduction
SU52/L2	Grey	Tuff	Flake	Broad	Flake scar	Feather	38	19	7	
SU53/L1	Grey	Tuff	Flake	Broad	Flake scar	Feather	90	27	11	Possible use wear on c 30mm length of distal end on one margin
SU65/L1	Grey	Tuff	Flake	Focal		Feather	32	36	6	
SU65/L1	Grey	Chert	Flaked piece				17	12	5	
SU65/L1	Red banded	Chert	Flake fragment				23	19	5	
SU65/L1	Grey	Tuff	Medial flake portion				33	15	4	Broken into 2 pieces
SU65/L1	Grey	Tuff	Flake fragment				16	14	5	
SU65/L1	Translucent	Quartz	Flake fragment				20	15	6	
SU65/L1	Grey	Tuff	Flake				67	22	16	Scraper. Micro-scars from ventral on one margin
SU65/L1	Grey	Tuff	Core fragment				54	30	22	
SU65/L2	Brown	Quartzite	Flake	Broad	Flake scar	Feather	52	40	18	
SU65/L3	Milky	Quartz	Flake	Broad		Feather	23	9	6	Hertzian
SU68/L1	Grey	Tuff	Flake	Focal		Feather	35	22	10	
SU68/L1	Grey	Tuff	Flake fragment				28	17	12	
SU68/L1	Grey	Tuff	Flake fragment				30	27	5	
SU68/L1	Milky	Quartz	Flake fragment				25	15	5	
SU68/L1	Milky	Quartz	Flake fragment				11	16	3	
SU68/L1	Milky	Quartz	Core fragment				24	24	10	
SU71/L1	Grey	VFGS	Ground edge hatchet				110	60	23	Pebble, bifacially flaked to shape, ground to fine edge - one half of which is missing
SU71/L1	Grey	Uncertain	Distal flake portion				118	55	25	90% pebble cortex; macro usewear along one margin 70 mm; damage or retouch

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
										from dorsal; very sharp edge. Possibly quartzite
SU71/L1	Milky	Quartz	Flake	Broad		Feather	44	21	9	Hertzian; high-quality material
SU71/L1	Translucent	Quartz	Bipolar core fragment				26	32	24	
SU72/L1	Grey	Chert	Flake	Broad		Feather	20	18	4	
SU72/L1	Grey	Chert	Flake	Focal		Feather	42	40	15	40% cortex (type uncertain); platform crushed
SU72/L1	Grey	Chert	Flake	Broad		Feather	32	20	5	
SU72/L1	Grey	Chert	Flake	Broad		Feather	16	22	5	
SU72/L1	Grey	Chert	Flake	Uncertain		Uncertain	38	23	8	30% cortex (type uncertain)
SU72/L1	Grey	Chert	Flake	Broad		Feather	20	26	9	
SU72/L1	Grey	Chert	Flake	Broad		Feather	42	30	11	
SU72/L1	Grey	Chert	Flake	Broad		Feather	28	21	6	
SU72/L1	Grey	Uncertain	Flake	Broad		Feather	35	33	10	Material heavy patina
SU72/L1	Grey	Chert	Flake	Broad		Feather	39	30	6	30% cortex (type uncertain)
SU72/L1	Grey	Uncertain	Flake	Broad		Feather	24	30	6	Material heavy patina
SU73/L1	Grey	Chert	Flake	Crushed			82	46	12	
SU73/L1	Grey	Tuff	Flake	Broad			90	19	12	Tip missing
SU73/L1	Grey	Tuff	Proximal flake portion	Focal			23	16	5	
SU73/L2	Translucent	Quartz	Flake				9	11	2	
SU73/L2	Milky	Quartz	Flake	Broad		Feather	11	12	3	
SU73/L2	Milky	Quartz	Flake	Broad		Feather	25	24	7	
SU73/L2	Grey	Tuff	Flake	Broad		Step	17	16	4	
SU76/L1		Tuff	Flake		Crushed	Hinge	50	19	7	Hertzian ; 15% terrestrial cortex; parallel arises
SU76/L2		Tuff	Proximal flake portion	Gullwing			27	35	13	Hertzian

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU76/L2		Tuff	Flake	Broad		Feather	48	65	15	Hertzian; 55% terrestrial cortex
SU76/L2		Chert	Flake		Faceted		37	51	9	Hertzian
SU76/L2		Tuff	Flake	Focal		Feather	16	12	4	Longitudinal break
SU76/L2		Chert	Flake	Focal		Feather	44	32	12	Hertzian
SU76/L2		Pebble	Manuport				140	58	49	Broken
SU76/L2		Tuff	Flake fragment				60	27	6	
SU76/L2	Red	Fine grained siliceous	Distal flake portion			Feather	11	29	8	
SU88/L1		Tuff	Proximal flake portion		Crushed		38	16	7	Hertzian
SU88/L1	Milky	Quartz	Flake	Broad			33	19	13	Crushed at distal end; Hertzian
SU88/L1	Milky	Quartz	Flake	Broad		Feather	15	13	7	Hertzian
SU88/L1		Tuff	Flake		Crushed	Feather	12	14	2	Hertzian; located on track
SU88/L1	Milky	Quartz	Flake piece				22	27	23	
SU88/L1	Milky	Quartz	Flake	Broad		Step	22	11	7	Hertzian
SU80/L1	Grey	Chert	Blade core				29	16	11	5 negative scars; 1 rotation; 25% terrestrial cortex
SU80/L1	Grey	Tuff	Core				78	82	22	4 negative scars
SU80/L2	Dark grey	Chert	Core				44	43	24	5+ negative scars
SU80/L2	Light grey	Chert	Flake piece				35	28	18	25% terrestrial cortex
SU80/L2	Grey	Chert	Flake	Focal		Feather	23	14	4	Hertzian
SU81/L1	Grey	Tuff	Flake	Broad		Feather	64	31	10	Hertzian
SU81/L1	Grey	Tuff	Flake	Focal		Feather	24	16	4	Hertzian
SU81/L1	Grey	Tuff	Medial flake portion				20	12	9	
SU81/L1	Grey	Chert	Distal flake portion				42	20	11	
SU81/L1	Grey	Tuff	Flake	Broad			76	70	20	Hertzian

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU81/L1	Grey	Tuff	Flake	Focal		Hinge	42	28	12	20% terrestrial cortex
SU81/L1	Milky	Quartz	Flake		Crushed	Step	41	32	12	Hertzian
SU81/L2	Grey	Chert	Flake	Gullwing		Feather	28	30	6	Hertzian
SU81/L2	Dark grey	Tuff	Flake fragment				25	28	4	
SU81/L2	Dark grey	Tuff	Flake fragment				26	16	6	
SU81/L2	Dark grey	Tuff	Flake fragment				24	25	10	
SU81/L2	Dark grey	Tuff	Flake	Broad		Feather	24	23	8	Hertzian
SU81/L3	Grey	Tuff	Distal flake portion				42	44	6	
SU85/L1		Pebble	Manuport; possible hammer stone				160	91	85	Broken one end; pitting on the other end
SU86/L1	Grey	Chert	Proximal flake portion				30	20	7	Hertzian
SU86/L1	Grey	Chert	Flake	Focal		Feather	68	17	6	Hertzian
SU86/L1	Grey	Tuff	Flake	Broad		Feather	34	28	7	Hertzian; 40% terrestrial cortex
SU86/L1	Grey	Tuff	Flake fragment				33	24	14	
SU86/L1	Grey	Tuff	Flake fragment				36	20	8	
SU86/L1	Grey	Tuff	Flake	Focal		Feather	24	16	4	Hertzian; longitudinal broken
SU86/L1	Brown	Chert	Flake	Broad		Feather	36	18	7	Hertzian; 30% terrestrial cortex
SU86/L1	Grey	Tuff	Flake	Broad		Feather	34	30	14	Hertzian
SU86/L1		Unknown	Possible hatchet				94	55	15	
SU86/L1	Grey	Tuff	Flake fragment				82	50	22	
SU86/L1	Grey	Chert	Flake	Broad		Feather	46	47	19	Hertzian
SU86/L1		Quartz	Core				38	37	40	6 negative scars; 2 rotations
SU89L/2		Chert	Proximal flake portion		Crushed		26	24	5	Hertzian

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU89/L3	Milky	Quartz	Core				31	76	56	Unifacial core
SU89/L4	Milky	Quartz	Flake		Crushed	Hinged	15	20	6	Hertzian
SU89/L5		Chert	Proximal flake portion		Crushed		32	17	9	Hertzian; located on vehicle track
SU91/L1		Tuff	Flake	Focal		Feather	24	21	6	Hertzian
SU91/L1		Tuff	Flake	Gullwing		Hinge	15	19	4	Hertzian
SU91/L1		Tuff	Flake fragment				8	10	3	
SU91/L1	Milky	Quartz	Flake				33	23	25	Compression flake
SU93/L1	Milky	Quartz	Flake	Broad		Feather	38	21	15	Hertzian
SU96/L1		Tuff	Flake	Broad		Feather	37	47	16	Hertzian
SU96/L1		?Basalt	Pebble				99	79	34	Unifacially flaked; very heavy
SU96/L2	Mottled grey	Chert	Distal flake portion			Step	39	32	16	Parallel arises
SU96/L2		Tuff	Core				62	58	47	Pebble core; 5 negative scars; located on track
SU96/L2	Grey	Chert	Flake	Broad		Feather	27	21	6	Hertzian
SU96/L2	Grey	Tuff	Flake	Broad		Hinge	17	42	10	Hertzian
SU96/L2	Cream	Chert	Flake fragment				29	46	11	40% terrestrial cortex
SU96/L2	Grey	Tuff	Flake fragment				27	26	6	
SU96/L3	Milky	Quartz	Flake	Broad		Feather	70	63	36	Hertzian; longitudinally broken; possible micro scarring from use from ventral to distal end (but could be damage)
SU96/L3		?Chert	Flaked pebble				98	77	32	Unifacially flaked pebble on opposing ends; split pebble
SU94/L4	Milky	Quartz	Flake	Focal		Step	42	33	14	Hertzian; high quality material
SU94/L4	Milky	Quartz	Flake fragment				33	42	14	High quality material

Locale	Colour	Material	Type	Platform	Platform surface	Termination	L	W	Th	Comments
SU94/L4	Milky	Quartz	Proximal flake portion	Focal			18	18	7	Hertzian
SU95/L5	Milky	Quartz	Flaked pebble				49	37	31	Unifacially flaked on one end
SU95/L5	Milky	Quartz	Flake	Focal		Feather	32	29	11	
SU95/L5	Milky	Quartz	Core				41	32	19	Bipolar core
SU95/L5	Milky	Quartz	Core				40	49	33	Flaked on one side; 4 negative scars
SU95/L5	Brown	Chert	Flake		Crushed	Hinge	28	57	9	Hertzian; longitudinally broken; 40% terrestrial cortex
SU95/L5		Quartz	Flake	Broad		Hinge	26	29	12	Hertzian
SU95/L6		Chert	Core				36	30	24	11 negative scars; 3 rotations
SU95/L6	Milky	Quartz	Flake piece				48	24	30	
SU95/L6		Tuff	Flake fragment				30	22	6	
SU98/L1	Milky	Quartz	Flake fragment				19	17	8	
SU98/L1	Milky	Quartz	Flake fragment				13	11	3	
SU98/L1		Tuff	Flake fragment				23	18	6	
SU98/L2	Grey	Tuff	Flake	Focal		Feather	58	84	19	Hertzian; 10% terrestrial cortex
SU98/L2		Tuff	Flake	Broad		Feather	31	66	13	Hertzian
SU98/L2		Unknown	Medial flake portion				32	37	13	
SU98/L2		Tuff	Flake	Focal		Feather	21	18	8	Hertzian
SU98/L2		Chert	Distal flake portion				11	11	2	

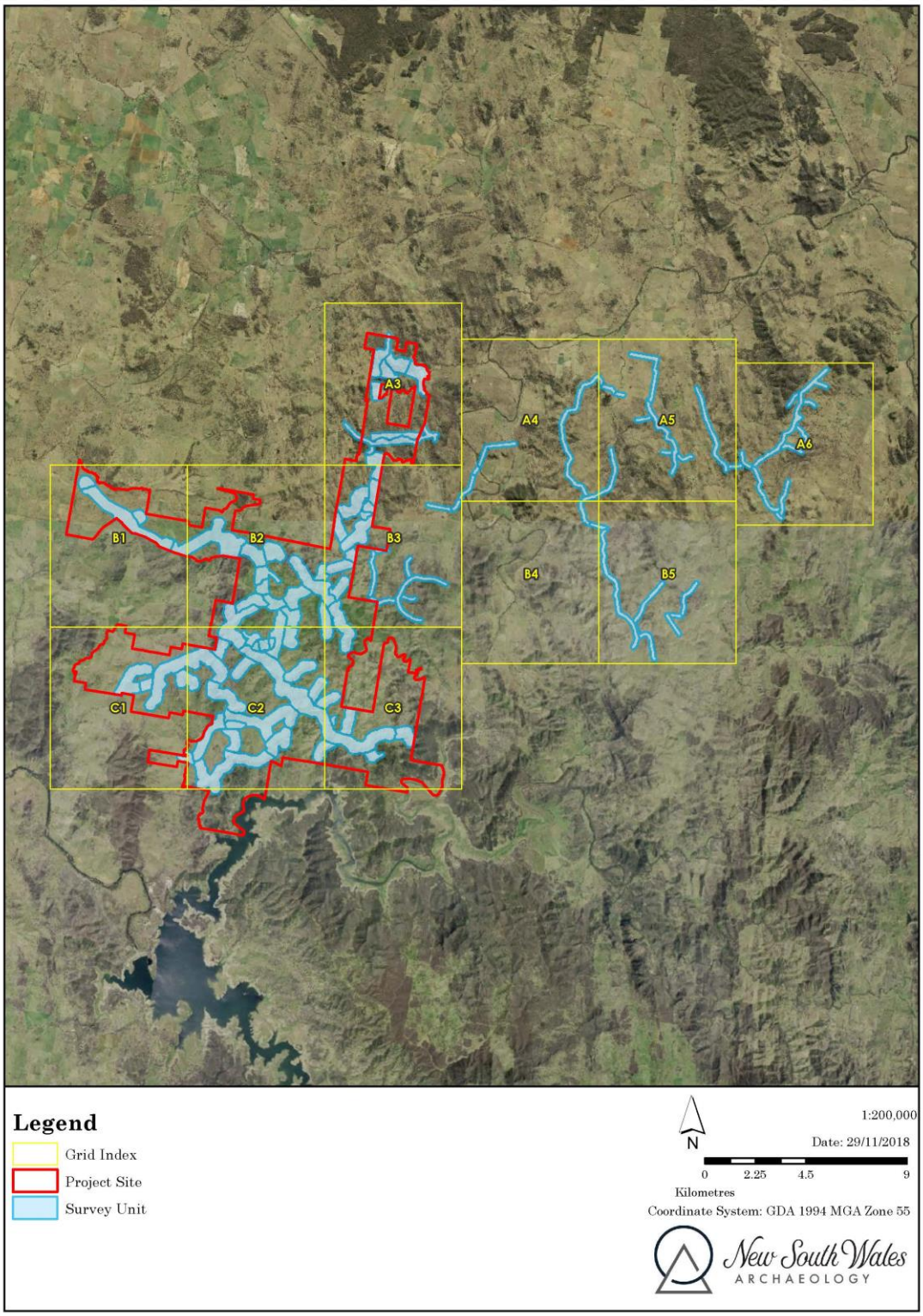


Figure 53 Survey Unit map overview.

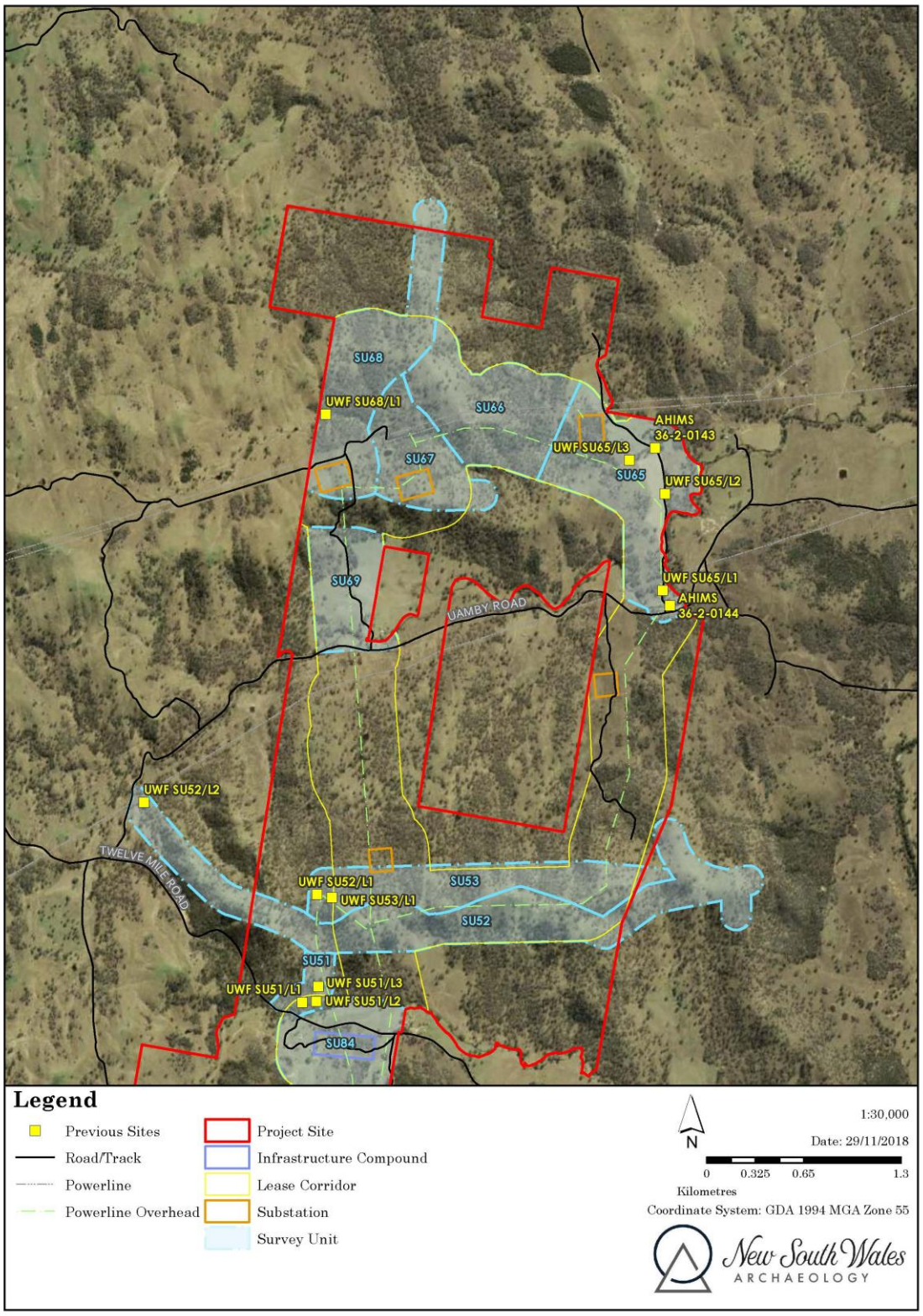


Figure 54 Survey Units and Aboriginal object sites (Map A3).

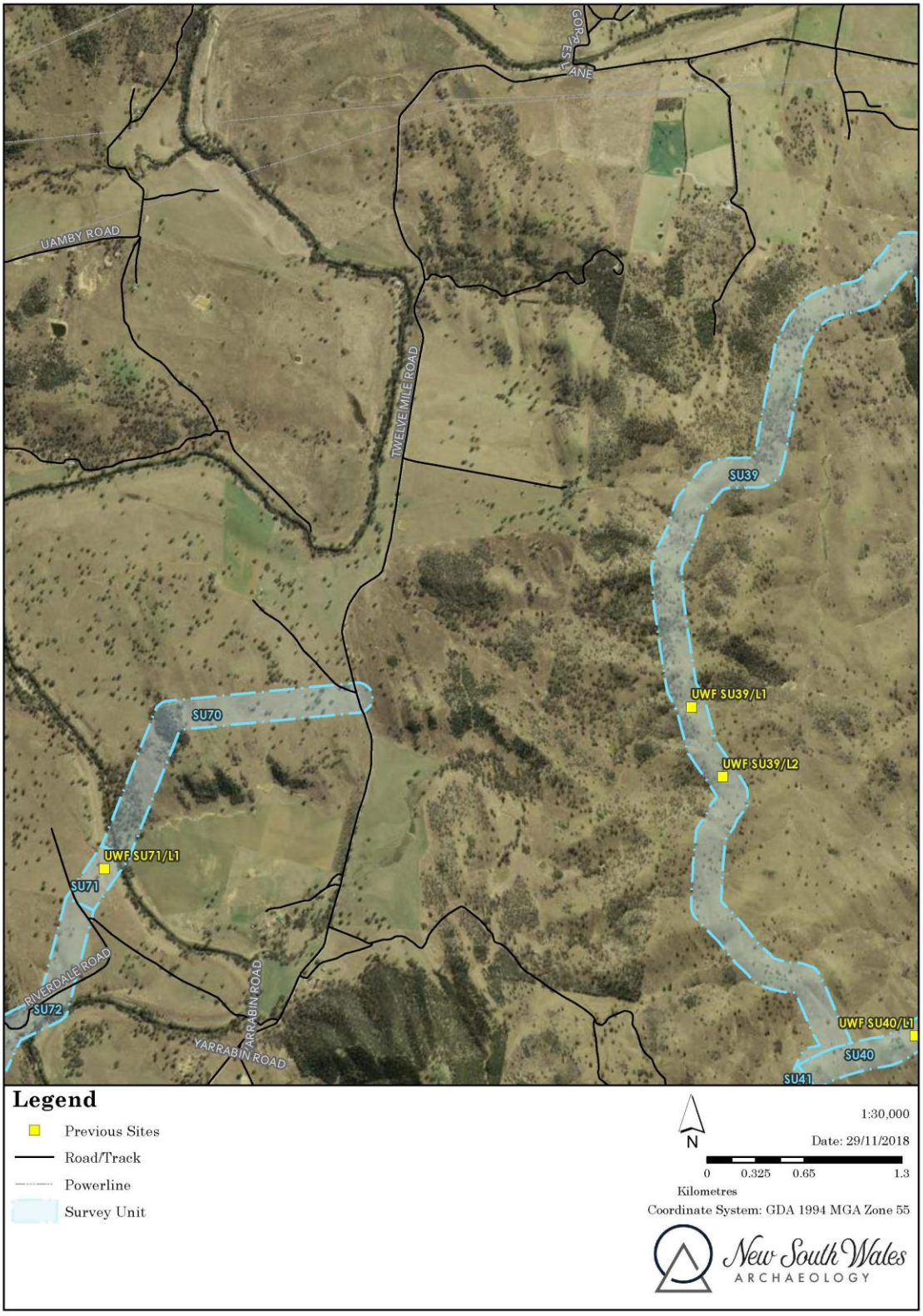


Figure 55 Survey Units and Aboriginal object sites (Map A4).

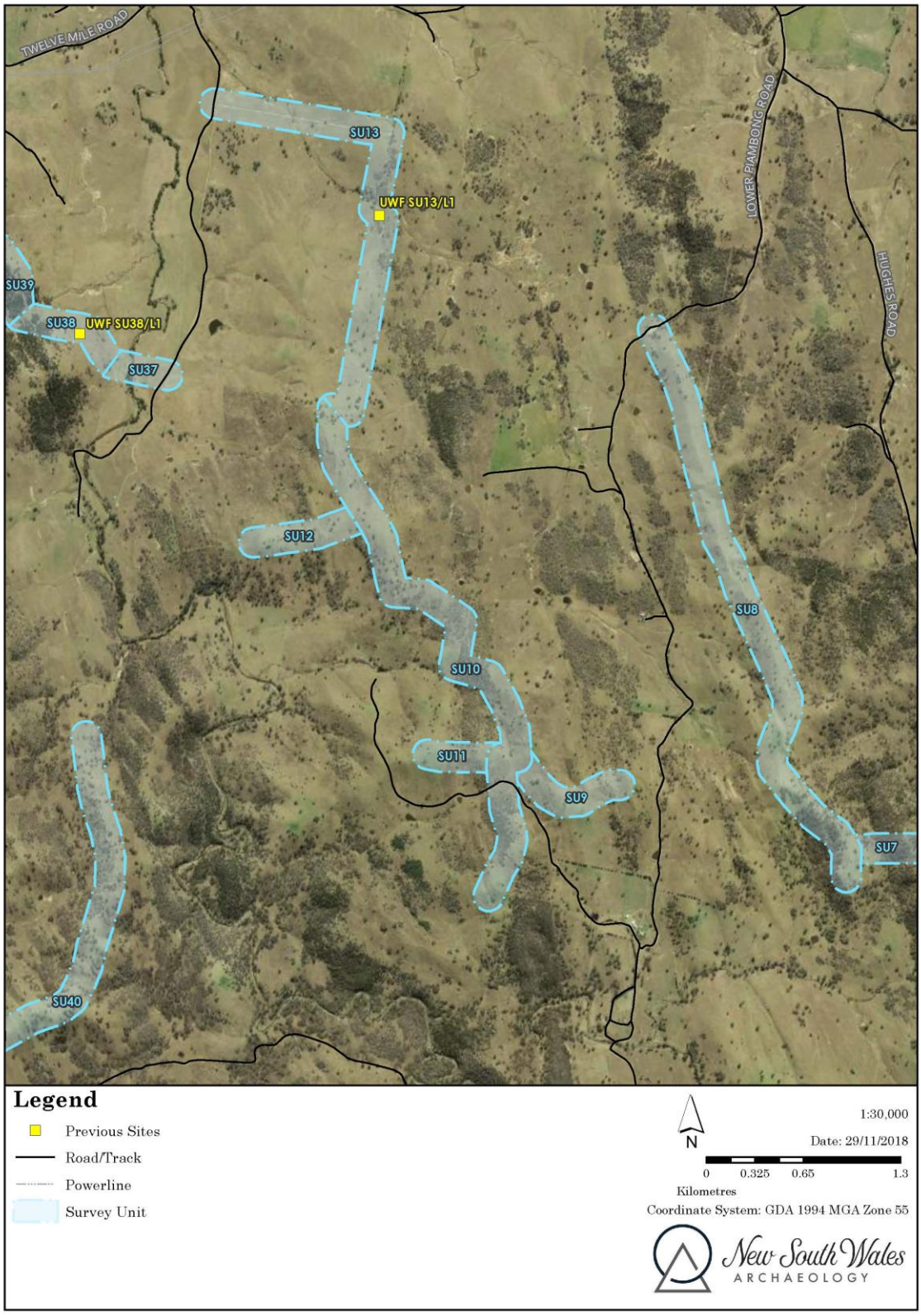


Figure 56 Survey Units and Aboriginal object sites (Map A5).

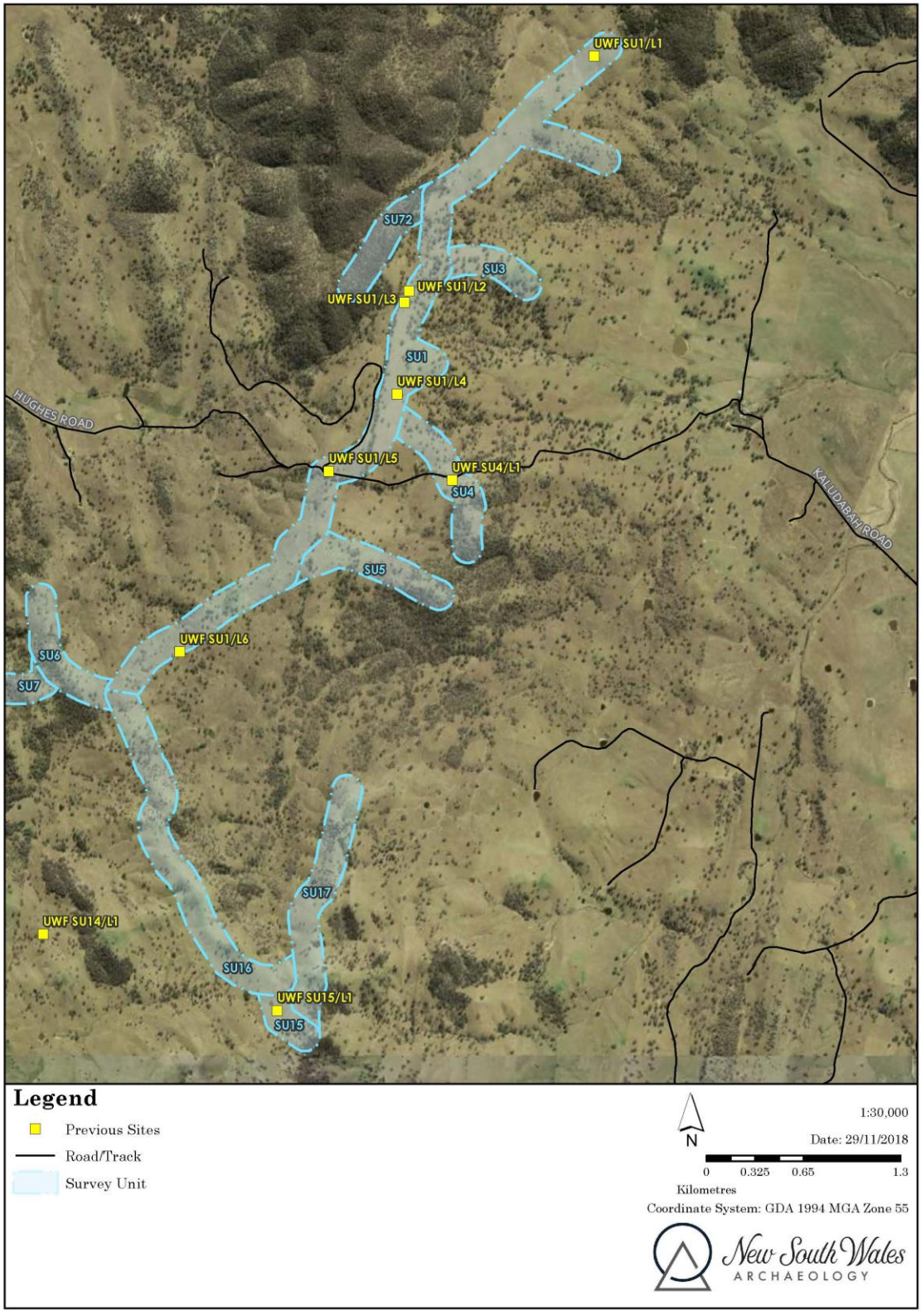


Figure 57 Survey Units and Aboriginal object sites (Map A6).

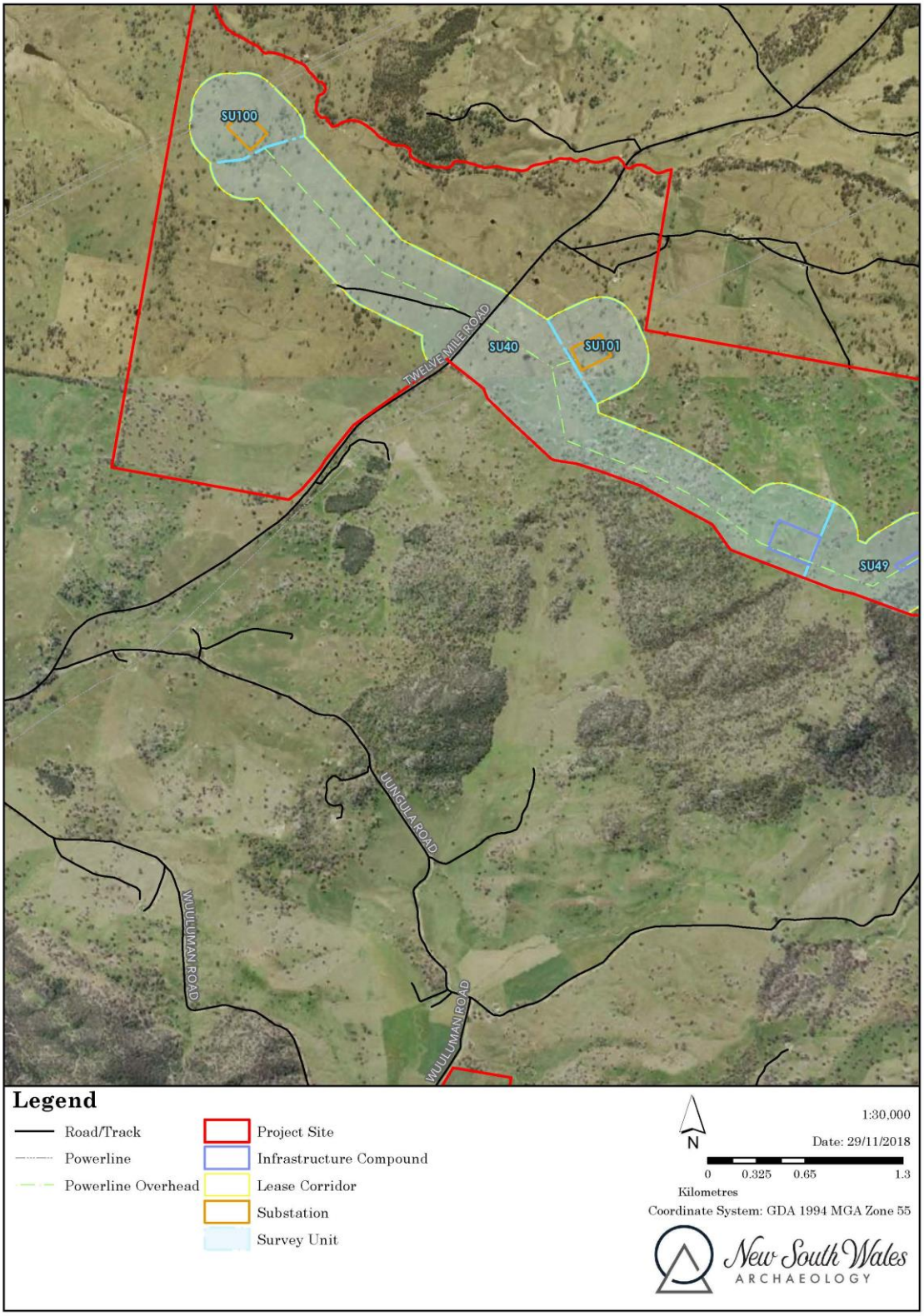


Figure 58 Survey Units and Aboriginal object sites (Map B1).

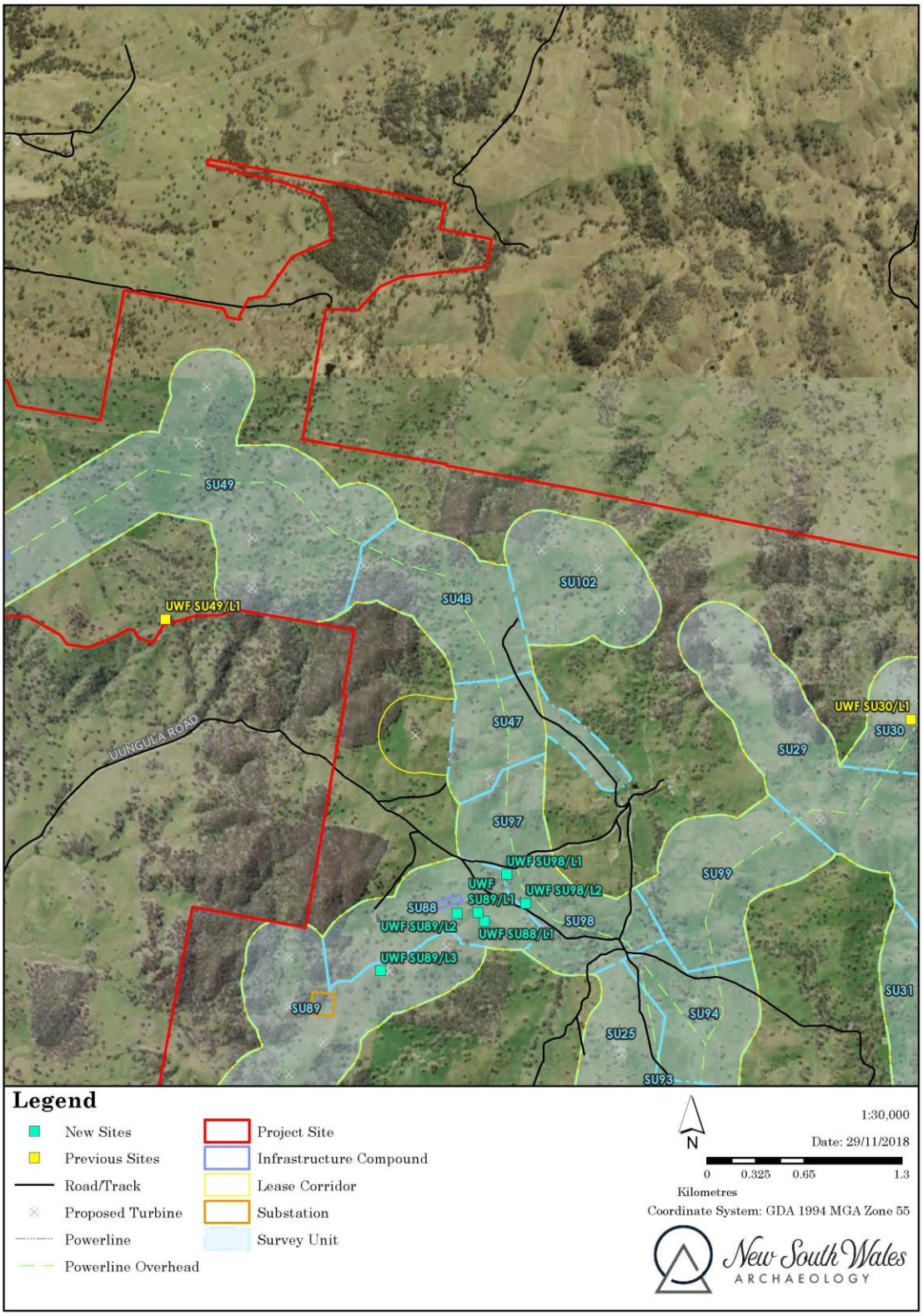


Figure 59 Survey Units and Aboriginal object sites (Map B2).

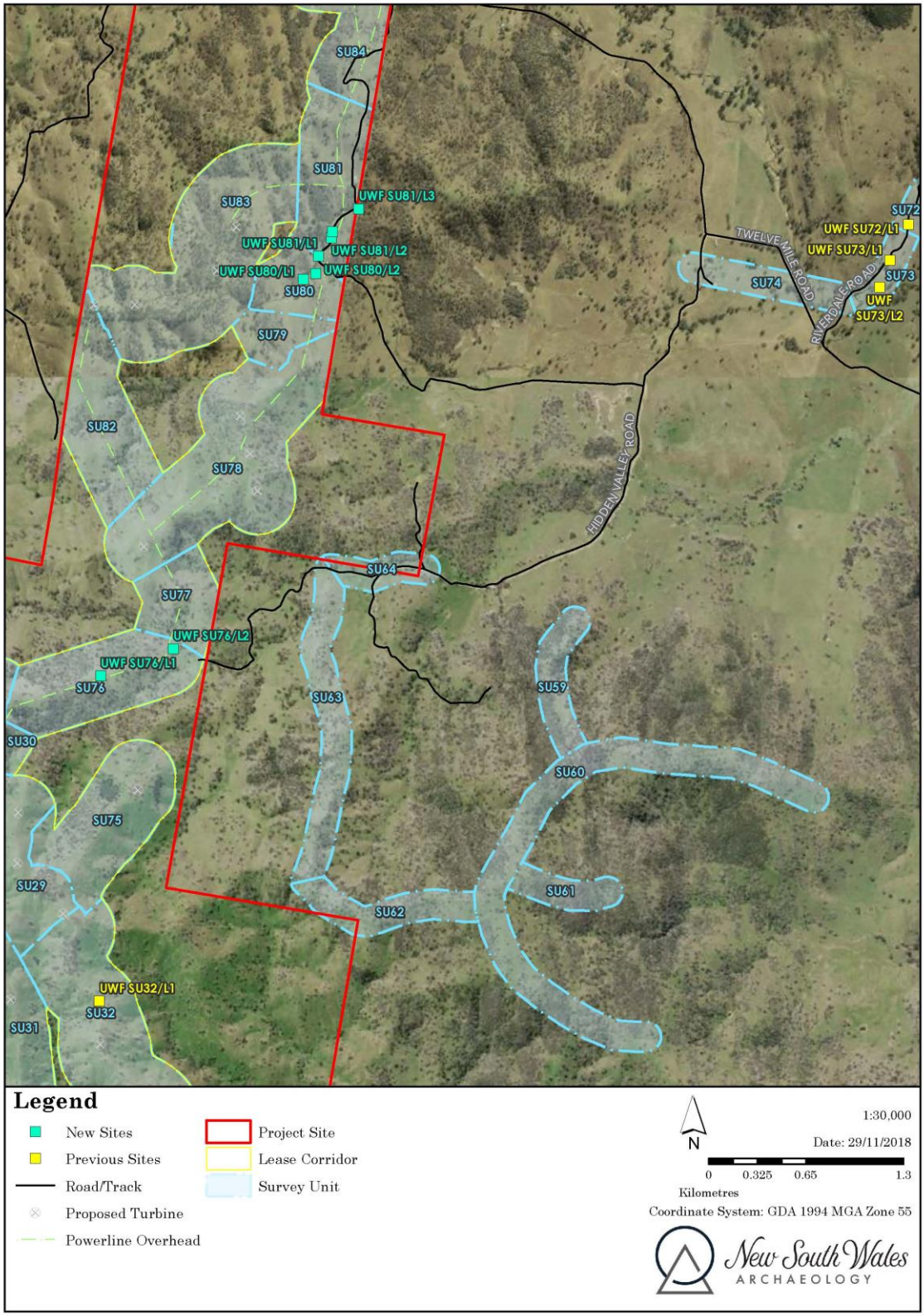


Figure 60 Survey Units and Aboriginal object sites (Map B3).

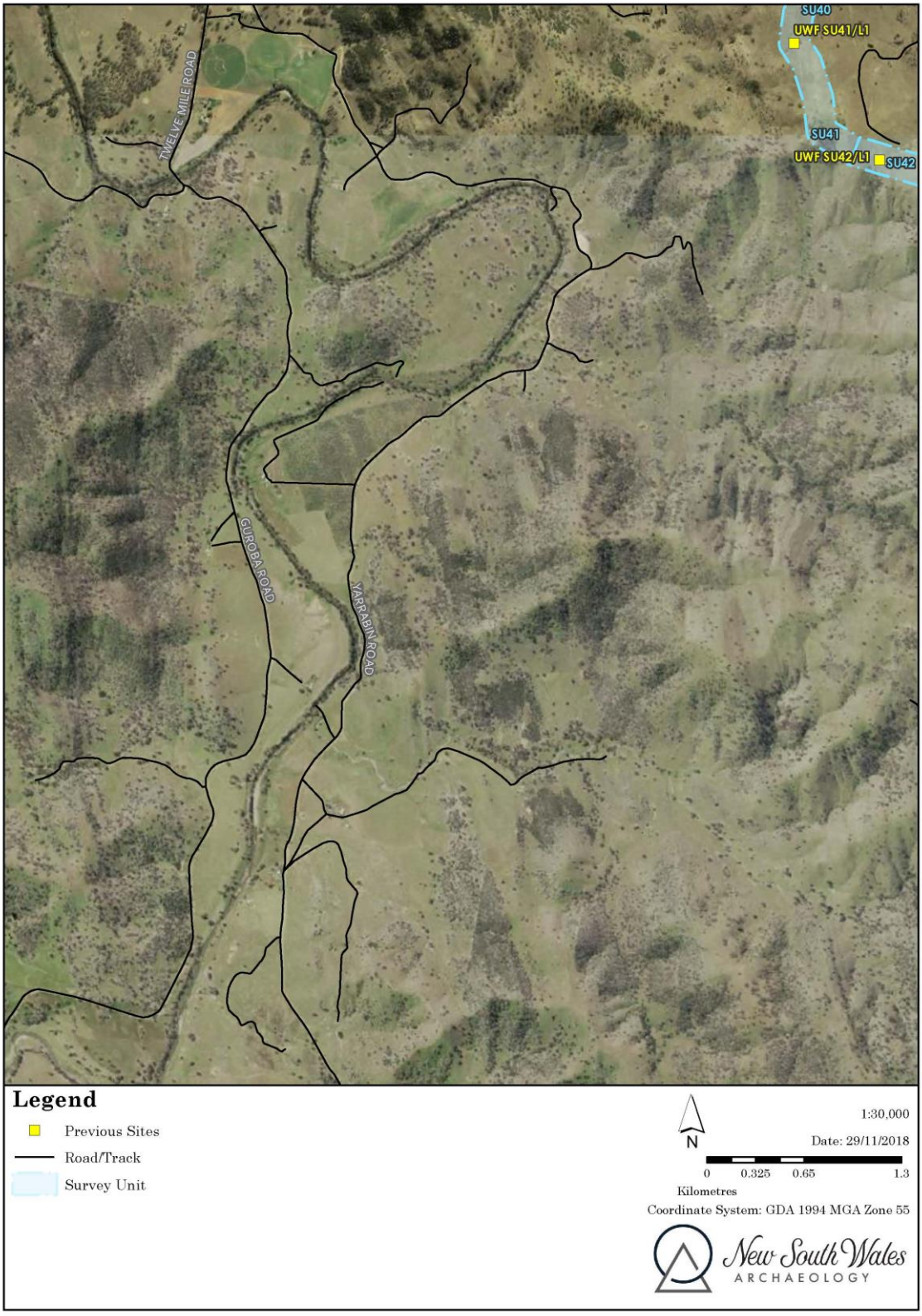


Figure 61 Survey Units and Aboriginal object sites (Map B4).

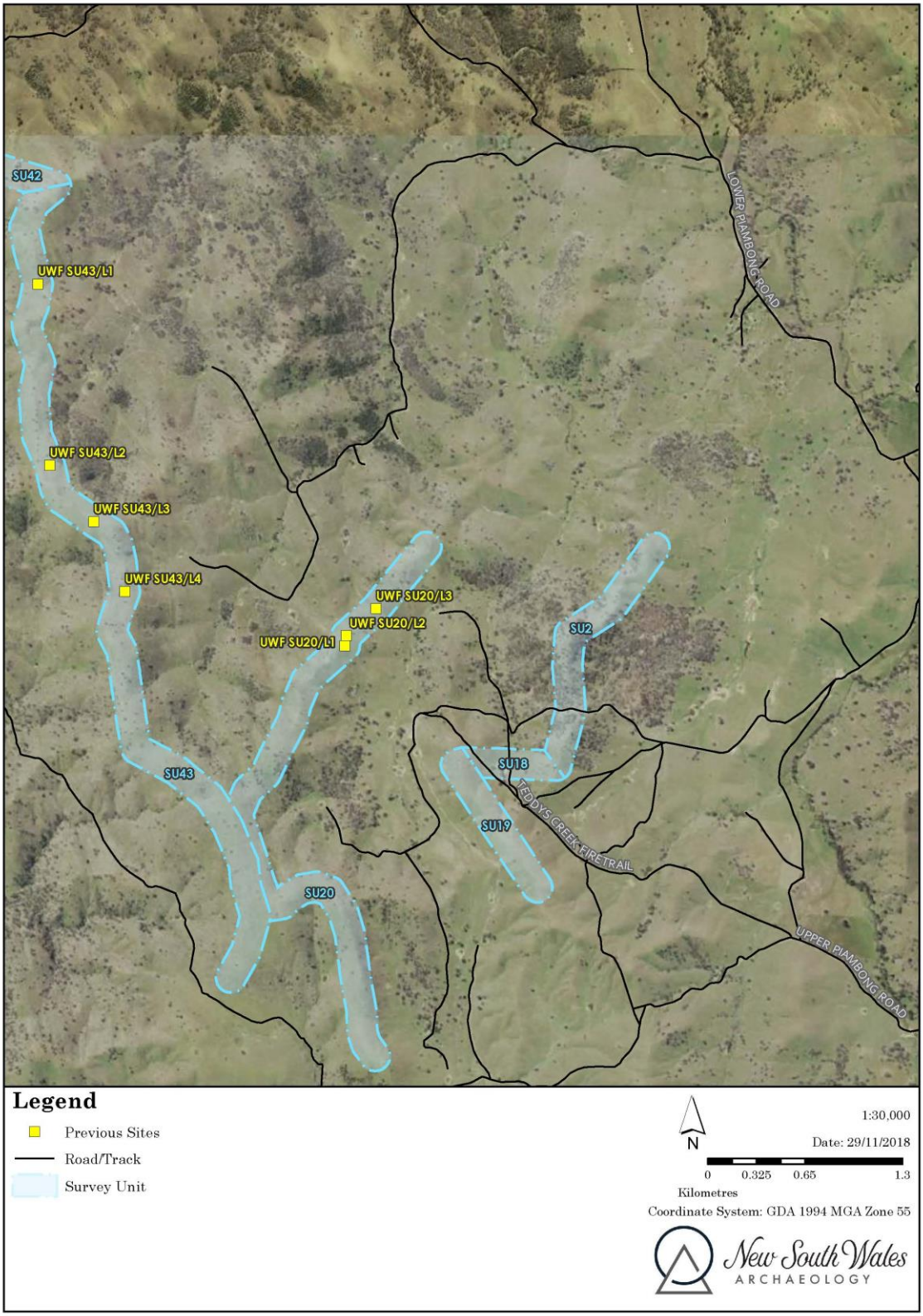


Figure 62 Survey Units and Aboriginal object sites (Map B5).

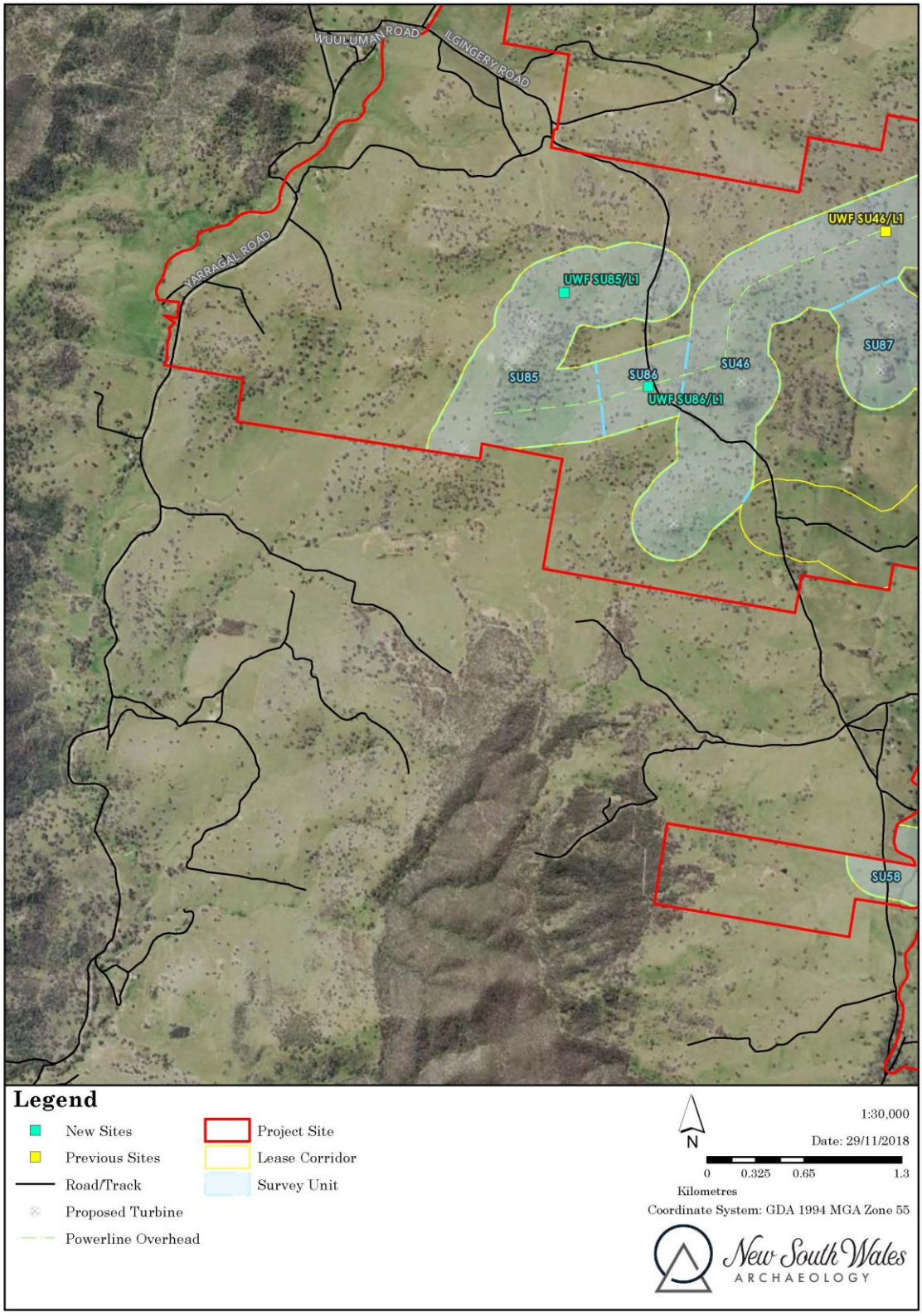


Figure 63 Survey Units and Aboriginal object sites (Map C1).

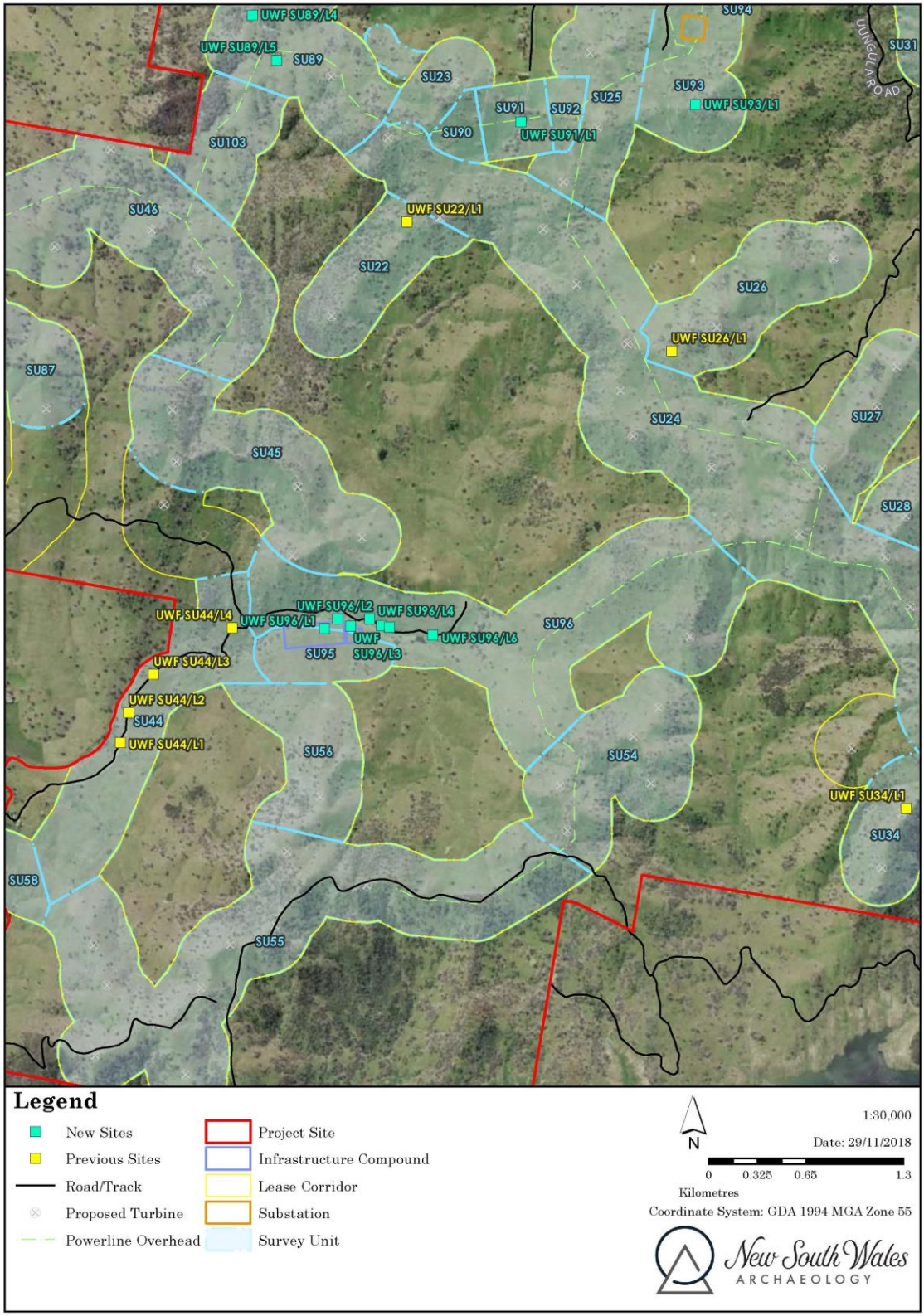


Figure 64 Survey Units and Aboriginal object sites (Map C2).

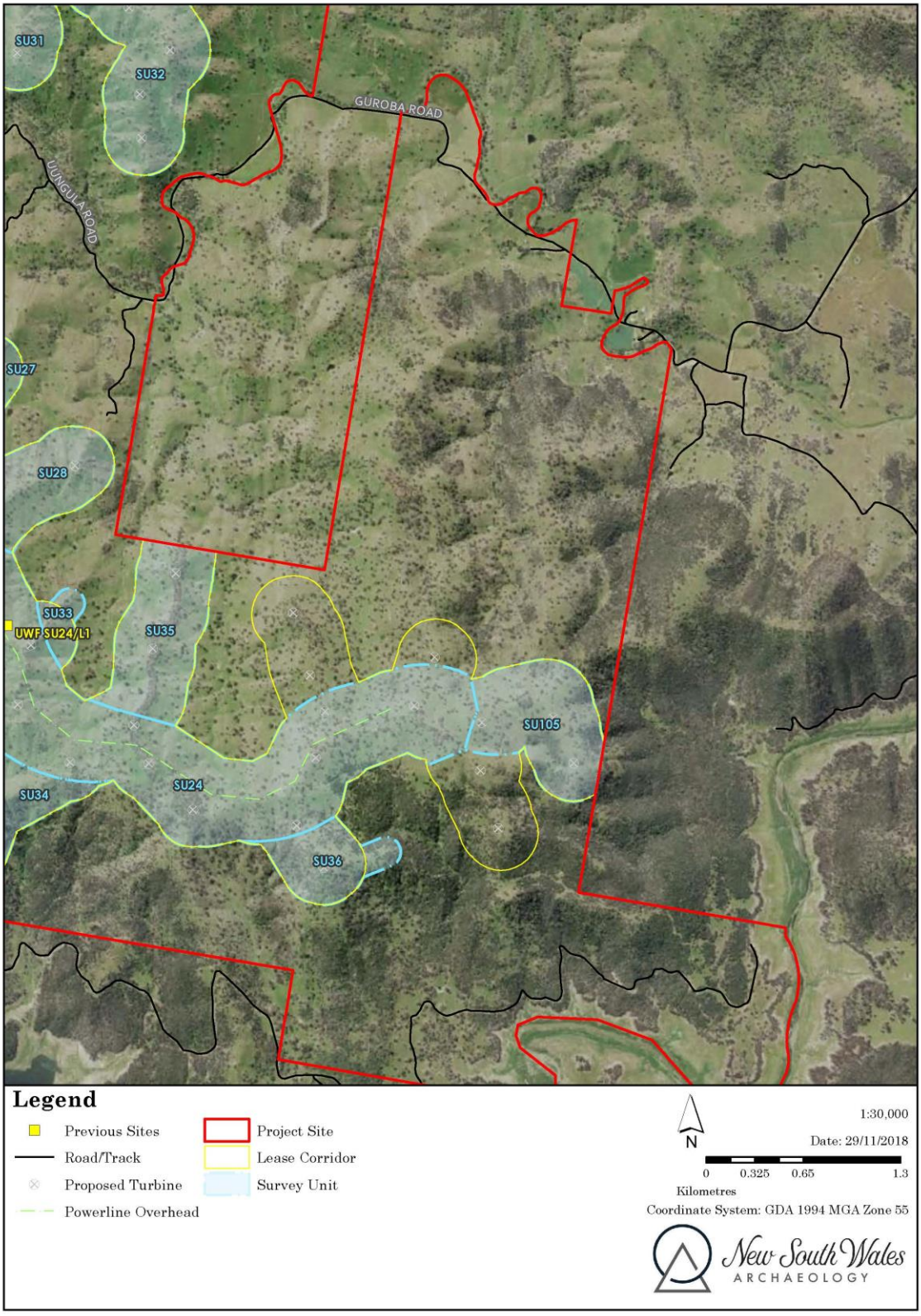


Figure 65 Survey Units and Aboriginal object sites (Map C3).

3. CONSULTATION PROCESS

A process of Aboriginal community consultation has been undertaken as a component of this assessment and has been conducted in accordance with the guidelines as set out in the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (NSW DEC July 2005) and OEH's *Aboriginal cultural heritage consultation requirements for proponents 2010* (NSW DECCW 2010b).

It is noted, in particular, that there was one late registration of interest and this party was accepted as a Registered Aboriginal Party in the process of consultation, and indeed, a representative from this group assisted with the field assessment. Mudgee Local Aboriginal Land Council was consulted, and sites officers participated in the heritage survey. Wellington Local Aboriginal Land Council (WLALC) was unable to be contacted (despite written attempts to do so) for the original survey as it was not operational. However, WLALC did assist with the 2018 survey.

3.1 Consultation

In order to identify, notify and register Aboriginal people who may hold cultural knowledge relevant to determining the cultural significant of Aboriginal objects and/or places in the area of the proposed Project, the following procedure was implemented (Copies of all documentation relating to this process have been submitted to OEH [Dubbo] in separate correspondence dated 4 March 2013).

Correspondence dated 9 July 2012 was sent to:

- OEH Dubbo office
- Mudgee Local Aboriginal Land Council
- Wellington Local Aboriginal Land Council
- the Registrar, Aboriginal Land Rights Act 1983
- the National Native Title Tribunal, requesting a list of registered native title claimants, native title holders and registered Indigenous Land Use Agreements
- Native Title Services Corporation Limited (NTSCORP Limited)
- Wellington Council
- Mid-Western Regional Council
- the Central West Catchment Management Authority, requesting contact details for any established Aboriginal reference group

In addition, an advertisement was placed in the 13 July 2012 edition of the Wellington Times newspaper (closing date for registration of interest was noted as 27 July 2012), and the 13 July 2012 edition of the Mudgee Guardian (closing date for registration of interest was noted as 26 July 2012).

Following advice received from NSW OEH (16 July 2012) the National Native Title Tribunal (18 July 2012), and the Mid-Western Regional Council (30 July 2012) and Wanaruah LALC (17 August 2012) further correspondence was sent to:

- Bill Allen
- Binjang Wellington Wiradjuri Heritage Survey
- Darlina Verrills
- David Maynard
- Deborah Foley
- Dhuuluu-Yala Aboriginal Corporation
- Jean Thornton
- Larry Foley
- Lyn Syme
- Mingaan Aboriginal Corporation
- Mooka
- Murong Gialinga Aboriginal & Torres Strait Islander Corporation
- North-Eastern Wiradjuri
- Wiradjuri Interim Working Party
- Wellington Valley Wiradjuri Aboriginal Corporation
- Wiradjuri Council of Elders
- Wiradjuri Traditional Owners Central West Aboriginal Corporation
- Dubbo Local Aboriginal Land Council
- Peter Peckham
- Trevor Robinson
- Warrabinga Native Title Claimants Aboriginal Corporation
- Wellington Valley Wiradjuri People
- Bathurst Local Aboriginal Land Council
- Wanaruah Local Aboriginal Land Council
- Orange Local Aboriginal Land Council
- Gilgandra Local Aboriginal Land Council
- John and Margaret Matthews Aboriginal Native Title Consultants
- Lloyd Matthews Bullen Bullen Heritage Consultants
- Justin Matthews Carrawonga
- Cacatua Culture Consultants
- Tracy Skene Culturally Aware
- Gidawaa Walang Cultural Heritage Consultancy

- Giwiirr Consultants
- Hunter Valley Aboriginal Corporation
- Hunter Valley Cultural Consultants
- Hunter Valley Cultural and Natural Resources
- Lower Hunter Wonnarua Council
- Hunter Valley Cultural Surveying
- Wonnarua Tribal Consultancy Pty Ltd
- Mingga Consultants
- Muswellbrook Cultural Consultants
- St Clair Singleton Aboriginal Corporation
- Ungooroo Aboriginal Corporation
- Ungooroo Cultural and Community Service Inc
- Upper Hunter Heritage Consultants
- Upper Hunter Wonnarua Council Inc
- Valley Culture
- Wanaruah Custodians
- Wattaka Wonnarua Cultural Consultants
- Wonnarua Cultural Heritage
- Wonnarua Elders Council
- Wonnarua Nation Aboriginal Corporation
- Wonn1 Contracting
- Yarrawalk
- Yinarr Cultural Services
- Janbant Mugrebea
- Aliera French Trading
- Waabi Gabinya Cultural Consultancy
- Galamaay Consultant
- Deslee Talbott Consultant
- KL.KG Saunders Trading Services

The list of Registered Aboriginal Parties (RAPs) for this Project has been forwarded to OEH and Mudgee LALC and include:

- Mudgee Local Aboriginal Land Council
- Murong Gialinga Aboriginal & Torres Strait Islander Corporation
- Buudang
- An anonymous RAP
- Binjang Wellington Wiradjuri Heritage Survey
- North East Wiradjuri
- Neville Williams
- Stuart Cutmore
- Hunter Valley Cultural Surveying
- Cacatua General Services

- Yinarr Cultural Services
- Tocomwall
- Kawul Cultural Services
- Warragil Cultural Services

An outline of the scope of the Project, the proposed cultural heritage assessment process and the heritage assessment methodology was forwarded to the registered parties on varying dates, immediately following receipt of their registration of interest. Three responses were received in regard to the consultation process and methodology. Various concerns were raised, and all were addressed. One anonymous RAP requested a meeting to discuss the Project and provide cultural knowledge. This meeting was duly held.

For review and comment, a draft copy of the 2013 report was forwarded to the registered parties on 5 April 2013. RAPs were invited to review the report and provide a response by 3 May 2013. No responses were received. A draft copy of this revised report was sent to RAPS on 17 December 2018.

One response was received from an anonymous RAP who recommended the following:

- Recommended that surface collection and subsurface excavation be conducted in SU98 if disturbance to occur in that area;
- Recommended that all artefacts in the 45 heritage sites be subject to surface collection;
- Recommended that subsurface excavation occur in areas which have in excess of 10 artefact per square metres and a defined A soil horizon;
- Recommended that non-surveyed areas be subject to survey prior to construction. In this regard Mr Bliss noted that ESC was 3.6 %, however the survey area (actual area surveyed and inspected was relatively comprehensive: 1,605 hectares; 200.9 linear kms);
- Recommended that all workers undergo Aboriginal cultural awareness training conducted by the anonymous RAP and Wellington Local Aboriginal Land Council.

We have responded to the anonymous RAP indicating that the recommendations would be considered further and addressed within the context of the preparation of the Aboriginal Heritage Management Plan for the project.

4. SUMMARY AND ANALYSIS OF BACKGROUND INFORMATION

In the previous section of this report, the results of the background research and the field survey have been outlined. The purpose of this section is to explain the results.

On turbine ridges (which include access tracks, turbines and electrical connections), biodiversity is assessed to be relatively low, and water sources are ephemeral. Accordingly, Aboriginal use of this landscape is predicted to have been sparse, of low intensity, and restricted to a limited range of activities; - movement through country, hunting and gathering forays and so on. These types of activities would have resulted in artefact discard which is patchy and very low or low density in distribution.

Given the extensive survey coverage (see Table 2), the paucity of stone artefacts recorded on the ridges is believed to be an accurate reflection of the artefactual status of the study area. That is, the majority of proposed impact areas are assessed to contain very low density artefact distribution. This assessment may be confidently extrapolated to any turbine ridges which have not been subject to survey during this assessment.

Some tracks and electrical connections would occur on more muted topography such as simple slopes and flats in lower order stream valleys. These landforms also were found to be eroded and highly disturbed (by prior agriculture, road works and so on), and have also been assessed to be of generally low cultural and archaeological significance. The Aboriginal sites recorded on simple slopes, lower simple slopes or flats have been found to be low or very low density and disturbed stone artefact occurrences. Landforms in valley contexts usually had some subsurface archaeological potential (albeit disturbed and possessing low density artefact distributions only) because of their aggrading geomorphological situation.

The levee on the floodplain adjacent to the Cudgegong River was, however, found to be of relatively higher cultural and archaeological potential. Because it is situated close to an abundant and permanent source of water, is likely to have sustained greater levels of occupation. Artefact density may well be high and artefact complexity may be greater than on other landforms because of base camp use. The levee is a deep alluvial deposit and, accordingly, has the potential to contain archaeological deposit that is relatively undisturbed. This area is now outside the Development Corridor for the revised Project Development Footprint (see Figure 55).

It is believed that the study area is likely to contain stone artefacts across the majority, if not all the Survey Units defined during this study. Accordingly, the stone artefact locales which have been recorded are expected to be indicative of the archaeological status of the proposal area only, rather than a comprehensive inventory. The majority of stone artefact recordings are very low or low density distributions and any unrecorded stone artefacts, either in surveyed areas or in adjacent terrain, are likewise predicted to be present in very low or very low/low densities only.

During the field survey only one landform, the levee on the flood plain adjacent to the Cudgegong River, was identified as likely to have been a significant environmental focal point and place that Aboriginal people would have habitually occupied.

The survey results confirm the predictions of generally very low density artefact distribution on turbine ridges. Furthermore, given the highly erosional context of the majority of areas, all artefact locales except UWF SU71/L1 are significantly disturbed and do not possess archaeological deposit. Accordingly, it is concluded that the proposed impacts to the archaeological resource can be considered to be of correspondingly low significance.

It is also relevant to take into consideration that impacts will be discrete in nature and will occupy a relatively small footprint. The archaeological resource in the broader development envelope (those areas which lie outside actual proposed impacts) will not sustain any impacts as a result of the proposal.

The Aboriginal cultural value of the landscape in general, as well as the Aboriginal objects it contains, is considerably higher than the scientific value. Both the landscape and the objects which are encompassed within it are material testament to the lives of people's ancestors and the focus of their current identity, concerns and aspirations. Therefore, the proposal would have an impact on the cultural significance which attaches to the area.

However, the archaeological results are in keeping with the information provided to us by the Aboriginal people who were interviewed or conducted the field survey. Given the location of the wind turbine ridges on high ridges which are well away from water, they have indicated that the area would have been used for hunting and gathering and possibly for travel

through country. Our informants also believe that the Cudgegong River would have been the focal point for occupation within the local area.

It is concluded that there are no information gaps which are of a significant magnitude to warrant any further consideration at this time.

5. CULTURAL HERITAGE VALUES AND STATEMENT OF SIGNIFICANCE

The following significance assessment criteria are derived from the relevant aspects of ICOMOS Burra Charter (Australian ICOMOS 1999).

Aboriginal cultural heritage sites are assessed under the following categories of significance:

- Social or cultural value to contemporary Aboriginal people;
- Historical value;
- Scientific/archaeological value;
- Aesthetic value.

Aboriginal cultural significance
The Aboriginal community will value a place in accordance with a variety of factors including contemporary associations and beliefs and historical relationships. Most heritage evidence is highly valued by Aboriginal people given its symbolic embodiment and physical relationship with their ancestral past.

Archaeological value
The assessment of archaeological value involves determining the potential of a place to provide information which is of value in scientific analysis and the resolution of potential archaeological research questions. Relevant research topics may be defined and addressed within the academy, the context of cultural heritage management or Aboriginal communities. Increasingly, research issues are being constructed with reference to the broader landscape rather than focusing specifically on individual site locales. In order to assess scientific value sites are evaluated in terms of nature of the evidence, whether or not they contain undisturbed artefactual material, occur within a context which enables the testing of certain propositions, are very old or contain significant time depth, contain large artefactual assemblages or material diversity, have unusual characteristics, are of good preservation, or are a part of a larger site complex. Increasingly, a range of site types, including low density artefact distributions, are regarded to be just as important as high density sites for providing research opportunities.

Aesthetic value
Aesthetic value relates to aspects of sensory perception. This value is culturally contingent.

5.1 Significance Value of the Aboriginal Objects in the Study Area

In order to assess the criteria of archaeological significance, and also to consider the criteria of rarity, consideration can be given to the distribution of stone artefacts across the continent. There are two estimates of the quantity of accumulated stone artefacts in Australia (Wright 1983:118; Kamminga 1991:14, 2002). Wright estimated an average of 500,000 flaking debris (termed débitage) items and 24,000 finished tools per square kilometre, which equates to a total of about 180 billion finished stone tools and four trillion stone débitage items in Australia. Kamminga's estimates, which were determined from a different set of variables, provide a conservative estimate of 200 billion stone tools and 40 million tonnes of flaking débitage (see Kamminga 1991:14; 2002). These two estimates are similar, and suggest that the actual number of stone tools and items of flaking débitage in Australia is in the trillions. The stone artefacts distributed in the proposal area cannot therefore, be considered to be rare.

The vast majority of stone artefacts found in Australia comprise débitage from stone tool making. While it can be reasonably inferred from a range of ethnographic and archaeological evidence that discarded stone artefacts and flaking debris was not valued by the maker, in certain circumstances these objects may to varying degrees have archaeological research potential and/or Aboriginal social value. However, only in very exceptional circumstances is archaeological research potential high for particular sites (Kamminga, J. pers. comm. June 2009).

All recorded artefacts are representative of flaking debitage except for several retouched artefacts, pebble hammerstones and hatchets. Accordingly, the artefact distribution is similar in content to many other lithic scatters in the local area and wider region; the artefact assemblage is therefore common under the criteria of representativeness.

The scientific significance of the recorded Aboriginal artefact locales in the study area is low. However, the cultural value and significance of these locales is generally high for the Aboriginal community.

5.1 Statement of Significance

The majority of Aboriginal sites recorded in the study area are low or very low density and highly disturbed artefact distributions. They do not possess subsurface archaeological potential because of high levels of soil erosion. They are assessed to be of low archaeological significance. One site,

however, is assessed to be of potential high archaeological significance: UWF SU71/L1. This site is no longer in the development corridor and will not be impacted (see Figure 55)

The Aboriginal cultural value of the landscape in general, as well as the Aboriginal objects it contains, is considerably higher than the scientific value. Both the landscape and the objects which are encompassed within it, are material testament to the lives of peoples' ancestors and the focus of their current identity, concerns and aspirations. Generally, out informants indicate that all artefacts, irrespective of distribution density or their nature, are significant.

6. THE PROPOSED ACTIVITY

In this section the nature and extent of the proposed activity and any potential harm to Aboriginal areas, objects and/or places is identified. A full description of the proposal and its potential impact on the landscape and heritage resource is described. A summary of the impact history of the study area has been described in Section 2 and is not repeated here. However, it is emphasised that prior and existing land uses have caused significant changes to geomorphological processes in the area with an associated effect on the archaeological resource.

Potential impacts to archaeology and heritage during the construction phase of the wind farm proposal relate to site preparation, operation of vehicles and machinery and the installation of infrastructure. This may involve earthworks and excavations and vegetation clearing.

6.1 Proposed Impacts

The proposal would involve the construction, operation, and decommissioning of the wind farm. The proposal would involve the following construction and/or impacts:

- The installation of up to 125 wind turbines;
- Electrical connections between wind turbines and on-site substations, which would be a combination of underground cable and overhead power lines;
- A collector substation, battery facility and switching station;
- Approximately two site compounds and lay down areas including site operations facilities and services buildings;
- Onsite control buildings and equipment storage facilities;
- Temporary concrete batching and rock crushing plants;
- Access roads, in addition to minor upgrades to access on farm tracks, as required, for the installation and maintenance of wind turbines;
- Permanent masts for wind speed verification and monitoring.

A description of the individual components and their related impacts are outlined as follows:

Turbines
The ground disturbance associated with each turbine would measure a maximum 25 x 25 metres. A wind turbine assembly/crane hardstand area adjacent to the turbine footings could measure up to 35 x 60 metres.

Electrical Connections
The onsite electrical works will include on-site power reticulation cabling (underground and overhead) linking the turbines to a substation. Underground cabling is proposed between the turbines, with overhead cabling proposed to connect the turbines in different areas. Underground cabling would be laid out in trenches measuring 1 - 1.5 metres deep and 0.5 - 1 metres wide and where possible would be installed either in or beside access tracks, with short spur connections to each turbine. Overhead cabling would require an easement of an average of 60 metres wide (actual impact would be considerably less).

Collector Substations
One substation is required to convert power from onsite reticulation voltage to a transmission voltage suitable to connect to the existing transmission system. The substation would occupy an area measuring c. 150 x 150 metres. The substations would be fenced and the ground covered with crushed rock and partly by concrete pads for equipment, walkways and cable covers.

Switching Stations
One switching station would occupy an area approximately 160 by 220 m and would be surrounded by a 3 m high security fence, surmounted by strands of barbed or razor wire. The arrangement would include an array of busbars, circuit breakers, isolators, buried earth grid, various voltage and current transformers, power conditioning equipment, an operations and facilities building with parking and a secondary distribution supply source. The ground surface within the enclosure will be covered partly with a layer of crushed rock and partly by concrete slabs.

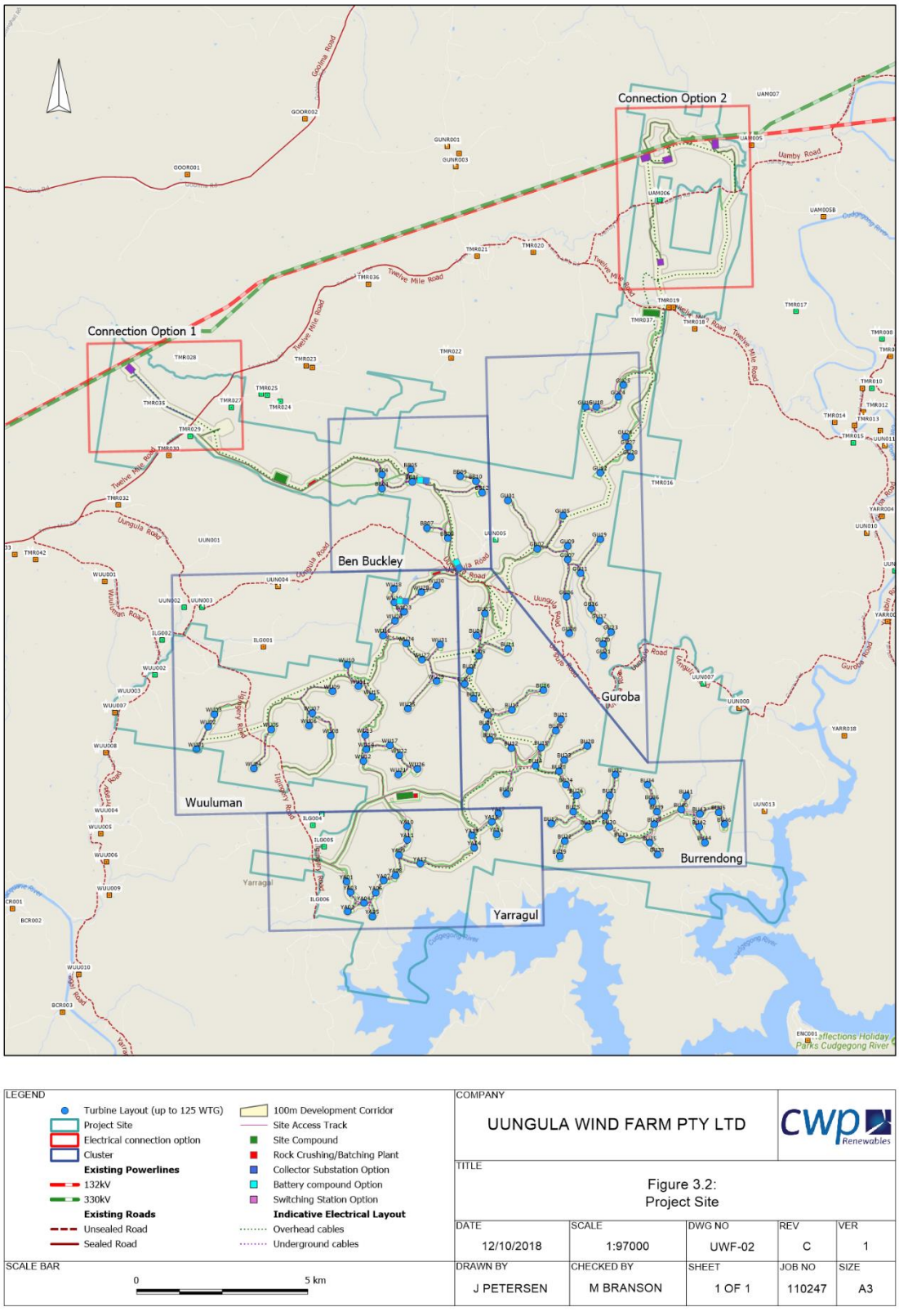
Operations Facilities Building
One or more facilities buildings would house instrumentation, electrical and communications equipment, routine maintenance stores, a small work area and staff amenities.

On-site Access Roads

Approximately 112 km (c. 6 m wide) of onsite access roads would be constructed.

Wind Monitoring Masts

Up to six permanent wind monitoring masts will be installed on-site each of which will measure up to 120 m in height. The purpose of the monitoring masts is to provide necessary information for the performance monitoring of the wind turbines. The wind monitoring masts would be of a guyed, narrow lattice or tubular steel design.



LEGEND				COMPANY				
Turbine Layout (up to 125 WTG)	100m Development Corridor			UUNGULA WIND FARM PTY LTD				cwp Renewables
Project Site	Site Access Track							
Electrical connection option	Site Compound			TITLE				
Cluster	Rock Crushing/Batching Plant			Figure 3.2: Project Site				
Existing Powerlines	Collector Substation Option			DATE	SCALE	DWG NO	REV	VER
132kV	Battery compound Option			12/10/2018	1:97000	UWF-02	C	1
330kV	Switching Station Option							
Existing Roads	**Indicative Electrical Layout**							
Unsealed Road	Overhead cables							
Sealed Road	Underground cables							
SCALE BAR				DRAWN BY	CHECKED BY	SHEET	JOB NO	SIZE
0	5 km			J PETERSEN	M BRANSON	1 OF 1	110247	A3

Figure 66 The Development Footprint of the Project.

6.2 Type of Harm

The proposed works entail ground disturbance and, accordingly, the construction of the wind farm has the potential to cause impacts to any Aboriginal areas, places or objects which may be present within the zones of direct impact.

Impacts in the study area will be located on land currently utilised for sheep and cattle grazing. Previous land use has resulted in relatively significant environmental impacts and a generally degraded landscape. European activated geomorphological processes and other natural and mechanical activities associated with prior land use, will have caused significant impacts to Aboriginal objects within the proposal area. Accordingly, in many instances, any proposed impacts would not necessarily be new; that is, most sites have been significantly impacted previously. In addition, it is emphasised that proposed impacts are discrete and small in overall footprint area.

However, irrespective of prior impacts and the small and discrete nature of those proposed, the construction of the wind farm would entail ground disturbance and, accordingly, the Project has the potential to cause impacts to any Aboriginal objects which may be present within the individual components of the proposal. The nature of impacts relating to each Aboriginal object locale is set out below in Table 9.

Table 9 Impact assessment.

Aboriginal object locale	Significance	Type of harm	Degree of harm	Consequence of harm
UWF SU1/L1	low	None	None	No loss of value
UWF SU1/L2	low	None	None	No loss of value
UWF SU1/L3	low	None	None	No loss of value
UWF SU1/L4	low	None	None	No loss of value
UWF SU1/L5	low	None	None	No loss of value
UWF SU1/L6	low	None	None	No loss of value
UWF SU4/L1	low	None	None	No loss of value
UWF SU13/L1	low	None	None	No loss of value
UWF SU14/L1	low	None	None	No loss of value
UWF SU15/L1	low	None	None	No loss of value
UWF SU20/L1	low	None	None	No loss of value
UWF SU20/L2	low	None	None	No loss of value
UWF SU20/L3	low	None	None	No loss of value
UWF SU22/L1	low	Direct	Total	Total loss of value
UWF SU24/L1	low	Direct	Total	Total loss of value

Aboriginal object locale	Significance	Type of harm	Degree of harm	Consequence of harm
UWF SU26/L1	low	Direct	Total	Total loss of value
UWF SU30/L1	low	Direct	Total	Total loss of value
UWF SU32/L1	low	Direct	Total	Total loss of value
UWF SU34/L1	low	Direct	Total	Total loss of value
UWF SU38/L1	low	None	None	No loss of value
UWF SU39/L1	low	None	None	No loss of value
UWF SU39/L2	low	None	None	No loss of value
UWF SU40/L1	low	None	None	No loss of value
UWF SU41/L1	low	None	None	No loss of value
UWF SU42/L1	low	None	None	No loss of value
UWF SU43/L1	low	None	None	No loss of value
UWF SU43/L2	low	None	None	No loss of value
UWF SU43/L3	low	None	None	No loss of value
UWF SU43/L4	low	None	None	No loss of value
UWF SU44/L1	low	Direct	Total	Total loss of value
UWF SU44/L2	low	Direct	Total	Total loss of value
UWF SU44/L3	low	Direct	Total	Total loss of value
UWF SU44/L4	low	Direct	Total	Total loss of value
UWF SU46/L1	low	Direct	Total	Total loss of value
UWF SU49/L1	low	None	None	No loss of value
UWF SU51/L1	low	Direct	Total	Total loss of value
UWF SU51/L2	low	Direct	Total	Total loss of value
UWF SU51/L3	low	Direct	Total	Total loss of value
UWF SU52/L1	low	None	None	No loss of value
UWF SU52/L2	low	None	None	No loss of value
UWF SU53/L1	low	None	None	No loss of value
UWF SU65/L1	low	Direct	Total	Total loss of value
UWF SU65/L2	low	Direct	Total	Total loss of value
AHIMS 36-2-0143	low	Direct	Total	Total loss of value

Aboriginal object locale	Significance	Type of harm	Degree of harm	Consequence of harm
UWF SU65/L3	low	Direct	Total	Total loss of value
AHIMS 36-2-0144	low	Direct	Total	Total loss of value
UWF SU68/L1	low	Direct	Total	Total loss of value
UWF SU71/L1	moderate	None	None	No loss of value
UWF SU72/L1	low	None	None	No loss of value
UWF SU73/L1	low	None	None	No loss of value
UWF SU73/L2	low	None	None	No loss of value
UWF SU76/L1	low	Direct	Total	Total loss of value
UWF SU76/L2	low	Direct	Total	Total loss of value
UWF SU88/L1	low	Direct	Total	Total loss of value
UWF SU80/L1	low	Direct	Total	Total loss of value
UWF SU80/L2	low	Direct	Total	Total loss of value
UWF SU81/L1	low	Direct	Total	Total loss of value
UWF SU81/L2	low	Direct	Total	Total loss of value
UWF SU81/L3	low	Direct	Total	Total loss of value
UWF SU85/L1	low	Direct	Total	Total loss of value
UWF SU86/L1	low	Direct	Total	Total loss of value
UWF SU89/L1	low	Direct	Total	Total loss of value
UWF SU89/L2	low	Direct	Total	Total loss of value
UWF SU89/L3	low	Direct	Total	Total loss of value
UWF SU89/L4	low	Direct	Total	Total loss of value
UWF SU89/L5	low	Direct	Total	Total loss of value
UWF SU91/L1	low	Direct	Total	Total loss of value
UWF SU93/L1	low	Direct	Total	Total loss of value
UWF SU96/L1	low	Direct	Total	Total loss of value

Aboriginal object locale	Significance	Type of harm	Degree of harm	Consequence of harm
UWF SU96/L2	low	Direct	Total	Total loss of value
UWF SU96/L3	low	Direct	Total	Total loss of value
UWF SU96/L4	low	Direct	Total	Total loss of value
UWF SU96/L5	low	Direct	Total	Total loss of value
UWF SU96/L6	low	Direct	Total	Total loss of value
UWF SU98/L1	low	Direct	Total	Total loss of value
UWF SU98/L2	Low to moderate	Direct	Total	Total loss of value

7. AVOIDING AND/OR MINIMISING HARM

The principles of ecologically sustainable development and the matter of cumulative harm have been considered for this project. The area is in a vast rural region and hence existing and future impacts are low, despite the proposed construction of numerous wind farms in the region including Bodangora, Crudine Ridge, and Liverpool Range wind farms. The majority of cultural values, including archaeological, which attach to the landform and the broader landscape remain intact across the region.

Avoidance or the mitigation of harm has been considered as an option in relation to the proposed activities. The archaeological heritage significance of the proposal area has not been assessed to be of sufficient significance to specifically warrant the implementation of avoidance strategies. A number of management and impact mitigation strategies are possible, and these are each given consideration below.

7.1 Management and Mitigation Strategies – Options

Further Investigation
The field survey has been focused on recording artefactual material present on visible ground surfaces. Further archaeological investigation would entail subsurface excavation undertaken as test pits for the purposes of identifying the presence of artefact bearing soil deposits and their nature, extent, integrity and significance.

Further archaeological investigation in the form of subsurface test excavation can be appropriate in certain situations. These generally arise when a proposed development is expected to involve ground disturbance in areas which are assessed to have potential to contain high density artefactual material and when the Effective Survey Coverage achieved during a survey of a Project area is low due to ground cover, vegetation etc.

No areas of the proposal area have been identified which warrant further archaeological investigation such as test excavation in order to formulate appropriate management and mitigation strategies. Based on a consideration of the predictive model of site type applicable to the environmental context in which impacts are proposed, the archaeological potential of the proposed impact areas is assessed not to warrant further investigation. It has not been demonstrated that Aboriginal objects with potential conservation value have a high probability of being present in the study area. Accordingly, test excavation conducted under OEH's *Code of*

Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010: 24) is not necessary. Furthermore, the environmental context in which the majority of impacts are proposed contain highly eroded landforms, most of which are weathered to bedrock. Accordingly, subsurface excavation is impractical.

Conservation
Conservation is a suitable management option in any situation however, it is not always feasible to achieve. Such a strategy is generally adopted in relation to sites which are assessed to be of high cultural and scientific significance but can be adopted in relation to any site type.

In the case at hand, avoidance of impacts (or minimisation of impacts) in regard to the recorded artefacts locales is not considered to be warranted. Such a strategy, would in any case, likely result in impacts to other Aboriginal objects (as predicted) which may not have been recorded because of their subsurface incidence or lack of obtrusiveness.

It is noted however, that many Aboriginal objects are now located outside the Project area and therefore would not be impacted.

Mitigated Impacts
Mitigated impact usually takes the form of partial impacts only (i.e. conservation of part of an Aboriginal artefact locale or Survey Unit) and/or salvage in the form of further research and archaeological analysis prior to impacts. Such a management strategy is generally appropriate when Aboriginal objects are assessed to be of moderate or high significance to the scientific and/or Aboriginal community and when avoidance of impacts and hence full conservation is not feasible. Salvage can include the surface collection or subsurface excavation of Aboriginal objects and subsequent research and analysis.

It is recommended also that a program of archaeological salvage excavation is likely to be an appropriate form of impact mitigation for Aboriginal cultural values. Such a programme has been recommended by Aboriginal stakeholders during field work. This work would be conducted in flat or lower elevation landforms where artefact density is considered to be high enough to warrant salvage. The locations in which salvage excavation is proposed are impact areas situated along Uungula Creek (SU98).

7.2 Management and Mitigation Strategies - Recommendations

The Aboriginal object locales recorded in the study area do not surpass scientific significance thresholds which would act to preclude the construction of the proposed wind farm. Based on a consideration of the predictive model applicable to the environmental context in which impacts are proposed, and the results of the study, it is concluded that the study area does not warrant further investigation such as subsurface test excavation. The environmental context in which the majority of impacts are proposed is predicted to contain a very low artefact density throughout. It is considered that subsurface testing is unlikely to produce results different to predictions made in respect of the archaeological potential of the landform in question.

It is, however, emphasised that the majority of Aboriginal sites recorded during the study are situated outside areas of proposed impact would not be harmed during construction (see Table 9). Where sites are situated outside but in close proximity to proposed impacts, practical measures to ensure they are not inadvertently impacted, such as cordoning off and sign posting as *no go* zones, could be adopted.

Given the nature of the artefact locales recorded in the proposal area and the low scientific significance rating they have been accorded, unmitigated impacts are considered appropriate if necessary; a strategy of impact avoidance is not warranted in regard to these locales.

It is recommended that a program of archaeological salvage excavation in Survey Unit 98 could be an appropriate form of impact mitigation for Aboriginal cultural values.

8. STATUTORY INFORMATION

The *National Parks and Wildlife Act 1974* (NPW Act) provides statutory protection for all Aboriginal objects and Aboriginal Places.

Under the Act, an 'Aboriginal object' is defined as:

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

An Aboriginal place is an area declared by the Minister to be an Aboriginal place for the purposes of the Act (s84), being a place that in the opinion of the Minister *is or was of special significance with respect to Aboriginal culture*.

Under s90 of the NPW Act a person must not destroy, damage or deface or knowingly cause or permit the destruction, damage or defacement of an Aboriginal object or Aboriginal Place without first obtaining the s90 consent Aboriginal Heritage Impact Permit (AHIP). Consents which enable a person to impact an Aboriginal object are issued by the OEH upon review of a s90 Aboriginal Heritage Impact Permit application.

The following authorisations are not required for State significant development that is authorised by a development consent granted after the commencement of this Division (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply):

- an Aboriginal heritage impact permit under section 90 of the NPW Act.

9. RECOMMENDATIONS

The following recommendations are made on the basis of:

- A consideration of the relevant section of the EP&A Act (see Section 8 Statutory Information).
- The results of the investigation as documented in this report.
- Consideration of the type of development proposed and the small and discrete nature of proposed impacts.
- The discussion is Section 7 regarding impact mitigation and management.

The following conclusions and recommendations are provided:

- The study area does not warrant further archaeological investigation such as subsurface test excavation.

- A total of 31 of 76 recorded Aboriginal object locales would not be impacted during construction. The remaining 45 locales and the predicted generally very low density subsurface artefact distribution in the majority of the study area does not surpass archaeological significance thresholds which would act to entirely preclude the proposal. There are no identified Aboriginal archaeological and cultural constraints.

- The recorded Aboriginal object locales which would be impacted are assessed to be representative of a very low density distribution of stone artefacts. The archaeological heritage significance of these locales is assessed to be low. Accordingly, unmitigated impact, where this would occur, is considered to be appropriate. A management strategy of impact avoidance is not warranted.

- Nevertheless, it is recommended that ground disturbance impacts associated with the proposal be kept to a minimum and to defined areas so as to ensure as little impact as possible to the Aboriginal objects (stone artefacts) which can be expected to extend in a relatively continuous, albeit very low density distribution across the broader landscape encompassed by the proposal.

- It is recommended that when the design is finalised, additional archaeological assessment is conducted in any areas which are proposed for impacts that have not been surveyed during the current assessment.

- The proponent should, in consultation with an archaeologist, develop a Cultural Heritage Management Plan, which documents the procedures to be followed for impact mitigation and management. The development of an appropriate Cultural Heritage Management Plan should be undertaken in consultation with an archaeologist, the Registered Aboriginal Parties and the NSW Office of Environment and Heritage. It would aim to provide clear guidance as to allowable impacts and to ensure the effectiveness and reliability of mitigation and management strategies which may include salvage excavation, if required.

  The Cultural heritage Management Plan would set out the procedures to be adopted in the unlikely event that human remains or unexpected Aboriginal objects are found during construction.

- Personnel involved in the construction and management phases of the Project should be trained in procedures to implement recommendations relating to cultural heritage, as necessary.

- Cultural heritage should be included within any environmental audit of impacts proposed to be undertaken during the construction phase of the development.

- The proponent should ensure that Aboriginal Site Impact Recording Forms are completed (and submitted to the NSW OEH) for each Aboriginal object site harmed during construction of the wind farm.

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GLOSSARY

Aboriginal object - A statutory term, meaning: '… any deposit, object or material evidence (not being a handicraft made for sale) 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' (s.5 NPW Act).

Declared Aboriginal place - A statutory term, meaning any place declared to be an Aboriginal place (under s.84 of the NPW Act) by the Minister administering the NPW Act, by order published in the NSW Government Gazette, because the Minister is of the opinion that the place is or was of special significance with respect to Aboriginal culture. It may or may not contain Aboriginal objects.

Development area - Area proposed to be impacted as part of a specified activity or development proposal.

Harm - A statutory term meaning '… any act or omission that destroys, defaces, damages an object or place or, in relation to an object – moves the object from the land on which it had been situated' (s.5 NPW Act).

Place - An area of cultural value to Aboriginal people in the area (whether or not it is an Aboriginal place declared under s.84 of the Act).

Proponent - A person proposing an activity that may harm Aboriginal objects or declared Aboriginal places and who may apply for an AHIP under the NPW Act.

Proposed activity - The activity or works being proposed.

Study area - The area that is the subject of archaeological investigation. Ordinarily this would include the area that is being considered for development approval, inclusive of the proposed development footprint and all associated land parcels. To avoid doubt, the study area should be determined and presented on a project-by-project basis. For the purposes of the current investigation, the study area is defined as the development footprint with a buffer of approximately 100 metres.

APPENDIX 1 OEH AHIMS RESULTS

Office of Environment & Heritage NSW

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Uungula-www
Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-5-0080	(refer to 36-5-0055)Open site 1/12 mile	AGD	55	714490	6396480	Open site	Deleted	Artefact : -		
	Contact	Recorders		NPWS - Bulga				Permits		
36-5-0082	LOC 5A and 6A	AGD	55	721310	6387759	Open site	Valid	Artefact : -	1739	
	Contact	Recorders		Mr.David Maynard				Permits		
36-5-0083	Yarrabin Rd Grattai	AGD	55	720520	6387102	Open site	Valid	Artefact : -		
	Contact	Recorders		Mr.Giles Hamm				Permits		
36-2-0104	YBCR-ST1	AGD	55	719670	6411642	Open site	Valid	Modified Tree (Carved or Scarred) : 2		98915
	Contact Murong Gialinga Aboriginal an	Recorders		Doctor.Jodie Benton				Permits		
36-2-0105	YBCR-PAD1	AGD	55	719560	6412130	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		98915,990379042,102443
	Contact Murong Gialinga Aboriginal an	Recorders		Doctor.Jodie Benton				Permits	1920,2060,2061	
36-2-0106	YBCR-OS2 with PAD	AGD	55	719669	6411920	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		98915,990379042,102443
	Contact Murong Gialinga Aboriginal an	Recorders		Doctor.Jodie Benton				Permits	1920,2060,2061	
36-2-0107	YBCR-OS1 with Pad	AGD	55	719449	6411791	Open site	Valid	Potential Archaeological Deposit (PAD) : -, Artefact : 1		98915
	Contact Murong Gialinga Aboriginal an	Recorders		Doctor.Jodie Benton				Permits		
36-2-0317	Goolma Creek 1 GC1	GDA	55	715348	6412819	Open site	Valid	Artefact : -		102066
	Contact	Recorders		Mudgee Local Aboriginal Land Council				Permits		
36-2-0315	UR 3 (Uamby Rd)	GDA	55	713760	6411566	Open site	Valid	Artefact : -		
	Contact	Recorders		Miss.Christine Maynard				Permits	3338	
36-2-0316	UR 4(Uamby Rd)	GDA	55	713830	6411582	Open site	Valid	Artefact : -		
	Contact	Recorders		Miss.Christine Maynard				Permits	3338	
36-2-0318	UR 1 (Uamby rd)	GDA	55	713944	6411690	Open site	Valid	Artefact : 36		
	Contact	Recorders		Miss.Christine Maynard				Permits		
36-2-0319	UR 2 (Uamby rd)	GDA	55	713876	6411655	Open site	Valid	Artefact : 81		
	Contact	Recorders		Miss.Christine Maynard				Permits		
36-5-0009	Macquarie River;Gigmalarie Creek;	AGD	55	694457	6387889	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders		G.W. Althofer,Michael Pearson				Permits		
36-5-0011	Ilgingerry Creek;	AGD	55	702555	6389003	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders		Mr.Warwick Pearson				Permits		

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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Office of Environment & Heritage NSW

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Uungula-www
Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-2-0019	Goolma;	AGD	55	714375	6411431	Open site	Valid	Artefact : -	Open Camp Site	1299
	Contact	Recorders		G.W. Althofer				Permits		
36-2-0036	GOOLMA;	AGD	55	718690	6413320	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1333
	Contact	Recorders		Warren Bluff				Permits		
36-5-0040	CM 1;	AGD	55	692189	6391834	Open site	Valid	Hearth : -, Artefact : -	Open Camp Site	1543
	Contact	Recorders		Mary Dallas Consulting Archaeologists,Miss.Lisa Smith				Permits		
36-5-0041	CM 2;	AGD	55	692350	6392650	Open site	Valid	Artefact : -	Open Camp Site	1543
	Contact	Recorders		Mary Dallas Consulting Archaeologists,Miss.Lisa Smith				Permits		
36-5-0001	Burganbungie;Gigmalarie;	AGD	55	694445	6387728	Open site	Valid	Hearth : -, Artefact : -	Open Camp Site	102800
	Contact	Recorders		Robert "Ben" Gunn				Permits		
36-2-0001	Mt Bodangora;	AGD	55	697863	6410220	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders		Glen Morris				Permits		
36-2-0108	YBCR-OS3	AGD	55	719329	6412034	Open site	Valid	Artefact : 2		99038
	Contact	Recorders		Doctor Jodie Benton				Permits	2060.2061	
36-2-0109	YBCR-OS4	AGD	55	719355	6412267	Open site	Valid	Artefact : 4		99038
	Contact	Recorders		Doctor Jodie Benton				Permits	2060.2061	
36-2-0155	GC OS 20 with PAD	GDA	55	717258	6412904	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders		OzArk Environmental and Heritage Management				Permits		
36-2-0390	CBR - OS - 24	GDA	55	721400	6414920	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Neville Baker				Permits		
36-2-0391	CBR - OS - 23	GDA	55	721220	6414610	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Neville Baker				Permits		
36-2-0392	CBR - OS - 22	GDA	55	721134	6414455	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Neville Baker				Permits		
36-2-0482	194 Hill End Rd Menah Quarry	GDA	55	717546	6410579	Open site	Valid	Stone Quarry : 1		
	Contact	Recorders		Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard				Permits		
36-2-0488	4789 Twelve Mile Rd OS1	GDA	55	718539	6410679	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard				Permits		
36-2-0489	4789 Twelve Mile Rd OS2	GDA	55	718521	6410665	Open site	Valid	Artefact : 1, Stone Quarry : 1		
	Contact	Recorders		Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard				Permits		

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Uungula-www
Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-5-0191	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact Mr.Bradley Bliss	Recorders		Mr.Bradley Bliss,Wellington Valley Wiradjuri Aboriginal Corporation					Permits	
36-2-0481	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact	Recorders		Mr.Bradley Bliss,Wellington Valley Wiradjuri Aboriginal Corporation					Permits	
36-5-0087	Leaning Oak Creek 1B Loc 1B	AGD	55	720633	6387730	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders		Mr.David Maynard					Permits	
36-5-0088	Leaning Oak Creek Loc 2B	AGD	55	720656	6387794	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders		Mr.Warren Mayers					Permits	
36-5-0089	Leaning Oak Creek Loc 3B	AGD	55	721250	6388022	Open site	Valid	Artefact : -, Stone Quarry : 1		
	Contact T Russell	Recorders		Mr.David Maynard					Permits	
36-2-0143	UC OS 2	AGD	55	710270	6409577	Open site	Valid	Artefact : 4		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat					Permits	
36-2-0144	UC OS 1 with PAD	AGD	55	710371	6408520	Open site	Valid	Artefact : 30		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat					Permits	
36-2-0145	GC OS 5 with PAD	AGD	55	716819	6412701	Open site	Valid	Artefact : 100		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat					Permits	
36-2-0146	CT OS 7	AGD	55	717231	6412758	Open site	Valid	Artefact : 15		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat					Permits	
36-2-0139	GC OS 6	AGD	55	717231	6412758	Open site	Valid	Artefact : 15		
	Contact Murong Gialinga Aboriginal an	Recorders		Mr.David Maynard,Doctor.Jodie Benton,Murong Gialinga Aboriginal and Torres St					Permits	
36-2-0141	UC OS 3 with PAD	AGD	55	709935	6409813	Open site	Valid	Artefact : 15		
	Contact Sarah Colley	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat					Permits	
36-2-0142	CR OS 4 with PAD	AGD	55	713405	6411246	Open site	Valid	Artefact : 1000		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat					Permits	
36-2-0270	Private Rd-Gorries Lane Goolma AS	GDA	55	714665	6413356	Open site	Valid	Artefact : 4		
	Contact	Recorders		Doctor.Maria Cotter					Permits	
36-2-0438	UWF SU13/L1	GDA	55	720773	6409698	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-5-0167	UWF SU20/L1	GDA	55	720538	6399589	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-5-0168	UWF SU20/L2	GDA	55	720549	6399657	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-5-0169	UWF SU20/L3	GDA	55	720747	6399837	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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Your Ref/PO Number : Uungula-www
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0170	UWF SU22/L1	GDA	55	702596	6396808	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0171	UWF SU24/L1	GDA	55	706049	6394103	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0172	UWF SU26/L1	GDA	55	704363	6395945	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0173	UWF SU30/L1	GDA	55	705972	6400713	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0174	UWF SU32/L1	GDA	55	706660	6398830	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0175	UWF SU34/L1	GDA	55	705929	6392887	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0441	UWF SU38/L1	GDA	55	718764	6408904	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0442	UWF SU39/L2	GDA	55	716945	6405936	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0443	UWF SU40/L1	GDA	55	718232	6404202	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0444	UWF SU41/L1	GDA	55	717425	6403616	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0445	UWF SU42/L1	GDA	55	717996	6402834	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0446	UWF SU43/L1	GDA	55	718486	6402006	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0176	UWF SU43/L2	GDA	55	718567	6400794	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0177	UWF SU43/L3	GDA	55	718860	6400418	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0178	UWF SU43/L4	GDA	55	719068	6399951	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0179	UWF SU44/L1	GDA	55	700681	6393326	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0180	UWF SU44/L2	GDA	55	700738	6393527	Open site	Valid	Artefact : -		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Uungula-www
Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-5-0181	UWF SU44/L3	GDA	55	700901	6393784	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-5-0182	UWF SU44/L4	GDA	55	701428	6394094	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-5-0183	UWF SU46/L1	GDA	55	699686	6396742	Open site	Valid	Artefact : -		
	Contact	Recorders		Mr.Christopher Dib					Permits	
36-5-0184	UWF SU49/L1	GDA	55	700987	6401383	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0447	UWF SU51/L1	GDA	55	708023	6406046	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0448	UWF SU51/L2	GDA	55	708117	6406053	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0449	UWF SU51/L3	GDA	55	708128	6406151	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0450	UWF SU52/L1	GDA	55	708122	6406768	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0451	UWF SU52/L2	GDA	55	706960	6407385	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0452	UWF SU53/L1	GDA	55	708221	6406748	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0453	UWF SU65/L1	GDA	55	710434	6408805	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0454	UWF SU65/L2	GDA	55	710449	6409452	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0455	UWF SU65/L3	GDA	55	710211	6409679	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0456	UWF SU68/L1	GDA	55	708180	6409986	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0457	UWF SU71/L1	GDA	55	712811	6405320	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0458	UWF SU72/L1	GDA	55	712066	6404020	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden					Permits	
36-2-0459	UWF SU73/L1	GDA	55	711941	6403782	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Uungula-www
Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Doctor Julie Dibden					Permits	
36-2-0460	UWF SU73/L2	GDA	55	711873	6403601	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden					Permits	
36-2-0474	Bodangora SU3/L1	GDA	55	696852	6411952	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden,NSW Archaeology Pty Ltd					Permits	
36-2-0475	Bondangora SU18/L1	GDA	55	692880	6411849	Open site	Valid	Stone Quarry : -		
	Contact	Recorders		Doctor Julie Dibden,NSW Archaeology Pty Ltd					Permits	

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Uungula-www
Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-5-0080	(refer to 36-5-0055)Open site 1/12 mile	AGD	55	714490	6396480	Open site	Deleted	Artefact : -		
	Contact	Recorders		NPWS - Bulga					Permits	
36-5-0082	LOC 5A and 6A	AGD	55	721310	6387759	Open site	Valid	Artefact : -	1739	
	Contact	Recorders		Mr.David Maynard					Permits	
36-5-0083	Yarrabin Rd Grattai	AGD	55	720520	6387102	Open site	Valid	Artefact : -		
	Contact	Recorders		Mr.Giles Hamm					Permits	
36-2-0104	YBCR-ST1	AGD	55	719670	6411642	Open site	Valid	Modified Tree (Carved or Scarred) : 2	98915	
	Contact	Recorders		Doctor.Jodie Benton					Permits	
36-2-0105	YBCR-PAD1	AGD	55	719560	6412130	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		98915.990379 9042.102443
	Contact	Recorders		Doctor.Jodie Benton					Permits	1920.2060.2061
36-2-0106	YBCR-OS2 with PAD	AGD	55	719669	6411920	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		98915.990379 9042.102443
	Contact	Recorders		Doctor.Jodie Benton					Permits	1920.2060.2061
36-2-0107	YBCR-OS1 with Pad	AGD	55	719449	6411791	Open site	Valid	Potential Archaeological Deposit (PAD) : -, Artefact : 1		98915
	Contact	Recorders		Doctor.Jodie Benton					Permits	
36-2-0317	Goolma Creek 1 GC1	GDA	55	715348	6412819	Open site	Valid	Artefact : -		102066
	Contact	Recorders		Mudgee Local Aboriginal Land Council					Permits	
36-2-0315	UR 3 (Uamby Rd)	GDA	55	713760	6411566	Open site	Valid	Artefact : -		
	Contact	Recorders		Miss.Christine Maynard					Permits	3338
36-2-0316	UR 4 (Uamby Rd)	GDA	55	713830	6411582	Open site	Valid	Artefact : -		
	Contact	Recorders		Miss.Christine Maynard					Permits	3338
36-2-0318	UR 1 (Uamby rd)	GDA	55	713944	6411690	Open site	Valid	Artefact : 36		
	Contact	Recorders		Miss.Christine Maynard					Permits	
36-2-0319	UR 2 (Uamby rd)	GDA	55	713876	6411655	Open site	Valid	Artefact : 81		
	Contact	Recorders		Miss.Christine Maynard					Permits	
36-5-0009	Macquarie River;Gigmalarie Creek;	AGD	55	694457	6387889	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders		G.W. Althofer,Michael Pearson					Permits	
36-5-0011	Ilgingerry Creek;	AGD	55	702555	6389003	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders		Mr.Warwick Pearson					Permits	

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-2-0019	Goolma;	AGD	55	714375	6411431	Open site	Valid	Artefact : -	Open Camp Site	1299
	Contact	Recorders		G.W. Althofer				Permits		
36-2-0036	GOOLMA;	AGD	55	718690	6413320	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1333
	Contact	Recorders		Warren Bluff				Permits		
36-5-0040	CM 1;	AGD	55	692189	6391834	Open site	Valid	Hearth : -, Artefact : -	Open Camp Site	1543
	Contact	Recorders		Mary Dallas Consulting Archaeologists,Miss.Lisa Smith				Permits		
36-5-0041	CM 2;	AGD	55	692350	6392650	Open site	Valid	Artefact : -	Open Camp Site	1543
	Contact	Recorders		Mary Dallas Consulting Archaeologists,Miss.Lisa Smith				Permits		
36-5-0001	Burganbungie-Gigmalarie;	AGD	55	694445	6387728	Open site	Valid	Hearth : -, Artefact : -	Open Camp Site	102800
	Contact	Recorders		Robert "Ben" Gunn				Permits		
36-2-0001	Mt Bodangora;	AGD	55	697863	6410220	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders		Glen Morris				Permits		
36-2-0108	YBCR-OS3	AGD	55	719329	6412034	Open site	Valid	Artefact : 2		99038
	Contact	Recorders		Doctor;Jodie Benton				Permits	2060.2061	
36-2-0109	YBCR-OS4	AGD	55	719355	6412267	Open site	Valid	Artefact : 4		99038
	Contact	Recorders		Doctor;Jodie Benton				Permits	2060.2061	
36-2-0155	GC OS 20 with PAD	GDA	55	717258	6412904	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders		OzArk Environmental and Heritage Management				Permits		
36-2-0390	CBR - OS - 24	GDA	55	721400	6414920	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Neville Baker				Permits		
36-2-0391	CBR - OS - 23	GDA	55	721220	6414610	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Neville Baker				Permits		
36-2-0392	CBR - OS - 22	GDA	55	721134	6414455	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mr.Neville Baker				Permits		
36-2-0482	194 Hill End Rd Menah Quarry	GDA	55	717546	6410579	Open site	Valid	Stone Quarry : 1		
	Contact	Recorders		Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard				Permits		
36-2-0488	4789 Twelve Mile Rd OS1	GDA	55	718539	6410679	Open site	Valid	Artefact : 1		
	Contact	Recorders		Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard				Permits		
36-2-0489	4789 Twelve Mile Rd OS2	GDA	55	718521	6410665	Open site	Valid	Artefact : 1, Stone Quarry : 1		
	Contact	Recorders		Mudgee Local Aboriginal Land Council ,Miss.Christine Maynard				Permits		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-5-0191	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact Mr.Bradley Bliss	Recorders		Mr.Bradley Bliss,Wellington Valley Wiradjuri Aboriginal Corporation				Permits		
36-2-0481	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact	Recorders		Mr.Bradley Bliss,Wellington Valley Wiradjuri Aboriginal Corporation				Permits		
36-5-0087	Leaning Oak Creek 1B Loc 1B	AGD	55	720633	6387730	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders		Mr.David Maynard				Permits		
36-5-0088	Leaning Oak Creek Loc 2B	AGD	55	720656	6387794	Open site	Valid	Artefact : 1		
	Contact T Russell	Recorders		Mr.Warren Mayers				Permits		
36-5-0089	Leaning Oak Creek Loc 3B	AGD	55	721250	6388022	Open site	Valid	Artefact : -, Stone Quarry : 1		
	Contact T Russell	Recorders		Mr.David Maynard				Permits		
36-2-0143	UC OS 2	AGD	55	710270	6409577	Open site	Valid	Artefact : 4		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat				Permits		
36-2-0144	UC OS 1 with PAD	AGD	55	710371	6408520	Open site	Valid	Artefact : 30		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat				Permits		
36-2-0145	GC OS 5 with PAD	AGD	55	716819	6412701	Open site	Valid	Artefact : 100		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat				Permits		
36-2-0146	CT OS 7	AGD	55	717231	6412758	Open site	Valid	Artefact : 15		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat				Permits		
36-2-0139	GC OS 6	AGD	55	717231	6412758	Open site	Valid	Artefact : 15		
	Contact Murong Gialinga Aboriginal an	Recorders		Mr.David Maynard,Doctor.Jodie Benton,Murong Gialinga Aboriginal and Torres St				Permits		
36-2-0141	UC OS 3 with PAD	AGD	55	709935	6409813	Open site	Valid	Artefact : 15		
	Contact Sarah Colley	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat				Permits		
36-2-0142	CR OS 4 with PAD	AGD	55	713405	6411246	Open site	Valid	Artefact : 1000		
	Contact	Recorders		Mr.David Maynard,Murong Gialinga Aboriginal and Torres Strait Islander Corporat				Permits		
36-2-0270	Private Rd-Gorries Lane Goolma AS	GDA	55	714665	6413356	Open site	Valid	Artefact : 4		
	Contact	Recorders		Doctor.Maria Cotter				Permits		
36-2-0438	UWF SU13/L1	GDA	55	720773	6409698	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden				Permits		
36-5-0167	UWF SU20/L1	GDA	55	720538	6399589	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden				Permits		
36-5-0168	UWF SU20/L2	GDA	55	720549	6399657	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor.Julie Dibden				Permits		
36-5-0169	UWF SU20/L3	GDA	55	720747	6399837	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Uungula-www

Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Doctor Julie Dibden				Permits		
36-5-0170	UWF SU22/L1	GDA	55	702596	6396808	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden				Permits		
36-5-0171	UWF SU24/L1	GDA	55	706049	6394103	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden				Permits		
36-5-0172	UWF SU26/L1	GDA	55	704363	6395945	Open site	Valid	Artefact : -		
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36-5-0173	UWF SU30/L1	GDA	55	705972	6400713	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden				Permits		
36-5-0174	UWF SU32/L1	GDA	55	706660	6398830	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden				Permits		
36-5-0175	UWF SU34/L1	GDA	55	705929	6392887	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden				Permits		
36-2-0441	UWF SU38/L1	GDA	55	718764	6408904	Open site	Valid	Artefact : -		
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36-2-0442	UWF SU39/L2	GDA	55	716945	6405936	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor Julie Dibden				Permits		
36-2-0443	UWF SU40/L1	GDA	55	718232	6404202	Open site	Valid	Artefact : -		
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36-5-0178	UWF SU43/L4	GDA	55	719068	6399951	Open site	Valid	Artefact : -		
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36-5-0179	UWF SU44/L1	GDA	55	700681	6393326	Open site	Valid	Artefact : -		
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36-5-0180	UWF SU44/L2	GDA	55	700738	6393527	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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Your Ref/PO Number : Uungula-www
Client Service ID : 380118

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0181	UWF SU44/L3	GDA	55	700901	6393784	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0182	UWF SU44/L4	GDA	55	701428	6394094	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-5-0183	UWF SU46/L1	GDA	55	699686	6396742	Open site	Valid	Artefact: -		
	Contact	Recorders		Mr.Christopher Dib					Permits	
36-5-0184	UWF SU49/L1	GDA	55	700987	6401383	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0447	UWF SU51/L1	GDA	55	708023	6406046	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0448	UWF SU51/L2	GDA	55	708117	6406053	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0449	UWF SU51/L3	GDA	55	708128	6406151	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0450	UWF SU52/L1	GDA	55	708122	6406768	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
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	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0452	UWF SU53/L1	GDA	55	708221	6406748	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0453	UWF SU65/L1	GDA	55	710434	6408805	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0454	UWF SU65/L2	GDA	55	710449	6409452	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0455	UWF SU65/L3	GDA	55	710211	6409679	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0456	UWF SU68/L1	GDA	55	708180	6409986	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0457	UWF SU71/L1	GDA	55	712811	6405320	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0458	UWF SU72/L1	GDA	55	712066	6404020	Open site	Valid	Artefact: -		
	Contact	Recorders		Doctor;Julie Dibden					Permits	
36-2-0459	UWF SU73/L1	GDA	55	711941	6403782	Open site	Valid	Artefact: -		

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Uungula-www
Client Service ID : 380118

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders		Doctor,Julie Dibden					Permits	
36-2-0460	UWF SU73/L2	GDA	55	711873	6403601	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor,Julie Dibden					Permits	
36-2-0474	Bodangora SU3/L1	GDA	55	696852	6411952	Open site	Valid	Artefact : -		
	Contact	Recorders		Doctor,Julie Dibden,NSW Archaeology Pty Ltd					Permits	
36-2-0475	Bondangora SU18/L1	GDA	55	692880	6411849	Open site	Valid	Stone Quarry : -		
	Contact	Recorders		Doctor,Julie Dibden,NSW Archaeology Pty Ltd					Permits	

Report generated by AHIMS Web Service on 01/11/2018 for Julie Dibden for the following area at Datum :GDA, Zone : 55, Eastings : 692000 - 722000, Northings : 6385000 - 6415000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 83

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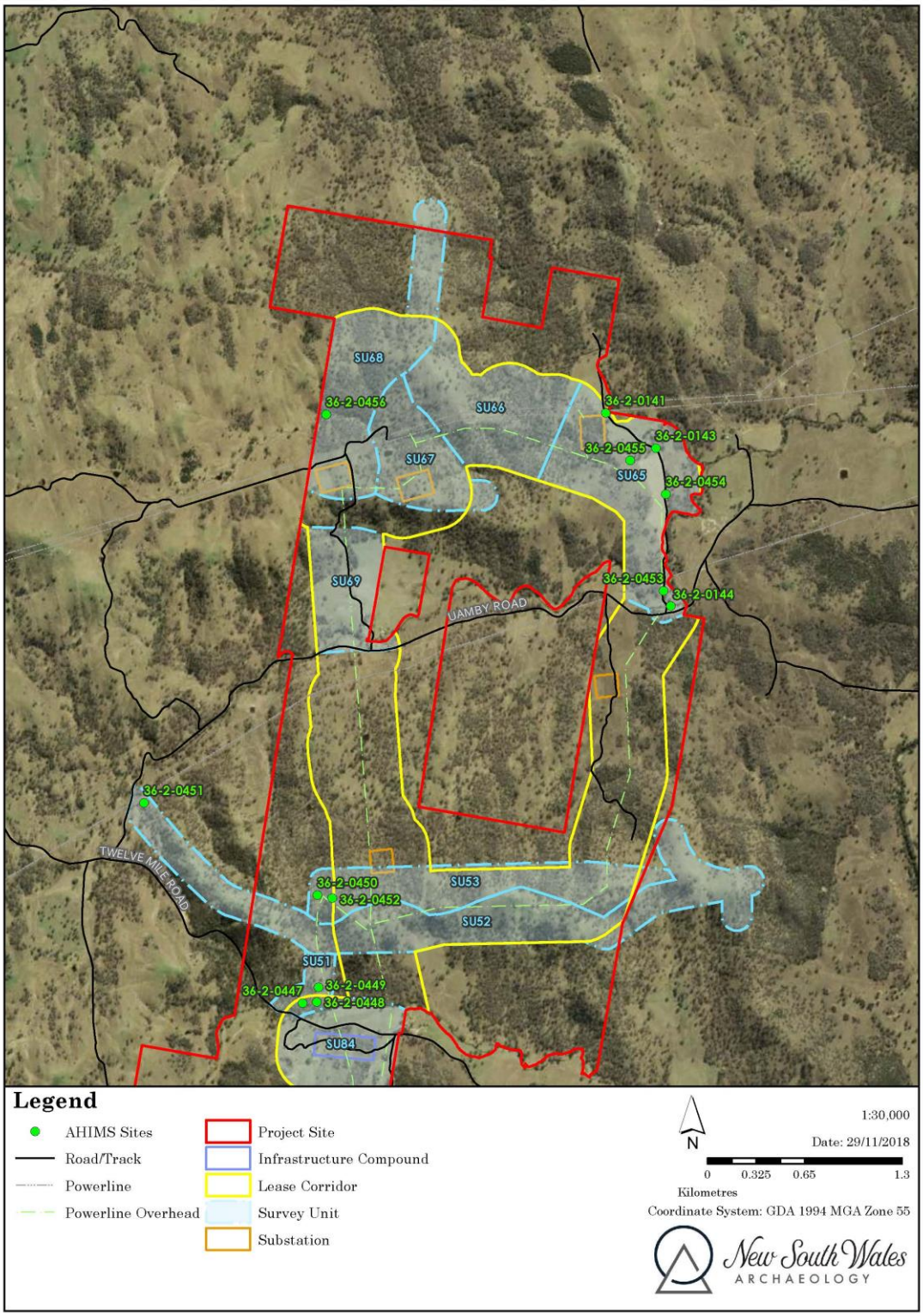
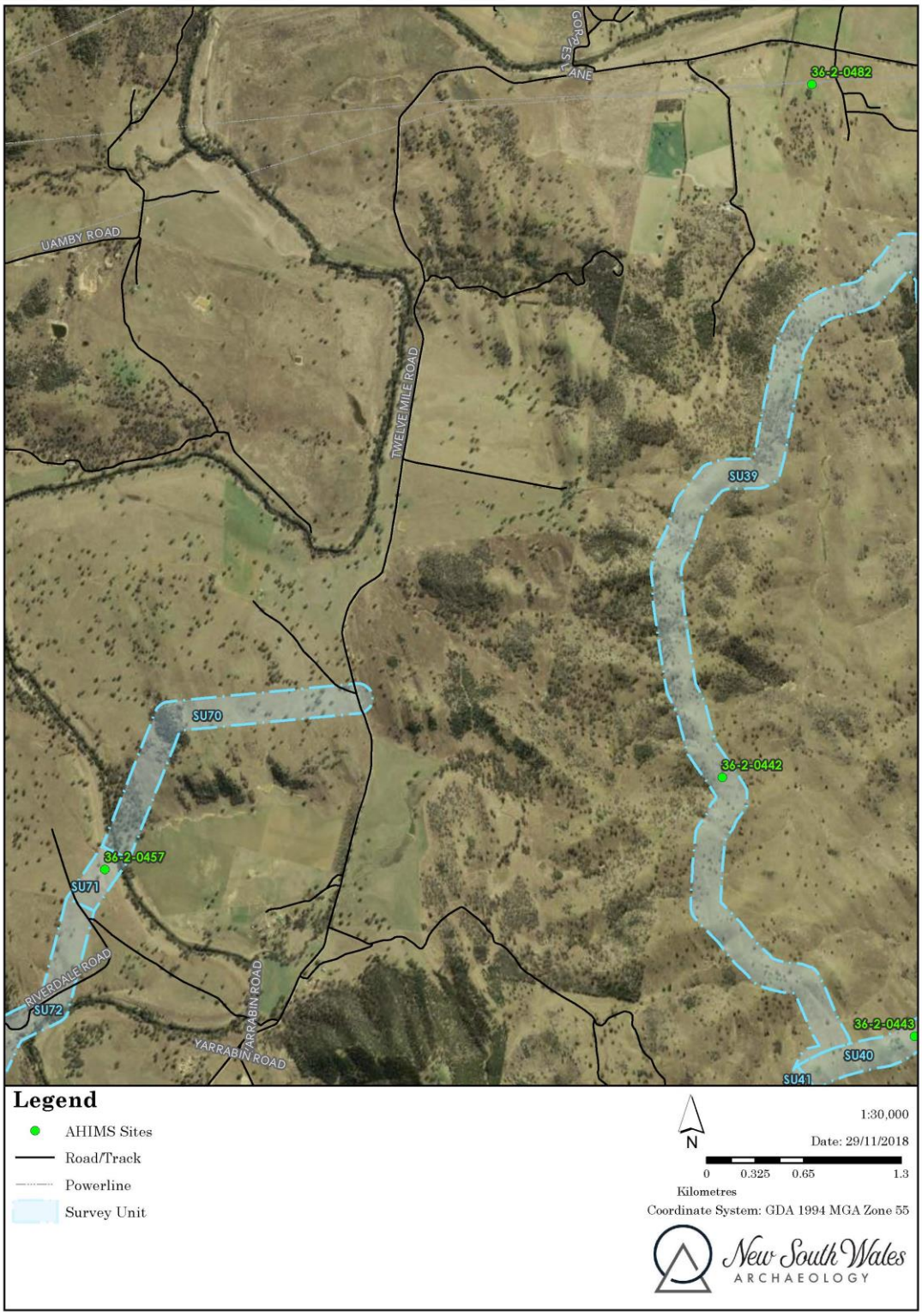
APPENDIX 2 IMPACT AREAS AND AHIMS SITE MAPPING

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SU70
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SU71
RIVERDALE ROAD
SU72
YARRABIN ROAD
YARRABIN ROAD
36-2-0443
SU40
SU41
Legend
AHIMS Sites
Road/Track
Powerline
Survey Unit
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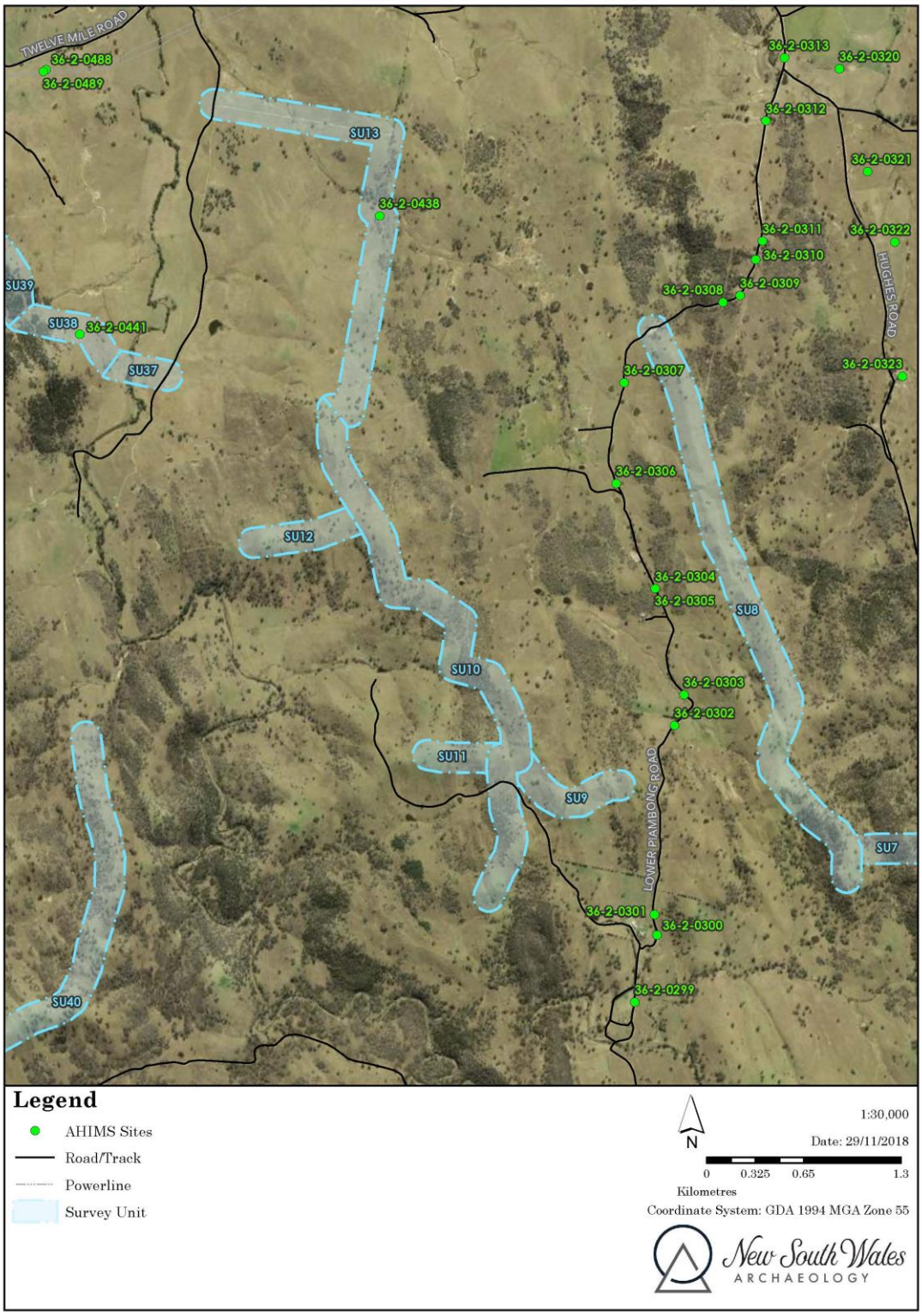
New South Wales
ARCHAEOLOGY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36-2-0322
36-2-0310
36-2-0309
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HUGHES ROAD
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36-2-0307
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SU8
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36-2-0302
LOWER PAMBONG ROAD
SU7
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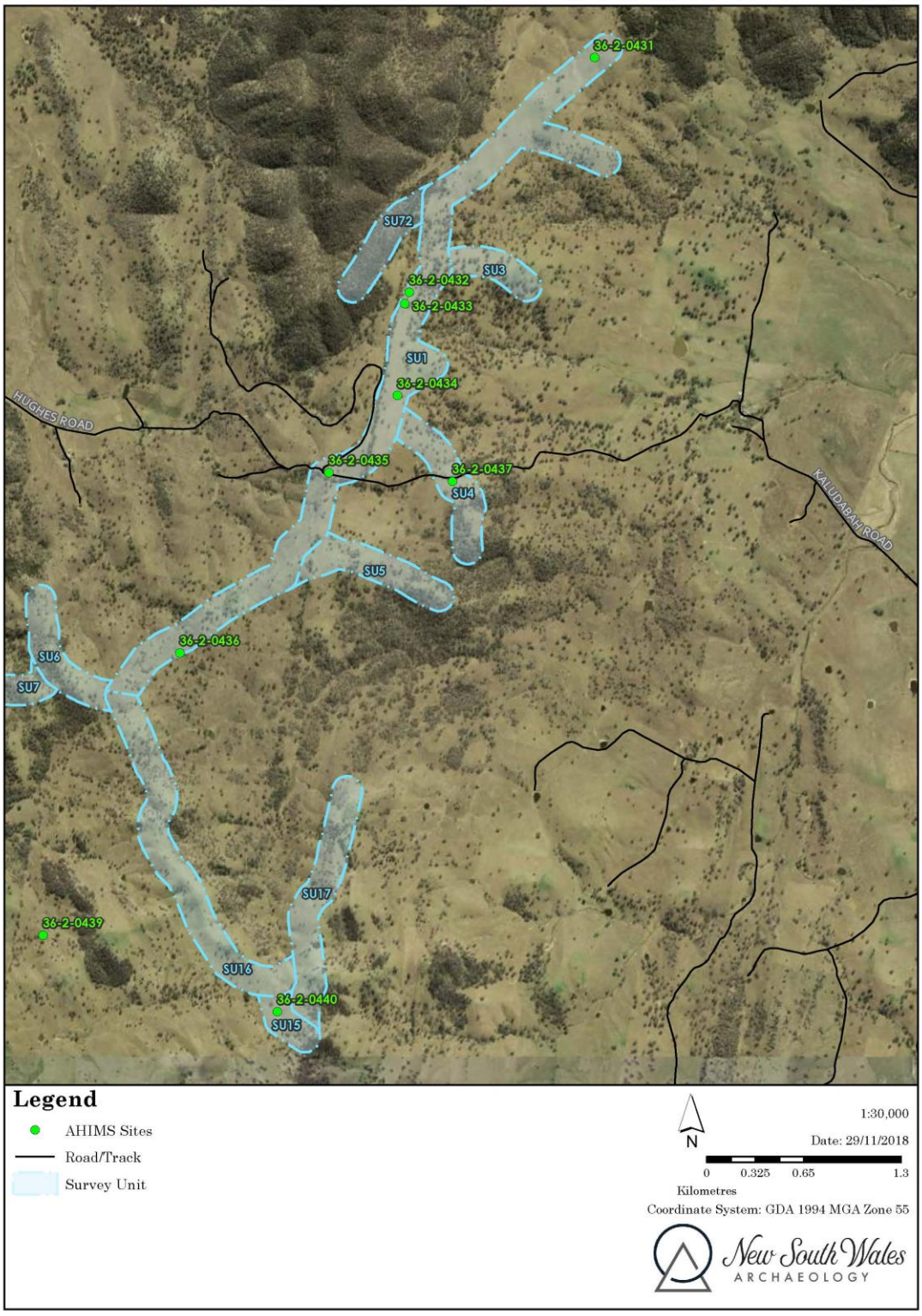
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SU4
KALUDABAH ROAD
SU5
36-2-0436
SU6
SU7
SU17
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SU16
36-2-0440
SU15
Legend
AHIMS Sites
Road/Track
Survey Unit
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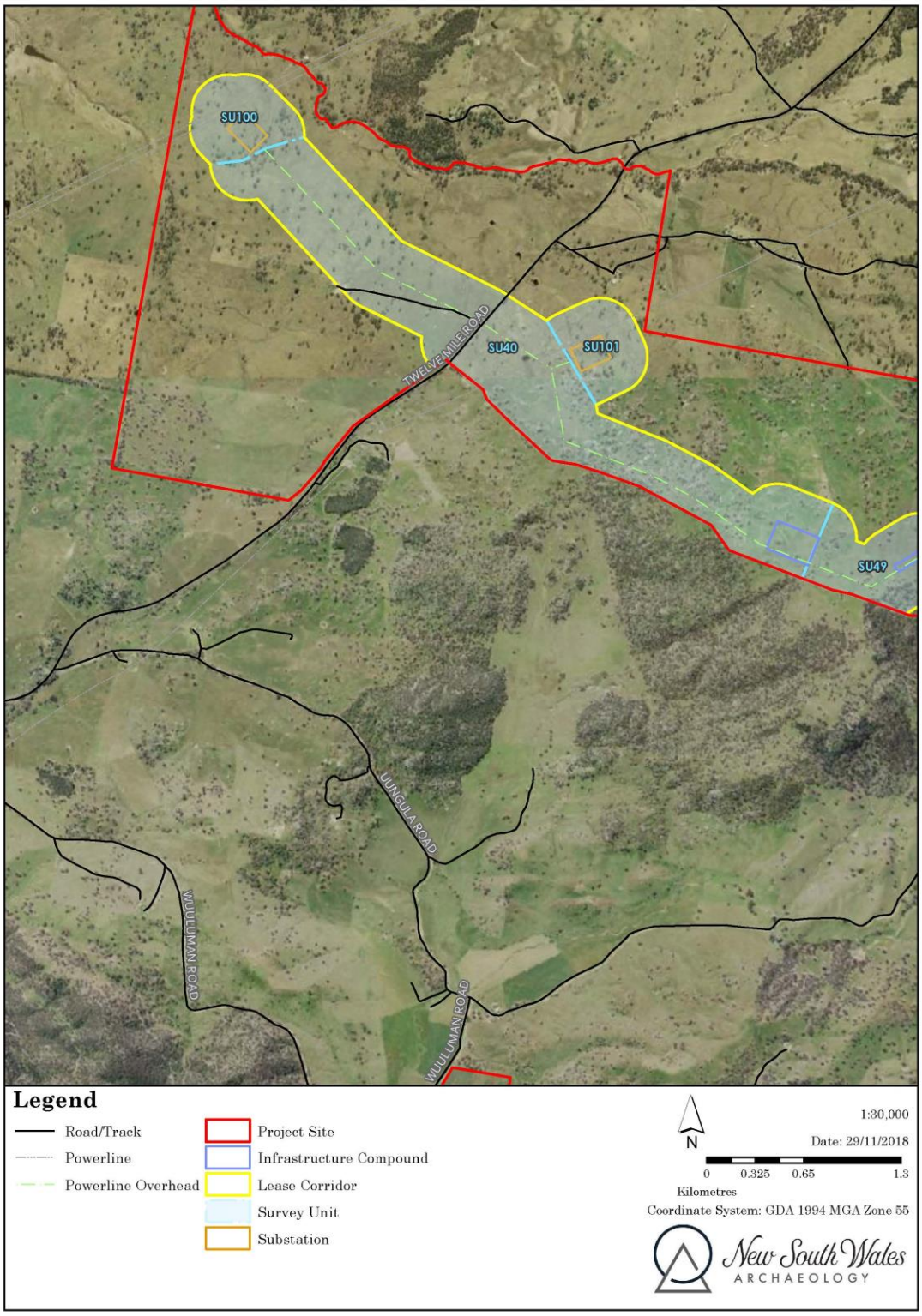
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WUULUMAN ROAD
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Road/Track
Powerline
Powerline Overhead
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Survey Unit
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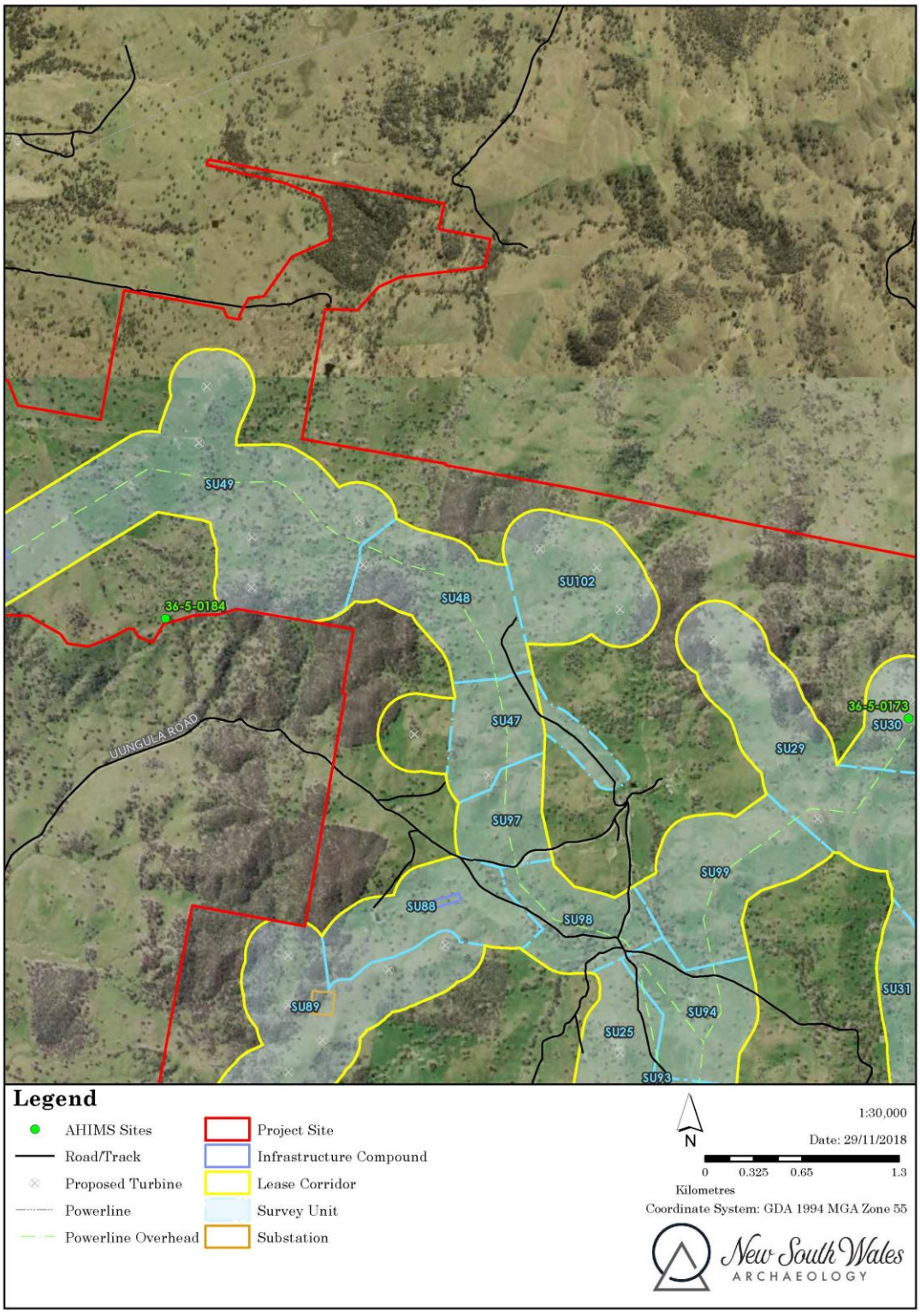
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SU89
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SU25
SU93
Legend
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Powerline
Powerline Overhead
Project Site
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Lease Corridor
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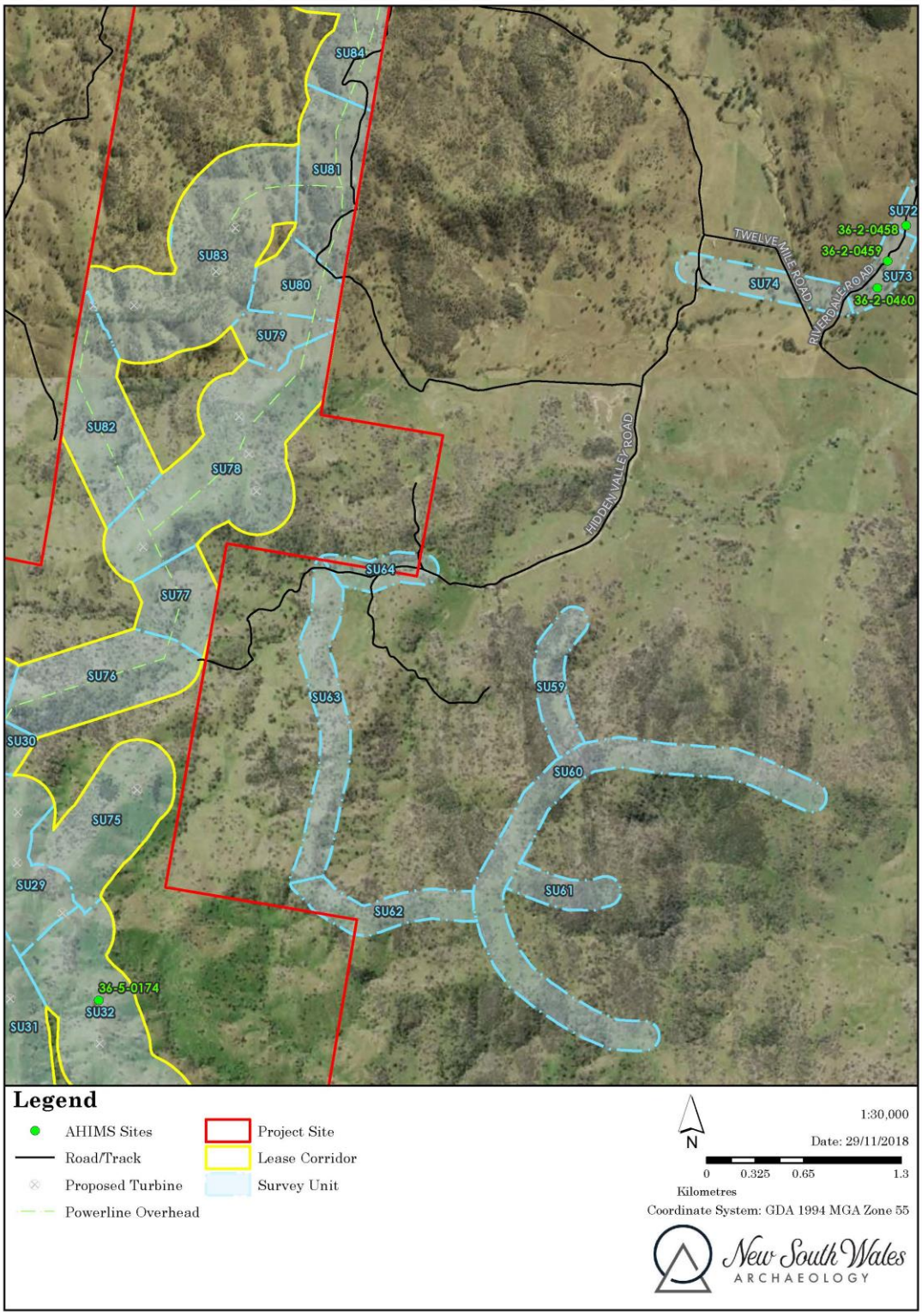
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TWELVE MILE ROAD
RIVERDALE ROAD
HIDDEN VALLEY ROAD
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AHIMS Sites
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Project Site
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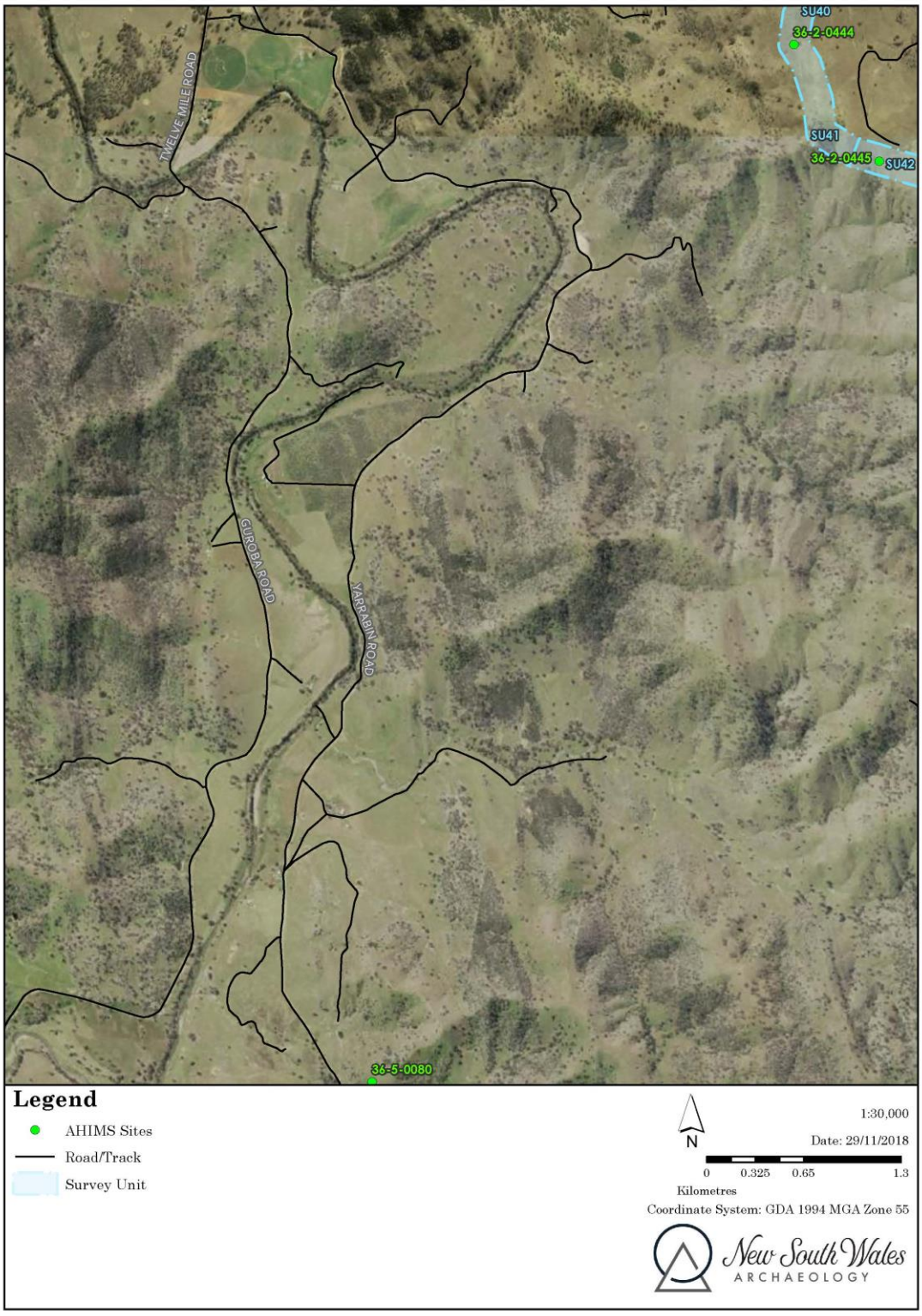
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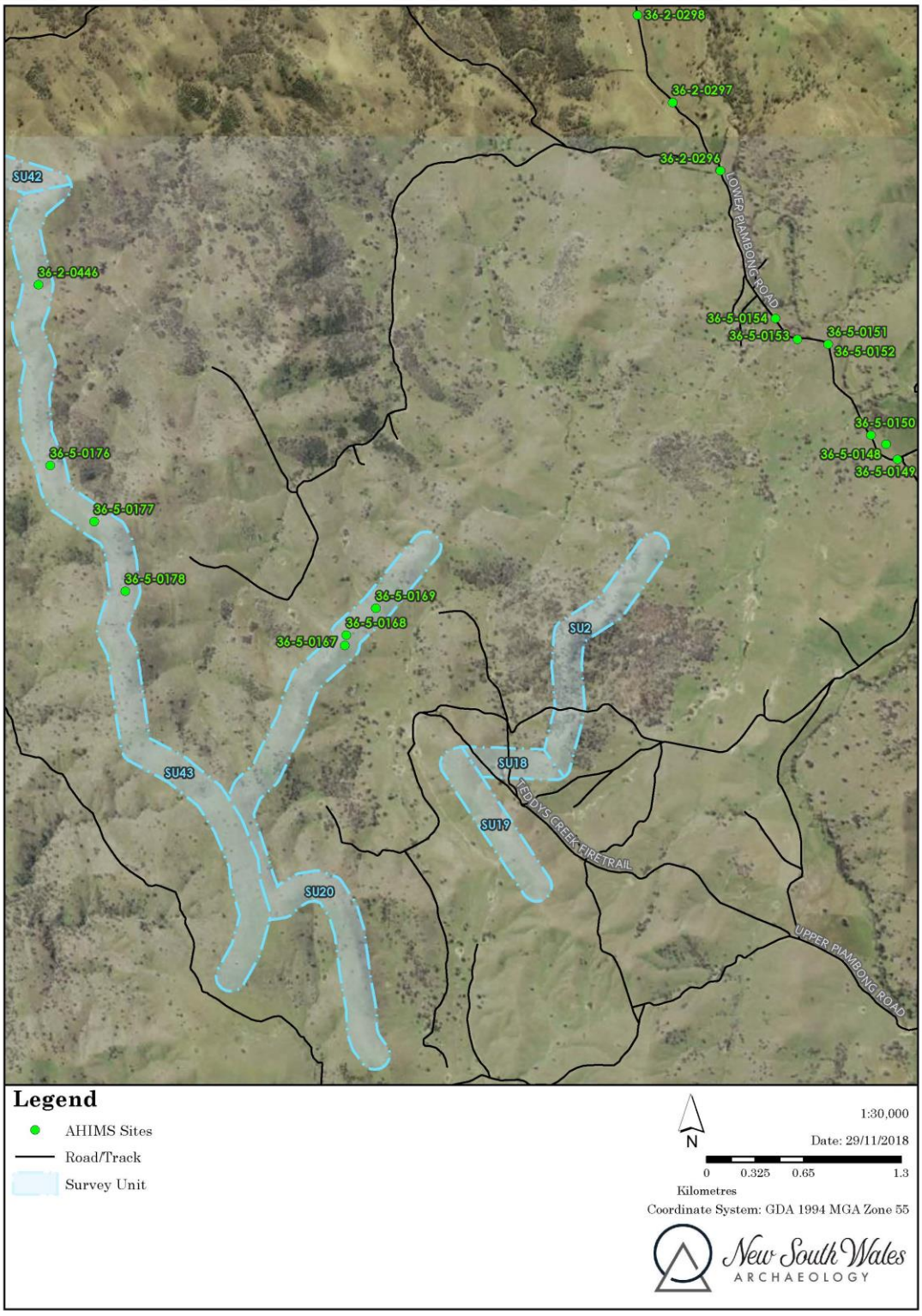
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SU42
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36-5-0168
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SU2
SU18
SU43
SU19
FEDDYS CREEK FIRE TRAIL
SU20
UPPER PIAMBONG ROAD
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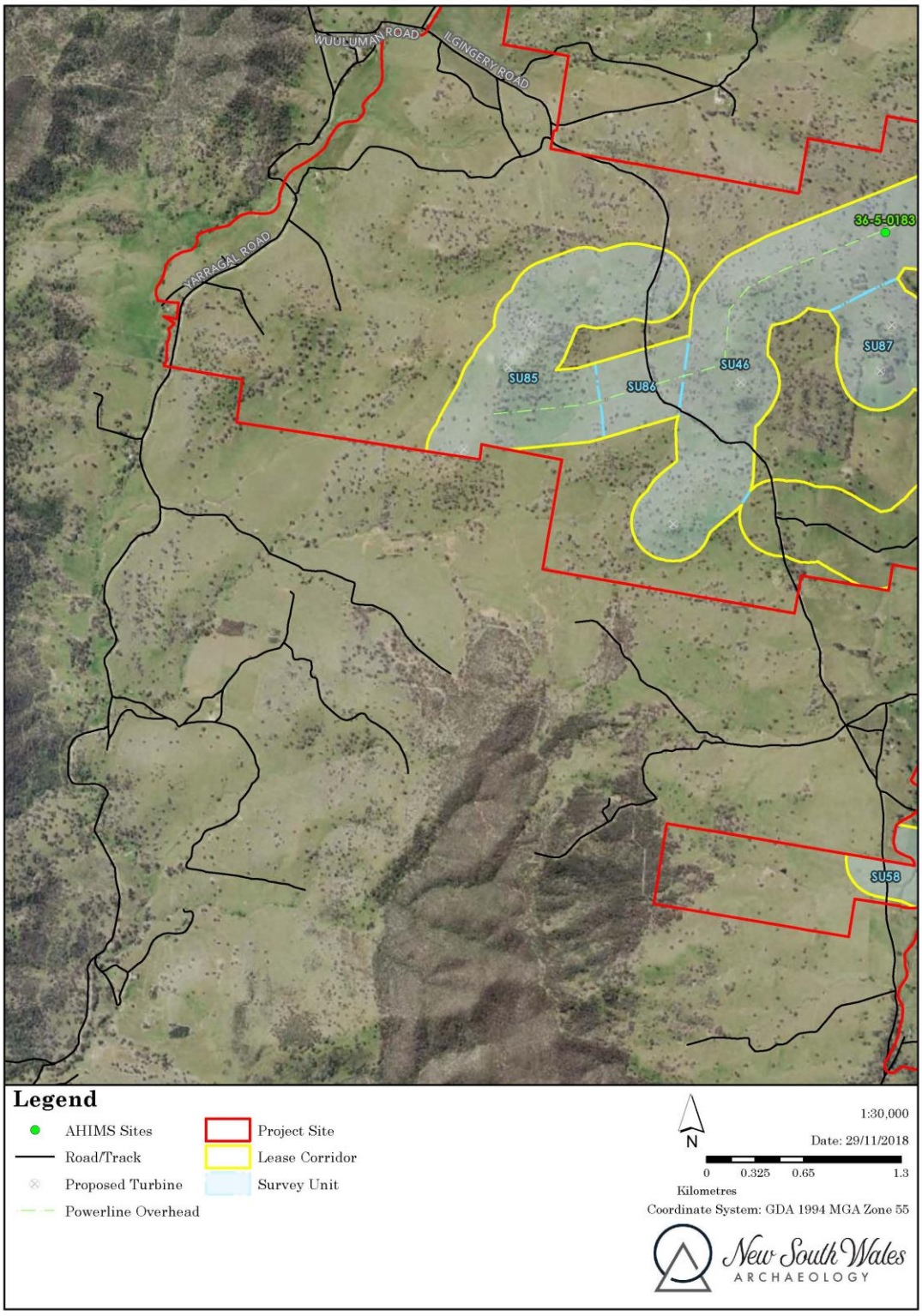
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SU86
SU46
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SU58
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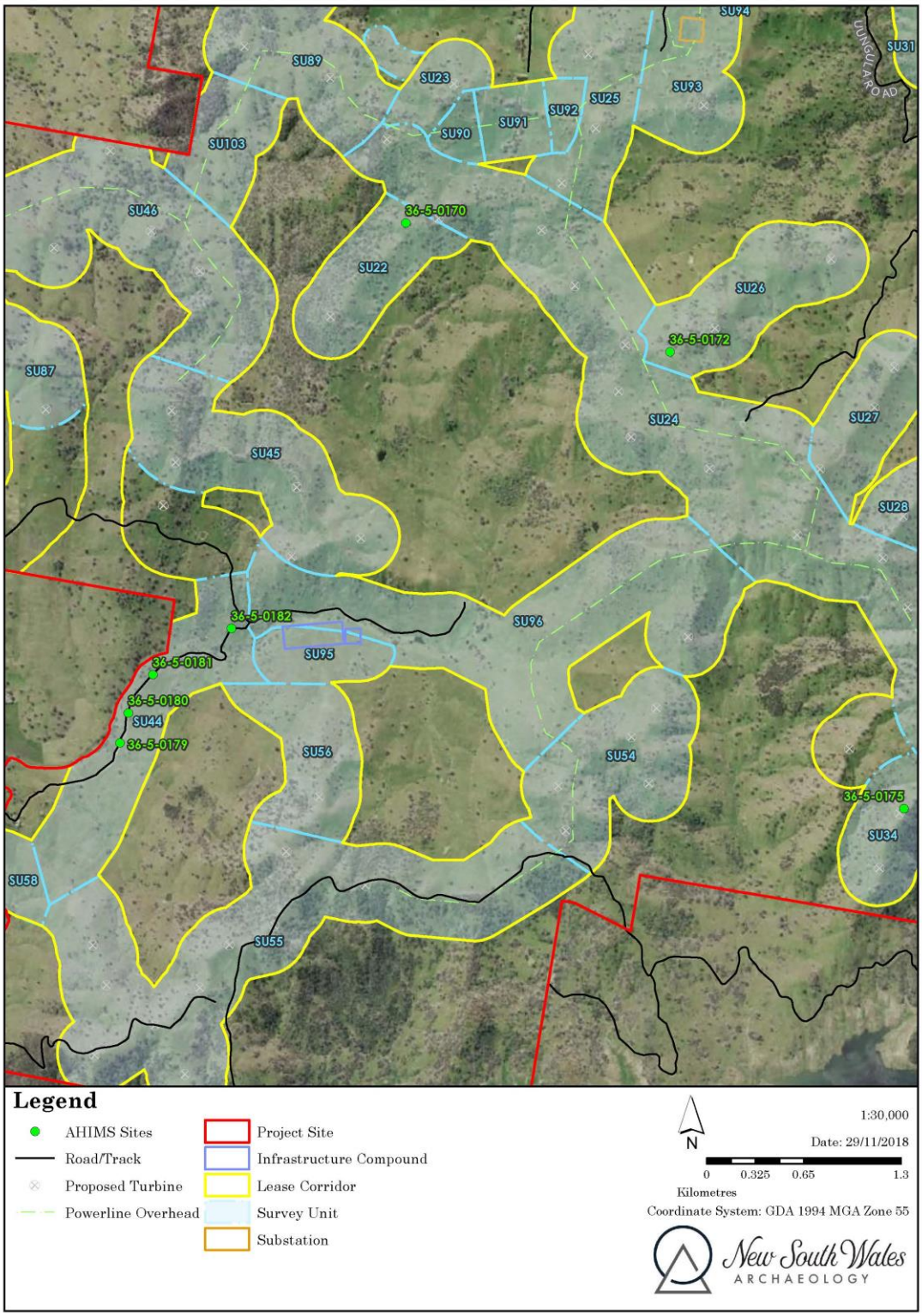
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SU95
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SU44
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SU56
SU54
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SU58
SU55
Legend
AHIMS Sites
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Project Site
Infrastructure Compound
Lease Corridor
Survey Unit
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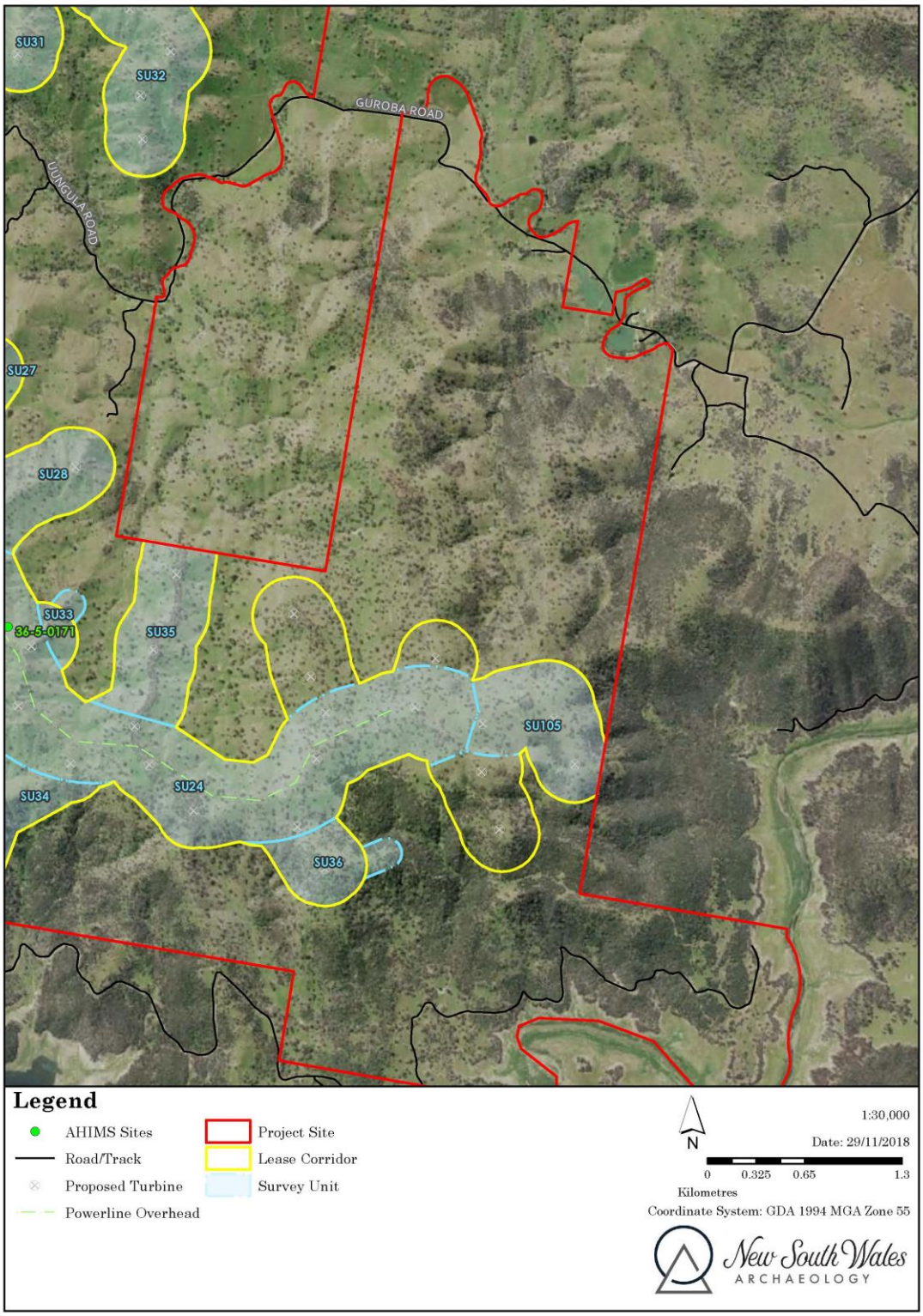
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Kilometres
Coordinate System: GDA 1994 MGA Zone 55
New South Wales
ARCHAEOLOGY

APPENDIX 3 HISTORIC HERITAGE

Historical Register Searches

Searches have been conducted for previous heritage listings in and around the study area; these searches have included all of the relevant heritage registers for items of local through to world significance. Details of these searches are provided below.

Australian Heritage Database

This database contains information about more than 20 000 natural, historic and Indigenous places.

A search of this database revealed that there are no items listed on the Register of the National Estate (RNE) as being in the proposed Uungula Wind Farm study area.

State Heritage Inventory

The NSW heritage database contain over 20,000 statutorily-listed heritage items in New South Wales. This includes items protected by heritage schedules to local environmental plans (LEPs), regional environmental plans (REPs) or by the State Heritage Register.

The information is supplied by local councils and State agencies and includes basic identification details and listing information. Consequently, listings should be confirmed with the responsible agency.

The Uungula Wind Farm falls within the boundaries of two local council areas, they being Wellington Shire and Mid Western Shire Council. A search of this database in relation to all council areas revealed no listings for items in the study area.

Results

Two potential European heritage items have been recorded during the study, neither of which satisfy heritage listing criteria. They are located outside impact areas.

European Mining Activity: UWF SU1/H1 Cluster; UWF SU1/H2 Cluster; UWF SU3/H1 Cluster

An area of former widespread mining activity is situated in the north-eastern section of the proposal area, dispersed across areas within Survey Units 1 and 3. Because the various relic features in the landscape related to this mining activity are roughly located in three groups, for ease of reference they have been assigned to one of three clusters (Figure 1). The broader overall area of the mining site, encompassing the three clusters, is approximately 625 x 425m or 26.5 ha. This cluster of mining sites are outside the proposed Development Footprint.

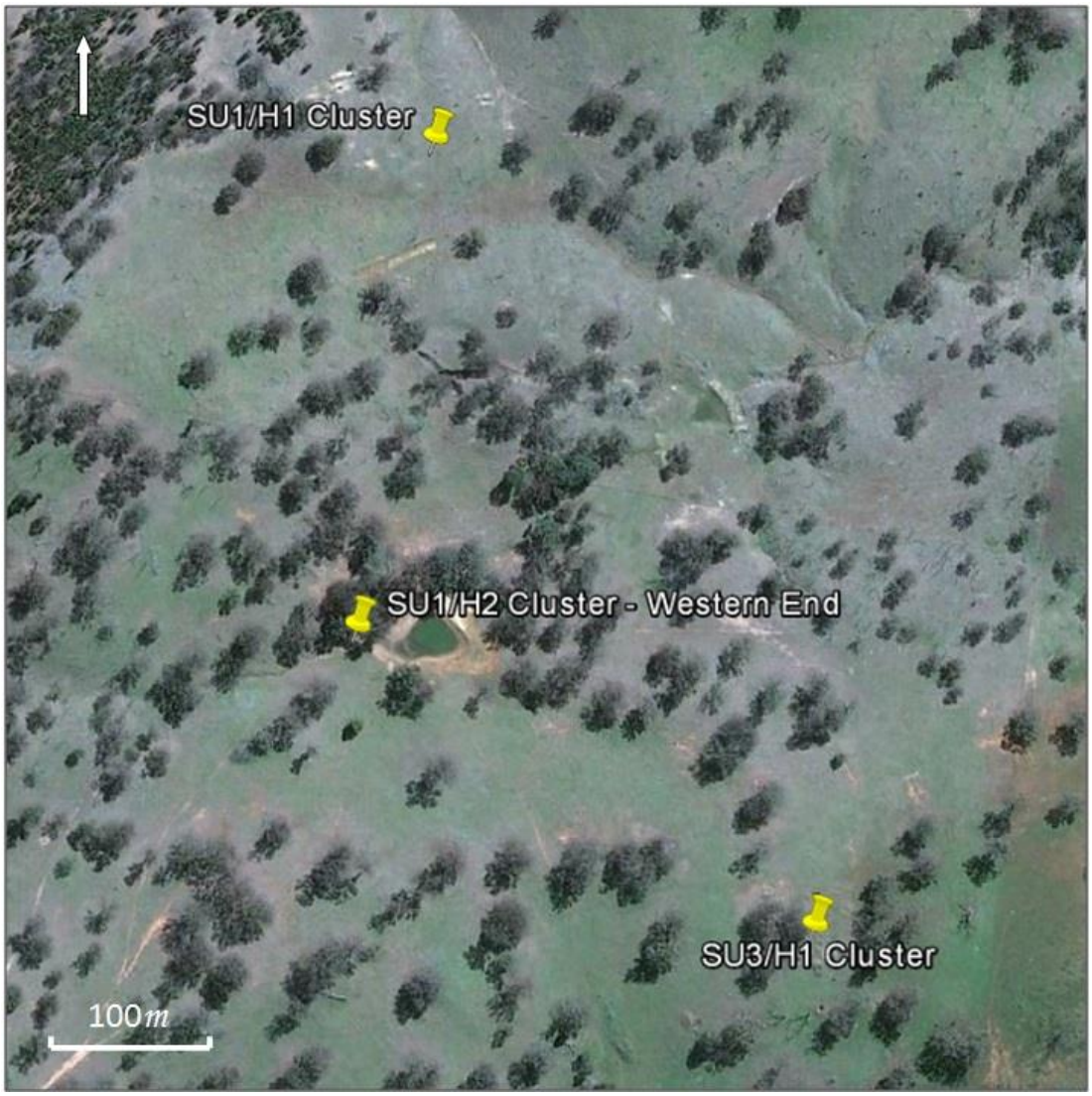

Figure 1 Satellite view of the former mining field showing the location of the three clusters (Google Earth, 2013).

The Parish of Biraganbil map of 1896 shows that at that time, this land was owned by a Richard Rouse (Figure 2). There were two prominent residents of the Mudgee district by the name of Richard Rouse at that time, both cousins. Richard Rouse (1842-1903) was the son of grazier Edwin Rouse of Guntawang, and Richard Rouse junior (1843-1906) was the son of

George Rouse. Edwin and George were, in turn, the sons of the pioneer Richard Rouse of Rouse Hill, west of Sydney (Lenehan 1976).

In 1822, Richard Rouse the elder, sent Edwin and George in search of good pasture in the area beyond the Blue Mountains, to the north-west. In 1825, they took up land past Bathurst, at Guntawang on the Cudgegong River after it had recently been relinquished by George and Henry Cox following hostilities with the Wiradjuri. This holding of 4,000 acres (1619 ha) was gradually increased and became two stations, Guntawang and Biraganbil, and these were inherited by the sons, Edwin and George (Lenehan 1976). Their sons in turn were left the properties, with the older Richard inheriting Guntawang in 1888, and the younger Richard Rouse inheriting Biraganbil. Both Richards became successful pastoralists and stud-breeders in the district, and both had some interest in gold mining after the gold rush struck the Gulgong area in the 1870s. Indeed, it was the discovery of gold on land purchased by the Rouse's of Guntawang that initiated the Gulgong gold rush.

Richard Rouse junior was a director and shareholder in the Biraganbil Gold Mining Company, areas of which it prospected for gold fell on his Biraganbil property. As well as being involved as investors in local mining companies, both Rouse families leased numerous areas of land on their various estates, under special terms, for third parties to mine and exploit.

It is understood that it is on land that was part of Richard Rouse's Biraganbil estate, as highlighted in the 1896 Parish map (Figure 2), that the most northern of the three subject clusters of mining activity are situated. There are numerous reports in the papers of the time describing mining undertakings on a 40 acre lease on Richard Rouse's Biraganbil estate. No other defined 40 acre lots, and none with gold leases, can be identified on Richard Rouse's estate on the Biraganbil Parish maps. Accordingly, these reports may well relate to the 40 acre lot, however, it should be noted that because of the number of gold leases offered by the Rouse's this has been unable to be confirmed in this research.

On 7th December 1872, the Empire newspaper in Sydney published ..."*On Monday last 2nd inst., Messrs. Plunkett and Co., auctioneers at Gulgong, proceeded to Biraganbil estate, property of Mr. Rouse, and submitted forty acres of untried ground to the competition of buyers. The best offer was only £10. There were estimated to be about 700 miners and others present….This forty acres is contiguous to the Biraganbil Gold Mining Company's lease, and the same lead is supposed to run through it. It constitutes a regular basin, being surrounded by high and precipitous ranges.*"

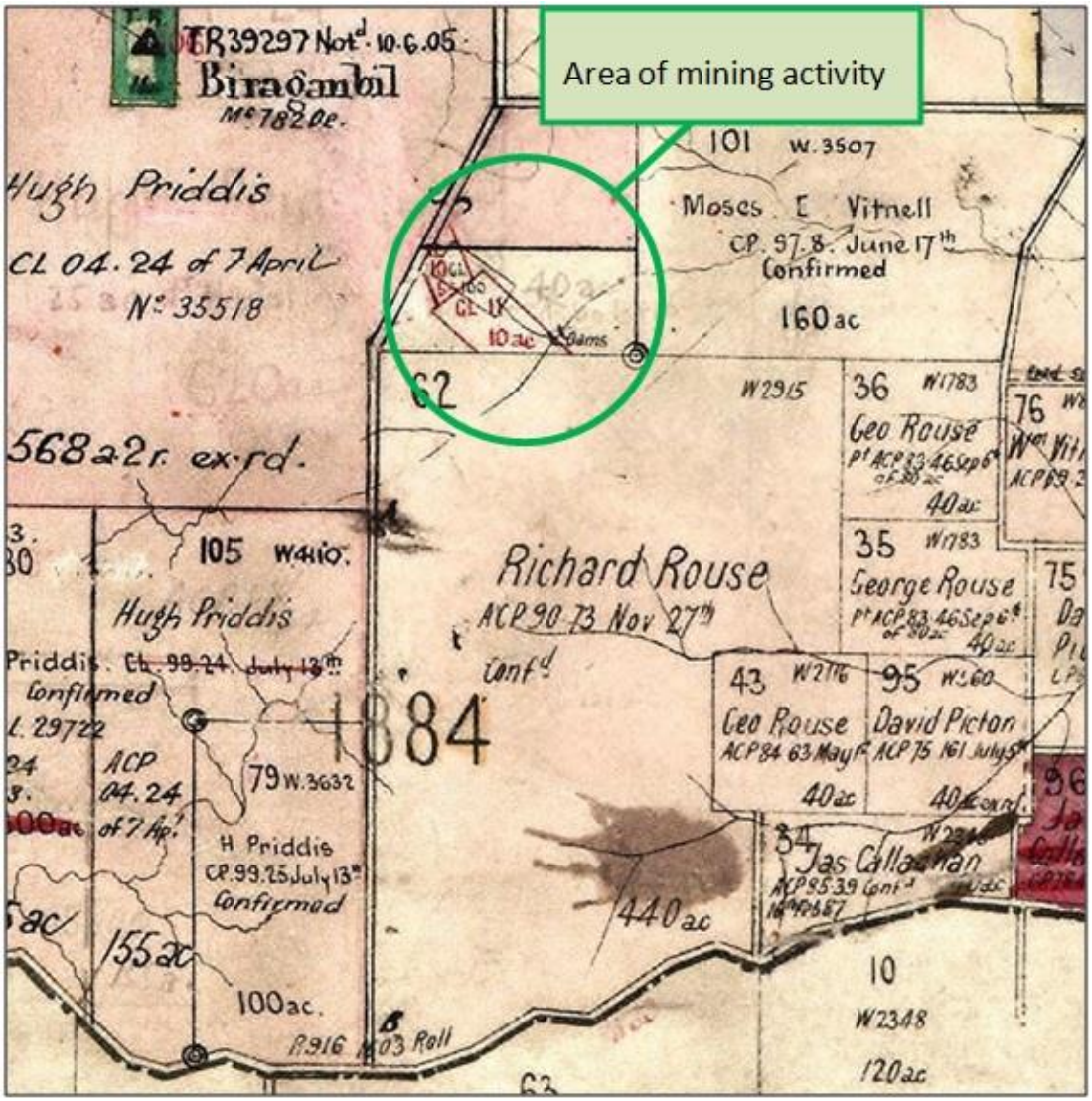

Figure 2 Map of the Parish of Biraganbil, County of Wellington, 1896, showing the area of mining activity on Richard Rouse's property.

The same newspaper reported on 1st February 1873 *"... I am informed that Messrs. Brown, Hunter and others who purchased a forty-acre lease from Mr. Rouse, on the Biraganbil Estate, an account of which I gave a few weeks ago, have already put on it three different leases more than thirty miners to open the ground and that additional hands will be employed as the work progresses. On three shafts already sunk, two are golden and payable. The lead has been driven across to a distance of nearly fifty feet, and things look prosperous."*

For reasons unknown, the Biraganbil Gold Mining Company was short lived and final settlement of outstanding issues was being heard in the insolvency court in 1975. Nevertheless, mining still continued on Biraganbil. Later reporting on the area in the Australian Town and Country Journal of 2nd July 1898, indicated in an article titled 'The Biraganbil Goldfield' ...*"This is a small field situated on the state, of Mr Richard Rouse, jun., Biraganbil....(It) is located on a low hill at the foot of*

a rough range of hills, of considerable elevation. The hill seems a mass of quartz leaders in an altered slate and sandstone formation, but there are also areas of diorite. The gold was first got in the alluvial on the surface, and was followed down to a depth of 18ft. In the quartz leaders in the portion of the hill nearest the range there is but little pyrites. At a depth of 50ft a reef from 2ft 6in to 4ft wide was struck, and in this formation 38oz of gold were obtained to one nailcan of dirt. Following the chute down, 8 z or 9oz of gold were obtained. A short distance below this point an alluvial formation of about 10 acres exists, which has produced a considerable quantity of gold, in some instances as much as 25oz to the load, and 10oz to the load was no uncommon yield. In some instances pieces up to 40oz were found in ironstone nodules. Underneath this alluvial the country rock is intersected with a mass of ironstone and quartz veins, mostly trending in a general north and south direction. Overlying this there are masses of grey porphyry clinkers, varying in depth from 6ft to 20ft. Adjoining, to the north a distance of about 500ft, a mass of pyritic veins exists, ranging from one-fourth of an inch to one inch wide, and carrying gold at the rate of from ½gr to lgr per dish. There is a shaft on this area 52ft deep, and all the way down these veins were present, underlaying to the west, and striking north-west and south east. In this shaft the porphyry clinkers were also carried down to a depth of 8ft. One small ore formation here is said to have turned out £3000 worth of gold. And gold to the value of £40,000 is said to have been won from the alluvial."

Each of the individual clusters relating to the site are described below:

UWF SU1/H1 Cluster (Figure 3)
This cluster is comprised of a number of features scattered over an area of c. 2ha on an undulating crest (Figure 3). Feature 1 (E727452 N6408825) and Feature 2 (E727354 N6408839) are costeans with associated mullock heaps rising to a maximum height of c. 0.5m. Feature 1 costean is 5 x 3m in size and c 1.3m deep. Feature 2 is an excavated costean or mine. Features 3 (E727372 N6408787) and 4 (E727413 N6408733) are linear depressions in the landscape which appear to have been mining drives. Feature 3 is a c. 60m long of southwest/northeast alignment measuring 2m in width and c. 0.7m deep. The costean has mullock along its eastern side.

There are no obvious artefacts in the immediate vicinity of the areas of mining, nor are there any other associated features such as vestiges associated with habitation. Given the absence of artefacts and other features such as occupation sites, it appears that this was a relatively brief extraction of gold deposits that was abandoned upon their exhaustion.

Figure 3 Satellite view of the SU1/H1 Cluster area showing various features created by previous mining (Google Earth, 2013)

UWF SU1/H2 Cluster (Figure 4)

The UWF SU1/H2 Cluster (west end E727365 N6408486) is comprised of a series of old mining features which possibly follow original alluvial gold deposits along a northeast flowing drainage line that leads from the undulating crest. From the western end in which excavations are visible, other features were visible for >300m along the descending drainage line, but at the time of field survey these were not investigated as they lay well away from areas of proposed impact.

Figure 4 Satellite view of the SU1/H2 Cluster area with the point of the western extent shown and the drainage depression visible extending to the northeast from that point (Google Earth, 2013)

UWF SU3/H1 Cluster (Figure 5)

This cluster is comprised of a distribution of mining features, comprised of an extensive array of costeans, some mining shafts, and possibly mining drives (E727642 N6408294 - centre). They are spread over an area of c. 1ha on an undulating crest in Survey Unit 3.

Figure 5 Satellite view of the SU3/H1 Cluster (Google Earth, 2013).

UWF SU10/H1 - Old Yards (Figure 6)

This recording is of an old dilapidated set of stock yards located in Survey Unit 10 (E720455 N6408286). The yards measure c. 35m x 12m. This site is outside the revised Development Footprint.

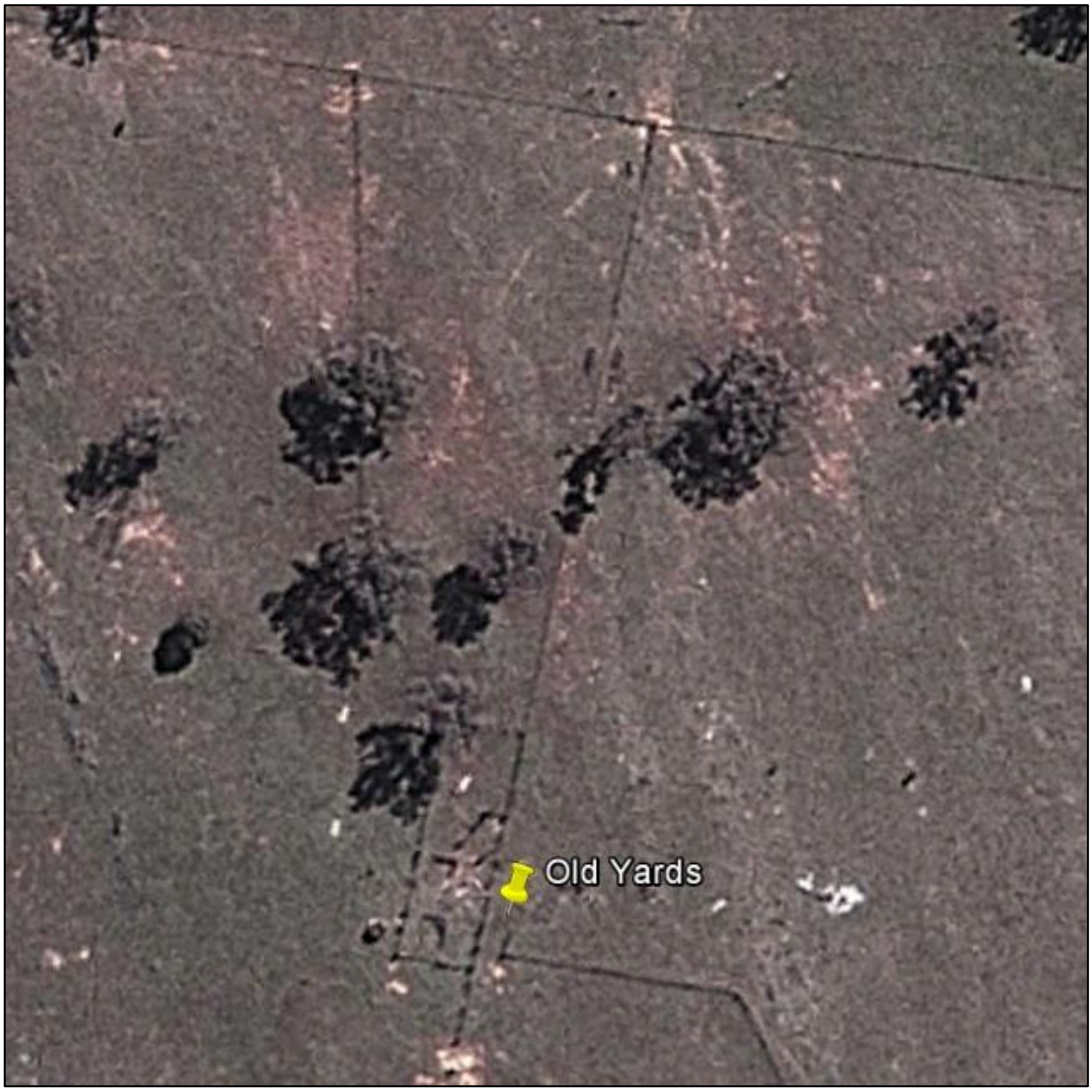

Figure 6 Satellite view of the UWF SU10/H1 - Old Yards. (Google Earth, 2013)