



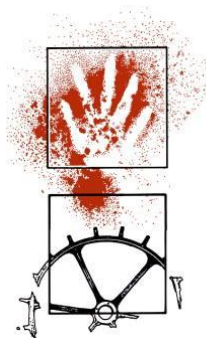
# Jumping Creek

Queanbeyan, NSW

## Cultural Heritage Assessment



June 2021



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Project client: SPACELAB Studio Pty Ltd  
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Internal review: S. McIntyre-Tamwoy  
Document status: Final v9.8  
Local Government Area: Queanbeyan Palerang

## Document revision status

Author	Revision number	Internal review	Date issued
N. Hayes	v1	S. McIntyre-Tamwoy	11/10/18
N. Hayes	v2	Following proponent review	19/11/18
N. Hayes	v3	Following RAP comments	08/01/19
N Hayes	v5	Final following proponent review	19/03/19
N. Hayes	v7	Draft following subsurface test excavation and DPIE comment	29/11/19
N. Hayes	v8	Draft following copy edit	9/12/19
N. Hayes	v8.3	Draft following proponent review	11/12/19
N. Hayes	v9	Final Following RAP comments	30/01/20
N. Hayes	v9.3	Following DPIE comment and further RAP consultation	20/03/20
N. Hayes	v9.4	Following proponent review	23/03/20
N. Hayes	v9.6	Following further DPIE comment and RAP consultation	4/6/20
N. Hayes	v9.7	Following further DPIE comment, RAP consultation and internal review	18/1/21
N.Hayes	v9.9	Following addition of conservation area	20/6/21

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## EXECUTIVE SUMMARY

Jumping Creek is a new residential development on the eastern side of the new Ellerton Drive Extension in Queanbeyan, bounded by the Queanbeyan River on the southern side of the site. The proposed residential development, will be in accordance with Queanbeyan Palerang Regional Council's Planning Proposal for the site, including areas of the site set aside for environmental living, environmental conservation and public recreation uses.

The Jumping Creek project will be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This report documents the results of an archaeological and cultural heritage assessment of Jumping Creek, Queanbeyan, New South Wales (NSW). The report was commissioned by SPACELAB Studio Pty Ltd on behalf of PEET Jumping Creek Limited.

The study area is located on the north-eastern outskirts of Queanbeyan, immediately east of Greenleigh Estate. Queanbeyan is located in the Southern Tablelands of NSW. The study area is approximately 95 hectares (ha) located within lot 1 DP 1249543.

A total of 59 Aboriginal recordings are listed on the Aboriginal Heritage Information Management System (AHIMS) around the Jumping Creek study area. NSW Archaeology undertook an archaeological assessment for the proposed rezoning of Jumping Creek in 2009. A total of 29 Aboriginal site locations were recorded during that survey. Aboriginal site locations were often found to cover reasonably large areas, due at least in part, to generally high levels of exposure and archaeological visibility.

One Aboriginal scarred tree were recorded during the field visit undertaken in September and October 2018. In addition, six new Aboriginal artefact locations were identified. Following consultation with Heritage NSW and due to the high number of overlapping and incorrect site recordings it has been decided to consolidate the site recordings for Jumping Creek into 25 site areas.

An Aboriginal cultural heritage assessment for the Ellerton Drive Extension Project was undertaken by Waters Consultancy in 2016. That report identified several areas of interest in relation to the current study area based on oral evidence from Aboriginal informants. The first was an area referred to as Valley (Jumping) Creek & Queanbeyan River Junction Resource Gathering and Camping Cultural Area (Site A). Although recorded as a site of medium cultural heritage significance the area was not precisely mapped but rather its general location was indicated by an elliptical shape drawn on an aerial photograph that encompassed most of the Jumping Creek Valley and the confluence with the Queanbeyan River.

Also identified by Waters (2016) as an area noted as a portion of a traditional walking track referred to Site B: Queanbeyan River Pathway Cultural Site. Additionally, Site B: Queanbeyan River Pathway Cultural Area (Site B), is identified as a site of high cultural heritage significance.

Waters also made passing reference to an Aboriginal ceremonial site, which although the site was not described, and the location was not recorded or verified was described as being near the confluence of Jumping Creek and the Queanbeyan river and therefore was possibly located within the study area. To ascertain if such a site existed within the study area Ms Waters was contacted but could not supply any further information, NOHC undertook additional consultation with the Aboriginal RAPs, and NOHC commissioned an anthropological report which specifically addressed this issue. Subsequently Adrian Brown has indicated that he is aware of where the ceremonial site is and that it is outside of the project development area.

The archaeological findings of the current investigation area generally consistent with the interpretation of the Jumping Creek Valley as having been a place where Aboriginal people camped and gathered food resources and further the current study has provided more detailed information on the specific locations of Aboriginal activity through mapping the archaeological evidence. However, the current study also revealed the level of historical and modern land use disturbance that has impacted these sites and which has a bearing on the assessment of their significance in most cases reducing them to low to moderate.

In addition to the Aboriginal heritage noted above, 13 potential non-Aboriginal heritage items were recorded within the Jumping Creek study area by NSW Archaeology in 2009. These items are as follows:

- JCH1 – Shearing shed complex (H3)
- JCH2 – Mine shaft (H1)
- JCH3 – Limestone quarry (H2)
- JCH4 – Brick lime kilns (H4)
- JCH5 – Limestone quarries (H7)
- JCH6 – Limekiln
- JCH7 – Mine workings (H6)
- JCH8 – Ore processing area (H5)
- JCH9 – Miners' camp
- JCH1 – Mine shafts
- JCH1 – Domestic site
- JCH1 – Building material dump (H9?)
- JCH1 – Mine diggings

Items JCH1 (Shearing shed complex), JCH3 (Limestone quarry), JCH4 (Brick lime kilns), JCH5 (Limestone quarries), JCH6 (Lime kiln), JCH7 (Mine workings), JCH8 (Ore processing area), JCH9 (Miners' camp) and JCH11 (Domestic site) were assessed by NSW Archaeology 2009 as having significance at a local level.

There is one item listed on the Queanbeyan Local Environmental Plan and on the NSW State Heritage Inventory as an archaeological site located within the current project area:

Greenleigh	Marchiori's Lime Kiln and quarry	South east corner of Jumping Creek	Part of Lot 1, DP 711905
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During the field assessment for the current project,

- additional locations consisting of historic building material dumps were located; these have been included and mapped as part of previously recorded site JCH12; and
- an additional site location was recorded, JCH14.

#### Impacts on cultural heritage sites

A total of 10 of the 25 recorded Aboriginal site locations will be totally harmed by the project (Figure 11.4 and Figure 11.5). In addition, 11 sites will be subject to limited harm by the project and 4 sites will not be impacted at all. Table 11.1 outlines each site and the impact. Impacts will occur from the construction of the residential subdivision as well as rehabilitation actions within Jumping Creek.

As well as individual site locations the Aboriginal archaeological resource within the Jumping Creek project area is best described as a disturbed remnant cultural landscape with an uneven distribution of artefacts surviving across the whole project area and some pockets of *in-situ* deposits within and area largely disturbed by historical and recent land use activity. The test excavation program has found that there are subsurface archaeological deposits found in the project area in the following landforms:

- spur line crests;
- saddle/drainage lines;
- flats; and
- adjacent to Jumping Creek.

The results show that where there is any remaining topsoil accumulation on a landform then there is likely to be subsurface archaeological deposit, and also where there is no soil accumulation that there

is unlikely to be subsurface archaeological deposits. Again, the areas with identified archaeological deposit will be impacted both by the residential construction activities as well the rehabilitation actions within Jumping Creek. Areas 2, 5, 8 and 12 will be totally harmed by the project and Areas 7, 17, 18 and 20 are subject to harm, limited harm and are partially within the no harm area.

A change to the design of the project has included a conservation area in the Jumping Creek and Valley Creek confluence portion of the project area. This conservation area limits harm to areas of identified archaeological deposit and surface artefact scatters. This will ensure that the archaeological deposits and subsurface artefacts in this area will be left in-situ and be retained ensuring intergenerational equity.

The track remediation works, erosion rehabilitation works and contamination rehabilitation works will also impact surface artefact scatters (Figure 11.4). Impacts to subsurface artefacts will be minimal due as the works will be shallow and are unlikely to substantially impact subsurface deposits. Additionally, impact to subsurface deposits will occur in locations where the creek rehabilitation is to occur.

Eight items of historical heritage will be subject to impacts from the project, they are:

JCH1, 2, 5, 6, 8, 9, 12 and 14

Sites JCH1, JCH5, JCH6, JCH8 and JCH9 have been assessed as meeting the criteria for local heritage listing. Sites JCH2, JCH12 and JCH14 have been assessed as not meeting the requirements for heritage listing.

Heritage listed site Marchiori's lime kiln and quarry (JCH3 and JCH4) may be impacted by erosion remediation works.

#### **Recommendations:**

All Aboriginal objects within the study area are considered by the local Aboriginal community to be of cultural significance and the RAPS have indicated their strong preference that Aboriginal cultural information be salvaged and their connection to the area be acknowledged. The archaeological evidence demonstrates that the area has been a focus of Aboriginal camping and resource gathering in the past and is consistent with the interpretation of such a place along a traditional pathway. However, the study area has been subject to substantial long-term, post-contact land use disturbance and this has negatively impacted many of the individual sites recorded in the area such that the Aboriginal landscape may best be described as a remnant cultural landscape with pockets of intact archaeological features in a disturbed landscape. Therefore, it is recommended that

1. Measures to celebrate the ongoing connection of Aboriginal people to Jumping Creek should be incorporated into the detailed design. These could include:
  - a. The naming of parks and areas of Jumping Creek with local Aboriginal names/words;
  - b. The use of native plants and bush food in gardens and landscaping;
  - c. Interpretation signage that informs residents of the past use and ongoing connection of Aboriginal people to Jumping Creek;
  - d. Further advice should be sought from the RAPs and appropriately qualified heritage professional on the exact nature of the interpretation measures and appropriate native vegetation and words that should be used.
2. The design of the green space in the conservation area should be undertaken with the local Aboriginal community including the selection of plants and any interpretation.
3. The proponent should consider Aboriginal Cultural Awareness training to be incorporated into the induction process for staff and sub-contractors working on the development of Jumping Creek;
4. The proponent should consider utilising local Aboriginal businesses for completing native plants and bush foods planting and landscaping.

5. Once the site is developed local council should consider allowing for Aboriginal Cultural Tours to be conducted in Jumping Creek in order to further inform the community of the Aboriginal past and future of Jumping Creek.
6. The conservation area should be preserved in perpetuity and a landscape plan should be developed following project approval.
7. All areas mapped as *No Harms* areas are to be avoided by the project. This includes ensuring that contractors do not drive off tracks with heavy machinery. To ensure this they should be fence or clearly demarcated during construction.
8. All topsoil from the project area should remain in the project area, either in the location from where it was excavated or in another part of the site. If topsoil is placed in another part of the project area the location should be recorded and submitted to AHIMS as a possible Aboriginal site containing artefacts (objects).
9. Prior to development impacts, a program of subsurface archaeological salvage should be undertaken for the project in areas subsurface archaeological deposit in areas of Harm see Table 11.1; this program is included in Appendix 6.
10. Prior to development impacts a surface artefact collection program should be conducted at all those Aboriginal sites in the Jumping Creek study area within areas of harm and limited harm, see Table 11.1. Aboriginal Site Impact Recording Forms should be completed for all impacted sites. The collection programme should be carried out in conjunction with the excavation program referred to in 9 above, to ensure optimum salvage of archaeological values.
11. In order to maximise the cultural heritage information from the excavated sites, all salvaged material should be appropriately analysed and catalogued and where appropriate results should inform the interpretative strategies for the site.
12. The current proposal avoids site JC Scarred Tree 1, Detailed design and/or design changes for the project should continue to avoid this site.
13. Site fencing should be installed to protect any sites or parts of sites that are outside the project area. This can be in the form of a project area fence or individual site fencing. Site fencing should be installed by an appropriately qualified heritage professional and RAP's so everyone can agree in the field on the exact location of the fencing necessary to effectively protect the sites.
14. A Return to Country Protocol or long-term management plan should be developed in consultation with the RAPs for any Aboriginal artefacts that are collected/salvaged during mitigation works associated with this project. This should take into consideration the significance and or research value of the material emerging from the analysis.
15. Archival recording of historic sites within the project area should be conducted where these have been assessed as locally significant. Archival recordings should include a detailed survey, mapping and photographic record of, those items that will be impacted. In many cases this will necessitate substantial vegetation clearance prior to and during survey work. Depending upon the results of such investigations there may be the need for additional work in the form of salvage excavation at some or all of the heritage items.
16. Marchiori's lime kiln and quarry (JCH3 and JCH4) should not be impacted by the project. Any erosion remediation works in the vicinity of this site should be designed so as to avoid impact the quarry or lime kiln locations.
17. Consideration should be given to incorporating the appropriate interpretation of the history and heritage of the area into the project design.
18. The unanticipated finds discovery protocol outlined in Appendix 7 should be implemented for this project.



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## Abbreviations

<b>ACHAR</b>	Aboriginal Cultural Heritage Archaeological Report
<b>AHIMS</b>	Aboriginal Heritage Information Management System
<b>AHIP</b>	Aboriginal Heritage Impact Permit
<b>ANU</b>	Australian National University
<b>BP</b>	Before Present
<b>BNAC</b>	Buru Ngunawal Aboriginal Corporation
<b>cm</b>	centimetre
<b>DECCW</b>	Department of Environment, Climate Change and Water (NSW)
<b>DPIE</b>	Department of Planning, Industry and Environment (formally OEH)
<b>ESD</b>	ecological sustainable principles
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act 1979</i>
<b>ESC</b>	effective survey coverage
<b>FGS</b>	fine grained siliceous
<b>GPS</b>	Global Positioning System
<b>ha</b>	hectare
<b>kms</b>	kilometres
<b>LES</b>	Local Environmental Study
<b>m</b>	metres
<b>m<sup>2</sup></b>	square metre
<b>mm</b>	millimetre
<b>NCDC</b>	National Capital Development Commission
<b>NPW Act</b>	<i>National Parks and Wildlife Act 1974</i>
<b>NOHC</b>	Navin Officer Heritage Consultants
<b>NPWS</b>	National Parks and Wildlife Service
<b>OEH</b>	NSW Office of Environment and Heritage (now known as DPIE)
<b>QPRC</b>	Queanbeyan Palerang Regional Council
<b>RAPs</b>	Registered Aboriginal Parties

## Glossary

<b>Aboriginal Object</b>	means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction and includes Aboriginal remains (National Parks and Wildlife Act 1974, s5(1)).
<b>Aboriginal Place</b>	means any place declared to be an Aboriginal place under section 84 (National Parks and Wildlife Act 1974, s5 (1)).
<b>Aboriginal site</b>	a place or location which relates to past or contemporary Aboriginal occupation. Sites can be divided into those identified from archaeological evidence (archaeological sites), and those related to intangible cultural values, such as revealed by oral tradition and lore, or from the historical record. An Aboriginal site may have both archaeological and intangible values.
<b>archaeological site</b>	a place or location with the confirmed presence of archaeological evidence of Aboriginal occupation, where the context of that evidence can be reliably related to the Aboriginal actions which produced the evidence.
<b>artefact</b>	an object, normally portable, made or modified by human hand.
<b>artefact occurrence</b>	a term usually applied to site recordings comprising stone artefacts and which refers to one or more stone artefacts situated within a specified surface area or subsurface deposit. Various measures are used for defining the boundaries of such recordings. Refer also to 'surface' and 'subsurface artefact occurrence'.
<b>artefact scatter</b>	a formerly used open site-type classification defined as two or more stone artefacts situated no more than a specified distance (such as 60m) away from any other included artefact. Typically, this category did not include isolated finds. The use of the term <i>scatter</i> was intended only to be descriptive and did not infer the original human behaviour which formed the site. The term <i>open camp site</i> has been used extensively in the past to describe open artefact scatters.
<b>background discard or scatter</b>	<p>there is no single concept for background discard or 'scatter', and therefore no agreed definition. The definitions in current use are based on the postulated nature of prehistoric activity, and often they are phrased in general terms and do not include quantitative criteria. Commonly agreed is that background discard occurs in the absence of 'focused' activity involving the production or discard of stone artefacts in a particular location. An example of unfocussed activity is occasional isolated discard of artefacts during travel along a route or pathway. Examples of 'focussed activity' are camping, knapping and heat-treating stone, cooking in a hearth, and processing food with stone tools.</p> <p>In practical terms, over a period of thousands of years an accumulation of 'unfocussed' discard may result in an archaeological concentration that may be identified as a 'site'. Definitions of background discard comprising only qualitative criteria do not specify the numbers (numerical flux) or 'density' of artefacts required to discriminate site areas from background discard.</p>



<b>developable land</b>	the portion of the project area that has been identified as developable for a residential estate by Queanbeyan Palerang Regional Council (QPRC).
<b>Diatoms</b>	are single-celled algae.
<b>isolated find</b>	a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a specified radius, such as 60 metres (depending on which archaeological convention is used). Isolated finds may represent single discard events, be constituent components of background scatter, or be indicative of larger obscured, remnant and disturbed sites.
<b>JCH</b>	<b>An abbreviation of 'Jumping Creek Historical' used as a prefix to feature numbers related to the historical or non-Aboriginal cultural features.</b>
<b>lithic assemblage</b> (of stone)	a collection of whole and fragmentary stone artefacts and manuports obtained from an archaeological site, either by collecting items scattered on the present ground surface (see lithic scatter) or by controlled excavation (see also 'stone artefact').
<b>open camp site</b>	a formerly used site type classification defined as an open context stone artefact occurrence (or artefact scatter), containing two or more artefacts situated no more than a specified arbitrary distance (such as 60 metres) away from any other included artefact. The term <i>open camp site</i> was based on ethnographic modelling suggesting that most artefact occurrences resulted from activities at camp sites. However, in order to separate the description from the interpretation of field evidence, both open camp sites and isolated finds are now referred to as <i>artefact occurrences</i> .
<b>potential archaeological deposit (PAD)</b>	a discrete location or area, defined spatially either by geomorphological, disturbance or administrative criteria, within which there is a predicted likelihood that subsurface archaeological material is present, and that this material would warrant archaeological investigation in order to determine its scientific, cultural, or statutory value and status.
<b>study area</b>	the area for which the assessment is being undertaken.
<b>Total Station</b>	an electronic transit theodolite integrated with electronic distance measurement (EDM) to measure both vertical and horizontal angles and the slope distance from the instrument to a particular point



# 1. INTRODUCTION

## 1.1 Project Description

Jumping Creek is a new residential development on the eastern side of the new Ellerton Drive Extension in Queanbeyan, bounded by the Queanbeyan River on the southern side of the site. The current DP number is 1249543. The site has a number of existing features including:

- Sloping lands heavily degraded by previous farming/industry uses;
- Former infrastructure associated with previous industry uses (mine sites);
- Remnant woodland vegetation communities to the boundaries of the site; and
- A currently weed infested and eroded creek (Jumping Creek) traversing the site and connecting into Queanbeyan River.

The study area is approximately 95 hectares (ha) located within lot 1 DP 1249543, on the north-eastern outskirts of Queanbeyan, immediately east of Greenleigh Estate. The location of the study area is shown in Jumping Creek project area location Figure 2.2.

The proposed development involves the creation of 218 residential lots and associated open space areas. The residential lots are proposed to be free-standing blocks ranging in size from 600 square metres (m<sup>2</sup>) to 2.8 ha.

The development is proposed to be serviced by 13 internal roads. These roads are proposed to comprise of local streets, with an 8 metre (m) carriageway and varying verge widths to accommodate services. Two proposed vehicle connections onto the Ellerton Drive Extension are proposed to allow for safe ingress and egress from the residential development. As part of the development, infrastructure will be constructed for sewer, water, stormwater, electricity and communications. Gas has been omitted from the development after receiving advice from Jemena that the site cannot be serviced.

This report documents the results of a cultural heritage assessment of Jumping Creek. The report was commissioned by SPACELAB Studio Pty Ltd on behalf of PEET Jumping Creek Limited.

## 1.2 Study Aims

The aims of the study are to locate and assess any Aboriginal and historical sites/objects not previously recorded in the project area and to provide an impact assessment for those sites.

## 1.3 Project Framework

The Jumping Creek project will be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

## 1.4 This Report

Documents the outcomes of the field survey, background research, test excavations and Aboriginal community consultation processes and follows the format outlined below.

### 1.4.1 Outline

This report:

- describes the proposed development/works etc (Section 1);
- provides a description of the study area (Section 2);



- describes the methodology used in this assessment (Section 3);
- describes consultation with Aboriginal people (Section 4);
- provides a heritage context for the study area (Section 5 and 6);
- describes the results of the current investigation (Section 7 and 8);
- describes the cultural heritage values and significance statement of the study area (Section 9)
- describes the proposed activity (Section 10);
- provides actions to avoid and minimise harm (Section 11); and
- provides management recommendations based on the results of the investigation (Section 12).

#### **1.4.2 Restricted Information**

Information in this report relating to the exact location of Aboriginal sites should not be published or promoted in the public domain without further consultation and agreement from the RAPs and in the context of an approved interpretation plan.

No information provided by Aboriginal stakeholders in this report has been specifically identified as requiring access restrictions due to its cultural sensitivity.

#### **1.4.3 Confidentiality**

No information in this report has been classified as confidential except in so far as outlined in section 1.4.2 above.



## 2. DESCRIPTION OF THE AREA

### 2.1 Location of Proposed Activity

The study area is located on the north-eastern outskirts of Queanbeyan, immediately east of Greenleigh Estate. Queanbeyan is located in the Southern Tablelands of NSW. The land in question measures approximately 95 ha. The topographic context of the study area is shown in Figure 2.2. The whole of the project area is located in lot 1 DP 1249543.

### 2.2 Environment

Jumping Creek is located within an enclosed valley drained by Jumping Creek and its ephemeral 1st and 2nd order tributaries. The Queanbeyan River forms part of the south-western boundary. Jumping Creek flows in a north-westerly direction from the south-eastern corner of the property and then commences an easterly meander before turning south at a rocky gorge. From the gorge the creek then flows to the west where it meets the Queanbeyan River. The majority of the creek flows through bedrock-based slopes. However, some alluvial flats are also present. It is an intermittent watercourse comprising a channel which varies in width to a maximum of 10 m. The entire Jumping Creek catchment measures 4,000 ha (Parsons Brinckerhoff Australia Pty Ltd 2008).

The geology present includes Colinton Volcanics dacitic tuff with interbedded siltstone and limestone, and Cappanana Beds siltstone and shale interbedded with limestone (Kuskie 1989).

The existing slopes in the study area are shown on Figure 2.1. The terrain is undulating and comprises crest, simple slope, lower slope and drainage depression/flat morphological landform elements. The slope gradient varies from steep to gentle.

The study area is heavily eroded due to years of neglect and is covered in significant areas of non-native vegetation. This is particularly evident along the creek corridor that has become overgrown with weeds and non-native vegetation mixed with a number of dumped car bodies and other items.

Vegetation across the property is dominated by remnant plantings from the historic land use including various fruit and ornamental trees and shrubs and agricultural weeds. Land adjacent to the site contains mixtures of box-gum woodland, dry open forest and grassland woodland mosaic communities (Parsons Brinckerhoff Australia Pty Ltd 2008); prior to European clearance, similar communities are likely to have been present in the study area.



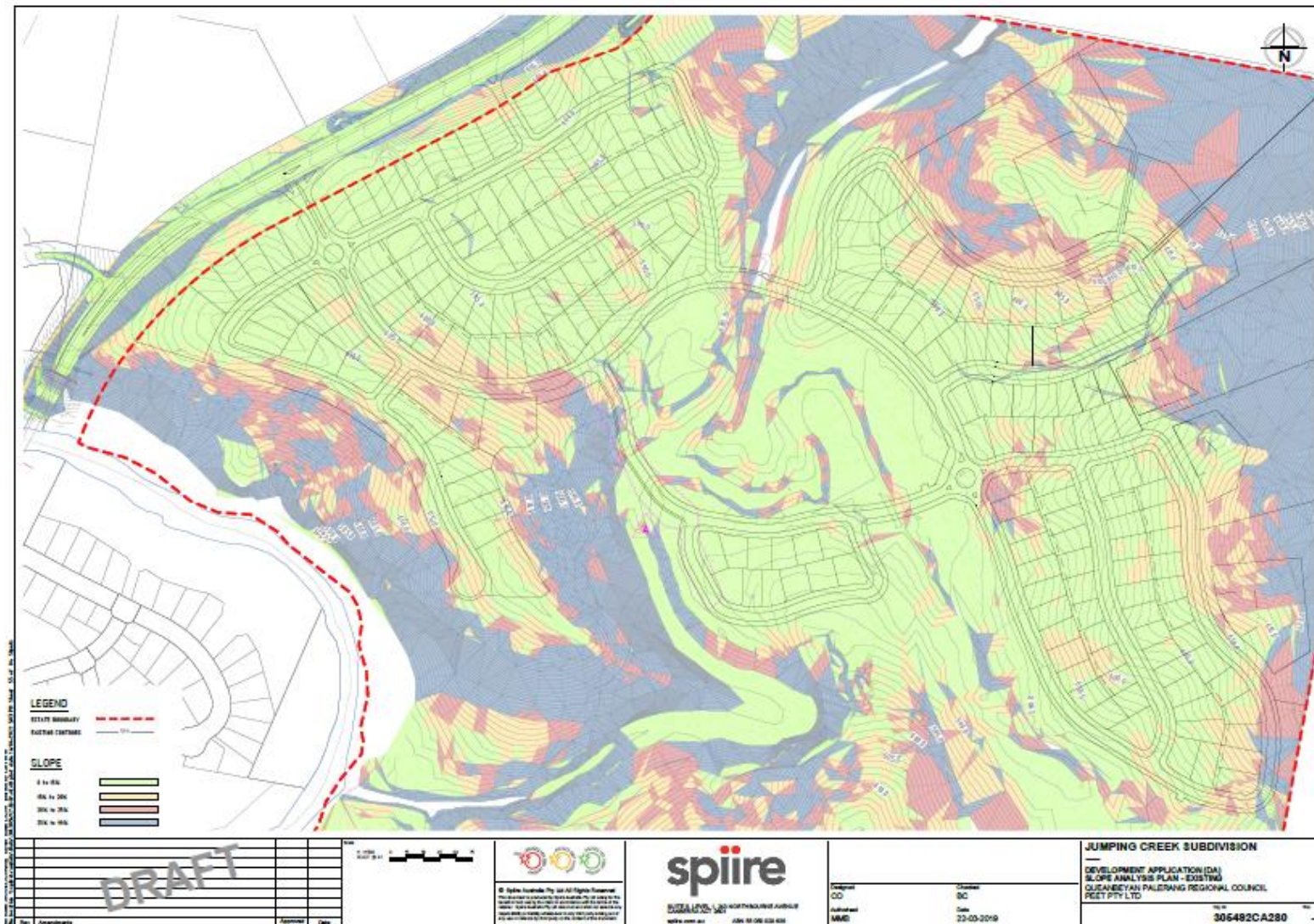


Figure 2.1 Jumping Creek slope analysis (provided by PEET Jumping Creek Pty Ltd)



### 2.2.1 Soils

The soils in the areas proposed for housing and the majority of related infrastructure, range from shallow well-drained Tenosols and Rudosols on crests and upper slopes, moderately deep and moderately drained red Kurosols and red Kandosols on mid and lower slopes. These soils are moderately-to-highly susceptible to erosion from non-concentrated and concentrated water flows.

The soil on the steeper slopes on the eastern boundary of the development range from shallow Rudosols to Yellow Kandosols to Brown Kurosols. These soils are moderately-to-highly susceptible to erosion from non-concentrated water flows and very highly susceptible to erosion from concentrated water flows. As these soils are located on steeper slopes, the erosion risk along drainage depressions and tracks which concentrate water flows is significant.

The soil on the steeper slopes along the northern boundary of the development range from shallow Rudosols on crests and side slopes to Red and Brown Kurosols on side slopes. These soils are moderately susceptible to erosion from non-concentrated water flows and highly susceptible to erosion from concentrated water flows. As these soils are located on steeper slopes, the erosion risk along drainage depressions and tracks which concentrate water flows is significant – however not as high a risk as along the slopes on the eastern boundary (Franklin Consulting Australia 2019).

## 2.3 Aboriginal People's Use of the Landscape

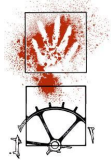
The spatial patterning of archaeological sites found during heritage studies undertaken in Jumping Creek, the Queanbeyan region, and in Canberra, indicate that there are no landscape types in this region that were not visited and occupied by Aboriginal people in the long period prior to European settlement.

Archaeological sites are scattered across a range of different landforms, and at varying distances from important landscape features like rivers and other water sources. Of these sites, artefact scatters and isolated artefacts are by far the most common site type. The lack of any large areas that are devoid of prehistoric sites presumably reflects the availability of resources and the relatively variable nature of the ecology across the region and the consequent proximity and accessibility of different ecological zones.

Aboriginal people of the Limestone Plains (the Canberra and Queanbeyan Region) utilised the resources of the waterways throughout the region including a wide range of fish, freshwater shellfish, crayfish, tortoise, platypus, and aquatic birds including ducks, swans, and brolgas. Aboriginal people utilised a wide range of land-based resources, including animals such as kangaroos, wallabies, possums, wild turkeys, wallaroos, wombats, and emus. Lizards, snakes, echidnas, ants, grubs and bird eggs were also important resources. Other land-based resources that were utilised by Aboriginal people in the region included plant foods such as the yam daisy, wattle-seeds, orchid tubers, tree-fern trunks, berries and grass seeds and plants for bush medicine. Wood was used to make boomerangs, spears, digging sticks, bark was used for canoes and shelters, fibre to produce string, and stone to make axes, grinding stones, and spear points. In the summer months there was also the 'annual pilgrimage to the adjacent high country of the Bogong Mountains... and the Snowy Mountains' (Avery 1994). In 1844 George Augustus Robinson on his travels through the region noted that,

*The Natives of the Low Country and of the Mountains assemble in large numbers in the fine Season to collect the Boogong fly a species of Moth found in myriads in the higher Altitudes of the Mountains. They are extremely nutritious, and the Natives subsist during the Season entirely upon them they are called Cori by the Omeo, and Boogong by the Yass Blacks' (in Mackaness 1941, cited in Waters Consultancy Pty Ltd 2016).*

Every year people travelled from the mountains, the tablelands and the coast to gathering places on the fringes of the high country and then further up into the high country to where the Bogong moths gathered. These annual gatherings combined feasting on the rich resource of the moths with the holding of important ceremonial events. These gatherings continued well into the 19th Century until the impacts of the European invasion, through disease and settlement, brought them to an end (Cootamundra Herald, 4 May 1920).



One of the most important resources for prehistoric groups, and one that is relatively easy to identify in the landscape, is water. The proximity of Jumping Creek to the Queanbeyan River provided a stable source of water year-round.

The geology of the region provides relatively plentiful sources of stone, suitable for the production of flaked or ground tools. Hills, spurs and ridgelines across the region have variable erosion on their crests that frequently exposes bedrock, which includes granite and other igneous rocks, hornfels and other metamorphic rocks, and quartz. Sedimentary rock is also present in the Canberra region, some of which takes the form of flakeable silcrete and mudstone.

Larger rivers in the region have transported pieces of rock down from the ranges, and large gravel-beds have been deposited in lower-lying areas. These gravel beds contain a sample of the region's geology and sometimes functioned as procurement areas where prehistoric groups could access stone. Most of the rock in these gravels is igneous or metamorphic, but pieces of sedimentary rock and fine-grained rocks such as chert are also present.

The variable distribution of different landforms near Jumping Creek would also have provided a variety of floral and faunal resources for prehistoric groups. The variation in elevation around Jumping Creek, with ranges to the east and west and undulating hills and plains across the Canberra area would have created a closely spaced distribution of ecological zones that could have been exploited by mobile hunter-gatherer groups.



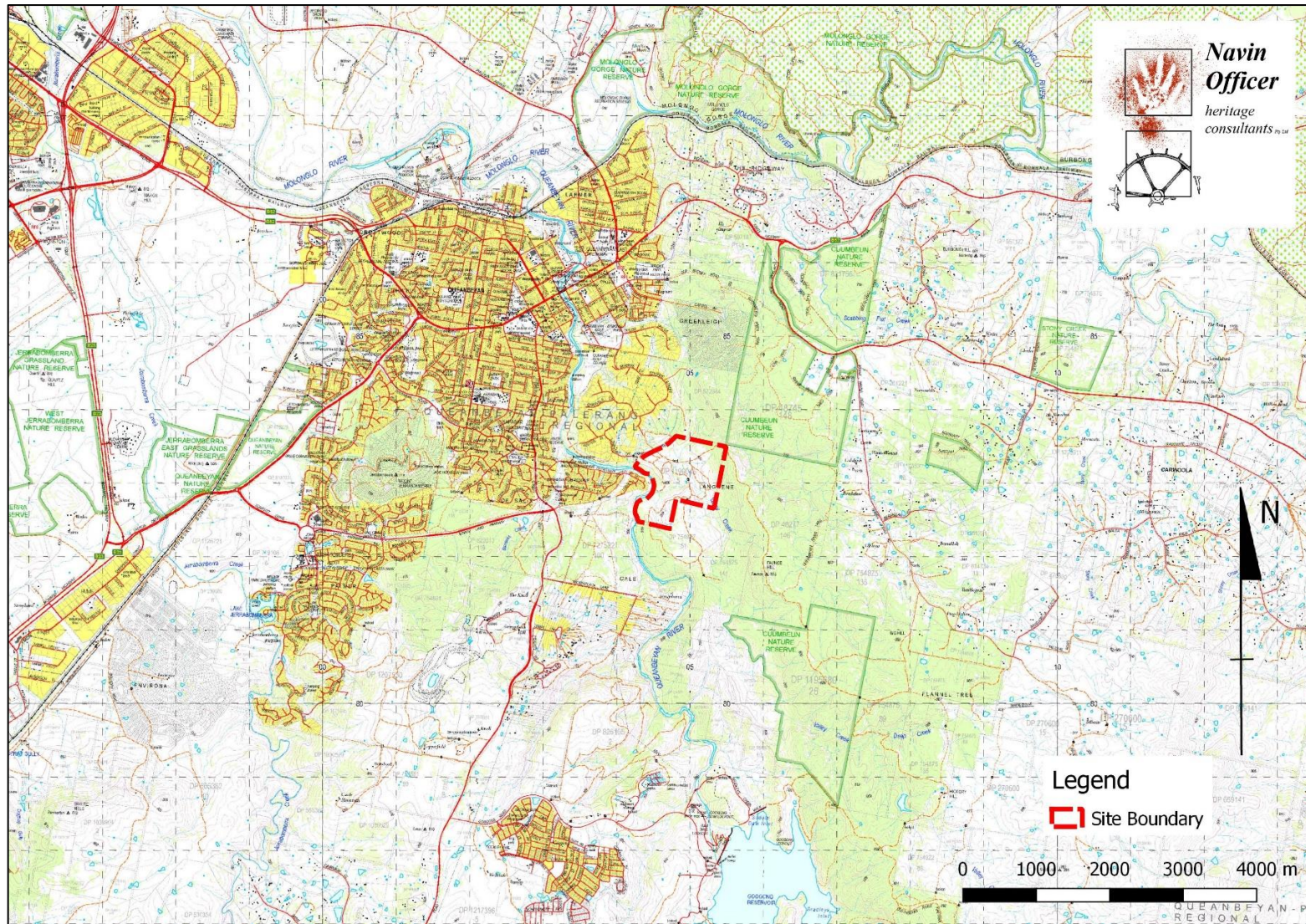


Figure 2.2 Jumping Creek project area location



### 3. STUDY METHODOLOGY

#### 3.1 Contributors

The field survey was carried out by archaeologists Nicola Hayes and Jasmine Fenyvesi (Navin Officer Heritage Consultants (NOHC)) with assistance from the Aboriginal representatives listed in Section 4. The subsurface testing program was carried out by Nicola Hayes and Adrian Cressey with assistance from Ben Sybert. Murray Holland, Donna-Lee Wynen and Jacob McIntyre provided field assistance, with assistance from the Aboriginal representatives listed in Section 4.

This report was prepared by Nicola Hayes.

Nicola has a Bachelor of Arts/Science and a Graduate Diploma in Archaeology from the Australian National University (ANU). Jasmine has a Bachelor of Archaeological Practice from the ANU. Adrian has a Bachelor of Arts (Hons) from the ANU. Ben has a Masters in Archaeological Science ANU.

Internal review of this report was completed by Susan McIntyre-Tamwoy.

#### 3.2 Literature and Database Review

A range of archaeological and historical data was reviewed for the Jumping Creek study area and its surrounds. This literature and data review were used to determine if known Aboriginal and historical sites were located within the area under investigation, to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and heritage management context. The review of documentary sources included heritage registers and schedules, local histories, and archaeological reports.

Aboriginal literature sources included the Aboriginal Heritage Information Management System (AHIMS) and associated files and catalogue of archaeological reports. Sources of historical information included regional and local histories, heritage studies and theses; parish maps; and where available, other maps, such as portion plans.

Searches were undertaken of the following statutory and non-statutory heritage registers and schedules.

Statutory Listings:

- AHIMS;
- Atlas of Aboriginal Places;
- World Heritage List;
- The National Heritage List (Australian Heritage Council);
- The Commonwealth Heritage List (Australian Heritage Council);
- The State Heritage Register (NSW Heritage Branch, Office of Environment and Heritage);
- Heritage Schedule(s) from the Queanbeyan Local Environmental Plan 2012.

Non-Statutory Listings:

- The State Heritage Inventory (NSW Heritage Branch, Office of Environment and Heritage);
- Register of the National Trust of Australia (NSW).





### 3.3 Field Survey Methodology

Field survey of the project area was undertaken on 17 September 2018 and an additional field visit was undertaken on 9 October 2018.

The archaeological field survey was completed on foot by 5–8 people walking selected traverses, spaced a regular distance apart between approximately 5 and 50 m apart. Extra focus was applied to locations of already recorded sites or potential archaeological deposits (PADs) and areas yielding high ground surface visibility/exposures.

Aboriginal field participants were encouraged to communicate knowledge regarding the cultural heritage values of the study area, archaeological and cultural sites, and the overall landscape. The project team consulted with the Aboriginal community in order to conduct the cultural assessment program in a culturally sensitive manner and have treated all information provided with respect. No material was identified by the Aboriginal participants as confidential.

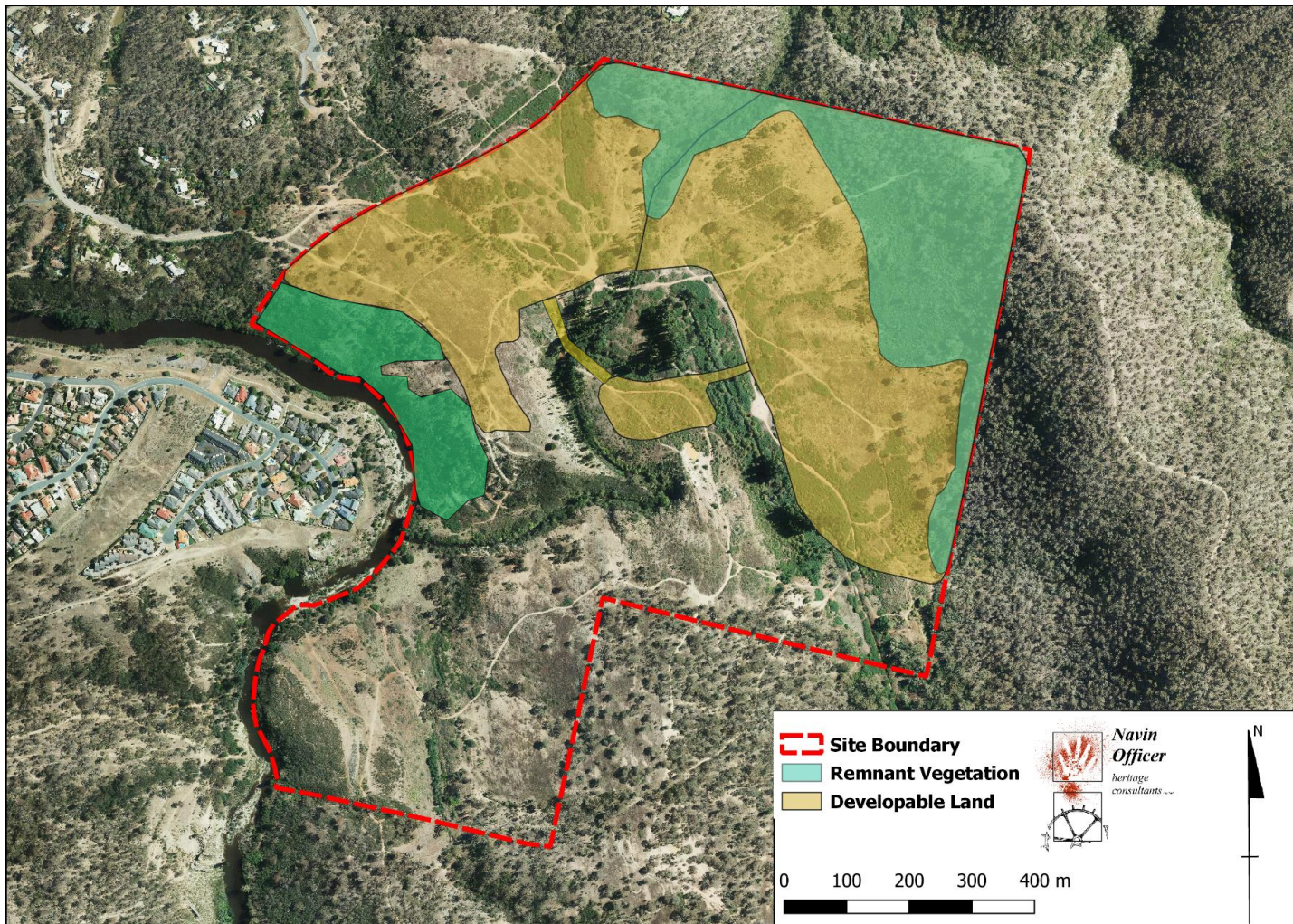
#### 3.3.1 Site Recording

All encountered surface archaeological objects, sites, potential archaeological deposits and places of Aboriginal cultural value were documented. All sites had the following details recorded using standardised recording forms:

- site name, recorder and date;
- site type;
- GPS coordinates;
- landscape and landform character;
- context information – cultural/spiritual location, proximity to other objects/sites etc.;
- site dimensions;
- site condition and potential to be larger;
- site content including numbers and artefact types, raw materials and detailed recording of a sample of artefacts;
- photos; and
- any other relevant information, such as oral information and informant details.

### 3.4 Sampling Strategy

The project aimed to undertake a sampling survey of the area identified by Queanbeyan Palerang Regional Council (QPRC) as 'Developable Land' (see Figure 3.1). The sampling strategy was completed in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (NSW Department of Environment, Climate Change and Water (DECCW) 2010b) and included the inspection of all landforms (and all individual instances of that landform) located within the 'developable land'. In designing the survey, it was assumed that all land within the area identified as 'developable land' would be impacted. In addition, the survey was flexible enough to respond to information from Aboriginal community representatives to incorporate any places of cultural value whether or not they also contained visible archaeological evidence.



**Figure 3.1 Indicative area of Developable Land within Jumping Creek (for latest plan refer to subdivision plan)**





## 3.5 Recording Parameters

### 3.5.1 Aboriginal Sites and PADs

The archaeological survey aimed to identify material evidence of Aboriginal occupation as revealed by surface artefacts and areas of archaeological potential without surface artefacts. Potential recordings fall into two broad categories: sites and PADs. At the same time the survey was flexible enough to incorporate any areas identified by the RAPs as having Aboriginal cultural value.

#### 3.5.1.1 Sites

An archaeological site is defined as any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity. Most Aboriginal sites are identified by the presence of three main categories of artefacts: stone or shell artefacts situated on or in a sedimentary matrix, marks located on or in rock surfaces, and scars on trees.

Frequently encountered site types within south-eastern Australia include stone artefact occurrences – including isolated finds and open artefact scatters, coastal and freshwater middens, rock shelter sites – including occupation deposit and/or rock art, grinding groove sites and scarred trees. For the purposes of this section, only the methodologies used in basic site identification are outlined, together with those for recording types encountered by this investigation.

Not all Aboriginal sites feature humanly modified objects. Some sites such as natural mythological (sometimes called Dreaming) sites are natural landscape features that have particular spiritual significance to Aboriginal people. In addition, traditional walking tracks and resources use places (such as hunting grounds and bush foods locations) may also be important features of the cultural landscape.

#### *Stone artefact occurrences*

Stone artefact occurrences are the most commonly recorded site type in Australia. They may consist of single artefacts – described as isolated finds; or as a distribution of more than one artefact – often described as an artefact scatter or ‘open camp site’ when recording surface artefacts, or as a subsurface artefact distribution when dealing with an archaeological deposit. Where artefact incidence is very low, either in terms of areal distribution (artefacts per square metre) or density (artefacts per cubic metre), then the differentiation of the recording from background artefacts counts or *background scatter* may be an issue.

#### *Isolated finds*

An isolated find is a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a radius of 60 m. Isolated finds may be indicative of:

- random loss or deliberate discard of a single artefact;
- the remnant of a now dispersed and disturbed artefact scatter; and
- an otherwise obscured or subsurface artefact scatter.

Except in the case of the latter, isolated finds may be considered to be constituent components of the *background scatter* present within any particular landform.

The distance used to define an isolated artefact varies according to the survey objectives, the incidence of ground surface exposure, the extent of ground surface disturbance, and estimates of *background scatter* or *background discard* densities. In the absence of baseline information relating to background scatter densities, the defining distance for an isolated find must be based on methodological and visibility considerations. Given the varied incidence of ground surface exposure and deposit disturbance within the study area, and the lack of background baseline data, the specification of 60 m is considered to be an effective parameter for surface survey methodologies. This distance provides a balance between detecting fine scale patterns of Aboriginal occupation and avoiding environmental





biases caused by ground disturbance or high ground surface exposure rates. The 60 m parameter has provided an effective separation of low-density artefact occurrences in similar southeast Australian topographies outside of semi-arid landscapes.

### *Background scatter*

Background scatter is a term used generally by archaeologists to refer to artefacts which cannot be usefully related to a place or focus of past activity (except for the net accumulation of single artefact losses).

There is no single defined concept for background discard or 'scatter', and therefore no agreed definition. The definitions in current use are based on the postulated nature of prehistoric activity, and often they are phrased in general terms and do not include quantitative criteria. Commonly agreed is that background discard occurs in the absence of 'focused' activity involving the production or discard of stone artefacts in a particular location. An example of unfocused activity is occasional isolated discard of artefacts during travel along a route or pathway. Examples of 'focused activity' are camping, knapping and heat-treating stone, cooking in a hearth, and processing food with stone tools. In practical terms, over a period of thousands of years an accumulation of 'unfocused' discard may result in an archaeological concentration that may be identified as a 'site'. Definitions of background discard comprising only qualitative criteria do not specify the numbers (numerical flux) or 'density' of artefacts required to discriminate site areas from background discard.

### *Artefact scatters*

Artefacts situated within an open context are classed as an open artefact scatter (or 'open camp site') when two or more occur no more than 60 m away from any other constituent artefact. The 60 m specification relates back to the definition of an isolated find (*refer above*). The use of the term *scatter* is intended only to be descriptive of the current archaeological evidence and does not infer the original human behaviour which formed the site. The term *open camp site* has been used extensively in the past to describe open artefact scatters. This was based on ethnographic modelling suggesting that most artefact occurrences resulted from activities at camp sites. However, in order to separate the description from the interpretation of field evidence, the terms *artefact scatter*, *artefact distribution* or *artefact occurrence* are now more extensively used. The latter two options can also be used to categorise artefacts occurring in subsurface contexts.

#### **3.5.1.2 Potential Archaeological Deposits**

A potential archaeological deposit, or PAD, is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape. The potential for subsurface material to be present is assessed using criteria developed from the results of previous surveys and excavations relevant to the region. Where necessary, PADs can be given an indicative rating of their 'archaeological potential' based on a combined assessment of their potential to contain artefacts, and the potential archaeological value of the deposit. Table 3.1 illustrates the matrix on which this assessment is based. Locations with low potential for artefacts fall below the threshold of classification. In such cases the potential incidence of artefactual material is considered to be the same as, or close to that for background scatter. Where there is moderate potential for artefacts, the predicted archaeological potential parallels the potential significance of the deposit. For deposits with high potential for artefacts, the assessed archaeological potential is weighted positively.

The boundaries of PADs are generally defined by the extent of particular micro-landforms known to have high correlations with archaeological material. A PAD may or may not be associated with surface artefacts. In the absence of artefacts, a location with potential will be recorded as a PAD. Where one or more surface artefacts occur on a sedimentary deposit, a PAD may also be identified where there is insufficient evidence to assess the nature and content of the underlying deposit. This situation is due mostly to poor ground surface visibility.



**Table 3.1 Matrix showing the basis for assessing the archaeological potential (shown in bolded black text) of a potential archaeological deposit**

		<b>Potential to contain Aboriginal objects</b>		
		<i>Low</i>	<i>Moderate</i>	<i>High</i>
<b>Potential archaeological significance</b>	<i>Low</i>	---	<b>low</b>	<b>moderate</b>
	<i>Moderate</i>	---	<b>moderate</b>	<b>high</b>
	<i>High</i>	---	<b>high</b>	<b>high</b>

### 3.5.2 Historical Sites and Features

Historical archaeology refers to the 'post-contact' period and includes domestic, commercial and industrial sites as well as maritime sites. It is the study of the past using physical evidence in conjunction with historical sources. The three primary types of places or items that may form part of the historical archaeology context include:

- below ground evidence, including building foundations, occupation deposits, features and artefacts; and above ground evidence, including buildings, works, industrial structures and relics that are intact or ruined;
- areas of land that display evidence of human activity or occupation as fruit trees and ornamental plants; and
- shipwrecks, deposits and structures associated with maritime activities.

Within these broad parameters, an historical archaeological site may include:

- topographical features and evidence of past environments (that is, resident in pollens and diatoms);
- evidence of site formation, evolution, redundancy and abandonment (that is, features and materials associated with land reclamation, sequences of structural development, demolition/deconstruction, and renewal);
- evidence of function and activities according to historical theme/s represented (for example, an industrial site may contain diagnostic evidence of process, products and by-products);
- evidence associated with domestic occupation including household items and consumables, ornaments, personal effects and toys;
- evidence of diet including animal and fish bones, and plant residues;
- evidence of pastimes and occupations including tools of trade and the often-fragmentary signatures of these activities and processes;
- methods of waste disposal and sanitation, including the waste itself which may contain discarded elements from all classes of artefact as well as indicators of diet and pathology; and
- any surviving physical evidence of the interplay between site environment and people.

The information found in historical archaeological sites is often part of a bigger picture which offers opportunities to compare and contrast results between sites. The most common comparisons are made at the local level, however, due to advances in research and the increasing sophistication and standardisation of methods of data collection, the capacity for wider reference (nationally and,



occasionally, internationally) exists and places added emphasis on identification and conservation of historical archaeological resources.

### **3.6 Methodology for Archaeological Test Excavation Program**

#### **3.6.1 Study Aims**

While the survey assessment project includes the full range of heritage places, the archaeological test excavation component focussed solely on Aboriginal heritage. A landscape based archaeological subsurface testing program was undertaken in 14 October–8 November 2019 in consultation with the RAPs. The aim was to ascertain the presence and archaeological significance of any deposits within the landforms represented within Jumping Creek. Testing included all landforms within the project area. Testing was confined to areas of developable land as it is most likely that these areas will be directly impacted by the project. The information gained through the test excavation program will be applied across any area within Jumping Creek that is to be impacted by the project.

#### **3.6.2 Test Excavation Locations**

This program archaeologically tested seven areas to determine the nature and extent of any subsurface archaeological deposit across all of the landforms represented within Jumping Creek (Figure 3.2). Each landform type in the project area was tested. One test location is located within each landform. The landform types identified area:

- Spur line crest (high) (Test Location 1);
- Spur line crest (low) (Test Location 2);
- Saddle (Test Location 3);
- Saddle/drainage line (Test Location 4);
- Flats (Test Location 5);
- Hill slopes (Test Location 6);
- Jumping Creek (Test Location 7).

#### **3.6.3 Test Excavation Methodology**

The test excavation was undertaken in phases of testing (see Figure 3.3).

##### *Phase 1:*

Test pits were placed on two cross transects across the site at 10 m intervals.

10 test pits were completed at each location.

##### *Phase 2 (optional – results dependant):*

In the event that no artefacts are identified during the first phase of testing, additional pits were placed at intermediary 5 m intervals along the transects.

This comprised approximately 7 test pits.

##### *Phase 3:*

Additional test pits were placed on parallel offset transects at 10 m intervals to test the broader site/landform location.

This comprised approximately 4 test pits.



#### Phase 4:

If artefacts were found during any of these phases, then additional pits were excavated around excavation points with one or more of the following characteristics:

- diverse range of artefacts/materials;
- evidence of in situ knapping;
- low levels of disturbance;
- stratified deposits;
- other features indicative of substantial archaeological deposits.

Up to 12 pits of 50 x 50cm consistent with the Code of Practice will be combined in any one test location to explore the distribution artefacts across the site – e.g. excavation will attempt to follow higher artefact numbers.

Testing at each area followed a combination of all of the above phases. Additionally, if artefact numbers appeared to be increasing towards the margins of the area being tested, transects were extended in an attempt to identify site boundaries.

In summary, excavation proceeded to a more intensive level of testing regardless of whether artefacts are found during the first phases of testing. Following an on-site review, the test pit locations may have been varied slightly in order to avoid the following:

- large stone cobbles or tors (with maximum linear dimensions greater than 300 mm);
- outcropping bedrock;
- highly disturbed or eroded ground; and/or
- substantial vegetation (with stem diameter of 100 mm or greater).

#### 3.6.3.1 Hand Excavation

The test excavation program was carried out in accordance with the Code of Practice (Part 6 *National Parks and Wildlife Act 1974*), Requirement 16a. All pits were excavated by hand using 0.5 x 0.5 m units. The testing methodology consisted of the following:

1. All Pit locations were marked out and recorded..

The size of an individual testing point on a transect was 0.5 x 0.5 m.

2. Excavate pit.

Pits were excavated by shovel and trowel using standard by-hand archaeological methodologies including vertical and horizontal recording of spit levels and sedimentary, cultural and stratigraphic features.

The first excavation unit at each site was excavated and documented in 5 cm spits. Depending upon the results of the first excavation unit, subsequent spit intervals was 10 cm, except in circumstances where the excavation of cultural features or stratigraphic units necessitated a smaller interval.

Excavation ceased according to an on-site appreciation of the vertical extent of the archaeological deposit.

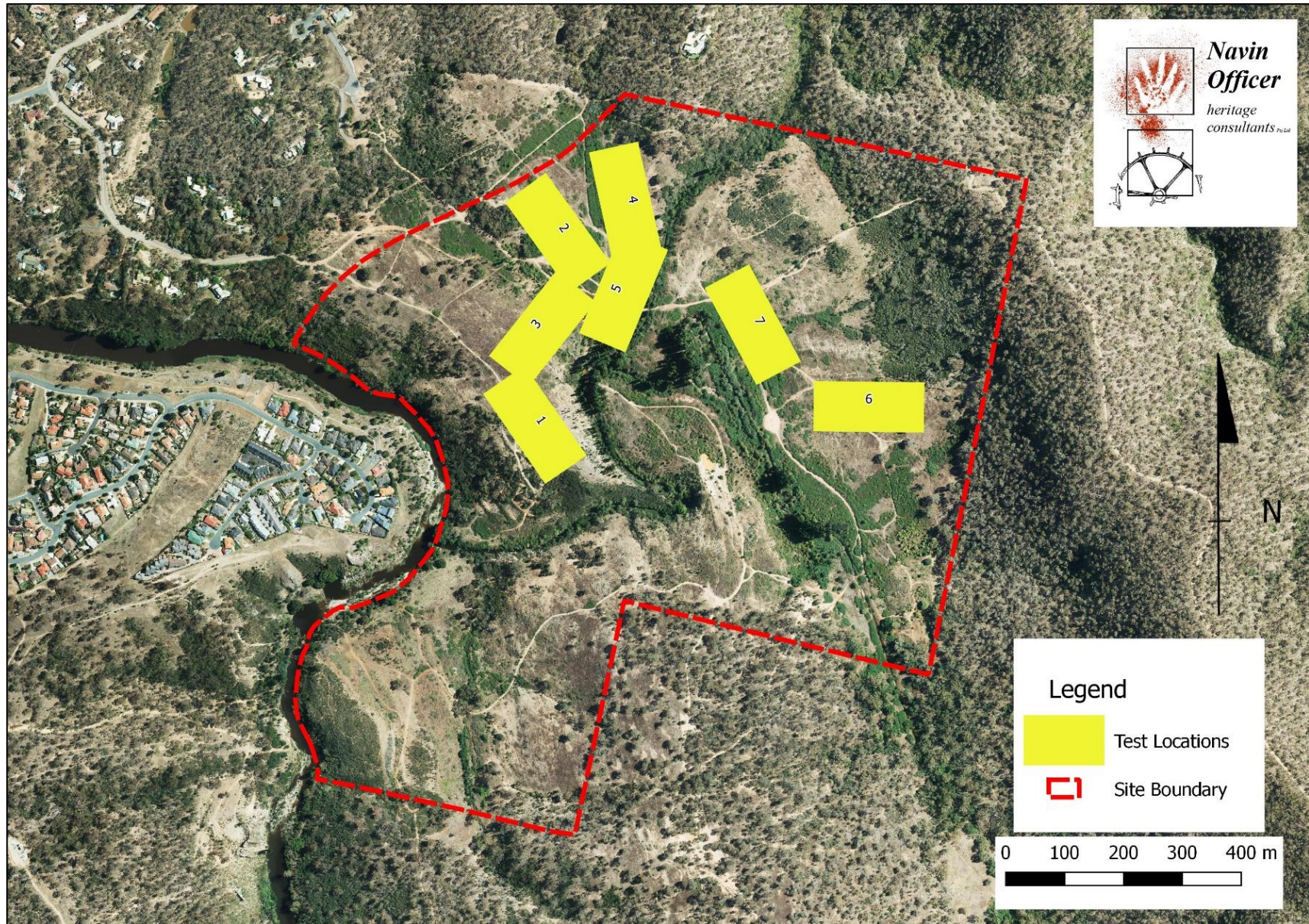
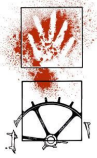
3. All excavated archaeological deposit was dry sieved. All material was sieved through 4 x 4 mm mesh, with use of a top larger mesh (10 x 10 mm) where appropriate. All identified or suspected cultural material recovered from sieving was retained, bagged and labelled.



4. Sieving was conducted over a tarpaulin, directly adjacent each excavation pit, and all excavated material was transferred from the tarpaulin back to the excavation pit immediately upon completion of each excavated pit, test pit excavation records are at Appendix 8 and artefact catalogue at Appendix 9.

Restricted Version





**Figure 3.2 Location of proposed test locations**



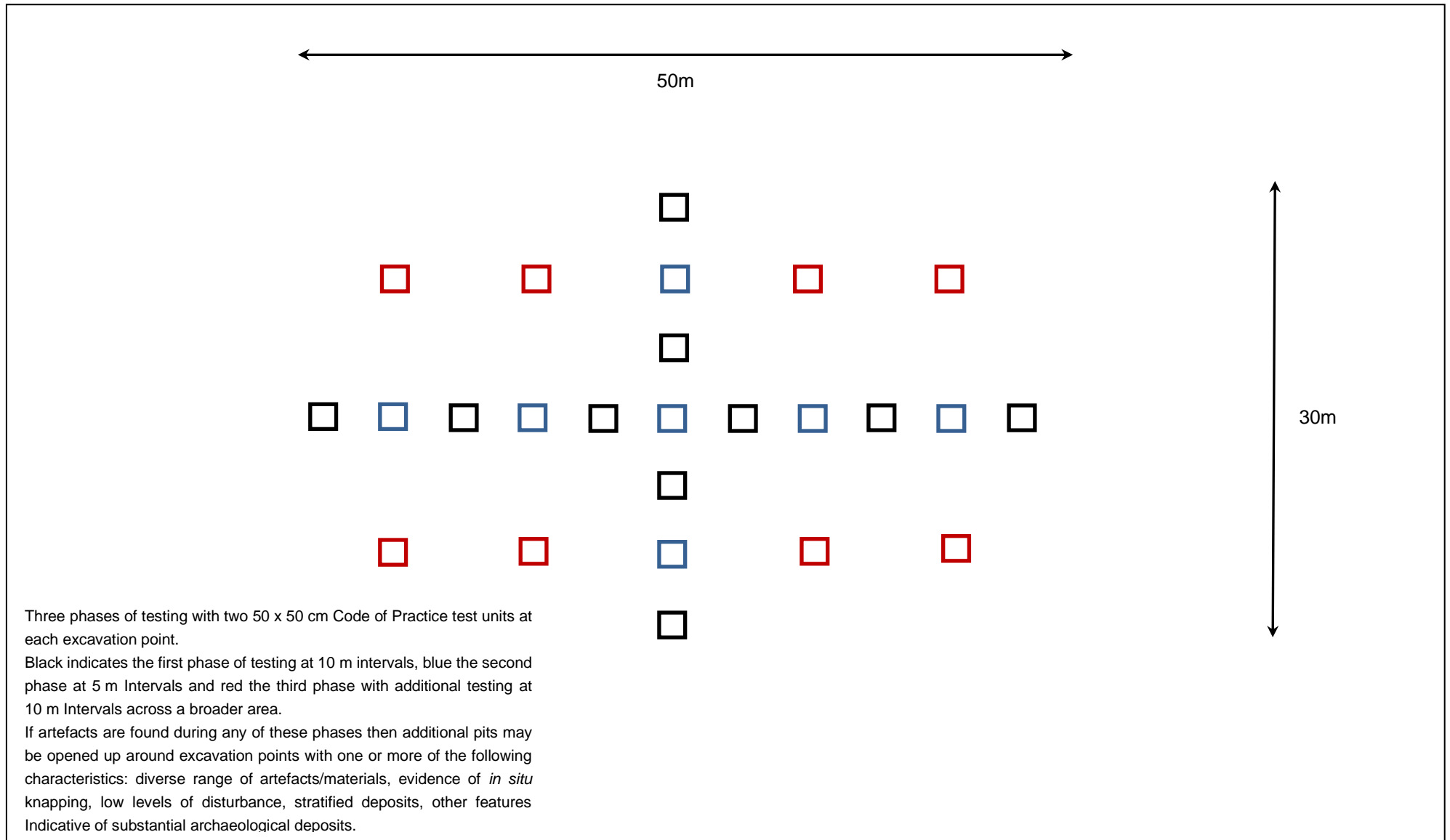


Figure 3.3 Test pit lay-out



## **3.7 Lithic Analysis**

### **3.7.1 Aims of the Artefact Analysis**

All 'lithic items' – that is, pieces of rock which had been identified as artefacts or potential artefacts in the field – were examined in the laboratory.

The primary aim of the analysis of the lithic items retrieved from the test locations was to assist in the assessment of the significance of the site/deposits and to identify appropriate management strategies.

To achieve this aim, laboratory analysis of the lithic items primarily aimed to:

- establish which of the lithic items could be identified as prehistoric stone artefacts, and which were non-artefactual – quantifying the number of artefacts recovered from the test pits is used to infer the density of subsurface artefacts at each study location;
- quantify the numbers of complete and broken artefacts recovered from each study location, to infer the rates of artefact breakage at each site;
- assess the variability within the artefact assemblage in terms of the types of stone material that were used, and the types of artefacts the prehistoric artisans created;
- analyse how the artefacts are distributed across each study location (in cases where multiple areas were excavated), and vertically within the deposits excavated; and
- establish the technological and behavioural activities of prehistoric groups within the study area and potentially across the wider landscape, as evidenced by the lithic artefacts discarded within the study area.

### **3.7.2 Method of Artefact Analysis**

Most of the lithic items were lightly cleaned to remove sediment encrusted on their surfaces. This cleaning involved briefly running under cold water, and lightly brushing sediments off the objects with a soft-bristled brush or paper towel. No attempt was made to thoroughly remove all sediment from the surfaces of the objects by prolonged scrubbing.

Objects were analysed using low-power magnification (hand lens) and occasionally a 50–200x digital microscope with polarised light to identify small features such as fine retouch scars, or to examine objects of quartz with surfaces that were reflective in a way that impeded identification of fracture features.

The method employed to record the nature of the stone artefact assemblage was developed to answer the aims of the analysis. The variables measured were accordingly selected to enable questions relating to the raw material composition of the assemblage, technological patterns of artefact production, and spatial distribution of artefacts to be answered. The variables recorded for each stone specimen in the assemblage are outlined in Table 3.2.





**Table 3.2 Variables recorded on artefacts, with a description of how observations were recorded for each variable**

<b>Variable</b>	<b>Observation recorded</b>
ID	Each specimen was allocated a sequential number
Pit	Pit number
Spit	Spit number
Technological type	flake, core, retouched flake, flaked piece, indeterminate shatter, hammer, errillure, anvil, ground artefact
Completeness	Complete, proximal fragment, medial fragment, distal fragment, LCS left, LCS right
Raw material	silcrete, quartz, quartzite, chert, FGS, volcanic, sandstone
Initiation	Hertzian, bending, axial
Platform type	single surface, dihedral (2 surfaces), multiple surfaces, shattered, cortical, faceted.
Termination	feather, step, hinge, inflex, retroflex, outrepasse
Retouched	Retouch scars present or absent
Heat damage	The presence of heat damage, in the form of crazing fractures, crenated fractures, potlid fractures or exfoliation surfaces.
Weight	Weight in grams (to nearest 0.1 g)
Length	Length along percussion axis in mm (to nearest 0.1 mm)
Width	Width perpendicular to percussion axis in mm (to nearest 0.1 mm)
Thickness	Thickness perpendicular to length and width in mm (to nearest 0.1 mm)
Platform thickness	Thickness of platform in mm (to nearest 0.1 mm)
Platform width	Width of platform in mm (to nearest 0.1 mm)
Overhang removal	Presence or absence of overhang removal scars on a flake's dorsal surface.
Number of negative scars	(Cores only) The total number of complete and partial negative scar surfaces visible
Number of rotations	(Cores only) The number of times a core was rotated during manufacture, based on the orientations of complete and partial negative scars visible
Overhang removal scars	The presence of small negative flake scars along the core's platform edge, at the proximal end of a larger negative flake scar
Technological class	Typological category (if any) within which the artefact could fall
Non-artefactual	Non-artefactual shatter, pebble, cobble, gravel, potlid
Notes	Ad-libitum recording of any points of interest not recorded elsewhere

Further definition of the variables and attributes listed in Table 3.2 are provided below to assist readers with interpretation of the results of the artefact analysis.



## Technological type

Classification of artefacts was based on technological criteria. The term 'technological type' is used instead of 'type' in this document, as type is often used to refer to formal tool types such as backed artefacts.

The following categories have been identified in the assemblage:

core:	Cores are a piece of rock from which flakes have been detached. Cores are characterised by negative flake scars where flakes have been detached.
flake:	A sharp edged piece of stone detached from a core by the application of force. Flakes are characterised by a number of features which may include a platform, bulb of percussion, a bulbar scar, ripple marks and fissures on the ventral surface and negative flake scars on the dorsal surface.
retouched flake:	A flake which has had flakes removed from it, subsequent to its original manufacture. A retouched flake has an identifiable ventral surface, and negative scars that are derived from or intrude onto this ventral surface.
flaked piece:	A flaked piece is an artefact that exhibits negative flake scars, and one surface which could possibly be a ventral surface. A flaked piece does not have any other features that would enable identification as a flake, a retouched flake or core. This category is therefore an ambiguous one and is used only for artefacts which cannot confidently be categorised more specifically.
hammer:	A piece of stone, usually a pebble, which possesses pitting or furrowing indicative of hammer impacts.
anvil:	A piece of stone which possesses pitting usually on a wide flat surface, indicating that it was struck repeatedly.
ground artefact:	Any piece of stone showing an area or areas which have been ground or polished.
erraillure:	A lens-shaped piece of stone which shatters off the bulb of a flake as the flake is struck (Faulkner 1972).

## Raw material

The raw material of each artefact is categorised according to the following:

- colour: The purpose of recording the colour of raw material is to assist during analysis in identifying source material (if possible), related objects within an episode or episodes of stone reduction and to infer heat treatment.
- raw material: The following raw materials were identified in the assemblage:

chert:	A cryptocrystalline siliceous rock of organic or inorganic origin. Chert is isotropic and brittle (Domanski et al. 1994). It is accordingly a highly favoured rock for artefact manufacture.
quartz:	The mineral quartz is crystalline silica with a hardness value of 7 (Mohs hardness scale). Given this property quartz flakes possess highly durable sharp edges (Domanski et al. 1994). However given quartz possesses internal flaws and cleavage planes it typically flakes in an unpredictable manner (Cotterell and Kamminga 1987).
silcrete:	This rock is formed by the impregnation of a sedimentary layer with silica; it consists of quartz grains in a matrix of either amorphous or fine-grained silica. The fracture properties of silcrete are dependent largely of the size of the quartz grains, with finer-grained silcretes having superior fracture properties (Domanski and Webb 1992; Domanski et al. 1994).



- hornfels:** A contact metamorphic rock, formed when the original rock is exposed to heat or pressure by the presence of an igneous body nearby. Hornfels are often fine-grained and silica-rich and are tough and fracture well. They can retain banded colours, or other coloration from their parent rock.
- quartzite:** Quartzite is formed by the cementing together of siliceous grains through pressure, heat and chemical processes. Fracture properties and flaking quality are variable, depending on how cohesively the individual grains have been cemented together.
- FGS:** Acronym for fine grained siliceous rocks, covering chert, siltstones, mudstones, hornfels, tuff etc where identification is unclear without petrological analysis.
- sandstone:** sand grains cemented together by a siliceous matrix. Usually friable and crumbly.
- IMT:** Acronym for Indurated Mudstone/Tuff, fine-textured, very hard, yellowish, orange, reddish-brown or grey rock. Where classification as either a mudstone or a tuff cannot be differentiated.

### Initiation type

The type of primary fracture initiation, recorded as one of the following:

- hertzian:** (also known as conchoidal fracture) Formed when stone is struck by a hammer forming a ring crack; the ring crack forms a cone that bends backward towards the surface of the core (Crabtree 1972a, 1972b; Cotterell and Kamminga 1987).
- bending:** (also known as opening fracture) Formed when the angle between the platform and surface of the core is acute. Initiation results from a simple opening fracture which forms on the platform surface. Flakes do not possess clear ring cracks or well defined bulbs of percussion (Cotterell and Kamminga 1979; Tsirk 1979).
- axial:** (also known as wedging fracture) Formed as a result of the compressive stress created by the hammerstone or indenter pressing into the platform surface. This compressive stress causes the material under the indenter to bifurcate in a symmetrical fashion, which leaves no ring crack or bulb of force as found on Hertzian initiations. Axial initiations are commonly called 'wedging' initiations by archaeologists (Cotterell and Kamminga 1979; Cotterell et al. 1985; Cotterell and Kamminga 1987).

### Platform type

The platform surface is the surface from which fractures begin propagating. The following classifications of platform surfaces were used:

- single:** Single flake scar.
- multiple scars:** With two or more scars.
- cortical:** Retaining evidence of cortex.
- shattered:** Sheared away during flake production: platform attributes cannot be identified.
- facetted:** three or more relatively small flake scars in uniform arrangement.
- focalised:** Fracture initiates close to the edge of the platform, and only a very small platform surface is present (usually no more than twice the area of the ring crack formed at the initiation point).

### Termination type

Termination refers to the manner in which the fracture ceases to propagate by running to meet a free surface. The termination type is classified according to how the fracture surface and the free surface (i.e. the distal surface of the flake) meet (Cotterell and Kamminga 1987).



feather:	Exhibits minimal thickness at the distal end and acute angle between ventral and dorsal surface.
hinge:	Forms when the fracture curves sharply and meets the surface of the core at c. 90° to the longitudinal axis of the flake.
step:	Forms when flake terminates abruptly in a right-angle break.
inflex:	A hinge termination on which the fracture surface deviates in the distal direction just before termination, leaving a 'finial' or 'lip' on the flake (Cotterell and Kamminga 1986; Sollberger 1986). Also known as a 'languette' fracture (Lenoir 1975).
retroflex:	Similar to an inflex, except that the deviation of the fracture surface is toward the proximal end of the flake: that is, the fracture curves back in the direction of the platform surface (Cotterell and Kamminga 1979; Cotterell and Kamminga 1986).
outrépassé:	Forms when the fracture plane curves away from the face of the core and terminates on the opposite side of the core, removing the core's base. Also known as a plunging termination (Whittaker 1994).

### Completeness

This category records whether an artefact is complete or a fragment of a complete artefact. Cores were coded simply as complete or incomplete. Flakes (including retouched flakes) were coded as one of the following categories:

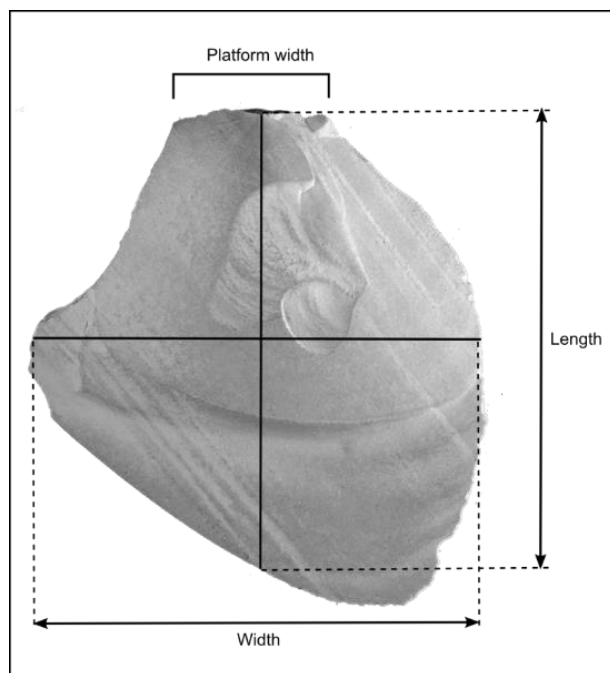
complete:	A complete flake, in which the platform surface and all original flake margins are intact.
distal fragment:	A broken flake which is missing its proximal end. These fragments do not possess their original platform surface.
medial fragment:	A broken flake that is missing its proximal and distal ends. This fragment is the original flake's mid-section, exhibiting dorsal scars and ventral surface features.
proximal fragment:	A broken flake missing its distal margin but retaining the platform and initiation.
longitudinal cone spit	(LCS left and right): A flake broken longitudinally, in which the break bifurcates the bulb of force and the ring crack. This distinctive breakage pattern occurs during flaking event. Separate categories for left and right LCS portions were used to facilitate artefact number estimates. Note that the LCS category can only be applied if the bifurcated ring crack and bulb of force are present.
marginal fragment:	A flake broken transversely or longitudinally, which is lacking both its initiation and termination and has a section of only one of the original flake's lateral margins.
margin missing:	A flake which is broken and missing a portion, or several portions of its lateral margins, but which has retained both its platform and its distal margin.

### Measurements

length:	On flakes (including retouched flakes) this measurement was taken from the initiation point, along the percussion axis (Figure 3.2).
width:	On flakes (including retouched flakes) this measurement was taken perpendicular to length, and halfway along length, from one margin of the flake to the other (Figure 3.2).



- thickness: On flakes (including retouched flakes) this measurement was taken at the intersection of length and width, and perpendicular to both length and width.
- platform width: On flakes (including retouched flakes) this measurement was taken across the platform, from one margin of the flake to the other (Figure 3.4).
- platform thickness: On flakes (including retouched flakes) this measurement was taken perpendicular to platform width, from the initiation point to the dorsal surface of the flake.



**Figure 3.4 Length, width and platform width measurements on a flake**

### **Non artefacts**

In any archaeological excavation, some of the specimens collected are not artefactual in the sense that they have no fracture surfaces that can be confidently identified as having been produced by humans. These were classified as gravel, cobbles or pebbles if they had no clear fracture surfaces at all.

Potlids (round lens-shaped pieces of rock broken off during heat-fracturing of larger rocks) were recorded.

Fragments of rock with other heat fracture surfaces, such as exfoliation scars or crenated fracture, were also recorded.

Pieces of rock with fractures that were not identifiable having been created by humans or by heat were recorded as non-artefactual shatter.

### **Implement type**

If artefacts had a suitable morphology to be classified into any existing formal tool types, this was recorded. Only types which are commonly in use in Australia were employed. These include backed artefacts (triangles, trapezes, crescents, trapezoids, woakwines), juan knives, tula adzes, burren adzes, graters, horsehoof cores, thumbnail scrapers, unifacial points, pirri points and bifacial points.

Data were entered into a relational database for storage and exported to a statistical analysis program (R) for data analysis.



## 4. CONSULTATION PROCESS

The *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (NSW DECCW 2010a) sets out the requirements for 'consulting with those Aboriginal people who can provide information about the significance of Aboriginal cultural heritage as part of the heritage assessment process that informs any AHIP [Aboriginal Heritage Impact Permit] application' (NSW DECCW 2010a:1).

The requirements apply to all activities throughout NSW that have the potential to harm Aboriginal *objects* or places and that also require an AHIP. The requirements specify four stages of consultation:

Stage 1 – notification of project proposal and registration of interest

Stage 2 – presentation of information about the proposed project

Stage 3 – gathering information about cultural significance

Stage 4 – review of draft cultural heritage assessment report

See Appendix 1 for all consultation records.

### 4.1 Stage 1

An advertisement was placed in the *Queanbeyan Age* which invited registration of interest by 31 July 2018.

Letters were sent to:

- Ngambri Local Aboriginal Land Council;
- Queanbeyan Palerang Regional Council (QPRC);
- South East Local Land Services;
- NSW OEH (now DPIE);
- Native Title Services Corporation Ltd; and
- Office of the Registrar Aboriginal Land Rights Act 1983.

A search was made of the National Native Title Tribunal registers on 11 July 2018.

Following advice received from DPIE and QPRC and the native title search results, letters were sent to all groups/individuals identified. The closing date for expressions of interest was 7 August 2018.

Twenty-one registrations of interest were received from the following Aboriginal parties:

Ngambri Local Aboriginal Land Council  
Murra Bidgee Mullangari Aboriginal Corporation  
Thunderstone Aboriginal Cultural and Land Management Services  
Gunjeewong Cultural Heritage Aboriginal Corporation  
Karlari Ngunnawal Pajong Wallabalooa Descendants  
Corroboree Aboriginal Corporation  
Buru Ngunawal Aboriginal Corporation  
Didge Ngunawal clan  
Ngunawal consultancy

Ngunnawal Elders Corporation  
Ms Lavinus Ingram  
Mr Robert Monaghan  
Mr Carl Brown  
Merrigarn  
Goobah  
Cullendulla  
Murramarang  
Gulaga  
Biamanga  
Nirrummurrin  
Muragadi



## 4.2 Stage 2 and 3

A copy of the methodology and cultural information request was sent to registered groups on 8 August 2018.

**Table 4.1 Responses to Submissions – Methodology 2018**

Date	Type of Contact (email, phone etc)	Group/Individual	Comment	Response
20/8/18	email	Muragadi	Endorse recommendations	
20/8/18	email	Murra Bidgee Mullangari Aboriginal Corporation	Endorse recommendations	
20/8/18	email	Merrigarn	Agrees with the information	
2/9/18	email	Buru Ngunawal Aboriginal Corporation (BNAC)	The proposed methodology is the normal practice but given the large number of site impacts would like to undertake a consultation process in the overall planning practice to try and preserve some of those sites, <i>i.e. landscape architecture</i> , instead of the usual salvage and destroy. In essence BNAC is in agreement with the methodology but would like to seek an alternative approach for a better outcome for what they see as their significant cultural presence in this area.	Further consultation was undertaken with Wally Bell (BNAC) following the completion of the draft ACHAR in order to address the concerns raised. As well as the recommended salvage program and identification of No Harm areas Wally also would like to ensure that even when sites are salvaged that the record of their location and content remains on AHIMS. Wally would like the ongoing connection of Aboriginal people to Jumping Creek be celebrated and made known to the public. All of these recommendations have been incorporated into the recommendations for the project

A revised copy of the subsurface testing methodology was sent to the registered groups on 23 September 2019 and phone calls were made to each group on 7 October. A change to the methodology was made to the size of pits from 0.5 x 1 m to 0.5 x 0.5 m. This change was made to enable a more efficient testing program across the project area. No issues were raised by the RAPs regarding this change both in consultation on the revised method or during the field program.





**Table 4.2 Responses to submissions – Methodology 2019**

<b>Date</b>	<b>Type of Contact (email, phone etc)</b>	<b>Group/Individual</b>	<b>Comment</b>
7/10/19	Phone call	remaining groups	No issues raised regarding the methodology
4/10/19	email	Murramarang	Supports the methodology
2/10/19	email	Biamanga	Supports the methodology
2/10/19	email	Goobah	Supports the methodology
2/10/19	email	Cullundulla	Supports the methodology

### **4.3 Archaeological Survey – Field Participation**

The following twelve representatives participated in the site survey on 17 September 2018 and 9 October 2018:

Jayden Channell (Ngunawal consultancy)  
 Piero Delponte (Ngunawal consultancy)  
 Sonia Shea (Thunderstone)  
 Mike Skinner (Corroboree Aboriginal Corporation)  
 Robert Monaghan  
 David Williams (Karlari Ngunawal Pajong Wallabalooa Descendants)  
 Kody (Didge Ngunawal clan)  
 Edward Furaki (Murra Bidgee Mullangari Aboriginal Corporation)  
 Luke Beard (Muragadi)  
 Shaun Carroll (Merrigarn)  
 Arnold Williams (Ngambri Local Aboriginal Land Council)  
 Wally Bell (BNAC)  
 Cherie Carroll–Turrise (Gunjeewong Cultural Heritage Aboriginal Corporation)

The following fourteen representatives participated in the subsurface test excavation program during the period 14 October–8 November 2019:

Piero Delponte (Ngunawal consultancy)  
 Sonia Shea (Thunderstone)  
 Garreth Conyard (Murra Bidgee Mullangari Aboriginal Corporation and Muragadi)  
 Daniel Williams, Arnold Williams, Trisha Williams, Cheryl Williams, Aaron Williams (Ngambri Local Aboriginal Land Council)  
 Marilyn Carroll-Johnson and Steve Johnson (Corroboree Aboriginal Corporation)  
 Adam King (Didge Ngunawal clan)  
 William Reynolds (Goobah and NirrumMurrin)  
 Jonathon Morgan (Biamanga and NirrumMurrin)  
 Marion Bell (Murramarang and NirrumMurrin)  
 Mundara Drew (Cullundulla and NirrumMurrin)  
 Joseph Campbell (Goobah and NirrumMurrin)





Arnold Williams (Ngannawal Elders Corporation)

Karne Denny (BNAC)

Shaun Carroll (Merrigarn)

#### 4.4 Stage 4

A draft copy of the survey report was provided to the RAPs for their input and comment on 3<sup>rd</sup> December 2018 with a comment period until 7<sup>th</sup> January 2019. Two responses were received, both in support of the recommendations.

Date	Type of Contact (email, phone etc)	Group/Individual	Comment
5/12/18	email	Merrigarn	agrees with this recommendation
7/12/18	email	Corroboree Aboriginal Corporation	no issues with the project and agrees with the report

A draft copy of this report was provided to the RAPs for their input and comment on 12th December 2019 with a comment period until 13<sup>th</sup> January 2020. One response was received.

Date	Type of Contact (email, phone etc)	Group/Individual	Comment
14/01/20	email	Muragadi	agrees with this recommendation

##### 4.4.1 Further consultations

In exploring the Aboriginal cultural values of the project area NOHC started with the consultation process set out in the Aboriginal *Cultural Heritage Consultation Requirements for Proponents 2010* but effective consultation often requires an iterative process and so additional steps were implemented in response to new information and issues as they emerged.

Further consultation was undertaken with Wally Bell and the NLALC following the completion of the draft ACHAR (version 9.6) in order to address the concerns raised in response to the methodology. A phone call was made to Wally Bell on 18 March 2020 by Nicola Hayes, and a discussion was also had with the NLALC on 20/3/20 the results of which are document in Section 11.2.

Two non-archaeological places of cultural significance had been identified within or overlapping the study area by Kate Waters (Waters Consultancy 2016). One of these was a portion of an unmarked traditional walking track (see Section 5.2 for more detail). Further consultation was also undertaken with the informants who had been involved in an earlier heritage project covering the study area (Waters Consultancy in 2016). Unfortunately, two have subsequently passed away. All remaining informants and relatives of those that have passed away are registered Aboriginal parties for the project and had received all project information and had been asked to comment on the project numerous times. We assume that any cultural knowledge of the area will have been passed on to relatives, if intergenerational transmission of cultural knowledge is occurring or alternatively will have died with the older knowledge holders. Emails to the following were sent on 21/5/20:

Arnold Williams (Snr)

Wally Bell

Tyrone Bell

Tina Brown



Phone calls were made on the 27/5/20. No further specific information was provided about ceremonial sites in Jumping Creek. Tyrone Bell provided the following additional recommendations for the project, and have been incorporated into the recommendations:

Native plants and bush foods to be planted and landscaped by an Aboriginal local business under Aboriginal procurement due to the significance around the Jumping Creek development.

Aboriginal Cultural Tours to reflect the past and future of Jumping Creek and Aboriginal Cultural Awareness training to be incorporated into the induction process for staff and sub-contractors.

Site fencing should be installed by an appropriately qualified heritage professional and RAP's so everyone can agree in the field the location where the fencing needs to go around sites.

Additional follow-up phone call was made with Wally Bell (15/3/21) to clarify his early comment regarding salvage and assessment. Wally indicated verbally that he thought that the report (version 9.7) and consultation addressed his concerns, and he provided a response to that effect in writing and is included below.

Consulted further with Paul House who discussed the adjacent LALC property which has reported burials on it and is of concern to them, particularly to gain access if possible. He indicated that it was not only the artefacts that were important but the environment such as the older trees that he would like to see remain as much as possible. He also said contacting Matilda would be ok.

Information on the conservation area was provided to all RAPs with an invitation to comment and/or meet in April 2021.

A message was left with Matilda on 15/3/21 and she was spoken to over the phone on the 18/3/21. Matilda asked to be provided a copy of the ACHAR so she could see the assessment and make further comment. The ACHAR (version 9.7) was provided to Matilda as a hard copy. Follow-up phone calls were made however Matilda was unable to talk. Her son Paul House has indicated that he is able to speak on Matilda's behalf. Paul indicated his agreement with the approach to the conservation area.

Consulted further with Adrian Brown (son of Carl Brown) who suggested that the source of the generalised comments, within the Water's Report and by Heritage NSW, regarding the possible location of a ceremonial site may derive over confusion with a site that he and his father identified outside of the project development area. Adrian indicated that site was located to the south near *White Rocks* (refer to Further RAP Responses). He confirmed that he did believe that the project area did not contain a ceremonial site. Further consultation will be undertaken with him as he wishes the site to be noted in AHIMS.

This iterative process has helped us to clarify questions as they have arisen about the cultural values of the project area and has resulted in a high degree of confidence that we understand the nature of the interest and concerns of the RAPs.

We note that within all the previous reports there has not been an instance where Aboriginal Heritage has been considered to be a constraint on the development area.

We note that throughout the consultation with the RAP's there has been no formal objection to the development.

## **4.5 Aboriginal Cultural Values Engagement**

Upon the request of Heritage NSW, NOHC engaged anthropologist Ophelia Rubinich OCR Consulting to complete an Aboriginal Cultural Values assessment for the Jumping Creek Project (see Appendix 10). The assessment was commissioned to investigate a passing reference in Waters Consulting 2016 to an unnamed and unidentified ceremonial site, of purported high cultural significance, referred to as being near the south-east junction of the Queanbeyan River and Jumping Creek. The precise location of this site was not identified by Waters nor was an indicative location drawn on an aerial photo as was in the case of the other locations referred to in that report. The results of the Aboriginal cultural values engagement undertaken by OCR Consulting may be summarised as follows:



- Navin Officer provided the names of the six RAPs that had been consulted by Waters regarding the Development Area. NOHC provided names of relatives of those people that had since passed. Each RAP was contacted on numerous occasions by phone to elicit an interview and to explain the purpose of further engagement.
- An interview was conducted with one RAP, and an interview and field trip with another. One RAP said they did not have particular interests in the area and the remaining three were not available for consultation.
- The two RAPs interviewed, both senior men, did not identify or know of an area of ceremonial or high cultural significance within the Development Area.
- A third RAP declined to be interviewed stating that he had no specific knowledge of the area.
- Both RAPs conveyed their concerns regarding the impact of works and damage to the Development Area. In addition to the recommendations contained in the Navin Officer Report (2020) the RAPs emphasised:
  - protecting the no harm and other sensitive areas with secure fencing
  - that the developer and those working on site respect the boundaries of these no harm areas
  - regeneration and green spaces.
- The RAPs made the following suggestion:
  - RAPs be on site to supervise when works begin.

A copy of the report was sent to all twenty-one RAPs on the 22<sup>nd</sup> December 2020 with an invitation to comment by the 8<sup>th</sup> January 2021. One reply was received and was in support of the report (see Appendix 1)

## 4.6 Identified Cultural Values

### Archaeological/Scientific Value

Assessment: The archaeological evidence is generally consistent with the interpretation of the Jumping Creek Valley as having been a place where Aboriginal people camped and gathered food resources. The project area is of low to moderate archaeological significance and can be described as a disturbed remnant cultural landscape. NOHC considers that parts of the cultural landscape would likely have been considered of moderate to high significance prior to the substantial disturbance to the deposits that have occurred due to past land use and erosion. Although the project area contains a large artefact scatter over most of its surface (see ACHAR for details); it has been highly disturbed, thereby severely compromising the potential of the material to provide substantial information through further or future archaeological research across most parts of the property. The possibility remains for small, isolated pockets of land to contain some *in-situ* deposits.

Rationale: Artefacts are most visible in the areas that have been the subject of the most impact from erosion and vehicle use. Artefacts are apparent in areas of very shallow to nil deposit on spur line crests and on vehicle tracks and erosion scalds. While the scatter has been recorded as several point locations on AHIMS, there is really almost a continuous spread of artefacts with different densities throughout the project area.

Subsurface test excavations were undertaken and revealed that there are archaeological deposits remaining in the project area, but these are restricted to areas that have some soil deposit, such as creek, and drainage lines and some of these locations are amongst the most disturbed by erosion and or historic land use activities. The remainder of the area has very shallow soils and almost no deposit. The area identified as having archaeological potential is about 25.8 ha.

The artefacts and the sites in the Jumping Creek development area have been heavily impacted by erosion, the invasion of woody weeds and the use of the area for 4wheel driving. This has disturbed the site and means that many of the artefacts are displaced from their original location or concentrated in areas that have been heavily eroded.

### Aesthetic Value



**Assessment:** The project area is of low aesthetic value.

**Rationale:** The project area has been subject to substantial land use disturbance include erosion, dumping and vehicular damage. Woody weed infestations have also modified the natural aesthetic landscape values that may once have existed in the project area.

### **Historic Value**

**Assessment:** The project area is of low -moderate historic value.

**Rationale:** The area has been subject to several historic settler activities over the years including mining and farming and several structural elements remain that relate to this historical activity. There is no definitive evidence that any of this relates to Aboriginal-European contact history. Several discrete historical features related to European historical settlement have been identified as having local historical significance and they will be managed and protected during the construction activity.

### **Social Value**

**Assessment:** The project area has moderate to high social value for the Aboriginal community.

**Rationale:** Representatives of the Aboriginal community have been involved in multiple archaeological surveys and investigations over this area, over a number of years and through this activity they have long been aware of the physical evidence of the past use of the area by their ancestors. This physical evidence of the past use of the area as a camping/living location and its location on a travel route is a tangible link to the history of their ancestors and this connection is valued by them.

The Aboriginal community not only value the artefacts and material remains of their people but the natural environment of the area, particularly the older trees. Damage to the environment through erosion, past land use activities and weed infestation has negatively affected the Aboriginal cultural values of the area that are embedded in the natural environment and the RAPs have indicated that the Aboriginal community is keen to see rehabilitation of parts of the project area and that they are keen to be involved in that activity.

The stories about their ancestors use of the area are also important and they are willing to share these stories and connections with the wider community. The wider area has also been used in modern times for camping and recreation by local Aboriginal families.

### **Spiritual value**

**Assessment:** the project area is not of particular spiritual value.

**Rationale:** None of the RAPs identified the area as having particular spiritual value. While Heritage NSW suggested that there might be evidence of a ceremonial site in the project area this has been investigated and no evidence to support this has been found. One of the RAPs has indicated that sometime ago, he and his father identified what they believe to be evidence of ceremonial activity at a location outside the current project area (see above information from Adrian Brown).



## 5. ABORIGINAL HISTORY

Tribal boundaries within Australia are based largely on linguistic evidence and it is probable that boundaries, clan estates and band ranges were fluid and varied over time. Consequently 'tribal boundaries' as delineated today must be regarded as approximations only, and relative to the period of, or immediately before, European contact. Social interaction across these language boundaries appears to have been a common occurrence.

A reconstruction of clan boundaries based on Tindale (1940, 1974) indicates that the south Canberra/Queanbeyan area was close to the tribal boundaries of the Ngunawal and Walgalu people. Horton's (1994) map shows the Ngarigo tribe in the southern Canberra area.

There is some uncertainty as to which language it was that was spoken by the Aboriginal people of Canberra/Queanbeyan. The area appears to have been close to the linguistic boundary between the Gundungurra and Ngunawal languages. Eades (1976) notes that published grammars for these two languages (Mathews 1900, 1901, 1904) are virtually identical. It has been communicated to NOHC that there is convincing evidence that the Ngunawal people had and still retain their own language with some words being shared with the Ngarigo and Gundungurra peoples for ceremonial and trade purposes (Glen Freeman, pers. Comm.).

References to the traditional Aboriginal inhabitants of the Canberra/Queanbeyan region are rare and often difficult to interpret (Flood 1980; Huys 1993). The consistent impression however is one of rapid depopulation and a desperate disintegration of a traditional way of life over little more than 50 years from initial white contact (Officer 1989). The disappearance of the Aboriginal people from the tablelands was probably accelerated by the impact of European diseases which may have included the smallpox epidemic of 1830, influenza, and a severe measles epidemic by the 1860s (Flood 1980; Butlin 1983).

Ceremonial gatherings are known to have occurred in the Queanbeyan area with local documentary records describing annual visits by Aboriginal people as late as the 1850s. Wright (1923) mentions the current showground reserve as one of several sites used by Aboriginal people to camp and hold corroborees (Biosis Research 2007) and is suggested to have been a traditional favoured camping ground and gathering place (Williams and Feary 1989). The showground area was the site of 'The Last Aboriginal Corroborre' held in the Queanbeyan district, lasting 'many weeks' and attended by 'many hundreds' including participants from the coast and regions of the lower Lachlan and Murrumbidgee rivers (Williams and Feary 1989).

Early accounts of Aboriginal lifestyles in areas comparable with the study locality describe aspects of a successful hunting and gathering economy, an eventful social life, and inter-group contacts. The material culture, which is partly reflected in the surviving archaeological record, included stone and wooden artefacts, skin clothing and bark and bough temporary dwellings.

Records indicate that a wide range of resources were exploited. Possums were available all year round within the wooded ranges of the ACT region: their skins were used for warmth (Bluett 1954). Smooth river cobbles were recorded as being used to grind up roasted Bogong moths during the production of 'moth cakes' (Flood 1996). A localised method of fishing was recorded by Shumack and Shumack (1967:151) who described Aboriginal people working together to drive fish to the end of a waterhole where they could be speared en-masse. Other observed activities include woodworking, food preparation and skin scraping activities with the use of a range of implements including digging sticks, bark vessels, hafted axes and a variety of flaked artefacts (Flood 1996:25–27). Wooden implements such as clubs, boomerangs and shields are recorded, as well as hammocks, nets, ropes, string bags, bone awls as well as the construction of bark huts (Flood 1980:25–26).

Food resources observed ethnographically include possum, kangaroos, wallabies, emus, reptiles, flying squirrel, fish, mussels, Bogong moths, yams, berries and wide range of seeds and plants (Throsby in Bennett 2003:173; Bluett 1954:5).

Estimates of Aboriginal population sizes when the Queanbeyan area was first settled by Europeans are difficult to establish, due to a general lack of comment by the early explorers regarding native sightings. Lea-Scarlett attributes this to the native population purposefully avoiding the European





settlers (1968:21). Observations made by Alan Cunningham, an early explorer of the region who was struck by the absence of signs of native occupation, tend to support Lea-Scarlett's argument.

Wright estimated a population of approximately 400–500 Aborigines practicing a traditional lifestyle in the area in 1850. However, inevitably, the traditional patterns of land use and resource exploitation would have been impeded by the arrival of European settlers in the early 1800s, restricting access to various resources and introducing diseases such as smallpox and influenza (Flood 1980). So great was the European impact on traditional Aboriginal society that within a few years most aspects of traditional life had disintegrated and only a small group, including a number of children of mixed descent, remained by 1862 (Lea-Scarlett 1968).

By the 1850s the traditional Aboriginal economy had largely been replaced by an economy based on European commodities and supply points. Reduced population, isolation from the most productive grasslands, and the destruction of traditional social networks meant that the final decades of the region's indigenous culture and economy was based around white settlements and properties (Officer 1989).

By 1856 the local 'Canberra Tribe', presumably members of the Ngunawal or Ngarigo, were reported to number around 70 (Schumack and Schumack 1967) and by 1872 recorded as only five or six 'survivors' (*Goulburn Herald* 9 November 1872). In 1873 one member remained – she was known to the white community as Nelly Hamilton or 'Queen Nellie'.

## **5.1 Material Evidence of Aboriginal Land Use**

### **5.1.1 Regional Overview**

Stone artefact scatters are the most frequently occurring residues of prehistoric activity in the region. They may range considerably in size and density, factors that are often interpreted as an indication of intensity of the Aboriginal land use. As well, they provide insight into stylistic and technological behavior. Such scatters are representative of one or more stages in what is termed a 'reduction sequence'. That is, the entire process from obtaining stone raw material, to manufacture of stone tools and to eventual discard or loss and incorporation into the archaeological record. Isolated finds are artefacts that occur without any apparently associated archaeological materials or deposit. Open scatters are defined as spatially concentrated occurrences of two or more flaked stone artefacts.

Broad distinctions may be made between sites formed as a result of general living and habitation activities and sites located in response to the fixed locations of specific resources. Occupation sites relating to the former activities are most commonly recognised by the discard of flaked stone materials in sedimentary deposits. Subsequent processes of erosion or land use may deflate or section these sediments to reveal surficial or embedded (sometimes stratified) materials. Sites formed as a result of resource location may be recognised by a range of features including the proximity of discarded stone materials to source stone materials and characteristic extraction and use marks upon stone or wood materials, such as hatchet grinding grooves and scarred trees.

The wider regional pattern of Aboriginal occupation within the Queanbeyan region is one of higher site size and frequency in areas proximate to major permanent creek lines with a reduction in site size and frequency around less permanent water sources. Whilst sites have been found to occur throughout topographic and vegetation zones there is a tendency for more of the larger sites to be located in proximity to creeks, wetlands and proximate parts of valley floors. A trend for larger sites to be near major water sources, but avoiding frost drainage hollows, was noted at a regional level by Flood (1980). Elsewhere in the Queanbeyan region high site and artefact frequencies have also been correlated with the geographic occurrence of specific resources and particularly stone procurement outcrop locations.

Numerous archaeological investigations have been carried out in the Queanbeyan region. Larger scale, research-orientated projects include Flood (Jumping Creek – 1980), Trudinger (Pialligo – 1989) and Kuskie (Jumping Creek – 1989). However, most investigations have involved relatively small area surveys necessitated by proposed developments (e.g. Boot and Heffernan 1989; Winston Gregson 1989; Navin and Officer 1990; Access Archaeology 1991; Williams 1992; NOHC 2004). These studies provide local contextual and site location data for the study area.



#### **5.1.1.1 Jerrabomberra**

A survey of the proposed 'Jerrabomberra Park' housing subdivision located two sites (National Parks and Wildlife Service (NPWS) Sites 57-2-0055 & 57-2-0056) in an area of 400 ha. One of these sites was situated on a hillslope and had been exposed as a result of the construction of a contour bank. It was noted that thick groundcover prevented a reliable assessment of the extent of the sites, or the existence of other sites in the area (Lewis 1984:2). One artefact was located on an undulating or hilly area away from the creek at Mount Jerrabomberra (Ballard 1986).

Twelve sites, comprising nine artefact scatters (AHIMS Sites 57-2-0111-57-2-0119) and three isolated finds were located within 'The Poplars' study area (Access Archaeology 1991). Survey for the Jerrabomberra Creek Trunk Sewer located three isolated finds in an area of approximately 260 ha (Access Archaeology 1992).

#### **5.1.1.2 Old Cooma Road**

Survey for the CSR Readymix Quarry on Cooma Road, to the south-west of the project area, did not locate any Aboriginal sites. Based on the relatively high degree of survey coverage achieved, and the generally unfavourable topographic setting for camp sites, the absence of sites within the project area was considered to be a real archaeological pattern (Navin 1993).

During 2001 and 2002, 7.5 kilometres (kms) of Old Cooma Road were surveyed as part of upgrades to the road (Saunders 2001c, 2002a). The first of these covered a 2 km section of road corridor to the north of Jerrabomberra Creek. It resulted in the location of one isolated find on low gradient basal slopes adjacent a drainage line (Saunders 2001c). The second survey covered approximately 4.5 kms of the corridor from Jerrabomberra Creek to the Monaro Highway. No sites were located during that survey; however, two areas of PAD were identified on the flats and basal slopes adjacent Jerrabomberra Creek and Guises Creek. Monitoring was recommended in both of these areas (Saunders 2002a).

In a 16 ha survey for a subdivision on the Old Cooma Road south of the project area, Australian Archaeological Survey Consultants (AASC 2001) located one isolated find (NPWS Site 57-2-0252) and one open artefact scatter (NPWS Site 57-2-0251) comprising one chert core and one chert flake (AASC 2001). Visibility conditions during the survey were generally good (15–20%), resulting in an overall effective survey coverage of 27%.

Soils were shallow gravelly loams, and areas of the study area were relatively steep and unsuitable for occupation. These factors, together with the good visibility and low numbers of artefacts recorded indicated that the area is of relatively low archaeological sensitivity.

NOHC (2009c) undertook a Cultural Heritage assessment for the realignment and upgrade of Old Cooma Road between Edwin Land Parkway and Googong Dam Road. Five Aboriginal sites comprising four artefact scatters (GA12, GA15, TSR1 and TSR2) and one PAD (GPAD7) had been previously identified in the Old Cooma Road study area. Five Aboriginal sites, comprising three isolated finds (OCR1, OCR2 and OCR5) and two artefact scatter (OCR3 and OCR4) were identified within the Old Cooma Road Realignment study area during the 2009 study.

Cultural Heritage Management Australia (2014) undertook an Aboriginal Cultural Heritage Assessment of the Old Cooma Road Duplication between Edwin Land Parkway and Southbar Road. The study found no Aboriginal heritage sites or places of archaeological potential. The study concluded that the natural landscape of the area had been almost entirely obliterated by urban development.

#### **5.1.1.3 Jerrabomberra Creek**

Saunders (2003) surveyed 6.5 ha of land. The area under investigation comprised moderate to steep mid-slopes of a ridge located 1 km east of Jerrabomberra Creek. No sites were identified, and the topography together with the shallow soils indicated that the archaeological potential of the area surveyed was generally low.



#### **5.1.1.4 Burra Creek and 'Little Burra'**

Archaeological investigations in the Burra Creek and 'Little Burra' areas have been undertaken by Boot and Cooke (1989) around Burra Creek, Saunders (1999, 2002b) at 'Little Burra', and in areas adjacent and along Old Cooma Road by AASC (2001) and Saunders (2001c, 2002a).

Investigation of 100 ha of ridgeline, creeks and alluvial flats at Burra Creek (Boot and Cooke 1989) located five isolated finds (NPWS Sites 57-2-0165 – 57-2-0169), one open camp site (NPWS Site 57-2-0172), and two limestone shelters with archaeological deposit (NPWS Sites 57-2-0170 & 57-2-0171). Excavation of the shelters (Douglas Cave and Burra Shelter) revealed low artefact densities and faunal remains at both sites, and two hearths at the Burra Shelter that were carbon dated to 700–900BP (Before Present). It was concluded that the archaeological evidence at the shelters was indicative of low intensity Aboriginal occupation during the past millennia (Boot and Cooke 1989:97).

Survey of 590 ha at the 'Little Burra' rural residential estate (Saunders 1999) identified one scarred tree, eight isolated finds, and 11 open artefact scatters (NPWS Sites 57-2-0272 – 57-2-0279). The artefact scatters were mainly small, low-density sites except for site LBA18 that extended for over 60 m along one of the tributaries of Jerrabomberra Creek. Artefact assemblages were dominated by flakes (77%) and cores (12%), with quartz as the dominant raw material (56%). Other stone materials recorded included chert, silcrete, volcanics and quartzite.

The distribution of identified sites suggested a strong preference for the creek flats and adjacent areas of low gradient. Visibility across the project area was variable, and 11 areas of PAD were identified on and adjacent to creek flat landforms where visibility inhibited assessment of the deposit (Saunders 1999).

Subsurface testing at Little Burra (Saunders 2002b) was undertaken adjacent sites LBA18 (Area 1) and LBA10 (Area 2). Testing consisted of grader scrapes to a depth of 150–200 mm across those areas to be impacted by the development (Area 1 = 315 x 4.5 m–24.5 m, Area 2 = 70 x 25 m and 30 x 25 m). Low-density artefact scatters were revealed in both areas, 42 artefacts from Area 1 (NPWS Sites 57-2-0247 – 57-2-0248, 57-2-0250) and 19 artefacts from Area 2 (NPWS Site 57-2-0249). Flaked pieces (48%) and flakes (38%) dominated the assemblages, with cores (6%), chips (6%) and one hammerstone also present.

Raw materials consisted of quartz (66%), chert (9%), tuff (8%), silcrete (3%), metamorphic sedimentary (3%) and isolated pieces of volcanic, glass and an unidentified raw material. Saunders (2002b) concluded that the distribution of artefacts had been impacted by European use of the area. Thus, the site disturbance, together with the nature of the sites (low density scatters adjacent water (i.e. regionally the most common site type) were considered indicative of a generally low archaeological significance for both sites (Saunders 2002b).

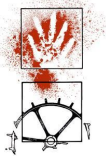
#### **5.1.1.5 Mount Pleasant**

A Due Diligence Assessment was undertaken of the Mount Pleasant project area was conducted by NOHC in 2014. No Aboriginal sites or PADs were recorded in the Mount Pleasant project area prior to the completion of the 2014 Due Diligence Assessment. Two isolated finds (MPIF1 and MPIF2), one possible Aboriginal modified tree (MPST1) and a large area of PAD were recorded in the course of the Due Diligence study (NOHC 2014a).

NOHC (2017) completed an archaeological assessment and Aboriginal cultural heritage assessment of Mount Pleasant. A survey of the project area identified 20 new sites including five isolated finds, 13 artefact scatters and two possible culturally modified scarred trees. Thirty-three test pits, each 1 m x 0.5 m in area, were excavated and 22 stone artefacts were recovered from subsurface sediments. The study confirmed the predictive model for the project area, in that the spur crest above the drainage line and the areas adjacent to, or in close proximity to the creek were used by Aboriginal people in the past.

An AHIP #C0002892 was issued for the project on 15 September 2017. The AHIP stipulated that salvage works would be carried out prior to construction activities, to recover surface artefacts from sites within the proposed impact zone, as well as subsurface artefacts from one site (MPAS13). The salvage works stipulated in the AHIP were carried out in September and October 2017 (NOHC 2018e).





A total of 1,622 artefacts were salvaged from all sites. Of these, 1,583 were recovered from MPAS13. Flaked artefacts (unretouched and retouched flakes, flaked pieces, cores and an errillure) comprise most of the salvaged artefacts. Three hammers and an anvil were also salvaged. No ground artefacts were found.

#### **5.1.1.6 Googong Water Supply**

In 1973, as part of an Environmental Impact Statement for the proposed Googong Water Supply Project, Flood recommended that an archaeological survey be completed for the area that was likely to be impacted by the proposed development (National Capital Development Commission (NCDC) 1973). Smith (1975) carried out a systematic archaeological survey of the Googong Dam on the Queanbeyan River to the southeast of the present study area. He located at least 13 sites, nine of which were isolated finds. One site (AHIMS Site No: 57-2-0018), however, contained a total of 81 artefacts. Common raw materials were chert, greywacke and silcrete. Most of these sites have been subsequently collected. A stone arrangement was located in the course of this survey (AHIMS Site No: 57-2-0018). It comprised two stone cairns 60 cm apart just below the crest of spur on south slope and at the high-water contour' (AHIMS Site Card).

#### **5.1.1.7 Googong**

Archaeological surveys, surface collection and subsurface testing within the Googong Township area have been undertaken by Saunders (2001a, 2001b) and NOHC (2003, 2010a, 2014b, 2014c, 2014d, 2015a, 2016a, 2016b, 2018b, 2019).

A survey for Aboriginal and European sites was conducted within the 216 ha property of *Talpa Crest* by Saunders in 2001 (2001a), in the north-eastern corner of the Googong Township area. Fourteen Aboriginal archaeological sites were identified, consisting of seven open artefact scatters (TC2, TC4, TC6, TC8, & TC10–12) and seven isolated finds (TC1, TC3, TC5, TC7, TC9, TC13 & TC14). The majority of the open sites were small low-density artefact scatters, however, sites TC2, TC4 and TC11 were substantially larger, comprising up to an estimated 500 artefacts.

Assemblages at these sites were dominated by flakes and flaked pieces, although cores, blades, hammer stones and a fragment of a ground edged axe were also recorded. The predominant stone types were quartz and quartzite, with chert, silcrete, volcanic, metamorphosed tuff and metamorphosed sedimentary also present. Areas of high archaeological potential were also identified along the low gradient southern sections of 'Gorge Creek' and the tributary adjacent to the east.

Saunders (2001b) conducted a preliminary archaeological assessment of an area encompassing the current project area as well as a number of properties to the north. During that survey a further five Aboriginal sites and three areas of high archaeological potential were identified.

In 2003, NOHC conducted a cultural heritage assessment of the proposed Googong New Town development area as part of a Local Environmental Study (LES). The assessment involved a comprehensive surface survey of approximately 1,000 ha. Prior to the 2003 field survey, 23 previously recorded archaeological sites (18 Aboriginal and five European) were known to exist in the study area. Thirty-four Aboriginal sites (20 artefact scatters and 14 isolated finds) and 24 areas of PAD were identified during the 2003 survey. The LES recommended a variety of further assessment strategies and/or salvage actions (NOHC 2003a).

The Googong New Town development area was subsequently divided into Neighbourhood 1A and 1B for a phased land release. A program of Aboriginal archaeological subsurface testing and collection was conducted within Neighbourhood 1A in February 2010 (NOHC 2010b).

Five PADs were tested: GAPAD13 (57-2-0592), GAPAD14 (57-2-0593), GAPAD16 (57-2-0594), GAPAD17 (57-2-0595) and GAPAD18 (57-2-0596). 89 test pits, four grader scrapes and one hand excavation were conducted during the subsurface testing program.

A total of 176 whole and broken artefacts were recovered during the surface collection (57 or 32.4%) and subsurface testing program (119 or 67.6%). A high proportion of artefacts (142 or 80.7%) came from GAPAD16 (57-2-0594), of which most (84 or 59.2%) were recovered from the hand excavation of Feature 1 within that PAD. Artefact types identified in the assemblage were: flakes, retouched flakes,



cores, flaked pieces, hammers and/or anvils and an edge-ground hatchet head. Based on the presence of backed artefacts, it is inferred that these sites were occupied in the Mid- to Late Holocene.

A range of raw material types was utilised to produce the artefacts, including: silcrete; chert; hornfels; quartz and quartzite; and tuff and volcanic rock types. Surface artefact areal incidences were very low with artefacts collected from the surface of two of the five test areas (GAPAD17 and GAPAD16). It was concluded that the location of sites within the study area is typical of most sites in south-eastern Australia with artefacts occurring on relatively level ground in locally well-drained contexts on spur line crests.

In general, the artefact assemblage is typical of most sites in south-eastern Australia. The exception is a rare cluster of silcrete indicative of a single activity associated with *in situ* artefact production. This 'knapping floor' was located in Feature 1, Transect 1, GAPAD16. Given the results of the extensive surface survey, surface collection and subsurface testing undertaken in the study area it was concluded that it was unlikely that another 'knapping floor' would be located in the area (NOHC 2010b).

NOHC undertook an Aboriginal and historical archaeological heritage assessment for the Googong New Town Trunk Water and recycled water system in 2009 (NOHC 2009c). Four Aboriginal sites (GWTP1–GWTP4) were identified. The sites comprised three artefact scatters (GTWP1 – GTWP3) and one isolated find (GTWP4). Subsequently in May 2013 (NOHC 2013b) the collection of site – GWTP2 was undertaken and a site impact recording form submitted to OEH.

In 2013, a surface salvage collection of Aboriginal objects located within Googong Neighbourhood 1A was conducted at the following sites: GA24 and GA26 within GAPAD16, GA21 within GAPAD17, and sites GA22 and GA25 (NOHC 2013b). A total of 225 artefacts were recovered with a range of raw material types utilised to produce the artefacts including chert, quartz and quartzite, with a large number (34 or 15%) of artefacts so weathered that their raw material type could not be identified beyond the general category of weathered fine grained sedimentary material. Artefact types identified in the assemblage include flakes, flaked pieces, retouched flakes, hammers and anvils. It was found that artefacts made from the more coarse-grained material quartzite were larger and exhibited more cortex coverage, indicating that they were on average less intensively reduced than artefacts made from finer-grained materials such as chert and silcrete. The presence of four backed artefacts suggests that these sites were occupied sometime in the Mid- to Late Holocene (NOHC 2013b).

Additional survey and review of the Googong Neighborhood 1B development area was conducted in December 2013. This survey identified several previously unrecorded archaeological sites and re-assessed previously recorded sites (NOHC 2014b and 2015a). Nine Aboriginal sites were recorded in the course of the survey – G1B AS1, G1B AS2, G1B AS3, G1B AS4, G1B AS5, G1B AS6, G1B AS7, G1B AS8 and G1B AS12.

Site G1B AS12 was originally assessed as a probable Aboriginal scarred tree. NOHC commissioned Danny Draper from Urban Tree Management Australia Pty to undertake an arboricultural assessment of the tree. The assessment revealed that the tree was likely to be of Aboriginal origin due to the dimensions and age of the tree, depth of the wound margins, size of the initial wound, and moderate weathering of its durable heartwood as delignification.

Previously recorded sites GA4, GA20 and GA23 were re-visited and artefacts were recorded to ensure consistent recording between all sites. Two of the previously recorded sites, GA19 and GA3, could not be found. Two areas of PAD were identified: G1B PAD and GA PAD19. Test excavation of the two PADs (GA PAD19 and G1B PAD) in February 2014, recovered a sparse assemblage of artefacts from subsurface sediments at both PADs.

In 2014, NOHC conducted a cultural heritage assessment of the Googong Balance Areas project area (NOHC 2016). The 2014 field survey identified 26 Aboriginal sites and comprised 14 artefact scatters (GRW1, 3, 5, 9–14, 16, 17, 22, 23 and 26) and 12 isolated finds (GRW2, 4, 6–8, 15, 18, 21, 24, 25, 27 and 28).

One Aboriginal feature (GRW Cultural Site) was identified within the Googong Balance Areas project area in the course of the 2014 field survey of the area. It was recommended that, where possible, Aboriginal sites/feature sites GA3 and GRW Cultural Site should be avoided by all activities.



Nine Aboriginal sites and three Aboriginal PADs were recorded within the Googong Balance Areas project area prior to the 2014 field survey of the area. These comprised six artefact scatters (GA1, GA3, GA5, GA6, GA7 and S Qbn – E1), three isolated finds (GA2, GA17 and GA18) and three PADs (GA PAD20, GA PAD21 and GA PAD22).

Surface salvage and recording of these sites and associated PADs was undertaken in June 2016. Nine surface artefact sites were re-found, left *in situ* and recorded as part of the research project on assessing farming impacts on Aboriginal surface sites (GA2, GRW1–4, GRW8, GRW11, GRW17 and GRW22). Fifteen sites were re-found for salvage of surface artefacts (GA6, GA18, GRW 5, GRW 6, GRW 7, GRW 9, GRW 10, GRW 12, GRW13 GRW 14, GRW 16, GRW 18, GRW 26, GRW 27 and GRW 28). Five sites were not able to be re-found for salvage of surface artefacts (GA5, GA7, GA17, GRW15 and SE Qbn E1). Ninety lithic artefacts were retrieved through surface collection.

In 2014, Googong Township Pty Ltd commissioned NOHC (NOHC 2016) to conduct an archaeological program of subsurface testing at a number of sites in areas of PAD in the proposed Googong New Balance Areas development area.

Subsurface testing was undertaken during August 2014 at GA PAD20, GA PAD21 and GA PAD22. The archaeological excavations were carried out in accordance with the NSW OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b). Five test pits were excavated at GA PAD20. Six artefacts were retrieved from GA PAD20. Nine test pits were excavated at GA PAD21. One artefact was retrieved from GA PAD21. Twenty-six test pits were excavated at GA PAD22. Fourteen artefacts were retrieved from GA PAD22. The results of the test excavations were consistent with other PADs excavated within the Googong urban release area.

In September 2014, NOHC conducted archaeological test excavations at the 'Bunyip' property within the Googong New Town area (NOHC 2017). An area of PAD (BGPAD1) had previously been identified in the course of the 'Bunyip' due diligence assessment which was conducted in 2012 (NOHC 2012). Eleven test pits – 1 m x 0.5 m in area – were excavated and six stone artefacts were recovered from subsurface sediments. No surface artefacts were found during excavations at BGPAD1. The density of subsurface artefacts was not high enough to warrant salvage excavations to be carried out.

Googong Township Pty Ltd commissioned NOHC to conduct an archaeological assessment of Googong Neighbourhood 2. This involved a program of surface and subsurface testing. The field survey was conducted in November 2016(a). The survey study located seven previously unrecorded Aboriginal sites during the survey of the study area (GRW29 – GRW35). Seven previously recorded sites were re-found during the current investigation (GRW1, GRW4, GRW5, GRW8, GRW10, GRW14 and GRW15). GRW1, GRW4 and GRW8 were left *in-situ* as part of the farming areas collection program and have been re-recorded. GRW5 and GRW10 were collected during the farming areas collection program and additional artefacts were recorded at these sites. Site GRW14 is located partially outside and GRW15 is located 26 m outside the Googong Neighbourhood 2 study area. GRW14 was collected during the farming areas collection program, and additional artefacts were recorded at this site. GRW15 could not be re-found during the collection program. All other previously recorded sites (GA5, GA6, GA7, GRW6, GRW7, GRW9, GRW12, GRW13 and GRW28) were revisited and re-inspected during the current investigation but no additional artefacts were found.

The subsurface testing program was conducted in June 2017. Eighty-six test pits were excavated in three test areas. Thirty-seven pits were excavated at GRW1. Forty-eight stone artefacts were recovered from GRW1. Twenty-four pits were excavated at Test Area 2. No subsurface artefacts were recovered from Test Area 2. One surface stone artefact was recorded and not collected at Test Area 2; this constitutes new site GRW37. Another two surface stone artefacts were recorded and not collected at Test Area 2 as well as three stone artefacts removed from Test Area 3; these five artefacts constitute the new site GRW36. Twenty-five pits were excavated at Test Area 3.

In 2018 NOHC was commissioned by Googong Township Pty Ltd to conduct an archaeological and cultural heritage assessment of Googong Neighbourhood 1A (NOHC 2019). One previously recorded PAD (GAPAD18) sits partially inside the Googong Neighbourhood 1A project area. In May 2018, GAPAD18 was revisited and re-inspected but no additional artefacts were found. One previously unrecorded Aboriginal site was located during the survey of the study area (GRW38).



#### **5.1.1.8 South Tralee**

The South Tralee study area, or parts thereof, have been the subject of a number of previous archaeological surveys (Access Archaeology 1991; Archaeological Heritage Surveys 2003a, 2003b; NOHC 2003b, 2010a, 2015, 2016c).

Access Archaeology undertook an archaeological survey of 'The Poplars' in 1991. This study included all of 'The Poplars' in the northern half of South Tralee. Nine Aboriginal artefact scatters (PPSD1–3 and PPS5–10), one scarred tree (PPS4) and three isolated finds (PIF1–3) were recorded.

Archaeological Heritage Surveys (2003a) undertook an assessment of 'The Poplars' in 2003. Five sites additional to those recorded by Access Archaeology were found (PPS11–12 and PIF4–6). Four areas of high archaeological potential were identified; these were PAD1-North, PAD2, PAD3 and PAD4.

No Aboriginal or European cultural heritage sites or areas of Aboriginal archaeological potential were located in the course of a cultural heritage assessment of the Tomsitt Drive Duplication in 2003 (Archaeological Heritage Surveys 2003b). The area was assessed as having minimal archaeological potential. Aboriginal sites PPS7 and PPS8 were not re-found during the survey. An Aboriginal cultural heritage assessment of North and South Tralee was included in the LES for Tralee in 2003 (NOHC 2003b).

- One Aboriginal site, a low-density stone artefact scatter Site TA1 (57-2-0337) was recorded during the 2003 survey. The site is located within the South Tralee residential project area.
- An area of PAD was identified along the southern side of Jerrabomberra Creek, PAD1-South.

An archaeological survey of the proposed North and South Tralee residential development was conducted in 2009 (NOHC 2010a). Six Aboriginal sites were identified in this study, comprising three artefact scatters (TA3, TA6 and TA7) and three isolated finds (TA2, TA4 and TA5) (NOHC 2010a). Previously recorded Aboriginal site TA1 was not re-found in 2009.

An archaeological survey of the proposed initial service infrastructure (including the sewage treatment plant) required to service the South Tralee property was conducted in 2010 (NOHC 2010b). The majority of the infrastructure corridor followed a dirt vehicle track that ran adjacent to the Goulburn–Bombala railway line. No Aboriginal sites were identified. The status of PAD1-North was confirmed as an area of archaeological potential. Two previously recorded sites, PPS5 and PAD3, were re-found and updated map coordinates were recorded during the site visit. No previously unrecorded Aboriginal sites or areas of archaeological potential were identified within the study area in the course of the investigation.

A cultural heritage assessment of South Tralee Residential area Stage 1 has been undertaken by NOHC (2018). This assessment included archaeological survey and a subsurface testing program. Seven previously recorded Aboriginal sites have been identified within the South Tralee Stage 1 residential study area. Two previously unrecorded Aboriginal sites were identified within the South Tralee Stage 1 residential study area in the 2014 field survey. Following test excavation of STPAD1, which recovered subsurface artefacts from two pits, these two pits were designated as sites, and the remainder of STPAD1 was found not to be a site.

#### **5.1.1.9 Royalla**

NOHC (2018d) undertook an assessment of a parcel of land is situated 18 kms south of Queanbeyan, NSW, and 3 km north of the junction of the Monaro Highway and Old Cooma Road. A field survey was conducted (NOHC 2018d), and identified two Aboriginal sites, each consisting of surface artefacts associated with an area of PAD, as well as two areas of PAD with no visible surface artefacts.

Archaeological test excavations were conducted at Area 1 transect (north of RSPAD1 and south of RSPAD2), Area 2 transect (north of RS2 and PAD), Area 3 transect (south of RS2 and PAD) and Area 4 transect (RS1 and PAD) in July 2017. Nine stone artefacts were recovered from subsurface deposits. The low artefact density encountered in the test excavation program is interpreted as evidence that archaeological material within the study area is characterised by low density artefact scatters, which are probably indicative of low frequency use of the landforms in the past by Aboriginal people.





#### **5.1.1.10 Millpost Stone Axe Quarry – Aboriginal place**

The Mill Post Stone Axe Quarry is listed as an Aboriginal place (Aboriginal place #2018–2162) under the NSW National Parks and Wildlife Act. The Mill Post Stone Axe Quarry is located in Wamboin approximately 12 kms northeast of Jumping Creek. The values for which the Millpost Stone Axe Quarry Aboriginal Place has been assessed as being significant to Aboriginal culture include, but are not limited to, the site being an important source of basalt (dolerite) which is a key stone material highly sought after for making stone axe heads. The basalt (dolerite) was also used as a trading commodity for the Ngambri and Ngunnawal peoples with neighbouring Aboriginal nations of south-eastern Australia including the Ngarigo people. The exchange of basalt (dolerite) axe heads would have occurred during the large intertribal gatherings of Aboriginal groups that passed through the area for such events as the feasting of the Bogong moths (Government Gazette No. 66 Friday 29 June 2018).

#### **5.1.1.11 Hume**

NOHC undertook a subsurface investigation of a PAD (JPAD1) along Jerrabomberra Creek within the ACT Prison Site in 2005 (NOHC 2005). The JPAD1 subsurface investigation was situated on a low spur line crest situated below the current tree line of the Jerrabomberra Creek valley. The very low density of artefact found provide strong support for concluding that the open context, valley floor natural grasslands of the Canberra region, were not foci for Aboriginal camping. It is postulated that this was due to their exposed and treeless aspect, and the presence of low temperatures from cold air drainage.

A large-area investigation of Hume was conducted by Barber (2000). The project assessed some 800 hectares of land and included an extensive field survey program. Barber noted that grass cover across the area was a severe limitation to the identification of both Aboriginal and European heritage sites. Nineteen Aboriginal sites were recorded during the survey. All Aboriginal sites consisted of surface scatters of artefacts within existing ground exposures. Seventeen areas of archaeological sensitivity were identified, consisting of locally elevated ground (mostly spur-line crests) adjacent to watercourses.

In 2003 Australian Archaeological Survey Consultants (AASC) undertook surface salvage of Site HA11 and test-pitting of Hume PAD1 and Hume PAD 2. Thirty-five artefacts were collected at site HA11. One artefact was located during the testing of PAD1 and 13 artefacts were located at PAD2. These sites were located adjacent to Dog Trap Creek.

Hughes et al. (2007) undertook monitoring of ground disturbance of HID1391 (HA11) and HID1395 (Hume PAD2). Grader scrapes were excavated at each site. A total of 300 artefacts were recovered from HID1391, and 450 from HID1395 (AASC 2003).

NOHC (2016b) completed an archaeological salvage program for the Mugga Lane Solar Park located on Dog Trap Creek located 3 kilometres south-west of the current project area. Tugg PAD 1, 21 artefacts were recovered. On Hume PAD 6c, 1720 artefacts were recovered.

These studies show that Dog Trap Creek may have been the greater focus of occupation in the area rather than Jerrabomberra Creek. This is possibly related to Dog Trap Creek being in a more protected and dryer/less swampy location than Jerrabomberra Creek, which is located on a wide plain with little or no protection and soil deposits indicating a swampy environment.

#### **5.1.2 Contact Sites in the Queanbeyan and ACT Region**

Avery completed an honours thesis in 1994 on Aboriginal and European encounter in the Canberra Region. The study looked at the effects of European settlement on Aboriginal economy in the Canberra Region during the nineteenth and early twentieth century. The study found that there are few known contact sites in the Canberra Region, and the majority of these has no material composition, being recognised on the basis of oral tradition or documentary evidence, those sites are summarised in Table 5.1.



**Table 5.1 Identified contact sites in the Canberra Region**

Site Name	Type	Location
Hongyong's Grave.	Burial/Grave.	On a rocky hill, approximately 100m north of the Tharwa bridge, Tharwa (ACT).
Rendezvous Creek Rockshelter.	Rock art.	Rendezvous Creek, Gudgenby Valley, Namadji National Park, (ACT).
King Billy's Grave.	Burial/Grave.	Section A, Row 1 Grave 1, Anglican portion of Tharwa Road Cemetery, Queanbeyan (NSW).
King Billy's House.	Dwelling.	Located near Riverside Homestead, Oaks Estate (ACT).
King Billy's or Marvellous's Grave.	Burial/Grave.	Entrance to Church of England portion, Riverside Cemetery, Queanbeyan (NSW).
Jacky's Grave.	Burial/Grave.	Anglican portion, Riverside Cemetery, Queanbeyan (NSW).
"Last Campsite of the Red Hill Aborigines".	Occupation site.	Hayes Crescent, Red Hill (ACT).
Site C3/12	Occupation / manufacturing site.	Ginninderra Creek, Gungahlin (ACT)
Site HP 5.	Occupation / manufacturing site.	Ginninderra Creek, Gungahlin (ACT)
Ginninderra Blacksmiths Shop artefact scatter.	Occupation / manufacturing site.	Adjacent to Ginninderra Blacksmith's Shop, Barton Highway, Ginninderra (ACT).
WB-C-C1/2.	Occupation / manufacturing site.	Gooromon Pond Creek, West Belconnen, (ACT)

Avery undertook field survey of selected locations to archaeologically investigate the locations of Aboriginal campsites mentioned in historical accounts. Four open artefact scatters with reported worked glass were examined. With the exception of one site located at West Belconnen (site WB-C-C1/2), the glass artefacts were either unable to be relocated or possessed no features that could be used to suggest their date of manufacture. Two sites were recorded in Oaks Estate that had Aboriginal and European artefacts. Avery also mentions other sites containing possible modified historical artefacts located at Pialligo (Saunders 1994 – pers. Comm.) and Jumping Creek, NSW (Kuskie 1989) (see below). Avery concludes:

*From the evidence examined, three different types of archaeological sites have been identified which may be representative of Aboriginal use during the contact period. Firstly, sites containing stone artefacts and worked glass appear to have been used either before or during early white settlement in the Canberra Region, where Aborigines were using traditional technology and resources. The second site type, consisting of stone artefacts and unmodified historical material, may have been used around the mid-nineteenth century, and suggest that Aborigines may have been using both European and traditional material culture, and perhaps traditional resources. Finally, sites containing historical artefacts may be characteristic of the late contact period, when Aborigines were probably using essentially European materials and resources.*





### 5.1.3 Ceremonial Sites

ACT Heritage Council has listed a ceremonial site with associated archaeological sites in the northeast of the ACT on Ginninderra Creek. *The Ginninderra Creek Corroboree Ground Cultural Gathering Place is located on what is now rural pastureland composed of gently undulating terrain on the edge of Ginninderra Creek. The place is associated with intangible heritage values relating to corroborees, as such the place is relevant to the history of the region and Aboriginal cultural values. Registration relates to the preservation of this locality as open space, as close to the natural state as can be managed given the landscape changes that have occurred since colonisation* (ACT Heritage Listing May 2021).

### 5.1.4 Jumping Creek

Fifty-nine Aboriginal recordings are listed on the AHIMS for the area around the Jumping Creek study area defined as the area within coordinates: GDA, Zone: 55, Eastings: 704243–705501, Northings: 6082383–6083642 with a Buffer of 200 m. All sites are open artefact scatters with one recorded PAD. A copy of the AHIMS search is provided in Appendix 2.

Surveys in the vicinity of the project area include Gale Precinct, Jumping Creek and south Jumping Creek. The results of these surveys indicate a relatively high site density for areas immediately adjacent to the Queanbeyan River. Bulbeck and Boot in a review of studies carried out on the Molonglo and Queanbeyan River systems noted that most sites were located on 'fairly level ground, particularly on river flats, terraces and ridges leading to water courses' (Bulbeck and Boot 1990:19).

During their preliminary archaeological survey of Jumping Creek, Boot and Heffernan (1989) sought to locate and record Aboriginal archaeological sites within an area of 100 ha known as the Jumping Creek Development Proposal. Twenty sites were located, and it was found that large and dense artefact scatters are concentrated around the confluence of Jumping Creek with its northern tributary. Smaller and less dense sites occur on the central ridge and lower slopes of hills in the north-western boundary. The current study area is included in this study.

Although Kuskie's 1989 research orientated approach to a study of the same 100 ha of Jumping Creek had substantially different aims to those of Boot and Heffernan's project, the findings of both were similar in many respects (Boot and Kuskie 1996:23–27). That study also encompassed the current study area. Kuskie located 20 sites comprising 1724 artefacts. All were open scatters of stone artefacts.

In 1995 Klaver undertook a summary of all archaeological sites identified along the proposed route of the Queanbeyan bypass. She concluded that patterns of site occurrence in Queanbeyan are 'largely restricted to open scatters of stone artefacts, isolated artefacts and scarred trees. There is an apparent trend for Aboriginal archaeological sites to be located on ridgelines and spurs, particularly where they lead to permanent water or along river flats. Approximately 65 percent of recorded Aboriginal activity (including artefact scatters, isolated finds and scarred trees) occurs on ridgelines and spurs. Approximately 21 percent of site activity occurs on gentle slopes and the remaining 14 percent occurs on flats and creek sides. Relatively unusual but extremely large sites have also been documented in the alluvial sand deposits adjacent to the Molonglo River' (Klaver 1995:12).

An archaeological survey of part Lot 1 DP 711905, Jumping Creek was undertaken by NOHC in 2004. Three Aboriginal sites (designated Jumping Creek 1-JC1, Jumping Creek 2-JC2, and Jumping Creek Valley 6-JCV6) were known to exist in the study area prior to the 2004 field survey. The archaeological survey confirmed the location of two of the three recorded Aboriginal sites – Jumping Creek 2 (JC2) and Jumping Creek Valley 6 (JCV6) and identified a further two Aboriginal sites – Jumping Creek 21 (JC21) and Jumping Creek 22 (JC22), and one area of PAD. A re-survey of this site was undertaken by NOHC in 2009 (2009a). As in a previous survey in 2004, JC2 was not relocated. One artefact from site JC21 was relocated.

The Jumping Creek Estate was again reassessed as part of a desktop study (Saunders 2007). The study concluded that despite being rich in Aboriginal sites, the recent archaeological investigations in the broader Queanbeyan region show that it is not unique in the region and that its significance may initially have been overstated.

NSW Archaeology undertook an archaeological assessment for the proposed rezoning of Jumping Creek in 2009. Artefacts were recorded in all Survey Units except SU8, SU14 and SU16. A total of 29



Aboriginal objects were recorded during the survey. The majority of previously recorded sites were re-found during the survey. The exception to this includes JC5 (similarly [Kuskie 1989] did not relocate this site), JCV3 and JC20. A number of Aboriginal objects were found in areas in which sites had not previously been located. These Aboriginal objects include SU2/L2, SU2/L3, SU2/4, SU3/L1, SU6/L1, SU10/L1, SU10/L2, SU11/L1, SU15/L1, SU15/L2, SU15/L3, SU15/L4, SU18/L1 and SU18/L2. Artefacts were often found to cover reasonably large areas, a factor at least in part, of generally high levels of exposure and archaeological visibility. In addition, artefact density was found to be generally low; this result also corresponds to the results obtained by Boot and Heffernan (1989) and Kuskie (1989). Table 5.2 and Figure 5.1 below details the sites recorded as part of this assessment.

Only three Survey Units have been assessed to have the potential to contain subsurface deposit (Survey Units 16 and 18). Survey Unit 9 was also assessed to possibly contain undisturbed deposit. The remainder are assessed to possess low to negligible potential to contain subsurface deposit given the skeletal nature of the soils, erosion to bedrock and high levels of prior disturbance.

In 2009 NOHC were engaged to undertake a heritage assessment before carrying out badly needed remediation and erosion works on an eroding hillside of Jumping Creek (NOHC 2009a). The study relocated four existing artefact scatters (JC12, JC14, JCR1 and JCR2), however sites JC13 and JC1 were unable to be relocated. The study determined that sites JC12 and JC14 were in fact part of the one large, low density scatter extending over the crest and upper slopes of a spur. The scatter comprised at least 24 artefacts extending over a large area, consisting of flakes and flaked pieces made from silcrete, volcanics and quartz.

A program of artefact salvage was recommended for all three of the relocated sites, which was undertaken in November 2010 with the contents of all three sites salvaged and reburied together at location 57-2-0683.

Cultural Heritage Management Australia (2015) undertook an Aboriginal Cultural Heritage assessment and Aboriginal Cultural Heritage Archaeological Report (ACHAR) for the Ellerton Drive Extension. The Ellerton Drive Extension runs along the eastern border of Jumping Creek. A further six sites were identified including four open artefact scatters (sites ED1, ED3, ED5 and ED6) and two isolated finds (ED2 and ED4). Two of these sites form part of a larger site complex (ED4 and ED5).

Prior to this assessment no subsurface test excavation program has been undertaken within or in the vicinity of Jumping Creek.

**Table 5.2 Sites recorded by NSW Archaeology 2009**

SU#	Easting	Northing	Area m <sup>2</sup>	Exposure	Exposure %	Visibility %	Previous recordings	Artefacts
SU1	704442	6083293	6257	bare earth vehicle erosion continuous	70	80	JC9 JCV4 JCV5	101
SU1	704614	6083124	4901	bare earth vehicle erosion continuous	60	80	JC12 JC13 JC14 JCV1 JCV2	7
SU2	705183	6082958	1073	vehicle 4 m wide	95	90	Possibly JCV14	12
SU2	705247	6083037	225	bare earth vehicle erosion continuous	80	90	Nil	6
SU2	705222	6083049	5	bare earth continuous	50	60	Nil	4
SU2	705177	6083046	1	bare earth continuous	50	80	Nil	2



SU#	Easting	Northing	Area m <sup>2</sup>	Exposure	Exposure %	Visibility %	Previous recordings	Artefacts
SU2	705149	6083149	2500	bare earth vehicle erosion continuous	50	90	JC8 JCV13	8
SU3	705131	6083344	1	bare earth continuous	30	80	Nil	2
SU4	705154	6083423	1927	bare earth vehicle erosion continuous but mostly on track	40	80	JC6 JCV9	23
SU5	704961	6083373	4138	bare earth vehicle erosion continuous	70	90	JC6 JCV10 JCV11	89
SU6	705027	6083305	100	vehicle 60 x 4 m	90	90	Nil	4
SU6	705029	6083225	1600	bare earth vehicle erosion	60	60	JC7 JCV12	8
SU7	704597	6083396	8484	bare earth vehicle erosion continuous	20	80	JC3 JC4 JCV7 JCV8	188
SU9	704424	6083408	200	bare earth vehicle erosion continuous	80	30	JC1	5
SU10	704686	6083528	900	bare earth erosion continuous	50	90	Nil	5
SU10	704724	6083445	100	bare earth bike track	60	90	Nil	2
SU11	704842	6083459	1600	bare earth erosion continuous	80	90	Nil	7
SU12	704790	6083311	400	bare earth vehicle erosion	90	90	JC4 JCV8	30
SU13	705028	6082808	1	bare earth continuous	50	70	JCV15	1
SU13	704960	6082792	900	bare earth vehicle erosion continuous	60	90	JC19 JCV16	10
SU15	704461	6082470	1	bare earth continuous	60	60	Nil	1
SU15	704402	6082703	1	bare earth continuous	70	90	Nil	1
SU15	704505	6082657	1	animal	80	90	Nil	1
SU15	704535	6082789	225	bare earth erosion continuous	80	20	Nil	4



SU#	Easting	Northing	Area m <sup>2</sup>	Exposure	Exposure %	Visibility %	Previous recordings	Artefacts
SU17	704911	6083072	12853	bare earth vehicle erosion arch visibility only on tracks	80	80	JC15 JC16 JC17 JC18 JCV17 JCV18 JCV19 JCV20	82
SU18	704905	6083286	30	vehicle erosion continuous	90	90	Nil	3
SU18	704910	6083267	20	erosion at edge of bank	50	90	Nil	2
SU19	704604	6082935	4	erosion continuous	80	80	JC11 JCV1	2
SU19	704338	6083269	1	bare earth continuous	40	90	JC10	2



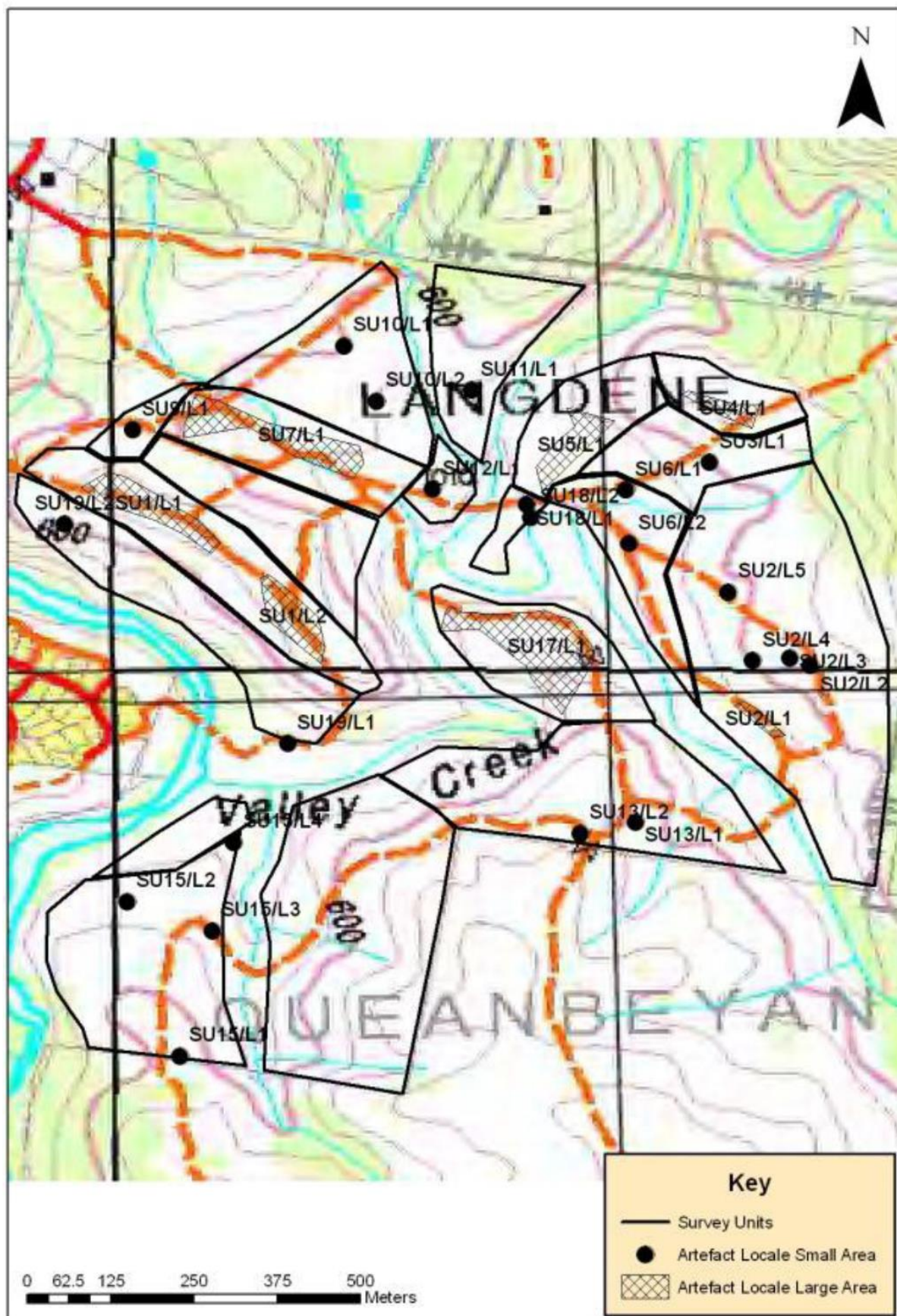


Figure 5.1 NSW Archaeology field survey results





### 5.1.5 Contact History at Jumping Creek

Kuskie in his 1989 honours thesis examined the post-contact Aboriginal history of Jumping creek. Kuskie states:

Glass fragments were observed in various parts of the study area. The identification of Aboriginal modification of these pieces is extremely difficult because glass has a tendency, when fractured by vehicles or treadage, to exhibit characteristics identical to those recognised as diagnostic of deliberate human knapping. None of the glass fragments found could be said to be unquestionably the product of Aboriginal modification. No evidence was found to prove Aborigines occupied the valley during post-contact period. (p26)

And further:

Conclusive evidence that Aborigines occupied the Jumping Creek Valley during the post-contact period was sought from historical and oral sources and by field surveying. No such evidence was located during the field survey and no definite information could be obtained from other sources. The possibility Aborigines utilised the field area contemporaneously with Europeans cannot be discounted on negative evidence. Indeed, Kevin Gilbert (1989 pers. Comm.) of the Ngunawal (now Ngambri) Local Aboriginal Land Council, claims his people camped in the valley during the post contact period. (p67).

And in conclusion:

No archaeological evidence could be located for Aboriginal/European interaction, but this does not negate the possibility Jumping Creek is a contact site. (p76),

## 5.2 Non – Archaeological Areas of Identified Cultural Significance

In addition to the archaeological studies noted above an Aboriginal cultural heritage assessment for the Ellerton Drive Extension Project was undertaken by Waters Consultancy in 2016. This report identified Valley (Jumping) Creek & Queanbeyan River Junction Resource Gathering and Camping Cultural Area (Site A). It was broadly identified as the Jumping Creek valley and its confluence with Queanbeyan River (Figure 5.2) and was recorded by Waters as a site as a resource area and camping place of medium significance associated with the pathway identified as Site B: Queanbeyan River Pathway Cultural Site. The boundary of this site was not mapped but was generally indicated by a large elliptical shape on an aerial photo.

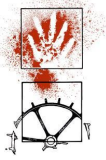
Additionally, Site B: Queanbeyan River Pathway Cultural Area (Site B) (Figure 5.3) was considered by Waters to have high cultural significance as a section of a pathway that travelled along the Queanbeyan River. This pathway was part of an interconnected series of pathways that linked the coastal area to the tablelands and then into the highlands. Presumably (although this is not articulated clearly in her report) it is the entire pathway that has high cultural significance and not just this section. Waters does not provide any information about how the relative significance of the sites identified was assessed.

Waters Consultancy (2016:18) also very briefly mentions:

*An area lying near the southeast junction of the Queanbeyan River and Valley (Jumping) Creek has been identified by a knowledge holder as having ceremonial significance.*

The vague location suggests that this place is possibly (but not certainly) located within the current study area and to try and clarify this further consultation with the RAPs was undertaken by NOHC as detailed in section 4.5 and below. At that time of the Waters investigation the nature of the possible ceremonial site was not described, and its location was not defined nor was it further investigated or entered on the AHIMS database.

NOHC contacted Kate Waters, to enquire if any specific information about this site including its location was known and who the informant was so that we could consult them Ms Waters indicated that she thought the location of the ceremonial site was likely to be somewhere within the overall study area but she could provide no further details on the location or the specific informant who had mentioned the site.

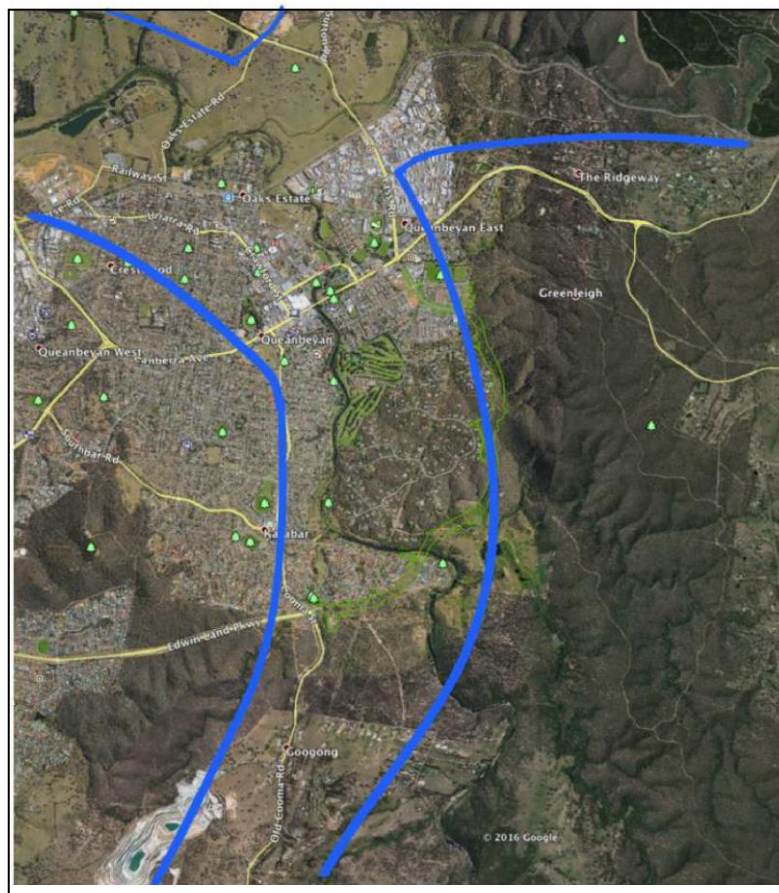


NOHC therefore contacted the informants listed in the Waters Consultancy 2016 report. Unfortunately, two have subsequently passed away. All remaining informants are registered Aboriginal parties for the project and had received all the project information and had been provided the opportunity to comment on the project and provide any relevant cultural heritage information on multiple occasions (see Section 4). Regardless of earlier opportunities, as a precaution, contact was again made by email and phone call between the 21/5 and 27/5 to try and ascertain if anyone had any information related to a possible ceremonial site in the study area. No further information was received, nor were any concerns that it might be located in the area raised,

Despite this outcome, Heritage NSW requested that NOHC engaged a qualified anthropologist to investigate the possibility that such a site exists and is known to the Aboriginal knowledge holders as identified by Waters. The consultation process followed is outline in section 4.5 of this report. That investigation revealed no information relating to a ceremonial site within the current study area.



**Figure 5.2 Site A: Valley (jumping) Creek and Queanbeyan River Junction Resource Gathering and Camping Cultural Area (indicative location) (Waters Consultancy 2016)**



**Figure 5.3 Site B: Queanbeyan River Pathway Cultural Site (indicative location) (Waters Consultancy 2016)**

### 5.3 Site Location Model

As a result of the numerous archaeological surveys undertaken to date in the local area, qualitative observations regarding Aboriginal site location parameters may be 49nsurance49 as follows.

- The most commonly recorded site types are low-density surface scatters of stone artefacts. Artefact densities in open artefact scatters may vary considerably.
- Open artefact scatters are most likely to occur on relatively level ground in locally well-drained contexts, either spur line crests, terraces or elevated creek banks in valley floor contexts, low gradient crests and streamline banks in mid valley slope contexts, and level crests, shoulders and saddles on major ridgelines and spurs.
- The majority of open artefact scatters are situated adjacent to, or in close proximity to, creek flats or valley bottom contexts, frequently on low gradient basal slopes adjacent to streams or wetlands.
- Artefacts may occur wherever surface exposures of exploitable rock occur, rock sources that are known to have been locally exploited include chalcedony, chert, quartz, and fine-grained igneous rocks such as fine-grained porphyry and fine-grained intrusives within granodiorite.
- Subsurface archaeological deposits are likely to occur where subsurface deposits have been preserved within the landscape, i.e. those areas where erosional factors have not substantially particularly in well drained sedimentary aggrading landforms adjacent to streamlines.



## 5.4 Limits on Use of Existing Information

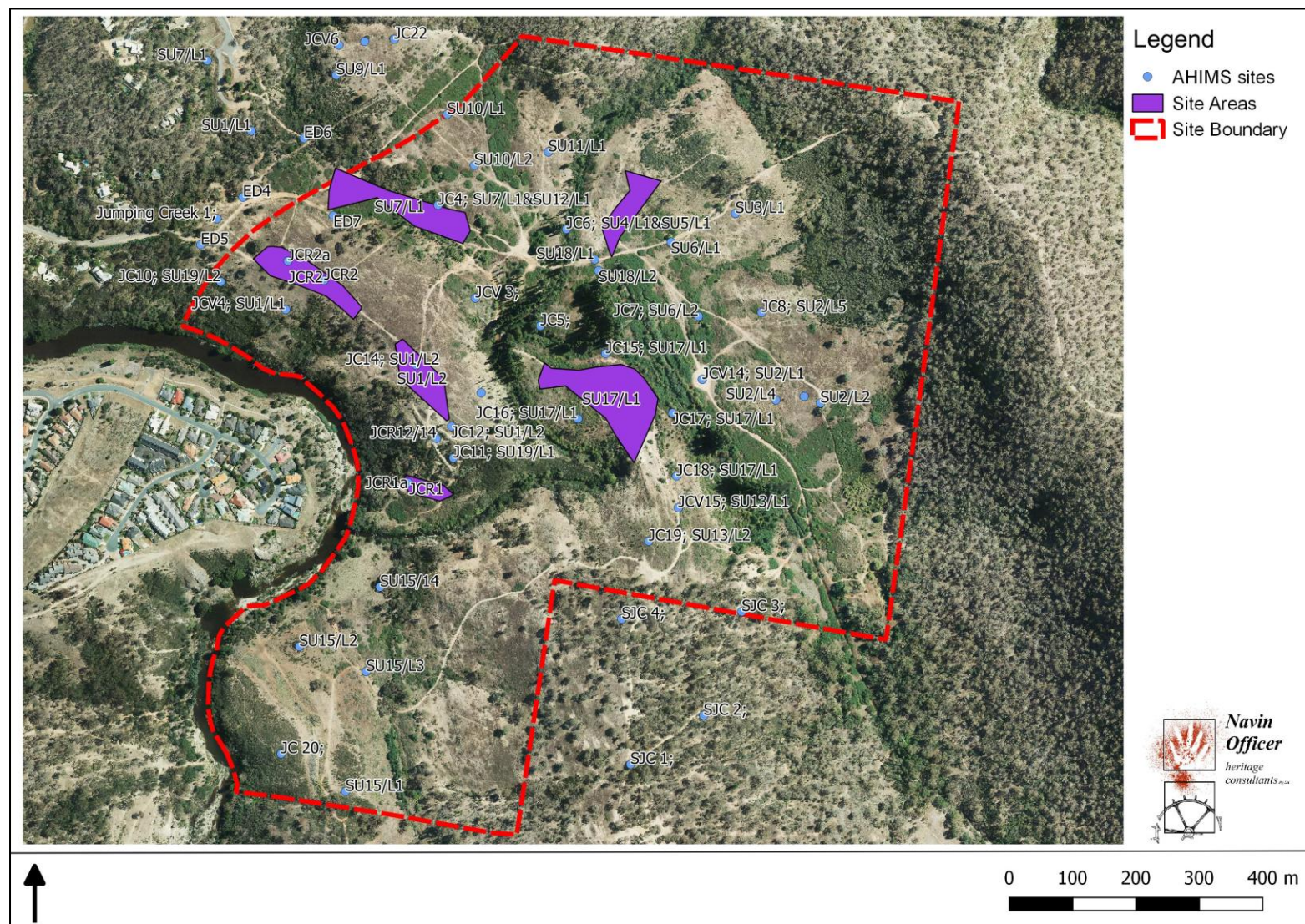
The data used to generate the general interpretation of Aboriginal prehistoric land use in the study area has been drawn from previous archaeological work carried out on areas being developed, from a number of broad scale research projects, and on the data gathered during the current cultural heritage assessment. These sources of data can be biased in their sampling of the landscape and are limited in their scope. Consequently, the data currently available are unlikely to have provided a completely accurate and comprehensive representation of the distribution of archaeological sites across the landscape, or of the relative frequency of different site types.

Archaeological assessments commissioned for development projects are restricted to the specific footprint that will be impacted by the project. The area of land being assessed is specifically constrained, and in many cases, will not include a representative sample of all the different landforms found across the wider region within which the study area sits.

These limitations will usually become less pronounced as more and more assessments are carried out in a region, since more and more patches of ground are being assessed. A systematic bias in the data can still easily occur, however, if the patches of ground are concentrated in one landform type. This could be the case if the assessments relate to development projects which preferentially occur on specific landforms. For example, roads tend not to traverse steep slopes, windfarms tend not to be built in valleys, and housing developments are preferentially situated on flat land.

Data on uses of the land by Aboriginal groups in the post-contact period, including the present day, might be limited if activities practiced by Aboriginal groups have not been reported in the public domain, and have not been reported to NOHC during consultations with Aboriginal groups. This could occur if land use practices are associated with knowledge that is culturally restricted or lost.









## 6. HISTORICAL CONTEXT

### 6.1 Historical Overview

#### 6.1.1 Jumping Creek Valley

Europeans have utilised the area for over 150 years. Captain A.T. Faunce formed a company to develop the suspected copper, silver and lead deposits in the area. A permit was granted, and the mine commenced operations in May 1851. The mine has subsequently been referred to as the Primrose Valley Mine. However, it did not yield a profitable lode and mining ceased several years later (Kuskie 1989:70; McGowan 1996:170–172).

Lea-Scarlett (1968:245) notes that in 1868 a group of Cornish miners were brought to work a mine in the valley and hopes were held for a rich yield of silver. However, a lack of investment and unpromising results caused the venture to be abandoned, after £300 had been spent.

Other extractive industries formed a significant component of European utilisation practices in the area. Sizeable bands and outcrops are present, and they were exploited through extraction and processing. The remains of brick kilns and limestone quarries are visible evidence of this industry in the valley.

Although there is uncertainty about the date of this activity in Jumping Creek Valley, John Gibbs is recorded in church registers as being a Limeburner in the Primrose Valley as early as 1862. However, the name 'Primrose Valley' was applied to two localities in the district – the Jumping Creek Valley and another valley to the east, near Carwoola.

In 1989 a local historian, Bert Sheedy, claimed that the remains of a brick lime kiln to the east of Jumping Creek probably was built in 1927, when the property belonged to Samuel Shannon. Sheedy stated that an Italian migrant, Giovanni Marchiori, built the kiln – but that was not confirmed by Mrs A.C. Amey, one of Shannon's daughters, who was unable to recall if the kiln was built during her childhood. Limestone was quarried near the kiln, and wood to fuel the burning process was obtained from the property and surrounding area. It is uncertain if the limestone extracted from an outcrop near the confluence of the creek was used for the same purpose (Kuskie 1989:71).

Lime produced by the burning of limestone in the brick kiln was mainly sold for mortar to the new Canberra market, which was experiencing a building industry boom after the decision to locate the Federal Capital there – but some was also sold to the closer Queanbeyan market. The remains of several other kilns exist in the district, one at White Rocks and one near Majura Road. A number of lime-burners, such as George Rottenbury, Tom Sayersbury and Moses Morley, are also mentioned in the historical records, so it appears the Jumping Creek Valley kiln was probably only one of a number that supplied lime mortar to the building industries of Canberra and Queanbeyan (Kuskie 1989:71–72).

By the 1940s, a decline in economic viability was probably the major reason for the cessation of lime burning in the area. The availability of raw materials was not a factor because piles of limestone can still be seen adjacent to the remains of the kiln, inside the kiln chambers and stacked against the quarry wall in the valley (Kuskie 1989:72).

Fossicking for gold in Jumping Creek and Queanbeyan River probably also occurred, with little or no returns. Alluvial prospecting was carried out on the Molonglo River in 1889 and fossickers obtained a small amount of gold from the district in 1955 (Kuskie 1989:72).

There is also evidence of pastoralism in the valley. Clearing of the original forest can be attributed to the desire for increased capacity of the land for grazing, in addition to the procurement of timber for lime burning production. Ringbarking was probably the method employed to kill trees, along with clearing the undergrowth and possibly burning. Sheep were the dominant livestock in the region from the 1830s and appear to have been grazed for some period in the Jumping Creek Valley. Pigs were the other introduced species exploited for commercial purposes in the valley, probably in the mid 20<sup>th</sup> Century. Kuskie (1989:73) identified the remains of a sheep dip and a piggery in his survey of the area in 1989.



The pattern of land usage that has prevailed in recent decades represents a very different style of usage to that of earlier years and could be characterised as one of largely recreational use. Trail-bike riders and four-wheel-drive owners often frequent the area for recreational purposes. The valley and surrounding area is also a popular source of firewood for locals in winter (Kuskie 1989:73).

## 6.2 Previous Cultural Heritage Studies

In 1989, Kuskie identified a possible limestone quarry in the study area. The location of this site is shown as H8 (using Kuskie's numbering). Kuskie noted there were cement pipe remains, limestone blocks and bricks located in an eroded gully at that location. He stated that, judging by the shape of the gully and the presence of a small spoil heap adjacent to it, soil might have been deliberately quarried from the gully (Kuskie 1989:4, 65).

A total of 13 potential heritage items were recorded within the Jumping Creek study area by NSW Archaeology in 2009. These items are as follows (see Appendix 3 for a full description), see Figure 6.1 for the location of each site.

JCH1 – Shearing shed complex (H3)

JCH2 – Mine shaft (H1)

JCH3 – Limestone quarry (H2)

JCH4 – Brick lime kilns (H4)

JCH5 – Limestone quarries (H7)

JCH6 – Limekiln

JCH7 – Mine workings (H6)

JCH8 – Ore processing area (H5)

JCH9 – Miners' camp

JCH10 – Mine shafts

JCH11 – Domestic site

JCH12 – Building material dump (H9?)

JCH13 – Mine diggings

## 6.3 Heritage Listed Items

One heritage listed item is located in the project area. Marchiori's Lime Kiln and quarry is listed on the Queanbeyan Local Environmental Plan and on the NSW State Heritage Inventory as an item of local significance, See Appendix 3 for the full listing. This site is equal to JCH3 and JCH4 above.

Greenleigh	Marchiori's Lime Kiln and quarry	South east corner of Jumping Creek	Part of Lot 1, DP 711905	Local	A2
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<b>Physical description:</b>	A brick and stone kiln built into the side of the creek embankment. The front of the kiln has two semicircular openings at ground level. The chamber behind is 2.4 m deep and about 3 m wide to a height of about 2 m. The front wall is about 600 mm thick. The kiln is heavily overgrown with blackberry. A contemporary photograph shows a low structure or wall above and behind the
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kiln. The remains of pathway lead back up to the quarry 54nsuran. 100 metres to the south. The quarry is about 60 m long, 15 m wide and about 10 m deep (guestimates only). Off to the side is a large mound of spoil.



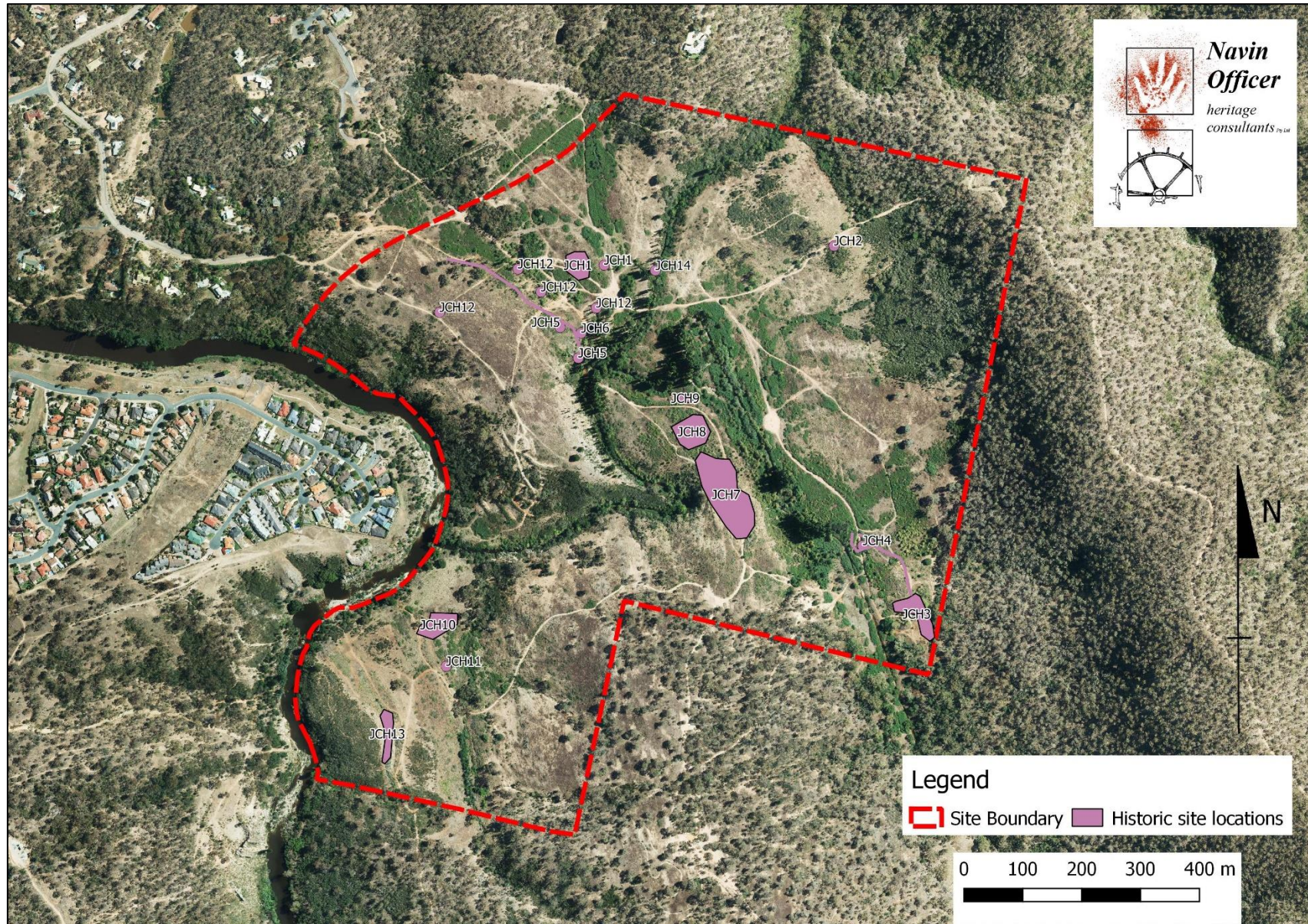


Figure 6.1 Historical sites in relation to Jumping Creek





## 7. RESULTS

### 7.1 Summary

- Two areas of identified cultural significance have been previously identified within the study area from oral testimony. In addition, RAPs have identified that all Aboriginal objects and site within Jumping Creek are considered to be of cultural significance.
- An unprovenanced and unverified reference to a ceremonial site being possibly located within the study area was investigated and the location identified on the southern side of Jumping Creek.
- One Aboriginal scarred tree was recorded during the field visit undertaken in September and October 2018. In addition, six new Aboriginal artefact locations were identified.
- Following consultation with Heritage NSW and due to the high number of overlapping and incorrect site recordings it has been decided to consolidate the site recordings for Jumping Creek into 24 site areas. Heritage NSW requested that the landscape design be altered in creek confluence area to incorporate a conservation area, this has been achieved.
- During the field assessment additional locations for building material dumps were located, these have been included and mapped as part of previously recorded site JCH12.
- A total of 162 test pits were excavated across seven test locations in Jumping Creek (Table 7.1).
- Five open test trenches were completed: one each at Areas 2, 4 and 7, and two trenches at Area 5.
- A total of 394 artefacts were retrieved from the test excavation program.

See Figure 7.2 for the location of all Aboriginal sites and Figure 7.4 for the location of all historical sites.

### 7.2 Areas of Identified Cultural Significance

As noted in section 5 above two general areas of cultural significance have previously been noted in the study area (Waters Consultancy 2016). These were recorded as Valley (Jumping) Creek & Queanbeyan River Junction Resource Gathering and Camping Cultural Area (Site A) (Figure 5.2) and Site B: Queanbeyan River Pathway Cultural Area (Site B) (Figure 5.3), neither area was precisely mapped in that study rather generalises locations were indicated. During the current study RAPs have stated that all Aboriginal objects and sites within Jumping Creek valley are considered to be of cultural significance. The outcomes of the archaeological survey are generally consistent with the interpretation of the Jumping Creek Valley as a focus of Aboriginal camping and resource gathering activity and such areas are known to occur along major traditional Aboriginal travel routes.

No evidence could be found of a purported ceremonial site referred to in Waters 2016 and thought to potentially be located within the study area.

### 7.3 Archaeological survey

#### 7.3.1 Aboriginal Sites

One Aboriginal scarred tree was recorded during the field visit undertaken in September and October 2018. In addition, six new Aboriginal artefact locations were identified. Following consultation with Heritage NSW and due to the high number of overlapping and incorrect site recordings it has been decided to consolidate the site recordings for Jumping Creek into 24 site areas. Table 7.1 lists and describes all of the sites and Figure 7.2 depicts the consolidated areas.

##### 7.3.1.1 JC Scarred Tree 1

**GDA: 704650.6083040**

This site is a scarred tree located on a spur crest above the Queanbeyan River (Figure 7.1).





#### Tree:

The tree is a white barked eucalypt. Overall, it is in moderate to poor condition with extensive limb loss, the tree is hollow and there is some regrowth. The tree's age is hard to ascertain but it is likely to be more than 150 years old.

#### Scar:

Inner width: 47 cm  
Outer width: 100 cm  
Inner height: 127 cm  
Outer height: 163 cm  
Scar depth: 23 cm

The scar extends to the ground but there is some evidence on the scar face that the original scar may have ended above the ground.

There are metal axe marks in the scar.

#### Archaeological Interpretation:

Our interpretation is based on the following observations:

- the tree is endemic to the area;
- the tree age estimated at least 150 years;
- the estimated regrowth is at least 100 years old;
- the scar does extend to ground;
- the scar sides are parallel if extend to ground.

We consider it likely that the scar has a deliberate human origin and it is possible that the scar has an Aboriginal origin.

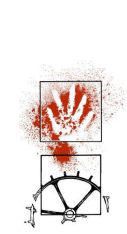


**Figure 7.1 JC Scarred Tree 1**



**Table 7.1 Consolidated site recordings for Jumping Creek**

Site No#	AHIMS Site ID Duplicates	Other sites included in site area	Easting	Northing	No. artefacts recorded per study	Minimum number of artefacts	Description
57-2-0069 (JC4)		SU7/L1 SU12/L1	704663	6083384	Kuskie (1989) – JC4 = 87 Dibden (2009) – SU7/L1 = 188 – SU12/L1 = 30	188	Site mapped using contours to encompass spur crest. GPS location has been updated to match original site description. Area measures approximately 330 x 60m. At least 188 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and sheet erosion.
57-2-0070 (JC5)			704868	6083196	Boot and Heffernan (1989) – JC5 = 3	3	Mapped as site area to encompass creek terrace. GPS location changed to centre of site area. At least 3 artefacts have been recorded across this site. Area measures approximately 85 x 120m. The site has been impacted by animals, weeds and sheet erosion.
57-2-0071 (JC6)	57-2-0622 (SU18/L1) 57-2-0623 (SU18/L2)	SU5/L2 SU4/L1 JCV 9 JCV10 JCV11	704929	6083339	Kuskie (1989) – JCV9 = 107 – JCV10 = 48 – JCV11 = 321 Boot and Heffernan (1989) – JC6 = 175 Dibden (2009) – SU4/L1 = 23 – SU5/L2 = 89 – SU18/L1 = 3 – SU18/L2 = 2	321	Site mapped using contours to encompass ridge and hill crest. Area measures approximately 380 x 280m. At least 28 artefacts have been recorded across this site. The site has been impacted by vehicle tracks. GPS location changed to match original site description.
57-2-0072 (JC7)	57-2-1090 (JC18-3) 57-2-0614 (SU6/L1) 57-2-0088 (JCV14)	JCV12 SU6/L2	705063	6083184	Kuskie (1989) – JCV12 = 237 NOHC 2009 – JC18-3 = 4	237	Site mapped using contours to encompass creek terrace. Area measures approximately 270 x 110m. At least 237 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and erosion.
57-2-0073 (JC8)	57-2-1089 (JC18-4) 57-2-1088 (JC18-5)	SU2/L5	705163	6083184	Boot and Heffernan (1989) – JC8 = 13 Dibden (2009) – SU2/L5 = 8 NOHC 2020 – JC18-4 = 2 – JC18-5 = 1	13	Site mapped using contours to encompass a small spur crest. Area measures approximately 100 x 60m. At least 13 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and erosion.
57-2-0074 (JC9)	57-2-0683 (JCR2a) 57-2-0645 (JCR2) 57-2-0075 (JC10) 57-2-0087 (JCV4)	JCV 5 SU19/L2 SU1/L1)	704430	6083298	Kuskie (1989) – JCV4 = 10 – JCV5 = 112 Boot and Heffernan (1989) – JC9 = 65 – JC10 = 5+ Dibden (2009) – SU19 /L2 = 2 – SU1/L1 = 101	112	Site mapped using contours to encompass ridge crest. Area measures approximately 200 x 115m. At least 140 artefacts have been recorded across this site. The site has been impacted by vehicle tracks.
57-2-0076 (JC11)			704663	6082984	Boot and Heffernan (1989) – JC11 = 3	3	This site is an artefact scatter of at least 3 artefacts located on a steep slope above Jumping Creek. The site has been impacted by vehicle tracks.



Site No#	AHIMS Site ID Duplicates	Other sites included in site area	Easting	Northing	No. artefacts recorded per study	Minimum number of artefacts	Description
57-2-0079 (JC14)	57-2-0077 (JC12) 57-2-0078 (JC13) 57-2-0682 (JCR12/14)		704613	6083134	Boot and Heffernan (1989) – JC12 = 12 – JC13 = 2 – JC14 = 2 NOHC 2009 – JCR12/14 = 23	23	Site mapped using contours to encompass ridge crest. Area measures approximately 340 x 100m. At least 23 artefacts have been recorded across this site. The site has been impacted by vehicle tracks.
57-2-0080 (JC15)	57-2-0081 (JC16) 57-2-0082 (JC17)	JCV18 JCV19 JCV20 SU17/L1	704713	6083084	Kuskie (1989) – JCV18 = 17 – JVC19 = 27 – JVC20 = 261 Boot and Heffernan (1989) – JC15 = 199 – JC16 = 11 – JC17 = 6 Dibden (2009) – SU17/L1 = 188	261	Site mapped using contours to encompass gentle spur crest. Areas measures approximately 260 x 160m. At least 261 artefacts have been recorded across this site. The site has been impacted by vehicle tracks, mining activities and erosion.
57-2-0084 (JC19)	57-2-0089 (JCV15) 57-2-0083 (JC18)	SU13/L1 SU13/L2	704963	6082834	Kuskie (1989) – JCV15 = 4 Boot and Heffernan (1989) – JC18 = 2 – JC19 = 9 Dibden (2009) – SU13/L1 = 1 – SU13/L2 = 10	11	Site mapped using contours to encompass spur crest. Area measures approximately 260 x 160m. At least 11 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and slope wash erosion.
57-2-0085 (JC20)			704363	6082534	Boot and Heffernan (1989) – JC20 = 3	3	Site located on a spur crest above the Queanbeyan River. Area measures approximately 36 x 60m. At least 3 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and sheet erosion.
57-2-0086 (JCV3)			704636	6083266	Kuskie (1989) – JCV3 = 3	3	GPS location changed to match original site description. Site located on a spur crest above the Jumping creek. Area measures approximately 29 x 20m. At least 3 artefacts have been recorded across this site. The site has been impacted by erosion and vehicle tracks.
57-2-0611 (SU2/L3)	57-2-0610 (SU2/L2) 57-2-0612 (SU2/L4)	SU2/L1	705222	6083049	Dibden (2009) – SU2/L1 = 12 – SU2/L2 = 6 – SU2/L3 = 4 – SU2/L4 = 2	12	Site mapped using contours to encompass a small spur crest. Area measures approximately 150 x 90m. At least 12 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and erosion.
57-2-0613 (SU3/L1)			705131	6083344	Dibden (2009) – SU3/L1 = 2	2	Site located on a spur crest. Area measures approximately 30 x 20m. At least 2 artefacts have been recorded across this site. The site has been impacted by sheet erosion.



Site No#	AHIMS Site ID Duplicates	Other sites included in site area	Easting	Northing	No. artefacts recorded per study	Minimum number of artefacts	Description
57-2-0616 (SU10/L2)	57-2-0615 (SU10/L1)		704724	6083445	Dibden (2009) – SU10/L1 = 5 – SU10/L2 = 2	5	Site mapped using contours to encompass gentle spur crest. Area measures approximately 120 x 110m. At least 5 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and erosion.
57-2-0617 (SU11/L1)			704842	6083459	Dibden (2009) – SU11/L1 = 7	7	Site located on a spur crest above two drainage lines. Area measures approximately 25 x 30m. At least 7 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and sheet erosion.
57-2-0618 (SU15/L1)			704461	6082470	Dibden (2009) – SU15/L1 = 1	1	Site located on a spur crest above the Queanbeyan River. Area measures approximately 32 x 40m. At least 1 artefact have been recorded across this site. The site has been impacted by vehicle tracks and sheet erosion.
57-2-0619 (SU15/L2)			704402	6082703	Dibden (2009) – SU15/L2 = 1	1	Site located on a spur crest above the Queanbeyan River. Area measures approximately 47 x 43m. At least 1 artefacts have been recorded across this site. The site has been impacted by erosion.
57-2-0620 (SU15/L3)			704505	6082657	Dibden (2009) – SU15/L3 = 1	1	Site located on a spur crest and a drainage line. Area measures approximately 35 x 25m. At least 1 artefact have been recorded across this site. The site has been impacted by vehicle tracks and sheet erosion.
57-2-0621 (SU15/L4)			704535	6082789	Dibden (2009) – SU15/L4 = 4	4	Site located on a spur crest and a drainage line. Area measures approximately 30 x 10m. At least 4 artefacts have been recorded across this site. The site has been impacted by sheet erosion.
57-2-0634/ 57-2-0684 (JCR1/JCR1a)			704589	6082951	NOHC 2009 – JCR1 = 15	15	Site located on a spur crest above the Queanbeyan River. Area measures approximately 32 x 40m. At least 15 artefacts have been recorded across this site. The site has been impacted by vehicle tracks and sheet erosion.
57-2-0945 (Ellerton Dr7)	57-2-0067 (JC3)		704497	6083379	Boot and Heffernan (1989) – JC3 = 28 OEK Staff – ED7 = 1	28	Site located on a spur crest above the Queanbeyan River. Area measures approximately 47 x 43m. At least 28 artefacts have been recorded across this site. The site has been impacted by erosion.



Site No#	AHIMS Site ID Duplicates	Other sites included in site area	Easting	Northing	No. artefacts recorded per study	Minimum number of artefacts	Description
57-2-1091 (JC 18-2)			704599	6083317	NOHC 2020 – JC 18-2 = 3	3	This site is a scatter of at least three artefacts located on a foot track mid-slope above a drainage line. Visibility on the track was 80% and off the track visibility reduced to <5%. Artefacts were located over an area of 28 x 5 m.
57-2-1092 (JC18-1)			704599	6082898	NOHC 2020 – JC 18-1 = 3	3	This site is a scatter of at least three artefacts located on a foot track mid-slope above a drainage line. Artefacts were located over an area of 28 x 5 m.



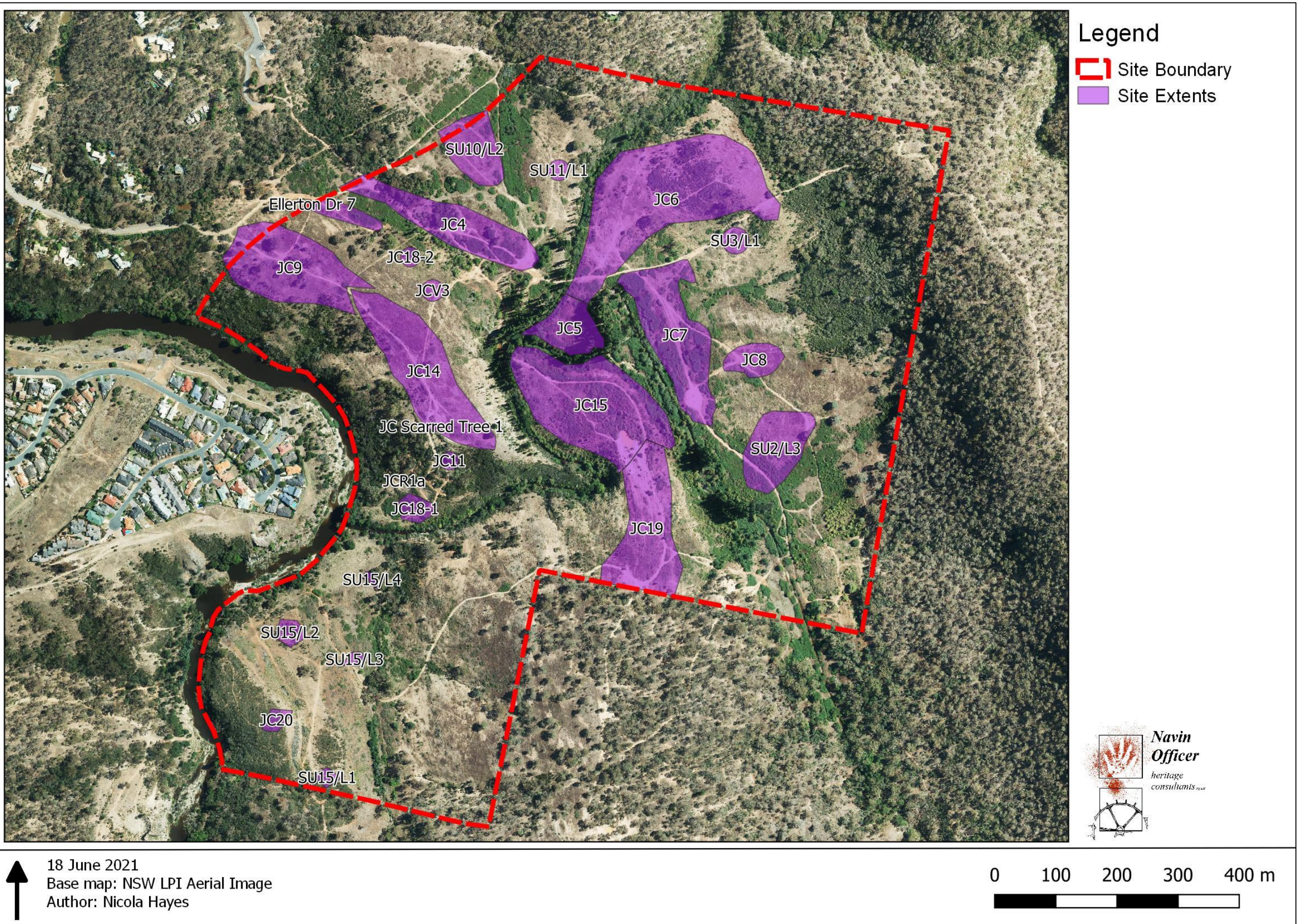


Figure 7.2 All recorded Aboriginal site locations in relation to Jumping Creek





### 7.3.2 Historical Sites

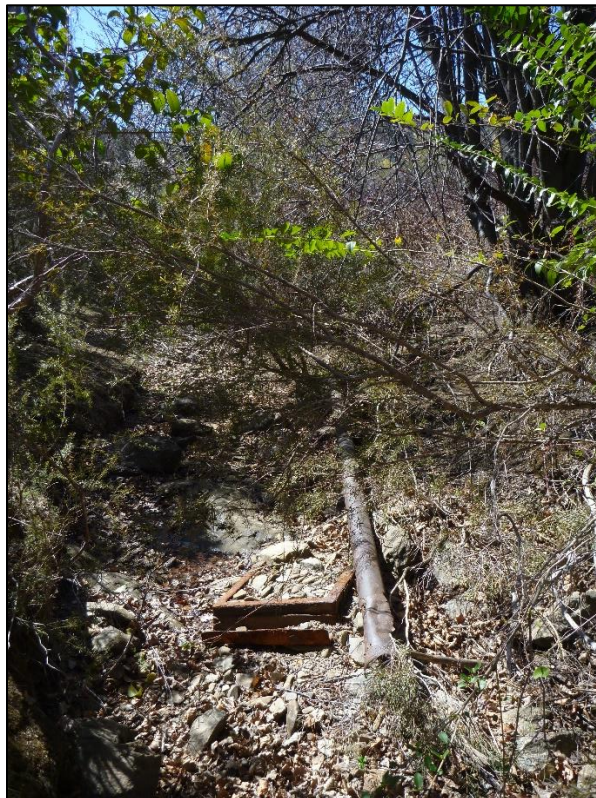
During the field assessment additional locations for building material dumps were located; these have been included and mapped as part of previously recorded site JCH12.

An additional site location was recorded, JCH14.

#### 7.3.2.1 JCH14

**GDA: 604863.6083343**

This site is a metal pipe that extends into the ground located in a drainage line (Figure 7.3). A square metal lid (purpose unknown) item is located adjacent to the pipe. It is unclear what this site is or what it is associated with.



**Figure 7.3 JCH14**



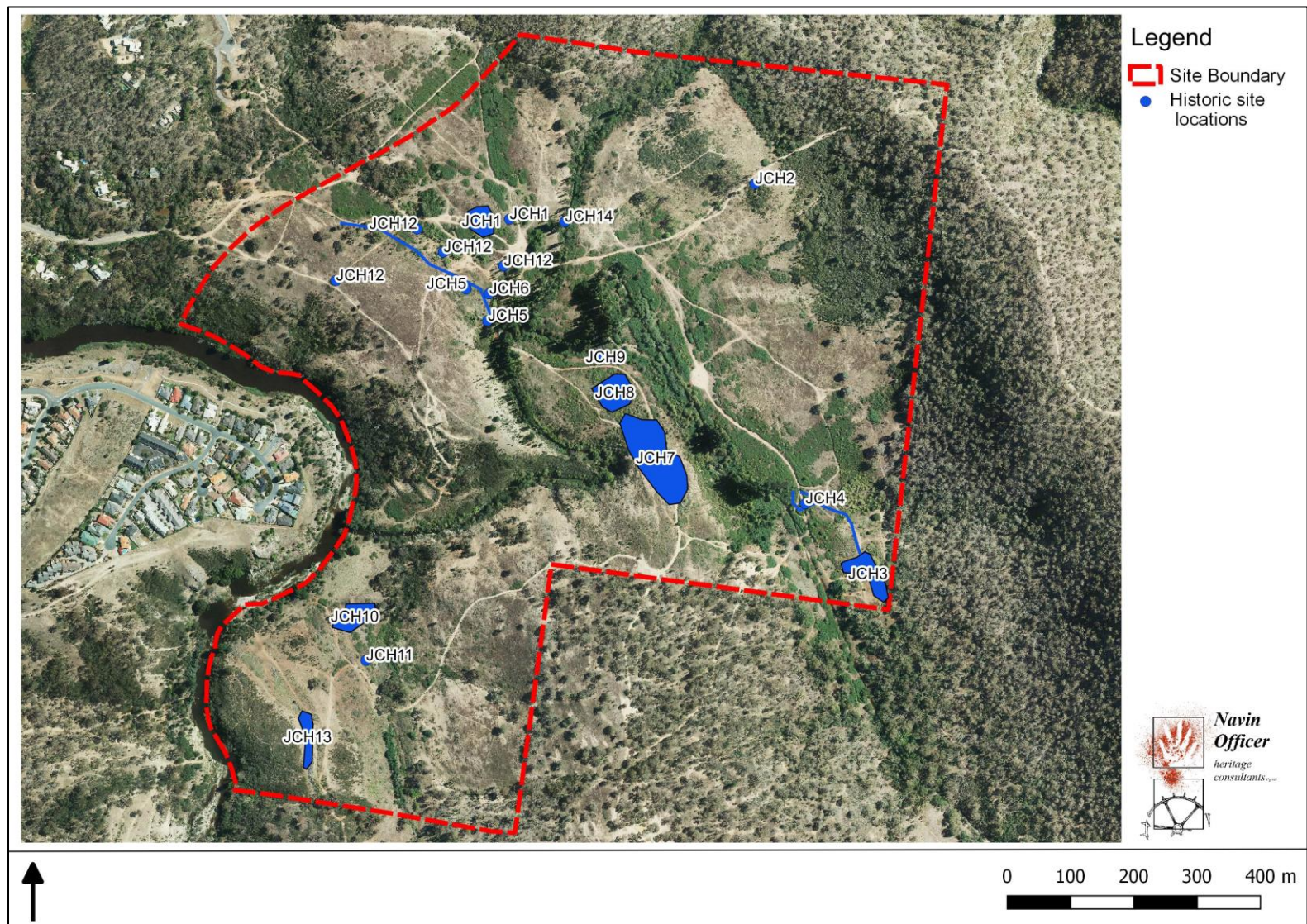


Figure 7.4 All Historical heritage sites in relation to Jumping Creek



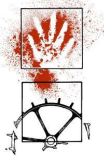
## 7.4 Survey Coverage and Visibility Variables

The effectiveness of archaeological field survey is to a large degree related to the obtrusiveness of the sites being looked for and the incidence and quality of ground surface visibility. Visibility variables were estimated for all areas of comprehensive survey within the study area. These estimates provide a measure with which to gauge the effectiveness of the survey and level of sampling conducted. They can also be used to gauge the number and type of sites that may not have been detected by the survey.

Ground surface visibility is a measure of the bare ground visible to the archaeologist during the survey. There are two main variables used to assess ground surface visibility, the frequency of exposure encountered by the surveyor and the quality of visibility within those exposures. The predominant factors affecting the quality of ground surface visibility within an exposure are the extent of vegetation and ground litter, the depth and origin of exposure, the extent of recent sedimentary deposition, and the level of visual interference from surface gravels. Two variables of ground surface visibility were estimated during the survey:

- a percentage estimate of the total area of ground inspected which contained useable exposures of bare ground; and
- a percentage estimate of the average levels of ground surface visibility within those exposures; this is a net estimate and accounts for all impacting visual and physical variables including the archaeological potential of the sediment or rock exposed.

The obtrusiveness of different site types is also an important factor in assessing the impact of visibility levels. For example, artefacts made from locally occurring rock such as quartz may be more difficult to detect under usual field survey conditions than rock types that are foreign to the area. Figure 7.5 depicts the survey transects completed and the landforms within the project area. Table 7.2 summarises estimates for the degree to which separate landforms within the study area were examined and also indicates the exposure incidence and average ground visibility present in each case. Taking into account survey coverage, archaeologically useable exposures, and visibility variables, the effective survey coverage (ESC) was 15% of the total survey area. The ESC attempts to provide an estimate of the proportion of the total study area that provided a net 100% level of ground surface visibility to archaeological surveyors.



**Table 7.2 Survey coverage data**

Survey unit	Landform	Survey unit area (m <sup>2</sup> )	Visibility %	Exposure %	Effective coverage area (m <sup>2</sup> ) survey unit area x visibility % x exposure %	Effective coverage % (effective coverage area/ survey unit area x 100)
1	Spur line crest	71804	80	35	20105.12	28
2	Spur line crest	38494	80	40	12318.08	32
3	Saddle	45559	80	30	10934.16	24
4	Spur line crest	19172	60	15	1725.48	9
5	Saddle/drainage line	13126	60	5	393.78	3
6	Crest	39053	80	20	6248.48	16
7	Saddle/drainage line	16959	60	5	508.77	3
8	Flats	10693	80	70	5988.08	56
9	Spur line crest	20218	60	20	2426.16	12
10	Spur line crest	19436	50	30	2915.4	15
11	Saddle	9039	60	60	3254.04	36
12	Saddle/drainage line	16371	50	20	1637.1	10
13	Spur line crest	17782	50	20	1778.2	10
14	Spur line crest	51174	60	50	15352.2	30
15	Hill slopes	62232	70	30	13068.72	21
16	Hill slopes	43703	70	30	9177.63	21
17	Saddle/drainage line	9766	60	20	1171.92	12
18	Jumping Creek	183353	60	10	11001.18	6
19	Spur line crest	111249	70	10	7787.43	7
20	Drainage line	45753	50	10	2287.65	5
21	Spur line crest	81762	80	30	19622.88	24
22	Mid slopes	13981	70	20	1957.34	14
23	Hill slopes	10023	50	10	501.15	5
24	Mid slopes	75353	50	10	3767.65	5
		<b>1,026,055</b>			<b>15,5928.6</b>	<b>15</b>

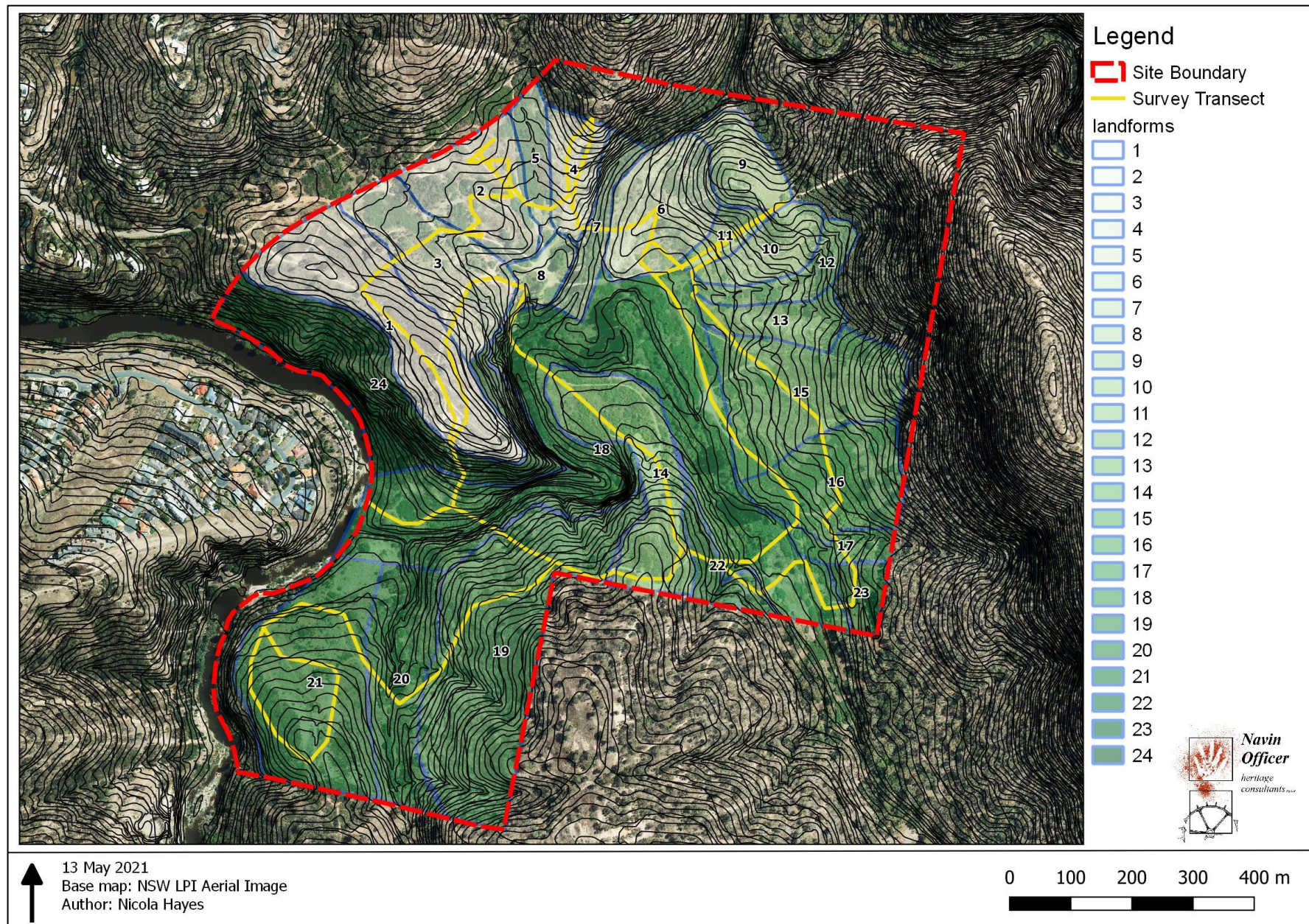




Table 7.3 Landform summary – sampled areas

Landform	Landform area (m <sup>2</sup> )	Area effectively surveyed (m <sup>2</sup> ) (effective coverage area)	% Landform effectively surveyed (area effectively surveyed/ landform area x 100)	Number of sites
spur line crest	431091	84030.95	19	12
saddle/drainage line	56222	3711.57	6	1
saddle	54598	14188.2	25	5
mid slope	89334	5724.99	6	1
Jumping Creek	183353	11001.18	6	5
hill slopes	115958	22747.5	19	2
flats	10693	5988.08	56	1
drainage line	45753	2287.65	5	2
crest	39053	6248.48	16	1





**Figure 7.5 Landforms within Jumping Creek and survey transects completed**



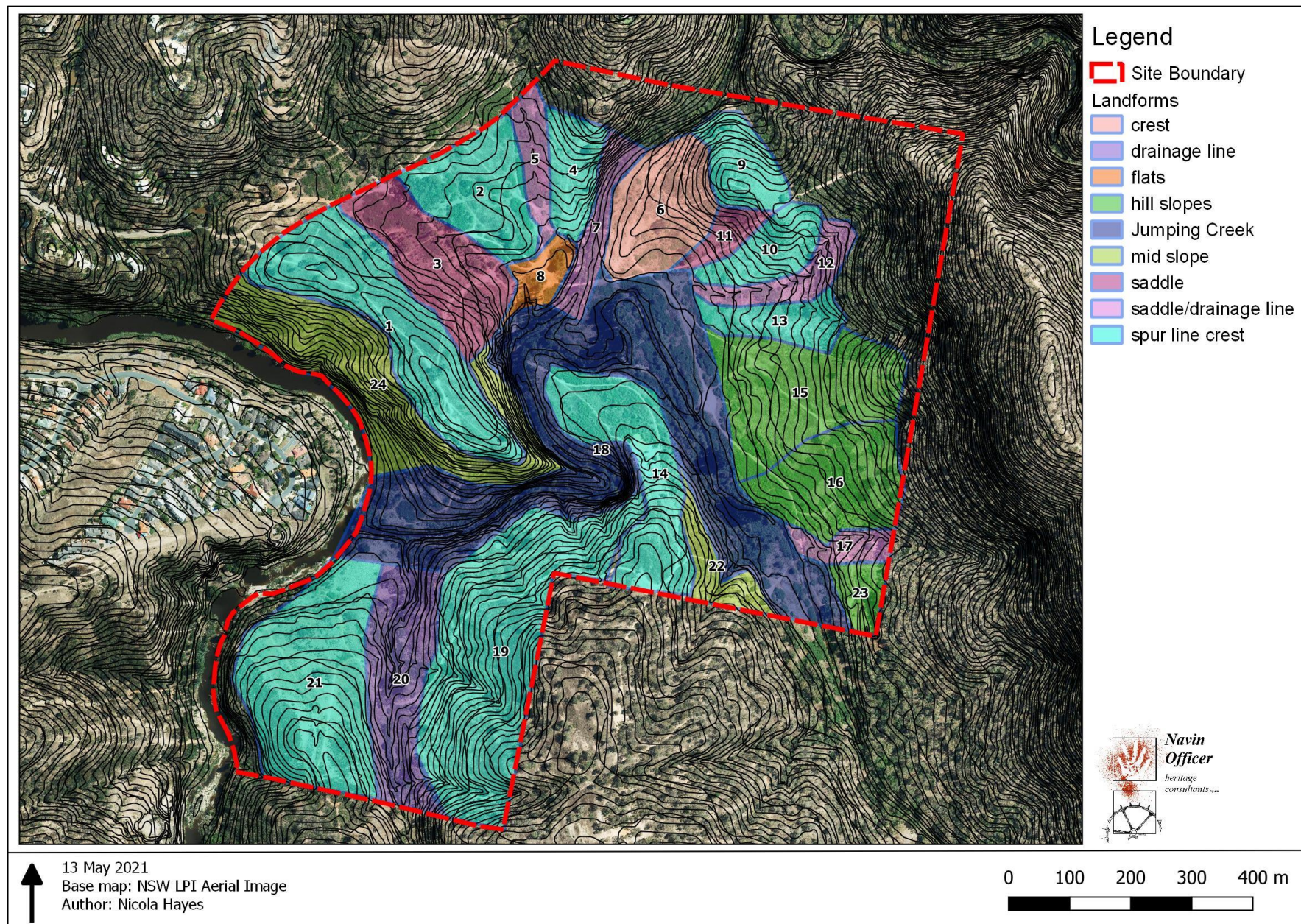


Figure 7.6 Jumping Creek Landforms





## 7.5 Subsurface Testing Program

### 7.5.1 Summary

A total of 162 test pits were excavated across the seven test locations:

- 27 test pits were excavated at Area 1;
- 25 test pits were excavated at Area 2;
- 27 test pits were excavated at Area 3;
- 26 test pits were excavated at Area 4;
- 21 test pits were excavated at Area 5;
- 25 test pits were excavated at Area 6;
- 11 test pits were excavated at Area 7.

Five open test trenches were completed: one each at Areas 2, 4 and 7, and two trenches at Area 5. A total of 394 artefacts were retrieved from the test excavation program.

### 7.5.2 Test Excavation Results

A total of 163 test pits were excavated across the seven test locations. Appendix 9 contains the artefact catalogue. Five open test trenches were completed including one each at Areas 2, 4 and 7 and two trenches were completed at Area 5.

The number of test pits at each location and their placement was dictated primarily by natural obstacles such as blackberries, creek lines and surface rock. Pits were placed in the optimal location within each identified test area in order to test the landform.

The test excavation program retrieved 394 artefacts. The highest number of artefacts came from Area 5 (148), followed by Area 2 (98), Area 4 (74), Area 7 (56), Area 6 (12), Area 1 (4) and Area 3 (2).

Minimum number of artefacts at each site is depicted in Table 7.4. This figure is derived by taking the sum of complete and proximal fragments and the highest total of LCS left or right fragments. Taken against the total number of flakes this may once again inform on the level of breakage.

**Table 7.4 Minimum number of artefacts**

	<b>MNI</b>	<b>Total</b>
Area 1	2	4
Area 2	59	98
Area 3	1	2
Area 4	44	74
Area 5	88	148
Area 6	5	12
Area 7	27	56



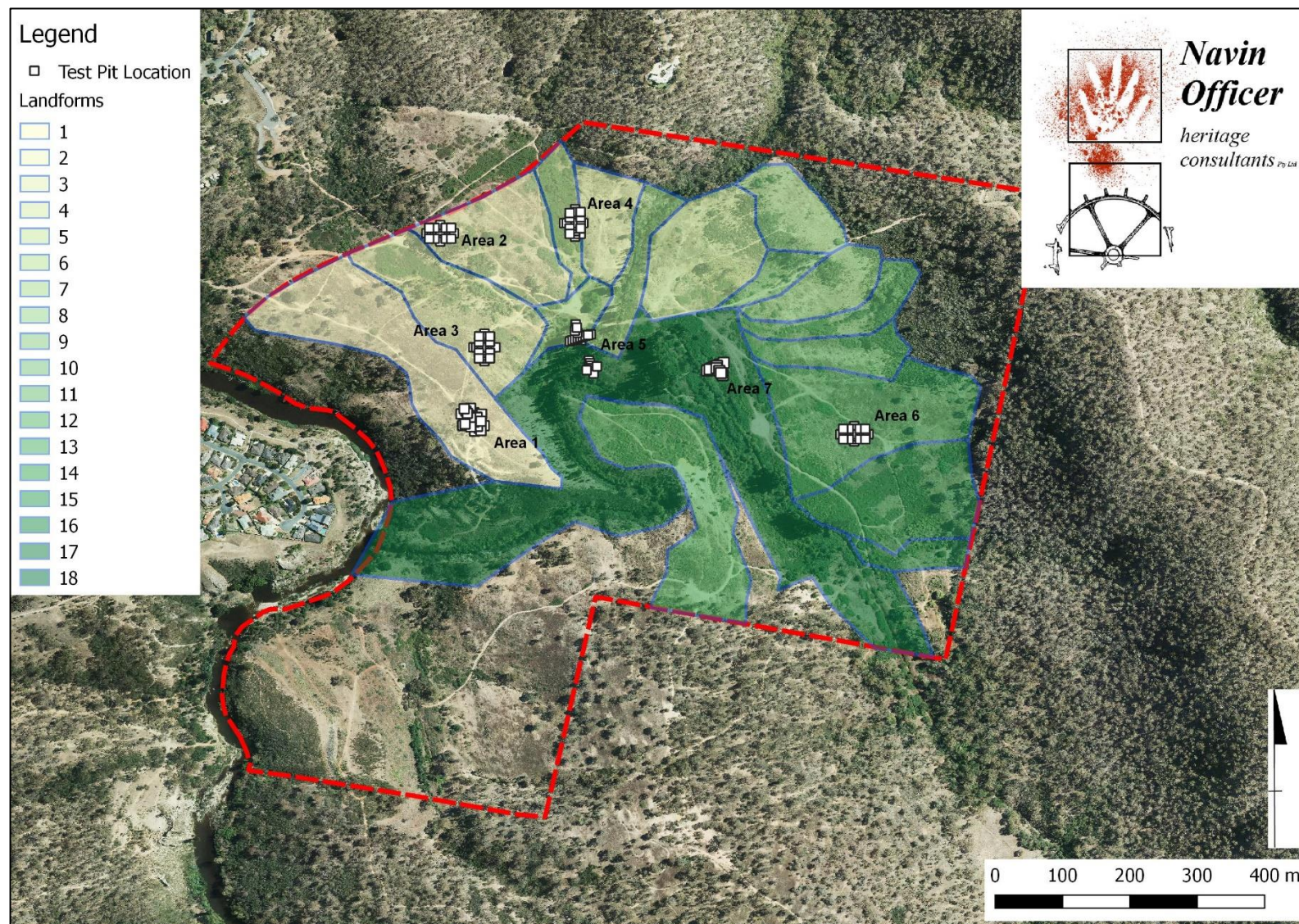


Figure 7.7 Landforms with test locations



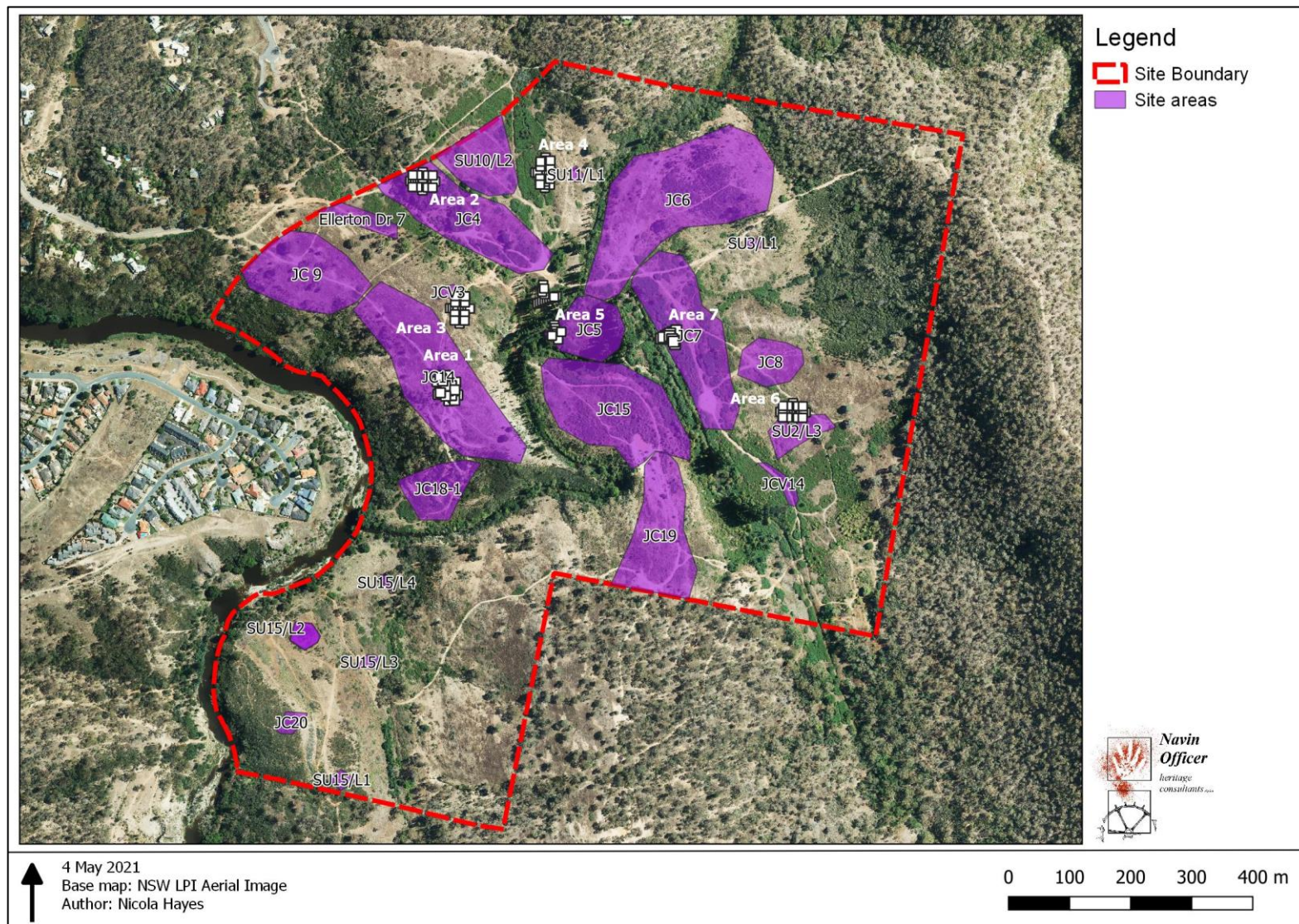


Figure 7.8 Location of test areas and recorded site areas



Most artefacts were in the form of unretouched flakes (271), followed by flaked pieces (93), cores (25) and retouched flakes (5) (Table 7.5).

**Table 7.5 Artefact types**

Area	Core	Flaked piece	Retouched flake	Unretouched flake	Total
1		1		3	4
2	5	32	1	60	98
3		1		1	2
4	4	18		52	74
5	12	25	2	109	148
6	2	4	1	5	12
7	2	12	1	41	56
<b>Total</b>	<b>25</b>	<b>93</b>	<b>5</b>	<b>271</b>	<b>394</b>

There were only 5 retouched flakes identified in the collected material from the test excavation program, this represents 1.2% of the total collection, an analysis of five artefacts would not provide any meaningful data for a comparative analysis. Assessments of rarity based on such small samples are not scientifically valid. Further description and photographs of each item is provided in Table 7.7 and Table 7.8 below.

Most of the artefacts were found in spits 1 (134) and 2 (196); spits 3 (40), 4 (17) and 5 (1) returned lower numbers (Table 7.6).







**Table 7.6 Artefact numbers by spit**

Spit	1	2	3	4	5	6	7	Total
Surface		2	1		1			4
Spit 1	4	46		28	41	12	1	134
Spit 2		48	1	46	82		10	196
Spit 3		1			9		29	40
Spit 4					1		15	17
Spit 5							1	1
Bulk		1			1			2
<b>Total</b>	<b>4</b>	<b>98</b>	<b>2</b>	<b>74</b>	<b>148</b>	<b>12</b>	<b>56</b>	<b>394</b>








Table 7.7 Retouched artefact images.

ID	Dorsal	Ventral	Retouched edge
228940			
229136			



ID	Dorsal	Ventral	Retouched edge
229143	 Jumping Creek ID: 229143 Area 5 Pit: E228 A29.5 S	 Jumping Creek ID: 229143 Area 5 Pit: E228 A29.5 S	 Jumping Creek ID: 229143 Area 5 Pit: E228 A29.5 S
229270	 Jumping Creek ID: 229270 Area 6 Pit: E290 N050 Sp	 Jumping Creek ID: 229270 Area 6 Pit: E290 N050 Sp	 Jumping Creek ID: 229270 Area 6 Pit: E290 N050 Sp



ID	Dorsal	Ventral	Retouched edge
229304			

Restricted





Table 7.8 Retouched artefacts recorded at Jumping Creek.

Weight (g)	0.33	0.36	1.57	2.94	0.19
Platform thickness (mm)	1.73	2.01	2.55	3.31	1.92
Platform width (mm)	5.35	3.96	16.9	6.32	3.36
Maximum thickness (mm)	2.86	3.41	4.15	4.18	3.01
Maximum width (mm)	8.58	6.77	15.4	18.1	6.67
Maximum length (mm)	15.29	18.26	21.53	39.2	9.7
Retouch shape quad 4		N/A	steep		N/A
Retouch initiation quad 4		N/A	ventral		N/A
Retouch type quad 4		N/A	SCRAPER		N/A
Retouch shape quad 3		N/A	steep		N/A
Retouch initiation quad 3		N/A	ventral		N/A
Retouch type quad 3		N/A	SCRAPER		N/A
Retouch shape quad 2		irregular	N/A		irregular
Retouch initiation quad 2		ventral	N/A		ventral
Retouch type quad 2		UTILISED	N/A		EDGEDAM AGE
Retouch shape quad 1		N/A	N/A		N/A
Retouch initiation quad 1		N/A	N/A		N/A
Retouch type quad 1		N/A	N/A		N/A
# retouched edges	1	1	2	1	1
Tool type	Retouched	Retouched	Scraper	Retouched	Retouched
Quads with flake scars	0	123	1	0	1
# flake scars		4	1		2
Platform type	Uni	Flaked	Flaked	Flaked	Uni
Exterior Platform Modification	SCAR	SCAR	SCAR	SCAR	N/A
Flake form	Elongated	Blade	Contracting	Blade	Expanding
CORTX	0%	0%	0%	0%	0%
Termination		FEATHER	ABRUPT		FEATHER
Colour	White	Black	White	Grey	White
Material	Milky Quartz	IMT	Milky Quartz	Medium Slicrete	Milky Quartz
Artefact type	PROXTOL	COMPTOOL	COMPTOOL	PROXTOL	COMPTOOL
ID	228940	229136	229143	229270	229304
Spit	2	1	2	1	4
Test Pit	E070.5N215	E228N429.5	E228A29.5	E290N050	E233N600
Area	Area 2	Area 5	Area 5	Area 6	Area 7



The raw materials found in the highest quantities were FGS (84), quartz vein (163), quartzite (62) and silcrete (54). The vast majority of quartzite was found in Area 5 (59); FGS had higher concentrations in Areas 2 (29) and 3 (38) (Table 7.9).

One flaked ceramic piece was also recorded at Area 1 in spit 1 (Figure 7.9). The ceramic piece has been flaked however upon further assessment it is concluded that the flaking is unlikely to be deliberate and is therefore not likely to be a result of Aboriginal use.

**Table 7.9 Raw material type**

Area	Banded FGS	Ceramic	Chert	Concretion	FGS	Igneous	IMT	Quartz, crystal	Quartz, vein	Quartzite	Sandstone	Silcrete	Total
1		1							3				4
2	1		10	1	29	1		1	43	2	1	9	98
3					1				1				2
4					38				19			17	74
5	1		1		8		2	1	59	59	5	12	148
6			4		1			1	5			1	12
7					7				33	1		15	56
<b>Total</b>	<b>2</b>	<b>1</b>	<b>15</b>	<b>1</b>	<b>84</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>163</b>	<b>62</b>	<b>6</b>	<b>54</b>	<b>394</b>

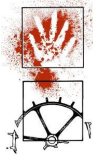


**Figure 7.9 Flaked ceramic piece Area 1**

52% of artefacts were found to be broken (Table 7.10). In Table 7.1, 'complete' indicates a complete artefact while 'broken' indicates an artefact that is fragmented in any way. Higher breakage rates could be an indication of disturbance activity. Areas 6 and 7 indicate an increased rate of breakage compared to other areas.

**Table 7.10 Complete and broken artefacts**

	Complete	Broken	Total	Complete %	Broken %
Area 1	2	0	2	100	0
Area 2	35	30	65	54	46
Area 3	0	1	1	0	1
Area 4	27	28	55	49	51
Area 5	57	58	115	49	51
Area 6	1	7	8	12.5	87.5
Area 7	14	29	43	33	67
<b>Total</b>	<b>136</b>	<b>153</b>	<b>289</b>	<b>47</b>	<b>52</b>



European artefacts were found in Areas 2, 5 and 7 (Table 7.11). In Areas 2 and 5, European material was found at spit 2 and in the first spit in area 7.

**Table 7.11 European artefacts**

Area	Glass	Metal	Total
2	1	1	2
5	3		3
7	1		1

Soil depth varied across the site with Areas 1 and 3 typically only reaching 10 cm before encountering bedrock. Area 3 typically reached 20 cm before encountering clay. Area 4 varied between 10 cm and 30 cm as it was placed on the edge of a drainage line/saddle and incorporated some of the shallow lower slopes. Area 5 achieved depths of 70 cm but typically reached 30 cm. Area 6 was again shallow, typically only reaching 10 cm. Area 7 was variable with depths of 15 cm and 50 cm. Appendix 8 contains the pit excavation records.

#### **7.5.2.1 Area 1**

A total of 27 test pits were excavated at Area 1 (Figure 7.10). No test trenches were completed as the results of the test pits did not warrant further excavation. Four artefacts were retrieved from the test pits (Figure 7.11).

#### **7.5.2.2 Area 2**

A total of 25 test pits were excavated at Area 2 (Figure 7.12). The test area was placed slightly to the west of the area indicated in the methodology in order to capture a part of the landform (spur line crest) that appeared to be relatively undisturbed. One open area trench of eight conjoined test pits was excavated, centring on test pit E070N215 (Figure 7.13). Ninety-eight artefacts were retrieved from the test pits including 64 from the test trench (Figure 7.14 and Figure 7.15).

#### **7.5.2.3 Area 3**

A total of 27 test pits were excavated at Area 3 (Figure 7.16). No test trenches were completed as the results of the test pits did not warrant further excavation. Two artefacts were recovered from Area 3 (Figure 7.17).

#### **7.5.2.4 Area 4**

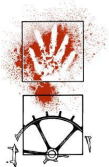
A total of 26 test pits were excavated at Area 4 (Figure 7.18). The test area was placed slightly to the west of the area indicated in the methodology in order to capture a part of the landform (saddle/drainage line) that appeared to be relatively undisturbed and not covered in blackberries. One open area trench of 11 conjoined test pits was excavated, centring on test pit E180N346 (Figure 7.19). A total of 74 artefacts were retrieved from the test pits including 72 from the test trench (Figure 7.20 and Figure 7.21).

#### **7.5.2.5 Area 5**

A total of 21 test pits were excavated at Area 5 (Figure 7.22). The area was split over both sides of Jumping Creek to capture both parts of the creek Flats and also to test the potential impacts across the area. One open area trench of seven conjoined test pits was excavated, centring on test pit E228N430 (west) (Figure 7.23). One open area trench of 10 conjoined test pits was excavated, centring on test pit E240N355 (east) (Figure 7.24).

A total of 148 artefacts were retrieved from the test pits, including 36 from the test trench west and 102 from test trench east (Figure 7.25 to Figure 7.27). Pit E240.5N355 in test trench west has 43 artefacts, the most of any test pit. This test trench had been impacted by rabbit burrowing that has disturbed and concentrate artefacts in a relatively small area.



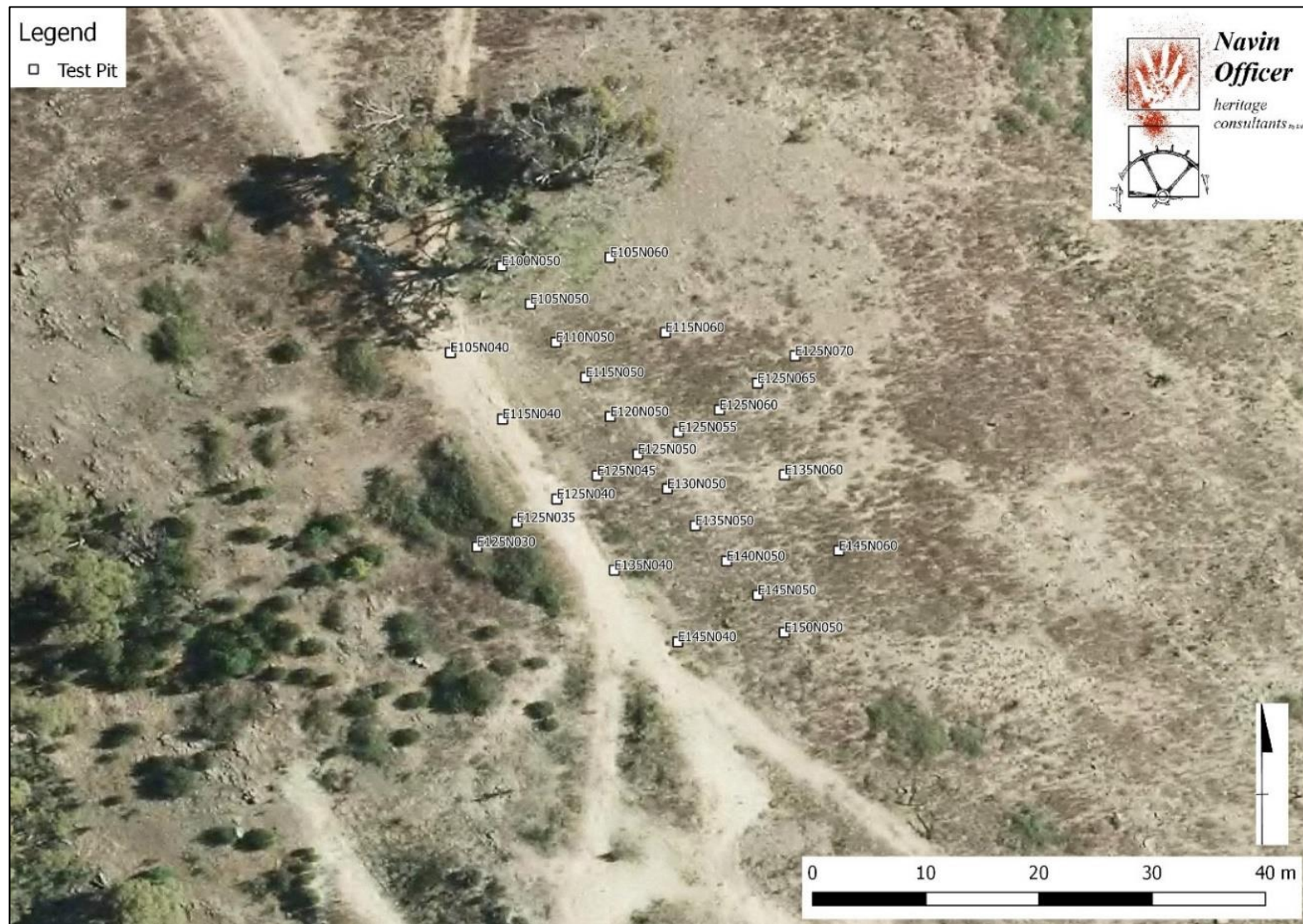


#### **7.5.2.6 Area 6**

A total of 25 test pits were excavated at Area 6 (Figure 7.28). The test area was placed slightly to the south of the area indicated in the methodology in order to capture a more representative part of the landform (hillslopes) to be tested. No test trenches were completed as the results of the test pits did not warrant further excavation. Seven artefacts were recovered from Area 6 (Figure 7.29).

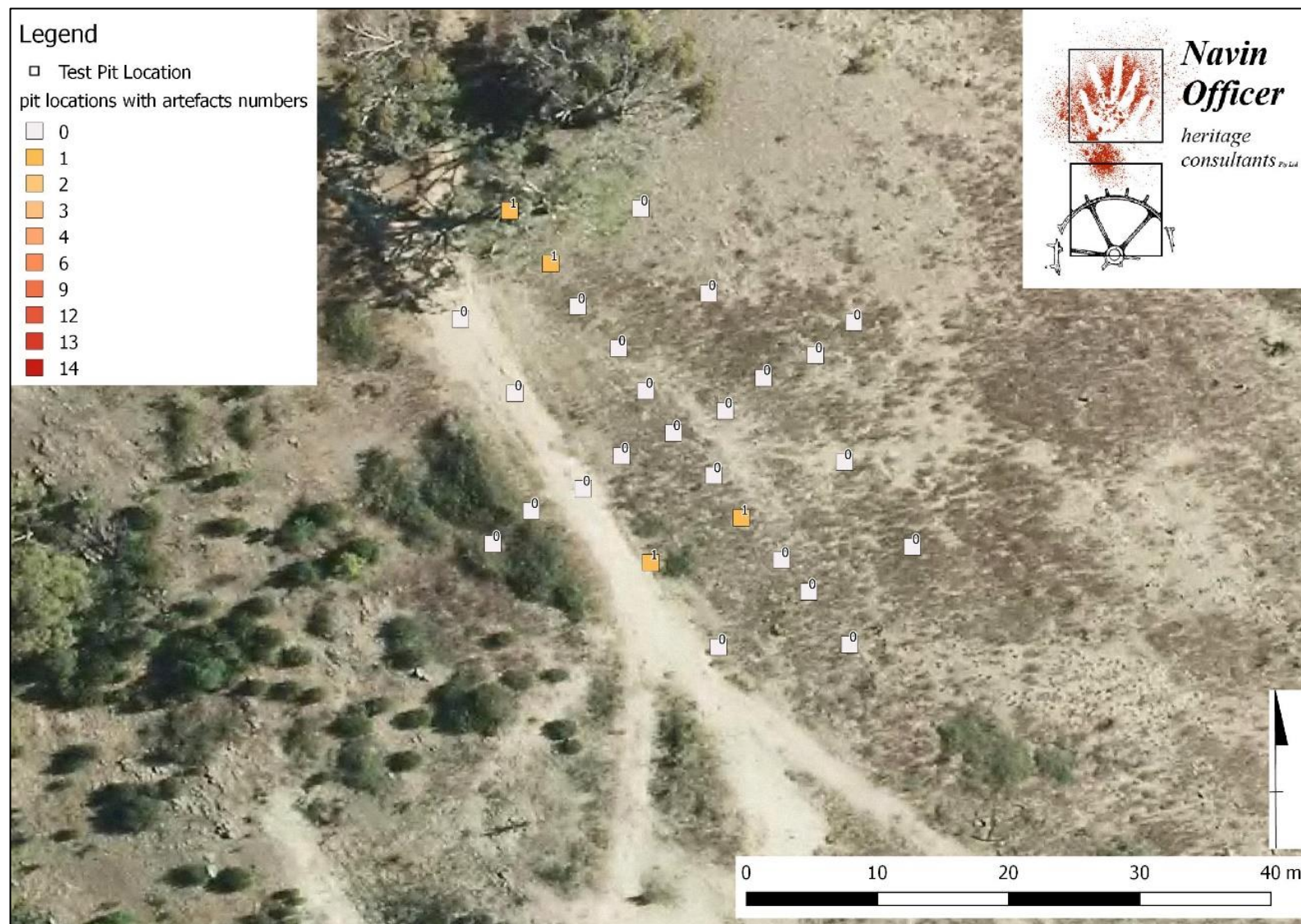
#### **7.5.2.7 Area 7**

A total of 11 test pits were excavated at Area 7 (Figure 7.30). The test area was placed slightly to the west of the area indicated in the methodology in order to capture a part of the landform (Jumping Creek) that appeared to be relatively undisturbed and not covered in blackberries. One open area trench of 7 conjoined test pits was excavated, centring on test pit E220N600 (Figure 7.31). Fifty-six artefacts were retrieved from the test pits including 42 from the test trench (Figure 7.32 and Figure 7.33).



**Figure 7.10 Test Pit Location Area 1**



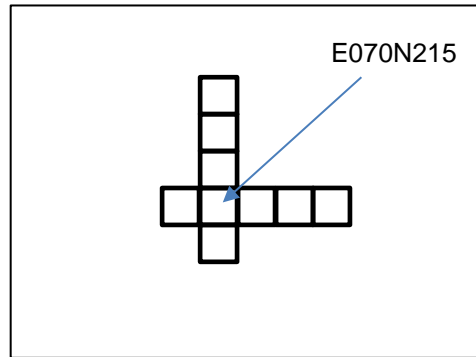
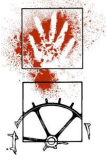


**Figure 7.11 Test Pit locations and artefact numbers in Area 1**





**Figure 7.12 Test pit location Area 2**



**Figure 7.13 Test trench at Area 2**



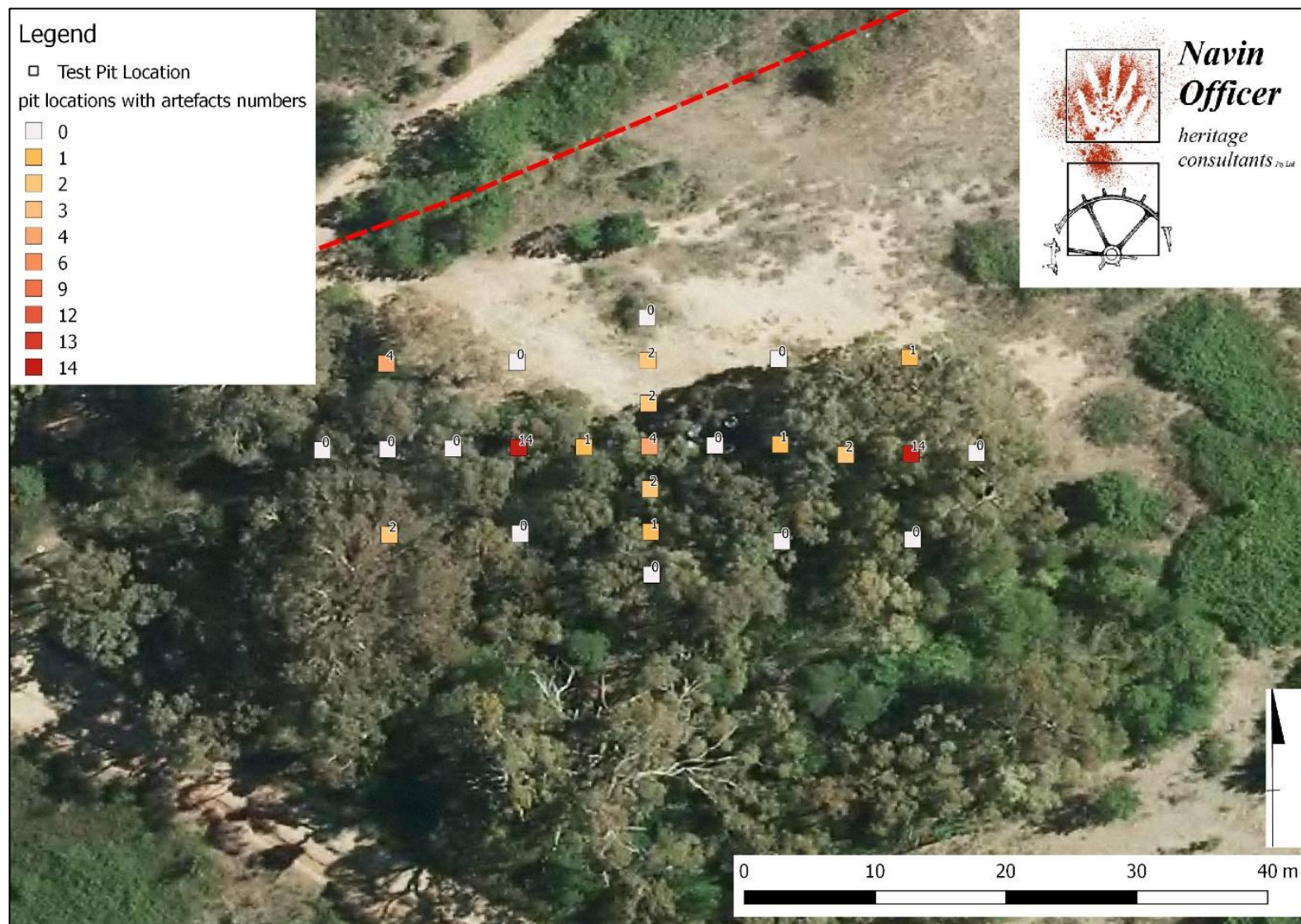
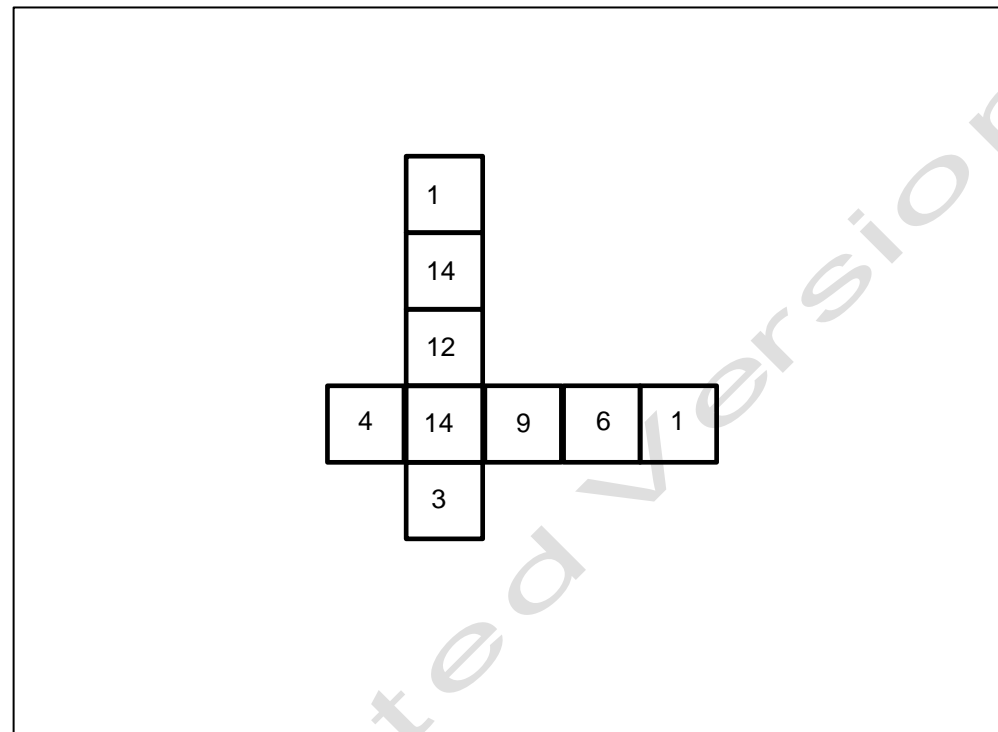


Figure 7.14 Test pit locations and artefact numbers in Area 2





**Figure 7.15 Test trench at Area 2 with artefact numbers**

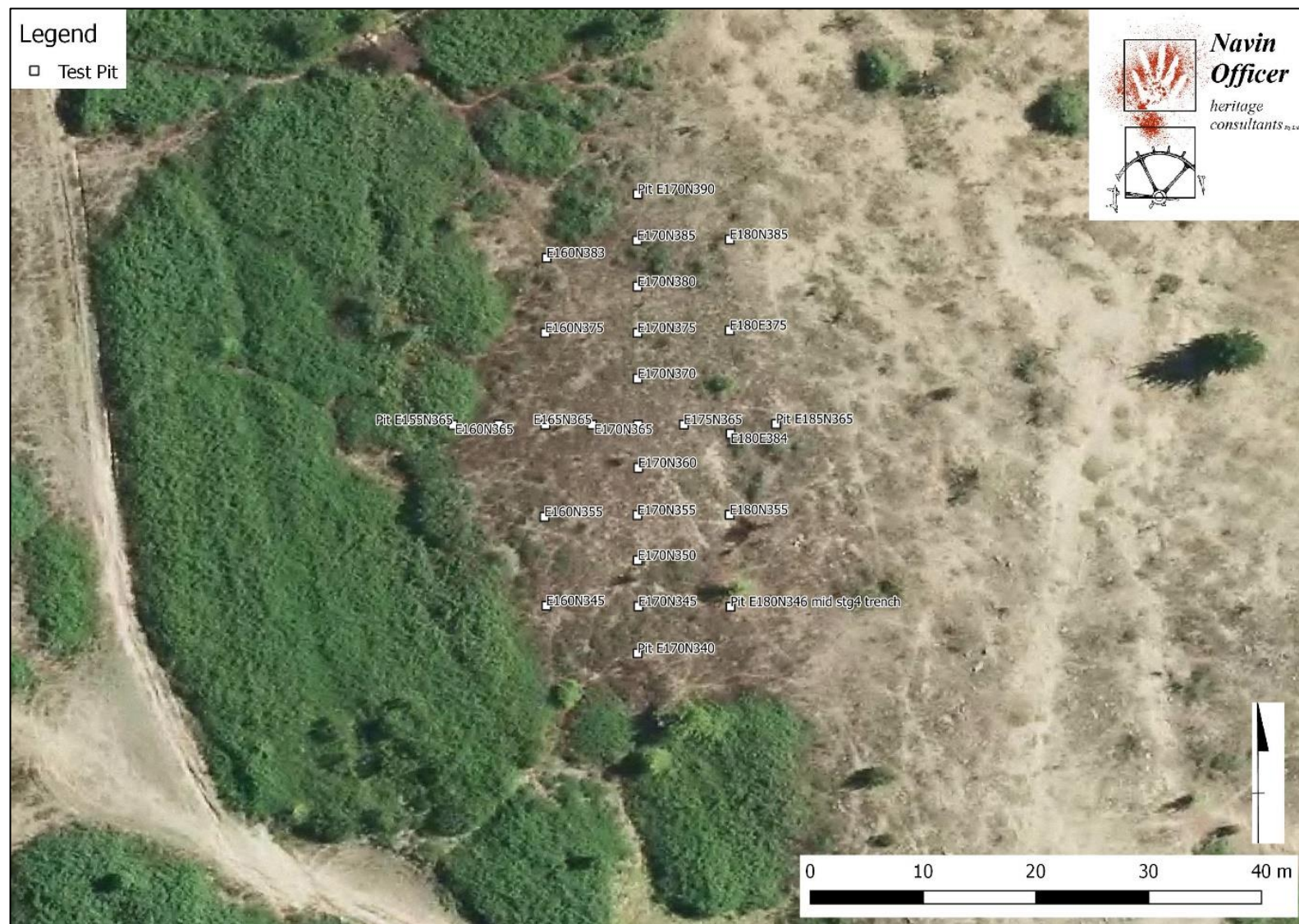




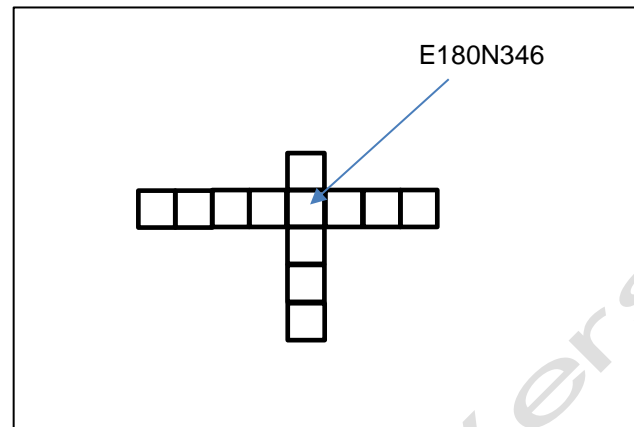


**Figure 7.17 Test pit locations and artefact numbers in Area 3**





**Figure 7.18 Test pit location Area 4**



**Figure 7.19 Test trench at Area 4**

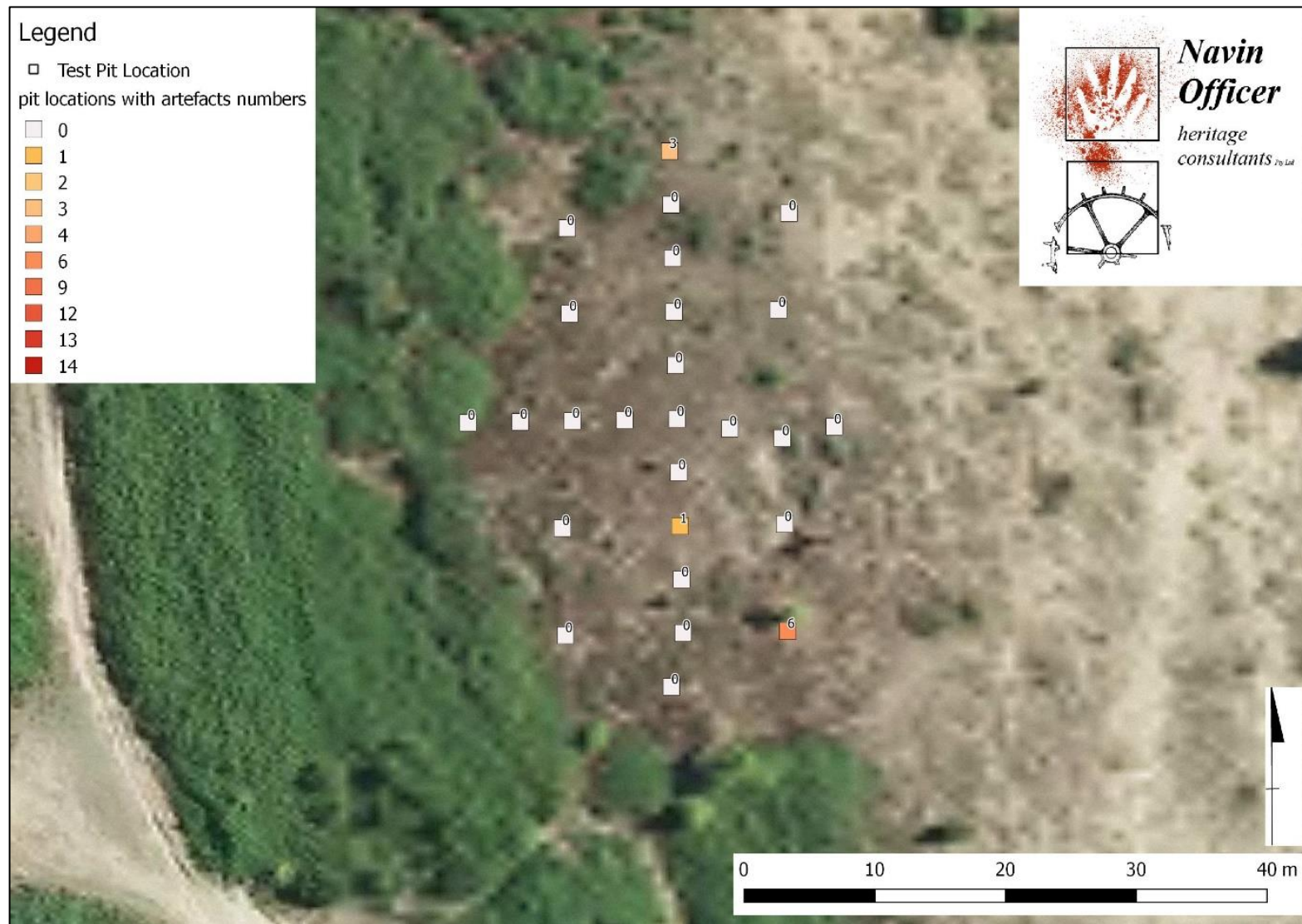
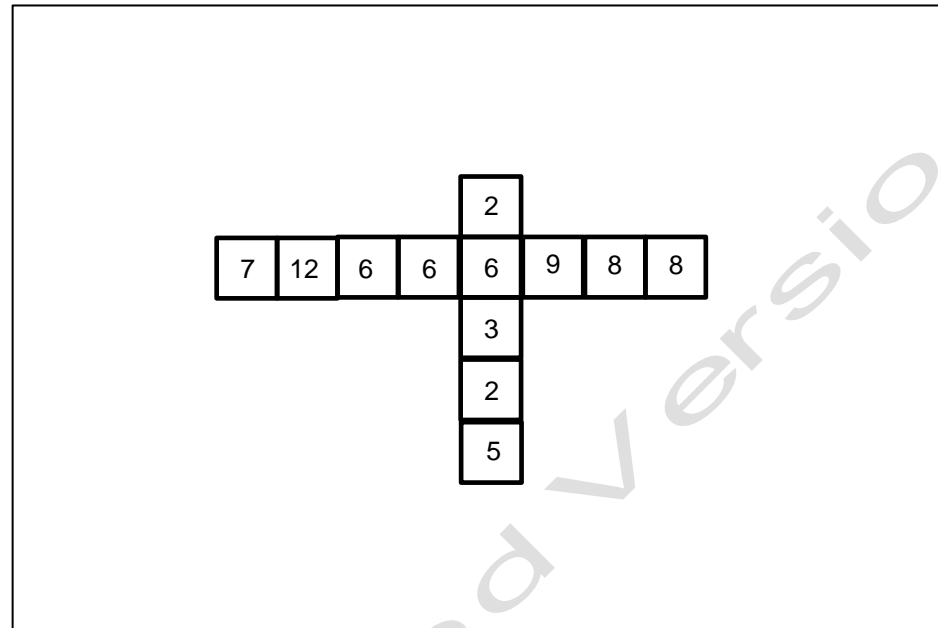


Figure 7.20 Test pit location with artefact numbers in Area 4

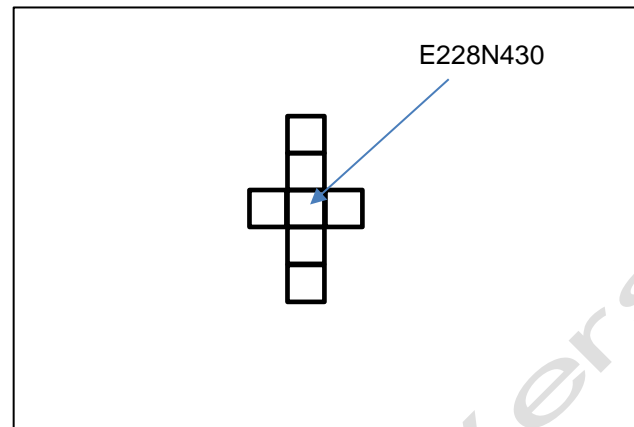




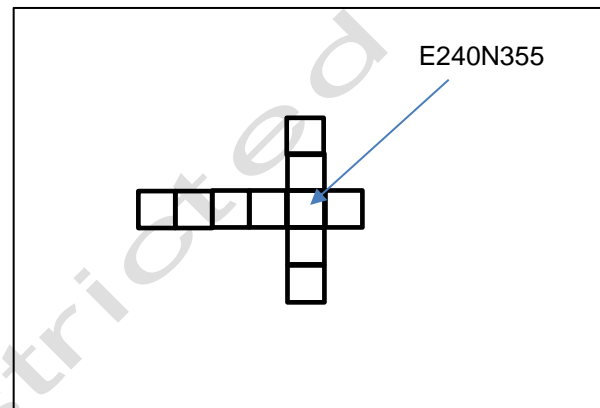
**Figure 7.21 Test trench with artefact numbers in Area 4**



**Figure 7.22 Test pit location Area 5**



**Figure 7.23 Test trench at Area 5 west**

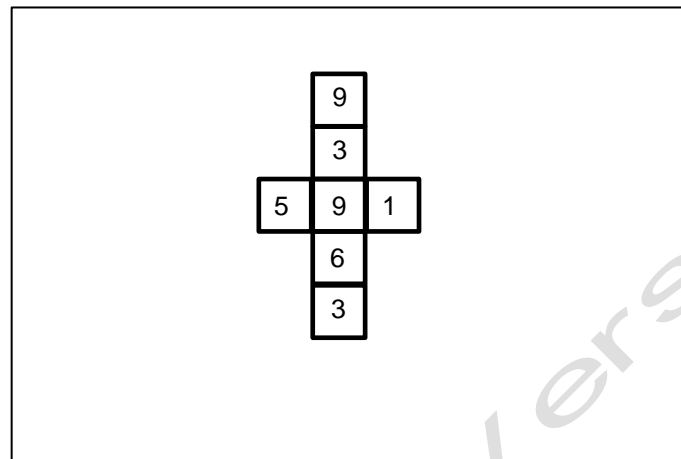


**Figure 7.24 Test trench at Area 5 east**

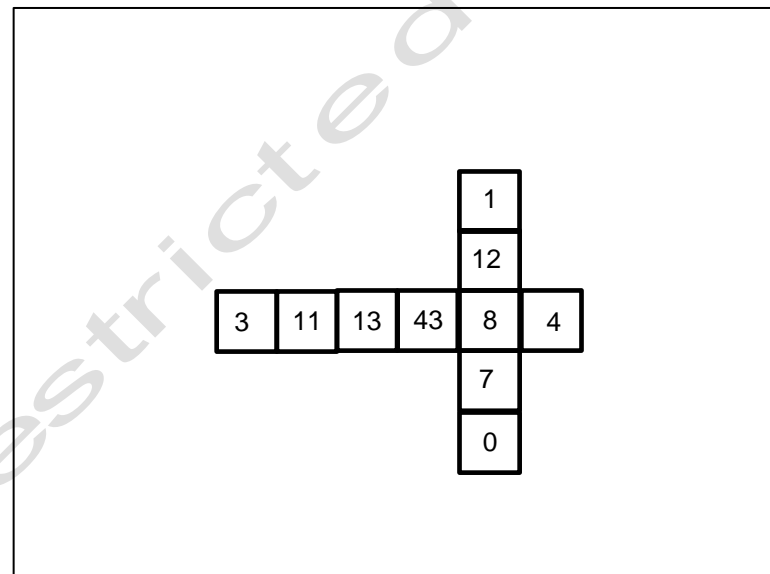




Figure 7.25 Test pit location with artefact numbers in Area 5



**Figure 7.26 Test trench with artefact numbers, Area 5 west**



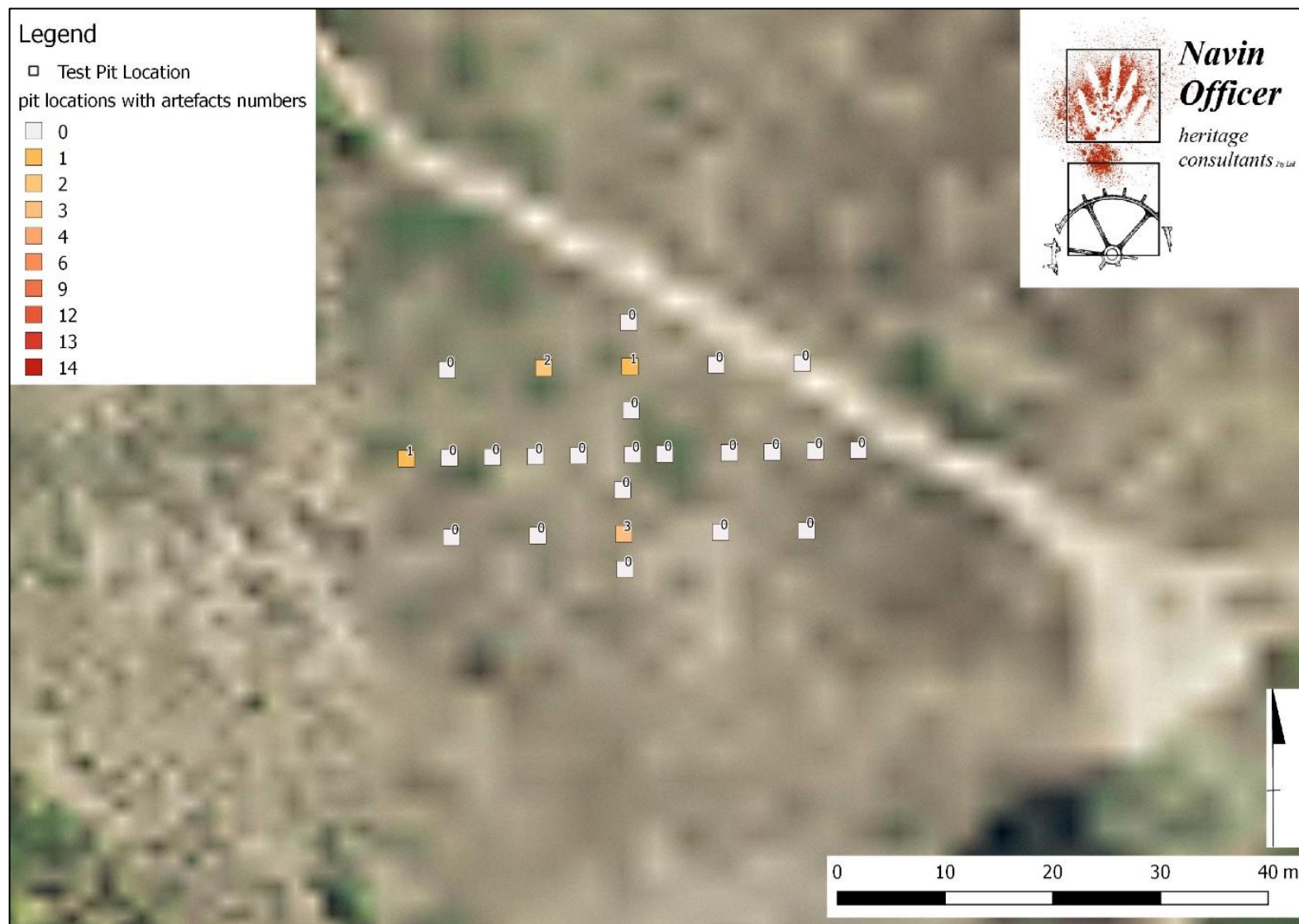
**Figure 7.27 Test trench with artefact numbers, Area 5 east**





**Figure 7.28 Test pit location Area 6**

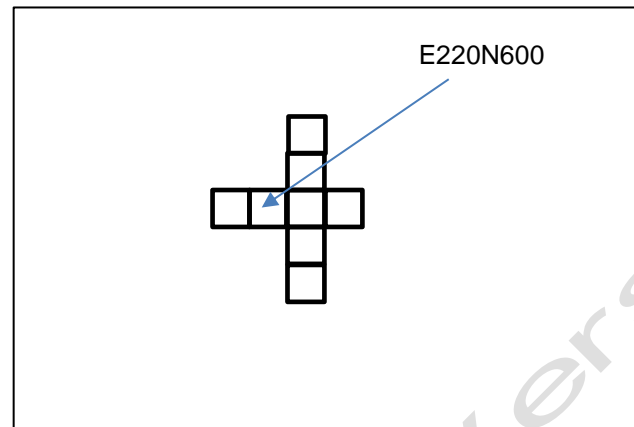




**Figure 7.29 Test pit location with artefact numbers in Area 6**



Figure 7.30 Test pit location Area 7



**Figure 7.31 Test trench at Area 7**



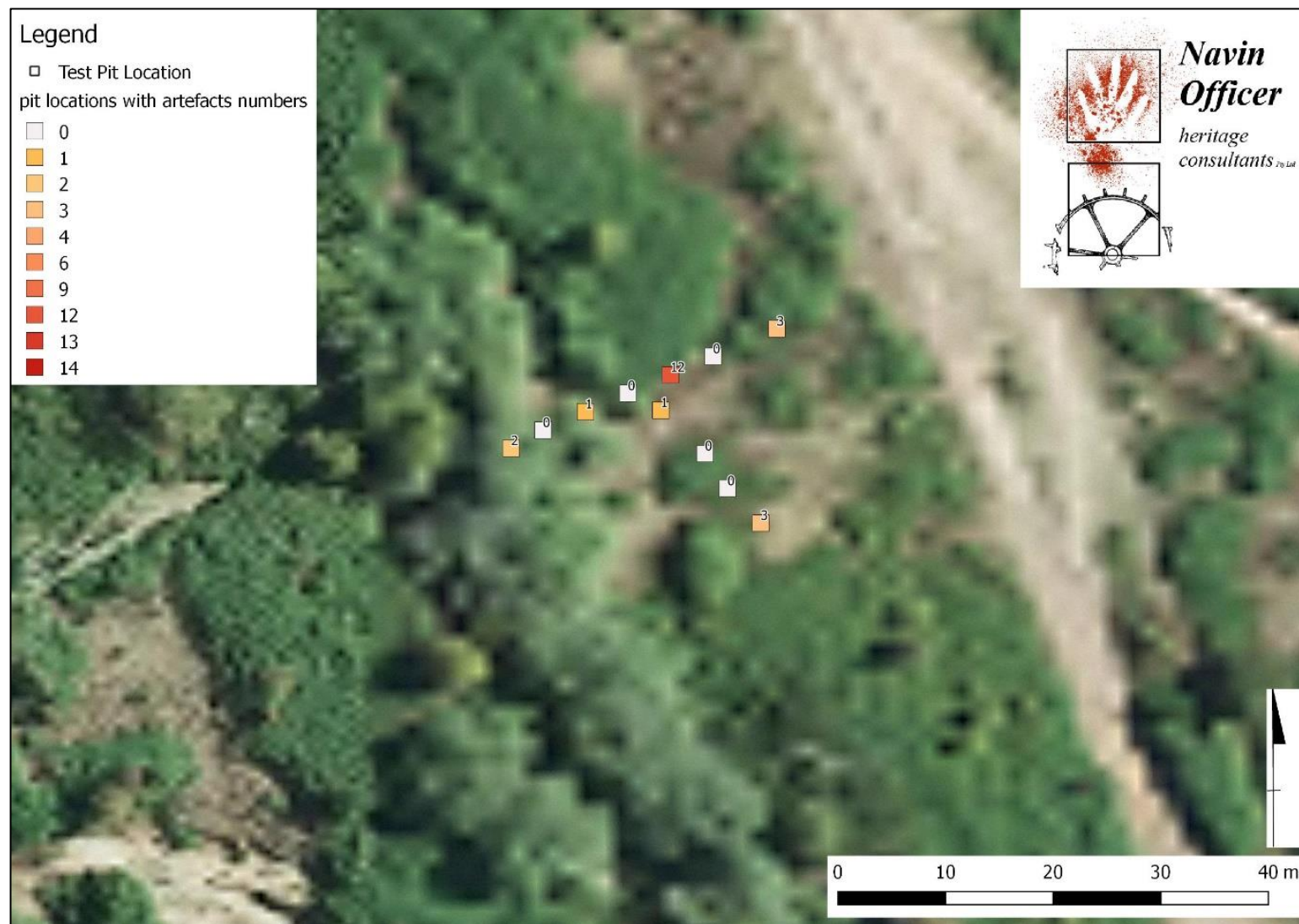
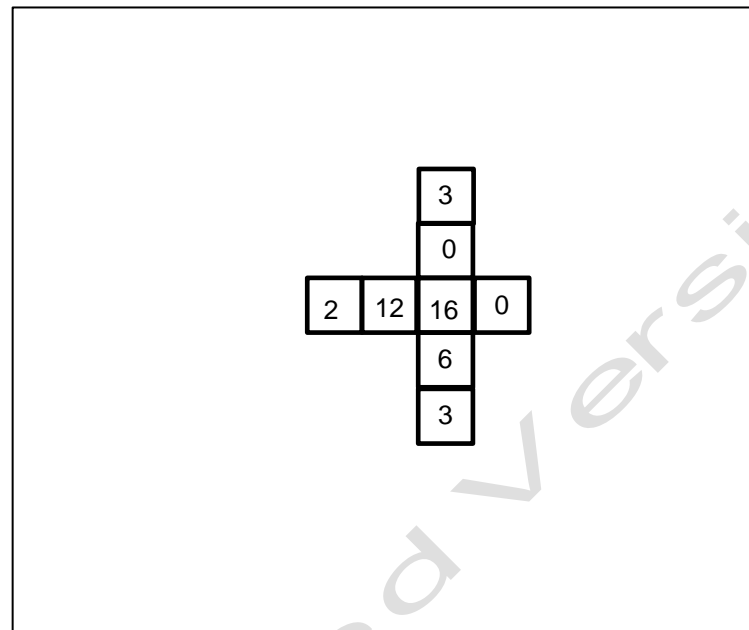
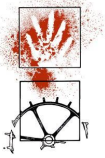


Figure 7.32 Test pit location with artefact numbers in Area 7



**Figure 7.33 Test transect with artefact numbers, Area 7**



## 8. DISCUSSION

Rather than seeing the archaeological resource within the Jumping Creek project area as individual sites, the area is best described as a disturbed remnant cultural landscape. The project area location conforms with regional site location models including that the sites are:

- located on relatively level ground in locally well-drained contexts, either spur line crests, terraces or elevated creek banks in valley floor contexts, low gradient crests and streamline banks in mid valley slope contexts, and level crests, shoulders and saddles on major ridgelines and spurs; and
- situated adjacent to, or in close proximity to, streams or wetlands.

It is likely that in the past Jumping Creek would have looked more like a wetland than it does today and therefore would have had a large range of the resources most favoured by Indigenous peoples. This and its proximity to the Queanbeyan River, a permanent source of water and another large resource zone, places Jumping Creek within an important camping, hunting and gathering location. This aligns closely with the Waters Consulting 2016 cultural values assessment identified the Valley (Jumping) Creek & Queanbeyan River Junction as a Resource Gathering and Camping Cultural Area (Site A).

The distribution of artefacts across the landscape is uneven and the result of varying factors including:

- the past Indigenous use of the site and the location of resources compared to the location of good camping ground;
- soil preservation effects including varying degrees of erosion and historical impacts such as mining and clearing; and
- landscape preservation across the site similar to the above, but also including underlying bedrock and site formation processes.

There was evidence that taphonomic processes such as direct impacts from vehicles and stock and soil accumulation and erosion have contributed to site patterning. 52% of the recovered artefacts were broken indicating that post depositional impacts have occurred, breakage can occur during ploughing or by being trampled by humans or stock when lying on the ground surface. Also, subsurface artefacts don't occur where there has been a high level of surface erosion and do occur where there has been soil accumulation.

Subsurface artefact occurrences are generally relatively concentrated occurrences that occur over spatially small areas of about 2m<sup>2</sup>. The high proportion of broken artefacts indicates that in general the archaeological deposit is disturbed. The results show that where there is any remaining soil accumulation on a landform then there is likely to be subsurface archaeological deposit, and also where there is no soil accumulation that there is unlikely to be subsurface archaeological deposits. Following the testing program survey units 2, 5, 7, 12, 8 17, 18 and 20 have archaeological subsurface potential (Figure 8.1).

Again, the results of the test excavation program align with the cultural understanding of the site as a camping and resource gathering area. The higher density sites are located in closer proximity to Jumping Creek, confirming that the creek was a focus for occupation. The general distribution of surface artefacts across the site also indicated use of the area on multiple occasions over time and are consistent with the use of the area as a travel route.

Test excavation did not occur in the mid-slope landform including landforms 19, 22 and 23 as minimal disturbance is to occur in these areas from the project. As outlined further below, disturbance in these areas is limited to erosion and track rehabilitation. The mid-slope landforms also have low soil coverage indicating low archaeological sensitivity. The test excavation program did also not test the tributary to the south of the project area. Again, this was because all proposed impacts in this area are very minimal with small areas of rehabilitation occurring.





The test excavation program recovered a ceramic piece that was identified as an unretouched flake. Aboriginal representatives indicated that they thought this was relatively recent as they are aware of people practicing flaking in the Jumping Creek area. There is no definitive evidence of how recently this ceramic was flaked, and contact period use of the site cannot be discounted. Kuskie (1989) concluded that despite not direct evidence being found that Jumping Creek could be a contact site, this appears to be largely based on evidence from oral evidence from a member for the NLALC at the time. The ceramic flake is the first piece of direct evidence of the use of Jumping Creek in the contact period. There are several contact sites recorded in the Canberra/Queanbeyan region including two sites in Oaks Estate located over the northern border of Queanbeyan (Avery 1994). Unfortunately, the NSW AHIMS sites database does not record contact sites as a separate site type nor does it allow for a search of individual artefact types so a wider examination of contact period sites could not be undertaken.

## 8.1 Regional Comparison

Two sites located within the region Googong and Mount Pleasant are comparable to Jumping Creek.

### Mt Pleasant

A total of 1644 artefacts have been recovered from test and salvage excavations at Mount Pleasant. The test excavation program completed thirty-three test pits, each 1 metre by 0.5 metre in area, and 22 stone artefacts were recovered from subsurface sediments. The archaeological test excavations recovered a low aerial incidence of artefacts, with an average of 1.33 artefacts/m<sup>2</sup>. Higher aerial incidence was encountered closer to the creek with values up to 12 artefacts/m<sup>2</sup>.

Following the test excavation program, it was also identified that subsurface salvage should be undertaken at site MPAS13. It was determined that MPAS13 had potential for subsurface material at on the grounds that the area is a level bench of ground, sitting at a height above the present level of Church Creek that would protect it from the majority of flood events, while also being close enough to the creek to enable access to water and associated resources. Artefact density within the four open excavation areas within this site ranged from a low of three artefacts per square metre to a high of 122 artefacts per square metre. The majority of squares contained ten artefacts or fewer. The number of squares containing higher counts than this declines asymptotically, with a long 'upper tail' of squares with very high artefact counts. The median number of artefacts per square is 16, and the mean number of artefacts per square is 20.53. Three quarters of the squares yielded 25 artefacts or fewer.

Combining all sites, the total area excavated is 92 square metres, equating to an average density of 17.61 artefacts per square metre. If the MPAS13 Salvage is removed from this equation the average density at Mount Pleasant would be 4.11 artefacts per square metre. The highest density site was MPAS13 located immediately adjacent to Church Creek.

### Googong

The work carried out at Googong has identified a pattern of artefacts being concentrated around drainage lines and permanent creek-lines, with the frequency of sites and the size of individual sites both increasing with proximity to watercourses. Whilst sites have been found to occur in all topographic and vegetational zones in the Googong project area, there is a clear tendency for a greater density of sites, and for the larger sites to be located in proximity to creeks and proximate parts of valley floors, which might have incorporated areas of permanent or ephemeral wetlands or ponds in the pre-contact period. The density of sites, and the size of sites, drops off markedly with terrain elevation, and sites on upper slopes, ridgelines and hill tops are comparatively rare (NOHC 2015a:49).

A total of 166 test pits have been excavated at Googong recovering at total of 152 artefacts. Combining all sites, the total area excavated is 103 square metres, equating to an average density of 1.48 artefacts per square metre. The low overall density of artefacts across the broader Googong project area is likely to be a consequence of the fact that activity in the region would have been focused on the nearby Queanbeyan River (which is one kilometre east of the project area boundary). The Googong project area would have been a comparatively less desirable area in which to camp or occupy for extended periods of time.



## Site Locations within the Wider ACT/NSW Region

Since the revised ACHAR was submitted in January 2021, ACT Heritage Council has provisionally listed a ceremonial site with associated archaeological sites in the north east of the ACT on Ginninderra Creek. This is an example of a similar site to Jumping Creek which is in substantially better condition than Jumping Creek and has not been impacted by development. In addition site MW5 (associated with the Ginninderra Creek corroboree ground) was found to have an artefact density of 27/m<sup>2</sup>.

A large-area investigation of Hume was conducted by Barber (2000). The study assessed some 800 hectares of land and included an extensive field survey program. Barber noted that grass cover across the area was a severe limitation to the identification of both Aboriginal and European heritage sites. Nineteen Aboriginal sites were recorded during the survey. All Aboriginal sites consisted of surface scatters of artefacts within existing ground exposures. Seventeen areas of archaeological sensitivity were identified, consisting of locally elevated ground (mostly spur-line crests) adjacent to watercourses.

In 2003 Australian Archaeological Survey Consultants (AASC) undertook surface salvage of Site HA11 and test-pitting of Hume PAD1 and Hume PAD 2. Thirty-five artefacts were collected at site HA11. One artefact was located during the testing of PAD1 and 13 artefacts were located at PAD2. These sites were located adjacent to Dog Trap Creek.

Hughes et al. (2007) undertook monitoring of ground disturbance of HID1391 (HA11) and HID1395 (Hume PAD2). Grader scrapes were excavated at each site. A total of 300 artefacts were recovered from HID1391, and 450 from HID1395 (AASC 2003).

NOHC (2016) completed an archaeological salvage program for the Mugga Lane Solar Park located on Dog Trap Creek located 11 km west of Jumping Creek in the Jerrabomberra Creek valley. On Hume PAD 6c, 1720 artefacts were recovered. The artefact density was found to be up to 127/m<sup>2</sup> at the Mugga Lane Solar park site.

## Comparative Analysis

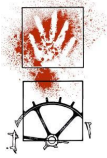
The data obtained on the distribution of sites within the Googong study area is consistent with the distribution of sites in the Mount Pleasant study area. The overall density of sites in the two study areas is remarkably similar (if MPAS13 is omitted): Googong contained 53 sites in a 6km<sup>2</sup> area (8.8 sites per km<sup>2</sup>), while Mount Pleasant contained 23 sites in a 3km<sup>2</sup> area (7.6 sites per km<sup>2</sup>). Jumping Creek however has 46 recorded site locations in an area of 95 hectares (0.95 km<sup>2</sup>) giving 48 sites per km<sup>2</sup>. The surface site distribution within Jumping Creek is definitely the highest.

The subsurface artefact densities are also consistent (Table 8.1) and are consistent with the results at jumping creek. The highest artefact densities have all come from sites/areas located immediately adjacent to major creek lines Church Creek (Mt Pleasant) and Jumping Creek. The Googong subsurface artefact densities are relatively low which can be attributed to the lack of a major consistent creek line in the project area, additionally the site with the highest artefact density GA PAD16 was located adjacent to the highest order drainage line in Googong.

An analysis of the frequency of retouched flakes suggests that the frequency of retouched flakes at Jumping Creek (1.2%) is low compared to Mount Pleasant (2.1%) and Googong (7.9%). A larger assemblage recovered and analysed following salvage would allow for regional comparisons and a greater understanding of activities undertaken at Jumping Creek in the past.

The above results show that Overall Jumping Creek is located within an important resource zone within the Queanbeyan region and contains evidence of the use of this resource zone.

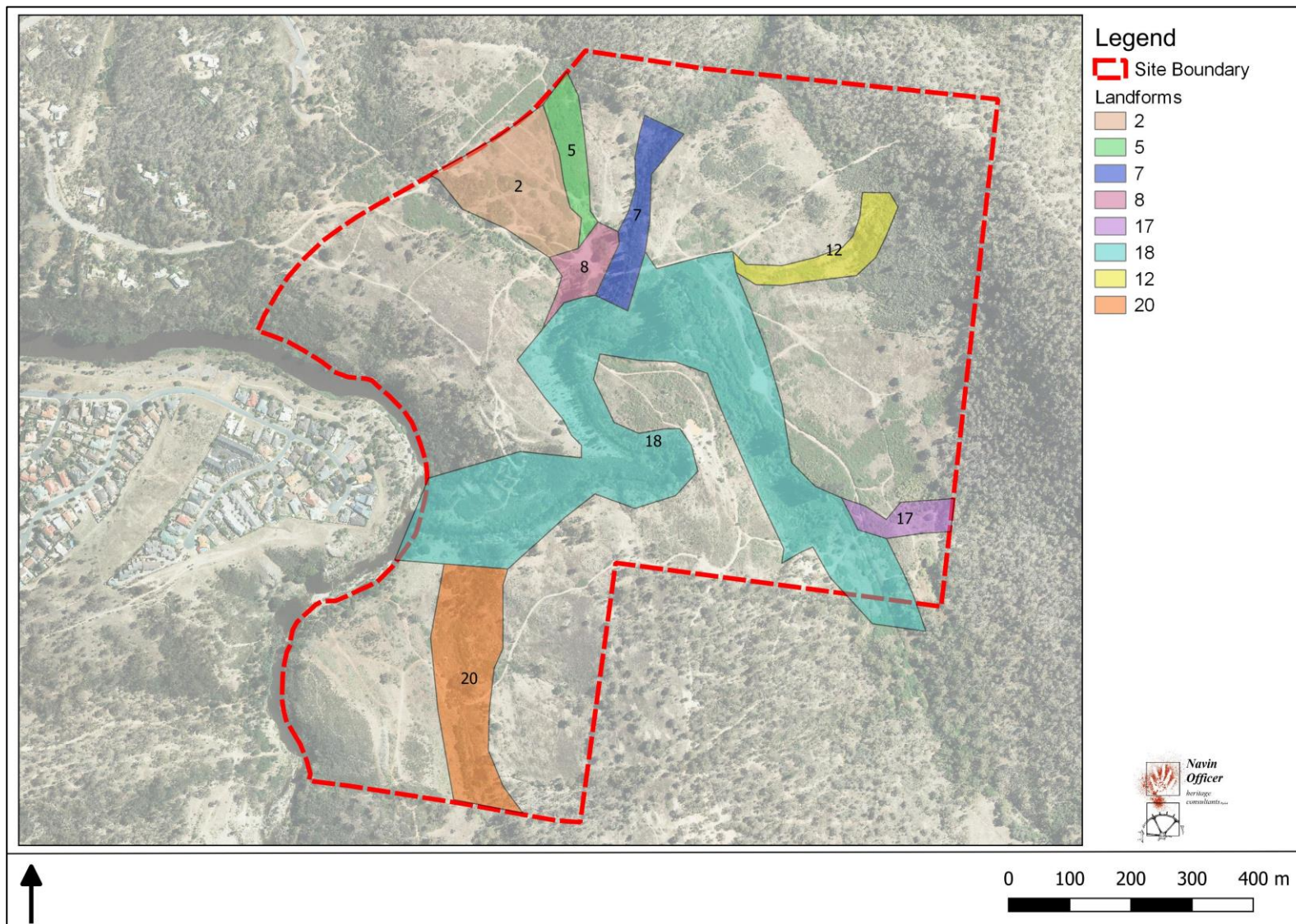
A regional cultural values assessment has not been undertaken for the QPRC area nor for the ACT region so a fully informed comparison of this type of site cannot be made.



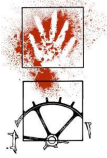
**Table 8.1 Artefact density comparison between Jumping Creek, Mount Peasant and Googong**

<b>Site</b>	<b>Location</b>	<b>Landform</b>	<b>Number of pits</b>	<b>Total count of artefacts recovered</b>	<b>Artefacts per m2</b>
Bunyip PAD	Googong	Flats	11	9	1.63
GA PAD16	Googong	Flats and basal slopes	33 pits and 20 squares to excavate 'feature 1'	94	2.58
GA PAD17	Googong	Crest	25	9	0.72
GA PAD18	Googong	Flats	12	1	0.17
GA PAD19	Googong	Spur Crest	37	15	0.81
GA PAD20	Googong	Spur Crest	13	20	1.20
GA PAD21	Googong	Basal slopes	9	1	0.33
GA PAD22	Googong	Drainage line	26	16	1.15
G1B PAD	Googong	Basal slopes	11	6	1.09
GRW1	Googong	Low spur	130	30	0.92
Googong Area 2 Test	Googong	Spur line	78	0	0
Googong Area 3 Test	Googong	Basal slopes	90	3	0.13
Mount Pleasant Test Excavation	Mount Pleasant	Various	33	22	1.33
MPAS13 (test excavation phase)	Mount Pleasant	Church Creek	6	17	2.5
MPAS13 (salvage phase)	Mount Pleasant	Church Creek	72.5 m <sup>2</sup>	1581	16
Area 1	Jumping Creek	Spur line crest	27	4	0.59
Area 2	Jumping Creek	Spur line crest	33	98	11.87
Area 3	Jumping Creek	Saddle	27	2	0.29
Area 4	Jumping Creek	Saddle/drainage line	37	74	8
Area 5	Jumping Creek	Flats	38	148	15.57
Area 6	Jumping Creek	Hill slopes	25	12	1.92
Area 7	Jumping Creek	Jumping Creek	18	56	12.44





**Figure 8.1 Survey units with archaeological subsurface potential following the test excavation program**



## 9. CULTURAL HERITAGE VALUES AND STATEMENT OF SIGNIFICANCE

### 9.1 Aboriginal Heritage

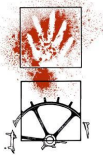
#### 9.1.1 Assessment Criteria

*The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* defines cultural significance as 'aesthetic, historic, scientific, social or spiritual value for past, present or future generations' (Australia ICOMOS Burra Charter, 2013a).

Assessing the Aboriginal cultural significance of a place involves identifying the range of values that are present and assessing them against relevant criteria, in order to define why a place is important and inform future planning and management. Table 9.1 provides definitions of these values and outlines the criteria for assessment.

**Table 9.1 Criteria used to assess the cultural significance of a place**

<b>Definition of value</b>	<b>Assessment criteria (after OEH 2011:10)</b>
<b>Historic value</b> refers to the associations of a place with a historically important person, event, phase or activity in an Aboriginal community (OEH 2011:9).	Is the subject area important to the cultural or natural history of the local area and/or region and/or state?
<b>Scientific (or archaeological) value</b> refers to the information content of a place and its ability to reveal more about an aspect of the past through examination or investigation of the place, including the use of archaeological techniques (Australia ICOMOS 2013b).  Sites may meet this criterion because they: contain intact archaeological deposits, have potential to answer research questions on past human behaviour, are very old or contain significant time depth, contain large artefactual assemblages or material diversity, are well preserved, or form part of a larger site complex or cultural landscape.	Does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state?
<b>Aesthetic value</b> refers to the sensory and perceptual experience of a place—that is, how we respond to visual and non-visual aspects such as sounds, smells and other factors having a strong impact on human thoughts, feelings and attitudes. Aesthetic qualities may include the concept of beauty and formal aesthetic ideals (Australia ICOMOS 2013b:3).	Is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state?



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## Definition of value

## Assessment criteria (after OEH 2011:10)

**Social (or cultural) value** refers to the spiritual, traditional, historical or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them (OEH 2011:8).

Does the subject area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?

Spiritual value is included in the definition of social value, and refers to the intangible values and meanings embodied in or evoked by a place which give it importance in the spiritual identity, or the traditional knowledge, art and practices of Aboriginal people (Australia ICOMOS 2013b:4).

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The *Aboriginal cultural heritage consultation requirements for proponents 2010* identify that 'Aboriginal people are the primary determinants of the cultural significance of their heritage' (DECCW 2010:iii). The significance of a place can be the result of a number of factors including: continuity of tradition, occupation or action; historical association; custodianship or concern for the protection and maintenance of places; and the value of sites as tangible and meaningful links with the lifestyle and values of ancestors. Aboriginal cultural significance may or may not parallel the archaeological significance of a site.

In assessing the significance of a site, it is also important to take into consideration the integrity of the site i.e. its wholeness or intactness. This includes considering how intact a site is and the nature and history of negative impacts or positive management measures that a site has been subject to. In other words, while a site may have once been significant its significance may be lowered if the site has been subject to irreparable damage and loss of attributes.

The following assessment of significance is made with reference to the criteria outlined above.

## 9.2 Cultural Heritage Values Identified

### 9.2.1 Social or Cultural Value

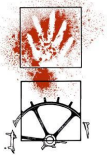
The Jumping Creek project RAPs have identified that all Aboriginal objects and sites in Jumping Creek have cultural value for present-day Aboriginal people, as they were created by ancestral Aboriginal people and provide tangible evidence of past occupation of the landscape.

The Valley (Jumping) Creek & Queanbeyan River Junction Resource Gathering and Camping Cultural Area (Site A) was identified by Waters Consultancy 2016 as a site of moderate significance as a resource area and camping place associated with the pathway identified as Site B: Queanbeyan River Pathway Cultural Site. Site B: Queanbeyan River Pathway Cultural Area was identified by Waters Consultancy 2016 as a site of high significance as a section of a traditional Aboriginal pathway that travelled along the Queanbeyan River. It should be noted that the archaeological evidence is generally consistent with the interpretation of the area as a focus of camping and resource gathering activity; however, the physical evidence demonstrates the substantial impact of land use disturbance since European settlement.

### 9.2.2 Scientific (Archaeological) Value

Individually most sites recorded across Jumping Creek have low or low to moderate scientific significance (Table 9.2) as all sites contain objects that are typical of the Queanbeyan region. Three locations have been assessed as having moderate to high scientific significance, this is due to the high artefact numbers at these locations. However, rather than seeing the archaeological resource within the Jumping Creek project area as individual sites, the area is best described as a disturbed, remnant cultural landscape.





The results of the surface survey and test excavation program have shown that some sites can be characterised by the visible sparse distribution of artefacts across the surface. Site preservation varies across the project area due to natural and anthropogenic impacts. Land use impacts are widespread and include erosion, vehicular damage, quarrying activity etc. Artefacts can be found on all landscape forms within the project area. There are areas where there is moderate to high potential for subsurface archaeological deposits to occur. These areas, detailed in Figure 8.1 above, have a higher scientific significance as they can potentially yield information about human activity in the past. This information can include how the Jumping Creek area was utilised and potentially the types of resources being utilised, the production of stone tools and the use of other resources outside of Jumping Creek through the importation of different stone material types. The high percentage of broken artefacts indicates that the subsurface deposits have been disturbed; however, the large number of artefacts present adds to the significance of the site.

There are few sites recorded in the Queanbeyan area that contain large numbers of surface artefacts and few that also contain subsurface archaeological deposits. The scientific significance of Jumping Creek prior to European impact could have been assessed as moderate to high at a local level. However, land use impacts mean that the integrity of many of the sites has been substantially compromised. This has reduced the significance of the site as low to moderate.



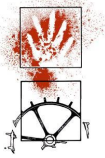
**Table 9.2 Scientific Significance of Individual Sites**

Site No#	Easting	Northing	Minimum number of artefacts	Condition	Landform	Subsurface Potential	Research potential	Representativeness	Rarity	Educational potential	Scientific significance
57-2-0069 (JC4)	704663	6083384	188	Highly disturbed	2 spur line crest 3 saddle 8 flats	Subsurface testing showed that landform 2 has subsurface potential	moderate	low	low	low	Low to moderate
57-2-0070 (JC5)	704868	6083196	3	Highly disturbed	18 Jumping Creek	Subsurface testing showed that landform 18 has subsurface potential	high	moderate	moderate	moderate	Moderate to high
57-2-0071 (JC6)	704929	6083339	321	Highly disturbed	6 crest 9 spur line crest 11 saddle	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0072 (JC7)	705063	6083184	237	Highly disturbed	18 Jumping Creek	Subsurface testing showed that landform 18 has subsurface potential	high	moderate	moderate	moderate	Moderate to high
57-2-0073 (JC8)	705063	6083184	13	Highly Disturbed	15 hill slope	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0074 (JC9)	704430	6083298	112	Highly disturbed	1 Spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0076 (JC11)	704663	6082984	3	Disturbed	24 hill slopes	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0079 (JC14)	704613	6083134	23	Highly disturbed	1 Spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0080 (JC15)	704713	6083084	261	Highly disturbed	14 spur line crest 18 Jumping Creek	Subsurface testing showed that landform 18 has subsurface potential	high	moderate	moderate	moderate	Moderate to high
57-2-0084 (JC19)	704963	6082834	11	Highly disturbed	14 spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0085 (JC20)	704363	6082534	3	Very low	21 spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0086 (JCV3)	704636	6083266	3	Very low	3 saddle	No, skeletal soil, shallow profile	low	low	low	low	Low
57-2-0611 (SU2/L3)	705222	6083049	12	Highly disturbed	15 and 16 hill slope	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0613 (SU3/L1)	705131	6083344	2	Highly disturbed	10 spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0616 (SU10/L2)	704724	6083445	5	Highly disturbed	2 spur line crest	Subsurface testing showed that landform 2 has subsurface potential	Moderate	low	low	low	Low to moderate
57-2-0617 (SU11/L1)	704842	6083459	7	Highly disturbed	4 spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0618 (SU15/L1)	704461	6082470	1	Moderately disturbed	21 spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low
57-2-0619 (SU15/L2)	704402	6082703	1	Moderately disturbed	21 spur line crest	No, skeletal soil eroded to bedrock	low	low	low	low	Low



Site No#	Easting	Northing	Minimum number of artefacts	Condition	Landform	Subsurface Potential	Research potential	Representativeness	Rarity	Educational potential	Scientific significance
57-2-0620 (SU15/L3)	704505	6082657	1	Moderately disturbed	20 drainage line	Subsurface testing showed that landform 20 has subsurface potential	moderate	low	low	low	Low to moderate
57-2-0621 (SU15/L4)	704535	6082789	4	Moderately disturbed	20 drainage line	Subsurface testing showed that landform 20 has subsurface potential	moderate	low	low	low	Low to moderate
57-2-0634/ 57-2-0684 (JCR1/JCR1a)	704589	6082951	15	Highly disturbed	18 Jumping Creek	Subsurface testing showed that landform 18 has subsurface potential	high	moderate	moderate	moderate	Moderate to high
57-2-0945 (Ellerton Dr7)	704497	6083379	28	Highly disturbed	3 saddle	No, skeletal soil, shallow profile	low	low	low	low	Low
57-2-1091 (JC 18-2)	704599	6083317	3	Highly disturbed	3 saddle	No, skeletal soil, shallow profile	low	low	low	low	Low
57-2-1092 (JC18-1)	704599	6082898	3	Highly disturbed	18 Jumping Creek	Subsurface testing showed that landform 18 has subsurface potential	high	moderate	moderate	moderate	Moderate to high
57-2-1093 (JC Scarred Tree 1)	704650	6083040		Moderate to poor	1 Spur line crest	nil	low	low	moderate	moderate	Low to moderate





### 9.2.3 Aesthetic Value

None of the sites is judged to have substantial aesthetic value, or value as an educational resource.

## 9.3 Historical Heritage

### 9.3.1 Assessment Criteria

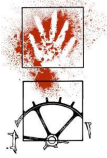
The NSW Heritage Branch has defined a methodology and set of criteria for the assessment of cultural heritage significance for items and places, where these do not include Aboriginal heritage from the pre-contact period (NSW Heritage Office & Department of Urban Affairs and Planning 1996; NSW Heritage Office 2000). The assessments provided in this report follow the Heritage Branch methodology.

The following heritage assessment criteria are those set out for Listing on the State Heritage Register. In many cases items will be significant under only one or two criteria. The State Heritage Register was established under Part 3A of the Heritage Act (as amended in 1999) for listing of items of environmental heritage that are of State heritage significance. Environmental heritage means those places, buildings, works, relics, moveable objects, and precincts, of state or local heritage significance (section 4, *Heritage Act 1977*). An item will be considered to be of State (or local) heritage significance if, in the opinion of the Heritage Council of NSW, it meets one or more of the following criteria:

- Criterion (a)** an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (b)** an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (c)** an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);
- Criterion (d)** an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;
- Criterion (e)** an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (f)** an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);
- Criterion (g)** an item is important in demonstrating the principal characteristics of a class of NSW's
  - cultural or natural places; or
  - cultural or natural environments.or a class of the local area's
  - cultural or natural places; or
  - cultural or natural environments.

An item is not to be excluded from the Register on the grounds that items with similar characteristics have already been listed on the Register. Only particularly complex items or places will be significant under all criteria. In using these criteria, it is important to assess the values first, then the local or State context in which they may be significant.

Different components of a place may make a different relative contribution to its heritage value. For example, loss of integrity or condition may diminish significance. In some cases, it is constructive to note the relative contribution of an item or its components. Table 9.3 provides a guide to ascribing relative value.



**Table 9.3 Guide to ascribing relative heritage value**

<b>Grading</b>	<b>Justification</b>	<b>Status</b>
Exceptional	Rare or outstanding item of local or State significance High degree of intactness Item can be interpreted relatively easily	Fulfils criteria for local or State listing
High	High degree of original fabric Demonstrates a key element of the item's significance Alterations do not detract from significance	Fulfils criteria for local or State listing
Moderate	Altered or modified elements Elements with little heritage value, but which contribute to the overall significance of the item	Fulfils criteria for local or State listing
Little	Alterations detract from significance Difficult to interpret	Does not fulfil criteria for local or State listing
Intrusive	Damaging to the item's heritage significance	Does not fulfil criteria for local or State listing

### 9.3.2 The Study Area

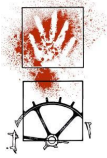
#### 9.3.2.1 Marchiori's lime kiln and quarry

Marchiori's lime kiln and quarry (JCH3 and JCH4) are assessed as significant for their important association with the construction of both Queanbeyan and the nation's capital in the late 1920s, 1930s and early 1940s. The kiln has technical significance for its ability to demonstrate lime burning techniques in the early to mid 20th Century. Each of the kilns is considered to be significant and worthy of listing in the local heritage schedule.

The other items within the project area have been assessed (NSW Archaeology 2009), this assessment is outlined in Table 9.4.

**Table 9.4 Historical heritage significance assessment**

<b>Item</b>	<b>Significance</b>	<b>Criteria</b>
JCH1 Shearing shed complex	Local significance	This item has research potential and significance at a local level against criterion 'e'. It has potential significance against criterion 'b' due to the possible links with the Willis and Gibbs families.
JCH2 Mine shaft	Does not meet the criteria for heritage listing	This item is not assessed to have significance against any of the criteria
JCH5 Limestone quarries	Local significance	This item has significance at a local level against criterion 'b' due to its apparent association with the Gibbs family. It may have significance against criterion 'e' as a component of the larger complex including JCH6. Because of this association with early lime burning and the relative rarity of such sites this item has local significance against criterion 'f'.



Item	Significance	Criteria
JCH6 Limekiln	Local significance	This item has research potential and significance at a local level against criterion 'e'. It has significance against criterion 'b' due to its association with the Gibbs family. There is significance against criterion 'f' due to the relative rarity of lime kiln sites in the local area, particularly sites dating to the 19th Century.
JCH7 Mine workings	Local significance	This item has significance at a local level against criterion 'a' due to its association with the early mining ventures in the region. It may also have significance against criterion 'e' as a component of a larger complex including JCH8 and JCH9.
JCH8 Ore processing area	Local significance	This item has research potential and significance at a local level against criterion 'e'. It has significance against criterion 'a' due to its role in the early 20th Century mining activities.
JCH9 Miners' camp	Local significance	This item has research potential and significance at a local level against criterion 'e'. It has significance against criterion 'a' due to its role in the early 20th Century mining activities.
JCH10 Mine shafts	Does not meet the criteria for heritage listing	This item is not assessed to have significance against any of the criteria
JCH11 Domestic site	Local significance	This item has research potential and significance at a local level against criterion 'e'. It has potential significance against criterion 'a' due to its possible association with 19th/20th Century mining activities.
JCH12 Building material dump	Does not meet the criteria for heritage listing	This item is not assessed to have significance against any of the criteria
JCH13 Mine diggings	Does not meet the criteria for heritage listing	This item is not assessed to have significance against any of the criteria
JCH14 Metal pipe	Does not meet the criteria for heritage listing	This item is not assessed to have significance against any of the criteria





## 10. THE PROPOSED ACTIVITY

### 10.1 Historical Overview

The Jumping Creek property is currently unoccupied and has not been worked or used since the 1960s (Parsons Brinckerhoff Australia Pty Ltd 2008). However, the area shows evidence of having undergone considerable prior impacts and modification during the period of European occupation and usage (cf Boot and Heffernan 1989; Kuskie 1989; Saunders 2007; Parsons Brinckerhoff Australia Pty Ltd 2008). The broad project area is highly eroded as a result of general clearance, farming and mining land use.

The historical context of land use on the property is outlined in detail in Section 6. In summary the property has a long history of rural grazing and extractive land uses (mining, quarrying and mineral processing). Impacts to the property from grazing include vegetation clearance, fencing, and sheep handling areas (such as the sheep dip described later in this report). On crests and slopes topsoil is generally entirely absent with shale bedrock exposed. It is likely that grazing has contributed to this phenomenon.

Mining activities for gold, copper and lead date back to the 1850s and continued into the early 1990s. Impacts to the environment relating to mining have been carried out over relatively extensive areas of the property although they are most obvious now as sites specific areas such as shafts or quarries.

The property is now utilised informally for motorbike riding and recreational walking. The site is crisscrossed by numerous braided tracks and trails. It also contains dumped rubbish, cars and other objects. The historical and modern land use disturbance resulting from the activities described has impacted the integrity of many of the Aboriginal and historic sites (Figure 10.1 and Figure 10.2).



**Figure 10.1 Woody weed coverage 2018**



**Figure 10.2 Example of large scale erosion, 2018**

## **10.2 Proposed Project**

The proposed development involves the creation of 218 residential lots and associated open space areas. The residential lots are proposed to be free-standing blocks ranging in size from 600 m<sup>2</sup> to 2.8 ha. See Figure 10.7 for the Landscape Masterplan for the project.

It is proposed that the development will be serviced by 13 internal roads. These roads are proposed to comprise of local streets, with an 8 m carriageway and varying verge widths to accommodate services. Two proposed egresses onto the Ellerton Drive Extension are proposed to allow for safe ingress and egress from the site. Figure 10.3 depicts the major earthworks disturbance area for the project.

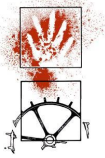
As part of the development infrastructure will be constructed for sewer, water, stormwater, electricity and communications. Gas has been omitted from the development after receiving advice from Jemena that the site cannot be serviced.

Stormwater and drainage measures for the site include the proposed construction of culvert road crossings, supplementary erosion and sediment controls, bioretention basins and wetlands. In order to meet the water quality objectives, the following treatment assets have been proposed for the site:

- 600 m<sup>2</sup> sedimentation basin discharging into a 470 m<sup>2</sup> bio retention basin prior to discharging into Jumping Creek;
- 600 m<sup>2</sup> sedimentation basin discharging into a 520 m<sup>2</sup> bio retention basin prior to discharging into Valley

An erosion and sediment control plan shall be prepared for approval by the NSW Natural Resources Access Regulator (NRAR) as part of the Controlled Activity Approval for the creek crossing. Further detailed design will be prepared at construction certificate stage.

The existing creeks within the site are in a highly degraded form due to creek scour and erosion, and significant infestation of weeds leading to a build-up of debris and organic matter. This area of the site has also been subjected to extensive unauthorised vehicle access resulting in areas of concentrated erosion of gullies and the dumping of used car bodies. Due to the extensive degradation, the area in



the middle of the site is proposed to be rehabilitated to ensure creek flows remain within the creek corridor, and erosion is mitigated. As such, work is proposed within the extent of the riparian corridor where required, and the riparian corridor is to be re-instated as part of the development to raise its ecological value. Extensive woody weeds (willows, poplars and blackberry) need to be removed. The edges of the creeks shall be excavated to flatten the banks and widened the waterway area to reduce stormwater flow velocity and reduce sediment erosion potential. Streets adjacent the creeks will be in earthwork fill to get them above the floodwater levels and comply with Council specification requirements. Between the creeks and the streets, the areas are predominantly in fill and these are the areas where the bioretention basins and active recreation spaces are located. Soils excavated from the creek would most likely be placed as fill in this area adjacent the creeks. Following this the area will be replanted and made into open space and recreation areas. In addition, a conservation area has been identified in this area, which has altered the initial design. The conservation area will be a limited harm area.

The location of the proposed development is largely dictated by the slope and therefore development is proposed within areas of flatter topography. Furthermore, the proposed development footprint is best suited to parts of the site which have been historically subject to human impact. As a result, only 4.61 ha of native vegetation is proposed to be removed as part of the proposal.

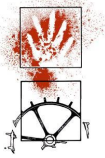
Areas of active erosion have been identified (Franklin Consulting Australia 2019a) (Figure 10.4). These areas will be rehabilitated. Rehabilitation strategies for each of the erosion sites comprise a range of interventions including revegetation and construction of erosion control earthworks. The staged erosion control works program will progressively reduce the sediment being mobilised on the site commensurate with the size of the development.

Several locations have been identified that have been the subject of past mining and dumping activity (Figure 10.5). These areas will also be rehabilitated. This will involve:

- Demolition of onsite structures
- Removal of loose building waste
- Weed removal or suppression
- Management of stockpiled material by either:
  - Placement within the mine shaft
  - Consolidation of the remining stockpiled material
- Placement of a geofabric marker layer over the consolidated contaminated materials. Similarly, the geofabric marker layer is to provide interim erosion control, as well as a marker for these materials
- Capping of Remediation Area with suitable barrier
- Stabilisation of the Site by revegetation with suitable plantings, in accordance with a landscaping plan.

Franklin Consulting Australia (2019b) was engaged by PEET Jumping Creek Limited to develop a Trail Management Plan to support the project. The focus of the trail management plan is to identify trails to retain as part of a strategic trail network that provides good access across the site to enable efficient land management activities. Works are required to upgrade the trail network to an appropriate standard. A site inspection was carried out Saturday 19 January 2019 during which a trail network of 12 trails was identified. Of these three were considered to provide a management function and four were critical to achieving the broader land management goals for the property. The remaining five trails did not fulfil a strategic land management/access function and were therefore considered to be redundant. The redundant trails will be removed to reduce the amount of sediment generated from unsealed trails, estimated to be in the order of 9.6 tonnes / year / kilometre (based on a 4-metre wide track) as well as reduce the costs associated with maintenance. A staged works program to upgrade trails to be retained to the required standard has been developed. Figure 10.6 depicts the locations of the trail remedial works including tracks that are to be rehabilitated and tracks that are to be upgraded.





A park, pedestrian walking track and viewing platform are planned to be placed in the southwest corner of the site. This is in addition to the park areas shown on the masterplan and is depicted in Figure 10.8. This park was developed to provide more opportunity for Aboriginal cultural interpretation of the area and is located in the area of the scarred tree. Some planting may occur in the park but impacts will be minimal.

### 10.3 Potential Harm

A number of archaeological sites identified have the potential to be harmed by the proposal. The nature of potential impacts to all archaeological sites is detailed in Section 11.

Aboriginal sites identified during this study fall into three categories:

- sites that would not be directly harmed;
- sites that will be subject to limited harm by the project, for example parts of a site will be harmed or only limited actions will be undertaken within a site such as remediation and weed removal (see Table 10.1 above); and
- sites that would be directly impacted by the project.

Impact to archaeological sites could arise through the following processes:

- Disturbance and damage to archaeological material through vehicle movements. The proposal involves the movement of a variety of vehicles along access tracks, around worksites and on vehicle laydown areas. The movement of vehicles across archaeological sites results in the movement and mixing of artefacts, and damage to artefacts through breakage – severe damage can destroy artefacts, in that it makes them unidentifiable and therefore archaeologically undetectable. This impact can be experienced by artefacts on the surface, and by subsurface artefacts if vehicle movement scuffs up subsurface deposits sufficiently to uncover buried artefacts.
- Disturbance and damage to archaeological material through excavations. Excavations would be carried out during laying house foundations, streets, streetlights and other infrastructure, subsurface services, and in the course of levelling, landscaping and stabilising the ground surface. Excavations result in the movement and mixing of artefacts and archaeological deposits, and damage to artefacts through breakage. The impact of excavation is experienced by artefacts on the ground surface and in subsurface deposits throughout the depth of the excavation.
- Disturbance and damage to archaeological material during revegetation of excavation sites and work sites. Revegetation would, where necessary, involve loosening areas of ground compacted by construction equipment. The loosening of ground could result in the movement and mixing of artefacts and archaeological deposits and could result in damage to the artefacts through coming into contact with the tools being used.
- Erosion of sediments from areas of disturbed ground. The proposal involves activities that would degrade or remove groundcover vegetation, and that would break up areas of ground and consequently make sediments more friable. These processes make areas of ground more prone to erosion. Vulnerability to erosion is heightened on sloped areas where surface water runoff occurs during rainfall. Erosion impacts archaeological sites by stripping away sediments which hold artefacts, consequently removing the potentially informative context of these artefacts; and by moving the artefacts themselves, which can result in artefacts from separate archaeological contexts being mixed together, and can also result in damage to artefacts as they collide with rocks and other objects (Wildesen 1982). As a process impacting sites, accelerated erosion could occur during the construction phase, and could also occur as an ongoing impact after the construction works have finished. Disturbed ground takes time to recover and revegetate, during which time it is prone to erosion.

Table 10.1 below outlines the remediation methodologies to be utilised across the project area and the degree of harm these will cause. Figures 10.9 to 10.12 depicts the areas of harm, limited harm and no harm in the project area.



**Table 10.1 Remediation Methodologies**

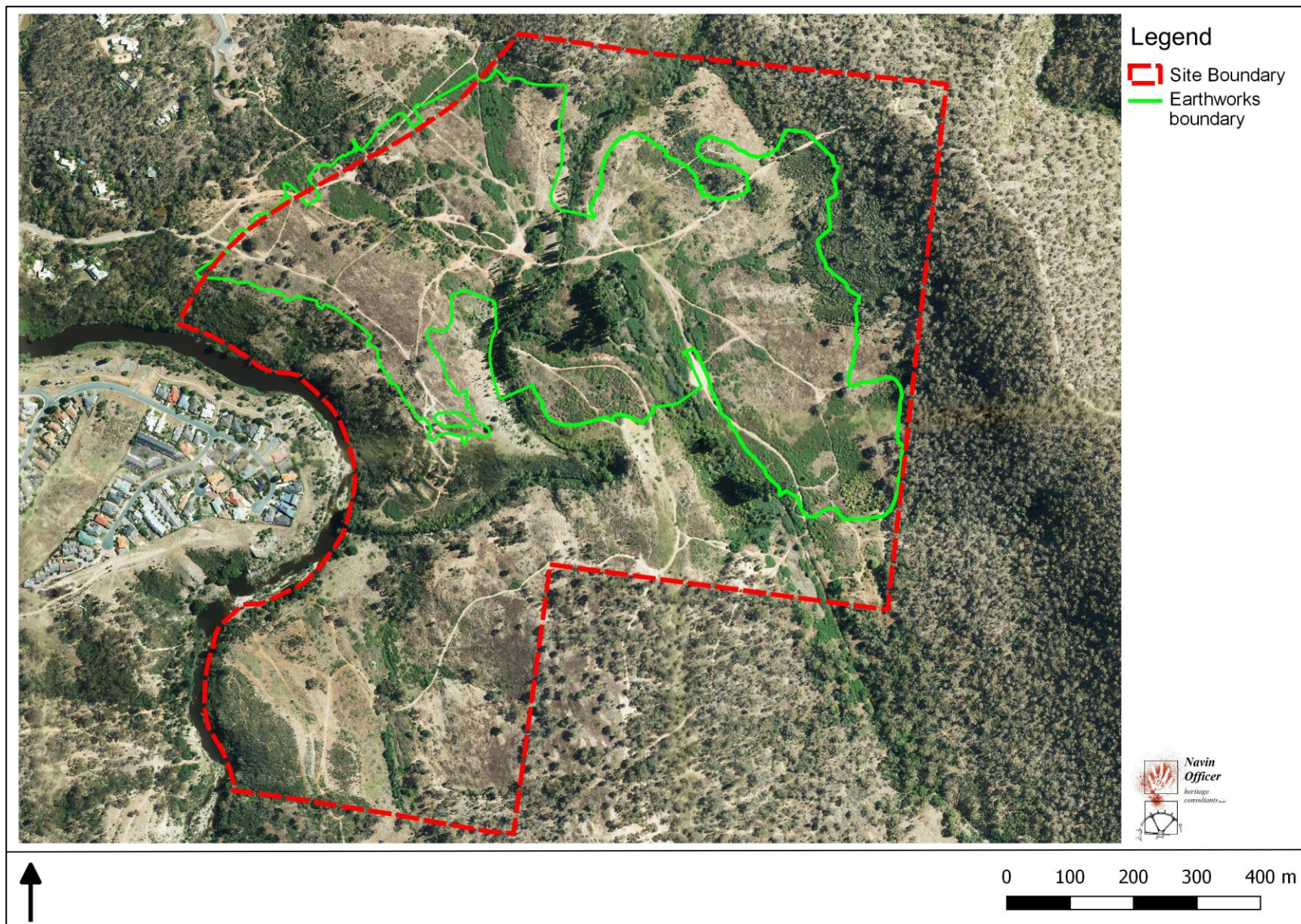
	No Harm	Partial/Potential Harm	Harm
Weed Removal Methodology	<ul style="list-style-type: none"> <li>Weeds chemically treated using knapsacks and/or drone applications.</li> <li>Dead weed vegetation either left in place or brush cut down using mechanical hand tools. Cut vegetation removed from area and added to burn pile.</li> </ul>	<ul style="list-style-type: none"> <li>Dead weed vegetation removed using a flail mower attached to a tractor. Flail mower pulverises vegetation above ground (approx. 100mm above surface) therefore only potential damage would be from tractor tracks skewing across the ground.</li> <li>In some cases (large blackberry stands) where vegetation is too thick for a flail mower, vegetation will be collected into a pile and burnt. Burn piles will be nominated in cleared area of the open space. Burning permits will be sought from QBN Fire and Rescue.</li> <li>Weed trees will be felled at ground level and dragged to the burn piles. Weed tree root balls will be painted with an appropriate herbicide and left to rot. Additional alternative could be to cover the root ball with 100mm of topsoil and seeded.</li> </ul>	
Revegetation Methodology	<ul style="list-style-type: none"> <li>Spraying using targeted herbicide (1m diameter) to promote growth without weed competition.</li> <li>Hand mulching using a highly decomposable organic mulch to enrich the site soil.</li> <li>Jute matting to steep areas (greater than 20%) and drainage lines. Top dress with topsoil and organic matter. Apply seed and bitumen straw mulch.</li> <li>Add 30mm – 50mm of topsoil and till the soil.</li> </ul>	<ul style="list-style-type: none"> <li>Plant native grass tubestock at approximately 4 – 6 per sqm using auger holes to be dug using hand-held or machine-based equipment (min. 75cm diameter soil) in batters greater than 20%</li> <li>Combined site soil with organic matter and other ameliorants to enrich soil.</li> <li>Machine based direct sow dryland grass and native seed mix. Apply bitumen straw mulch.</li> </ul>	<ul style="list-style-type: none"> <li>Ripping to a depth of 100mm and mounding on the contour (riplines min. 5m apart).</li> <li>Combine organic matter and work ground to a fine tilth to a depth of 100mm, Seed and bitumen straw mulch.</li> </ul>
Erosion Rehabilitation Methodology	<ul style="list-style-type: none"> <li>Install jute matting to areas steeper than 20% and/or drainage lines.</li> <li>Hand seed and bitumen straw mulch.</li> </ul>	<ul style="list-style-type: none"> <li>Light scarification (approx. 40mm)</li> <li>Lightly rip</li> <li>Fill with loose rock, topsoil and tubestock</li> </ul>	<ul style="list-style-type: none"> <li>Construct a small earth diversion bank</li> <li>Deep rip</li> <li>Any bare areas associated with the previous mining activity should be capped with coarse ballast rock and capped with topsoil</li> </ul>



	No Harm	Partial/Potential Harm	Harm
Trail Works Methodology		<ul style="list-style-type: none"><li>• Lay gravel surface</li></ul>	<ul style="list-style-type: none"><li>• Trail drainage works</li><li>• Construct crossover banks (reforming, shaping)</li><li>• Install concrete pipe culverts</li></ul>

Restricted Version





**Figure 10.3 Major Earthworks Disturbance Area**



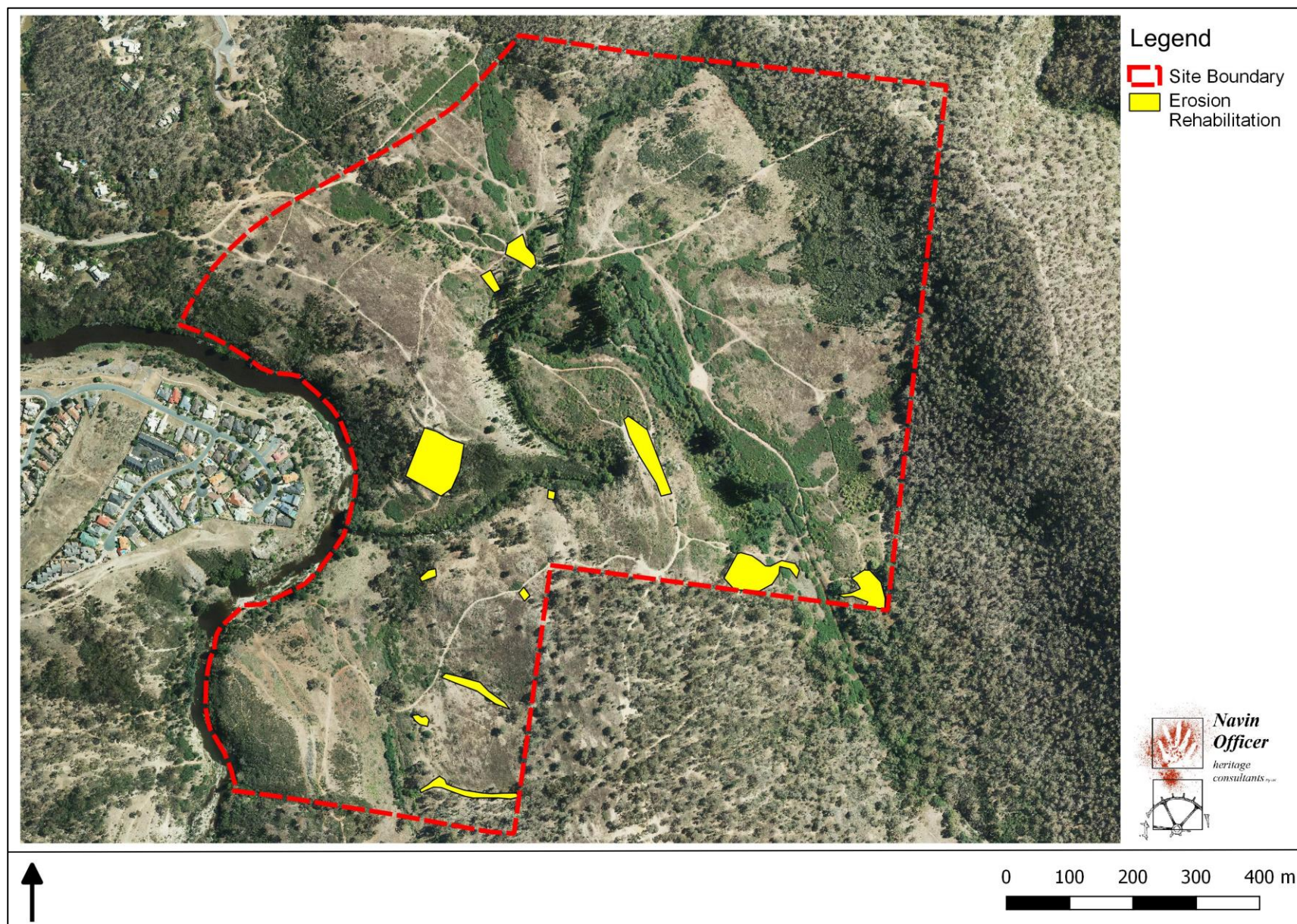
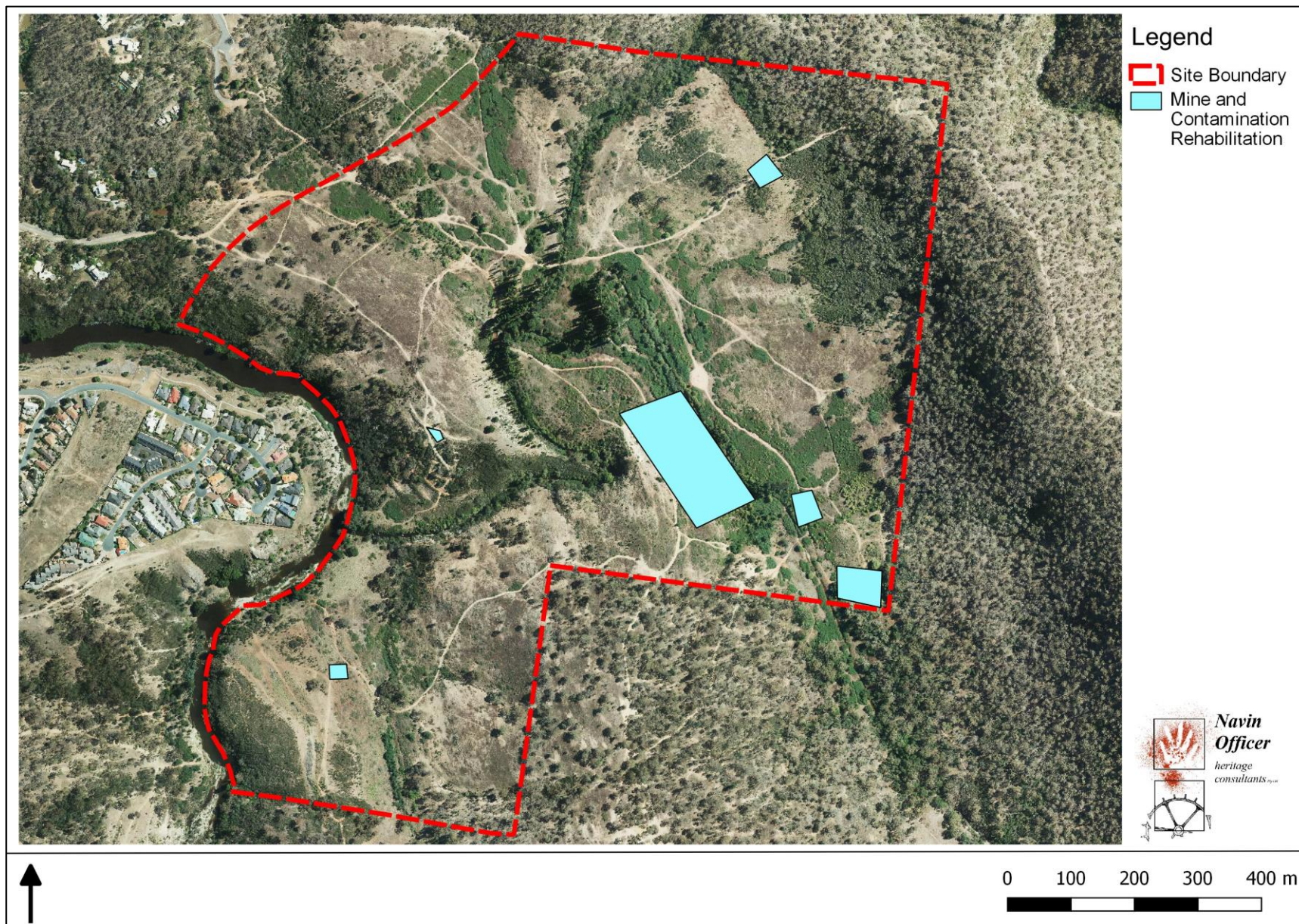


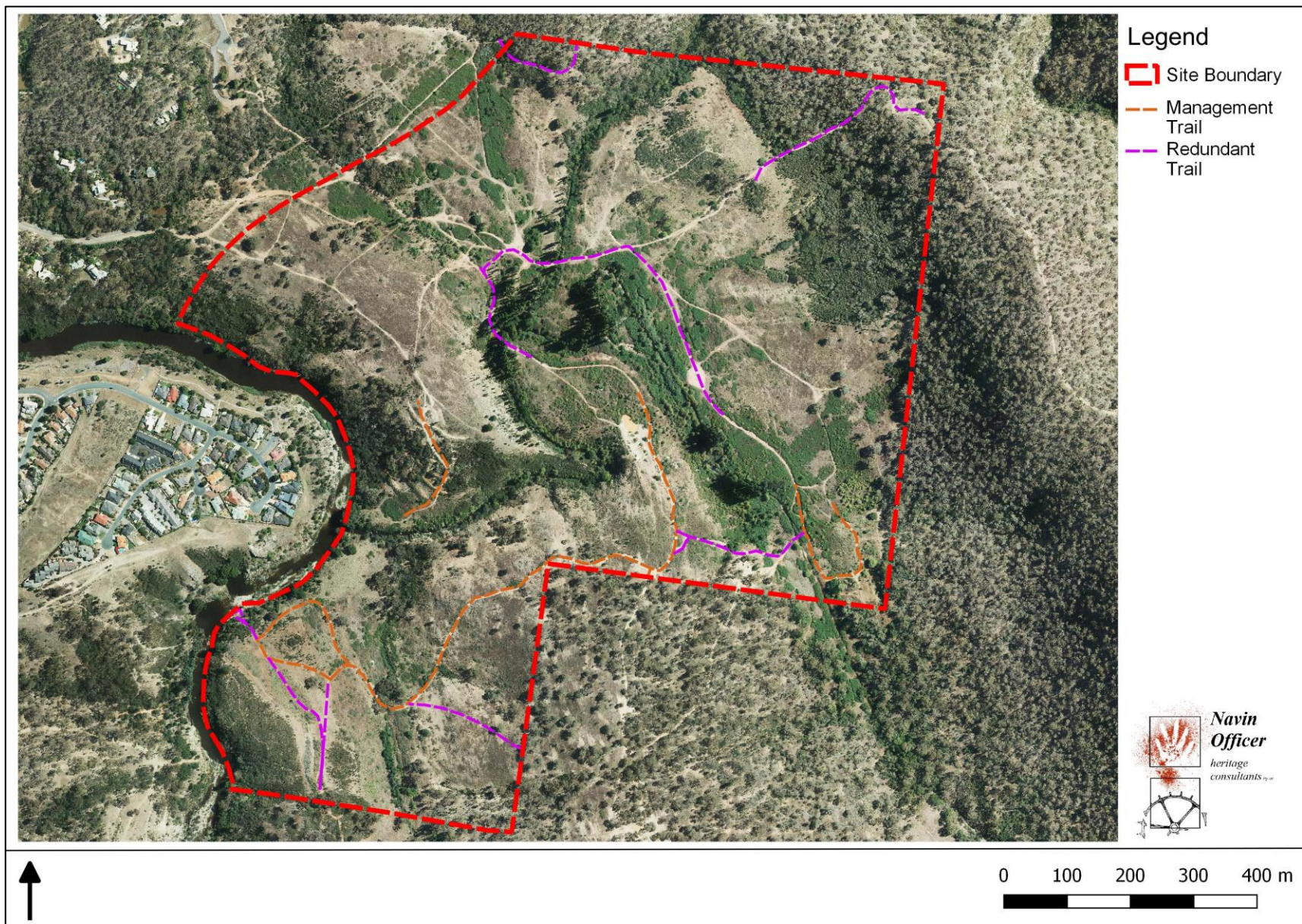
Figure 10.4 Areas of Erosion Rehabilitation





**Figure 10.5 Areas of Contamination Rehabilitation**





**Figure 10.6 Location of Trail Remediation Works**





## LEGEND

- Estate Boundary
- Nature Trail
- Conservation Area

### KEY DESIGN ELEMENTS

- 1 Planted Median & Roundabout at Estate Entry
- 2 Natural Riparian Corridor
- 3 WSUD Floodway & Wetlands
- 4 Area Subject to Vegetation Management
- 5 Play Ground
- 6 Bush Tucker Garden
- 7 Boardwalk & Platform at Wetland
- 8 Wide Verge with Groups of Native Trees & Native Understorey Planting
- 9 Lookout

### PROPOSED STREET TREES

- Acer truncatum 'Warrenred' Pacific Sunset
- Eucalyptus pauciflora 'Little Snowman'
- Eucalyptus polyanthemos
- Fraxinus pennsylvanica 'Lodna' Aerial
- Pistacia chinensis
- Lagerstroemia indica
- Pyrus betulaefolia 'Southworth Dancer'
- Cupressus leylandii
- Prunus cerasifera

### PROPOSED & OPEN SPACE NATIVE TREES

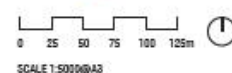
- Allocasuarina verticillata, Brachychiton populneus, Casuarina cunninghamiana, Eucalyptus melliodora, Eucalyptus polyanthemos, Eucalyptus bridgesiana, Eucalyptus bleakelyi, Eucalyptus mannifera, Eucalyptus rossii, Melaleuca linariifolia

### PROPOSED OPEN SPACE NATIVE SHRUBS

- Shrubs: A. dealbata, Callistemon citrinus, Cassinia longifolia, Kunzea ericoides, Leptospermum multicaule. Groundcover/Grasses: Poa labillardieri, Lomandra longifolia, Lomandra multiflora, Hardenbergia violacea, Chrysoccephalum apiculatum, Chrysoccephalum semipapposum

### PROPOSED OPEN SPACE NATIVE WETLAND PLANTS

- Carex appressa, Carex fasciculata, Ficinia nodosa, Juncus australis, Juncus usitatus, Baumea articulata, Bolboschoenus caldwelii, Crassula helmsii, Eleocharis acuta, Eleocharis sphacelata, Phragmites



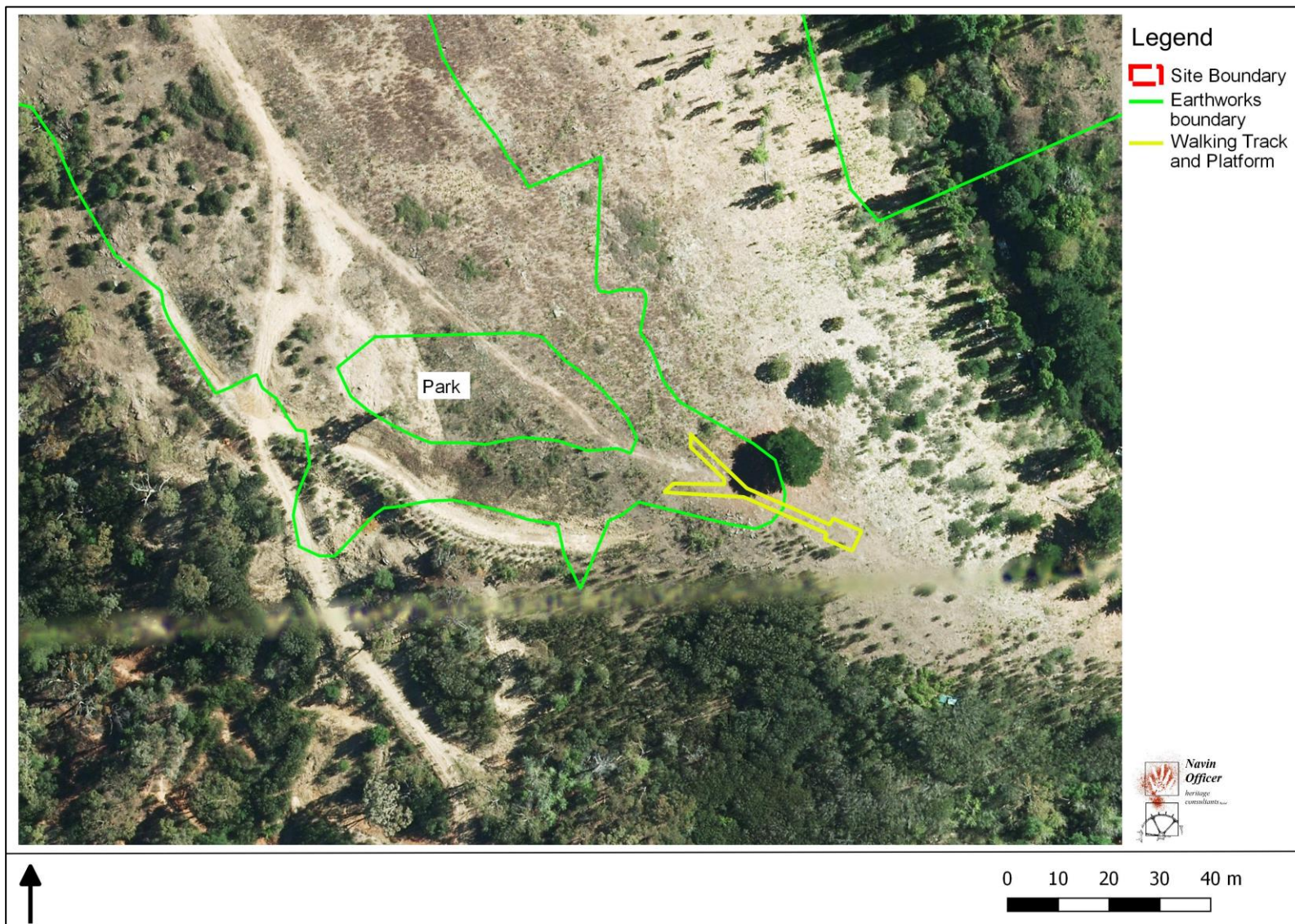
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## LANDSCAPE MASTER PLAN JUMPING CREEK ESTATE DEVELOPMENT

DOC NO. LMP001  
REV A  
DATE 18/06/2021  
DESIGNER SR  
CHECKED AT/PB  
AUTH PB

Figure 10.7 Jumping Creek Landscape Masterplan





**Figure 10.8 Walking Track, Park and Viewing Platform**





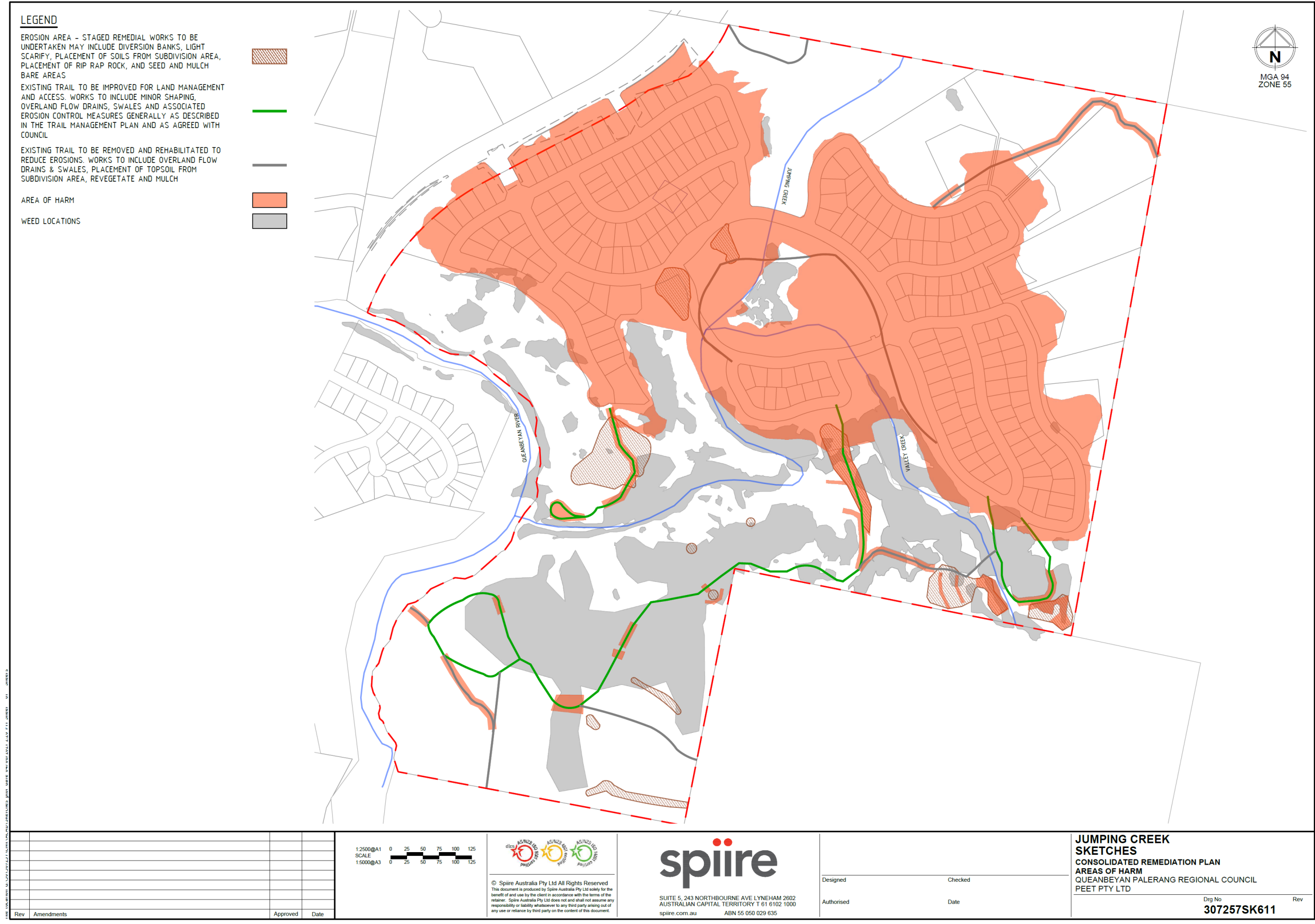


Figure 10.10 Area of direct harm in the project area



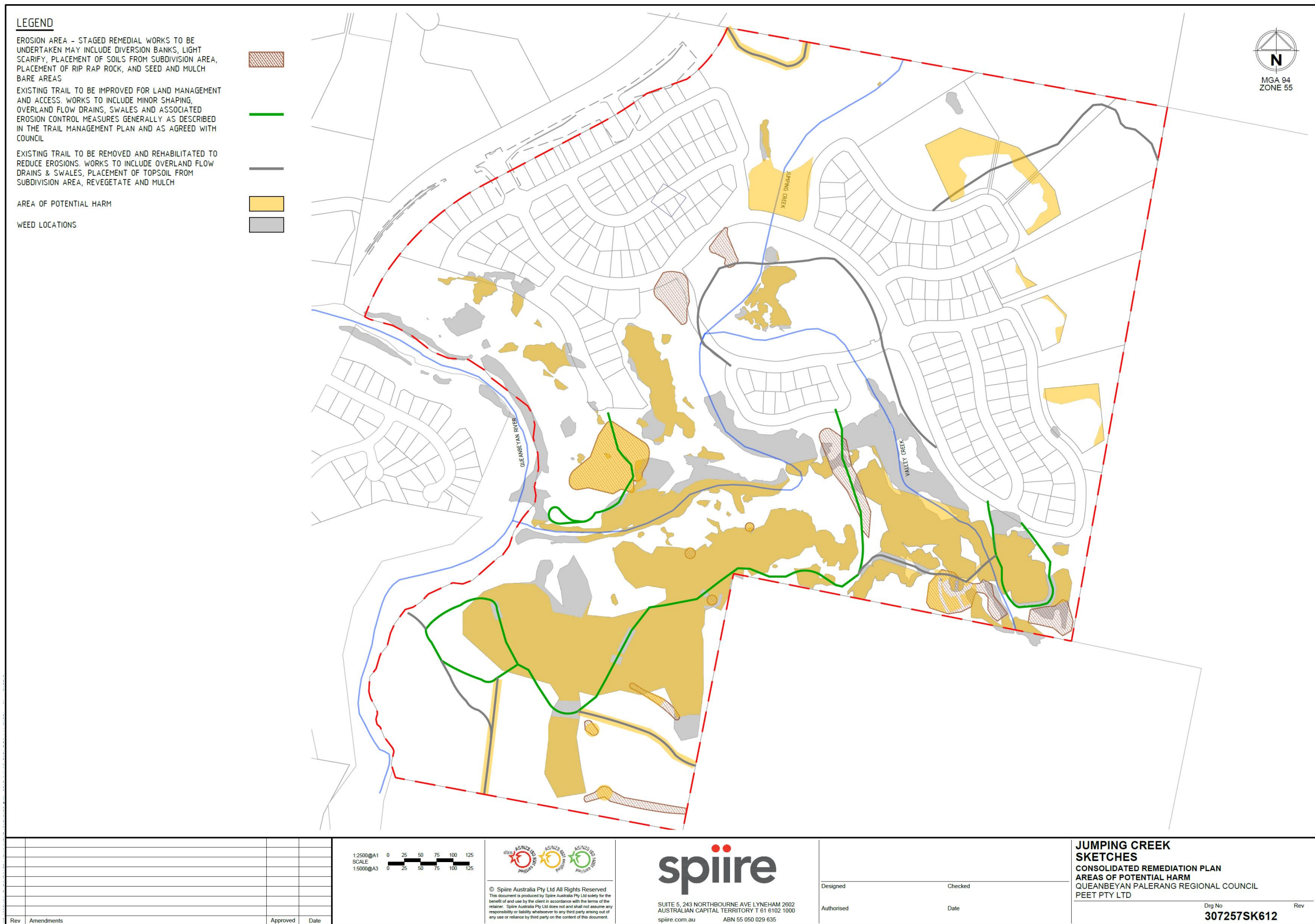


Figure 10.11 Area of potential/limited harm in the project area







## 11. AVOIDING AND MINIMISING HARM

### 11.1 Impact Assessment

Due to the identified significance of the sites and areas outlined above the proponent has explored conservation options as part of project planning, for example the area of green space is located in the most archaeologically sensitive part of the site and early planning has changed site layout to avoid impact to the scarred tree (JC Scared Tree 1).

In addition, the project design has been altered to incorporate a conservation area in the central section of the project area. Figure 11.1 and Figure 11.2 depict this change.



**Figure 11.1 Project design prior to change to incorporate conservation area**





**Figure 11.2 Project design following incorporation of conservation area (yellow)**

The two areas of cultural significance identified by Waters Consultancy (2016), Site A and Site B will be partially impacted by the project (Figure 11.3). Much of Jumping Creek will be rehabilitated and more easily accessed following the construction of the development. This will allow for the Aboriginal community to use the area more easily for any cultural practices than is currently available to them. In addition, mitigation measures specific to the cultural values of the area have been developed in consultation with the RAPs, see Section 12. As detailed below and in Figure 11.3 the 'No Harm' area also include parts of the areas of cultural significance.

A total of 10 of the 25 recorded Aboriginal site locations will be totally harmed by the project (Figure 11.4). In addition, 11 sites will be subject to limited harm by the project and 4 sites will not be impacted at all. Table 11.1 outlines each site and the impact. Impacts will occur from the construction of the residential subdivision as well as rehabilitation actions within Jumping Creek.

As well as individual site locations the archaeological resource within the Jumping Creek project area is best described as a as a disturbed, remnant cultural landscape with an uneven distribution of artefacts across the whole project area. The test excavation program has found that there are subsurface archaeological deposits found in the project area in the following landforms:

- spur line crests;
- saddle/drainage lines;
- flats; and
- adjacent to Jumping Creek.





The results show that where there is any remaining soil accumulation on a landform then there is likely to be subsurface archaeological deposit, and also where there is no soil accumulation that there is unlikely to be subsurface archaeological deposits. These areas will be impacted both by the residential construction activities as well the rehabilitation actions within Jumping Creek (Figure 11.5). Areas 2, 5, 8 and 12 will be totally harmed by the project and Areas 7, 17, 18 and are subject to harm, limited harm and are partially within the no harm area.

For the remaining areas and sites in Jumping Creek that will not be impacted by the project all measures will be implemented to prevent or reduce damage to Aboriginal objects and areas of cultural significance. These areas have been classified as 'No Harm' Areas (Figure 10.12).

Ten items of historical heritage will be subject to impacts from the project Figure 11.6, they are JCH1, 2, 3, 4, 5, 6, 8, 9, 12 and 14

Heritage listed site Marchiori's lime kiln and quarry (JCH3 and JCH4) may be impacted by erosion remediation works. Sites JCH1, JCH5, JCH6, JCH8 and JCH9 been assessed as meeting the criteria for local heritage listing. Sites JCH2, JCH12 and JCH14 have been assessed as not meeting the requirements for heritage listing.



**Table 11.1 Impact assessment**

Site No#	Anticipated impact	Significance	Type of harm	Degree of harm	Consequence of harm	Mitigation action
57-2-0069 (JC4)	Residential	Low to moderate	harm	total	Total loss of value	Salvage of surface and subsurface artefacts
57-2-0070 (JC5)	Within conservation zone, some weed remediation required, edges may be directly impacted, partially in no-harm area	Moderate to high	harm, limited harm, no harm	partial	Partial loss of value	Conservation of area, salvage of surface and subsurface artefacts within areas of harm
57-2-0071 (JC6)	Residential and partially within conservation zone	Low	harm, limited harm, no harm	partial	Partial loss of value	Conservation of area, salvage of surface artefacts within areas of harm
57-2-0072 (JC7)	Residential and trail remediation,	Moderate to high	harm	total	Partial loss of value	Salvage of surface and subsurface artefacts in areas of harm
57-2-0073 (JC8)	Residential	Low	harm	total	Total loss of value	Salvage of surface artefacts in areas of harm
57-2-0074 (JC9)	Residential, partially in no-harm area	Low	harm, limited harm, no harm	partial	Partial loss of values	Salvage of surface artefacts in areas of harm
57-2-0076 (JC11)	Erosion remediation, partially in no-harm area	Low	harm, limited harm, no harm	partial	Partial loss of values	Salvage of surface artefacts in areas of harm
57-2-0079 (JC14)	Residential, erosion remediation and partially in no-harm area	Low	harm, limited harm, no harm	partial	Partial loss of values	Salvage of surface artefacts in areas of harm

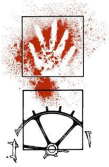


Site No#	Anticipated impact	Significance	Type of harm	Degree of harm	Consequence of harm	Mitigation action
57-2-0080 (JC15)	Residential, contamination remediation, partially in no-harm area	Moderate to high	harm, no harm	partial	Partial loss of value	Salvage of surface artefacts in areas of harm
57-2-0084 (JC19)	contamination remediation, erosion remediation and trail remediation, partially in no-harm area	Low	harm, limited harm, no harm	partial	Partial loss of values	Salvage of surface artefacts in areas of harm
57-2-0085 (JC20)	Not impacted	Low	no harm	nil	No loss in value	No action required
57-2-0086 (JCV3)	Residential	Low	harm	total	Total loss of value	Salvage of surface artefacts
57-2-0611 (SU2/L3)	Residential	Low	harm	total	Total loss of value	Salvage of surface artefacts
57-2-0613 (SU3/L1)	Residential	Low	harm	total	Total loss of value	Salvage of surface artefacts
57-2-0616 (SU10/L2)	Residential	Low to moderate	harm	total	Total loss of value	Salvage of surface and subsurface artefacts
57-2-0617 (SU11/L1)	Residential	Low	harm	total	Total loss of value	Salvage of surface artefacts
57-2-0618 (SU15/L1)	Not impacted	Low	no harm	nil	No loss in value	No action required
57-2-0619 (SU15/L2)	Weed remediation, partially in no-harm area	Low	no harm, limited harm	nil	Partial loss of values	Salvage of surface artefacts in areas of harm
57-2-0620 (SU15/L3)	Trail management	Low to moderate	limited harm	partial	Partial loss of value	Salvage of surface artefacts
57-2-0621 (SU15/L4)	Not impacted	Low to moderate	no harm	nil	No loss in value	No action required
57-2-0634/ 57-2-0684 (JCR1/JCR1a)	May be impacted by Erosion remediation	Moderate to high	limited harm	partial	Partial loss of value	Salvage of surface artefacts





Site No#	Anticipated impact	Significance	Type of harm	Degree of harm	Consequence of harm	Mitigation action
57-2-0945 (Ellerton Dr7)	Residential	Low	harm	total	Total loss of value	Salvage of surface artefacts
57-2-1091 (JC 18-2)	Residential	Low	harm	total	Total loss of value	Salvage of surface artefacts
57-2-1092 (JC18-1)	trail remediation, partially in no-harm area	Moderate to high	no harm, limited harm	partial	Partial loss of values	Salvage of surface artefacts
57-2-1093 (JC Scarred Tree 1)	Not impacted	Low to moderate	no harm	nil	No loss in value	Site to be fenced during construction



### 11.1.1 Impact on Aboriginal Cultural Heritage Values

Archaeological sites have cultural heritage value for present-day Aboriginal groups, in that they are manifestations of their ancestors and their occupation and use of the land. In that sense, the impacts to archaeological sites discussed above carry with them an impact to the cultural heritage value of the study area. The avoidance of sites was considered during the planning process, the residential development is bound by consideration of slope with the most moderate levels on spur crests being targeted. Generally, the spur crests have been found to have surface artefact scatters and no archaeological deposit. This means that surface collection and subsequent return of artefacts elsewhere within the area can keep the connection of those artefacts to Jumping Creek.

As discussed, the areas of highest archaeological sensitivity will be converted to green space following rehabilitation and will be incorporated into a Conservation area and will be an area of no Harm. To rehabilitate Jumping Creek and other drainage lines woody weeds must be cleared and surface erosion and vehicle impacts need to be remediated, these activities will constitute limited harm.

As noted in section 5 the area previously recorded Valley (Jumping) Creek & Queanbeyan River Junction Resource Gathering and Camping Cultural Area (Site A) is more accurately described through the distribution of archaeological evidence which generally supports the use of this area as a locus of camping and resource gathering activity. However, the significance assigned by Water (2016) did not take into account the substantial and prolonged attrition of land use disturbance impacts on the site this current report has assessed the areas as having low to moderate significance. Site B: Queanbeyan River Pathway Cultural Area, is a small portion of a much larger traditional pathway and was assessed by Waters as having high cultural significance, although it is presumed that this relates to the traditional pathway in its entirety. Figure 11.3 depicts these areas in relation to the areas of proposed disturbance from the project. Approximately 40% of the identified area of cultural significance of the indicative area indicated as Site A (Waters 2016) will be impacted by the project and less than 5% of Site B will be impacted.

Further consultation has occurred with the RAPs for this project to identify measures that can be adopted that will serve to mitigate the impact to the identified areas of cultural value in the study area. Below are recommendations developed following this consultation that aim to celebrate the ongoing connection of Aboriginal people to Jumping creek, these measures should be incorporated into the detailed design:

- a. The naming of parks and areas of Jumping Creek with local Aboriginal names/words;
- b. The use of native plants and bush food in gardens and landscaping; and
- c. Interpretation signage that informs residents of the past use and ongoing connection of Aboriginal people to Jumping Creek.

Further advice should be sought on the exact nature of the interpretation measures and appropriate native vegetation and words that should be used.

These measures may serve to enhance the cultural connection to the place by enabling the Aboriginal community an opportunity to celebrate the cultural significance of the place and educating the residence on the importance of Jumping Creek to them now and in the past. Much of Jumping Creek will be rehabilitated and more easily accessed following the construction of the development. This will allow for the Aboriginal community to use the area more easily for any cultural practices than is currently available to them. In addition the inclusion of the Conservation area will preserve the subsurface deposit and allow any subsurface artefacts to remain in-situ.

### 11.1.2 Impact on Aboriginal Scientific Heritage Values

The consequences of impact to archaeological sites, in terms of degrading these sites as sources of information about the past, is dependent on both the severity of impact – how badly it disturbs the site, and damages or destroys artefacts – and on the scientific significance of the site in its undisturbed state. This is a simple consequence of the fact that scientific significance refers to the amount of information a site can potentially yield about human activity in the past. Impact to a site of high significance would have more severe consequences than impact to a site of low significance, as degradation of a high significance site represents a greater loss of information.



The results of the surface survey and test excavation program have shown the while some sites can be characterised by the visible sparse distribution of artefacts across the surface, there are areas where there is moderate to high potential for subsurface archaeological deposits to occur. The scientific significance of Jumping Creek has been assessed to be moderate to high at a local level.

Restricted Version



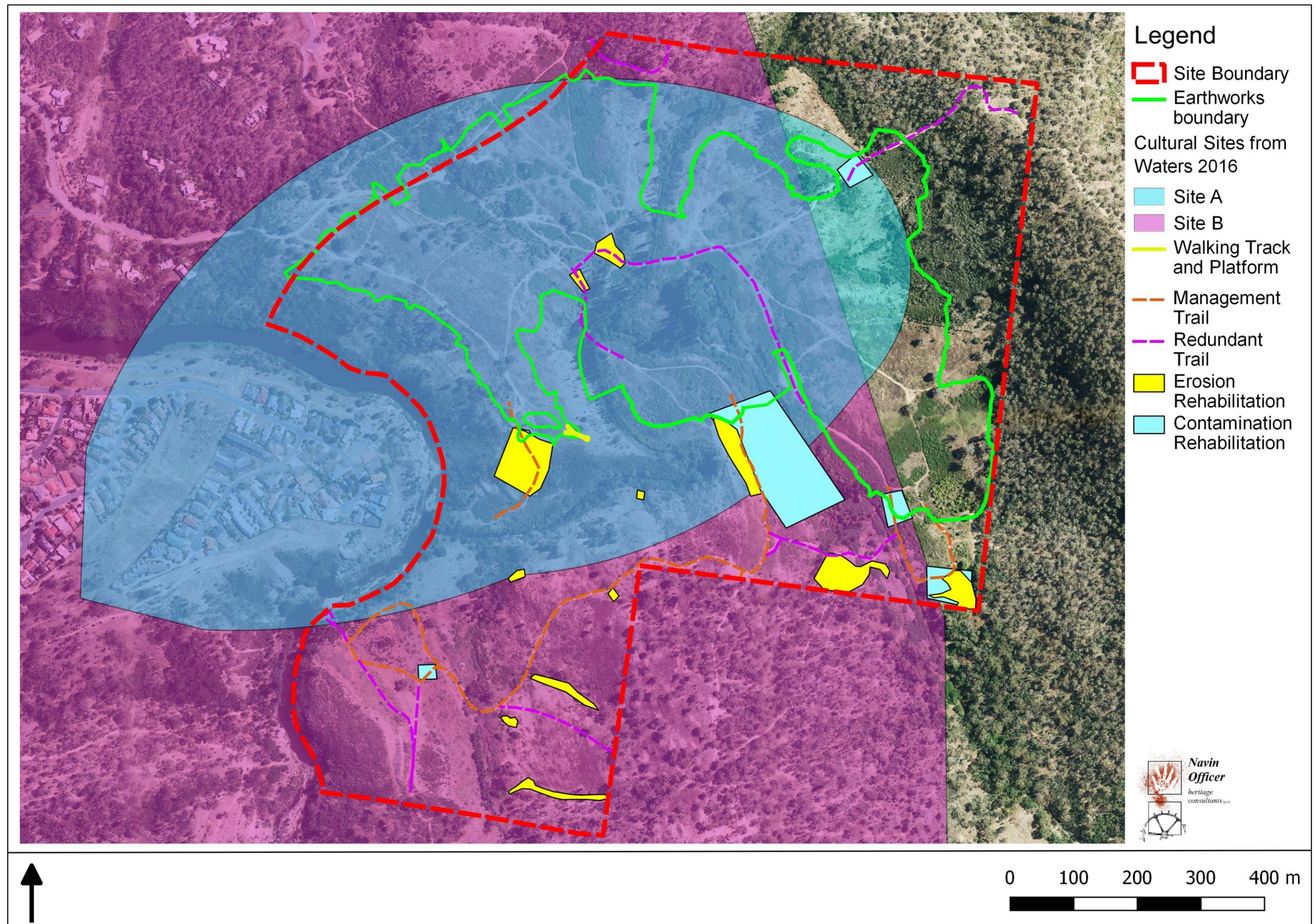


Figure 11.3 Disturbance areas and Areas of Identified Cultural Significance



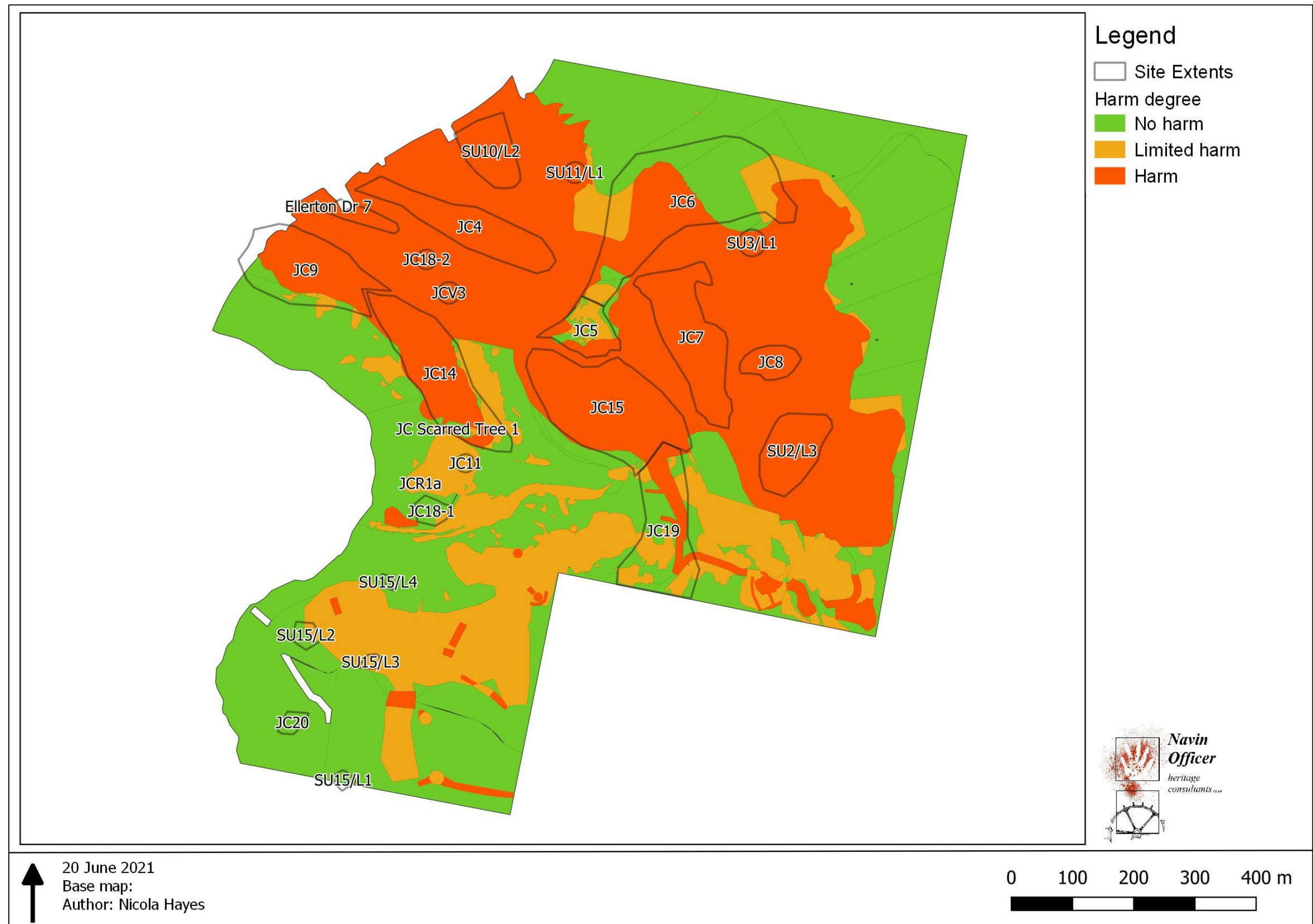


Figure 11.4 Degree of Harm and Recorded Aboriginal sites

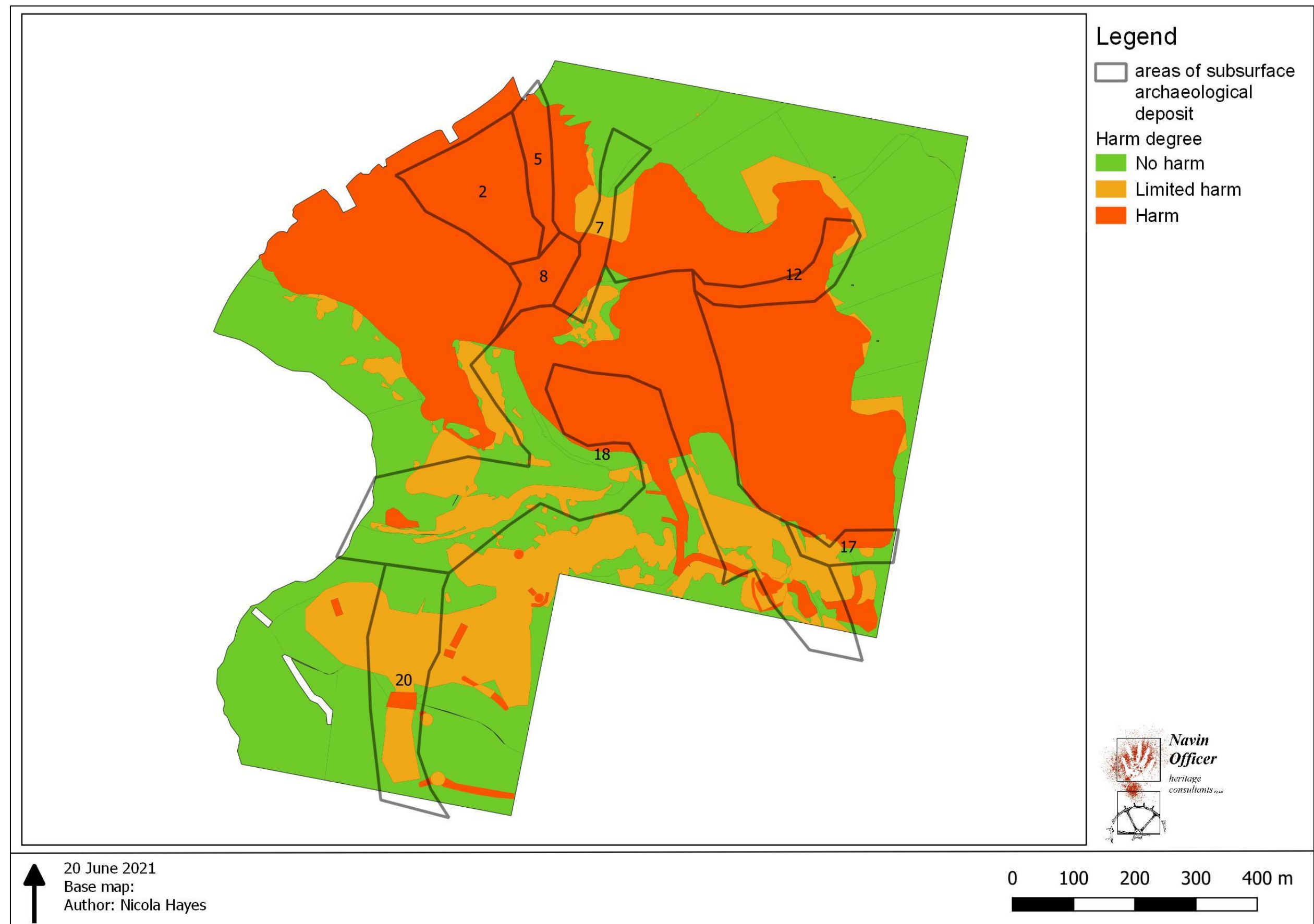


Figure 11.5 Areas of harm and areas of subsurface archaeological deposit



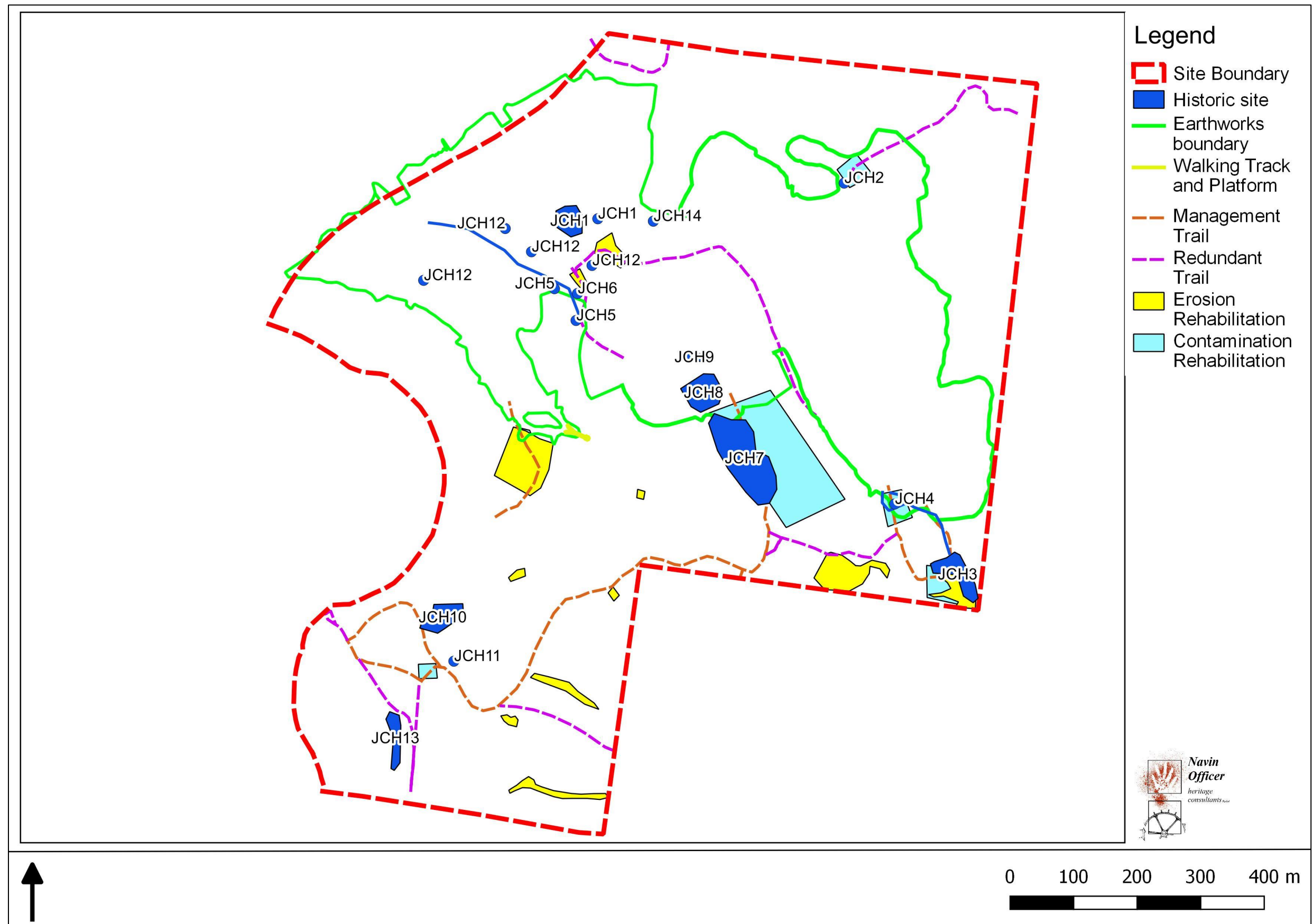
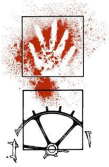


Figure 11.6 All Impacts with European sites



## 11.2 Input by Aboriginal People

Further consultation was undertaken with Wally Bell (BNAC) following the completion of the draft ACHAR in order to address the concerns raised previously. As well as the recommended salvage program and identification of No Harm areas Wally also would like to ensure that even when sites are salvaged that the record of their location and content remains on AHIMS, this would allow for the continuing record of the occupation of the area. All salvaged artefacts should be returned to Jumping Creek and an appropriate area identified for their placement that will not be impacted in the future. Wally was concerned that the proponent should understand the consequence of impacting the No Harm areas and that machinery should keep to defined impact areas such as the tracks. Wally would like the ongoing connection of Aboriginal people to Jumping Creek be celebrated and made known to the public, Wally was positive about the following measures:

- a. The naming of parks and areas of Jumping Creek with local Aboriginal names/words;
- b. The use of native plants and bush food in gardens and landscaping; and
- c. Interpretation signage.

Discussion with the NLALC also indicated that the above measures were acceptable and would like to see signage and suggested a bush tucker walk that could be achieved along the southern management trail. Paul House also agreed with the above measures and would like to see the involvement of the NLALC in the design of the conservation area and interpretation.

Tyrone Bell provided the following additional recommendations for the project, and have been incorporated into the recommendations:

Native plants and bush foods to be planted and landscaped by an Aboriginal local business under Aboriginal procurement due to the significance around the Jumping Creek development.

Aboriginal Cultural Tours to reflect the past and future of Jumping Creek and Aboriginal Cultural Awareness training to be incorporated into the induction process for staff and sub-contractors.

Site fencing should be installed by an appropriately qualified heritage professional and AP's so everyone can agree in the field the location where the fencing needs to go around sites.

All of the above measures have been incorporated into the recommendations for this project.

## 11.3 Description of How Ecological Sustainable Development Principles Have Been Considered

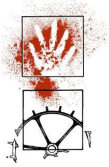
Ecological sustainable principles (ESD) (defined in s.6 of the *Protection of the Environment Administration Act 1991*) requires the integration of *economic* and *environmental* considerations (including cultural heritage) in the decision-making process. In regard to Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity and productivity of the environment for the benefit of future generations.

The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation. In applying the precautionary principle, decisions should be guided by:

- a careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment;
- an assessment of the risk-weighted consequences of various options.

Assessing cumulative impacts involves the consideration of the proposed impact in the context of existing developments and past destruction of heritage sites, as well as the population of heritage sites



that still exist in the region of interest (Godwin 2011). The concept of assessing cumulative impacts means avoiding considering the impact of a development in isolation and aims to assess the impact in terms of the overall past and future degradation of a region's heritage resource.

This report considers ESD principles in relation to intergenerational equity, the precautionary principle and cumulative impacts, as discussed further, below.

### **11.3.1 Intergenerational Equity**

Intergenerational equity is being considered through the avoidance of impact to archaeological sites where possible, and through the salvaging of archaeological sites where impacts cannot be avoided. Measures taken to avoid impact to sites (including planning the location of work to physically avoid sites) ensure that these sites remain in their current condition and are available for future generations.

A conservation area has been included in the project area in areas identified as containing subsurface archaeological deposit and surface artefacts. The inclusion of the conservation area will preserve the archaeological deposit in that area and retain any subsurface artefacts in-situ.

Where impacts are proposed, salvage of the archaeological material through surface collection and excavation would identify, recover, and analyse Aboriginal objects that would potentially be subject to harm. The recording of the location of the sites and objects and for this information to remain on AHIMS and in a salvage report will assist in documenting and archiving the ongoing Aboriginal connection to Jumping Creek. The objects salvaged will be returned to country according to the Return to Country Protocol outlined in Appendix 6 (see A6.3) to ensure that the objects themselves will be available for future generations to potentially access.

Large areas of the project area are not being impacted by the project. A total of 10 of the 25 recorded Aboriginal site locations will be totally harmed by the project, 11 sites will be subject to limited harm and 4 sites will not be impacted at all. The establishment of the conservation area preserves parts of 2 sites. The preservation of these sites into the future will ensure intergenerational equity. Large parts of the project area that have been identified as having archaeological deposit will also be preserved as well as areas of land that are likely to have unrecorded surface and sub-surface artefacts.

To mitigate the impact to the areas of cultural significance measures to celebrate the ongoing connection of Aboriginal people to Jumping Creek should be incorporated into the final design. These measures will assist in reducing the impact to the cultural significance of Jumping Creek. These measures may serve to enhance the cultural connection to the place by enabling the Aboriginal community an opportunity to celebrate the cultural significance of the place and educating the residence on the importance of Jumping Creek to them now and in the past. Much of Jumping Creek will be rehabilitated and more easily accessed following the construction of the development. In addition a Conservation Area has been incorporated that will preserve subsurface archaeological deposits and surface artefact scatters. This will allow for the Aboriginal community to use the area more easily for any cultural practices than is currently available to them.

### **11.3.2 Precautionary Principle**

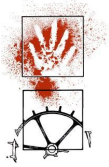
The precautionary principle is relevant to the NSW DPIE consideration of potential impacts to Aboriginal cultural heritage where:

- the proposal involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places; and
- there is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

Where this is the case, a precautionary approach should be taken, and all cost-effective measures implemented to prevent or reduce damage to the objects/place.

The proposal will guard against inadvertent impacts to archaeological sites near the areas of proposed work. This will be done through the administrative control of marking the boundaries of no-go zones





around sites on all maps and plans used by PEET Jumping Creek Pty Ltd and its contractors. In cases where inadvertent impacts are considered to be likely, an additional engineering control of placing physical fences along the boundaries of these no-go zones will also be employed.

The proposal will aim to identify, recover and analyse Aboriginal objects that would potentially be subject to harm through the conduct surface and subsurface salvage program. In addition, PEET Jumping Creek Pty Ltd will implement the protocols for the unanticipated discovery of burials so that if burials are encountered the appropriate steps are taken.

For the remaining areas, including parts of the areas of cultural significance and sites in Jumping Creek that will not be impacted by the project all measures will be implemented to prevent or reduce damage to Aboriginal objects. These areas have been classified as 'No Harm' Areas.

### 11.3.3 Cumulative Impacts

Rather than seeing the archaeological resource within the Jumping Creek project area as individual sites, the area is best described as a disturbed, remnant cultural landscape. The site has been assessed for its scientific significance as moderate to high at a local level as there are few sites in the Queanbeyan area that contain large numbers of surface artefacts and few that also contain subsurface archaeological deposits. However, land use impacts mean that the integrity of many of the sites has been substantially compromised. The Aboriginal community have identified the area as having cultural significance as a travel route and resource gathering area connected to the presence of artefacts in the area. Substantial investigation has occurred in the area including two cultural values assessments and numerous archaeological surveys. This has ensured that there is a clear understanding of the cultural values and scientific values of the study area. There are several other areas of identified cultural value and other areas with similar artefact distribution, but few that display both. This is likely because up until now both values have not been documented for all sites investigation in the region rather than there being a substantial lack of such locations. A region wide cultural values assessment has not been undertaken for the QPRC area nor for the ACT region so a fully informed comparison of this type of site can not be made. That being said, the impact to Jumping Creek will further reduce the number of sites within the Queanbeyan area.

Impact to sites was anticipated during the planning stages of Jumping Creek and wherever possible areas of conservation have been built into the design. A large proportion of the project area will not be impacted by any activities, and activities in other areas are for rehabilitation rather than for residential development. A large area of Jumping Creek corridor is to be rehabilitated, weeds removed, and areas of erosion stabilised. A conservation area has also been included in this area to preserve the archaeological deposit and surface sites. Some of the area is covered in woody weeds which are required to be removed and have substantial impacts from erosion and vehicle use that also require remediation. This will involve ground movement but all of the soil in this area can be retained, therefore any Aboriginal objects can also be retained in the area. These actions will lessen the cumulative impacts caused by the project. The design of the stormwater quality basins was significantly modified as too was the extent of the active recreation area to provide an area of No Harm within the central park area, adjacent the confluence of the two creeks (Jumping Creek and Valley Creek), where it is considered a high number of subsurface artefacts may be present. Further landscape design works will be undertaken with the LALC to incorporate culturally sensitive design.

Current impacts are ongoing and include continued surface erosion, weed coverage and vehicle use. The sites located in Jumping Creek do not have the ability to withstand these impacts. It is likely that the continued erosion, disturbance by weeds and vehicle damage over time will have a similar attrition and disturbance rate to the archaeological resource at Jumping Creek compared to the proposed impacts from the current project.

Approximately 40% of the identified area of cultural significance Site A will be impacted by the project and less than 5% of Site B will be impacted. Measures to celebrate the ongoing connection of Aboriginal people to Jumping creek should be incorporated into the final design. These measures will assist in reducing the impact to the cultural significance of Jumping Creek. These measures may serve to enhance the cultural connection to the place by enabling the Aboriginal community. Regionally there are several significant cultural sites that have been documented and remain. Waters Consultancy (2016) identified two other sites of Medium significance Site C: Queanbeyan River and Hills Resource



Cultural Site and Site D: Queanbeyan River Camping Cultural Site located norther and east of Jumping creek. Some highly significant sites include the Queanbeyan Showground, this site was the site of 'The Last Aboriginal Corroborre' held in the Queanbeyan district and still remains relatively unaltered. In addition, the Mill Post Stone Axe Quarry is located in Wamboin approximately 12 kms northeast of Jumping Creek and is listed as an Aboriginal place (Aboriginal place #2018–2162) under the NSW National Parks and Wildlife Act. This indicates that it is likely that many areas of significance remain in the region.



## 12. RECOMMENDATIONS

All Aboriginal sites within the study area are of cultural significance to the local Aboriginal community. The archaeological evidence demonstrates that the area has been a focus of Aboriginal camping and resource gathering in the past and is consistent with the interpretation of such a place along a traditional pathway. However, the study area has been subject to substantial long-term, post-contact land use disturbance and this has negatively impacted many of the individual sites recorded in the area such that the Aboriginal landscape may best be described as a remnant cultural landscape with pockets of intact archaeological features in a disturbed landscape. Therefore, it is recommended:

1. Measures to celebrate the ongoing connection of Aboriginal people to Jumping Creek should be incorporated into the detailed design. These could include:
  - a. The naming of parks and areas of Jumping Creek with local Aboriginal names/words;
  - b. The use of native plants and bush food in gardens and landscaping;
  - c. Interpretation signage that informs residents of the past use and ongoing connection of Aboriginal people to Jumping Creek;
  - d. Further advice should be sought from the RAPs and appropriately qualified heritage professional on the exact nature of the interpretation measures and appropriate native vegetation and words that should be used.
2. The design of the green space in the conservation area should be undertaken with the local Aboriginal community including the selection of plants and any interpretation.
3. The proponent should consider Aboriginal Cultural Awareness training to be incorporated into the induction process for staff and sub-contractors working on the development of Jumping Creek;
4. The proponent should consider utilising local Aboriginal businesses for completing native plants and bush foods planting and landscaping.
5. Once the site is developed local council should consider allowing for Aboriginal Cultural Tours to be conducted in Jumping Creek in order to further inform the community of the Aboriginal past and future of Jumping Creek.
6. The conservation area should be preserved in perpetuity and a landscape plan should be developed following project approval.
7. All areas mapped as *No Harms* areas are to be avoided by the project. This includes ensuring that contractors do not drive off tracks with heavy machinery. To ensure this they should be fence or clearly demarcated during construction.
8. All topsoil from the project area should remain in the project area, either in the location from where it was excavated or in another part of the site. If topsoil is placed in another part of the project area the location should be recorded and submitted to AHIMS as a possible Aboriginal site containing artefacts (objects).
9. Prior to development impacts, a program of subsurface archaeological salvage should be undertaken for the project in areas subsurface archaeological deposit in areas of Harm see Table 11.1; this program is included in Appendix 6.
10. Prior to development impacts a surface artefact collection program should be conducted at all those Aboriginal sites in the Jumping Creek study area within areas of harm and limited harm, see Table 11.1. Aboriginal Site Impact Recording Forms should be completed for all impacted sites. The collection programme should be carried out in conjunction with the excavation program referred to in 9 above, to ensure optimum salvage of archaeological values.





11. In order to maximise the cultural heritage information from the excavated sites, all salvaged material should be appropriately analysed and catalogued and where appropriate results should inform the interpretative strategies for the site.
12. The current proposal avoids site JC Scarred Tree 1, Detailed design and/or design changes for the project should continue to avoid this site.
13. Site fencing should be installed to protect any sites or parts of sites that are outside the project area. This can be in the form of a project area fence or individual site fencing. Site fencing should be installed by an appropriately qualified heritage professional and RAP's so everyone can agree in the field on the exact location of the fencing necessary to effectively protect the sites.
14. A Return to Country Protocol or long-term management plan should be developed in consultation with the RAPs for any Aboriginal artefacts that are collected/salvaged during mitigation works associated with this project. This should take into consideration the significance and or research value of the material emerging from the analysis.
15. Archival recording of historic sites within the project area should be conducted where these have been assessed as locally significant. Archival recordings should include a detailed survey, mapping and photographic record of, those items that will be impacted. In many cases this will necessitate substantial vegetation clearance prior to and during survey work. Depending upon the results of such investigations there may be the need for additional work in the form of salvage excavation at some or all of the heritage items.
16. Marchiori's lime kiln and quarry (JCH3 and JCH4) should not be impacted by the project. Any erosion remediation works in the vicinity of this site should be designed so as to avoid impact the quarry or lime kiln locations.
17. Consideration should be given to incorporating the appropriate interpretation of the history and heritage of the area into the project design.
18. The unanticipated finds discovery protocol outlined in Appendix 7 should be implemented for this project.



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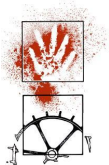


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## **APPENDIX 1**

### **RECORD OF ABORIGINAL CULTURAL HERITAGE CONSULTATION REQUIREMENTS FOR PROPONENTS 2010**

Restricted Version



## Notice in Queanbeyan Age:

### ABORIGINAL HERITAGE ASSESSMENT

Navin Officer Heritage Consultants Pty Ltd has been commissioned by PEET Jumping Creek Limited C/- SPACELAB Studio Pty Ltd to conduct a cultural heritage assessment of the Jumping Creek Estate project.

The investigation is required to assess the potential impact of the proposed development of these lands on Aboriginal cultural heritage values.

As required by the Office of Environment and Heritage's *Aboriginal cultural heritage consultation requirements for proponents 2010*, we invite Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of objects and places in the investigation area, and who have an interest in this project, to register an interest in a process of community consultation.

The purpose of this consultation is to assist the proponent and government authorities in the preparation and assessment of legislative requirements, permits and approvals.

Please forward expressions of interest to:

The Secretary  
Navin Officer Heritage Consultants Pty Ltd  
4/71 Leichhardt Street  
Kingston ACT 2604

The closing date for this registration of interest is, 31<sup>st</sup> July 2018

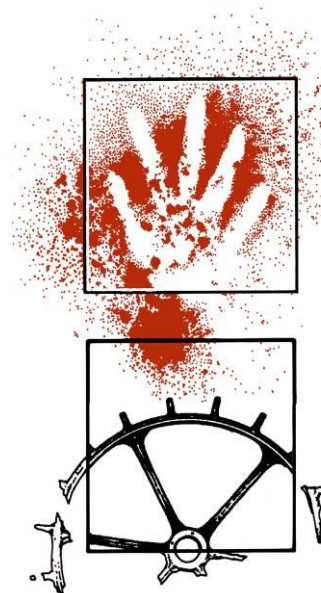




**Stage 1 Letter Example:**

11 July 2018

The Secretary  
Ngambri Local Aboriginal Land Council  
PO Box 150  
Queanbeyan NSW 2620



**Navin  
Officer**

*heritage  
consultants  
pty ltd*

*abn: 28 092 901 605*

Dear Sir/Madam,

**Re: Implementation of the OEH Aboriginal cultural heritage consultation requirements for proponents 2010 for the Jumping Creek Estate project**

Navin Officer Heritage Consultants Pty Ltd has been commissioned by PEET Jumping Creek Limited C/- SPACELAB Studio Pty Ltd to conduct a cultural heritage assessment of the Jumping Creek Estate project (please see attached map).

We are required to implement the Office of Environment and Heritage's *Aboriginal cultural heritage consultation requirements for proponents 2010* for this project.

This requires us to ascertain, from reasonable sources, the names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal objects or places relative to Jumping Creek study area.

I am therefore writing to inform you of this development proposal and associated archaeological assessment program and request that you provide us with the names of Aboriginal people who you know that may hold cultural knowledge relevant to determining the significance of Aboriginal objects or places for the Jumping Creek Estate project.

Please respond in writing within 14 days to:

The Secretary  
Navin Officer Heritage Consultants Pty Ltd  
4/71 Leichhardt Street  
KINGSTON ACT 2604

or by fax to; (02) 6282 9416

Yours faithfully,

*Nicola Hayes*

Nicola Hayes  
Principal Archaeologist



Local Land  
Services  
South East

24th July 2018

Secretary

Navin Officer Heritage Consultants Pty Ltd

4/71 Leichardt Street

Kingston ACT 2604

**Re: Jumping Creek Estate Project**

Thank you for your letter dated 11<sup>th</sup> July 2018 requesting assistance with identifying Aboriginal stakeholder groups or persons who may have an interest in your project area.

Catchment Management Authorities are listed in *Section 4.1.2 (g)* of the *Aboriginal cultural heritage consultation requirements for proponents 2010*, under *Part 6, National Parks and Wildlife Act 1974* as a source of information to obtain the "names of Aboriginal people who may hold cultural knowledge relevant to determining the significance of Aboriginal *objects* and/or *places*". We understand that with the loss of Catchment Management Authorities in NSW such requests are likely to be forwarded to Local Land Services.

South East Local Land Services is a partner with many Aboriginal communities in the region on natural resource management (NRM) projects. We are not, however, the primary source for contacting or managing contact lists for Aboriginal communities or persons that may inform or provide comment on planning issues. Currently we do not coordinate or administer any Aboriginal reference group for our region.

We strongly recommend that you make contact with the Office of Environment and Heritage (OEH), Cultural Heritage Division, Queanbeyan for all-inclusive contact lists of persons and organisations that may assist with your investigation.

Yours sincerely,

Noel Webster

Aboriginal Community Support Officer

South East Local Land Services  
PO Box 3095  
Wollongong NSW 2500  
Tel: 02 42249700 | Fax: 02 42249669 | [www.lls.nsw.gov.au](http://www.lls.nsw.gov.au)



**Office of  
Environment  
& Heritage**

Your reference: Jumping Creek Estate Project,  
Queanbeyan  
Our reference: DOC18/490139  
Contact: Kym McNamara 6229 7028

The Secretary  
Navin Officer Heritage Consultants Pty Ltd  
4/71 Leichhardt Street  
KINGSTON ACT 2604  
via email: [nhayes@nohc.com.au](mailto:nhayes@nohc.com.au)

The Secretary,

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

**RE: Jumping Creek Estate Project, Queanbeyan, NSW**

I refer to your emailed letter received by the Office of Environment and Heritage (OEH) on 6 July 2018 regarding the above matter.

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

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

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

If you wish to discuss any of the above matters further please feel free to contact Kym McNamara on 6229 7028.

Yours sincerely

  
**Jackie Taylor**  
**Team Leader, Aboriginal Heritage - South East**  
**Regional Operations Division**

PO Box 733 Queanbeyan NSW 2620  
11 Farrer Place Queanbeyan NSW  
Tel: (02) 6229 7188 Fax: (02) 6229 7001  
ABN 30 841 387 271  
[www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)





Your Ref: Jumping Creek Subdivision  
Our Ref: SF140635  
C1893461

16 July 2018

The Secretary  
Navin Officer Heritage Consultants Pty Ltd  
4/71 Leichhardt Street  
KINGSTON ACT 2604

Attention: Nicola Hayes

**Implementation of the OEH Aboriginal cultural heritage consultation  
requirements for proponents 2010 for the Jumping Creek Estate project**

Council refers to your letter dated 11 July 2018 regarding the above request. You are advised to contact the Ngambri Local Aboriginal Land Council and the United Ngunnawal Elders Council.

**Ngambri Local Aboriginal Land Council**

CEO – Patricia Williams  
PO Box 150, Queanbeyan  
ceo@ngambri.com.au  
Ph: 6297 4152

**United Ngunnawal Elders Council (UNEC)**

Secretariat and administrative support for UNEC is provided by the ACT Office for Aboriginal and Torres Strait Islander Affairs. Please contact the secretariat on (02) 6207 9784 or by e-mail at [oatsia@act.gov.au](mailto:oatsia@act.gov.au) for further details.

Correspondence for UNEC should be addressed as follows:

Co-Chairs  
United Ngunnawal Elders Council  
C/- Office for Aboriginal & Torres Strait Islander Affairs  
GPO Box 158  
Canberra ACT 2600

Yours sincerely

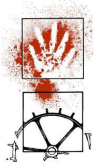
**Arthean McBride**  
Senior Strategic Planner  
Queanbeyan-Palerang Regional Council

**OFFICES**  
144 Wallace St, Braidwood  
10 Majara St, Bungendore  
256 Crawford St, Queanbeyan

**POSTAL**  
PO Box 348, Bungendore NSW 2621  
PO Box 90, Queanbeyan NSW 2620

**PHONE/FAX**  
Bungendore/Braidwood  
P: 02 6238 8111  
Queanbeyan  
P: 02 6285 6000 F: 02 6285 6666

**EMAIL/WEB**  
W: [www.qprc.nsw.gov.au](http://www.qprc.nsw.gov.au)  
E: [council@qprc.nsw.gov.au](mailto:council@qprc.nsw.gov.au)  
ABN 95 933 070 982

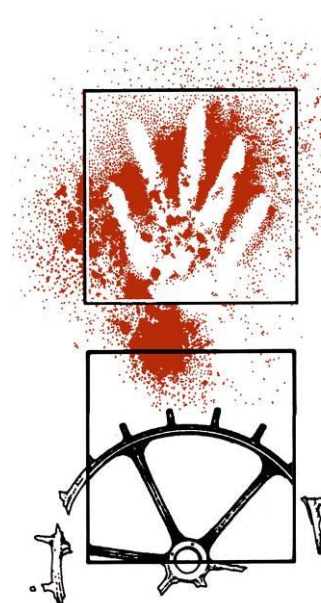


**Example letter to OEH groups:**

24 July 2018

Ms Trisha Williams  
A/g CEO  
Ngambri Local Aboriginal Land Council  
PO Box 150,  
QUEANBEYAN NSW 2620

[ceo@ngambri.com.au](mailto:ceo@ngambri.com.au)



**Navin  
Officer**

*heritage  
consultants  
pty ltd*

*abn: 28 092 901 605*

Dear Trisha,

**Re: Implementation of the OEH Aboriginal cultural heritage consultation requirements for proponents 2010 for the Jumping Creek Estate project**

Navin Officer Heritage Consultants Pty Ltd has been commissioned by PEET Jumping Creek Limited C/- SPACELAB Studio Pty Ltd to conduct a cultural heritage assessment of the Jumping Creek Estate project.

Name and contact details of the proponent:

PEET Jumping Creek Limited  
C/- SPACELAB Studio Pty Ltd  
**Mr Geoff Bunnett**  
Phone: 02 6262 6363  
5/97 Northbourne Avenue Turner ACT 2612

The project is known as the Jumping Creek Estate. Jumping Creek Estate is a residential subdivision located north-east of Queanbeyan, NSW (please see attached map). The Jumping Creek Estate project may be the subject of an application for an Aboriginal heritage impact permit, therefore we are implementing the NSW Office of Environment and Heritage *Aboriginal cultural heritage consultation requirements for proponents 2010*.

The purpose of the community consultation with relevant Aboriginal people is to assist PEET Jumping Creek Limited in the preparation of an application for an Aboriginal heritage impact permit and to assist the Director-General in their consideration and determination of the application.

I am therefore writing to inform you of this development proposal and invite registration as an interested group.

Please respond in writing within 14 days to:

The Secretary  
Navin Officer Heritage Consultants Pty Ltd  
4/71 Leichhardt Street  
KINGSTON ACT 2604

or by fax to: (02) 6282 9416

or by email [to: navinofficer@nohc.com.au](mailto:navinofficer@nohc.com.au)



Please note it is a requirement of the *Aboriginal cultural heritage consultation requirements for proponents 2010* that we provide your name to the NSW Office of Environment and Heritage and to the Local Aboriginal Land council unless you specify otherwise.

Yours faithfully,

*Nicola Hayes*

Nicola Hayes  
Principal Archaeologist

Restricted Version





# Methodology for Aboriginal Cultural Heritage Assessment

## Jumping Creek Estate

Navin Officer Heritage Consultants

August 18

### i. 1. THE PURPOSE OF THIS DOCUMENT

The purpose of this document is to:

- provide to registered Aboriginal parties (RAPs), information about the proposed project;
- provide for review and comment, a proposed methodology for the preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Jumping Creek Estate project; and
- provide an opportunity whereby registered Aboriginal parties can contribute culturally appropriate information that will enable the cultural significance of Aboriginal objects and/or places in the proposed project area to be determined.

This document is provided to registered Aboriginal parties (RAPs), for review and comment.

The methodology outlined below has been developed in accordance with the *NSW OEH Code of Practice for Aboriginal cultural heritage consultation requirements for proponents 2010*.

In accordance with the NSW OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* Registered Aboriginal parties are invited to provide comments and suggestions back to Navin Officer Heritage Consultants (NOHC) by **5<sup>th</sup> September 2018**.

NOHC contact information is as follows:

The Secretary  
Navin Officer Heritage Consultants Pty Ltd  
4/71 Leichhardt Street  
Kingston ACT 2604

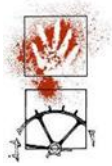
email: [navinofficer@nohc.com.au](mailto:navinofficer@nohc.com.au)

phone: 02 62829415

fax: 02 62829416

Proponent contact:

PEET Jumping Creek Limited  
C/- SPACELAB Studio Pty Ltd  
**Mr. Geoff Bunnett**  
Phone: 02 6262 6363  
5/97 Northbourne Avenue Turner ACT 2



## ii. 2. The Study Area

Jumping Creek Estate is a proposed residential subdivision located north-east of Queanbeyan, NSW (Fig. 1), approximately 3km south-east of the Queanbeyan CBD, and bounded by the Queanbeyan River on the southern side of the site. The Jumping Creek Estate Area consists of approximately 96.43 hectares of land. The area sits within an enclosed valley, with the creek flowing in a north westerly direction through basal slopes, some alluvial flats are also present in the landsc.

## iii. 3. Project Description

Jumping Creek is a new residential development on the eastern side of the new Ellerton Drive Extension in Queanbeyan. The proposed residential development, will be in accordance with Queanbeyan Palerang Regional Council's Planning Proposal for the site. The subject area has been divided between three proposed zones, environmental conservation, environmental living, and public recreation. The current DP number is 1199045. Access to Jumping Creek will be from two proposed new access points off the Ellerton Drive extension.

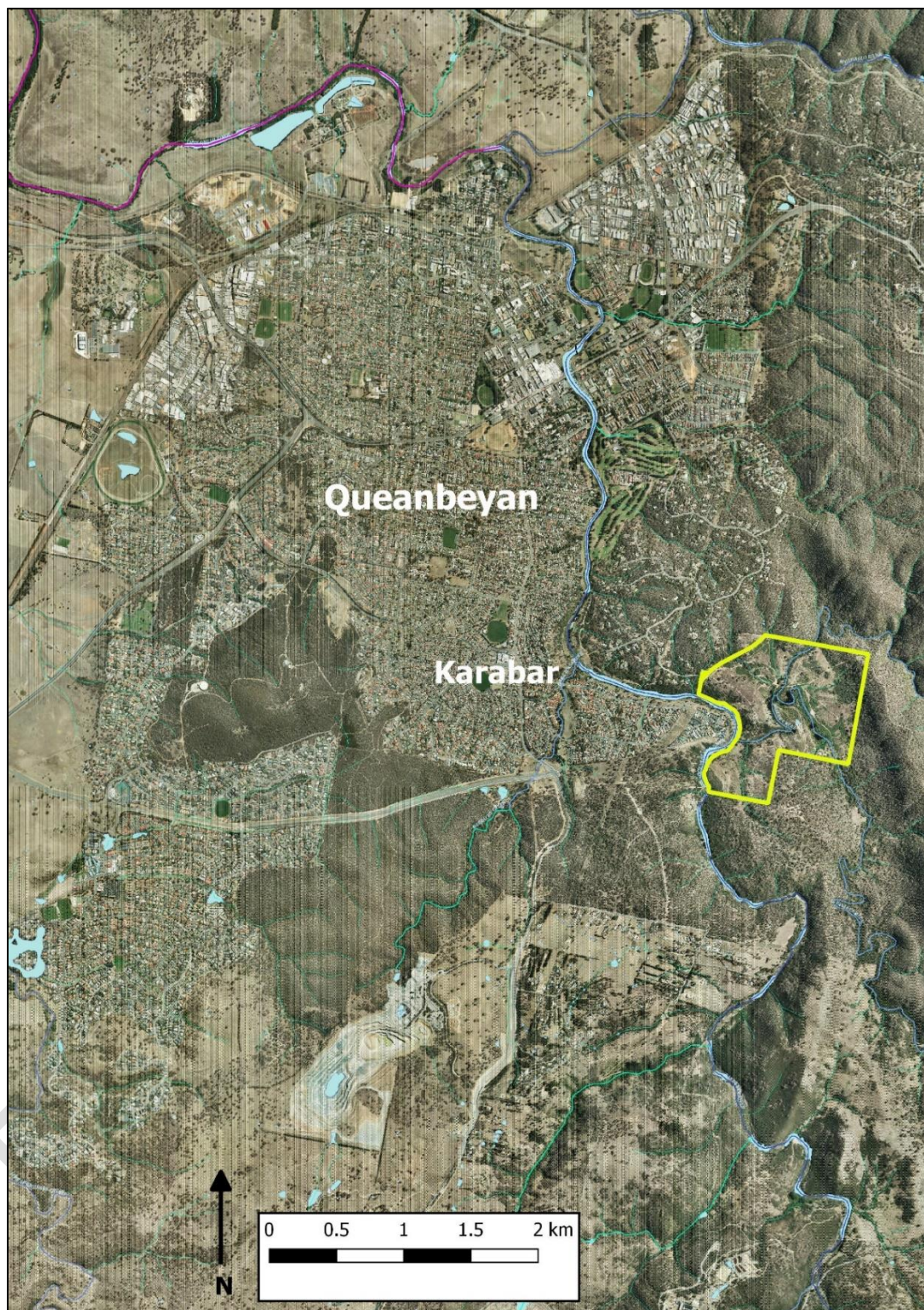
The site has a number of existing features including:

- . Sloping lands heavily degraded by previous farming/industry uses;
- . Former infrastructure associated with previous industry uses (mine sites);
- . Remnant woodland vegetation communities to the boundaries of the site; and
- . A currently weed infested and eroded creek (Jumping Creek) traversing the site and connecting into Queanbeyan River.

Forty Aboriginal heritage recordings may be impacted by the development:

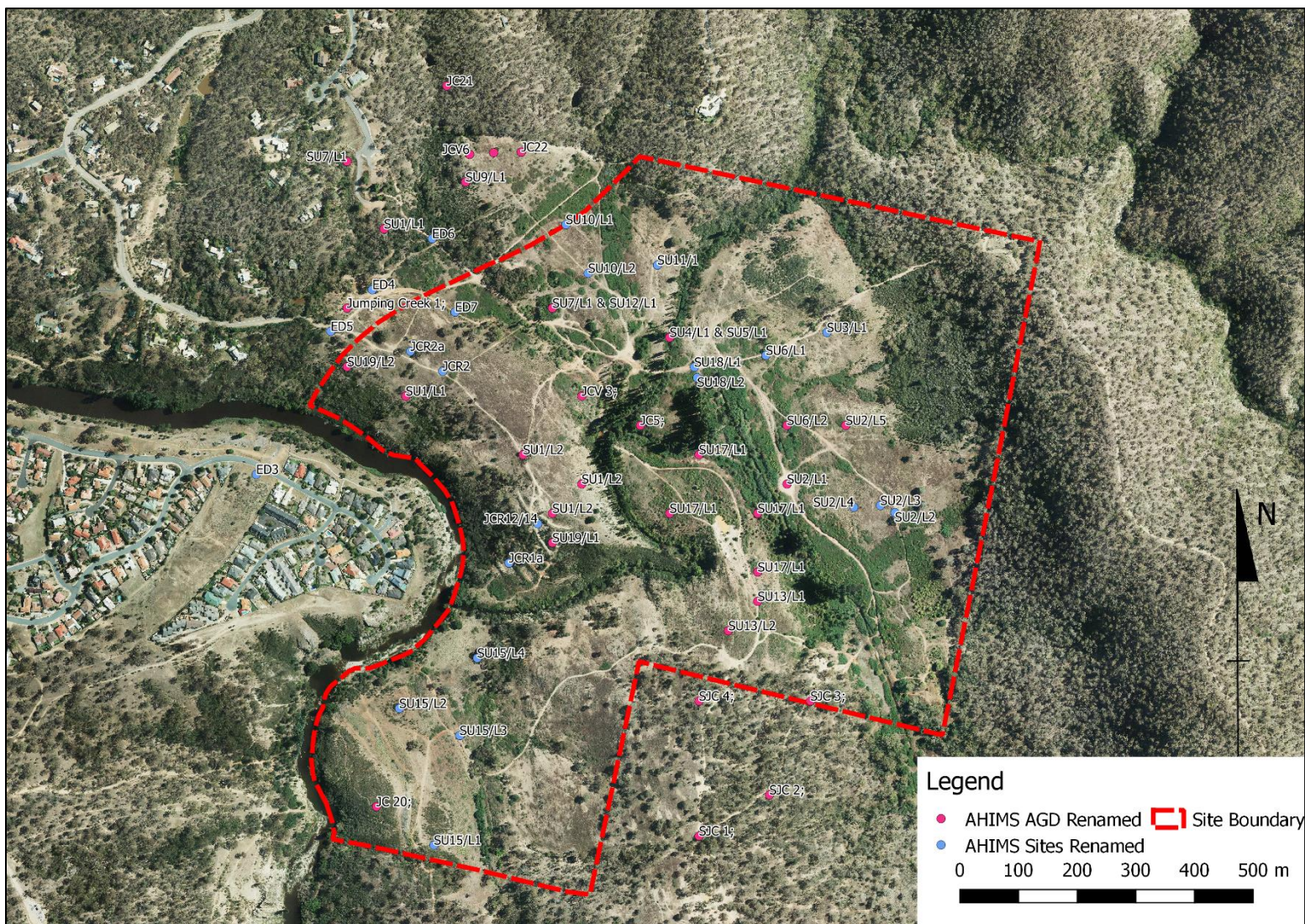
SU1/L1	SU3/L1	SU9/L1	SU15/L1	SU18/L2	JCR2
SU1/L2	SU4/L1	SU10/L1	SU15/L2	SU19/L1	JCR12/14
SU2/L1	SU5/L1	SU10/L2	SU15/L3	SU19/L2	JCR1
SU2/L2	SU6/L1	SU11/L1	SU15/L4	JC5	SJC3
SU2/L3	SU6/L2	SU12/L1	SU16	JC20	ED7
SU2/L4	SU7/L1	SU13/L1	SU17/L1	JCV3	
SU2/L5	SU8	SU14	SU18/L1	JCR2a	





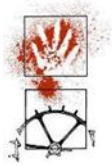
**Figure 1 Location of Jumping Creek Project Area**  
(Aerial Image)





**Figure 2 Location of Previously Recorded Ss.**





#### IV. 4. Cultural Heritage Assessment

There have been a number of archaeological surveys conducted in the Jumping Creek Estate area over the last 40 years. The Jumping Creek area was first surveyed by Boot and Heffernan (1989), and then later that year by Kuskie (1989). Boot and Heffernan recorded 20 new sites, JC 1-20, during a survey for the initial rezoning of the Jumping Creek estate. Kuskie surveyed the area as part of investigations for an undergrad thesis, he recorded 4 new site locations and refound 18 of the 20 sites recorded by Boot and Heffernan. He also introduced a new naming system for the sites, JCV1 – JCV20 respectively. The site was revisited by NOHC in 2004, and a survey was undertaken for a rezoning proposal, two new sites and a potential archaeological deposit, JC21, JC22, and JCPAD1, were located as a result of this. Saunders reassessed the significance of the Jumping Creek Estate site as part of a desktop assessment in 2007, finding it to be of low to medium significance, as the site types and densities are not unique to the region, as was originally suggested by Boot and Heffernan in 1989.

In 2009, NSW Archaeology Pty Ltd conducted a heritage assessment for the *Proposed Jumping Creek Rezoning*. The study included indigenous and non-indigenous heritage. The 2009 report tabulated all previous Aboriginal site recordings, subsumed most of them into new sites and renamed them. This resulted in twenty-nine Aboriginal sites being identified within the Jumping Creek Rezoning Area.

The 29 Aboriginal sites previously identified in the study area by NSW Archaeology Pty Ltd in 2009 were all stone artefact scatters. None of the Aboriginal sites recorded in the 2009 study were assessed as having a high potential for subsurface artefacts to be present, apart from one small area SU9/L1. Two other sites have been identified outside of the proposed development zone, SU16 and SU18/L2, and are predicted to have subsurface potential of moderate local scientific significance. The 2009 report recommended that if impacts were proposed at these two locations that salvage excavation be undertaken. The remainder of the rezoning study area was assessed as having low to negligible potential to contain subsurface archaeological deposit given the skeletal nature of the soils, erosion to bedrock and high levels of prior disturbance.

Since 2009 a number of sites have been added to the AHIMS registrar within the site boundary, including JCR1, JCR2a, JCR2, JCR12/14, SJC3 AND ED7. JCR1, JCR2, JCR12/14 were recorded by NOHC in 2009, salvaged in 2010, and were subsequently relocated and reburied at site No# 57-2-683 (JCR2a) under AHIP No# 3252. ED7 is an isolated find and was recorded by an OEH staff member in 20



## v. 5. Previously Recorded Sites and PADs

Site No#	AHIMS Site ID	Easting	Northing	Previous recordings	Recorded Artefacts	Condition	Subsurface Potential
SU1 /L1	57-2-0074 57-2-0087	704442	6083293	JC9 JCV4 JCV5	101	Highly disturbed	No, skeletal soil eroded to bedrock
SU1 /L2	57-2-0077 57-2-0078 57-2-0079	704614	6083124	JC12 JC13 JC14 JCV1 JCV2	7	Highly disturbed	No, skeletal soil eroded to bedrock
SU2 /L1	57-2-0079	705183	6082958	Possibly JCV14	12	Highly disturbed	No, skeletal soil eroded to bedrock
SU2 /L2	57-2-0610	705247	6083037	Nil	6	Highly disturbed	No, skeletal soil eroded to bedrock
SU2 /L3	57-2-0611	705222	6083049	Nil	4	Highly disturbed	No, skeletal soil eroded to bedrock
SU2 /L4	57-2-0612	705177	6083046	Nil	2	Highly disturbed	No, skeletal soil eroded to bedrock
SU2 /L5	57-2-0073	705149	6083149	JC8 JCV13	8	Highly disturbed	No, skeletal soil eroded to bedrock
SU3 /L1	57-2-0613	705131	6083344	Nil	2	Highly disturbed	No, landform not sensitive
SU4 /L1	57-2-0071	705154	6083423	JC6 JCV9	23	Highly disturbed	No, skeletal soil eroded to bedrock
SU5 /L1	57-2-0071	704961	6083373	JC6 JCV10 JCV11	89	Highly disturbed	No, skeletal soil eroded to bedrock
SU6 /L1	57-2-0614	705027	6083305	Nil	4	Highly disturbed	Yes, high disturbance
SU6 /L2	57-2-0072	705029	6083225	JC7 JCV12	8	Highly disturbed	Yes, high disturbance
SU7 /L1	57-2-0068 57-2-0069	704597	6083396	JC3 JC4 JCV7 JCV8	188	Highly disturbed	No, skeletal soil eroded to bedrock
SU9 /L1	57-2-0066	704424	6083408	JC1	5	Highly disturbed	No
SU10 /L1	57-2-0615	704686	6083528	Nil	5	Highly disturbed	No, skeletal soil eroded to bedrock
SU10 /L2	57-2-0616	704724	6083445	Nil	2	Highly disturbed	No, skeletal soil eroded to bedrock





Site No#	AHIMS Site ID	Easting	Northing	Previous recordings	Recorded Artefacts	Condition	Subsurface Potential
SU11 /L1	57-2-0617	704842	6083459	Nil	7	Highly disturbed	No, skeletal soil eroded to bedrock
SU12 /L1	57-2-0069	704790	6083311	JC4 JCV8	30	Highly disturbed	No, high disturbance
SU13 /L1	57-2-0089	705028	6082808	JCV15	1	Highly disturbed	No, skeletal soil eroded to bedrock
SU13 /L2	57-2-0084	704960	6082792	JC19 JCV16	10	Highly disturbed	No, skeletal soil eroded to bedrock
SU15 /L1	57-2-0618	704461	6082470	Nil	1	Moderately disturbed	No, skeletal soil eroded to bedrock
SU15 /L2	57-2-0619	704402	6082703	Nil	1	Low	No, skeletal soil eroded to bedrock
SU15 /L3	57-2-0620	704505	6082657	Nil	1	Low	No, skeletal soil eroded to bedrock
SU15 /L4	57-2-0621	704535	6082789	Nil	4	Low/ moderate	Yes, Small toe slope
SU17 /L1	57-2-0089 57-2-0081 57-2-0082 57-2-0083	704911	6083072	JC15 JC16 JC17 JC18 JCV17 JCV18 JCV19 JCV20	82	Moderate	Yes, however high disturbance and shallow soil
SU18 /L1	57-2-0622	704905	6083286	Nil	3	Low/ moderate	No
SU18 /L2	57-2-0623	704910	6083267	Nil	2	Moderate	Yes
SU19 /L1	57-2-0076	704604	6082935	JC11 JCV1	2	Very low	No, skeletal soil eroded to bedrock. High erosion
SU19 /L2	57-2-0075	704338	6083269	JC10	2	Very low	No
JC5	57-2-0070	704700	6083000	Nil			
JC20	57-2-0085	704250	6082350	Nil			
JCV3	57-2-0086	704600	6083050	Nil			
JCR2a	57-2-0683	704421	6083312	Nil	130	n/a	Return to country location
JCR2	57-2-0635	704476	6083278	Nil	10	Highly disturbed	No, skeletal soil eroded to bedrock
JCR12/14	57-2-0682	704638	6083018	JC 12 JC14	24	Disturbed	No, skeletal soil, shallow profile
JCR1	57-2-0634	704589	6082951	Nil	15	Highly disturbed	Moderate, however all deposits are likely to be highly disturbed
SJC3	57-2-0097	704990	6082530	Nil			
ED7	57-2-0945	704497	6083379	Nil	1	Not recorded	Not record



## **vi. 6. Methodology**

Based on the recommendations provided in the 2009 Rezoning Report, and the time elapsed since the assessment, NOHC anticipates the following Aboriginal cultural heritage works will be required.

Where development impact is anticipated an Aboriginal archaeological survey of areas will be conducted. An archaeological technical paper will be prepared in accordance with the Code and an Aboriginal Cultural Heritage Assessment Report (ACHAR) in accordance with the OEH *Guide to investigation, assessing and report on Aboriginal cultural heritage in NSW*.

Additionally, the 2009 report recommended salvage excavation in Units 9/L1, 16 and 18/L2 if these areas were going to be impacted. Unit 9/L1 has been subject to salvage as part of the Ellerton Drive Extension project and as such, the site has been destroyed. As part of the archaeological survey all of the sites will be reassessed, including SU18/L2, in light of the current knowledge and the level of testing required within the project area will be determined.

QPRC/NSW Planning may also require that separate testing occurs prior to development.

### **Field Equipment:**

The field team will carry the required field recording equipment: such as compass, GPS, site forms, maps, camera and notebook; and required safety equipment such as first aid kits, mobile phones and two way radios.

### **Field Assessment of the recorded sites Will Inve:**

#### *vii. 1. Site recording*

- GPS positions will be logged for the site including each individual artefact location.
- One or more digital photographs will be taken and logged, showing the general context of the s.

#### *viii. 2. Field Consultation with Representative Aboriginal Parties (RAPs)*

RAPs will be invited to participate in the field survey according to the protocol defined below. Aboriginal field participants will be invited to communicate any knowledge that they may have regarding the cultural heritage values of the study area, archaeological and cultural sites, and the overall landscape.

The project team will conduct the cultural assessment program in a culturally sensitive manner and treat the information provided with respect (and in confidence, where requested and required).

The results of the investigation will be documented in a report, consistent with Office of Environment and Heritage NSW OEH: *Code of Practice for Aboriginal cultural heritage consultation requirements for proponents 2010* and *Guide to Investigating, Assessing and reporting on Aboriginal Cultural heritage in NSW*. Management recommendations and information surrounding cultural significance, based on the input received from the Registered Aboriginal Parties (RAPs), will be incorporated into the ACHAR.

## **7. Registered Aboriginal Party Participation in Field Work**

The proponent is committed to providing an opportunity to the representatives of registered Aboriginal parties to participate in the conduct of the field program.

## **8. Cultural Input from Registered Stakeholders**

In order to assess the possible impacts of this proposed development, it is important to assess any potential effects on Aboriginal cultural values. Only Aboriginal people can assess the



impacts to Aboriginal cultural values, therefore you (or your organisation or group) are asked to identify whether there are any Aboriginal objects of places of cultural value to Aboriginal people in the area of the project. We also seek your views of the potential management options for any sites/objects that may be found in the project area during the investigation.

To do this, you (or your organisation or group) are invited to provide a written submission on its views. Your report will be provided to government authorities responsible for making decisions about the development proposal.

Your report will be most effective if it is provided on the letterhead of your organisation and signed by an executive office holder.

Your report will be included in the cultural heritage assessment report. The draft cultural heritage assessment report will be provided to registered stakeholders for comment. Comments and the assessment of potential development impacts on cultural sensitivity conducted by the participants will then be incorporated into the survey report where appropriate.

## **9. References**

Boot, P. and K. Heffernan 1989 *Jumping Creek. Local Environmental Study. Preliminary Archaeological Survey*. Report to Kinhill Engineers Pty Ltd.

Kuskie, P. J. 1989 *Changing Land Use Patterns from Prehistoric to Modern Times at Jumping Creek Valley, Queanbeyan, New South Wales*. Unpublished B.A. Hons Thesis, Australian National University, Canberra.

Navin Officer Heritage Consultants (NOHC) 2004 *Jumping Creek Queanbeyan NSW, Archaeological Survey*. Report to Greater Queanbeyan City Council.

NSW Archaeology Pty Ltd 2009 *Proposed Jumping Creek Rezoning, Queanbeyan, NSW, Aboriginal Archaeological Assessment*. A Report to Canberra Investment Corporation.

Saunders, P. 2007 *Jumping Creek Estate, Cultural Heritage Assessment, Desktop Study*. Report to Parsons Brinckerhoff Pty Ltd.





## Field Survey - Methodology Responses:

**From:** Muragadi <muragadi@yahoo.com.au>  
**Sent:** Monday, 20 August 2018 3:49 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Jumping creek estate project methodology

Dear Nicola,

I have read the methodology for the Jumping creek estate project and endorse the recommendations made by Navin Officer Heritage.

Kind regards

Jesse

**From:** Shaun Carroll <Merrigarn@hotmail.com>  
**Sent:** Monday, 20 August 2018 3:50 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Jumping creek estate project.

Hi Nicola,

I have read and agree with the project information and methodology for the above project, I look forward to hearing from you.

Kind regards

Shaun



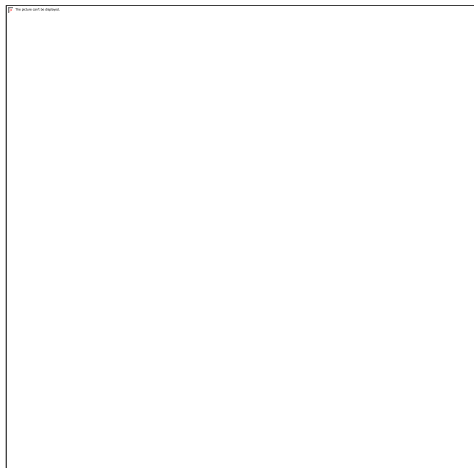
**From:** Ryan Johnson <murrabidgeemullangari@yahoo.com.au>  
**Sent:** Monday, 20 August 2018 3:47 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Jumping Creek Estate Project methodology

Hi Nicola,

I have read the project information and methodology for the above project and endorse the recommendations made by Navin Officer Heritage.

Kind regards

Ryan Johnson | **Murra Bidgee Mullangari**



Aboriginal Corporation Cultural Heritage

**A:** PO Box 246, Seven Hills, NSW, 2147

**E:** [murrabidgeemullangari@yahoo.com.au](mailto:murrabidgeemullangari@yahoo.com.au)

**ICN:** 8112



**From:** Wally Bell <walbell@bigpond.net.au>  
**Sent:** Sunday, 2 September 2018 1:51 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Cc:** Kazdenny@hotmail.com.au  
**Subject:** RE: Jumping Creek OEH Consultation

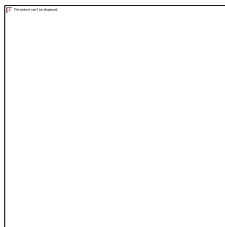
Hi Nicola,

Thanks for the provision of the proposed methodology for this project. As you are undoubtedly aware BNACC has participated in prior Aboriginal cultural assessments for this area. It is with this knowledge that BNACC does have a concern about the impacts of the proposed project on the Aboriginal Cultural significance of this area. BNACC would like to state that the proposed methodology is the normal practice but given the large number of site impacts would like to undertake a consultation process in the overall planning practice to try and preserve some of those sites, *i.e. landscape architecture*, instead of the usual salvage and destroy.

In essence BNACC is in agreement with the methodology but would like to seek an alternative approach for a better outcome for our quite significant cultural presence in this area.

Regards,

**Wally Bell**



**Traditional Custodian Group**

**PO Box 255 Kippax ACT 2615**

**Mb: 0419 425347**

[www.buru-ngunawal.com](http://www.buru-ngunawal.com)





## **1. Test Excavation**

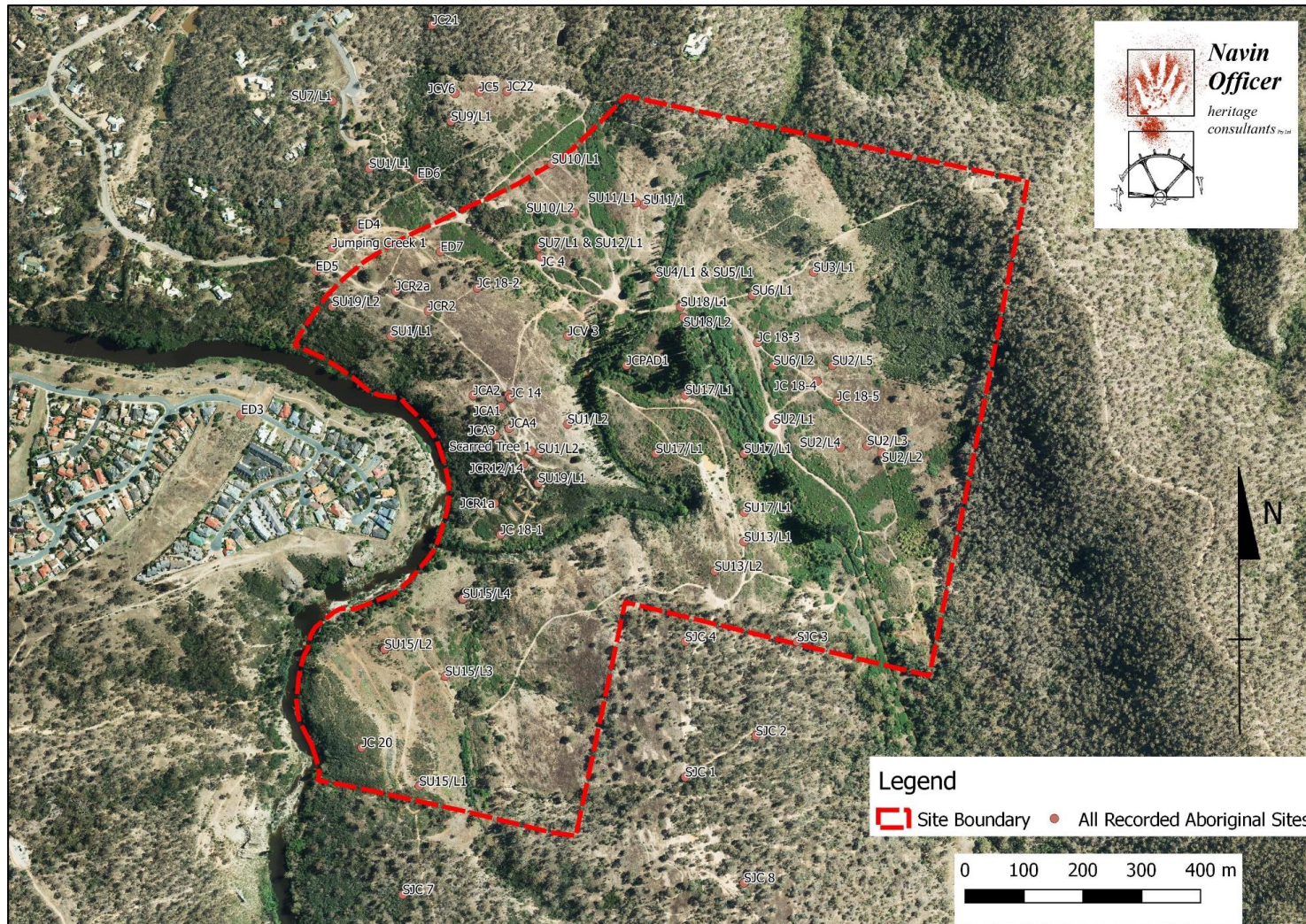
### **1.1 Background**

A total of 59 Aboriginal recordings are listed on the OEH AHIMS around the Jumping Creek study area. NSW Archaeology undertook an archaeological assessment for the proposed rezoning of Jumping Creek in 2009. A total of 29 Aboriginal object locales were recorded during that survey. Artefact locales were often found to cover reasonably large areas, due at least in part, to generally high levels of exposure and archaeological visibility.

The 2018 field visit recorded six new Aboriginal site locations, including five artefact locations and one scarred tree. Surface visibility in the area was high and large numbers of artefacts were noted in locales previously recorded.

It was recommended that a landscape based archaeological subsurface testing program should be developed in consultation with the RAPs, and conducted, prior to development impacts. Testing should be undertaken across all landforms within the project area that will be directly impacted. The aim: to ascertain the presence and archaeological significance of associated deposits.

- ix. If the archaeological deposits are identified and assessed to be of low scientific significance (at either a local or state level), no further archaeological works will be necessary prior to the granting of an AHIP and approval for development-related impacts.
- x. If the archaeological deposits are assessed to be of moderate to high significance (at either a local or state level), then a program of archaeological salvage will be required in order to retrieve the requisite amount of information from the site prior to approval for development related impacts.



**Figure 2 All Recorded Aboriginal Site locations in relation to Jumping k**





## **xi. 1.2 Methodology for Archaeological Test Excavation Program**

### **Study Aims**

A landscape based archaeological subsurface testing program will be undertaken in consultation with the RAPs, and conducted, prior to development impacts. The aim is to ascertain the presence and archaeological significance of any deposits within the landforms represented within Jumping Creek. Testing will include all landforms within the project area. Testing is confined to areas of developable land as it is most likely that these areas will be directly impacted by the project. The information gained through the test excavation program can then be applied across any area within Jumping Creek that is to be impacted by the project.

### **Test Excavation Locations**

This program is will archaeologically test seven areas to determine the nature and extent of any subsurface archaeological deposit across all of the landforms represented within Jumping Creek (Figure 3). Each landform type in the project area will be tested. One test location is located within each landform. The landform types identified area:

- Spur line crest (high) (Test Location 1)
- Spur line crest (low) (Test Location 2)
- Saddle (Test Location 3)
- Saddle/drainage line (Test Location 4)
- Flats (Test Location 5)
- Hill slopes (Test Location 6)
- Jumping Creek (Test Location 7)

### **Test Excavation Methodology**

The test excavation will be undertaken in phases of testing (see Figure 4).

#### **Phase 1:**

Test pits will be placed on two cross transects across the site at 10 metre intervals.

Approximately 10 test pits will be completed at each location.

#### **Phase 2 (optional – results dependant):**

In the event that no artefacts are identified during the first phase of testing, additional pits will be placed at intermediary 5 metre intervals along the transects.

This comprises approximately 7 test pits.

#### **Phase 3:**

Additional test pits will be placed on parallel off-set transects at 10 metre intervals to test the broader site/landform location.

This comprises approximately 4 test pits.

#### **Phase 4:**

If artefacts were found during any of these phases then additional pits will be excavated around excavation points with one or more of the following characteristics:

- Diverse range of artefacts/materials;
- Evidence of in situ knapping;
- Low levels of disturbance;
- Stratified deposits;





- Other features indicative of substantial archaeological deposits.

Up to 12 50x50cm Code of Practice pits will be combined in any one test location to explore the distribution artefacts across the site – e.g. excavation will attempt to follow higher artefact numbers.

Testing at each area may follow a combination of all of the above phases, or it may only comprise Phases 1, 3 and 4. Additionally, if artefact numbers appear to be increasing towards the margins of the area being tested, transects will be extended in an attempt to identify site boundaries.

In summary, excavation will proceed to a more intensive level of testing regardless of whether artefacts are found during the first phases of testing. This methodology is proposed as a means of not only testing the archaeological deposits at Jumping Creek, but also testing the methodology itself.

Following an on-site review, the test pit locations may be varied slightly in order to avoid the following:

- large stone cobbles or tors (with maximum linear dimensions greater than 300 mm);
- outcropping bedrock;
- highly disturbed or eroded ground; and/or
- substantial vegetation (with stem diameter of 100 mm or greater).

### **Hand Excavation**

The test excavation program would be carried out in accordance with the Code of Practice (Part 6 *National Parks and Wildlife Act 1974*) Requirement 16a.

All pits would be excavated by hand using 0.5 x 0.5 metre units. An indicative testing methodology would consist of the following:

5. Mark out and record pit location(s).

The size of an individual testing point on a transect would be 0.50 x 0.50 metres.

However, additional test excavation units may be added to create a test trench comprising up to 12 excavation units (3m<sup>2</sup>) at any one testing point on a transect.

6. Excavate pit.

Pits would be excavated by shovel and trowel using standard by-hand archaeological methodologies including vertical and horizontal recording of spit levels and sedimentary, cultural and stratigraphic features.

The first excavation unit at each site would be excavated and documented in 5 cm spits. Depending upon the results of the first excavation unit, subsequent spit intervals would be at 10 cm, except in circumstances where the excavation of cultural features or stratigraphic units necessitates a smaller interval.

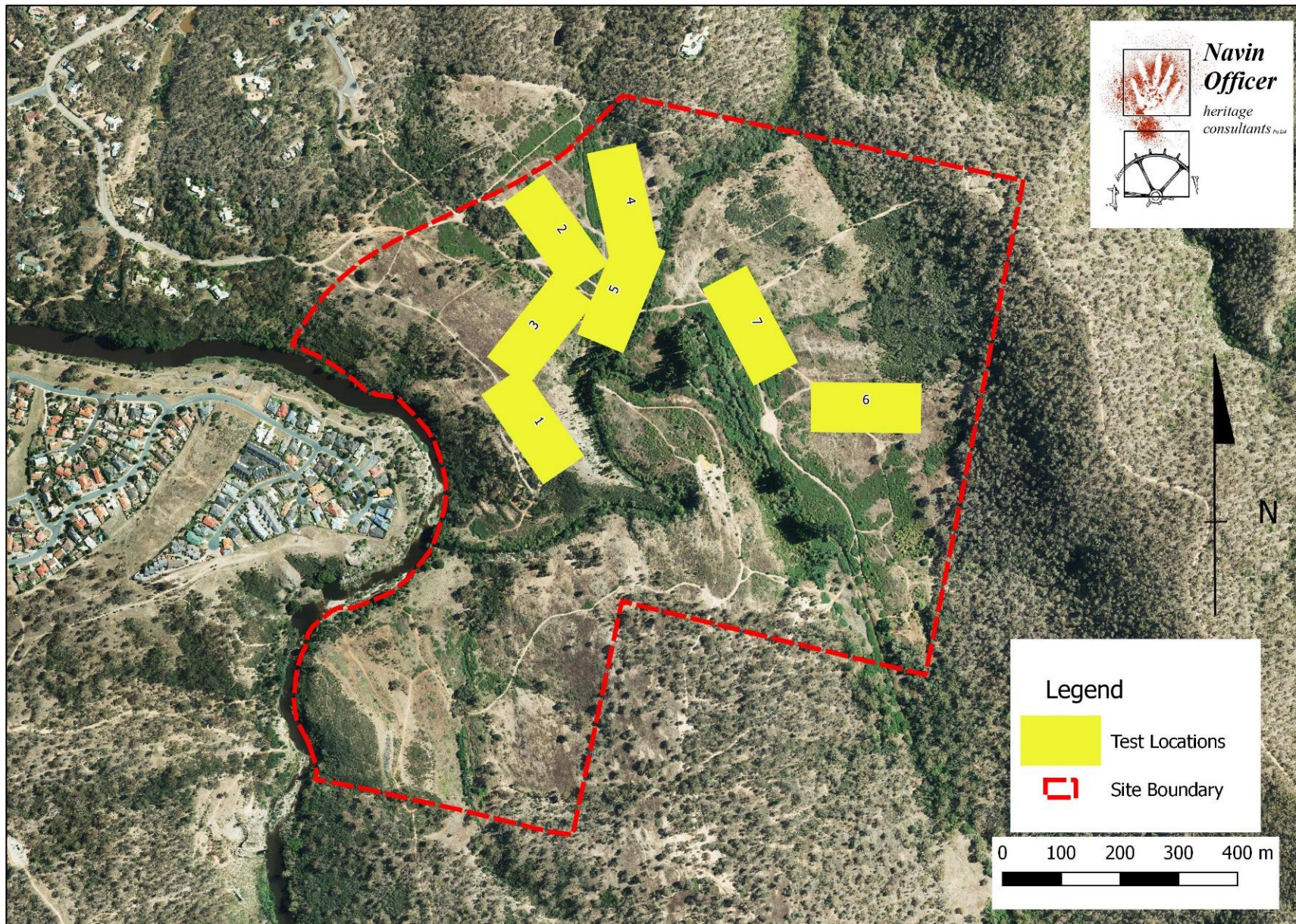
Excavation would cease according to an on-site appreciation of the vertical extent of the archaeological deposit.

7. Where cultural features are identified, such as heat treatment pits or hearths, detailed plans would be drawn and samples of dateable material would be obtained.
8. Other samples may be obtained for the potential analysis of paleoenvironmental indicators such as pollen, phytoliths and microfauna.



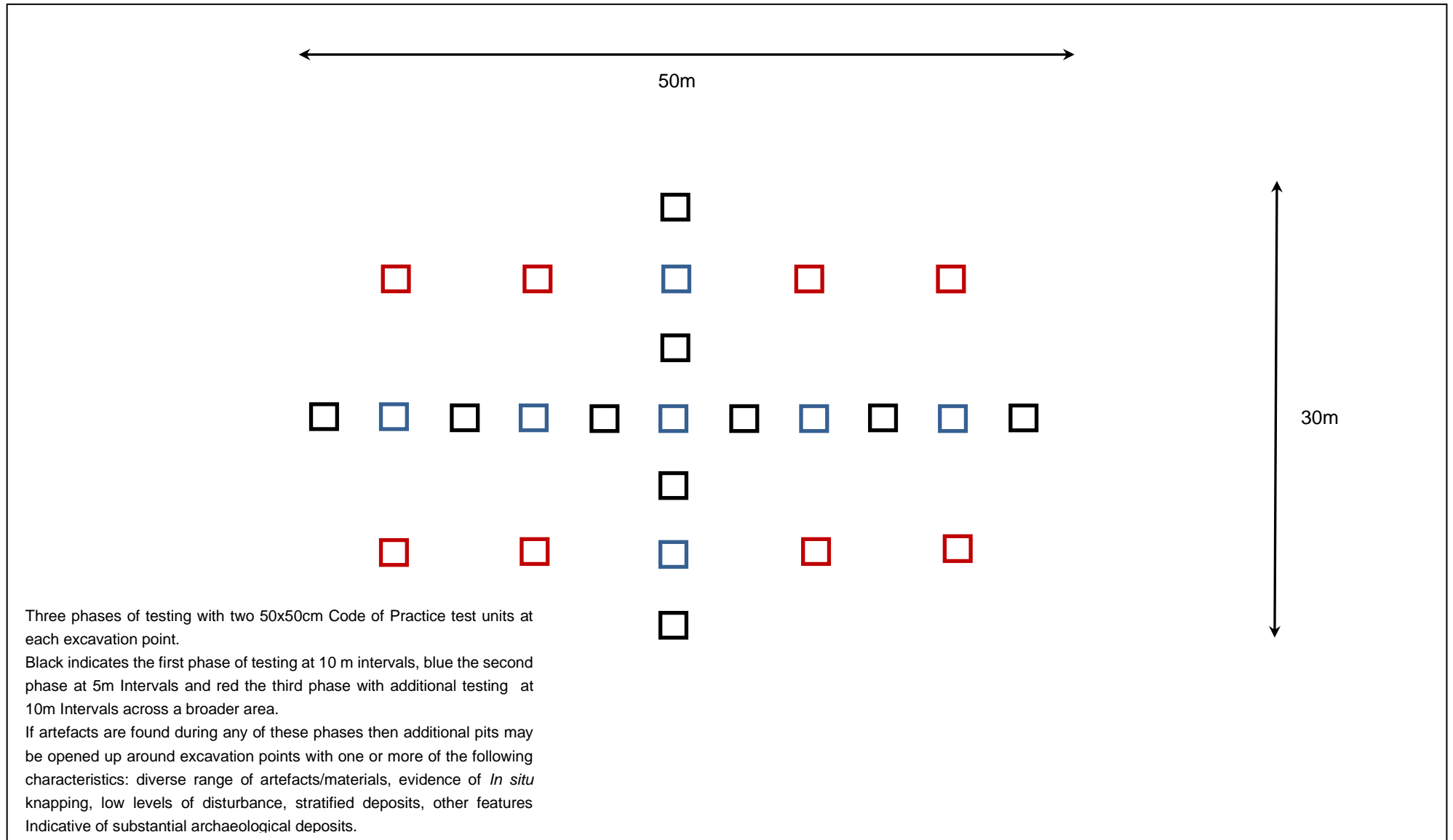
9. All excavated archaeological deposit would be dry sieved. All material would be sieved through 4 x 4 millimetre mesh, with use of a top larger mesh (10 x 10 mm) where appropriate. All identified or suspected cultural material recovered from sieving would be retained, bagged and labelled.
10. Sieving would be conducted over a tarpaulin, directly adjacent each excavation pit, and all excavated material would be transferred from the tarpaulin back to the excavation pit immediately upon completion of each excavated pit. This is to prevent injury to grazing animals.





**Figure 3 Location of proposed Test locations**





**Figure 4 Tet Pit lay-out**



## 14.2. Lithic Analysis

All lithic items would be examined in detail by a lithic specialist such as Dr Tessa Bryant (or other suitably qualified lithic specialist, depending on availability), using a low-power binocular microscope and incident illumination and/or hand lens. Descriptive recording of collected material would be to a level concomitant with the stated testing and salvage aims of the investigation, and the number of artefacts/type of material recovered.

The primary aim of the analysis of the lithic items retrieved from the test locations would be to assist in the assessment of the significance of the sites/deposits and to identify appropriate management strategies.

Raw material type would be recorded for each stone artefact. Attributes for each artefact in the assemblage would be entered into a relational database and digital photographs may be taken of selected artefacts, where appropriate. Information for each specimen recorded in the analysis would be provided in an appendix in the final report.

Analysis will be consistent with standards and guidelines defined by OEH.

## 15.3. Protocol to be followed if suspected human remains are encountered

In the event that suspected human remains are encountered during any of the proposed test or salvage excavations, protocols for the unanticipated discovery of archaeological material and suspected human remains (presented in Attachment 1) would be adopted.

## 16.4. Environmental Safeguards

Minimal vegetation would be removed to facilitate the testing program.

Dry sieving methods would be adopted as a means to minimise possible erosion caused by wet sieving and in order to reduce vehicle movements.

All pits would be backfilled as soon as practicable after completion of test excavation using material that is excavated from the pits to prevent possible sediment contamination from backfilling with introduced soil.

## 5. Care and Management of Recovered Artefacts

Disposition and storage of collected stone artefact assemblages during this test excavation would be dealt with in accordance with the Code of Practice (Part 6 *National Parks and Wildlife Act 1974*) under Requirement 26.

After examination and measurement, all recovered artefacts would be stored individually in standard resealable plastic bags or bagged in appropriate and identifiable units. The bags would be labelled using a permanent black pen with the item's unique identification number (where generated and appropriate), and/or details of its provenance within the excavation (as appropriate).

Following completion of the analysis of the recovered artefacts and once their scientific significance has been assessed; the long-term management of the artefacts will be discussed with the RAPs as outlined in Requirement 26 of the Code of Practice. One option for the long-term management is that Aboriginal objects be repositioned back into the landscape ('returned to country'). All locations of repositioned artefacts would be recorded on appropriate OEH forms and lodged with the AHIMS, administered by OEH.



### **17.6. Registered Aboriginal Party Participation in Field Work**

The proponent is committed to providing an opportunity to the representatives of registered Aboriginal parties to participate in the conduct of field survey program.

The test excavation program would take approximately four weeks to complete using one team that would comprise:

- One primary archaeologist (from Navin Officer Heritage Consultants (NOHC)).
- Three assisting archaeologists/field assistants (from NOHC).
- Four Aboriginal Site Officers.

### **18.7. Report preparation**

Information gained in the course of the survey and information provided by the Aboriginal community will be documented in a report (except where information has been identified as culturally sensitive and therefore restricted). The report will detail the survey methodology, results, archaeological test excavation methodology and results and assessment of significance of identified sites. Recommendations will be provided for the management of sites.





## **19. Attachment 1: Protocol to be followed in the event that suspected human remains are encountered**

1. All ground surface disturbance in the area of the finds should cease immediately after the finds are uncovered.
  - a. The discoverer of the find(s) will notify all field workers and machinery operators in the immediate vicinity of the find(s) so that work can be halted; and
  - b. The excavation director, site supervisor and representatives of the proponent will be informed of the find(s).
2. If there is substantial doubt regarding a human origin for the remains, then consider if it is possible to gain a qualified opinion within a short period of time. If feasible, gain a qualified opinion (this can circumvent proceeding further along the protocol for remains which turn out to be non-human). If conducted, this opinion must be gained without further disturbance to any remaining skeletal material and its context (Be aware that the site may be considered a crime scene containing forensic). If a quick opinion cannot be gained, or the identification is positive, then proceed to the next step.
3. Immediately notify the following people of the discovery:
  - a) The local Police (this is required by law);
  - b) NSW Department of Planning, Industry and Environment (DPIE);
  - c) An archaeologist or Aboriginal Heritage Officer (as appropriate) from the DPIE (Environment hotline: 131 555);
  - e) Representative(s) from the registered Aboriginal parties (as appropriate); and
  - f) The project archaeologist (if not already present).
4. Facilitate the evaluation of the find(s) by the statutory authorities and comply with any stated requirements. Depending on the evaluation of the find(s), the management of the find(s) and their location may become a matter for the Police and/or Coroner.
5. Excavation works in the area of the find(s) may not resume until the proponent receives written approval from the relevant statutory authority: from the Police or Coroner in the event of an investigation, or from DPIE in the case of Aboriginal or Non-Aboriginal remains outside of the jurisdiction of the Police or Coroner.

**In the event that the proponent continues an active role in the evaluation and/or management of the find(s),** via a direction or advice from the Police, Coroner and/or the DPIE or Heritage Council, then all or some of the following steps *may* be conducted:

6. Facilitate, in co-operation with the appropriate authorities, the definitive identification of the skeletal material by a specialist (if not already completed). This must be done with as little further disturbance to any remaining skeletal material and its context as possible.
7. If the specialist identifies the remains as non-human then, where appropriate, the protocol for the discovery of Non-Aboriginal or Aboriginal artefacts should be followed.
8. If the specialist determines that the remains are human, then the proceeding course of action may be of three types:
  - a. The remains are of an Aboriginal or non-Aboriginal person who died less than 100 years ago. All further decisions and responsibilities regarding the remains and find location rest with the Police and/or the State Coroner.

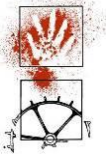


- b. The remains are of a non-Aboriginal person who died more than 100 years ago. In this case, and where the Police have indicated that they have no interest in the find(s), the following steps may be followed:
  - i. Ascertain the requirements of the Heritage Branch (DPIE), the proponent, the project archaeologist, and the views of any relevant community stakeholders;
  - ii. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following:
    - 1. Avoiding further disturbance to the find and conserving the remains in situ (this option may require relocating the development and this may not be possible in some contexts);
    - 2. Conducting (or continuing) archaeological salvage of the finds following receipt of any required statutory approvals;
    - 3. Scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial;
    - 4. Recovering samples for dating and other analyses; and/or
    - 5. Subsequent reburial at another place and in an appropriate manner determined by the Heritage Council and in consultation with other relevant stakeholders.
- c. The remains are of an Aboriginal person who died more than 100 years ago. In this case the following steps may be followed:
  - i. Ascertain the requirements of the relevant registered Aboriginal parties, the DPIE, the proponent, and the project archaeologist;
  - ii. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following:
    - 1. Avoiding further disturbance to the find and conserving the remains in situ, (this option may require relocating the development and this may not be possible in some contexts);
    - 2. Conducting (or continuing) archaeological salvage of the finds following receipt of any required statutory approvals (e.g. AHIP issued);
    - 3. Scientific description (including excavation where necessary and where an AHIP has been issued), and possibly also analysis of the remains prior to reburial;
    - 4. Recovering samples for dating and other analyses; and/or
    - 5. Subsequent reburial at another place and in an appropriate manner determined by the registered Aboriginal parties and the DPIE.
  - iii. No removal of human remains will take place unless an AHIP has been issued.

#### **Reference/Sources:**

Donlan, D., McIntyre-Tamwoy, S. and A. Thorne 2002 Aboriginal Skeletal Remains Manual. NSW National Parks and Wildlife Service, Hurstville.

Heritage Office, NSW 1998 *Skeletal Remains Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977*.



## Subsurface Testing Methodology Responses

**From:** Goobah <goobahchts@gmail.com>  
**Sent:** Wednesday, 2 October 2019 1:07 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Re: Subsurface testing Jumping Creek

Good afternoon Nicola, the Site Officer that will be representing Goobah is Johnathan Morgan, Goobah agrees and supports the methodology, please find attached our Certificate of Cu're'cy's for Workers Compensation and Public Liability. Can you please send me the times and dates of the rostered days at your earliest convenience and thank you again for the opportunity to participate in this phase of the fieldwork.

---

**From:** Cullendulla <cullendullachts@gmail.com>  
**Sent:** Wednesday, 2 October 2019 1:03 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Re: Subsurface testing Jumping Creek

Good afternoon Nicola, the Site Officer that representing Cullendulla is Michael Williams-Moran, Cullendulla agrees and supports the methodology, please find attached our Certificate of Cu're'cy's for Workers Compensation and Public Liability. Can you please send me the times and dates of the rostered days at your earliest convenience and thank you again for the opportunity to participate in this phase of the fieldwork.

---

**From:** Biamanga <biamangachts@gmail.com>  
**Sent:** Wednesday, 2 October 2019 1:09 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Re: Subsurface Testing Jumping Creek

Good afternoon Nicola, the Site Officer that will be representing Biamanga is Wayne Williams, Biamanga agrees and supports the methodology, please find attached our Certificate of Cu're'cy's for Workers Compensation and Public Liability. Can you please send me the times and dates of the rostered days at your earliest convenience and thank you again for the opportunity to participate in this phase of the fieldwork.





## Survey Draft Report Responses

**From:** Marilyn Carroll-Johnson <corroboreecorp@bigpond.com>  
**Sent:** Friday, 7 December 2018 12:17 PM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Re: Jumping Creek Report

Hi Nicola

We see no issues with the project. We agree with your report. Thanks

Kind regards

Marilyn Carroll-Johnson

Director CAC

---

**From:** Shaun Carroll <Merrigarn@hotmail.com>  
**Sent:** Wednesday, 5 December 2018 11:21 AM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** Re: Jumping Creek Report

Hi Nicola,

I have read the information and recommendations made by Navin Officer Heritage, I agree with this recommendations for the Jumping Creek project.

Thanks

Shaun Carroll

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## ACHAR Draft Report Responses

**From:** Muragadi <muragadi@yahoo.com.au>  
**Sent:** Tuesday, 14 January 2020 9:03 AM  
**To:** Nicola Hayes <nhayes@nohc.com.au>  
**Subject:** RE: Jumping Creek Report

Dear Nicola,

I have read the project information, report and methodology for Jumping Creek. I agree with the recommendations made by Navin Officer Heritage.

Kind regards

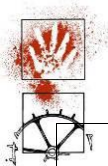
Jesse Johnson/Anthony Johnson

0418970389



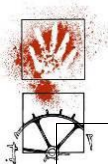
## Consultation Log

Date	Method of communication	Organisation	Individual	NOHC Staff	Matters discussed	Records/Replies
11/07/2018	post and email	NLALC, ORALRA, NTSCorp, QPRC, SELLS, OEH		NH	Stage 1 consultation guidelines	
13/07/2018	email	OEH			provided list of parties	
16/07/2018	post	QPRC			contact NLALC and UNEC	
18/07/2018	email	ORALRA			suggested contact NLALC	
24/07/2018	post	SELLS			contact OEH	
24/07/2018	post and email			NH	letter to all identified above to invite registration of interest	responses received from: Ngambri Local Aboriginal Land Council Murra Bidgee Mullangari Aboriginal Corporation Thunderstone Aboriginal Cultural and Land Management Services Gunjeewong Cultural Heritage Aboriginal Corporation Karlari Ngunnawal Pajong Wallabalooa Descendants Corroboree Aboriginal Corporation Buru Ngunawal Aboriginal Corporation Didge Ngunawal clan Ngunawal consultancy Ngunnawal Elders Corporation Ms Lavinus Ingram Mr Robert Monaghan Mr Carl Brown Merrigarn Goobah Cullendulla Murramarang Gulaga Biamanga Nirrummurrin Muragadi
8/08/2018	post and email	all		NH	methodology for field survey sent to each group	
20/08/2018	email	Muragadi			endorsed methodology	
20/08/2018	email	Murra Bidgee Mullangari Aboriginal Corporation			endorsed methodology	
20/08/2018	email	Merrigarn			agrees with the information	
2/09/2018	email	BNAC			The proposed methodology is the normal practice but given the large number of site impacts would like to undertake a consultation process in the overall planning practice to try and preserve some of those	

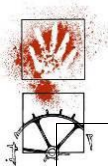


Date	Method of communication	Organisation	Individual	NOHC Staff	Matters discussed	Records/Replies
					sites, i.e. landscape architecture, instead of the usual salvage and destroy. In essence BNAC is in agreement with the methodology but would like to seek an alternative approach for a better outcome for what they see as their significant cultural presence in this area	
17/09/2018	field survey				The following attended: Jayden Channell (Ngunawal consultancy) Piero Delponte (Ngunawal consultancy) Sonia Shea (Thunderstone) Mike Skinner (Corroboree Aboriginal Corporation) Robert Monaghan David Williams (Karlari Ngunnawal Pajong Wallabalooa Descendants) Kody (Didge Ngunawal clan) Edward Furaki (Murra Bidgee Mullangari Aboriginal Corporation) Luke Beard (Muragadi) Shaun Carroll (Merrigarn) Arnold Williams (Ngambri Local Aboriginal Land Council)	
9/10/2018	field survey				Wally Bell (BNAC) Cherie Carroll–Turrise (Gunjeewong Cultural Heritage Aboriginal Corporation)	
3/12/2018	email and post	all	draft report	NH		
5/12/2018	email	Merrigarn			agrees with this recommendation	
7/12/2018	email	CAC			no issues with the project and agrees with the report	
3/06/2019	email and post	all		NH	update letter on the project sent to each group	
23/09/2019	email and post	all		NH	information, updated methodology and information on field program	
23/09/2019	phone	DNC	Paul Boyd	NH	will have representatives available for the field program	
23/09/2019	email	BNAC	Wally Bell	NH	take up invitation including certificates of currency	
23/09/2019	email	CAC	Marilyn Carroll-Johnson	NH	will have RAP available	
23/09/2019	email	DNC		NH	certificates of currency	
24/09/2019	phone		Robert Monaghan	NH	does not have insurance needs to know if this is ok	
24/09/2019	phone	DNC	Paul Boyd	NH	can please have the same day as CAC	
24/09/2019	phone	Nirrummurrin	Hika	NH	talked about how many REPs said they should be able local and have local knowledge, asked how many I said one representing the whole groups would be be, he will supply names, I said once we know numbers I can tell him how many days	

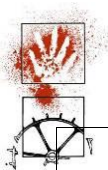




Date	Method of communication	Organisation	Individual	NOHC Staff	Matters discussed	Records/Replies
24/09/2019	email	Muragadi	Jesse Carroll	NH	did not receive invitation letter so resent	
24/09/2019	email	MBMAC	Ryan Johnson	NH	did not receive invitation letter so resent	
24/09/2019	phone	MBMAC	Darleen	NH	asked for letter to be posed as well which it has been, is available for work	
24/09/2019	email	Merrigarn	Shaun	NH	sent certificates of currency	
24/09/2019	phone	KNPWD	Rebecca Ingram	NH	register to participate in fieldwork, has a group of representatives, will need to know days	
24/09/2019	email	Nirrummurrin	Hika	NH	8 parties registered under Nirrummurrin have with drawn and will contact directly and Nirrummurrin remains	
26/09/2019	email	BADU	Karia Bond	NH	is now separate from Nirrummurrin and requested documents	
26/09/2019	email	Gangangarra	Kim Carriage	NH	is now separate from Nirrummurrin and requested documents	
26/09/2019	email	Badu and Gangangarra		NH	sent both groups the letter, methodology and SPACELAB letters	
27/09/2019	email	NLALC	Trisha	NH	take up invitation including certificates of currency	
1/10/2019	email	Thunderstone	Tyronne Bell	NH	take up invitation no insurance provided	emailed reply 8/10 requesting insurance certificates
1/10/2019	email		Arnold Willimas	NH	take up invitation no insurance provided	emailed reply 8/10 requesting insurance certificates
2/10/2019	email	Minnamunnung	Aaron Broad	JF	is now separate from Nirrummurrin and requested documents	
2/10/2019	email	Minnamunnung	Aaron Broad	JF	sent the letter, methodology and SPACELAB letters	
2/10/2019	email	Cullundulla		NH	take up invitation including certificates of currency	
2/10/2019	email	Goobah		NH	take up invitation including certificates of currency	
2/10/2019	email	Biamanga		NH	take up invitation including certificates of currency	
2/10/2019	phone	Gungeewong	Cherie Carroll-Turise	JF	Checking when the roster would be sent out	
3/10/2019	phone		Lavinus Ingram	JF	had called and left message, I called back, double checking what information needed to be sent to PEET, checking when roster would be sent out	
3/10/2019	phone	KNPWD	Rebecca Ingram	JF	Brent Lyons will be coming out for KNPWD, checking when roster would be sent out	
3/10/2019	email	Nirrummurrin	Hika	NH	provided sites officers, no insurance certificates attached	emailed reply 8/10 requesting insurance certificates
3/10/2019	email	Murrabidgee	Darleen	NH	requesting roster dates	
4/10/2019	email	Murramarang		NH	take up invitation including certificates of currency	
5/10/2019	email	CAC	Marilyn Carroll-Johnson	NH	requested week of the 16th	

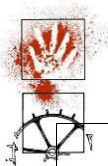


Date	Method of communication	Organisation	Individual	NOHC Staff	Matters discussed	Records/Replies
7/10/2019	email	Gungeewong	Cherie Carroll-Turise	NH	no insurance attached	emailed reply 8/10 reque192nsuranceuracne certificates
7/10/2019	phone	all those not responded to the method: Tina Brown, PD Ngunawal, Gulaga			no issues raised, voicemailsleft for Tina and Pete	
8/10/2019	phone		Lavinus Ingram	NH	following up on insurances	
8/10/2019	phone and email	KNPWD	Rebecca Ingram	NH	following up on insurances	
8/10/2019	phone	KNPWD	Rebecca Ingram	NH	asked if they could sign a waiver form for liability	I have followed up with SAPCELAB and they will get back to me
9/10/2019	email	rostered groups		NH	sent rostered groups up u <sup>nti</sup> l 4th Nov invitations to fieldwork	
9/10/2019	phone	Murrabidgee	Darleen	NH	did not receive letter	resent
9/10/2019	email	Nirrummurrin	Hika	NH	received insurances	
9/10/2019	phone	Gungeewong	Cherie Carroll-Turise	NH	chase up insurances and also where to send fieldwork info	
10/10/2019	phone	PD Ngunawal	Pete	NH	asked of to late to be included on the roster, I said no just have to get insurance to us ASAP, is doing that today	
10/10/2019	email	PD Ngunawal		NH	sent invitation to field work	
14/1/19-8/11/19	fieldwork				the following attended: Piero Delponte (Ngunawal consultancy) Sonia Shea (Thunderstone) Garreth Conyard (Murra Bidgee Mullangari Aboriginal Corporation and Muragadi) Daniel Williams, Arnold Williams, Trisha Williams, Cheryl Williams, Aaron Williams (Ngambri Local Aboriginal Land Council) Marilyn Carroll-Johnson and Steve Johnson (Corroboree Aboriginal Corporation) Adam King (Didge Ngunawal clan) William Reynolds (Goobah and NirrumMurrin) Jonathon Morgan (Biamanga and NirrumMurrin) Marion Bell (Murramarang and NirrumMurrin) Mundara Drew (Cullundulla and NirrumMurrin) Joseph Campbell (Goobah and NirrumMurrin) Arnold Williams (Ngunnawal Elders Corporation) Karne Denny (BNAC) Shaun Carroll (Merrigarn)	
12/12/2019	email and post	all		NH	draft report	
14/01/2020	email	Muragadi			agrees with the recommendations	



Date	Method of communication	Organisation	Individual	NOHC Staff	Matters discussed	Records/Replies
18/3/20	phone	BNAC	Wally Bell	NH	<p>Discussed the recommendations with Wally and asked if he wanted to add anything else to the report. As well as the recommended salvage program and identification of No Harm areas Wally also would like to ensure that even when sites are salvaged that the record of their location and content remains on AHIMS, this would allow for the continuing record of the occupation of the area. All salvaged artefacts should be returned to Jumping Creek and an appropriate area identified for their placement that will not be impacted in the future. Wally was concerned that the proponent should understand the consequence of impacting the No Harm areas and that machinery should keep to defined impact areas such as the tracks. Wally would like the ongoing connection of Aboriginal people to Jumping Creek be celebrated and made known to the public, Wally was positive about the following measures:</p> <ul style="list-style-type: none"> <li>a. The naming of parks and areas of Jumping Creek with local Aboriginal names/words;</li> <li>b. The use of native plants and bush food in gardens and landscaping; and</li> <li>c. Interpretation signage.</li> </ul>	Discussion included in report and recommendations
20/03/20	Face to face talk	NLALC	Trisha Williams	NH	<p>Discussion with the NLALC also indicated that the measures discussed with Wally were acceptable and would like to see signage and suggested a bush tucker walk that could be achieved along the southern management trail.</p>	Discussion included in report and recommendations
4/05/2020	phone call	BNAC		NH	<p>ask about naming, would like to know where the locations are</p>	





Date	Method of communication	Organisation	Individual	NOHC Staff	Matters discussed	Records/Replies
6/05/2020	email	BNAC		NH	maked up plan to Wally with park locations also offered sit down with Mitchell	
21/5/2020	email	Arnold Williams (Snr) Wally Bell Tyrone Bell Tina Brown		NH	Ceremonial site at jumping creek	
27/5/2020	Phone call	Arnold Williams (Snr) Wally Bell Tyrone Bell Tina Brown		NH	<p>No further specific information was provided about ceremonial sites in Jumping Creek. Tyrone Bell provided the following additional recommendations for the project, and have been incorporated into the recommendations:</p> <p>Native plants and bush foods to be planted and landscaped by an Aboriginal local business under Aboriginal procurement due to the significance around the Jumping Creek development.</p> <p>Aboriginal Cultural Tours to reflect the past and future of Jumping Creek and Aboriginal Cultural Awareness training to be incorporated into the induction process for staff and sub-contractors.</p> <p>Site fencing should be installed by an appropriately qualified heritage professional and RAP's so everyone can agree in the field the location where the fencing needs to go around sites</p>	
16/06/2020	email	All RAPs		NH	project update and final report	
18/01/2021	email	All RAPs		AC	ACV report sent to all RAPs for comment	
15/3/2021	phone	Wally Bell		NH	Wally indicated verbally that he thought that the report and consultation addressed his concerns, and he provided a response to that effect in writing	
15/3/2021	phone	Matilda House		Nh	Left message	



Date	Method of communication	Organisation	Individual	NOHC Staff	Matters discussed	Records/Replies
18/3/2021	phone	Matilda House		NH	Not able to talk at that time	
30/04/2021	email	All RAPs		NH	Conservation area update to all RAPs	
25/5/2021	phone	Matilda House		NH	Unable to talk at that time	
26/5/2021	Phone	Paul House		NH	Can speak on Matildas behalf as she is very busy. Ngambri LALC should be consulted re naming, access and interpretation. Agrees with approach for conservation area.	
11/6/2021	In person	Trisha Williams Ngambri LALC		NH and PEET	Agrees with approach and would like to be involved in design etc of conservation area and interpretation	



## Cultural Values Report Response



Navin Officer Heritage Consultants  
Number 4, Kingston Warehouse  
71 Leichhardt Street  
KINGSTON ACT 2604

### Re: Jumping Creek Aboriginal Cultural Values Report

Thank you for your correspondence in which you provided a report on the above requesting input from Buru Ngunawal Aboriginal Corporation (BNAC) as the Representative Aboriginal Party (RAP) who participated in the Aboriginal cultural heritage consultation.

BNAC members are the Traditional Custodians for the ACT and surrounding areas in NSW. We would like to point out that all sites, objects, and lands within our tribal boundary do hold an incredibly significant social, spiritual and cultural importance to us as a direct cultural link to Country.

BNAC have always displayed a reluctance to agree with the archaeological site significance evaluations as a matter of perspective and would like to add the following comment regarding the Aboriginal cultural significance of all sites.

As is the case in most Aboriginal cultural heritage investigations conducted via archaeological methodology many sites/objects appear to hold low scientific significance. But to the Traditional Custodians on whose land the study is being conducted there is an extraordinarily strong significance from a cultural perspective because these sites/objects provide a bond via strong rich story and song line of our Aboriginal Traditional practices and our history and connection to Country which we have occupied for a scientifically validated tens of thousands of years.

Consideration must be instituted about all aspects of the Aboriginal Cultural Values. The core values are spirit and integrity, cultural continuity, equity, exchange, respect, and responsibility which are important to all Aboriginal people. Land, family, lore, ceremony and language are five key interconnected elements of culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the lore and observed through ceremony. In this world, nothing is inanimate, everything is alive; animals, plants, and natural elements, all are energised by a spirit. As such, humans are on an equal footing with nature; are part of nature and are morally obligated to treat animals, plants and landforms with respect. It is this spiritual connection with the land that determines who we are.

BNAC finds that this assessment of the Ngunawal Aboriginal cultural values of this project are an accurate reflection of the storyline as expressed during the consultation process as made by the Ngunawal Aboriginal community as reviewed.

BNAC relating to the areas of cultural significance outlined in report state that there is an extraordinarily strong significance from a cultural perspective for the proposed area to be impacted.

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PO Box 255, KIPPAX ACT 2615 Mb: 0419 425347 Email: [wally@buru-ngunawal.com](mailto:wally@buru-ngunawal.com) [www.buru-ngunawal.com](http://www.buru-ngunawal.com)





BNAC acknowledges the content of the Aboriginal Cultural Values Report consultations and would consider providing any further content if the need arises as we understand the complexity involved in portraying cultural practice in a tangible and intangible context can be most perplexing.

BNAC looks forward to being actively involved in working towards a healthy and productive process in developing a better understanding of Aboriginal cultural heritage significance and its connection with Country and provide an avenue to progress the reconciliation process.

Thank you for the opportunity to provide comment.

Yours faithfully

Wally Bell (Ngunawal TC)  
Chair  
3 January 2021



The following is from Arnold Williams from 1/10/2020

### Jumping Creek

In the 1980s -90s Arnold WILLIAMS as CEO of the Ngunnawal Local Aboriginal Land Council placed a claim on Crown Land in Jumping Creek - please contact Ngambri Local Aboriginal Land Council and speak to Trisha Williams. We are not sure of the status of the claim.

Arnold Williams, Kate Holder, Joe House(deceased) and David Newton visited a cultural place there, when water still ran in the creek. The young men built a bora ring and they hoped to start visiting this place more often. There were plans made for this place but they did not eventuate.

There are memories of a shed in this area which might help you locate it. If the remains of the farm shed are still there then this is the place that would be very good for a regenerated garden of those plants that would have been there before farming etc.

In the 1980s-1990s it could not be reached by a normal car, only in a four wheel drive and then you had to walk.

It would be good to find that place again.

Ferns still grew in the little creek which still ran and it was green and cool and it felt still quiet and peaceful.

Jumping Creek has areas of high densities of artifact remains compared to some other areas surveyed around Queanbeyan. We know that from early surveys even though lots have been scattered by vehicles and farm and clearing.

It would be good to regenerate and have peaceful spaces in consultation with Ngunnawal Ngambri residents.

To the best of our knowledge the claim on the Crown Land relates to the lot south of the Jumping Creek development lot and was successful with the LALC now owners of Lot 51. It is thought there are burials on that lot.



The following is from Wally Bell 21/3/21



ABN : 24 059 704 833

Navin Officer Heritage Consultants  
Number 4, Kingston Warehouse  
71 Leichhardt Street  
KINGSTON ACT 2604

**Re: Jumping Creek Aboriginal Cultural Values Report**

I was informed during conversation in relation to other matters that there appears to be some concerns that your organisation has not fully met the criteria for the above report.

This may have come about due to my correspondence of 3 January 2021 in response to the Cultural Values Report. In that correspondence it was my intention to highlight that the field of archaeology relates its investigations and findings on a purely scientific basis as is the requirement to undertake an unbiased approach to the project at hand.

I tried to intimate that being involved from an Aboriginal cultural point of view would highlight the vast separation of views. Aboriginal people always had future uses of the land in mind and to abide by their spiritual value or connection to country. Spiritual connection with the land is a part of Aboriginal society and as such explains why Aboriginal people have such close ties with the land, whether it is the spirits of a mountain, the water, or the flora and fauna. Therefore, open sites such as the stone artefact scatters found throughout the region will be related to other landscape features by story and association.

Traditionally, the Dreaming plays a central part in the lives of Aboriginal Australians. It provides a spiritual connection with the land and connections between people, groups, land, animals and plants. It also provides people with the Lore, which tells people how to look after the land and the rules for social behaviour.

This project area is a strong spiritual place of connection as is evident by the many stone artefact site areas that lie within the landscape.

Aboriginal people belong to the land of their ancestors, which we call their Country or our 'Belonging Place'. Country, and everything in it, is part of our spiritual identity.

Aboriginal Australians believe that the Ancestral Beings created our Country during the Dreaming and that the Ancestral Beings continue to inhabit it. We have a responsibility to manage the land and its resources. Dreaming stories teach people the best ways to do this. This is called 'Caring for Country'.

For more than 50 000 years, Aboriginal Australians lived in harmony with their Country. We understood and managed it closely. We took only the resources we needed from the land. We ensured that the land and the environment would not be damaged. Rivers, waterholes and springs were also carefully managed to ensure they were not damaged for future generations. Aboriginal people deliberately lit fires, known as fire-stick farming, in order to manage the environment. We burned undergrowth regularly to reduce the risk of uncontrolled bushfires and to encourage the growth of plants.

Many Aboriginal Australians living on their Country continue to hunt and gather traditional foods as well as buying food from shops. Today we tend to use modern fishing equipment or other modern

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tools, but we often use them in a traditional way. We make sure our children continue to learn the Dreaming knowledge of their Country and learn the skills required for looking after Country. The traditional custodians of Australia's capital cities are very significant. Our significance is recognised through the acknowledgement of our cultural heritage.

As the Custodians for our Country, we feel privileged that non-Aboriginal people work alongside us showing respect and gaining an understanding of our cultural beliefs and our connection to country. This understanding stands us in good stead for the future not only of our culture but also for the natural environment in which we live together.

I stand by my comments as stated with the conviction that the story and use of this project area will not be lost. I foresee a strong connection being born out of the development but only if it is designed to incorporate that story and highlight its significance for all to take custodianship of to look after and continue that storytelling.

The *11.3.3 Cumulative Impacts* section makes a call to not dismiss this significant place just because the scientific value of this area may not be as high as other places. Mitigating impacts on the area would be seen as a precedent in residential development which also incorporates the story and meaning of place.

*Section 12. RECOMMENDATIONS* does incorporate a lot of the discussion that has occurred over time during this lengthy process. The implementation of those recommendations would be a progressive forward movement.

Thank you for the opportunity to provide comment.

Yours faithfully

Wally Bell (Ngunawal TC)  
Chair  
21 March 2021



Since the Rubinich anthropological report was complete in November 2020, Nicola Hayes has been in contact with Mr Adrian Brown who said he believed the reference to a possible ceremonial site related to a place that he and his father (Carl Brown) discovered on the Queanbeyan River. Nicola met with Adrian and the site was plotted using google earth. The site is located in the south west corner of the lot refer aerial image below. This shows the approximate lot boundary in red and the location with a yellow pin.



Approximate location of ceremonial place identified by Adrian Brown 31 March 2021 from aerial.  
Actual location to be confirmed by site visit.



## **APPENDIX 2**

### **AHIMS REGISTER SEARCH RESULTS**





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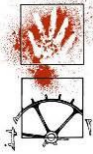
## AHIMS Web Services (AWS) Extensive search - Site list report

Your Ref/PO Number : Jumping Creek EN  
Client Service ID : 360550

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
57-2-0909	ED3 - Ellerton Drive 3 <u>Contact</u>	GDA Recorders	55	704158	6083102	Open site	Destroyed	Artefact: -	Permits 3843	103667
57-2-0919	ED5 - Ellerton Drive <u>Contact</u>	GDA Recorders	55	704285	6083346	Open site	Destroyed	Artefact: 4	Permits 3843	103667
57-2-0918	ED4 - Ellerton Drive <u>Contact</u>	GDA Recorders	55	704356	6083417	Open site	Destroyed	Artefact: 1	Permits 3843	103667
57-2-0619	Jumping Creek SU15/L2 <u>Contact</u>	GDA Recorders	55	704402	6082703	Open site	Valid	Artefact: 1	Permits 3843	101510
57-2-0683	JCR2a <u>Contact</u>	GDA Recorders	55	704421	6083312	Open site	Valid	Artefact: 3	Permits 3843	102088,103667
57-2-0910	ED6 - Ellerton Drive 6 <u>Contact</u>	GDA Recorders	55	704458	6083504	Open site	Partially Destroyed	Artefact: -	Permits 3843	103667
57-2-0618	Jumping Creek SU15/L1 <u>Contact</u>	GDA Recorders	55	704461	6082470	Open site	Valid	Artefact: 1	Permits 3843	101510
57-2-0635	JCR2 <u>Contact</u>	GDA Recorders	55	704476	6083278	Open site	Destroyed	Artefact: -	Permits 3843	103667
57-2-0945	Ellerton Drive 7 <u>Contact</u>	GDA Recorders	55	704497	6083379	Open site	Valid	Artefact: 1	Permits 3843	103667
57-2-0620	Jumping Creek SU15/L3 <u>Contact</u>	GDA Recorders	55	704505	6082657	Open site	Valid	Artefact: 1	Permits 3843	101510
57-2-0621	Jumping Creek SU15/L4 <u>Contact</u>	GDA Recorders	55	704535	6082789	Open site	Valid	Artefact: 4	Permits 3843	101510
57-2-0684	JCR1a <u>Contact</u>	GDA Recorders	55	704589	6082951	Open site	Valid	Artefact: 3	Permits 3843	102088
57-2-0634	JCR1 <u>Contact</u>	GDA Recorders	55	704589	6082951	Open site	Valid	Artefact: -	Permits 3843	102088
57-2-0682	JCR12/14 <u>Contact</u>	GDA Recorders	55	704638	6083018	Open site	Valid	Artefact: -	Permits 3843	102088
57-2-0615	Jumping Creek SU10/L1 <u>Contact</u>	GDA Recorders	55	704686	6083528	Open site	Valid	Artefact: 5	Permits 3843	101510
57-2-0616	Jumping Creek SU10/L2 <u>Contact</u>	GDA Recorders	55	704724	6083445	Open site	Valid	Artefact: 2	Permits 3843	101510
57-2-0617	Jumping Creek SU11/L1 <u>Contact</u>	GDA Recorders	55	704842	6083459	Open site	Valid	Artefact: 7	Permits 3843	101510

Report generated by AHIMS Web Service on 30/07/2018 for Jasmine Pennyvest for the following area at Datum : GDA, Zone : 55, Eastings : 704243 - 705501, Northings : 6082383 - 6083642 with a Buffer of 200 meters. Additional Info : The data is to be used for archaeological investigation. Number of Aboriginal sites and Aboriginal objects found is 59

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Extensive search - Site list report

Your Ref/PO Number : Jumping Creek EN  
Client Service ID : 360550

SiteID	SiteName	Datum	Zone	Eastings	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
57-2-0622	Jumping Creek SU18/L1 <b>Contact</b>	<b>Recorders</b> GDA	55	704905	6083285	Open site	Valid	Artefact : 3 <b>Permits</b>		101510
57-2-0623	Jumping Creek SU18/L2 <b>Contact</b>	<b>Recorders</b> GDA	55	704910	6083267	Open site	Valid	Artefact : 2 <b>Permits</b>		101510
57-2-0614	Jumping Creek SU6/L1 <b>Contact</b>	<b>Recorders</b> GDA	55	705027	6083305	Open site	Valid	Artefact : 4 <b>Permits</b>		101510
57-2-0613	Jumping Creek SU3/L1 <b>Contact</b>	<b>Recorders</b> GDA	55	705131	6083344	Open site	Valid	Artefact : 2 <b>Permits</b>		101510
57-2-0612	Jumping Creek SU2/L4 <b>Contact</b>	<b>Recorders</b> GDA	55	705177	6083046	Open site	Valid	Artefact : 2 <b>Permits</b>		101510
57-2-0611	Jumping Creek SU2/L3 <b>Contact</b>	<b>Recorders</b> GDA	55	705222	6083049	Open site	Valid	Artefact : 4 <b>Permits</b>		101510
57-2-0610	Jumping Creek SU2/L2 <b>Contact</b>	<b>Recorders</b> GDA	55	705247	6083037	Open site	Valid	Artefact : 6 <b>Permits</b>		101510
57-2-0075	JC10; <b>Contact</b>	<b>Recorders</b> AGD	55	704200	6083100	Open site	Valid	Artefact : - <b>Permits</b>	Open Camp Site	1579,103667
57-2-0066	Jumping Creek 1; <b>Contact</b>	<b>Recorders</b> AGD	55	704200	6083200	Open site	Destroyed	Artefact : - <b>Permits</b>	Open Camp Site	1579,103667
57-2-0067	Jumping Creek 2; <b>Contact</b>	<b>Recorders</b> AGD	55	704200	6083450	Open site	Valid	Artefact : - <b>Permits</b>	Open Camp Site	1579
57-2-0068	JC3; <b>Contact</b>	<b>Recorders</b> AGD	55	704200	6083450	Open site	Valid	Artefact : - <b>Permits</b>	Open Camp Site	1579
57-2-0085	JC 20; <b>Contact</b>	<b>Recorders</b> AGD	55	704250	6082350	Open site	Valid	Artefact : - <b>Permits</b>	Open Camp Site	1579
57-2-0074	JC9; <b>Contact</b>	<b>Recorders</b> AGD	55	704263	6083335	Open site	Destroyed	Artefact : - <b>Permits</b>	Open Camp Site	1579,103667
57-2-0087	JCV 4; <b>Contact</b>	<b>Recorders</b> AGD	55	704300	6083050	Open site	Valid	Artefact : - <b>Permits</b>	Open Camp Site	1579
57-2-0090	SJC 7; <b>Contact</b>	<b>Recorders</b> AGD	55	704320	6082100	Open site	Valid	Artefact : - <b>Permits</b>	Open Camp Site	1877,102775
57-2-0430	Jumping Creek, Queanbeyan - JC21 <b>Contact</b>	<b>Recorders</b> AGD	55	704370	6083579	Open site	Valid	Artefact : 3 <b>Permits</b>		99378
57-2-0428	Jumping Creek, Queanbeyan - JC1 <b>Contact</b>	<b>Recorders</b> AGD	55	704402	6083415	Open site	Destroyed	Artefact : 1 <b>Permits</b>		99378,103667

Report generated by AHIMS Web Service on 30/07/2018 for Jasmine Fenyevesi for the following area at Datum :GDA, Zone : 55, Eastings : 704243 - 705501, Northings : 6082383 - 6083642 with a Buffer of 200 meters. Additional Info : The data is to be used for archaeological investigation. Number of Aboriginal sites and Aboriginal objects found is 59  
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## AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Jumping Creek EN  
Client Service ID : 360550

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
57-2-0429	<b>Contact</b> T Russell Jumping Creek, Queanbeyan - JCV6	<b>Recorders</b> AGD	55	704409	6083462	Open site	Valid	Artefact : 1	3843	99378
57-2-0432	<b>Contact</b> T Russell Jumping Creek, Queanbeyan - JCPAD1	<b>Recorders</b> AGD	55	704450	6083465	Open site	Valid	Potential Archaeological Deposit (PAD) :-	Permits	99378
57-2-0431	<b>Contact</b> T Russell Jumping Creek, Queanbeyan - JC22	<b>Recorders</b> AGD	55	704497	6083466	Open site	Valid	Artefact : 3	Permits	99378
57-2-0079	<b>Contact</b> JC14; T Russell	<b>Recorders</b> AGD	55	704500	6082950	Open site	Valid	Artefact :-	Permits	1579,102088
57-2-0076	<b>Contact</b> JC11;	<b>Recorders</b> AGD	55	704550	6082800	Open site	Valid	Artefact :-	Permits	1579
57-2-0077	<b>Contact</b> JC12;	<b>Recorders</b> AGD	55	704550	6082850	Open site	Valid	Artefact :-	Permits	1579,102088
57-2-0069	<b>Contact</b> JC4;	<b>Recorders</b> AGD	55	704550	6083200	Open site	Valid	Artefact :-	Permits	1579
57-2-0078	<b>Contact</b> JC13;	<b>Recorders</b> AGD	55	704600	6082900	Open site	Valid	Artefact :-	Permits	1579
57-2-0086	<b>Contact</b> JC3;	<b>Recorders</b> AGD	55	704600	6083050	Open site	Valid	Artefact :-	Permits	1579
57-2-0070	<b>Contact</b> JC5;	<b>Recorders</b> AGD	55	704700	6083000	Open site	Valid	Artefact :-	Permits	1579
57-2-0081	<b>Contact</b> JC16;	<b>Recorders</b> AGD	55	704750	6082850	Open site	Valid	Artefact :-	Permits	1579
57-2-0071	<b>Contact</b> JC6;	<b>Recorders</b> AGD	55	704750	6083150	Open site	Valid	Artefact :-	Permits	1579
57-2-0099	<b>Contact</b> SJC 1;	<b>Recorders</b> AGD	55	704800	6082300	Open site	Valid	Artefact :-	Permits	1877
57-2-0096	<b>Contact</b> SJC 4;	<b>Recorders</b> AGD	55	704800	6082530	Open site	Valid	Artefact :-	Permits	1877
57-2-0080	<b>Contact</b> JC 15;	<b>Recorders</b> AGD	55	704800	6082950	Open site	Valid	Artefact :-	Permits	1579
57-2-0084	<b>Contact</b> JC 19;	<b>Recorders</b> AGD	55	704850	6082650	Open site	Valid	Artefact :-	Permits	1579

Report generated by AHIMS Web Service on 30/07/2018 for Jasmine Fenyvesi for the following area at Datum :GDA, Zone : 55, Eastings : 704243 - 705501, Northings : 6082383 - 6083642 with

a Buffer of 200 meters. Additional Info : The data is to be used for archaeological investigation. Number of Aboriginal sites and Aboriginal objects found is 59

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

Your Ref/PO Number : Jumping Creek EN  
Client Service ID : 360550

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
57-2-0093	SJC 8; <b>Contact</b>	AGD Recorders	55	704900	6082120	Open site	Valid	Artefact :-	Open Camp Site	1877,102775
57-2-0089	JCV 15; <b>Contact</b>	AGD Recorders	55	704900	6082700	Open site	Valid	Artefact :-	Open Camp Site	1579
57-2-0083	JC 18; <b>Contact</b>	AGD Recorders	55	704900	6082750	Open site	Valid	Artefact :-	Open Camp Site	1579
57-2-0082	JC 17; <b>Contact</b>	AGD Recorders	55	704900	6082850	Open site	Valid	Artefact :-	Open Camp Site	1579
57-2-0098	SJC 2; <b>Contact</b>	AGD Recorders	55	704920	6082370	Open site	Valid	Artefact :-	Open Camp Site	1877
57-2-0088	JCV 14; <b>Contact</b>	AGD Recorders	55	704950	6082900	Open site	Valid	Artefact :-	Open Camp Site	1579
57-2-0072	JC7; <b>Contact</b>	AGD Recorders	55	704950	6083000	Open site	Valid	Artefact :-	Open Camp Site	1579
57-2-0097	SJC 3; <b>Contact</b>	AGD Recorders	55	704990	6082530	Open site	Valid	Artefact :-	Open Camp Site	1877
57-2-0073	JC8; <b>Contact</b>	AGD Recorders	55	705050	6083000	Open site	Valid	Artefact :-	Open Camp Site	1579

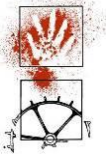
Report generated by AHIMS Web Service on 30/07/2018 for Jasmine Penryvesi for the following area at Datum :GDA, Zone : 55, Eastings : 704243 - 705501, Northings : 6082383 - 6083642 with a Buffer of 200 meters. Additional Info : The data is to be used for archaeological investigation. Number of Aboriginal sites and Aboriginal objects found is 59

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## **APPENDIX 3**

## **HERITAGE ITEMS**



## 1. JCH1 – Shearing shed complex

**GPS (WGS 84): 704742.6083351**

Jumping Creek historical item 1 (JCH1) includes the site previously recorded by Kuskie (1989) as H3. This item is located across the crest of a spur in the northwest of the study area. It comprises the remains of a shearing shed, concrete sheep dip and various associated buildings and fences. The site extends in the south from 704737.608338, where there are deciduous trees growing adjacent various building remains and 20th Century artefacts associated with a disturbed area that may be the remains of a building platform, through to 704726.6083384, where there are the remains of a small animal enclosure, evidenced by timber remains, post holes, chicken wire and partial stone footings.

Across the centre of the site there are various wooden stumps and fence post remains adjacent a concrete sheep dip that extends for about 10 m to the east of a concrete pad. There are remains of fencing surrounding both the pad and the dip and there is a low earth and stone mound bordering the dip on the southern side. The entrance to the sheep dip was in the north, the channel then turning towards the west where the sheep would climb up onto the concrete area that drains back into the dip. The concrete pad is presumed to be the drying pen.

Immediately adjacent to the northwest of this pen there are the remains of at least eight stumps and ten other post holes that appear to correspond to the footings of a building measuring ca. 5 x 6 m (704717.6083356). This is thought to be the remains of a small shearing shed, which based on the quantities of corrugated iron lying around, was originally clad in that material.

Additional post remains to the east of these footings appear to be part of a set of pens associated with the dip and the shed. There is a large boobialla tree growing in the middle of this area, which presumably postdates the yards.

Approximately 5 m to the north of the shed and associated yards and dip there is a plane tree with a series of post holes and at least one post located on the western side. These features appear to delimit the boundary of a smaller structure (704719.6083371). Once again the pieces of galvanised and corrugated iron on and adjacent this feature indicate an iron clad building, probably a shed of some form. Additional fence remains can be found to the east of this structure.

Approximately 40 m to the east of JCH1 and possibly associated with that complex, there are the remains of a small concrete structure set into the lower slopes of the spur (704780.6083368). The item in question measures 1.7 x 1.2 m and is at least 0.7 m deep. The base of the pit is filled with local limestone rubble; it is unclear how far the structure actually extends into the ground. There are remains of metal hinges and a latch point for a cover that was once fitted over the pit. It is unclear exactly what purpose this feature served, although it is likely to have been used as a storage area and given the way in which it is set into the ground it may have been an insulated store for foodstuffs or a form of magazine for storing gunpowder or similar explosives. The latter is perhaps more likely given the separation between this feature and the other structures on the crest to the west.

A short distance to the east (704804e 6083366n) there are the disturbed remains of building footings in the form of various wooden stumps across an area that has been subject to mechanical disturbance such as ripping.

Across the whole site there are various artefacts and pieces of building materials. Corrugated iron and other types of sheet metal are particularly common. Other artefacts include bottle glass, various ceramic fragments, tins, tent pegs, an enamel pot lid, and pieces of fibro cement. The artefacts appear to largely be indicative of 20th Century occupation. In addition to the building remains and surface artefacts there are a number of introduced plant species including oak, roses and at least one fruit tree (peach). The presence of these species is likely to be indicative of a domestic dwelling, which is further supported by the presence of bottle glass and ceramic fragments.

Overall the area appears to be relatively undisturbed, although the southern and western sides have been impacted to some extent by vehicular tracks. The possible building platform to the south of the sheep dip





also appears to have been subject to substantial disturbance, possibly associated with camping and/or bottle hunting activities.

Excavation potential across the site varies from fair to very good. It is probably highest across the area of the shearing shed and adjacent building to the north.

While it is unclear exactly how old this site may be, it appears to date to at least the first half of the 20th Century and possibly earlier. There is clearly evidence for sheds, animal yards and a sheep dip as well as some form of storage area that is possibly a magazine. The artefacts and flora are also indicative of a domestic residence, which suggests that the complex actually relates to a homestead and associated sheds and yards.

It is probable that the complex relates to the Willis family and possibly the activities of the Gibbs family.

## **2. JCH2 – Mine shaft**

**GPS (WGS84): 705178.6083390**

Located on the crest of a spur in the northeast of the study area there is a single mine shaft that was previously recorded by Kuskie (1989) as site H1. The shaft itself measures approximately 1.5 x 2 m and is around 15-20 m deep. There is a 6 x 6 m area of spoil built up around the shaft, this pile of spoil is up to 2 m high. There is a wooden stump in the spoil on the southern side of the shaft that may be either the remains of a dead tree or part of the headgear associated with the shaft. In addition there is a eucalypt that has grown out of the side of the shaft on the northern side. There are no artefacts visible on or adjacent to this item and there are no other obvious associated features nearby.

It is unclear what was being mined at this site, however given the depth of the shaft, amount of associated spoil and absence of other associated features, it is likely that this represents a relatively short lived and largely exploratory venture.

On the basis of the available history for Jumping Creek it is likely that this site relates to late 19th Century mining activities.

## **3. JCH3 – Limestone quarry**

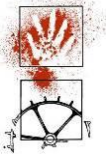
**GPS (WGS84): 705289.6082752 – 705336.6082696**

This site comprises a large limestone quarry and associated spoil heap in the far south-eastern corner of the study area; it was previously recorded by Kuskie (1989) as site H2. The quarry itself measures approximately 45 x 20 m and is around 8 m deep at its deepest point in the south-eastern end. There are no obvious signs of tool marks on the face of the quarry. From the entrance to the quarry, at the north-western end, there is a shallow road cutting that leads down to the remains of two lime kilns constructed of brick (JCH4). Immediately to the southwest of the quarry entrance (705289.6082752) there is a large area of spoil that measures approximately 20 x 15 m and is up to 5 m high. This area presumably relates to the dumping of quarried materials that were unsuitable for burning and was probably also used to break up the limestone prior to slaking.

Approximately 20 m to the north of this spoil area there is a shallow circular depression dug into the hillslope on the northern side of the access track (705313.608277). This feature is about 5 m across and is built up ca. 0.5 m on the south-western side. There is a large deciduous tree growing out of the centre of this feature. It is unclear what this feature may be, although it may have been a trial/temporary kiln area where the quarried limestone was burnt prior to construction of the nearby brick kilns.

This site is in good condition and shows minimal signs of disturbance. There is a car body dumped in the quarry and remains of a fence line around the quarry edge at the south-eastern end.

Given the apparent association between the quarry and JCH4 (see below) it is likely that this item relates to lime extraction during the late 1920s-1930s.



#### **4. JCH4 – Brick lime kilns**

**GPS (WGS84): 705221.6082866.**

This site was previously recorded by Kuskie (1989) as H4. It is located on the lower slopes on the north-eastern side of Jumping Creek, about 150 m northwest of the quarry entrance.

The site comprises two kilns measuring between 3.0 m and 2.6 m long and 2.4 m wide. Both kilns are built into the hillslope with spoil built up around the western and eastern sides. Along the southern face the exterior of the eastern kiln, which is the larger of the two, is visible as a wall of brick with limestone buttressing at the south-eastern corner. The brickwork is 2.5 m high; it is laid in Flemish bond and is braced with pieces of railway track and wooden posts. Much of the wall is in poor condition with many of the bricks missing. At the base of the wall there are two arched apertures that formed the flues for the kiln. Kuskie (1989) describes an identical pair of flues on the western kiln.

The track from the quarry leads around the northern side of the kilns and curves down around the south before apparently re-joining the path to the quarry. It appears that both kilns were loaded with limestone from the road on the northern side and that the slaked lime was then removed via the flues on the southern side.

A small area of burnt lime is visible on a vehicle track to the west of the kilns (705205.6082881). It is assumed that this relates to an area in which the slaked lime was store or packaged prior to delivery.

The kilns themselves appear to be in fair condition, although both are very heavily overgrown. It is unclear whether there are remains of additional structures located in areas adjacent the kilns. The kilns and the surrounding area are likely to have very good excavation potential.

#### **5. JCH5 – Limestone quarries**

**GPS (WGS84): 704733.6083200 & 704696.6083262**

Located on the western bank of the creek at the confluence of Jumping Creek and its northern tributary (704733.6083200) there is a substantial limestone cliff that appears to have been exploited as a quarry. This location corresponds to the previously recorded site H7 (Kuskie 1989).

The cliff is approximately 8 m high and 20 m long. There is an area about 10 m wide in front of the cliff that is littered with broken limestone and some modern building rubble. This area appears to correspond to the quarried section of the cliff and was presumably also used for processing, or breaking up, the quarried limestone.

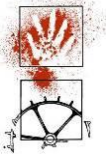
To the north of this area there is an overgrown track that leads past item JCH6 and continues up around the hill to the northwest. Approximately 60 m to the northwest of this quarry there is a cutting into the hillside that measures ca. 15 x 20 x 3 m (704696.6083262). This area is quite overgrown; however there appear to be a number of limestone blocks in and around the feature. The abovementioned path winds around the north-eastern side of this feature, which corresponds with the entrance to the cutting. It is possible that this area also contains the remains of a limestone quarry, although that could only be confirmed through more detailed survey, including some vegetation clearance.

Both of these apparent quarry features are situated within 40 m of item JCH6 (see below) and both are located adjacent a path that links all three features and continues northwest out of the study area towards Queanbeyan.

#### **6. JCH6 – Lime kiln**

**GPS (WGS84): 704736.6083248**

Situated almost equidistant between the two limestone quarries described above there is a circular stone-lined pit built into the hillslope on the eastern side of the track that joins the three features and immediately



west of the existing vehicular track. This pit measures approximately 5 m across and 1.5 m deep, it is heavily overgrown with blackberries and as such the front of the structure could not be recorded. Nevertheless, on the south-eastern side there is a level area that appears to have been culturally formed. The stone used to line the pit is local limestone rubble.

Given the problems of visibility it is difficult to be certain about the function and age of this site. It does however appear likely to be the remains of a lime kiln, a hypothesis that is supported by the association with the track and quarries. As with the brick lined kilns at JCH4 this site has access from the road on the upslope side and a potential area for storage and packaging of slaked lime adjacent on the downslope side.

Additional survey work, including vegetation clearance, would be necessary at this site and the adjacent features that comprise JCH5 in order to clarify the nature of these items. Nonetheless, the evidence does suggest that this complex may relate to the extraction and burning of limestone that was undertaken by the Gibbs brothers in the 19th Century, which would make it the oldest known limestone kiln in the local area. Given the general proximity to JCH1 it is possible that all of these features relate to the pastoral and industrial activities of the Gibbs family. This possibility would also potentially explain the function of the concrete pit at JCH1, which may then have been a powder magazine for storing explosives used in the quarrying process.

This site appears to be in relatively good condition despite being so overgrown, it displays good excavation potential.

## **7. JCH7 – Mine workings**

**GPS (WGS84): 705028.6082899 – 704944.6083027**

This recording comprises a series of mining features over an area measuring 170 m north–south and 60 m east–west. Within this area there are various pits, adits and an open-cut mine; the latter corresponding to the open quarry recorded by Kuskie (1989) as site H6.

Along the eastern margin of this area there are three areas of diggings with associated mullock heaps. The southernmost is a 5–8 m wide cutting (705028.6082899) that runs downslope with mullock piled at the bottom, the next is a cutting measuring ca. 10 x 5 m (704999.6082959) that is very overgrown. At the northern end there is a larger area of workings (704997.6082985 – 705001.6083021) with what appears to be an adit leading in from the north and a pile of mullock stacked on the eastern side. The diggings extend for approximately 40 m in length and average about 5 m in width.

Approximately 20–30 m west of these workings there is a large open area cutting (704976.6082949 – 704944.6083027) that extends for about 80 m north–south and around 20 m across. Along the centre of this feature there is an outcrop of bedrock extending north–south that presumably relates to the ore lode that was being exploited.

This feature appears to be the shallow pit referred to by Boot and Heffernan (1989), although presumably it is related to the early 20th Century mining of lead, copper, zinc and gold documented by IT Environmental (1999).

All of these diggings are situated in close proximity to the processing area (JCH8) and associated camp site (JCH9), which appear to be dominated by building materials and artefacts indicative of 20th Century occupation.

As a whole the diggings are in good condition.

## **8. JCH8 – Ore processing area**

**GPS (WGS84): 704921.6083072**

Immediately to the north of the open-cut diggings there are the remains of three relatively large structures that are described by Kuskie (1989) as H5: structures A, B and C. Kuskie interprets these features as stock





yards and troughs. As noted by IT Environmental (1999) this area actually appears to be the processing area for the adjacent mine.

The complex covers an area of some 60 x 60 m. The three main structures are evidenced by brick and concrete footings and drainage channels and the timber remains of the building frame. In addition there are the remains of concrete pads, sections of fencing and remains of a smaller stone structure on the north-eastern side.

The building remains appear to be in a relatively stable condition, although they are all very heavily overgrown. The extent of vegetation precluded any more detailed survey.

Artefacts visible across the surface included mass produced bricks, galvanised corrugated iron, glass fragments and bullet head nails. All of these items are indicative of a 20th Century site, which suggests that this is indeed the processing area for the early 20th Century lead, copper, zinc and gold mining documented by IT Engineering (1999).

This complex is relatively undisturbed and displays good excavation potential.

## **9. JCH9 – Miners' camp**

**GPS (WGS84): 704918.6083130**

Immediately to the north of the track that extends around the northern side of JCH8 there is a level area above the creek that displays evidence of human occupation. The area measures approximately 30 x 20 m and there are the remains of at least one building, which is evidenced by an ephemeral earth platform (c. 4 x 4 m) with remnants of stone footings and a possible hearth area. Additional more ephemeral platforms may be present, particularly to the north where the vegetation becomes very thick and obscures visibility.

Artefacts are scattered over the area and include handmade, wire and rhomboid head nails, bottle glass, brown and white glaze ceramics and buckles from saddlery or clothing. The artefacts appear to be representative of late 19th to early 20th Century occupation.

The area is relatively undisturbed and displays good excavation potential, particularly across the identified structure. The presence of additional features with excavation potential could only be confirmed by more detailed survey and vegetation clearance.

It is assumed that this site is the miners' camp for the adjacent mine and processing area.

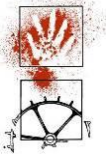
## **10. JCH10 – Mine shafts**

**GPS (WGS84): 704509.6082662 – 704522.6082672**

This recording is located on the western slopes of a drainage line in the southwest of the study area; it comprises two mine shafts that appear to correspond with those described by Boot and Heffernan (1989).

Each shaft measures around 2 m across and is surrounded by a low mound of spoil that extends around 5–8 m across. The eastern-most shaft appears to be around 15 m deep while the western one is somewhat smaller.

Given the size of the shafts they probably represent short term mining or prospecting activity. It is possible that they are also associated with mine workings at JCH13 and/or the nearby domestic site at JCH11.



## 11. JCH11 – Domestic site

**GPS (WGS84): 704480.6082728**

Situated at the northern end of the ridge on which features JCH10 and JCH13 are located there are the remains of several structures and a series of earthworks.

The main building remains are located in the southwest of the complex (704476.6082727) and comprise an overgrown L-shaped platform with stone footings and a possible hearth at the eastern end. In addition to the stone footings there are a few hand pressed bricks scattered around the northern side of the platform, where there are also various pieces of machinery. A couple of metres to the southeast of the platform there is a circular feature measuring approximately 2 m across, with stones around the northern half. This feature is set into the ground slightly. A few metres further to the southeast there is a small pile of burnt lime and to the north of this there are more ephemeral structural remains including a line of stones along the eastern margin of a level area of ground.

To the northeast of this cluster of features there are a series of earthworks (704483.6082753 – 704490.6082774 – 704524.6082733). There is a large level platform in the southwest with a stone retaining wall along the western margin and a series of narrow terraces extending off to the east and the north. It is unclear what this area was used for, although it may have been either an agricultural or industrial area.

Given the proximity to items JCH10 and JCH13, both of which are mining sites, it is possible that the complex as a whole is the residential area for those working the mines. The terraces may thus be the gardens and fields for the residence or a form of processing area associated with the mines. The circular stone feature may either be the footings for a water tank, the remains of a basic form of lime kiln or a similar type of structure.

There are very few artefacts visible on the surface at this site. Aside from the bricks and machinery pieces there are the remains of a brown two-piece moulded alcohol bottle and a few fragments of ceramic. It is difficult to ascertain a date range based on these sparse items, however the site may relate to occupation during the late 19th through to the early 20th Century.

Overall the site is quite well preserved, if a little overgrown. The main structure and the associated circular feature both display very good excavation potential.

## 12. JCH12 – Building material dump

**GPS (WGS84): 704633.6083356**

Kuskie (1989) recorded a collection of galvanised and corrugated iron sheeting (Site H9) below and to the east of Aboriginal site JCV8. During this survey the exact location of H9 could not be ascertained, possibly because the metal sheeting has been moved during the intervening 20 years. In any case, a corrugated iron tank and a rubbish area dominated by metal sheeting were located in the gully to the west of JCH1.

None of these materials appear to be *in situ* as such. Given the proximity to JCH1 it is probable that these items are remains of the sheds and other buildings that once stood nearby. It is presumed that the materials recorded by Kuskie were similarly remains of structures from that complex.

## 13. JCH13 – Mine diggings

**GPS (WGS84): 704415.6082503 – 704418.608590**

In the far south-western corner of the study area there is a long shallow cutting located on the centre of the spur crest, approximately 150 m southwest of JCH10. This cutting is similar to that identified at JCH7 and is presumed to be a similar sort of open-cut mine.

The cutting itself is about 30 m wide, 90 m long and around 1–2 m deep; some spoil is built up at the northern end of the feature.



There are no artefacts obvious on the surface and no other features adjacent.

Given the proximity to JCH10 and possible associations with JCH11 it is possible that these three features relate to the same mining activities. It is presumably the shallow prospecting cutting referred to by IT Environmental (1999).





## **APPENDIX 4**

### **HERTIAGE LISTING**



04/01/2017

Marchiori's Lime Kiln and Quarry | NSW Environment &amp; Heritage

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## Marchiori's Lime Kiln and Quarry

### Item details

<b>Name of item:</b>	Marchiori's Lime Kiln and Quarry
<b>Type of item:</b>	Archaeological-Terrestrial
<b>Group/Collection:</b>	Manufacturing and Processing
<b>Category:</b>	Kiln Lime
<b>Primary address:</b>	South East Corner, Greenleigh, NSW
<b>Local govt. area:</b>	Queanbeyan

### All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
South East Corner	Greenleigh	Queanbeyan			Primary Address

### Statement of significance:

Marchiori's lime kiln and quarry are significant for their important association with the construction of both Queanbeyan and the nation's capital in the late 1920s, 1930s and early 1940s. The kiln has technical significance for its ability to demonstrate lime burning techniques in the early to mid twentieth century.

Each of the kilns is considered to be significant and worthy of listing in the local heritage schedule

**Date significance updated:** 18 Nov 11

*Note: There are incomplete details for a number of items listed in NSW. The Heritage Division intends to develop or upgrade statements of significance and other information for these items as resources become available.*

### Description

**Physical description:** A brick and stone kiln built into the side of the creek embankment. The front of the kiln has two semicircular openings at ground level. The chamber behind is approx 2.4m deep and about 3 m wide to a height of about 2 m. The front wall is about 600 mm thick. The kiln is heavily overgrown with blackberry. A contemporary photograph shows a low structure or wall above and behind the kiln. The remains of pathway lead back up to the quarry approx 100 metres to the south. The quarry is about 60 m long, 15 m wide and about 10 m deep (guestimates only). Off to the side is a large mound of spoil.

**Further information:** Only the Marchiori kiln has been surveyed as part of this study.

Check if other kilns have been entered.

### History

**Historical notes:** The subject of lime kilns in the local area has been covered by Brendan O'Keefe in 'Limburners of the Limestone Plains and beyond, 1833-1943', Canberra Historical Journal, new series no. 34, September 1994, pp. 16-26. The article includes photographs of the kilns.

Marchiori's kiln was initially established by Italian immigrant F Petralia in 1924-5 who provided lime to the Canberra market as well as Queanbeyan. Petralia sold his limeburning, terrazzo and marble business to a man named Zimmery who in turn sold it to a partnership of Arminio Marchiori, Caprin and another man in 1928. (Marchiori had emigrated from Italy in 1924, settling in Queanbeyan about 1928 with his wife Edvige and son John). The partnership dissolved shortly afterwards and Marchiori ran the limeburning, terrazzo and fibrous plaster business on his own. In the late 1920s Marchiori built a second kiln attached to the northern

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## Marchiori's Lime Kiln and Quarry | NSW Environment & Heritage

side of Petralia's original kiln, thus forming a double structure. With the closure of other limeburning operations in the area around 1930, Marchiori became the sole remaining supplier of lime in the Canberra Queanbeyan area. The lime was hauled to the Federal Capital in his 30 hundredweight Chevrolet truck where it was used not only in construction, but as a fertiliser on Canberra's gardens and as a purifying agent in sewerage treatment. The limeburning operation closed in about 1943.

Other lime kilns of interest are:

The 1860-70s kiln of John and William Gibbs in Jumping Creek Valley.

The kiln of Moses Morley, now on the CSR Readymix site south of Queanbeyan. The kiln, which operated from 1876-77 through to the early 1900s, stands on either Portion 103 or 104 of the Parish of Googong.

The 1920s kiln of Charles T. Beazley at White Rocks on the Queanbeyan River.

Most, if not all, of these kilns stand within the old Queanbeyan City Council area.

### Historic themes

Australian theme (abbrev)	New South Wales theme	Local theme
3. Economy-Developing local, regional and national economies	Industry-Activities associated with the manufacture, production and distribution of goods	(none)-

### Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Local Environmental Plan					

### Study details

Title	Year	Number	Author	Inspected by	Guidelines used
Queanbeyan Heritage Survey - 2010	2010		Pip Giovannelli		Yes

### References, internet links & images

None

Note: internet links may be to web pages, documents or images.



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04/01/2017

Marchiori's Lime Kiln and Quarry | NSW Environment & Heritage

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### Data source

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**Name:** Local Government

**Database number:** 2290484

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## **APPENDIX 5**

### **STATUTORY AND POLICY CONTEXT<sup>1</sup>**

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<sup>1</sup> The following information is provided as a guide only. Readers are advised to seek qualified legal advice relative to legislative matters.



## National Parks and Wildlife Amendment Bill 2010

The National Parks and Wildlife Amendment Bill 2010 (also known as the Omnibus Bill), was implemented on 1 October 2010 to amend the *National Parks and Wildlife Act 1974* (NPW Act). Existing offences relating to Aboriginal objects and places were replaced with new offences, including a strict liability offence, along with offence exemptions and defences.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and declared Aboriginal places by establishing offences of harm. Harm is defined to mean destroying, defacing, damaging or moving an object from the land. There are a number of defences and exemptions to the offence of harming an Aboriginal object or place. One of the defences is that the harm was carried out under an Aboriginal Heritage Impact Permit (AHIP).

In practice, archaeologists use a methodology that groups 'Aboriginal objects' into various site classifications according to the nature, occurrence and exposure of archaeological material evidence. The archaeological definition of a site may vary according to survey objectives; however a site is not recognised or defined as a legal entity in the NPW Act.

It should be noted that even single and isolated artefacts are protected as Aboriginal objects under the NPW Act.

In 2010 the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* was adopted by clause 3A of the National Parks and Wildlife Regulation 2009 (NPW Regulation). The code allows for the subsurface test excavation of Aboriginal objects without the need for an AHIP. The code establishes the requirements for undertaking test excavation without an AHIP and establishes the requirements that must be followed when carrying out archaeological investigation in NSW where an application for an AHIP is likely to be made.

Additional amendments that commenced on 1 October 2010 include the introduction of new processes for AHIP applications, consultation guidelines to support the AHIP application process, and mechanical provisions such as the transfer and variations of conditions of AHIPs.

## NSW Heritage Act 1977 and Heritage Amendment Acts 1998 and 2009

The purpose of these Acts is to ensure that the heritage of NSW is adequately identified and conserved. In practice the Acts have focused on items and places of non-Indigenous heritage to avoid overlap with the NPW Act, which has primary responsibilities for nature conservation and the protection of Aboriginal relics and places in NSW.

The *Heritage Amendment Act 1998* came into effect in April 1999. The Act instigated changes to the NSW heritage system, which were the result of a substantial review begun in 1992. A central feature of the amendments was the clarification and strengthening of shared responsibility for heritage management between local government authorities, responsible for items of local significance, and the NSW Heritage Council. The Council retained its consent powers for alterations to heritage items of State significance.

The *Heritage Amendment Act 2009* came into effect in October 2009. The Act includes greater fairness and rigour in the heritage listing process while retaining key elements of the current system, including local and State listings, and the Heritage Council.

One of the changes to the former Heritage Act has been the move from the arbitrary 50 year age-based definition for archaeology, to one based on significance where relics have to demonstrate local or State significance.

Under the *Heritage Act 1977* a 'relic' had been defined as any deposit which related to the European settlement of NSW and was 50 years old or more. This broad definition captured too many items – many of which would not generally be considered part of the State's archaeological heritage. This approach brings archaeological heritage management more consistently within the management of other heritage items,





which is based on an assessment of significance. The previous definition of archaeological relic encompassed a significant number of items over 50 years of age that had no heritage value.

The Heritage Act is concerned with all aspects of conservation ranging from the most basic protection against damage and demolition, to restoration and enhancement. It recognises two levels of heritage significance – State and Local significance – across a broad range of values.

Some key provisions of the Act are:

- the establishment and functions of the Heritage Council (Part 2);
- Interim Heritage Orders (Part 3), the State Heritage Register (Part 3A);
- Heritage Agreements (Part 3B);
- environmental planning instruments (Part 5);
- the protection of archaeological deposits and relics (Part 6); and
- the establishment of Heritage and Conservation Registers for State government owned and managed items (Part 7).

Generally this Act provides protection to items that have been identified, assessed and listed on various registers including State government section 170 registers, local government Local Environmental Plans and the State Heritage Register. The Interim Heritage Order provisions allow the minister or his delegates (local government may have delegated authority) to provide emergency protection to threatened places which have not been previously identified.

In addition, the Act includes provisions which relate to the definition and protection of relics.



## **APPENDIX 6**

### **SALVAGE METHODOLOGY**

# **DRAFT**

To be finalised following DA approval and prior to AHIP application



A total of 35 recorded Aboriginal site locations will be directly impacted by the project. Impacts will occur from the construction of the Residential subdivision as well as rehabilitation actions within Jumping Creek. As well as individual site locations the archaeological resource within the Jumping Creek project area is best described as a site complex with an uneven distribution of artefacts across the whole project area. Any artefacts location within the Residential subdivision as well as rehabilitation areas will be impacted.

The test excavation program has found that there are subsurface archaeological deposits found in the project area in the following landforms:

- spur line crests;
- saddle/drainage lines;
- flats; and
- adjacent to Jumping Creek.

## A6.1 Archaeological Collection Program

All Aboriginal artefact occurrences within Jumping Creek that will be directly impacted by the project will be searched for and collected. This will be undertaken prior to the start of construction. The sites are:

Site Name	AHIMS #	Anticipated impact
SU1/L2 (JC14)	57-2-0079	Residential
SU2/L1 (JCV14)	57-2-0088	Riparian corridor rehabilitation
SU2/L2	57-2-0610	Residential
SU2/L3	57-2-0611	Residential
SU2/L4	57-2-0612	Residential
SU2/L5 (JC8)	57-2-0073	Residential
SU3/L1	57-2-0613	Residential
SU4/L1 & SU5/L1 (JC6)	57-2-0071	Riparian corridor rehabilitation
SU6/L1	57-2-0614	Residential
SU6/L2 (JC7)	57-2-0072	Residential
SU7/L1 & SU12/L1 (JC4)	57-2-0069	Residential
SU10/L1	57-2-0615	Residential
SU10/L2	57-2-0616	Residential
SU11/L1	57-2-0617	Residential
SU13/L1 (JCV15)	57-2-0089	Trail remediation
SU15/L3	57-2-0613	Trail remediation
SU17/L1 (SU15 and 16)	57-2-0080 57-2-0081	Residential
SU17/L1 (JC16)	57-2-0081	Residential
SU17/L1 (JC17 and 18)	57-2-0083 57-2-0082	Mine rehabilitation
SU18/L1	57-2-0622	Riparian corridor rehabilitation, Trail remediation
SU18/L2	57-2-0623	Riparian corridor rehabilitation
SU19/L1 (JC11)	57-2-0076	Erosion rehabilitation
SU19/L2 (JC10)	57-2-0075	Residential
ED7	57-2-0945	Residential
JC 18-1	57-2-1092	Trail remediation
JC 18-2	57-2-1091	Residential
JC 18-3	57-2-1090	Riparian corridor rehabilitation
JC 18-4	57-2-1089	Residential
JC 18-5	57-2-1088	Residential
JC5	57-2-0070	Riparian corridor rehabilitation





Site Name	AHIMS #	Anticipated impact
JCR1	57-2-0634 57-2-0684	Erosion rehabilitation
JCR12/14	57-2-0682	Earthworks, trail remediation and Erosion rehabilitation
JCR2	57-2-0635 57-2-0683	Residential
JCV 3	57-2-0086	Riparian corridor rehabilitation

The distribution of artefacts across each site will be recorded by GPS and or *Total Station*, a photograph will be taken with survey flags/markers marking the surface artefact and artefacts will be collected, bagged individually and labelled.

## A6.2 Vegetation Removal

As much of the salvage area is currently covered in woody weeds, such as blackberries, a program of vegetation removal will be undertaken prior to the conduct of any salvage excavation works. Woody weeds will be removed using mechanical methods with as minimal ground disturbance as possible.

Following weed removal, the areas will once again be inspected for surface artefacts and artefacts collected.

## A6.3 Salvage Excavation Methodology

The salvage excavation will be undertaken as a two-phase approach.

### Phase 1

A series of 25 transects will be completed across the areas identified in Figure A6.1. Phase 1 transects will be placed every 20 m in areas of residential development and every 40 m in areas of Rehabilitation/Remediation, in some small remediation locations only 1 pit will be excavated, such as in landform area 20. Salvage pits will be 1 x 1 m and will be conducted every 10 m along each transect, with each pit offset 5 m from the pit on the adjacent transect. A total of approximately 480 salvage pits are planned to be excavated.

Additional transects and/or transect extensions may be placed according to an archaeological appreciation of the results from the initial pits.

### Phase 2

Subsequent pits and/or additional salvage areas adjoining the area of those finds (open area excavation) will be excavated according to an archaeological appreciation of the results from the initial Phase 1 pits. In the event that one or more of the following elements are encountered in the initial pits, then additional salvage areas adjoining the area of those finds will be excavated:

- artefact incidences of high density are encountered within a context which warrants further investigation or salvage. High density occurrences are defined as 10 or more artefacts;
- any level of artefact incidence within a stratigraphic or pedological context which warrant further investigation;
- *in situ* bone material relating to Aboriginal occupation;
- the remains of a hearth in a relatively undisturbed condition;
- a lithic flaking floor in a relatively undisturbed condition;



- an arrangement of stones (showing evidence of deliberate placement by a human agency) in a relatively undisturbed condition; or
- a dense layer or lens of cultural material.

Open area excavation will also be conducted around the test trenches that contained high artefact numbers and will be directly impacted. These are areas 2, 4 and 5 (east and west).

Approximately 20, 1 x 1 m test pits will be combined in any one salvage location to explore the distribution artefacts across the location, salvage excavation will attempt to follow higher artefact numbers. It is estimated that up to 60(m<sup>2</sup>) salvage pits will be excavated.

### Excavation Sequence

1. Conduct initial surface inspection of test area to establish premium locations for a series of test pits.
2. Excavate salvage pits.

380 1 x 1 m pits are planned to be excavated initially along 18 transects.

Subsequent pits or pit extensions, will be conducted according to an appreciation of the results from the initial salvage pits.

Pits will be excavated using standard by-hand archaeological methodologies including vertical and horizontal recording of spit levels and sedimentary, cultural and stratigraphic features.

Tools employed for excavation will include brushes, spades, trowels, mattocks, picks, shovels, buckets and pans. Where it is necessary to excavate highly compacted, hard or stony deposit, a hand-operated pneumatic drill/hammer will be employed.

We anticipate that pits will not exceed 500 mm in depth.

Indicative spit intervals will be 10 cm, but may be larger or smaller depending on pit specific assessments and conditions.

A handheld GPS will be used to document each test pit location, and records will include photographic records of each site prior to and during excavation and may include site plans and test pit sections.

Excavation would continue until bedrock or archaeologically sterile layers were encountered.

3. Where cultural features are identified, such as heat treatment pits or hearths, detailed plans will be drawn and samples of dateable material will be obtained.
4. All excavated archaeological deposit will be wet sieved. All material will be sieved through 4 x 4 mm mesh, with use of a top larger mesh (10 x 10 mm) where appropriate. All identified or suspected cultural material recovered from sieving will be retained, bagged and labelled.
5. All pits will be backfilled with the remaining excavated and sieved spoil. Where and as necessary, clean material will be sourced separately to allow backfilling of pits.
6. Following cessation of excavation, the face of one or both sides of a sample of pits or sections from the open area excavation will be cleaned and the stratigraphic, geomorphological and pedological characteristics of the soil profile described and checked with the separately documented incremental spit descriptions. PH measurements may be taken from representative pits at various vertical increments down the profile. The soil profile will be photographed, and where appropriate, also drawn and measured.
7. Where necessary pits and open areas of excavation will be fenced to exclude stock prior to backfilling.



## **Lithic Analysis**

All lithic items recovered from archaeological test pits will be examined in detail by a suitably qualified lithic specialist, such as Dr Tessa Bryant, using a low-power binocular microscope and incident illumination and/or hand lens.

Descriptive recording of collected material will be to a level concomitant with the stated aims of the investigation, and the number of artefacts recovered.

A basic analysis of lithic technology variables within the sample assemblage, such as rock type, lithic types, size distribution, utilisation and secondary flaking characteristics, etc., will be conducted to a level concomitant with the stated aims of the investigation, and will include as a minimum: artefact numbers, artefact size (length, width, thickness), artefact material, artefact type/tool form/typology, platform surface and type, termination type, and cross section. Use wear and residue analysis will be undertaken, should cultural objects be recovered that exhibit this potential and where this type of analysis would provide meaningful information for analysis.

## **Post-testing Management of Recovered Objects**

All recovered objects will be temporarily stored at the NOHC lab (Wollongong Street, Fyshwick ACT).

## **Reporting**

The results of the salvage will be presented in a salvage report. The report will also provide an updated assessment of heritage significance for the investigated sites (including RAP perspectives on cultural significance), a heritage impact assessment for the Project, and recommendations for any final heritage investigations or salvage (including collection of surface artefacts and any other final works).

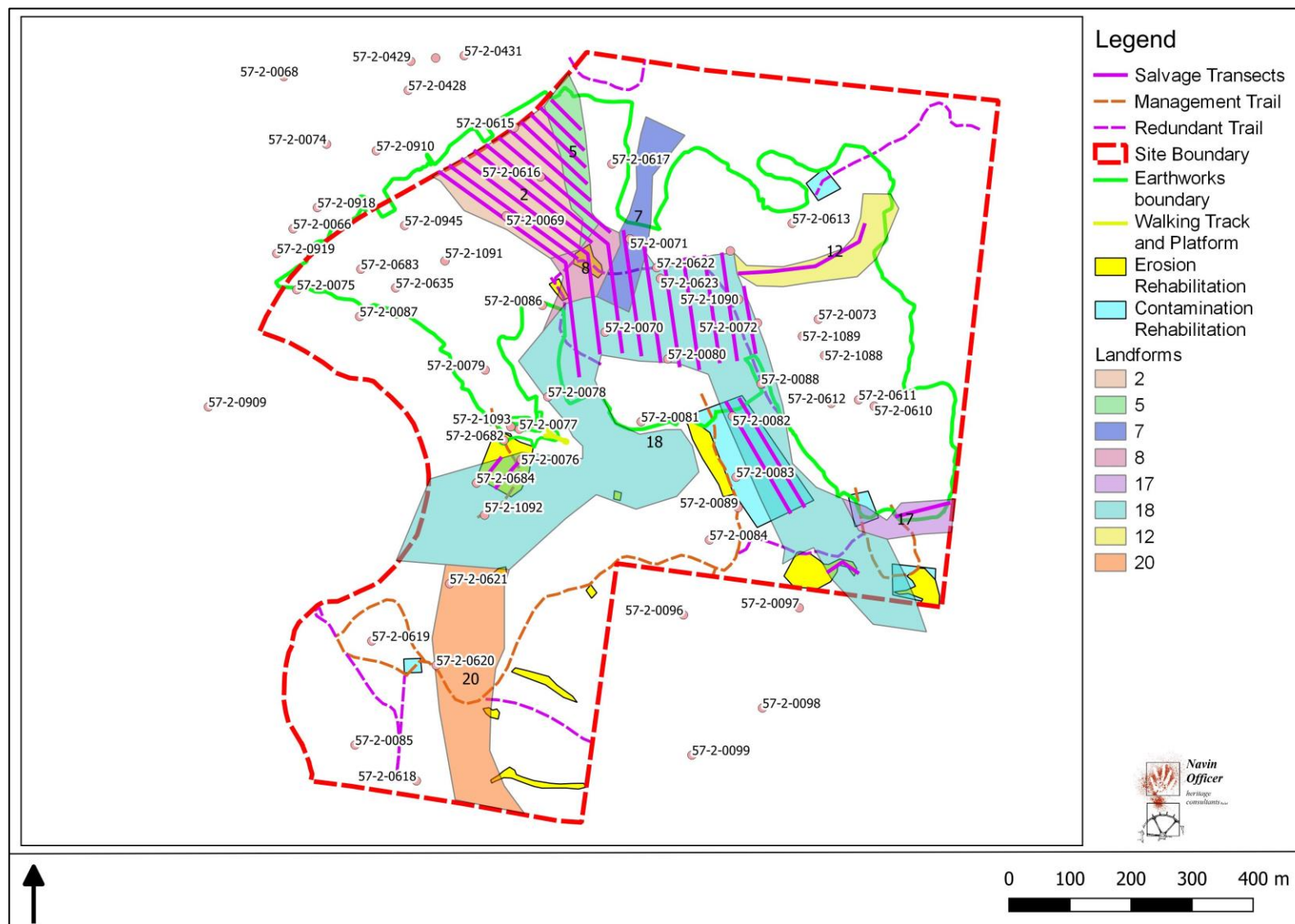
## **A6.4 Return to Country Protocol**

All artefacts recovered from the test excavation and the subsequent salvage excavation and collection will be curated as follows.

All artefacts will be placed in the return location decided upon following consultation with the RAPs; this is where artefacts have also been returned from the test excavation program. The artefacts will be placed once construction has concluded so that no inadvertent impact can occur to the artefacts

The reburial location will be recorded on an AHIMS site card and lodged with AHIMS.





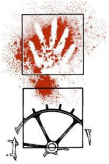
**Figure A6.1 Indicative layout of phase 1 salvage transects**



## **APPENDIX 7**

### **UNANTICIPATED DISCOVERY PROTOCOLS**

Restricted Version



## **Protocol to follow in the event that Aboriginal object(s) or historical relics (other than human remains) are encountered and no AHIP has been approved**

In the event that object(s) which are suspected of being Aboriginal object(s) or relic(s) are encountered during development works, then the following protocol will be followed:

1. Cease any further excavation or ground disturbance, in the area of the find(s):
  - a. The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be temporarily halted; and
  - b. The site supervisor and the Principal will be informed of the find(s).
2. Do not remove any find(s) or unnecessarily disturb the area of the find(s).
3. Ensure that the area of the find(s) is adequately marked as a no-go area for machinery or further disturbance, and that the potential for accidental impact is avoided.
4. Note the location and nature of the finds, and report the find to:
  - a. Relevant project personnel responsible for project and construction direction and management, and
  - b. Report the find to the Office of Environment and Heritage (OEH).
5. Where feasible, ensure that any excavation remains open so that the finds can be recorded and verified. An excavation may be backfilled if this is necessary to comply with work safety requirements, and where this action has been approved by the OEH. An excavation that remains open should only be left unattended if it is safe and adequate protective fencing is installed around it.
6. Following consultation with the relevant statutory authority (OEH), and, where advised, any other relevant stakeholder groups, the significance of the finds should be assessed and an appropriate management strategy followed. Depending on project resources and the nature of the find(s), this process may require input from a consulting heritage specialist.
7. Development works in the area of the find(s) may re-commence, if and when outlined by the management strategy, developed in consultation with, and approved by the relevant statutory authority.
8. If human skeletal material is encountered, the protocol for the discovery of human remains should be followed (refer attached).



## Protocol to follow in the event of the discovery of suspected human remains

The following protocol will be actioned if suspected human material is revealed during development activities or excavations:

1. All works must halt in the immediate area of the find(s) and any further disturbance to the area of the find(s) prevented.
  - a. The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted; and
  - b. The site supervisor and the Principal/Project manager will be informed of the find(s).
2. If there is substantial doubt regarding a human origin for the remains, then consider if it is possible to gain a qualified opinion within a short period of time. If feasible, gain a qualified opinion (this can circumvent proceeding further along the protocol for remains which are not human). If conducted, this opinion must be gained without further disturbance to the find(s) or the immediate area of the find(s). (Be aware that the site may be considered a crime scene that retains forensic evidence.) If a quick opinion cannot be gained, or the identification is positive, then proceed to the next step.
3. Immediately notify the following of the discovery:
  - a. the local Police (this is required by law);
  - b. an OEH archaeologist or Aboriginal Heritage Officer NSW OEH;
  - c. representative(s) from the Local Aboriginal Land Council; and
  - d. the project archaeologist (if not already notified).
4. Co-operate with and be advised by the Police and/or coroner with regard to further actions and requirements concerning the find area. If required, facilitate the definitive identification of the material by a qualified person (if not already completed).
5. In the event that the Police or Coroner instigate an investigation, construction works are not to resume in the designated area until approval in writing is gained from the NSW Police.
6. In the event that the Police and/or Coroner advise that they do not have a continuing or statutory role in the management of the finds then proceed with the following steps.
7. If the finds are not human in origin but are considered to be archaeological material relating to Aboriginal occupation then proceed with Protocol for the discovery of Aboriginal objects (other than human remains).
8. If the finds are Aboriginal or probably Aboriginal in origin:
  - a. Ascertain the requirements of OEH, the Heritage Branch, the Project Manager, and the views of the Aboriginal organisations, and the project archaeologist.
  - b. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following:
    - i. avoiding further disturbance to the find and conserving the remains *in situ*;
    - ii. conducting archaeological salvage of the finds following receipt of any required statutory approvals;
    - iii. scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial;





- iv. recovering samples for dating and other analyses; and/or
  - v. subsequent reburial at another place and in an appropriate manner determined by the AFG.
9. If the finds are non-Aboriginal in origin:
- a. Ascertain the requirements of the Heritage Branch, Project Manager, and the views of any relevant community stakeholders and the project archaeologist.
  - b. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following:
    - i. avoiding further disturbance to the find and conserving the remains *in situ*;
    - ii. conducting archaeological salvage of the finds following receipt of any required statutory approvals;
    - iii. scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial;
    - iv. recovering samples for dating and other analyses; and/or
    - v. subsequent reburial at another place and in an appropriate manner determined in consultation with the Heritage Office and other relevant stakeholders.
10. Construction related works in the area of the remains (designated area) may not resume until the proponent receives written approval in writing from the relevant statutory authority: from the Police or Coroner in the event of an investigation, from OEH in the case of Aboriginal remains outside the jurisdiction of the Police or Coroner, and from the Heritage Branch in the case of non-Aboriginal remains outside of the jurisdiction of the Police or Coroner.



## **APPENDIX 8**

### **PIT EXCAVATION RECORDS**

Restricted Version



## Pit Excavation Records

### Test Area 1

Pit	Spit	Description
E100 N050	Surface	Rocky surface with some gravel and leaf litter some exposed bedrock in surrounding areas.
	1 (5 cm)	Silty brown loam with gravels and bedrock in patches, uneven change.
	2 (10 cm)	Onto slatey shaley bedrock. Undulating. <i>Note: pit excavated at 5 cm spits.</i> Excavation ceased at 10 cm.
E105 N050	Surface	Silty gravelly loam and some leaf litter.
	1	Yellow brown gravelly silt onto bedrock. Excavation ceased at 6–10 cm.
E110 N050	Surface	Eroded surface with outcropping bedrock and some gravels.
	1	Onto bedrock, yellow brown silty gravel, degrading bedrock. Uneven base. Excavation ceased at 10 cm.
E115 N050	Surface	Outcropping bedrock and yellow brown gravelly silt.
	1	Yellow brown gravelly silt onto bedrock. Excavation ceased at 3 cm.
E120 N050	Surface	Sparse weeds and outcropping bedrock amongst gravels.
	1	Onto bedrock. Some brown silt in voids of bedrock. Uneven base. Excavation ceased at 10 cm.
E125 N050	Surface	Sparse weeds onto gravelly silt.
	1	Silty gravel onto bedrock. Excavation ceased at 6 cm.
E130 N050	Surface	Sparse weeds onto gravelly silt, outcropping bedrock adjacent to pit.
	1	Brown gravelly silt onto bedrock. Excavation ceased at 7–10 cm.
E135 N050	Surface	Sparse weeds onto gravelly silt.
	1	Yellow brown gravelly silt onto bedrock. Excavation ceased at 5–9 cm.
E140 N050	Surface	Sparse weeds onto brown silty loam.
	1	Brown silty gravel onto bedrock. Uneven base. Excavation ceased at 5–10 cm.
E145 N050	Surface	Sparse weeds onto yellow brown gravelly silt.
	1	Yellow brown gravelly silt onto bedrock. Excavation ceased at 4–8 cm.
E150 N050	Surface	Some bedrock onto gravelly silty loam.
	1	Yellow brown gravelly silt onto bedrock. Excavation ceased at 1–7 cm.
E125 N030	Surface	Sparse weed onto gravelly silt.

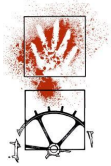


Pit	Spit	Description
	1	Gravelly silt onto bedrock. Excavation ceased at 2–10 cm.
E125 N035	Surface	Blackberries grass and weeds etc.
	1	Brown silty loam, soft lower gravel content onto bedrock. Uneven base. Excavation ceased at 10 cm.
E125 N040	Surface	Sparse weeds onto gravelly silt. <i>Note: Pit offset by 7 cm to get off track</i>
	1	Brown red clayey gravel onto bedrock. Uneven base. Broken glass noted. Excavation ceased at 1–8 cm.
E125 N045	Surface	Sparse weeds onto gravelly silt.
	1	Gravelly silt onto bedrock. Excavation ceased at 10 cm.
E125 N055	Surface	Sparse weeds onto yellow brown gravelly silt.
	1	Yellowy brown gravelly silt onto bedrock. Excavation ceased at 10 cm.
E125 N060	Surface	Sparse weeds onto gravelly silt.
	1	Gravelly silt onto slatey bedrock. Excavation ceased at 5–8 cm.
E125 N065	Surface	Sparse weeds onto yellow brown gravelly silt.
	1	Yellowy brown gravelly silt onto bedrock. Excavation ceased at 6–10 cm.
E125 N070	Surface	Sparse weed onto silty shaley gravel.
	1	Gravelly (shale) silt onto bedrock. Excavation ceased at 6–10 cm.
E145 N040	Surface	Sparse weed onto silty gravel and bedrock.
	1	Yellowy brown gravelly silt onto bedrock. Excavation ceased at 2 cm.
E135 N040	Surface	Weeds onto yellow brown silty gravel.
	1	Yellow brown silty gravel onto bedrock. Excavation ceased at 7–10 cm. <i>Note: Ceramic sherd found in sieves</i>
E115 N040	Surface	Weeds onto brown loam.
	1	Brown gravelly loam to 2 cm then changing to yellow brown gravelly silt then bedrock. Excavation ceased at 6–10 cm.
E105 N040	Surface	Yellowy brown silty gravel and outcropping bedrock.
	1	Yellowy brown silty gravel onto bedrock. Excavation ceased at 2 cm.
E145 N060	Surface	Outcropping bedrock and yellow brown silty gravel. Some weeds.
	1	Yellowy brown silty gravel onto bedrock. Excavation ceased at 7–9 cm.



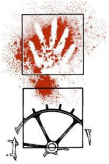


Pit	Spit	Description
E115 N060	Surface	Yellowy brown silty gravel
	1	Yellowy brown silty gravel onto bedrock. Excavation ceased at 3–5 cm.
E105 N060	Surface	Leaf litter and gravelly silty loam.
	1	Brown loam to 3 4 cm depth, then changing to yellow brown gravelly silt onto bedrock. Root in NW corner of pit, left <i>in situ</i> . Excavation ceased at 5–10 cm.



## Test Area 2

Pit	Spit	Description
E070 N200	Surface	Leaf litter onto brown gravelly silt.
	1 (5 cm)	Brown Gravelly silt, slate gravels, very dry, moderate compaction.
	2 (10 cm)	Brown gravelly silt, tree roots.
	3 (15 cm)	Brown silty gravel, tree roots, becoming more orange with depth.
	4 (20 cm)	<i>Brown silty gravel, quickly changes to dry gravelly clay.</i> <i>Note: pit excavated at 5 cm spits.</i> Excavation ceased at 20 cm.
E070 N205	Surface	Leaf litter onto brown gravelly silt.
	1	Darker brown gravelly silt to 4 cm depth onto lighter brown (damp), some larger cobble sized gravels.
	2	Brown gravelly silt with larger gravels onto red/brown gravelly clay. Excavation ceased at 20 cm.
E070 N210	Surface	Eroded surface compacted leaf litter.
	1	Brown gravelly silt with slate gravels.
	2	Increase in gravel and cobbles with depth, degrading slate gravel. Becoming more yellow with depth and clay increasing.
	3	Yellow orange brown clayey gravelly silt. Grades quickly to orange brown gravelly silty clay. Excavation ceased at 21–23 cm.
E070 N215	Surface	Leaf litter eroded on surface. Brown gravelly silt with some weeds.
	1	Brown gravelly silt becoming lighter brown at 6–7 cm. Becoming more compact with depth.
	2	Brown gravelly silt with larger cobble sized gravel onto orange brown clay. Excavation ceased at 20 cm.
E070 N214.5	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt, becoming lighter with depth.
	2	As above, larger gravels with depth, then onto orange brown gravelly clay. Excavation ceased at 20 cm.
E070 N215.5	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt.
	2	Larger gravels onto orange brown gravelly clay. Excavation ceased at 20 cm.
E070.5 N215	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt.
	2	Larger gravels, becoming lighter with depth onto orangey brown gravelly clay. Excavation ceased at 20 cm.

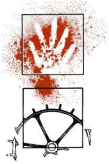


Pit	Spit	Description
E069.5 N215	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt.
	2	Larger gravels, becoming lighter with depth onto orangey brown gravelly clay. Excavation ceased at 20 cm.
E070 N216	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt.
	2	Larger gravels, becoming lighter with depth onto orangey brown gravelly clay. Excavation ceased at 20 cm.
E071 N215	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt.
	2	Larger gravels, becoming lighter with depth onto orangey brown gravelly clay. Excavation ceased at 20 cm.
E071.5 N215	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt.
	2	Larger gravels, becoming lighter with depth onto orangey brown gravelly clay. Excavation ceased at 20 cm.
E070 N216.5	Surface	Brown gravelly silt with some weeds.
	1	Brown gravelly silt.
	2	Larger gravels, becoming lighter with depth onto orangey brown gravelly clay. Excavation ceased at 20 cm.
E070 N220	Surface	Sparse weeds onto brown gravelly silt.
	1	Brown gravelly silt, larger cobble sized slate rock/stones.
	2	Brown silty gravel, larger cobble sized gravels.
	3	Brown silty gravel onto red/brown gravelly clay. Some charcoal in base and side. Excavation ceased at 25 cm.
E070 N225	Surface	Adjacent to track. Sparse weeds, brown gravelly silt.
	1	Compact brown gravelly silt. Ant nest bioturbation.
	2	Brown gravelly silt onto dry orange brown gravelly clay. Ants continue. Excavation ceased at 20 cm.
E070 N235	Surface	Weeds and leaf litter onto dark brown loam.
	1	Dark brown loam wit some larger pieces of charcoal. Glass present.
	2	Dark brown loam grades to yellow orange brown silty gravel. Cobbles throughout.
	3	Yellow orange brown gravel onto orange brown gravelly clay. Excavation ceased at 24 cm.
E070 N240	Surface	Loose leaf litter onto grey-brown silt.
	1	Soft grey brown silt to 4cm depth with small rootlets throughout. Transitions onto orangey brown silt, becoming more compact with depth.
	2	As above, patches of clay at base of spit.



Pit	Spit	Description
	3	Clean up of soft orangey brown silt onto clay. Excavation ceased at 21–23 cm.
E070 N245	Surface	Leaf litter and loam.
	1	Dark brown loam onto yellow brown gravelly silt. Tree roots. Evidence of burning throughout spit.
	2	Yellow brown gravelly silt onto orange brown gravelly clay. Tree roots. Excavation ceased at 20 cm.
E070 N250	Surface	Loose leaf litter onto dark brown silt. Surface evidence of burning including charcoal. Stump of old building directly adjacent to pit.
	1	Dark brown loose silt onto grey silt. Rootlets throughout. Grass and nails present in spit.
	2	Yellow brown clayey silt, patches of clay onto clay base, roots throughout. Excavation ceased at 20 cm.
E055 N225	Surface	Heavily eroded track, sheet erosion, no organic matter.
	1	Grey brown clayey silt.
	2	As above, some streaks of orange clay through deposit.
	3	Clayey silt continues, increase in angular rock content, clay increasing. Excavation ceased at 28–30 cm.
E060 N225	Surface	Unformed track, sparse grass onto orange brown silt.
	1	Compact brown gravelly silt with tree roots. Damp from overnithg train.
	2	Brown compact silt gravel, some charcoal. Becoming more yellow with depth. Tree roots.
	3	Brown gravelly silt onto gravelly orange brown clay. Tree roots. Excavation ceased at 28 cm.
E065 N225	Surface	On track, shurb on northern end of pit.
	1	Yellow brown clayey silt with sparse gravels and rootlets.
	2	Clayey silt, becoming more orange with depth, onto solid orange clay. Excavation ceased at 18–20 cm.
E075 N225	Surface	On track, patchy shrubs and grass.
	1	Orange brown pale compact clayey silt with angular gravels, rootlets throughout.
	2	As above, grades onto orange compact clay at base of pit. Excavation ceased at 16–18 cm.
E080 N225	Surface	Partially located in unformed vehicle track, gravelly silt.
	1	Light brown compact gravelly silt.
	2	As above, some cobble sized gravels, grades onto orange brown gravelly clay. Excavation ceased at 20 cm.
E085 N225	Surface	Patchy grass onto eroded silty gravel.
	1	Yellow brown clayey silt with patches of clay, rootlets in top 5 cm.
	2	As above, grading to clay. High rock and gravel content ranging from anular to sub-angular. Excavation ceased at 18–20 cm.



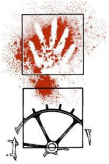


Pit	Spit	Description
E060 N205	Surface	Leaf litter.
	1	Brown gravelly silt with tree roots. Getting lighter with depth.
	2	As above, becoming more gravelly with depth.
	3	As above, onto brown orange clay. Excavation ceased at 25 cm.
E060 N215	Surface	Partially eroded from surface water wash, some leaf litter.
	1	Brown gravelly silt with tree roots, dry and compact, becoming lighter with depth.
	2	As above, onto orange brown gravelly clay. Excavation ceased at 20 cm.
E060 N235	Surface	Thick leaf litter.
	1	Brown gravelly loam onto light brown silty gravel onto orange brown gravelly clay. Excavation ceased at 10 cm.
E060 N245	Surface	Leaf litter onto brown loam.
	1	Brown loam quickly grading onto brown silt, then onto light orange brown gravelly silt. Some tree roots.
	2	Orangey brown gravelly silt.
	3	As above, onto orange gravelly clay. Excavation ceased at 23 25 cm.
E080 N215	Surface	Sparse grass and leaf litter. Located adjacent to swale drain, may be in located spoil area.
	1	Brown loam with many rootlets, onto brown silty angular gravel (up to cobble size). Getting lighter with depth.
	2	As above, onto orange brown silty gravel, onto clay. Excavation ceased at 20 cm.
E080 N235	Surface	Thick leaf litter.
	1	Dark brown loam, becoming lighter with depth, with some cobble sized gravels.
	2	As above, becoming more compact with depth and transitioning to a silty gravel. Tree roots.
	3	Light yellow brown silty gravel with some cobble sized gravels.
	4	As above, grading to orangey brown clay. Tree roots continue. Excavation ceased at 35 38 cm.
E080 N245	Surface	Thick leaf litter.
	1	Dark brown loam with many roots. Grades onto light brown gravelly silt.
	2	As above, grades to yellow brown gravelly silt.
	3	As above, grades to orange brown gravelly clay at base of pit. Excavation ceased at 25 cm.



### Test Area 3

Pit	Spit	Description
E100 N125	Surface	Weeds onto brown silty gravel
	1 (5 cm)	Brown silty gravel Excavation ceased at 7–10 cm.
	2 (10 cm)	Brown silty gravel onto bedrock Excavation ceased at 7–10 cm
E105 N125	Surface	Weeds onto brown silty gravel
	1	Brown silty gravel onto bedrock Excavation ceased at 7–9 cm.
E110 N125	Surface	Weeds onto brown silty gravel
	1	Brown silty gravel onto bedrock Excavation ceased at 4–8 cm.
E115 N125	Surface	Weeds onto brown silty gravel
	1	Brown silty gravel onto bedrock. Excavation ceased at 10 cm.
E121 N125	Surface	Weeds onto brown silty gravel
	1	Brown silty gravel onto bedrock Excavation ceased at 6–8 cm.
E125 N125	Surface	Weeds onto brown silty gravel and bedrock
	1	Brown silty gravel onto bedrock. Excavation ceased at 4–6 cm.
E131 N126	Surface	Weeds onto yellow brown silty gravel
	1	Yellow brown silty gravel onto bedrock Excavation ceased at 10 cm.
E135 N125	Surface	Weeds onto brown silty gravel
	1	Brown silty gravel onto bedrock Excavation ceased at 6–8 cm.
E140 N125	Surface	Weeds onto brown silty gravel
	1	Brown silty gravel onto bedrock Excavation ceased at 10 cm.
E120 N100	Surface	Tussock grass onto brown silty gravel with some cobbles.
	1	Brown silty gravel onto bedrock Excavation ceased at 9–10 cm.
E120 N110	Surface	Tussock grass onto brown silty gravel with some cobbles.
	1	Brown silty gravel onto bedrock Excavation ceased at 9–10 cm.
E121 N120	Surface	Sparse weeds onto yellow brown silty gravel with some cobbles. #1 – artefact collected by excavators.
	1	Yellow brown silty gravel onto bedrock Excavation ceased at 4–5 cm.

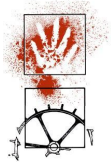


Pit	Spit	Description
E120 N130	Surface	Sparse weeds onto yellow brown silty gravel with some cobbles.
	1	Yellow brown silty gravel onto bedrock Excavation ceased at 5–6 cm.
E120 N140	Surface	Sparse weeds onto yellow brown silty gravel with some cobbles. Outcropping bedrock adjacent.
	1	Yellow brown silty gravel onto bedrock Excavation ceased at 10 cm.
E120 N150	Surface	Sparse weeds onto orange brown silty gravel with some cobbles. Outcropping bedrock adjacent.
	1	Orange brown silty gravel onto gravelly clay of same colour, then onto bedrock. Excavation ceased at 10 cm.
E110 N105	Surface	Weeds onto brown silty gravel
	1	Brown silty gravel onto bedrock Excavation ceased at 7–10 cm.
E110 N115	Surface	Weeds onto brown silty gravel and bedrock .
	1	Brown silty gravel onto bedrock Excavation ceased at 0–10 cm.
E110 N135	Surface	Tussock grass and weeds onto brown gravelly silt
	1	Brown gravelly silt, a little more loamy than elsewhere in test area, onto bedrock Excavation ceased at 8–10 cm.
E110 N145	Surface	Weeds onto brown silty gravel.
	1	Brown silty gravel onto bedrock Excavation ceased at 9–10 cm.
E130 N105	Surface	Tussock grass onto brown silty gravel.
	1	Brown silty gravel onto bedrock Excavation ceased at 9–10 cm.
E130 N115	Surface	Tussock grass onto brown silty gravel.
	1	Brown silty gravel onto bedrock Excavation ceased at 7–9 cm.
E130 N135	Surface	Weeds onto brown silty gravel.
	1	Brown silty gravel onto bedrock Excavation ceased at 7–10 cm.
E130 N145	Surface	Weeds onto yellow brown silty gravel.
	1	Yellow brown silty gravel onto bedrock Excavation ceased at 7–9 cm.
E120 N105	Surface	Weeds onto brown silty gravel.
	1	Brown silty gravel onto bedrock Excavation ceased at 10 cm.
E120 N115	Surface	Weeds onto yellow brown silty gravel.
	1	Yellow brown silty gravel onto bedrock Excavation ceased at 2 cm.



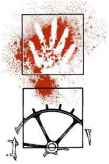
Pit	Spit	Description
E120 N135	Surface	Weeds onto yellow brown silty gravel.
	1	Yellow brown silty gravel onto bedrock Excavation ceased at 7–10 cm.
E120 N145	Surface	Weeds onto brown silty gravel.
	1	Brown silty gravel onto bedrock Excavation ceased at 7–9 cm.



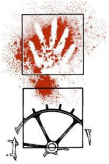


## Test Area 4

Pit	Spit	Description
E170 N340	Surface	Sparse weeds onto grey brown dry silt.
	1 (5 cm)	Grey brown dry silty topsoil with rootlets.
	2 (10 cm)	Becomes more shaley (bedrock) @ 6–7 cm depth, particularly in northern half of pit. Soil becoming yellow grey brown clayey silt at base of pit. Excavation ceased at 10–11 cm.
E170 N345	Surface	Sparse weeds onto grey brown dry silt.
	1	Grey brown silty topsoil with shale gravels (30%) some rootlets. Becomes more shaley at base of spit.
	2	50% shale bedrock increasing with depth. Excavation ceased at 10–11 cm. Rock remains in centre of pit pulled out in next spit.
	3	Rock pulled out leaving large hole in centre of pit. Excavation ceased at 26 cm.
E170 N350	Surface	Grey brown silty topsoil with shale gravels.
	1	Grey brown silty topsoil with angular shale gravels (30%) some rootlets. Becomes more shaley at 7–9 cm.
	2	As above, Shale increasing with depth, insitu bedrock at base. Excavation ceased at 11–14 cm
E170 N355	Surface	Grey brown silty topsoil with shale gravels.
	1	Grey brown silty topsoil with angular shale gravels (30%) some rootlets. Becomes more shaley at 7–9 cm.
	2	As above yellow brown silt filling voids and crevices of shale bedrock. Excavation ceased at 11–14 cm
E170 N360	Surface	Sparse weeds onto grey brown silt with shale gravels and rock.
	1	Grey brown silty topsoil with angular shale gravels (30%) some rootlets. Becomes more shaley at 7–9 cm.
	2	As above yellow brown silt filling voids and crevices of shale bedrock. Excavation ceased at 13–15 cm
E170 N365	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silty topsoil with angular shale gravels (30%) some rootlets. Becomes more shaley at 7–9 cm. Grades onto shale bedrock across pit. Excavation ceased at 10 cm
E170 N370	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silty topsoil with angular shale gravels (30%) some rootlets. Becomes more shaley at 7–9 cm. Grades onto shale bedrock across pit. Excavation ceased at 9–13 cm
E170 N375	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silty topsoil with angular shale gravels (30%) some rootlets. Becomes more shaley at 8 cm. Grades onto shale bedrock across pit.
	2	As above yellow brown silt filling voids and crevices of shale bedrock. Excavation ceased at 13–16 cm



Pit	Spit	Description
E170 N380	Surface	Sparse weeds onto grey brown dry silty topsoil with angular gravels.
	1	Grey brown silty topsoil with angular shale gravels (30%) some rootlets. Becomes more shaley at 6–7 cm. Grades onto shale bedrock across pit. Excavation ceased at 10 cm
E170 N385	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Silty topsoil with angular gravels (40%). Becomes increasingly shaley at 7–8 cm depth.
	2	As above grey brown silt filling voids and crevices of shale bedrock. Excavation ceased at 13–15 cm
E170 N390	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Brown silty topsoil with some humic matter and rootlets throughout down to 7–9 cm. Becomes more clayey silty orangey brown soil below.
	2	As above, increasingly clayey with depth. Grades to massed orangey brown clay at 16–20 cm depth. Excavation ceased at 20 cm
E155 N365	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Brown silty topsoil with small angular gravels (2%). Some rootlets. Increasingly compact with depth.
	2	Becomes slightly yellowy grey brown compact silt at 9–11 cm depth. Slowly grades to compact yellow brown silty clay at base of spit.
E160 N383	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Medium brown silty topsoil with rootlets. Changes to brown clayey silt @ 7–9 cm depth.
	2	As above, increasingly compact with depth. Yellowy grey brown silty clay at base of pit. Excavation ceased at 20 cm
E165 N365	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silty topsoil. Slate gravels throughout. Shale bedrock from 8-11 cm depth. Excavation ceased at 9–11 cm
E175 N365	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt filling crevices and voids of shale bedrock. Excavation ceased at 6–8 cm
E180 N364	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt filling crevices and voids of shale bedrock. Excavation ceased at 5–8 cm
E185 N365	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt filling crevices and voids of shale bedrock. Excavation ceased at 1–8 cm
E160 N345	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Medium brown silty topsoil, rootlets throughout.



Pit	Spit	Description
	2	Becomes more compact orangey brown clay silt at 9–11 cm. Isolated angular shale gravels. Becomes orange brown clayey silt at 17–18 cm.
	3	As above, slowly becoming more clayey with depth. Compact yellowy orange brown silty clay at base of spit. Excavation ceased at 24–30 cm
E160 N355	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Medium brown silty topsoil with rootlets. Some angular shale gravels throughout (10%).
	2	Shale bedrock in eastern side of pit from 9–11 cm. Brown silt filling vrevices and voids of bedrock. Bedrock starts at 18cm depth on west side of pit. Excavation ceased at 19–21 cm
E160 N365	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Medium brown silty topsoil with rootlets. Some sand and gravel inclusions.
	2	At start of spit deposit becomes more brown clayey silt. Some isolated shale rocks at base of spit.
	3	Becomes orange brown silty clay at start of spit.
	4	Becomes very clayey at 31–32 cm depth. Excavation ceased at 31–36 cm
E160 N375	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Medium brown silty topsoil with rootlets. Some angular shale gravels throughout (20%).
	2	Shale gravels from 9–12 cm, transitioning into shale bedrock. Yellowy grey silt filling crevices of bedrock. Excavation ceased at 19–22 cm
E180 N345	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Medium brown silty topsoil with rootlets. Some angular shale gravels throughout.
	2	As above increasinly compact with depth. Shale rock in wall of NE corner. Becomes more clayey with depth. Yellow brown silty clay at baseof spit. Excavation ceased at 16–21 cm
E180 N355	Surface	Sparse weeds onto grey brown dry silty topsoil. Shale encountered immediately on upslope side of pit.
	1	Grey brown silt filling crevices and voids of shale bedrock. Excavation ceased at 8–9 cm
E180 N375	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt filling crevices and voids of shale bedrock. Excavation ceased at 4–8 cm
E180 N385	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (30%). Grades onto shale bedrock. Excavation ceased at 9–10 cm
E176 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (10%). Changes to yellow brown silt at 7–9 cm depth.

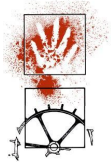


Pit	Spit	Description
	2	As above, increasingly clayey and compact with depth. Yellow brown silty clay at base of spit. #1 – silcrete flake (16 cm depth)
	3	As above. Yellow brown clay at base. Some gravels. Excavation ceased at 25–27 cm
E177 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–9 cm depth. #1 – silcrete flake (5 cm depth)
	2	As above, increasingly compact with depth. Some shale gravels. Yellow brown silty clay at base. Excavation ceased at 20 cm.
E178 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–9 cm depth.
	2	As above, increasingly compact with depth. Some shale gravels. Yellow brown silty clay at base. #1 – cobble at 20 cm depth (probable manuport) Excavation ceased at 20 cm.
E179 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–10 cm depth.
	2	As above, increasingly compact with depth. Some (5-10%) shale gravels. Shale bedrock at 17 cm in north side of pit. Yellow brown silty clay at base. Excavation ceased at 19 cm.
E180 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–10 cm depth.
	2	As above, increasingly compact with depth. Some (10%) angular shale gravels. Yellow brown silty clay/clay at base. Excavation ceased at 20 cm.
E180 N344	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–10 cm depth.
	2	As above, increasingly compact with depth. Some (10%) angular shale gravels. Yellow brown silty clay/clay at base. Excavation ceased at 20 cm.
E180 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–10 cm depth.
	2	As above, increasingly compact with depth. Some (10%) angular shale gravels. Yellow brown silty clay/clay at base. Excavation ceased at 20 cm.
E180 N347	Surface	Sparse weeds onto grey brown dry silty topsoil.



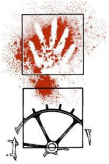


Pit	Spit	Description
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–10 cm depth.
	2	As above, increasingly compact with depth. Some (5-10%) angular shale gravels. Yellow brown silty clay/clay at base. Excavation ceased at 20 cm.
E181 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–11 cm depth.
	2	As above, increasingly compact and clayey with depth. Some (5-10%) angular shale gravels. Yellow brown silty clay/clay at base. #1 – core at 15 cm depth
	3	As above, Increasingly compact and clayey with depth. Shale bedrock in parts of base . Excavation ceased at 30 cm. Main purpose of digging to this depth was to confirm absence of cultural material. No artefact from this spit.
E182 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–10 cm depth.
	2	As above, increasingly compact with depth. Some (5-10%) angular shale gravels. Yellow brown silty clay/clay at base. #1 – silcrete flake at 11 cm depth. #2 – silcrete flake at 14 cm depth. Excavation ceased at 20 cm.
E183 N346	Surface	Sparse weeds onto grey brown dry silty topsoil.
	1	Grey brown silt with rootlets throughout. Angular shale rocks and gravels (5%). Changes to yellow brown silt/clayey silt at 7–10 cm depth.
	2	As above, increasingly compact with depth. Some angular shale gravels. Yellow brown silty clay/clay at base. Excavation ceased at 19–20 cm.



## Test Area 5 – West

Pit	Spit	Description
E210 N420	Surface	Leaf litter onto brown humic silt
	1 (5 cm)	Brown humic silt with a small amount of rounded to sub-rounded gravels (2–5%) mostly shales.
	1a (10 cm)	Becoming more moist at 7 cm depth.
	2	As above, gravel amount increasing to about 20% at 10–12 cm depth.
	2a	At 16cm depth medium sized cobbles and rocks (10–20 mm diameter). 15% cobbles and 30% gravels (all rounded to sub-rounded).
	3	As above, becoming more moist with depth
	3a	As above, becoming more moist with depth
	4	Rounded cobbles and rocks cease at 30–32 cm depth. Soil is brown silty clay/ clayey silt. 20% rounded to sun-rounded gravels ranging from 10–20 mm in diameter.
	4a	As above
	5	Disturbance from burrow at 41 cm depth in NE corner of pit. Soil as above.
	5a	As above
	6	Soil becoming very moist and gravelly clay from 52 cm.
	6a	Excavation ceased at 60 cm
E216 N420	Surface	Eroded surface adjacent to track
	1	Thin layer of orange brown clayey silt onto dark brown gravelly silt.
	2	Grades onto brown gravelly silt, gravels sub-rounded to rounded.
	3	Orange brown gravelly san. Some larger cobble sized gravels.
	4	Some charcoal noted. Orange brown gravelly sand, small sized gravels and some larger cobbles. Becoming more clayey with depth.
	5	Charcoal rich in NE corner of pit (softer to dig). Likely root burnout. Orangey brown gravelly clay across rest of pit. Excavation ceased at 50 cm.
E220 N420	Surface	Weeds and blackberries onto grey brown silty topsoil.
	1	Brown silty topsoil with some small gravels (rounded and sub-rounded)
	2	At 9–11 cm quick transition to rocky gravelly brown silt. Rock are mostly shale based and rounded to sub-rounded (about 40% of deposit)
	3	As above
	4	Changes to yellow brown gravelly (rounded to sub-rounded 10–15%) silt sand.
	5	As above
	6	As above, becomes more brown clayey silt at base of spit. Increasingly compact with depth
	7	As above, grading to compact brown silty clay at base of spit. Excavation ceased at 68–70 cm.
E225 N420	Surface	Leaf litter, some tussock grass.
	1	Brown gravelly loam.

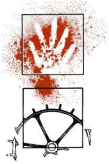


Pit	Spit	Description
	2	Increase in gravels with depth. Some larger cobbles (rounded/sub-rounded). Light brown silt.
	3	More gravels with depth, sandy silt.
	4	Unsorted rounded gravels throughout
	5	As above, transitioning to gravelly silty clay at base of spit. Excavation ceased at 50 cm.
E230 N420	Surface	Weeds and blackberries onto grey brown silty topsoil.
	1	Brown silty topsoil with some shale gravels (rounded and sub-rounded)
	2	Transitions to yellow brown sandy gravelly silt. Small to medium rounded and sub-rounded gravels. Rock throughout (about 15%).
	3	As above
	4	Changes at 30–34 cm depth to yellow orangey brown moist sandy gravelly clayey silt. No more cobbles or rocks.
	5	As above, becoming silty clay at base of spit. Gravels are rounded to sub-rounded shales. Excavation ceased at 50 cm.
E235 N420	Surface	Leaf litter
	1	Dry brown gravelly sandy silty loam.
	2	Changes quickly to yellow brown silty gravel (sub-rounded)
	3	Increase in gravel with depth, only about 10% silt.
	4	As above, transitioning to gravelly clay at base of spit. Excavation ceased at 40 cm.
E240 N421	Surface	Leaf litter onto grey brown silty topsoil.
	1	Brown silty topsoil with some shale gravels (rounded and sub-rounded 5–10%). Changes to yellowy brown rocky sandy silt at 7–10 cm depth.
	2	As above
	3	As above, rocks decreasing in number and size.
	4	As above.
	5	As above, changes quickly at 43 cm depth to brown gravelly clayey silt. Gravels reduce to about 15%, still sub-rounded shales. Becomes brown gravelly clay @ about 47 cm depth. Excavation ceased at 47–50 cm.
E245 N420	Surface	Leaf litter onto grey brown silty topsoil.
	1	As above gravels are small and mostly subrounded.
	2	Gravels increase at 9–10 cm depth. Then further change to yellow brown gravelly silt at 17–19 cm depth.
	3	As above, becoming slightly clayey at top of spit. Becoming more clayey and compact with depth. Gravelly clay at base of spit. Excavation ceased at 30 cm.
E250 N420	Surface	Leaf litter onto yellow brown gravelly silt
	1	As above, gravels are subrounded to subangular shales (5%). Changes to more gravelly deposit at 7–8 cm depth.



Pit	Spit	Description
	2	As above, rootlets throughout.
	3	As above, at 20–21 cm soil becomes gravelly clayey silt. Increasingly compact and clayey with depth. Gravelly clay (brown) at base of spit. Excavation ceased at 30 cm.
E220 N415	Surface	Leaf litter and weeds onto brown silt.
	1	Brown silty loam. Gravels increasing with depth, poorly sorted, subangular.
	2	Brown silty gravel, gravels increasing with depth.
	3	Silty gravel with some large cobbles. Excavation ceased at 30 cm.
E230 N415	Surface	Leaf litter and cleared blackberries
	1	Dark brown gravelly silty loam. Sub-angular cobble sized gravels
	2	Dark brown gravelly silty loam. Gravels increase with depth. Becoming lighter brown at base.
	3	Light brown silty gravel (unsorted). Mostly gravel at base. Excavation ceased at 30 cm.
E240 N415	Surface	Weeds onto brown silty loam.
	1	Brown silty loam with gravels and some larger cobbles.
	2	Brown silty gravel. Tree roots throughout.
	3	Brown silty gravel with subangular poorly sorted cobbles. Very rocky at base. Excavation ceased at 30 cm.
E230 N425	Surface	Leaf litter and cleared blackberries
	1	Dark brown loam, lots of roots
	2	Dark brown sandy gravel, some larger cobbles. The changes to yellow brown gravelly silt with clay.
	3	Brown gravelly sand. Poorly sorted sub-rounded gravels
	4	Brown sandy gravel with gravels increasing with depth. Very gravelly at base. Excavation ceased at 40 cm.
E230 N439	Surface	Weeds onto orangey brown silty sand
	1	Brown silty sand
	2	Brown dry silty sand. Increasingly compact with depth.
	3	Brown silty sand grading to sandy gravel then dry compact orange brown gravelly clay Excavation ceased at 30 cm.
E230 N445	Surface	Leaf litter onto orange brown gravelly sand
	1	Orange brown sandy silt with some roots
	2	Brown silty sand with lots of tree roots.
	3	Brown silty sand continuing along with tree roots. Becoming darker brown with depth.
	4	Dark brown sand silt with angular gravels. Becoming compact gravelly clay at base. Excavation ceased at 40 cm.



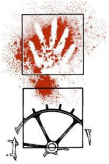


Pit	Spit	Description
E228 N429.5	Surface	Weeds onto brown sandy silt
	1	As above, some cobbles and gravel inclusions
	2	Cobbles and gravels increase to silty gravel at base
	3	Becoming silty clayey gravel and then silty gravelly clay at base. Excavation ceased at 30 cm.
E228 N430	Surface	Weeds onto brown silty loam. Large stone in middle of pit.
	1	Brown sandy silt with some gravel.
	2	Brown gravelly silt. Becomes more gravelly at 18 cm depth (sub-angular).
	3	Light brown silty gravel
	4	Gravels increasing with depth, larger cobbles and stones at base. Excavation ceased at 40 cm.
E228 N430.5	Surface	Weeds onto brown sandy silt
	1	Brown sandy silt , larger cobbles at base.
	2	Brown sandy silt onto gravelly (sub-angular) sand. Excavation ceased at 20 cm.
E227.5 N430	Surface	Weeds onto brown sandy silt
	1	Brown sandy silt , larger cobbles at base.
	2	Brown sandy silt onto silty gravel. Excavation ceased at 20cm.
E228 N431	Surface	Weeds onto brown sandy silt
	1	Brown sandy silt , larger cobbles at base.
	2	Brown sandy silt onto silty gravel. Excavation ceased at 20 cm.
E228.5 N430	Surface	Weeds onto brown sandy silt
	1	Brown sandy silt, larger cobbles at base.
	2	Brown sandy silt onto silty gravel. Excavation ceased at 20 cm.
E225 N435	0	Leaf litter onto yellow brown silty sand
	1	As above
	2	As above, some small angular gravel inclusions
	3	As above, increase in gravels at 28 cm depth, becomes yellow borwn gravelly silt (sub-rounded gravels)
	4	Gravelly sandy clay, degrading stone and gravels. Excavation ceased at 40 cm.



## Test Area 5 – East

Pit	Spit	Description
E220 N355	Surface	Weeds onto brown silty sand.
	1 (5 cm)	Brown silty sand, some gravels inclusions (sub-angular).
	1a (10 cm)	As above
	2 (15 cm)	Hard compact clayey silt.
	2a (20 cm)	As above, excavation ceased at 20 cm.
E230 N355	Surface	Weeds onto brown sandy silt.
	1	Compact brown sandy silt.
	2	Compact brown silty sand onto light brown gravelly silt.
	3	Grades to yellow brown sandy clay. Excavation ceased at 30 cm.
E230 N345	Surface	Weeds and brown silty sand.
	1	Dry brown clumpy silty sand.
	2	Compact dry brown silty clay. Excavation ceased at 20 cm.
E230 N360	Surface	Weeds and brown sandy silt.
	1	Dry compact brown sandy silt.
	2	Brown sandy silt. Very dry becoming more compact and clayey with depth.
	3	Grades to dark brown clumping compact silty soil, becoming darker with depth, some gravels, then changes to dark brown silty clay. Excavation ceased at 30 cm.
E230 N365	Surface	Weeds and light brown sandy silt.
	1	Light brown sandy silt, gravel inclusions at base of spit.
	2	Light brown sandy gravel, poorly sorted and sub-angular, onto degrading compact silty gravels. Excavation ceased at 20 cm.
E230 N370	Surface	Weeds and light brown sandy silt.
	1	As above, quickly changes to yellow brown clay. Excavation ceased at 10 cm.
E230 N365	Surface	Sparse weeds on brown sandy silt.
	1	Brown sandy silt with some gravel inclusions. #1 – artefact <i>in situ</i> at 15 cm depth.
	2	As above, transitions onto compact brown silty clay. Excavation ceased at 20 cm.
E240 N354.5	Surface	Sparse grass onto dry sandy silt.
	1	As above, sand decreasing with depth. Becoming more compact with depth. #1 – Quartz flake at 9 cm depth.



Pit	Spit	Description
	2	Brown compact silt with gravels Becoming more clayey with depth. Very compact and consolidated at base. Excavation ceased at 20 cm.
E240 N355	Surface	Rabbit burrow disturbance on surface. Brown silty sand.
	1	As above, some gravel inclusions.
	2	As above, transitioning into compact clayey silt. Excavation ceased at 20 cm.
E240 N355.5	Surface	Brown silty sand disturbed by rabbits.
	1	Brown silty sand.
	2	Brown silty sand with some gravels, increasingly compact with depth. Excavation ceased at 20 cm.
E240 N355.5	Surface	Brown silty sand disturbed by rabbits.
	1	Brown sandy silt with some gravel inclusions
	2	As above, onto dark orange/brown clayey compact silt. Excavation ceased at 20 cm.
E240.5 N355	Surface	Sparse grass into brown sandy silt.
	1	As above. #1 – Core recorded insitu at 9cm depth
	2	Brown silt with some gravels (sub-rounded to sub-angular). Increasingly compact with depth. Soil loose around concentration of artefacts described below. #1 – Concentration of 14 insitu artefacts (11–15 cm depth) #2 – <i>In situ</i> flake at 14 cm depth #3 – <i>In situ</i> flake at 19 cm depth
	3	As above, becoming brown clayey silt at about 22cm depth. Dark brown humic silt associated with burrows. #1 – <i>In situ</i> flake at 27 cm depth #2 – <i>In situ</i> flake at 23 cm depth #3 – <i>In situ</i> flake at 25 cm depth
	4	As above, burrows decreasing in size with depth. Becoming silty clay with weathered gravels at base. Very compact. Excavation ceased at 40 cm.
E241 N355	Surface	Sparse grass onto brown sandy silt. NW corner of pit is deflated due to infilled rabbit burrow. <i>Excavated in 5 cm spits due to high number of pits adjacent.</i>
	1a	As above, sand decreasing with depth.
	1b	As above, becoming more compact with depth. Brown compact silt at base of spit.
	2a	As above, mottle with gravels (sub-rounded to sub-angular). #1 – <i>In situ</i> artefact at 11 cm depth #2 – <i>In situ</i> artefact at 11 cm depth #3 – <i>In situ</i> artefact at 14 cm depth #4 – <i>In situ</i> artefact at 15 cm depth (base of spit)



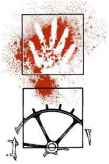
Pit	Spit	Description
	2b	As above, increasingly compact with depth.
	3a	Some rounded to sub-rounded gravels. Mottled brown clayey silt. Some ant bioturbation.
	3b	As above, becoming more compact and clayey with depth. Darker loose patch of humic silt with some clay associated with burrowing.
	4a	Insitu soils are gravelly silty clay (medium brown). Burrow disturbance decreasing in size. Increasingly compact with depth. Weathered gravels.
	4b	As above, increasingly compact with depth. Excavation ceased at 40 cm.
E241.5 N355	Surface	Sparse grass onto medium brown silt, some sand inclusions.
	1	As above, some rootlets, increasingly compact with depth. #1 – <i>In situ</i> artefact at 5 cm depth #2 – <i>In situ</i> artefact at 6 cm depth
	2	Brown silt mottled with gravels. Increasingly compact with depth.
	3	Becoming compact brown clayey silt with some gravels at top of spit. Increasingly clayey with depth. Excavation ceased at 40 cm.





## Test Area 6

Pit	Spit	Description
E315 N035	Surface	Tussock grass onto orangey brown gravelly silt wit some outcropping bedrock.
	1 (5 cm)	Brown silty gravel onto bedrock
	2 (10 cm)	As above, excavation ceased at 3–10 cm.
E315 N040	Surface	Tussock grass onto orangey brown gravelly silt.
	1	Orange brown gravelly silt onto compact clay. #1 – <i>In situ</i> artefact at 5 cm depth. Excavation ceased at 7–9 cm.
E315 N045	Surface	Tussock grass onto orangey brown gravelly silt.
	1	Orange brown gravelly silt onto compact silty clay. Excavation ceased at 10cm.
E315 N050	Surface	Tussock grass onto orangey brown gravelly silt.
	1	Orange brown gravelly silt onto compact silty clay. Excavation ceased at 10 cm.
E315 N055	Surface	Tussock grass onto orangey brown silty gravel.
	1	Orange brown silty gravel onto compact silty clay. Excavation ceased at 10 cm.
E315 N060	Surface	Tussock grass onto orangey brown silty gravel.
	1	Orange brown silty gravel onto compact silty clay. Excavation ceased at 10 cm.
E315 N065	Surface	Tussock grass onto grey brown silt.
	1	Grey brown silt with some small angular gravels. Rootlets throughout. Changes to pale yellow brown compact silty clay with angular gravels.
E290 N050	Surface	Tussock grass onto orangey brown silty gravel.
	1	Orange brown silty gravel onto compact silty clay. Excavation ceased at 7 cm.
E295 N050	Surface	Tussock grass onto orangey brown gravelly silt.
	1	Orange brown gravelly silt onto compact silty clay. Excavation ceased at 10 cm.
E300 N050	Surface	Tussock grass onto orangey brown gravelly silt.
	1	Orange brown gravelly silt onto compact silty clay. Excavation ceased at 10 cm.
E305 N050	Surface	Tussock grass onto orangey brown gravelly silt.
	1	Orange brown gravelly silt onto compact silty clay. Excavation ceased at 10 cm.
E310 N050	Surface	Tussock grass onto orangey brown gravelly silt.
	1	Orange brown gravelly silt onto compact silty clay. Excavation ceased at 10 cm.
E320 N050	Surface	Tussock grass onto orangey brown silt.

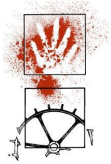


Pit	Spit	Description
	1	Orange brown silt onto compact clay. Excavation ceased at 10 cm.
E325 N050	Surface	Tussock grass onto orangey brown silty gravel.
	1	Orange brown silty gravel onto compact silty clay. Excavation ceased at 10 cm.
E330 N050	Surface	Tussock grass onto orangey brown silty gravel.
	1	Orange brown gravelly silt.
	2	Orange brown gravelly silt onto compact silty clay. Excavation ceased at 13–15 cm.
E334 N050	Surface	Weeds brown silty loam and bedrock.
	1	Brown silty loam onto slatey bedrock. Excavation ceased at 5 cm.
E340 N050	Surface	Weeds brown silty loam and bedrock.
	1	Brown silty loam onto slatey bedrock. Excavation ceased at 5 cm.
E295 N040	Surface	Tussock grass onto brown silt.
	1	As above, becomes yellow brown clayey silt at 7 cm depth. Becomes more compact and clayey with depth. Excavation ceased at 10 cm.
E305 N040	Surface	Tussock grass onto grey brown silt.
	1	As above, becomes yellow brown clayey silt at 7 cm depth. Becomes more compact and clayey with depth. Excavation ceased at 10 cm.
E325 N040	Surface	Tussock grass onto grey brown silt.
	1	As above, becomes yellow brown clayey silt at 8 cm depth. Becomes more compact and clayey with depth. Excavation ceased at 10 cm.
E335 N040	Surface	Tussock grass onto grey brown silt.
	1	As above, becomes yellow brown clayey silt at 8 cm depth. Becomes more compact and clayey with depth. Softer medium brown silt in NE corner of pit.
	2	Continued excavation in NE corner only, down to 20 cm. all other corners stopped at 10 cm depth.
E295 N060	Surface	Tussock grass onto grey brown silt with angular gravels.
	1	As above, becomes yellow brown clayey silt at 7–8 cm depth, some gravels. Shale bedrock at base of spit. Excavation ceased at 10 cm.
E305 N060	Surface	Tussock grass onto grey brown silt.
	1	As above, becomes yellow brown clayey silt at 8 cm depth. Becomes more compact and clayey with depth. Excavation ceased at 10 cm.
E325 N060	Surface	Tussock grass onto grey brown gravelly silt.
	1	As above, becomes yellow brown clayey silt with shaley gravels at 8–9 cm depth.



Pit	Spit	Description
		Excavation ceased at 10 cm.
E330 N060	Surface	Tussock grass onto grey brown gravelly silt.
	1	As above, becomes more compact brown shaley clayey silt at 6–7 cm depth. Shale bedrock in NE corner of pit. Shaley clay everywhere else at base. Excavation ceased at 10 cm.

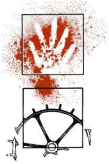
Restricted Version



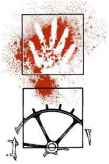
## Test Area 7

Pit	Spit	Description
E200 N600	Surface	Grass and thorny saplings onto dark grey brown silty topsoil
	1	As above, quickly becomes more clayey @ 12 cm depth, changing to grey brown clayey silt. Very compact. Some rootlets.
	1a	Becomes silty clay of same colour at 8 cm depth.
	2	As above, massed compact clay with some roots from 12 cm depth. Excavation ceased at 15 cm.
E205 N600	Surface	Low grass onto moist dark brown silty topsoil.
	1	As above, Changes to dark brown clayey silt at 3–4 cm depth. Some small rootlets. Increasingly compact and clayey with depth. Changes to clay at 8–9 cm depth. Excavation ceased at 10–12 cm.
E210 N600	Surface	Tussock grass onto dry grey brown silty topsoil with some small angular gravels.
	1	As Above, becomes very compact silt of the same colour at 3cm depth. Still has small angular gravels. Large roots along southeast edge of pit were left in-situ.
	2	As above, increasingly compact with depth, mottled with ironstone nodules and charcoal flecks. Slowly transitions to clayey silt of same colour. Extremely compact, left roots in place. Excavation ceased at 20 cm.
E215 N600	Surface	Tussock grass onto dry grey brown silty topsoil.
	1	As above, rootlets throughout as well as small angular gravels. Rootlets significantly reduce at 9–10 cm depth and silt becomes more compact.
	2	Grey brown silt with small angular gravels. Increasingly compact with depth.
	3	As above, very compact, mottled with ironstone gravels and some charcoal flecks. #1 – broken quartz flake found <i>in situ</i> at 29 cm depth
	4	As above very slowly grading to grey brown silty clay. Ironstone gravels throughout. Extremely compact. Excavation ceased at 37–38 cm.
E220 N600	Surface	Thin sparse low grass onto grey brown silt with angular gravels throughout.
	1	As above, rootlets down to 7–8 cm depth and becoming more compact at same depth.
	2	As above, gradual colour change at 10–12 cm depth to yellowy grey brown with a few small (less than 8 mm diameter) orangey clayey nodules. Gravels are angular to sub-rounded. Increasingly compact with depth.
	3	Changes to dry pale grey gravelly silt @ 20–23 cm depth. Another change begins near base of spit (28–30 cm depth), where soil becomes more dark grey brown. Charcoal throughout both small flecks and some concentrations up to 15 mm in diameter.
	4	As above, layer is clearly associated with burning and is more compact than adjacent deposits in N/NE side of pit. Charcoal sample taken at 33 cm depth. #1 – <i>In situ</i> flake at 31 cm depth #2 – <i>In situ</i> flake at 32 cm depth #3 – <i>In situ</i> flake at 33 cm depth
	5	As above, quick change at 41–42 cm depth to extremely compact pale light brown silty gravel. Gravels are small (up to 4 mm diameter) and sub-rounded to angular.

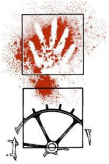




Pit	Spit	Description
		Excavation ceased at 44–46 cm.
E226 N600	Surface	Blackberries onto grey brown gravelly silt.
	1	As above, gravels are angular to sub-angular. Rootlets throughout.
	2	As Above, some subangular to sun-rounded rocks (10–20 mm diameter) begin at 10–12 cm depth.
	3	As above, hard to contact onto brown compact silt at 23–24 cm with some sand throughout. Gradually becoming more compact with depth. Changes to clayey silt of same colour at 30 cm depth.
	4	As above becoming increasingly clayey with depth. Pale yellow brown gravelly clay at base of 36–38 cm. Excavation ceased at 36–38 cm.
E233 N600	Surface	Blackberries onto grey brown gravelly silt.
	1	As above, rootlets throughout, gravel % increasing with depth. Up to 20% gravels.
	2	As above.
	3	As above, quick change to grey brown gravelly silt with loose angular shale rocks (measuring approximately 15–25 mm)
	4	As above.
	5	As above, quick change to orangey grown gravelly clay at 46–47 cm depth. Excavation ceased at 50 cm.
E221 N595	Surface	Blackberries onto grey brown gravelly silt with angular gravels
	1	As above, rootlets throughout.
	2	As above.
	3	Quick change to moist dark brown silt at 30–31 cm depth.
	4	As above, deposit changes at 37–38 cm depth to gravelly silt. Increasingly compact with depth.
	5	As above, changes to mottled grey brown gravelly silty compact. Excavation ceased at 50 cm.
E221.5 N589	Surface	Grass and blackberries onto grey brown gravelly silt with angular gravels
	1	As above, rootlets throughout.
	2	As above, quick change at 19–20 cm depth to brown compact silt/clayey silt. Much less gravel than preceding layer.
	3	As above, increasingly compact with depth.
	4	As above, increasingly clayey with depth. Becomes grey brown silty clay with some small gravels at 38 cm depth. Excavation ceased at 40 cm.
E221 N585	Surface	Tussock grass onto grey brown gravelly (small angular) silt.
	1	As above, rootlets throughout.
	2	As above, changes to brown slightly moist compact silt. Small amount of clay content. Small angular to sub-rounded gravels.
	3	As above, increasingly compact with depth.
	4	As above, changes to pale grey brown silty clay mottled with ironstone gravels. Very compact.



Pit	Spit	Description
		Excavation ceased at 40 cm.
E221 N580	Surface	Tussock grass onto grey brown gravelly (small angular) silt.
	1	As above, rootlets throughout.
	2	As above, some small angular shale rocks from 11–12 cm depth. Slight change at bottom of spit (20 cm) where deposit becomes more compact and less gravelly brown silt. Slightly moist.
	3	As above, small amount of clay content increasing with depth.
	4	As above, grades onto very compact grey brown silty clay mottled with ironstone gravels. Excavation ceased at 40 cm.
E219.5 N600	Surface	Tussock grass onto grey brown silt with small angular to sub-angular gravels.
	1	As above, becomes more gravelly at 7–9 cm depth.
	2	As above, developing a yellowy grey brown colour. Gravels throughout. #1 – <i>In situ</i> silcrete flake at 18 cm depth
	3	As above, changes at 28–30 cm depth on E side of pit to dark grey brown gravelly silt with charcoal flecks throughout. Still brown compact gravelly silt on W side of pit.
	4	As above, layer with charcoal continues, but reduces in area quickly @ 37 cm depth. Continues into underlying deposits, shape suggestive tree stump/root burnout. Grades quickly onto compact pale grey brown gravelly silty clay at 38–40 cm everywhere else. Excavation ceased at 40 cm.
E220.5 N600	Surface	Tussock grass onto grey brown silt with small angular to sub-angular gravels.
	1	As above, becomes more compact at 7–8 cm depth.
	2	As above.
	3	As above, changes to brown gravelly silt at 28–30 cm depth.
	4	As above, increasingly compact with depth. Changes to very compact pale grey brown mottled gravelly silty clay at 38–40 cm depth. Excavation ceased at 40 cm.
E220.5 N599	Surface	Grass onto grey brown gravelly silt.
	1	As above.
	2	As above, becomes much less gravelly at 21 cm. Now brown silt (some clay)
	3	As above, becoming more compact with depth.
	4	As above, becomes pale grey brown silty gravelly clay at 37 cm depth. Excavation ceased at 40 cm.
E220.5 N599.5	Surface	Grass onto grey brown gravelly silt.
	1	As above, rootlets throughout, becoming more compact and gravelly at 7–9 cm depth.
	2	As above, gravels reduce @ 19–21 cm depth and silt becomes more medium brown colour.



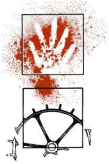
Pit	Spit	Description
	3	As above.
	4	As above, becomes pale grey brown silty gravelly clay at 36 cm depth. Excavation ceased at 40 cm.
E220.5 N600.5	Surface	Grass onto grey brown gravelly silt.
	1	As above.
	2	Slowly grades to brown gravelly silt with orangey mottling.
	3	As above
	4	As above, grades to pale grey brown silty gravelly clay at base of spit. Excavation ceased at 40 cm.
E221 N600	Surface	Grass onto dry grey brown/brown gravelly silt.
	1	As above, gravels angular to sub-angular.
	2	As above, changing to a brown/orange brown colour.
	3	As above, changes to medium grey brown colour at 25 cm depth. Gravel decreasing at this point and deposit becomes more compact.
	4	As above, transitions to more pale grey brown gravelly silt at 31–33 cm. Deposit then changes to pale light grey brown silty gravelly clay at 37–38 cm depth. Excavation ceased at 40 cm.



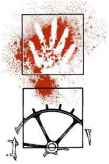
## Pit Locations

Pit Number	x	y
E220N600	705005	6083200
E221N580	705009	6083181
E233N600	705011	6083203
E200N600	704986	6083190
E185N365	704808	6083461
E155N365	704780	6083462
E170N390	704796	6083487
E170N340	704795	6083437
E180N346	704804	6083442
E315N065	705202	6083084
E290N050	705181	6083069
E315N036	705201	6083056
E340N050	705223	6083069
E230N370	704811	6083212
E230N445	704793	6083278
E230N415	704800	6083249
E230N425	704798	6083259
E210N420	704783	6083247
E250N420	704815	6083259
E070N200	704594	6083406
E100N125	704640	6083240
E120N150	704657	6083264
E120N120	704656	6083214
E145N040	704638	6083088
E145N060	704653	6083097
E115N060	704638	6083121
E115N040	704623	6083112
E105N040	704619	6083119
E105N060	704633	6083129
E115N050	704631	6083116
E105N050	704626	6083124
E145N050	704645	6083093
E135N050	704640	6083100
E125N065	704646	6083115
E125N055	704639	6083110
E125N045	704631	6083106
E125N050	704635	6083108
E125N030	704621	6083098
E125N040	704628	6083103
E125N070	704649	6083118
E125N060	704642	6083113
E150N050	704648	6083088
E140N050	704643	6083096
E130N050	704638	6083104





Pit Number	x	y
E120N050	704633	6083112
E110N050	704628	6083120
E100N050	704623	6083129
E135N060	704648	6083105
E135N040	704633	6083096
E125N035	704624	6083101
E170N365	704796	6083462
E170N345	704796	6083442
E170N350	704796	6083447
E170N355	704796	6083452
E170N360	704796	6083457
E170N370	704796	6083467
E170N375	704796	6083472
E170N380	704796	6083477
E170N385	704796	6083482
E175N365	704800	6083461
E180E384	704804	6083460
E165N365	704792	6083462
E160N365	704788	6083462
E160N365	704784	6083462
E180N355	704804	6083452
E180E375	704804	6083472
E160N355	704787	6083452
E160N375	704788	6083472
E160N383	704788	6083480
E180N385	704805	6083481
E160N345	704787	6083442
E120N105	704656	6083219
E120N110	704656	6083224
E120N115	704656	6083229
E120N120	704656	6083234
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E115N125	704652	6083239
E125N125	704660	6083239
E130N125	704664	6083239
E135N125	704668	6083239
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E130N145	704665	6083259
E110N135	704648	6083249

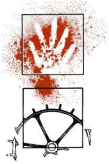


Pit Number	x	y
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E130N115	704664	6083229
E130N105	704664	6083219
E215N600	704997	6083196
E210N600	704993	6083194
E205N600	704989	6083192
E220N600	705001	6083198
E221N595	705000	6083194
E221.5N589	705004	6083189
E221N585	705006	6083185
E315N050	705202	6083069
E315N040	705201	6083060
E315N045	705201	6083065
E315N055	705202	6083074
E315N060	705202	6083079
E319N050	705205	6083069
E326N050	705211	6083069
E330N050	705215	6083069
E335N050	705219	6083069
E310N050	705197	6083069
E305N050	705193	6083069
E300N050	705189	6083069
E295N050	705185	6083069
E070N205	704594	6083411
E070N210	704594	6083416
E070N215	704594	6083421
E070N220	704594	6083426
E070N225	704594	6083431
E070N230	704594	6083436
E070N235	704594	6083441
E070N240	704595	6083446
E070N245	704595	6083451
E070N250	704595	6083456
E075N225	704598	6083431
E080N225	704602	6083431
E085N225	704606	6083431
E065N225	704590	6083431
E060N225	704586	6083431
E080N235	704603	6083441
E080N245	704603	6083451
E055N225	704582	6083431
E060N235	704586	6083441
E060N245	704586	6083451
E060N215	704586	6083421



Pit Number	x	y
E060N205	704586	6083411
E080N215	704602	6083421
E080N205	704602	6083411
E315N045	705210	6083060
E335N045	705218	6083060
E295N045	705193	6083060
E295N045	705185	6083060
E305N060	705194	6083079
E295N060	705185	6083079
E315N060	705210	6083079
E335N045	705218	6083079
E215N420	704787	6083249
E220N420	704791	6083251
E225N420	704795	6083252
E230N420	704799	6083254
E235N420	704803	6083255
E240N420	704807	6083257
E245N420	704811	6083258
E228N430	704795	6083263
E225N435	704791	6083266
E230N439	704794	6083272
E230N365	704812	6083207
E230N360	704813	6083202
E230N355	704815	6083198
E230N345	704817	6083188
E240N355	704822	6083201
E220N355	704807	6083194





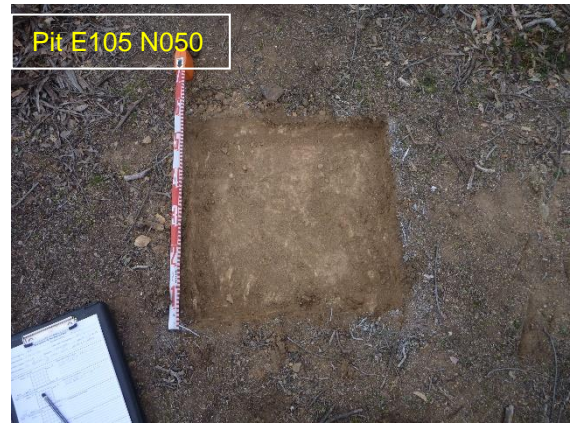
## Test Area 1







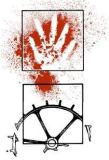








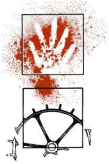




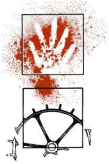
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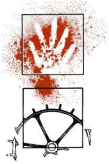








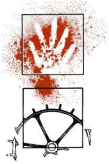




### Test Area 3









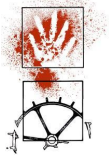






Restricted Version

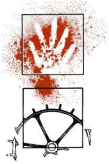




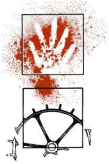
## Test Area 4







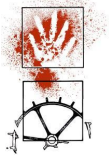








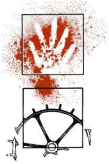




## Test Area 5 – West



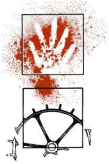








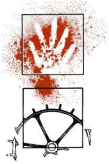




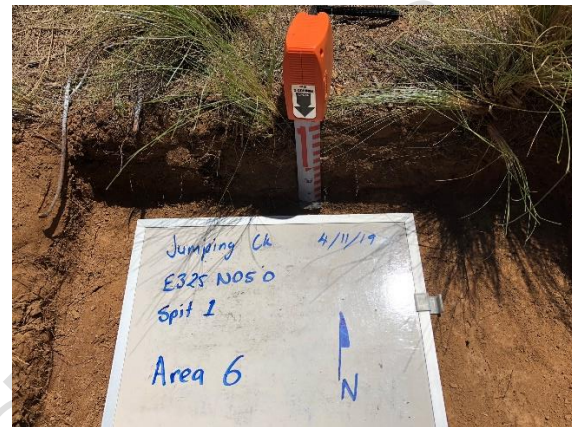
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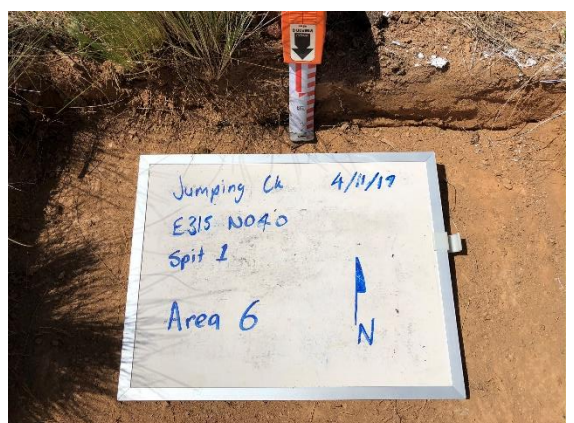
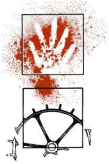




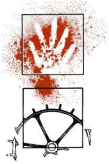
## Test Area 6











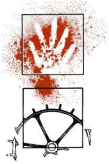




## Test Area 7











## **APPENDIX 9**

### **ARTEFACT CATALOGUE**

Restricted Version



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
228989	2	E060N205	Spit 1	Unretouched flake	FGS	Complete	38.93	27.62	11.71	15.17	
228990	2	E060N205	Spit 2	Flaked piece	Quartz, vein		12.13	7.47	2.14	0.28	
228991	2	E060N205	Surface	Unretouched flake	Quartz, vein	Complete	15.09	16.65	6.68	1.79	
228992	2	E060N205	Spit 3	Unretouched flake	Quartz, vein	Complete	4.3	7.01	0.95	0.04	
228952	2	E060N225	Spit 2	Unretouched flake	Quartz, vein	Proximal fragment	18.41	11.09	8.01	2.5	
228953	2	E060N225	Spit 2	Flaked piece	Quartz, vein	Complete	21.82	26.18	12.28	6.33	Found in pit at 13 cm depth, one single large negative flake scar covering majority of dorsal surface, no other features
228985	2	E060N245	Spit 1	Flaked piece	Quartz, vein		19.96	17.24	11.46	3.88	
228993	2	E065N225	Not stated	Flaked piece	Quartz, vein		18.71	15.45	4.19	1.28	
228947	2	E069.5N215	Spit 2	Unretouched flake	Quartz, vein	Complete	22.97	7.58	6.18	1.66	
228948	2	E069.5N215	Spit 2	Flaked piece	Quartz, vein		26.61	9.67	5.15	1.88	
228949	2	E069.5N215	Spit 2	Flaked piece	Quartz, vein		7.43	7.15	4.43	0.21	
228950	2	E069.5N215	Spit 2	Flaked piece	Quartz, vein		6.03	5.77	2.71	0.11	
228937	2	E070.5N215	Spit 2	Unretouched flake	Chert	Complete	24.41	7.79	5.28	1.18	
228938	2	E070.5N215	Spit 2	Unretouched flake	Chert	Complete	20.28	11.82	3.22	1.15	
228939	2	E070.5N215	Spit 2	Flaked piece	FGS		22.21	10.28	5.68	1.03	
228940	2	E070.5N215	Spit 2	Retouched flake	Quartz, vein	Medial fragment	14.63	6.39	2.42	0.32	
228941	2	E070.5N215	Spit 2	Unretouched flake	Silcrete	Complete	16.29	7.04	2.15	0.41	
228942	2	E070.5N215	Spit 2	Unretouched flake	FGS	Proximal fragment	17	6.41	3.7	0.49	
228943	2	E070.5N215	Spit 2	Flaked piece	FGS		13.21	6.92	3.45	0.2	
228944	2	E070.5N215	Spit 2	Non-artefact	Quartz, vein		10.74	7.7	4.33	0.31	
228945	2	E070.5N215	Spit 2	Flaked piece	FGS		14.19	10.55	1.87	0.16	
228946	2	E070.5N215	Spit 2	Unretouched flake	Silcrete	Complete	6.26	4.87	0.55	0.02	
228902	2	E0707N215	Spit 2	Core	Chert	Broken	16.4	19.22	9.29	4.15	
228925	2	E070N214.5	Spit 1	Flaked piece	Quartz, vein		10.48	6.32	3.65	0.25	
228926	2	E070N214.5	Spit 2	Flaked piece	Quartz, vein	Complete	9.18	8.25	1.8	0.24	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
228927	2	E070N214.5	Spit 2	Flaked piece	Quartz, vein		13.05	5.19	4.58	0.26	
228896	2	E070N215	Spit 1	Unretouched flake	FGS	Proximal fragment	6.11	8.01	3.26	0.32	
228897	2	E070N215	Spit 1	Unretouched flake	Quartz, vein	Complete	13.18	13.74	3.48	1.05	
228898	2	E070N215	Surface	Unretouched flake	Silcrete	Proximal fragment	13.44	14.86	3.64	0.74	
228899	2	E070N215	Bulk	Unretouched flake	FGS	Complete	22.57	12.93	4.81	2.25	
228900	2	E070N215	Spit 2	Unretouched flake	Chert	Complete	26.98	19.54	7.4	4.2	10-11 cm, noted while excavating
228901	2	E070N215	Spit 2	Unretouched flake	Chert	Complete	26.13	20.66	9.4	4.31	
228903	2	E070N215	Spit 2	Unretouched flake	Silcrete	Proximal fragment	18.34	12.69	3.08	1.03	
228904	2	E070N215	Spit 2	Unretouched flake	Chert	Complete	14.49	11.84	3.76	0.74	
228905	2	E070N215	Spit 2	Unretouched flake	Chert	Proximal fragment	13.45	9.32	2.52	0.48	
228906	2	E070N215	Spit 2	Flaked piece	Silcrete		13.49	12.42	5.04	0.71	
228907	2	E070N215	Spit 2	Flaked piece	Concretion		12.3	10.75	2.74	0.48	
228908	2	E070N215	Spit 2	Unretouched flake	Quartz, vein	Proximal fragment	12.99	10.77	4.53	0.85	
228909	2	E070N215	Spit 2	Unretouched flake	Chert	Complete	13.39	7.48	2.39	0.42	
228968	2	E070N215.5	Spit 1	Unretouched flake	Quartz, vein	Complete	18.37	15.16	8.94	3.15	
228969	2	E070N215.5	Spit 1	Flaked piece	Quartz, vein	Complete	12.64	10.15	2.92	0.3	
228970	2	E070N215.5	Spit 1	Flaked piece	Quartz, vein		11.15	5.73	2.03	0.15	
228971	2	E070N215.5	Spit 1	Unretouched flake	Quartz, vein	Complete	4.95	4.75	1.03	0.04	
228972	2	E070N215.5	Spit 1	Core	Quartz, vein	Broken	24.25	18.38	12.1	5.63	
228973	2	E070N215.5	Spit 1	Unretouched flake	Silcrete	Complete	17.03	14.47	11.09	3.28	
228974	2	E070N215.5	Spit 1	Unretouched flake	Silcrete	Complete	20.39	8.71	3.05	0.61	
228975	2	E070N215.5	Spit 1	Unretouched flake	Banded FGS	Complete	15.4	9.48	4.27	0.63	
228976	2	E070N215.5	Spit 1	Unretouched flake	Silcrete	Proximal fragment	18.04	8.88	3.2	0.71	
228977	2	E070N215.5	Spit 1	Non-artefact	Silcrete		12.5	8.56	3	0.27	
228978	2	E070N215.5	Spit 1	Unretouched flake	FGS	Complete	12.35	7.16	1.26	0.17	
228979	2	E070N215.5	Spit 1	Non-artefact	Silcrete		8.29	6.83	1.71	0.08	





ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
228980	2	E070N215.5	Spit 2	Unretouched flake	Quartz, vein	Distal fragment	6.11	10.35	1.55	0.14	
228981	2	E070N215.5	Spit 2	Unretouched flake	Sandstone	Complete	27.24	34.05	11.21	13.09	10cm deep, 470mm from South edge
228917	2	E070N216	Spit 2	Unretouched flake	Quartz, vein	Complete	29.37	15.66	6.02	4.55	
228918	2	E070N216	Spit 2	Unretouched flake	Quartz, vein	Complete	15.34	12.53	4.12	1.06	
228919	2	E070N216	Spit 2	Unretouched flake	FGS	Proximal fragment	12.12	9.56	3.06	0.55	
228920	2	E070N216	Spit 2	Flaked piece	FGS		8.98	10.81	2.94	0.4	
228921	2	E070N216	Spit 2	Non-artefact	FGS		13.88	8.32	3.67	0.45	
228922	2	E070N216	Spit 2	Unretouched flake	Quartz, vein	Proximal fragment	8.88	6.5	1.63	0.12	
228923	2	E070N216	Spit 2	Non-artefact	Quartz, vein		11.61	5.79	3.65	0.26	
228924	2	E070N216	Spit 2	Flaked piece	Quartz, vein		7.04	4.66	3.33	0.13	
228954	2	E070N216	Spit 2	Core	Quartz, vein	Broken	38.7	25.45	18.81	17.21	
228955	2	E070N216	Spit 1	Unretouched flake	Quartz, vein	Complete	22.97	12.36	5.01	1.46	
228956	2	E070N216	Spit 1	Unretouched flake	Chert	Proximal fragment	13.11	7.81	3.96	0.55	
228957	2	E070N216	Spit 1	Unretouched flake	FGS	Proximal fragment	8.1	9.85	3.6	0.43	
228958	2	E070N216	Spit 1	Flaked piece	FGS		7.47	7.77	0.91	0.07	
228959	2	E070N216	Spit 1	Flaked piece	Quartz, vein		10.19	4.06	2.7	0.12	
228983	2	E070N216	Spit 2	Unretouched flake	Quartz, vein	Proximal fragment	11.39	5.18	21.75	1.34	
228984	2	E070N216	Spit 2	Flaked piece	Quartz, vein		9.18	7.86	3.73	0.26	
228982	2	E070N216.5	Spit 2	Flaked piece	Quartz, vein		7.72	5.61	1.97	0.07	
228916	2	E070N220	Spit 1	Unretouched flake	Quartz, vein	Complete	27.47	21.2	15.69	9.39	
228910	2	E070N225	Spit 2	Unretouched flake	FGS	Proximal fragment	38.69	12.36	7.92	4.46	Conjoins with ID 228914
228911	2	E070N225	Spit 1	Unretouched flake	FGS	Complete	44.8	39.45	18.23	38.92	
228912	2	E070N225	Spit 1	Unretouched flake	FGS	Proximal fragment	42.26	11.83	6.21	3.32	
228913	2	E070N225	Spit 1	Non-artefact	Quartz, vein		11.97	11.19	9.79	1.67	
228914	2	E070N225	Spit 2	Unretouched flake	FGS	Distal fragment	17.16	9.77	7.42	1.73	Conjoins with ID 228910



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
228951	2	E070N235	Spit 2	Unretouched flake	Quartzite	Proximal fragment	13.9	18.94	3.63	1.26	
228997	2	E070N240	Spit 1	Core	Quartz, vein		37.03	24.48	17.5	12.06	PLATFORM CORTEX
228998	2	E070N240	Spit 1	Flaked piece	FGS		21.26	15.66	6.18	1.96	
228888	2	E070N245	Spit 1	Core	Quartz, vein	Complete	38.66	30.89	22.25	29.03	
228889	2	E070N245	Spit 2	Unretouched flake	Quartzite	Proximal fragment			31.2	30.99	
228890	2	E070N245	Spit 2	Flaked piece	Quartz, vein		32.66	27.2	21.64	20.89	
228892	2	E070N245	Spit 2	Non-artefact	FGS		8.12	7.41	4.43	0.2	
228893	2	E070N245	Spit 2	Unretouched flake	Chert	Proximal fragment	6.33	13.81	2.43	0.31	
228894	2	E070N245	Spit 2	Unretouched flake	Quartz, vein	Complete	14.12	9.01	5.99	0.75	
228895	2	E070N245	Spit 2	Non-artefact	Quartz, vein		9.75	6.21	6.69	0.59	
228928	2	E070N245	Spit 1	Unretouched flake	FGS	Complete	12.2	12.52	7.57	1.16	
228929	2	E070N245	Spit 1	Flaked piece	FGS		11.42	6.37	3.16	0.19	
228930	2	E070N245	Spit 1	Unretouched flake	FGS	Proximal fragment	7.7	9.55	1.4	0.13	
228931	2	E070N245	Spit 1	Flaked piece	FGS		12.55	6.63	1.22	0.13	
228932	2	E070N245	Spit 1	Flaked piece	Quartz, crystal		9.8	7.85	2.52	0.18	
228933	2	E070N245	Spit 1	Flaked piece	Quartz, vein		8.27	6.37	1.31	0.08	
228934	2	E070N245	Spit 1	Flaked piece	FGS		8.37	8.07	2.6	0.11	
228935	2	E070N245	Spit 1	Flaked piece	Quartz, vein		8.19	3.65	3.62	0.05	
228936	2	E070N245	Spit 1	Flaked piece	FGS		9.75	6.45	1.02	0.06	
228999	2	E070N250	Spit 1	European	Metal					174.68	
229000	2	E070N250	Spit 2	European	Glass					2.1	
228988	2	E071.5N215	Spit 1	Unretouched flake	Igneous	Complete	32.28	46.72	9.69	16.94	
228960	2	E071N215	Spit 1	Non-artefact	FGS		16.26	11.29	7.22	1.56	
228961	2	E071N215	Spit 1	Non-artefact	Quartz, vein		20.21	9.57	4.83	0.99	
228962	2	E071N215	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	5.51	11.53	3.51	0.22	
228963	2	E071N215	Spit 1	Unretouched flake	Quartz, vein	Complete	8.28	5.2	2.11	0.07	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
228964	2	E071N215	Spit 1	Unretouched flake	FGS	Proximal fragment	12.6	10.95	2.92	0.47	
228965	2	E071N215	Spit 1	Unretouched flake	FGS	Complete	14.45	19.5	5.4	1.83	
228966	2	E071N215	Spit 1	Unretouched flake	FGS	Proximal fragment	14.8	18.82	7.05	2.28	
228967	2	E071N215	Spit 2	Unretouched flake	FGS	Proximal fragment	15.59	11.78	3.71	0.83	
228994	2	E075N225	Spit 1	Non-artefact	FGS		31.91	26.08	16.04	17.77	
228995	2	E075N225	Spit 1	Unretouched flake	Silcrete	Proximal fragment	21.8	8.69	4.16	0.88	
228996	2	E075N225	Spit 1	Unretouched flake	Quartz, vein	Complete	11.22	10.14	2.74	0.36	
228986	2	E080N205	Spit 1	Flaked piece	FGS		19.74	18.8	8.33	3.7	
228987	2	E080N205	Spit 1	Unretouched flake	Quartz, vein	Complete	15.82	6.59	5.77	0.7	
228915	2	E080N225	Spit 1	Unretouched flake	FGS	Complete	21.8	18.91	7	3.6	
228884	1	E100N050	Spit 1	Flaked piece	Quartz, vein		12.75	9.57	5.95	0.64	
228879	1	E105N050	Spit 1	Unretouched flake	Quartz, vein	Complete	17.85	11.89	4.44	0.87	
229002	3	E120E120	Surface	Flaked piece	FGS		40.31	30.94	11.3	14	
228887	1	E125N035	Spit 1	Non-artefact	FGS		64.72	38.82	21.11	34.69	
228877	1	E125N040	Spit 1	Non-artefact	Quartz, vein		8.02	4.91	3.69	0.13	
228878	1	E125N040	Spit 1	Non-artefact	Quartz, vein		6.77	3.73	2.79	0.08	
228880	1	E125N055	Spit 1	Non-artefact	Quartz, vein		18.32	13.52	9.49	1.69	
228881	1	E125N055	Spit 1	Non-artefact	Quartz, vein		18.61	13.22	6.72	1.62	
228882	1	E125N055	Spit 1	Non-artefact	Quartz, vein		14.27	7.59	2.85	0.36	
228883	1	E125N055	Spit 1	Non-artefact	Quartz, vein		9.14	5.64	1.47	0.1	
229001	3	E135E125	Spit 2	Unretouched flake	Quartz, vein	LCS right	19.04	9.45	4.87	0.95	
228876	1	E135N040	Spit 1	Unretouched flake	Ceramic		22.6	17.87	8.5	3.95	
228885	1	E135N050	Spit 1	Non-artefact	Quartz, vein		40.26	21.21	17.98	15.35	
228886	1	E135N050	Spit 1	Unretouched flake	Quartz, vein	Complete	21.04	17.07	8.8	2.92	
229003	4	E170N355	Spit 1	Unretouched flake	Quartz, vein	Complete	19.3	28.71	6.42	3.1	
229004	4	E170N390	Spit 1	Unretouched flake	Quartz, vein	Complete	20.13	8.41	5.14	1.04	





ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229005	4	E170N390	Spit 2	Unretouched flake	Silcrete	Proximal fragment	18.37	10.39	4.51	1.34	
229006	4	E170N390	Spit 2	Flaked piece	Quartz, vein		15.18	13.04	5.96	1.2	
229045	4	E176N346	Spit 1	Unretouched flake	FGS	LCS right	8.06	5.85	1.63	0.1	
229046	4	E176N346	Spit 2	Unretouched flake	Silcrete	Complete	20.1	9.53	5.13	1.6	
229047	4	E176N346	Spit 2	Unretouched flake	Silcrete	Proximal fragment	13.94	9.93	3.46	0.58	
229048	4	E176N346	Spit 2	Unretouched flake	Silcrete		9.34	9.39	1.33	0.14	
229049	4	E176N346	Spit 2	Flaked piece	Quartz, vein		15.27	11.16	4.98	0.71	
229050	4	E176N346	Spit 2	Flaked piece	FGS		7.93	5.36	3.57	0.16	
229051	4	E176N346	Spit 2	Flaked piece	Silcrete		43.21	17.72	8.3	4.96	
229052	4	E177N346	Spit 1	Core	FGS	Broken	32.76	19.04	12.47	5.61	#1 insitu
229053	4	E177N346	Spit 1	Non-artefact	FGS		15.65	11.92	3.57	0.48	
229054	4	E177N346	Spit 1	Non-artefact	FGS		21.34	11.23	6.37	1.1	
229055	4	E177N346	Spit 1	Unretouched flake	Silcrete	LCS right	20.17	8.63	6.05	1.19	
229056	4	E177N346	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	13.02	11.87	2.85	0.66	
229057	4	E177N346	Spit 1	Flaked piece	Quartz, vein		8.59	7.38	2.32	0.13	
229058	4	E177N346	Spit 1	Unretouched flake	FGS	Complete	5.01	6.01	0.83	0.04	
229059	4	E177N346	Spit 2	Unretouched flake	Quartz, vein		17.2	12.16	7.36	1.95	
229060	4	E177N346	Spit 2	Unretouched flake	Quartz, vein	Complete	10.55	13.01	1.91	0.4	
229061	4	E177N346	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	9.99	7.37	1.85	0.2	
229062	4	E177N346	Spit 2	Unretouched flake	FGS	Complete	13.11	6.41	2.7	0.28	
229063	4	E177N346	Spit 2	Unretouched flake	FGS	Complete	5.19	9.56	1.59	0.1	
229030	4	E178N346	Spit 1	Unretouched flake	FGS	Complete	8.23	6.15	3.14	0.18	
229031	4	E178N346	Spit 1	Non-artefact	Sandstone		46.12	21.81	7.73	10.29	
229032	4	E178N346	Spit 2	Unretouched flake	FGS	Complete	16.03	14.43	4.5	1.58	
229033	4	E178N346	Spit 2	Flaked piece	FGS		23.21	14.45	4.76	1.8	
229034	4	E178N346	Spit 2	Unretouched flake	FGS	Proximal fragment	17.96	8.75	4.87	0.86	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229035	4	E178N346	Spit 2	Unretouched flake	Quartz, vein	Complete	10.26	6.68	2.74	0.19	
229036	4	E178N346	Spit 2	Unretouched flake	FGS	Complete	9.93	3.72	0.68	0.07	
229037	4	E178N346	Spit 2	Non-artefact	Sandstone		74.77	46.9	33.47	115.26	
229038	4	E179N346	Spit 2	Unretouched flake	Quartz, vein	Complete	17.92	7.79	3.97	0.74	
229039	4	E179N346	Spit 1	Unretouched flake	FGS	Proximal fragment	15.04	8.91	2.44	0.51	
229040	4	E179N346	Spit 1	Flaked piece	FGS		11.56	8.74	2.82	0.21	
229041	4	E179N346	Spit 2	Unretouched flake	Silcrete	Proximal fragment	10.96	5.98	1.84	0.2	
229042	4	E179N346	Spit 2	Unretouched flake	Quartz, vein	Complete	9.85	5.73	2.53	0.1	
229043	4	E179N346	Spit 2	Non-artefact	Quartz, vein		10.93	5	3.41	0.15	
229044	4	E179N346	Spit 2	Unretouched flake	FGS	Complete	4.8	4.57	0.76	0.04	
229014	4	E180N343	Spit 1	Non-artefact	FGS		15.13	13.43	3.27	0.54	
229015	4	E180N343	Spit 1	Flaked piece	Silcrete		12.78	12.62	5.41	1.1	
229016	4	E180N343	Spit 1	Non-artefact	FGS		8.08	6.22	1.12	0.06	
229017	4	E180N343	Spit 1	Unretouched flake	FGS	Proximal fragment	7.58	6.04	1.39	0.1	
229018	4	E180N343	Spit 2	Unretouched flake	FGS	Proximal fragment	12.11	12.84	3.09	0.51	
229019	4	E180N343	Spit 2	Flaked piece	FGS		22.01	10.2	4.86	0.79	
229020	4	E180N343	Spit 1	Flaked piece	FGS		16.02	15.26	7.18	1.43	
229025	4	E180N344	Spit 1	Non-artefact	FGS		12.63	7.52	4.79	0.33	
229026	4	E180N344	Spit 2	Unretouched flake	FGS	LCS left	15.75	6.27	6.24	0.91	
229027	4	E180N344	Spit 2	Unretouched flake	FGS	Complete	13.19	7.11	3.52	0.3	
229021	4	E180N345	Spit 1	Unretouched flake	FGS	LCS left	11.85	10.49	2.44	0.41	
229022	4	E180N345	Spit 1	Flaked piece	Quartz, vein		12.86	12.01	6.36	0.6	
229023	4	E180N345	Spit 2	Non-artefact	FGS		16.97	8.11	5.36	0.56	
229024	4	E180N345	Spit 2	Unretouched flake	Quartz, vein	Complete	13.29	20.37	7.8	2.47	
229007	4	E180N346	Spit 1	Unretouched flake	Silcrete	Medial fragment	11.65	13.47	4.8	1.01	
229008	4	E180N346	Spit 1	Unretouched flake	Silcrete	Proximal fragment	12.33	15.81	3.4	1.1	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229009	4	E180N346	Spit 1	Flaked piece	FGS		12.03	9.01	1.56	0.18	
229010	4	E180N346	Spit 2	Non-artefact	FGS		22.47	13.3	6.65	1.43	
229011	4	E180N346	Spit 2	Flaked piece	Quartz, vein		30.91	20.45	10.23	7.01	
229012	4	E180N346	Spit 2	Flaked piece	FGS		15.19	8.31	2.64	0.33	
229013	4	E180N346	Spit 2	Unretouched flake	Quartz, vein	Complete	13.96	5.11	2.18	0.21	
229028	4	E180N347	Spit 1	Flaked piece	Quartz, vein		13.95	7.08	4.01	0.39	
229029	4	E180N347	Spit 1	Core	FGS		37.88	26.95	12.65	11.11	
229072	4	E181N346	Spit 1	Unretouched flake	Silcrete	Broken	15.28	10.64	2.56	0.58	
229073	4	E181N346	Spit 1	Unretouched flake	FGS	Medial fragment	6.8	6.85	1.59	0.09	
229074	4	E181N346	Spit 2	Unretouched flake	Silcrete	Complete	19.55	16.88	4.6	1.72	
229075	4	E181N346	Spit 2	Unretouched flake	Silcrete	Distal fragment	10.52	8.99	2.13	0.3	
229076	4	E181N346	Spit 2	Core	FGS	Complete	26.48	22.05	20.1	13.01	1 PLATFORM
229077	4	E181N346	Spit 2	Non-artefact	FGS		13.12	7.71	6.31	0.55	
229078	4	E181N346	Spit 2	Unretouched flake	FGS	LCS right	10.81	4.82	1.22	0.09	
229079	4	E181N346	Spit 2	Flaked piece	FGS		9.8	6.13	3.83	0.18	
229080	4	E181N346	Spit 2	Flaked piece	FGS		11.13	7.46	3.96	0.22	
229081	4	E181N346	Spit 2	Unretouched flake	FGS	Complete	6.27	5.28	1.37	0.04	
229082	4	E182N346	Spit 1	Unretouched flake	Quartz, vein	Complete	13.06	11.52	3.12	0.63	
229083	4	E182N346	Spit 1	Core	Quartz, vein	Complete	39.7	27.37	21.23	23.11	
229084	4	E182N346	Spit 2	Unretouched flake	FGS	Complete	8.61	9.06	1.92	0.2	
229085	4	E182N346	Spit 2	Unretouched flake	FGS	Medial fragment	9.24	9.12	2.1	0.27	
229086	4	E182N346	Spit 2	Unretouched flake	Silcrete	Broken	8.63	7.01	0.95	0.07	
229087	4	E182N346	Spit 2	Unretouched flake	Silcrete	Proximal fragment	5.54	7.57	3.56	0.2	
229088	4	E182N346	Not stated	Unretouched flake	FGS	Proximal fragment	21.86	19.66	8.11	5.16	Insitu #1
229089	4	E182N346	Not stated	Unretouched flake	Silcrete	Medial fragment	14.85	16.1	5.41	1.79	Insitu #2
229064	4	E183N346	Spit 1	Unretouched flake	Silcrete	Complete	10.28	16.82	4.98	0.78	
229065	4	E183N346	Spit 1	Unretouched flake	FGS	Complete	15.51	7.9	2.88	0.42	





ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229066	4	E183N346	Spit 2	Unretouched flake	FGS	Complete	18.36	7.36	2.97	0.45	
229067	4	E183N346	Spit 2	Unretouched flake	Silcrete	Proximal fragment	7.52	16.63	8.82	1.69	
229068	4	E183N346	Spit 2	Unretouched flake	FGS	Medial fragment	16.26	9.33	3.35	0.49	
229069	4	E183N346	Spit 2	Flaked piece	FGS		17.75	8.2	5.98	0.74	
229070	4	E183N346	Spit 2	Unretouched flake	FGS	Proximal fragment	9.02	8.58	1.93	0.18	
229071	4	E183N346	Spit 2	Unretouched flake	FGS	Complete	15.12	6.29	1.8	0.2	
229299	7	E200N600	Spit 1	Unretouched flake	Silcrete	Medial fragment	8.96	13.63	5.89	0.76	
229300	7	E200N600	Spit 2	Unretouched flake	FGS	Complete	11.25	17.45	2.66	0.82	
229295	7	E210N600	Spit 2	Unretouched flake	Quartz, vein	Complete	19.74	17.14	4.11	1.92	
229296	7	E215N600	Spit 1	Non-artefact	FGS		27.08	13.84	7.44	2.28	
229297	7	E215N600	Spit 3	Non-artefact	Quartz, vein		32.19	23.87	10.81	7.43	conjoined non artefact, excavation damage.
229298	7	E215N600	Spit 1	European	Glass					12.71	
229179	5	E216N420	Spit 2	Unretouched flake	Quartz, vein	Distal fragment	12.85	10.54	4.62	0.73	
229180	5	E216N420	Spit 2	Flaked piece	Quartz, vein		10.07	6.81	2.74	0.26	
229360	7	E219.5N600	Spit 2	Unretouched flake	Silcrete	LCS right	18.54	13.31	2.47	0.9	INSITU #1 18CM DEEP
229361	7	E219.5N600	Spit 3	Unretouched flake	Silcrete	Proximal fragment	19.15	11.95	3.65	1.33	
229362	7	E219.5N600	Spit 3	Non-artefact	Quartz, vein		20.27	14.49	10.09	3.02	
229351	7	E220.5N599	Spit 2	Non-artefact	Quartz, vein		12.97	6.78	3.24	0.25	
229352	7	E220.5N599	Spit 2	Non-artefact	Quartz, vein		8.8	6.97	1.82	0.12	
229353	7	E220.5N599	Spit 3	Unretouched flake	Quartz, vein	Complete	19.42	14.41	3.65	1.28	
229354	7	E220.5N599	Spit 3	Unretouched flake	Quartz, vein	Complete	13.41	8.22	1.58	0.24	
229355	7	E220.5N599	Spit 3	Unretouched flake	Quartz, vein	Complete	6.22	4.03	2.04	0.05	
229339	7	E220.5N599.5	Spit 2	Unretouched flake	FGS	Proximal fragment	38.91	25.99	4.35	4.68	
229340	7	E220.5N599.5	Spit 2	Non-artefact	Quartz, vein		20.45	14	8.04	2.7	
229341	7	E220.5N599.5	Spit 2	Unretouched flake	Quartz, vein	Distal fragment	9.3	8.98	2.35	0.21	
229342	7	E220.5N599.5	Spit 2	Non-artefact	Quartz, vein		11.44	6.09	2.3	0.13	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229343	7	E220.5N599.5	Spit 3	Non-artefact	Banded FGS		20.79	13.47	4.78	1.21	
229344	7	E220.5N599.5	Spit 3	Non-artefact	Quartz, vein		22.54	10.74	4.8	1.12	
229345	7	E220.5N599.5	Spit 3	Unretouched flake	Silcrete	Proximal fragment	10.98	12.39	2.27	0.43	
229346	7	E220.5N599.5	Spit 3	Unretouched flake	Quartz, vein	Proximal fragment	15.02	8.11	3.44	0.75	
229347	7	E220.5N599.5	Spit 3	Flaked piece	Quartz, vein		11.62	8.14	2.22	0.2	
229348	7	E220.5N599.5	Spit 3	Non-artefact	Quartz, vein		7.5	7.74	2.57	0.12	
229349	7	E220.5N599.5	Spit 4	Unretouched flake	Quartz, vein	Medial fragment	8.46	8.4	2.84	0.23	
229350	7	E220.5N599.5	Spit 4	Non-artefact	Quartz, vein		6.53	5.27	1.55	0.04	
229312	7	E220.5N600	Spit 2	Flaked piece	Quartz, vein		42.86	41.64	11.36	21.66	
229313	7	E220.5N600	Spit 2	Flaked piece	Quartz, vein		19.81	12.71	6.82	2.08	
229314	7	E220.5N600	Spit 2	Unretouched flake	Quartz, vein	Medial fragment	8.32	12.49	3.63	0.62	
229315	7	E220.5N600	Spit 3	Non-artefact	Quartz, vein		19.91	14.26	11.49	4.09	
229316	7	E220.5N600	Spit 3	Unretouched flake	Silcrete	LCS left	22.08	10.97	6.13	1.38	
229317	7	E220.5N600	Spit 3	Unretouched flake	Quartz, vein	Complete	18.85	13.88	5.4	1.56	
229318	7	E220.5N600	Spit 3	Unretouched flake	FGS	Complete	16.35	10.92	2.28	0.67	
229319	7	E220.5N600	Spit 3	Flaked piece	Quartz, vein		14.06	12.1	8.97	1.26	
229320	7	E220.5N600	Spit 3	Unretouched flake	Silcrete	Medial fragment	10.97	9.16	3.24	0.42	
229321	7	E220.5N600	Spit 3	Unretouched flake	Quartz, vein	Distal fragment	16.23	7.37	2.27	0.36	
229322	7	E220.5N600	Spit 3	Unretouched flake	Quartz, vein	Medial fragment	15.71	10.17	3.47	0.66	
229323	7	E220.5N600	Spit 3	Non-artefact	Quartz, vein		13.11	11.19	5.85	0.62	
229324	7	E220.5N600	Spit 3	Unretouched flake	Quartz, vein	Distal fragment	11.56	10.45	3.31	0.57	
229325	7	E220.5N600	Spit 3	Flaked piece	Quartz, vein		10.93	7.43	4.09	0.35	
229326	7	E220.5N600	Spit 3	Unretouched flake	Quartz, vein	Proximal fragment	9.2	11.57	3.21	0.57	
229327	7	E220.5N600	Spit 3	Unretouched flake	Quartz, vein	Proximal fragment	13.83	8.62	4.29	0.54	
229328	7	E220.5N600	Spit 4	Unretouched flake	Quartz, vein	Complete	19.4	16.65	5.19	2.62	
229329	7	E220.5N600	Spit 4	Unretouched flake	Quartz, vein	Medial fragment	8.96	10.14	2.97	0.37	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229330	7	E220.5N600	Spit 4	Non-artefact	Quartz, vein		17.63	8.21	5.12	0.67	
229356	7	E220.5N600.5	Spit 2	Non-artefact	Quartz, vein		15.98	8.82	4.99	0.84	
229357	7	E220.5N600.5	Spit 3	Non-artefact	Quartz, vein		11.45	7.8	3.66	0.43	
229358	7	E220.5N600.5	Spit 3	Non-artefact	Quartz, vein		12.79	9.46	3.6	0.42	
229359	7	E220.5N600.5	Spit 3	Non-artefact	Quartz, vein		11.65	7.49	5.54	0.43	
229363	7	E220.5N601	Spit 4	Unretouched flake	FGS	Complete	15.95	15.6	4.71	1.35	
229364	7	E220.5N601	Spit 4	Unretouched flake	Silcrete	Proximal fragment	22.19	11.88	4.41	1.76	
229366	7	E220.5N601	Spit 2	Unretouched flake	Silcrete	Complete	18.68	8.05	2.79	0.47	
229367	7	E220.5N601	Spit 3	Non-artefact	Quartz, vein		21.66	12.12	7.33	1.57	
229368	7	E220.5N601	Spit 3	Non-artefact	Quartz, vein		11.63	11	3.19	0.56	
229369	7	E220.5N601	Spit 3	Non-artefact	Quartz, vein		8.65	8.89	4.26	0.19	
229190	5	E220N355	Spit 1	Unretouched flake	Quartz, crystal	Complete	9.84	7.37	2.61	0.21	
229280	7	E220N600	Spit 3	Unretouched flake	FGS	Complete	24.49	22.5	11.21	8.3	
229281	7	E220N600	Spit 3	Unretouched flake	FGS	Complete	25.58	23.25	6.62	4.95	
229282	7	E220N600	Spit 3	Flaked piece	Quartz, vein		15.51	14.71	4.29	1.39	
229283	7	E220N600	Spit 3	Unretouched flake	Quartz, vein	Proximal fragment	13.3	15.58	5.17	1.12	
229284	7	E220N600	Spit 3	Flaked piece	Silcrete		9.77	6.76	3.63	0.2	
229285	7	E220N600	Spit 4	Flaked piece	Silcrete		12.5	6.64	2.56	0.26	
229286	7	E220N600	Spit 4	Unretouched flake	Quartz, vein	Medial fragment	9.43	7.26	2.6	0.21	
229287	7	E220N600	Spit 4								
229288	7	E220N600	Spit 3	Unretouched flake	Silcrete	Proximal fragment	16.68	7.67	2.79	0.44	
229289	7	E220N600	Spit 4	Unretouched flake	Silcrete	Complete	26.08	12.82	5.36	2.29	CONJOINED PIECES INSITU #2
229290	7	E220N600									
229291	7	E220N600	Spit 4	Unretouched flake	Silcrete	Proximal fragment	12.26	9.47	2.11	0.37	INSITU #2
229292	7	E220N600	Spit 4	Core	Silcrete		34.54	21.74	18.13	17.5	INSITU #1
229293	7	E220N600	Spit 4	Flaked piece	Silcrete		11.42	5.72	2.09	0.17	INSITU #3





ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229294	7	E220N600	Spit 4	Non-artefact	Charcoal					42.87	33CM
229338	7	E221.5N589	Spit 4	Non-artefact	Banded FGS		20.3	17.2	6.79	2.48	
229331	7	E221N580	Spit 4	Unretouched flake	Quartzite	Medial fragment	21.69	11.86	3.75	1.33	
229332	7	E221N580	Spit 3	Flaked piece	Quartz, vein		8.86	5.77	0.74	0.07	
229333	7	E221N580	Spit 3	Flaked piece	Quartz, vein		7.8	7.47	1.95	0.08	
229334	7	E221N585	Spit 3	Non-artefact	Quartz, vein		23.89	14.16	8.88	3.16	
229335	7	E221N585	Spit 3	Non-artefact	Quartz, vein		10.98	8.41	3.68	0.23	
229336	7	E221N595	Spit 3	Flaked piece	Quartz, vein		8.47	7.43	3.27	0.14	
229337	7	E221N595	Spit 3	Non-artefact	FGS		12.62	6.28	1.47	0.13	
229365	7	E221N600	Spit 2	Non-artefact	Quartz, vein		17.43	11.03	3.33	0.44	
229301	7	E223N600	Spit 2	Non-artefact	Quartz, vein		17.99	9.26	5.01	0.73	
229303	7	E223N600	Spit 3	Unretouched flake	Quartz, vein	Distal fragment	15.85	9.23	5.25	0.77	
229141	5	E225N435	Spit 3	Unretouched flake	Quartz, vein	Complete	25.55	13.81	6.98	3.04	
229142	5	E225N435	Spit 3	Flaked piece	Quartz, vein		18.84	16.6	8.11	2.96	
229307	7	E226N600	Spit 2	Unretouched flake	Quartz, vein	Distal fragment	10.3	10.97	2.79	0.38	
229308	7	E226N600	Spit 3	Unretouched flake	Quartz, vein	Proximal fragment	12.49	16.91	4.07	1.07	
229309	7	E226N600	Spit 3	Non-artefact	Quartz, vein		13.5	10.07	7.15	0.76	
229310	7	E226N600	Spit 4	Unretouched flake	FGS	Proximal fragment	24.28	22.89	11.39	6.88	
229311	7	E226N600	Spit 4	Non-artefact	Quartz, vein		18.79	12.92	4.94	1.17	
229155	5	E227.5N430	Spit 1	Non-artefact	FGS		14.24	12.53	2.61	0.36	
229156	5	E227.5N430	Spit 1	Unretouched flake	FGS	Distal fragment	9.34	5.07	1.3	0.09	
229157	5	E227.5N430	Spit 1	European	Glass		9.82	7.08	2.64	0.14	
229158	5	E227.5N430	Spit 1	Non-artefact	Quartz, vein		9.24	6.88	4.05	0.22	
229159	5	E227.5N430	Spit 1	Non-artefact	Quartz, vein		7.99	5.41	2.63	0.15	
229160	5	E227.5N430	Spit 2	Flaked piece	Silcrete		21.26	12.42	4.64	1.16	
229161	5	E227.5N430	Spit 2	Core	Quartz, vein		37.84	15.72	15.73	11.53	
229162	5	E227.5N430	Spit 2	Flaked piece	Quartz, vein		9.53	5.81	2.85	0.15	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229134	5	E228 N429.5	Spit 1	Unretouched flake	IMT	Complete	27.11	14.72	4.15	1.3	
229135	5	E228 N429.5	Spit 1	Unretouched flake	Quartz, vein	Medial fragment	7.94	6.77	2.16	0.2	
229136	5	E228 N429.5	Spit 1	Retouched flake	Chert	Complete	18.34	6.89	3.13	0.4	retouched distal rh end
229137	5	E228 N429.5	Spit 1	Non-artefact	Quartz, vein		10.1	7.8	3.17	0.2	
229138	5	E228 N429.5	Spit 1	Non-artefact	Quartzite		14.1	10.72	5.3	0.5	
229139	5	E228 N429.5	Spit 1	Non-artefact	Quartz, vein		12.75	9.37	9.58	1.1	
229140	5	E228 N429.5	Spit 1	Non-artefact	Limestone		13.15	9.92	4.71	0.5	
229149	5	E228.5N430	Spit 2	European	Glass		27.63	16.38	2.78	1.91	
229150	5	E228.5N430	Spit 2	European	Glass		12.47	7.7	3.95	0.41	
229151	5	E228.5N430	Spit 2	Non-artefact	Quartz, vein		14.01	10.89	4.44	0.66	
229152	5	E228.5N430	Spit 2	Non-artefact	Quartz, vein		10.82	9.36	5.4	0.43	
229153	5	E228.5N430	Spit 2	Unretouched flake	Quartz, vein	Complete	14.19	5.74	2.94	0.31	
229143	5	E228A29.5	Spit 2	Retouched flake	Quartz, vein	Complete	14.68	17.92	4.14	1.57	
229144	5	E228A29.5	Spit 2	Core	Quartz, vein	Complete	33.88	21.47	17.88	15.04	
229145	5	E228A29.5	Spit 2	Unretouched flake	FGS	Medial fragment	14.19	7.75	3.39	0.47	
229146	5	E228A29.5	Spit 2	Non-artefact	Quartz, vein		15.84	14.49	4.52	0.9	
229147	5	E228A29.5	Spit 2	Non-artefact	Quartz, vein		15.18	7.96	3.34	0.38	
229148	5	E228A29.5		Non-artefact	Quartz, vein		7.83	7.23	2.67	0.14	
229154	5	E228N430	Bulk	Unretouched flake	FGS	Complete	25.26	10.46	1.53	0.44	
229181	5	E228N430	Spit 2	Non-artefact	Quartz, vein		26.72	15.37	11.64	4.48	
229182	5	E228N430	Spit 2	Core	Silcrete		27.27	24.49	22.67	10.12	2 PLATFORMS 2 FLAKED SURFACES
229183	5	E228N430	Spit 2	Unretouched flake	Quartzite	Medial fragment	18.26	20.45	7.42	3.77	
229184	5	E228N430	Spit 2	Unretouched flake	Silcrete	Complete	14.18	20.08	2.86	1.2	
229185	5	E228N430	Spit 2	Core	Silcrete		23.46	16.26	15.79	5.02	
229186	5	E228N430	Spit 2	Flaked piece	Silcrete		25.05	16.84	4.44	1.3	
229187	5	E228N430	Spit 2	Flaked piece	Quartz, vein		10.26	7.16	4.08	0.31	
229188	5	E228N430	Spit 2	Flaked piece	Quartz, vein		8.32	6.57	3.25	0.19	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229189	5	E228N430	Spit 2	Unretouched flake	Quartz, vein	Complete	9.51	5.18	1.85	0.13	
229163	5	E228N430.5	Spit 1	Unretouched flake	Quartz, vein	LCS right	14.76	12.4	2.89	0.63	
229164	5	E228N430.5	Spit 1	Unretouched flake	Quartz, vein	Medial fragment	13.15	9.39	3.26	0.64	
229165	5	E228N430.5	Spit 2	Flaked piece	Quartz, vein		10.54	7.12	1.95	0.16	
229166	5	E228N431	Spit 1	Core	Quartz, vein		20	16.32	12.44	4.84	
229167	5	E228N431	Spit 2	Unretouched flake	Quartz, vein	Complete	47.43	38.79	12.07	17.9	
229168	5	E228N431	Spit 2	Unretouched flake	Quartz, vein	Complete	17.47	13.38	4.22	1.1	
229169	5	E228N431	Spit 2	Unretouched flake	Quartz, vein		13.37	11.53	5.48	1.07	
229170	5	E228N431	Spit 2	Unretouched flake	Quartz, vein	Proximal fragment	16.49	10.42	3.89	1.15	
229171	5	E228N431	Spit 2	Unretouched flake	Quartz, vein	Complete	10.49	12.79	5.02	0.86	
229172	5	E228N431	Spit 2	Non-artefact	Quartz, vein		16.86	10.1	4.32	0.79	
229173	5	E228N431	Spit 2	Unretouched flake	Quartz, vein	Complete	13.94	8.36	3.24	0.42	
229174	5	E228N431	Spit 2	Unretouched flake	Quartz, vein	Complete	4.61	5.8	1.46	0.06	
229175	5	E228N431	Spit 2	Unretouched flake	Quartz, vein	Complete	8.74	4.38	1.26	0.09	
229191	5	E230N345	Spit 1	Flaked piece	Quartz, vein		23.73	17.26	6.34	2.03	
229192	5	E230N355	Spit 1	Core	Quartz, vein		30.35	16.81	12.89	4.93	
229193	5	E230N355	Spit 1	Unretouched flake	Sandstone	Distal fragment	7.76	5.9	1.69	0.1	
229194	5	E230N355	Spit 1	Unretouched flake	Quartz, vein	Medial fragment	6.19	5.8	2.23	0.13	
229195	5	E230N355	Spit 1	Unretouched flake	Sandstone	Distal fragment	3.88	6.8	1.36	0.09	
229302	7	E233N600	Spit 2	Non-artefact	Quartz, vein		8.86	6.54	3.29	0.16	
229304	7	E233N600	Spit 4	Retouched flake	Quartz, vein	Complete	9.33	5.59	2.94	0.2	
229305	7	E233N600	Spit 4	Unretouched flake	Quartz, vein	Medial fragment	19.93	11.72	5.62	1.44	
229306	7	E233N600	Spit 5	Core	Quartz, vein	Broken	19.41	11.4	10.93	1.77	
229196	5	E239.5N355	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	12.43	10.98	3.26	0.58	
229197	5	E239.5N355	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	10.94	12.09	6.23	0.91	
229198	5	E239.5N355	Spit 2	Unretouched flake	Quartz, vein	Proximal fragment	9.89	17.94	3.95	0.86	





ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229199	5	E239.5N355	Spit 2	Flaked piece	Quartz, vein		12.99	7.84	5.97	0.61	
229090	5	E240.5N355	Surface	Unretouched flake	Quartzite	Complete	61.74	25.58	19.38	31.82	
229091	5	E240.5N355	Spit 1	Core	FGS		46.27	34.44	27.14	57.77	Insitu #1
229092	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Proximal fragment	23.25	30.5	5.25	5.01	Insitu #2
229093	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Proximal fragment	24.21	23.57	8.35	4.51	Insitu #3
229094	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Proximal fragment	28.87	27.82	7.79	9.3	Insitu #1
229095	5	E240.5N355	Spit 2	Core	Quartzite	Broken	42.48	33.16	17.72	23.3	Insitu #1
229096	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	39.14	32.38	13.6	16.52	Insitu #1
229097	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	39.17	20.49	3.97	3.42	Insitu #1
229098	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	41.87	22.92	6.74	6.33	Insitu #1
229099	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	28.31	26.03	9.7	6.54	Insitu #1
229100	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	29.5	20.8	6.03	4.78	Insitu #1
229101	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	39.91	10.56	6.39	3.04	Insitu #1
229102	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	27.99	17.77	5.74	3.97	Insitu #1
229103	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Proximal fragment	22.53	18.84	4.95	2.95	Insitu #1
229104	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	16.47	22.39	4.42	2.04	Insitu #1
229105	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Marginal fragment	31.97	13.11	2.42	1.36	Insitu #1
229106	5	E240.5N355	Spit 2	Flaked piece	Quartzite		12.81	9.31	1.73	0.31	Insitu #1
229107	5	E240.5N355	Spit 2	Flaked piece	Quartzite		16.45	7.39	2.33	0.46	Insitu #1
229108	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Proximal fragment	53.48	30.16	10.54	23.7	
229109	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	27.91	16.97	4.48	2.87	
229110	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Marginal fragment	25.53	13.23	3.96	1.78	
229111	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Distal fragment	29.78	10.53	7.72	3.25	
229112	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Proximal fragment	14.03	17.54	6.69	1.78	
229113	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Distal fragment	16.31	19.87	4.15	1.79	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229114	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	25.26	16.5	6.06	2.66	
229115	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	26.29	10.44	3.46	1	
229116	5	E240.5N355	Spit 2	Flaked piece	Quartzite		21.24	13.42	3.47	0.94	
229117	5	E240.5N355	Spit 2	Unretouched flake	Quartz, vein	Medial fragment	21.63	12.81	3.12	1.11	
229118	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	LCS left	9.66	18.72	7.34	1.51	
229119	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Medial fragment	10.33	15.54	4.58	0.98	
229120	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Complete	21.01	12.93	1.93	0.66	
229121	5	E240.5N355	Spit 2	Flaked piece	Quartzite		16.71	12.18	7.03	1.65	
229122	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	Medial fragment	8.36	13.35	3.03	0.49	
229123	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	LCS right	10.03	7.32	2.29	0.17	
229124	5	E240.5N355	Spit 2	Unretouched flake	Quartzite	LCS right	11.27	5.59	2.78	0.27	
229125	5	E240.5N355	Spit 2	Non-artefact	FGS		10.62	10.64	1.75	0.23	
229126	5	E240.5N355	Spit 4	Unretouched flake	Quartzite	Complete	33.61	37.85	8.07	11.48	Insitu #1
229127	5	E240.5N355	Spit 3	Unretouched flake	Quartzite	Complete	42.57	42	8.14	17.94	Insitu #2
229128	5	E240.5N355	Spit 3	Unretouched flake	Quartzite	Marginal fragment	24.21	14.44	3.11	1.25	Insitu #1
229129	5	E240.5N355	Spit 3	Unretouched flake	Quartzite	Proximal fragment	22.48	22.65	5.26	3.99	
229130	5	E240.5N355	Spit 3	Unretouched flake	Quartz, vein	Complete	23.21	14.08	4.2	1.55	
229131	5	E240.5N355	Spit 3	Unretouched flake	Quartzite	Proximal fragment	21.77	8.93	4.5	1.1	
229132	5	E240.5N355	Spit 3	Unretouched flake	Quartzite	Proximal fragment	8.92	9.97	1.81	0.32	
229133	5	E240.5N355	Spit 3	Unretouched flake	Quartzite	Complete	28.11	37.68	12.69	16.46	Insitu #3
229263	5	E240N354	Spit 1	Unretouched flake	Silcrete	Complete	28.04	26.47	9.07	5.67	
229220	5	E240N354.5	Spit 1	Unretouched flake	Quartz, vein	Complete	9.71	5.11	1.84	0.11	
229221	5	E240N354.5	Spit 1	Unretouched flake	Sandstone	Complete	42.37	52.23	18.29	49.83	INSITU #1
229222	5	E240N354.5	Spit 2	Core	Quartz, vein	Broken	43.15	24.16	20.2	20.71	
229223	5	E240N354.5	Spit 2	Unretouched flake	Silcrete	Proximal fragment	22.65	20.13	4.33	3.05	
229224	5	E240N354.5	Spit 2	Unretouched flake	Quartz, vein	Medial fragment	12.8	16.9	3.01	0.92	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229225	5	E240N354.5	Spit 2	Unretouched flake	Quartzite	Complete	32.01	11.14	2.48	1.13	
229226	5	E240N354.5	Spit 2	Unretouched flake	FGS	Complete	17.49	7.81	2.86	0.33	
229227	5	E240N354.5	Spit 2	Unretouched flake	Quartz, vein	Complete	13.61	15.65	4.01	0.94	
229228	5	E240N354.5	Spit 2	Unretouched flake	Quartz, vein	LCS left	26.22	17.56	6.73	3.62	
229229	5	E240N354.5	Spit 2	Unretouched flake	Quartz, vein	Complete	15.36	11.78	3.02	0.71	
229230	5	E240N354.5	Spit 2	Flaked piece	Quartz, vein		18.97	12.53	5.59	1.27	
229231	5	E240N354.5	Spit 2	Unretouched flake	Silcrete	Medial fragment	11.92	17.77	3.18	1.09	
229200	5	E240N355	Spit 1	Unretouched flake	Sandstone	Complete	18.92	19.46	6.24	2.58	
229201	5	E240N355	Spit 1	Flaked piece	Quartzite		29.8	20.85	6.36	3.79	
229202	5	E240N355	Spit 1	Unretouched flake	Silcrete	Proximal fragment	28.59	19.21	5.98	4.7	
229203	5	E240N355	Spit 1	Non-artefact	FGS		23.91	17.42	14.4	3.46	
229204	5	E240N355	Spit 1	Non-artefact	Quartz, vein		22.84	19.87	9.05	3.02	
229205	5	E240N355	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	10.11	8.95	2.72	0.43	
229206	5	E240N355	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	7.04	8.65	3.58	0.35	
229207	5	E240N355	Spit 1	Flaked piece	Quartz, vein		9.98	5.53	2.27	0.15	
229208	5	E240N355	Spit 1	Unretouched flake	Quartz, vein	Complete	9.08	4.63	1.86	0.12	
229209	5	E240N355	Spit 1	Non-artefact	Quartz, vein		7.45	6.17	2.02	0.09	
229210	5	E240N355	Spit 2	Flaked piece	Quartz, vein		8.95	3.34	1.69	0.07	
229211	5	E240N355.5	Spit 1	Unretouched flake	Quartzite	Complete	43.89	22.84	12.49	16.96	
229212	5	E240N355.5	Spit 1	Unretouched flake	FGS	Complete	40.83	22.42	12.7	19.15	
229213	5	E240N355.5	Spit 1	Unretouched flake	Silcrete	Proximal fragment	12.26	23.03	5.08	1.73	
229214	5	E240N355.5	Spit 1	Unretouched flake	FGS	LCS right	12.03	13.44	5.21	1.45	
229215	5	E240N355.5	Spit 1	Non-artefact	FGS		13.96	11.44	1.21	0.22	
229216	5	E240N355.5	Spit 2	Non-artefact	Quartz, vein		21.4	11.71	10.51	2.59	
229217	5	E240N355.5	Spit 2	Unretouched flake	Quartz, vein	Medial fragment	13.03	14.76	5.09	1.66	
229218	5	E240N355.5	Spit 2	Flaked piece	Quartz, vein		17.82	14.04	4.51	0.96	





ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229219	5	E240N355.5	Spit 2	Unretouched flake	Quartzite	Complete	38.13	20.21	5.97	5.83	
229176	5	E240N415	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	28.8	37.98	9.92	10.76	
229177	5	E240N415	Spit 2	Flaked piece	Quartz, vein		10.59	6.55	4.65	0.32	
229178	5	E240N415	Spit 2	Flaked piece	Quartz, vein		12	7.03	5.89	0.67	
229232	5	E241.5N355	Spit 1	Unretouched flake	Quartz, vein	Complete	60.65	26.3	12.22	18.3	INSITU #1
229233	5	E241.5N355	Spit 1	Core	Quartzite	Broken	74.34	48.08	18.91	55.07	
229234	5	E241.5N355	Spit 1	Unretouched flake	Quartzite	LCS right	28.84	11.8	2.1	1.05	
229235	5	E241.5N355	Spit 1	Unretouched flake	Quartz, vein	Complete	25.26	12.91	4.34	1.76	
229236	5	E241.5N355	Spit 1	Flaked piece	Quartz, vein		15.34	10.76	8.87	1.69	
229237	5	E241.5N355	Spit 1	Unretouched flake	IMT	Complete	18.78	7.86	1.94	0.46	
229238	5	E241.5N355	Spit 1	Unretouched flake	Quartzite	Proximal fragment	14.84	5.43	2.29	0.22	
229239	5	E241.5N355	Spit 1	Unretouched flake	Sandstone	Complete	11.11	8.57	1.75	0.22	
229240	5	E241.5N355	Spit 2	Flaked piece	Quartzite		18.15	8.03	2.52	0.46	
229241	5	E241.5N355	Spit 2	Unretouched flake	Quartz, vein	Medial fragment	14.32	7.98	5.49	0.84	
229242	5	E241.5N355	Spit 2	Non-artefact	Quartz, vein		8.94	5.72	3.83	0.21	
229243	5	E241.5N355	Spit 2	Unretouched flake	Quartzite	Proximal fragment	23.42	26.08	4.08	3.13	
229262	5	E241N354	Spit 1	Unretouched flake	Banded FGS	Medial fragment	11.24	7.2	3.89	0.39	
229244	5	E241N355	Spit 1a	Unretouched flake	Quartz, vein	Complete	18.38	6.14	3.49	0.47	
229245	5	E241N355	Spit 1b	Flaked piece	Quartz, vein		16.74	6.45	4.15	0.36	
229246	5	E241N355	Spit 2a	Unretouched flake	Silcrete	Proximal fragment	13.5	15.08	9.1	3.18	
229247	5	E241N355	Spit 2a	Non-artefact	FGS		20.19	15	6.14	1.68	
229248	5	E241N355	Spit 2a	Non-artefact	FGS		18.41	11.51	4.7	0.77	
229249	5	E241N355	Spit 2a	Unretouched flake	Quartzite	Proximal fragment	36.33	24.21	4.48	5.12	INSITU #1
229250	5	E241N355	Spit 2a	Core	Quartzite		51.22	58.42	20.74	58.69	INSITU #2
229251	5	E241N355	Spit 2a	Unretouched flake	Quartzite	Proximal fragment	26.34	17.37	6.64	5.11	INSITU #3
229252	5	E241N355	Spit 2a	Non-artefact	Quartz, vein		42.52	27.2	15.06	11.47	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229253	5	E241N355	Spit 2b	Non-artefact	Quartz, vein		6.19	4.03	1.65	0.04	
229254	5	E241N355	Spit 2b	Flaked piece	Silcrete		17.7	16.1	5.91	1.67	
229255	5	E241N355	Spit 2b	Unretouched flake	Quartzite	LCS right	16.41	14.14	1.91	0.52	
229256	5	E241N355	Spit 2b	Non-artefact	Quartz, vein		13.18	10.96	4.4	0.58	
229257	5	E241N355	Spit 2b	Unretouched flake	Quartz, vein	Complete	9.22	7.88	1.33	0.12	
229258	5	E241N355	Spit 2b	Unretouched flake	Quartzite	Complete	40.41	43.1	5.41	11.95	INSITU #1
229259	5	E241N355	Spit 2b	Core	Quartzite	Complete	43.38	27.26	24.84	26.73	INSITU #2
229260	5	E241N355	Spit 3b	Unretouched flake	Quartzite	Complete	38.05	28.08	6.71	9.71	
229261	5	E241N355	Spit 4b	Unretouched flake	Quartz, vein	Complete	23.15	18.77	4.81	3.11	
229264	5	E242N355	Spit 1	Unretouched flake	Quartzite	Proximal fragment	27.8	24.16	8.43	6.64	
229265	5	E242N355	Spit 2	Unretouched flake	FGS	Complete	16.73	6.49	3.58	0.43	
229266	5	E242N355	Spit 2	Unretouched flake	Quartzite	Complete	17.62	6.77	2.58	0.45	
229270	6	E290N050	Spit 1	Retouched flake	Silcrete	LCS left	37.51	15.15	4.14	2.97	
229276	6	E305N060	Spit 1	Unretouched flake	Quartz, vein	Proximal fragment	9.31	9.16	2.43	0.26	
229272	6	E305N040	Spit 1	Unretouched flake	Quartz, crystal	Proximal fragment	9.08	8.35	2.36	0.22	
229273	6	E305N040	Spit 1	Unretouched flake	Quartz, vein	LCS right	17.57	11.08	3.99	1.1	
229274	6	E305N040	Spit 1	Flaked piece	Quartz, vein		23.51	8.81	7.57	1.56	
229275	6	E305N040	Spit 1	Non-artefact	Quartz, vein		6.47	6.32	3.08	0.13	
229277	6	E305N060	Spit 1	Flaked piece	Quartz, vein		13.26	5.79	2.11	0.14	
229267	6	E315N040	Spit 1	Unretouched flake	Chert	Complete	39.81	23.59	6.36	7.94	one conjoining piece with ID: 229268, smaller following pieces are all excavation debitage
229268	6	E315N040	Spit 1	Flaked piece	Chert	Broken	18.67	11.69	5.5	0.76	Conjoins with ID:229267
229269	6	E315N040	Spit 1	Flaked piece	Chert	Broken	8.13	5.92	0.95	0.15	3 pieces this same size, 2 which were too small to measure or weigh, all conjoins with ID: 229267,229268
229271	6	E315N060	Spit 1	Core	Chert	Broken	15.93	12.96	7.26	1.38	
229278	6	E325N040	Spit 1	Core	Quartz, vein	Broken	26.73	17.47	14.13	6.36	



ID	Area name	Pit	Unit	Type	Material	Completeness	Length	Width	Thickness	Weight	Comments
229279	6	E325N040	Spit 1	Unretouched flake	FGS	Proximal fragment	8.19	12.79	3.56	0.52	
228891	2	E70N245	Spit 2	Non-artefact	FGS		13.64	11.14	2.31	0.51	

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## **APPENDIX 10**

### **ABORIGINAL CULTURAL VALUES REPORT**

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