Past Traces Heritage Consultants

Iceton Place Yass

Aboriginal Cultural Heritage Assessment Report.

Report Prepared for Iceton Investments Pty Ltd

By Lyn O'Brien Past Traces Pty Ltd

LGA: Yass Valley Council

Date: 5 November 2019

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Document Control

Revision	Date	Author	Reviewed
Draft	5/11/2019	**Lyn O'Brien**	**RAPS/Client**

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Restricted Information

Information contained within this report is culturally sensitive and should not be made publically available. The information that is restricted includes (but is not limited to):

- Maps, Mapping Grid Reference Co-ordinates or images for Aboriginal heritage sites, places and objects.
- Location or detailed information regarding places of Aboriginal cultural significance, as expressed or directed by Representative Aboriginal Organisations, Aboriginal elders, or members of the wider Aboriginal community.
- Other culturally appropriate restricted information as advised by Aboriginal representatives and traditional knowledge holders.

Information in the report covered by the above categories should be redacted before being made available to the general public. This information should only be made available to those persons with a just and reasonable need for access.

ACKNOWLEDGEMENTS

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

- Corroboree Aboriginal Corporation
- Muragadi Aboriginal Corporation
- Murrabidgee-Mullangarri Aboriginal Corporation
- Onerwal Local Aboriginal Land Council
- Ms Janine Thompson
- Buru Ngunawal Aboriginal Corporation
- Karlari Ngunnawal Pajong Wallabalooa Descendants
- Ngunnawal Pajong wallabalooa Descendants

ABBREVIATIONS

AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
CHA	Cultural Heritage Assessment Report
DECCW	NSW Department of Environment, Climate Change and Water now DPIE
DP	Deposited Plan
DPIE	NSW Department of Planning, Industry and Environment (formerly OEH)
GPS	Global Positioning System
GSV	Ground Surface Visibility
LALC	Local Aboriginal Land Council
MGA	Map Grid of Australia
OEH	NSW Office of Environment and Heritage now DPIE
PAD	Potential Archaeological Deposit
SU	Survey Unit

CONTENTS

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FIGURES

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EXECUTIVE SUMMARY

Iceton Investments Pty Ltd are proposing to undertake the proposed development of 175 ha located across Lot 2 DP1243702, Lot 13 & 14 DP786575 for residential housing. The proposed housing lots are approximately 1-2 hectares in size. The property is currently used for agricultural production and has been subject to land clearing and regular ploughing for cropping. The study area is shown on Figure 1 in a regional context with details of the project area in Figure 2.

This Aboriginal Cultural Heritage Assessment Report (ACHAR) has been undertaken to determine the extent of impacts to heritage that may result from the proposed future stages of development. Background research and a field survey over the entire project area has been undertaken to determine the presence of heritage sites. No registered sites (Aboriginal or historical) are present within the project area and the field survey did not identify any Aboriginal heritage sites or areas of potential archaeological deposit (PAD).

Consultation with the Aboriginal community has been undertaken to assist the heritage team in assessing significance of any identified heritage sites and to provide guidance in the development of culturally appropriate management strategies. Consultation was in accordance with the *Consultation Guidelines for Proponents NSW* (DECCW 2010a). Aboriginal representatives participated in the field survey undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b).

As a result of the background assessment, Aboriginal heritage field survey and consultation with the local Aboriginal community, there are no items of significance that would preclude development of the project area on condition that the following heritage recommendations are implemented.

- No registered heritage sites (Aboriginal or historical) are present within the project area.
- No areas of potential archaeological deposits or heritage sites have been identified within the development area and the potential for Aboriginal or historical heritage objects to be present within the development area has been assessed as low.
- All Aboriginal objects are protected under the *NSW National Parks and Wildlife Act 1974*. It is an offence to disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.
- In the unlikely event that human remains are discovered during the construction, all work must cease. DPIE, the local police and the appropriate LALC should be notified. Further assessment would be required to determine if the remains are Aboriginal or non-Aboriginal.
- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation

1 INTRODUCTION

1.1 PROJECT BRIEF

Iceton Investments Pty Ltd are proposing to undertake the proposed development of 175 ha at Lot 2 DP1243702, Lot 13 & 14 DP786575 for residential housing. The proposed housing lots are approximately 1-2 hectares in size. The property is currently used for agricultural production and has been subject to land clearing and regular ploughing for cropping. The study area is shown on Figure 1 in a regional context with details of the proposed subdivision in Figure 2.

It is proposed to subdivide the existing lot into a residential development, with associated infrastructure including sewerage, electricity and communication cabling. This will involve the substantial displacement and removal of soil and the importation of materials. Ground disturbance has the potential to impact on Aboriginal heritage sites and objects which are protected under the NSW *National Parks and Wildlife Act 1974* or historical sites which are protected under the *NSW Heritage Act 1977*. The purpose of the assessment is therefore to investigate the presence of any heritage sites and to assess the impacts and management strategies that may mitigate any impacts, including application for an Aboriginal Heritage Impact Permit (AHIP) if required.

The aim of this assessment is to inform the developer of their responsibilities in regards to Aboriginal cultural heritage sites that exist within the project area and allow for design to minimise or avoid impacts. This report details the investigation and assessment of cultural heritage undertaken for the project. Reporting will follow the guidelines of NSW Office of Environment and Heritage (OEH), in particular the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a).

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

1.2 RESTRICTED AND CONFIDENTIAL INFORMATION

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

Any figures within the report which show the location of heritage sites is restricted and not to be made available to the general public.

1.3 ASSESSMENT OBJECTIVES

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

- Identify and consult with Registered Aboriginal Parties (RAPs).
- Review previous heritage reports in the immediate region of the project area in order to recognise any pattern in Aboriginal site distribution.

- Search AHIMS and LEP register to identify listed Aboriginal cultural heritage sites within the project area
- Summarise past Aboriginal occupation within the project area using the archaeological record and develop a predictive site location model.
- Conduct a field survey of the project area to identify heritage sites and to assess the archaeological potential and levels of previous disturbance.
- Through consultation with the Aboriginal community assess the significance of identified heritage sites.
- Identify the impacts of the proposed development on heritage sites within the project area.
- Develop management strategies for any identified heritage sites within the project area if applicable.

1.4 INVESTIGATORS AND CONTRIBUTORS

1.4.1 Lyn O'Brien

This report has been prepared by Lyn O'Brien, Director of Past Traces Pty Ltd. With over 20 years' experience in the heritage profession, Lyn O'Brien has developed effective solutions to heritage issues that ensure successful outcomes for each project she works on. Since completing her BA (Hons) in Archaeology at the Australian National University (ANU) in 1996, Lyn has held a variety of consulting positions, from field assistant through to regional manager/senior archaeologist, accumulating skills and experience in field techniques, project management and liaison, negotiation and consultation. As a senior archaeologist Lyn has extensive experience managing major and small scale projects, conducting numerous field surveys and excavations and authoring reports across both Aboriginal and Historical archaeology.

1.4.2 Ms Georgia Scully

Georgia is currently a master's candidate at the Australian National University (ANU). Georgia is a graduate of the University of Sydney (Bachelor of Arts majoring in Archaeology 2016) and the Australian National University (Graduate Certificate of Studies, specialising in Forensic Archaeology and Paleopathology 2017). Georgia holds a range of skills including survey techniques, lithic artefact identification, scarred tree assessment and landscape assessment. Georgia has assisted with the field survey, landform assessment and field team management for the project.

1.5 ABORIGINAL CONSULTATION

Consultation with the Aboriginal community has been undertaken to assist the heritage team in assessing significance of any identified heritage sites and to provide guidance in the development of culturally appropriate management strategies. Consultation was in accordance with the *Consultation Guidelines for Proponents NSW* (DECCW 2010a). Aboriginal representatives participated in the field survey undertaken in October 2019 and provided input into the management recommendations.

The *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* guideline (DECCW 2010a) outlines the following process to be undertaken:

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

The full list of consultation steps, including those groups and individuals that were contacted and a consultation log is provided in Appendix 2. A summary of actions carried out in following these stages are as follows.

Stage 1. Letters outlining the development proposal and the need to carry out a CHA were sent to the Onerwal Local Aboriginal Land Council (LALC), and various statutory authorities including the NSW Department of Planning, Industry and Environment (DPIE), as identified under the consultation guidelines (DECCW 2010). A further series of letters was sent to organisations identified by these agencies in response to the request. Responses are provided in Appendix 2. In each instance, the closing date for submission was 14 days from receipt of the letter.

An advertisement was placed in the local newspaper the Yass Tribune (16/8/2019) and Canberra Times (17/8/2019) seeking registrations of interest from Aboriginal people and organisations. The advertisement is provided in Appendix 2.

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

- Corroboree Aboriginal Corporation
- Muragadi Aboriginal Corporation
- Murrabidgee-Mullangarri Aboriginal Corporation
- Onerwal Local Aboriginal Land Council
- Ms Janine Thompson
- Buru Ngunawal Aboriginal Corporation
- Karlari Ngunnawal Pajong Wallabalooa Descendants
- Ngunnawal Pajong Wallabalooa Descendants

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

Stage 3. A Methodology Pack with the proposed heritage assessment methodology for the proposal was sent to all RAPs. The document invited comments regarding the proposed methodology and also sought any information regarding known Aboriginal cultural significance values associated with the subject area and/or any Aboriginal objects contained therein. No responses were received within the 28 day review period. This document is attached at Appendix 2.

Stage 4 a draft version of this *Aboriginal Cultural Heritage Assessment Report* for the project (this document) was forwarded to the RAPs and a timeframe of 28 days provided to allow for responses to the document.

1.6 ABORIGINAL COMMUNITY FEEDBACK

Aboriginal community feedback has been sought during the design of methodology and cultural assessment. No information in respect of the project area holding specific cultural values or known heritage sites being located within the project boundaries has been provided.

Representatives of the Aboriginal community (Corroboree Aboriginal Corporation, Muragadi Aboriginal Corporation, Karlari Ngunnawal Pajong Wallabalooa Descendants and Murrabidgee-Mullangarri Aboriginal Corporation) were present during the field survey and provided feedback on the project in relation to significance and management recommendations.

A draft of this report was forwarded on its completion to the RAPs for their comments. Responses received in relation to the project are provided in Appendix 2.

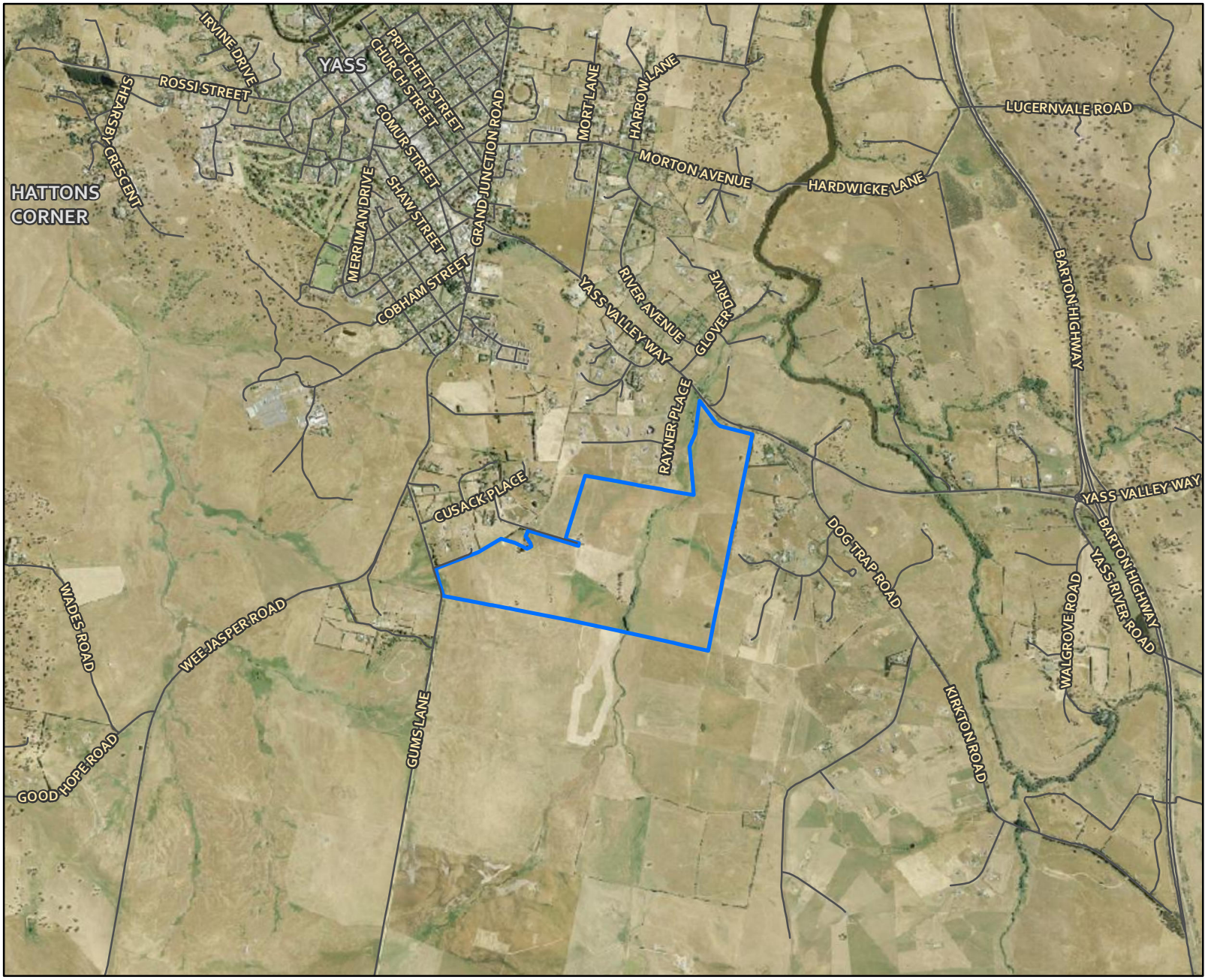

Figure 1: Regional Context

Legend

Study Area

N

1:40,000

0 0.25 0.5 1 1.5 2

Kilometers

Coordinate System:
GDA 1994 MGA Zone 55

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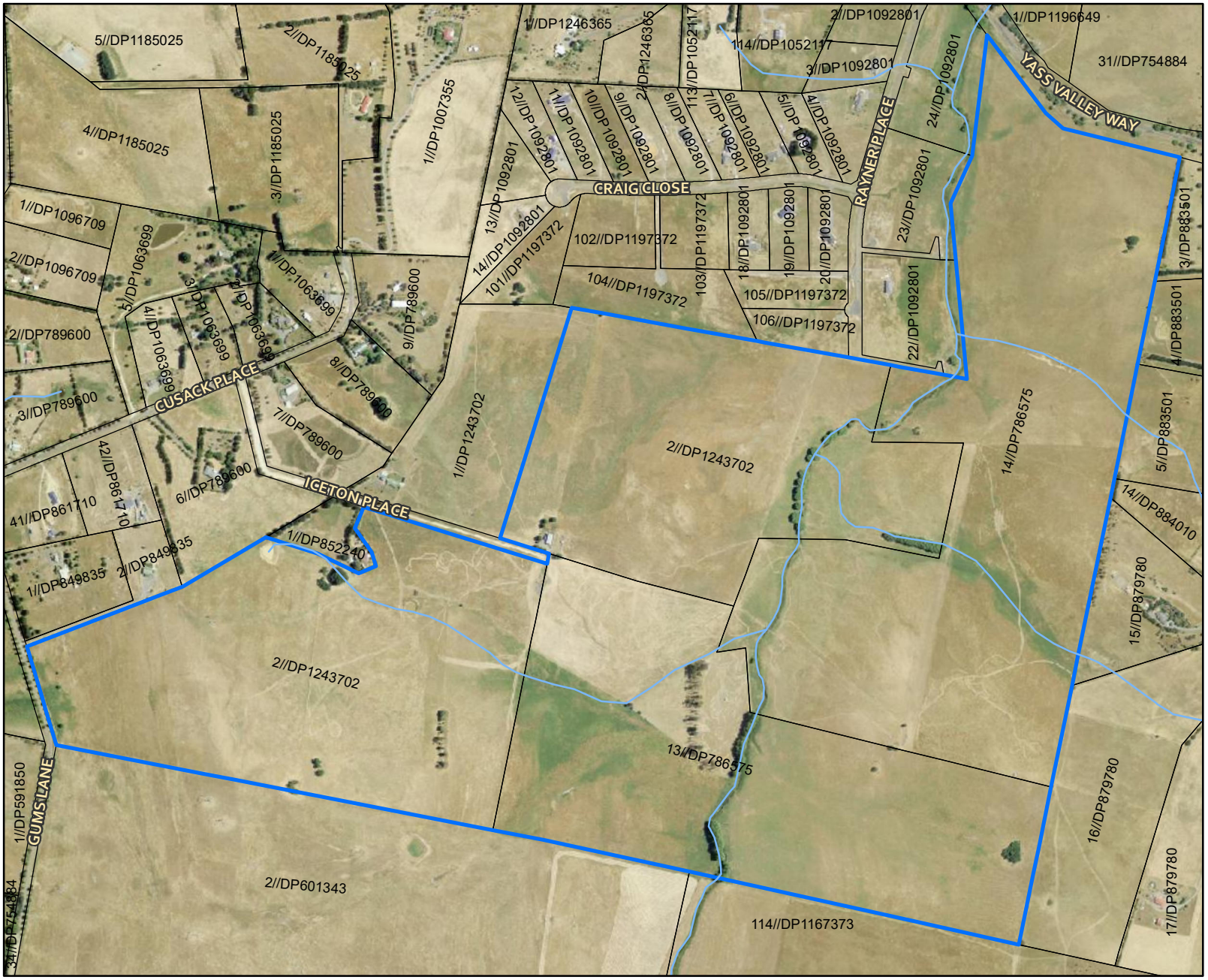

Figure 2: Study Area

Legend

- Study Area
- Lot

N

1:11,000

0 65 130 260 390 520

Meters

Coordinate System:
GDA 1994 MGA Zone 55

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2 ABORIGINAL ARCHAEOLOGICAL CONTEXT

A desktop assessment has been undertaken to review completed archaeological studies for the Project Area, and the wider Yass region. This information was then used to develop an Aboriginal site prediction model for the Project Area. The previous reports also served to identify known Aboriginal sites and/or places recorded in the Project Area and associated landforms. This review has been prepared in accordance with requirements 1 to 4 of the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).

2.1.1 Aboriginal Groups within the Project Areas

The major language group identified in the Yass region by Norman Tindale in his seminal work on Aboriginal tribal boundaries are the Ngunnawal people. The Ngunawal (Ngunnawal) were also known as the Yass tribe, Lake George Blacks or Molonglo tribe. The boundaries of the Ngunawal ran to the south east where they met the Ngarigo at the Molonglo and the Gundungurra to the north of Lake George (Tindale 1974). This distribution with minor amendments is still accepted and the review of tribal boundaries undertaken in the 1990s (Horton 1996) confirmed these earlier linguistic divisions.

One of the best sources for observations of the Indigenous inhabitants of the Yass region is Bennett who lived in the district from the 1830s and noted many features and traditions of Aboriginal life (1834). His observations must be viewed as from a white perspective and reflect his cultural traditions as with all cross cultural ethnography but despite these limitations his work is a valuable reference for the region. His reflections on the Aboriginal life of the region provide an overview of a functioning hunter and gatherer lifestyle with a cycle of repeated visits to areas at times of seasonable resource availability and a ceremonial life that imposed duties and responsibilities on members of the group.

The flat, rolling topography of the Yass region and the lack of natural physical barriers (such as impassable gorges or rivers) would have facilitated contact and movement through the region. Broad ridgelines were often used for travelling distances through country, avoiding steep valleys and river gorges to reach resource areas. The Yass River is a major waterway which would have provided a permanent water resource, along with a range of resources. The oldest dates for Aboriginal people living in the broad region comes from around Lake George, where stone artefacts were excavated from a layer of sand that dated to between 17,000 and 23,000 years ago (BHM 2016:21).

Following the European settlement at Sydney a range of diseases spread to the Aboriginal populations probably commencing with the smallpox epidemic originating in Sydney in 1789 possibly spreading throughout the region (Flood 1980:32). This disease would have decimated the Aboriginal population and was followed by Influenza in 1846. The declining number of the Aboriginal people was noted in 1845 at Bungonia and in 1848 at Goulburn by the Bench of Magistrates (Tazewell 1991:244).

2.2 PREVIOUS ARCHAEOLOGICAL WORK

A large number of cultural heritage surface surveys and sub-surface excavations have been conducted throughout the Yass region of New South Wales in the past 30 years. There has been an increasing focus on cultural heritage assessments in NSW due to ever increasing development, along with the legislative requirements for this work and greater cultural awareness of Aboriginal cultural heritage. This body of work allows for the development of regional settlement models; landscape usage; the use of resources;

group movements; and the range of site types that are likely to be present. The most relevant of these studies are summarised below.

Packard (1984) completed an assessment into the distribution of Aboriginal sites at 35 modern salinization and salt scalding sites around the Yass area. The assessment found that the sites were located on area with gradients of less than 5 degrees with a range of artefact types present at each site, indicating wide ranging activities rather than specialisation.

White (1986) completed the most thorough assessment to date of the burial and settlement patterns through the Yass district. White found that burial were generally in deep soils on eastern slopes and that site locations (camping/resting) were related to water and resource availability. Site modelling based on water resources was developed.

Witter (1980) surveyed a lineal tract of land for a proposed gas pipeline from Dalton to Canberra. The route travelled across the Yass River in the centre of the Upper Yass catchment. The survey located eleven low density artefact scatters and thirty two isolated artefact sites. The sites were mainly located on water courses and lower slopes.

Koettig and Silcox (1985) completed a 14 kilometre long lineal survey undertaken for the proposed freeway bypass north and east of Yass. Eight low density stone artefact scatters were located along with 50 isolated stone artefact sites. Most of the sites were located on low ridges and slopes and all of them were within 200 metres of water. Proximity to water was considered to be important in site location.

Koettig and Silcox (1988) followed on from their previous work in 1985, further survey work and test excavation were completed within a 6km route of the proposed Barton Highway extension. The survey located five isolated artefacts, a large stone artefact scatter and two moderately dense subsurface stone artefact sites were located. The artefacts were made up of flaked pieces, cored and backed blades. The main artefact material was silcrete and the rest was made up of quartz, mudstone, volcanic and chert.

Navin Officer (2001) completed an assessment for the proposed Yass substation on low gradient slopes along the middle reaches of Booroo Ponds Creek. At this location Navin Officer located one small artefact scatter along a spur crest. The site comprised four flakes of volcanic, silcrete and chert. They concluded that spur lines and water lines were a focus of utilisation.

AHS (2003a) surveyed a 60 ha block of land for a residential subdivision in East Yass. This area is located 750m north west of the current project area in similar landforms. Only one low density stone artefact scatter was located during the site inspection and one area of archaeological potential. The artefacts were all quartz flakes located on the crest of a ridgeline knoll.

AHS (2003b) following on from her previous work, an additional 7.5ha was added to the south of the East Yass project area. No additional archaeological sites were located amongst the undulating terrain.

Thompson (2003) undertook an archaeological survey for a residential subdivision along Yellow Creek Road, Yass. Six archaeological sites were recorded during the survey and consisted of three scarred trees and three isolated stone artefacts within 200m of creek line. Proximity to water resources was concluded as the determining factor.

NSW Archaeology (2009a) completed a heritage assessment for the purpose of establishing the Yass Dam Raising Project. Four Aboriginal stone artefact sites were recorded within the study area along the Yass River banks. These sites consisted entirely of isolated finds.

NSW Archaeology (2009b) completed the heritage assessment for the Yass Valley Wind Farm. The project involved survey work over a large study area (approximately 1237ha). Five hundred and eighty three Aboriginal stone artefact sites were recorded all along the crests of hills or on simple slopes. Two areas of potential archaeological deposit were also located.

Bowen Heritage Management (2016) completed an assessment for a residential development at Lot 107/108 Irvine Drive Yass. The field survey covered 106 acres located to the north west of the current project area at a distance of approximately 5km. The survey identified 3 Aboriginal sites (2 isolated finds and one small surface scatter). The model of site location focused on waterways was found to be supported.

RPS (2018) undertook the assessment for the underground water pipeline alignment for the Yass-Murrumbateman Water Supply project. A section of this alignment runs through the current project area and is currently under construction. No sites or areas of potential were identified and the overall area was considered to hold low potential due to the high level of past disturbance.

OzArk (2019) completed the assessment for Coppabella Wind Farm Transmission line. This field survey covered the entire 39km length of the power line. Although situated to the north of Yass the large area covered by the field survey makes it important for an understanding of site location models. The project identified a number of small sites, either located on ridge lines or in proximity to water, thus confirming the previously developed models.

2.3 AHIMS SEARCH AND SITE ANALYSIS

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

An extensive search of the AHIMS database (Client service number 309350) was undertaken on 13/8/2019, resulting in the identification of no sites within the project area and a further 7 within a 1km radius. A breakdown of the site types is shown in Table 1. The site search results are attached at Appendix 1.

Table 1. Site types within AHIMS search

Site Type	Number
Open site (artefact scatter)	1
Isolated Find	3
Contact site (historical)	1
Scarred Tree	2

The location of recorded AHIMS sites is shown on Figure 3.

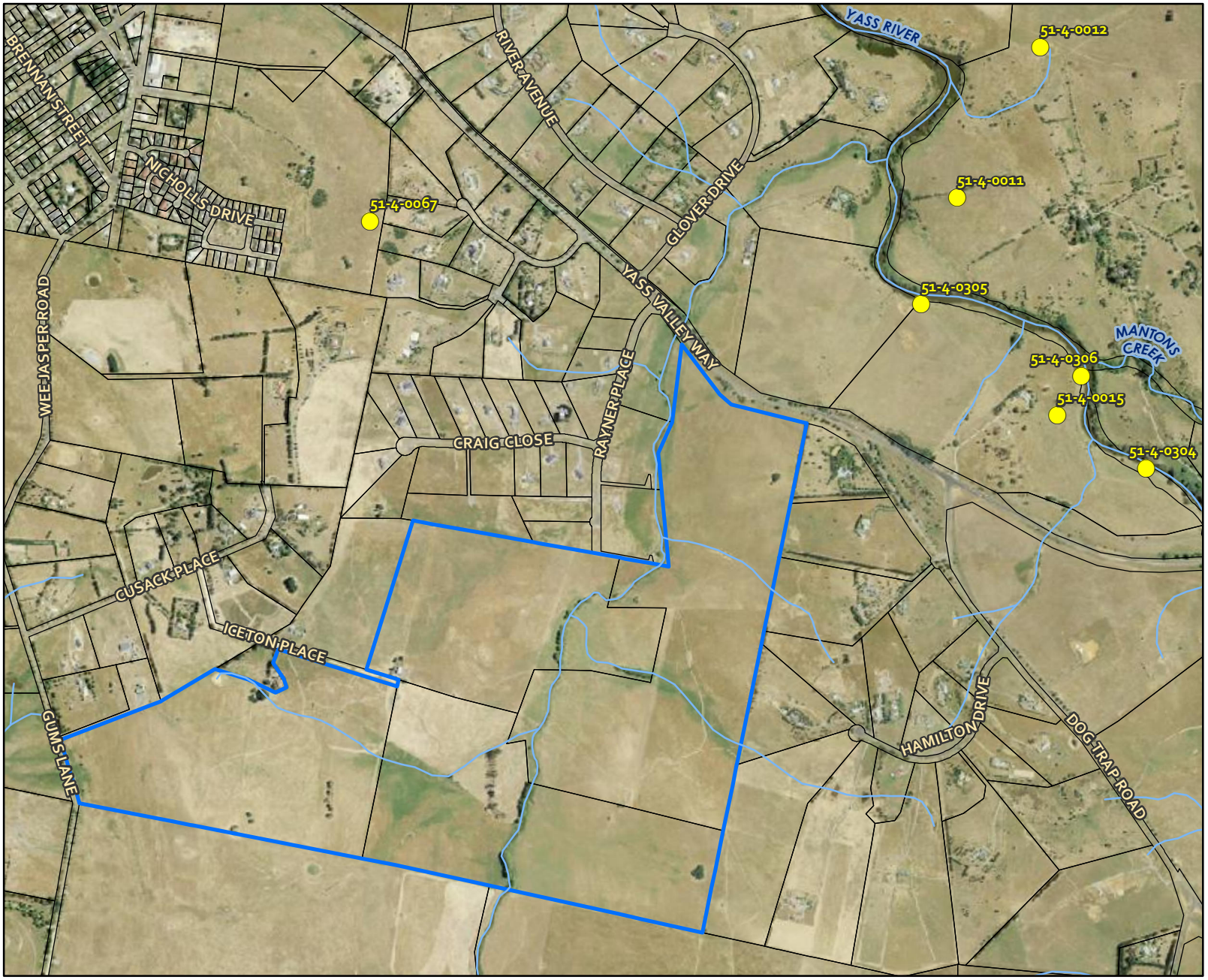

Figure 3: AHIMS

Legend

- AHIMS Site
- Study Area
- Lot

N

1:17,000

0 105 210 420 630 840

Meters

Coordinate System:
GDA 1994 MGA Zone 55

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2.4 HISTORICAL HERITAGE

A search of the NSW Heritage Database and the Yass Valley Local Environment Plan (LEP) Schedule 5 was undertaken to determine if any known historical heritage sites had been previously recorded within the project area. No items were located and no known heritage features are present within the project area.

To the north of the project area is the listed property of the Cooma, Hardwicke and Douro Landscape area. Composed of the interrelated three historic property this area is listed on the following registers:

Register of the National Estate (RNE) – The Cooma Cottage, Hardwicke and Douro Landscape Area, Hume Hwy, Yass, NSW, Australia was registered on the RNE (Place ID 18150) in 1992 due to the relationship with the O'Brien and Hume families and the aesthetic location of the three historic homesteads in a characteristically nineteenth century landscape. The RNE was closed in 2007 and currently exists as an archive of places.

Yass Valley Council Local Environment Plan (LEP) – The property of Hardwicke is listed on the Yass Valley Local Environment Plan 2013 due to its relationship with the O'Brien and Hume families and the early settlement of the region. This provides protection at a local level to the property. The property of Douro is also listed on the Yass LEP. Both of these properties are located distant to the north of the project area.

The project area was a component of these larger O'Brien family holdings at Douro as shown on Figure 4 (Parish Map 1884).

Henry O'Brien settled at Yass in the 1820's and was one of the leading squatters in the Yass district with 12,000 sheep in 1833. It was noted in 1830 by Edward Riley whilst visiting Douro that Henry was crossbreeding merino and saxon sheep to improve his flocks. By the late 1830's Henry was Justice of the Peace and a member of the Yass Hunt and Steward of the Yass Races. He opened his new homestead at Douro in 1840 with a fashionable ball for the elites of the area (NSW State Heritage Database).

Cornelius O'Brien bought Hardwicke in 1838, joining the property to his family holdings adjacent at Douro. Henry O'Brien played the leading role in developing the concept of boiling down sheep for tallow in the early 1840's. Woolgrowers who had previously thought their flocks worthless turned to this alternative revenue stream which contributed to saving the Australian wool industry. The pilot melt down works was located on Hardwicke on the main crossing of the Yass River prior to its destruction during flooding.

Henry was elected to the State legislature in 1860 and was notable in the passage of the Robertson Land Acts (1861). He died at Douro at 1866 (Scott 1967) leaving a considerable fortune.

The estate was sold in the 1890s and subdivided over the intervening years. Whilst the northern section has been developed into a residential estate, the current project area has continued under pastoral usage. No historical dwellings or structures were constructed within the current project area and impacts have continued to be confined to pastoral activities.

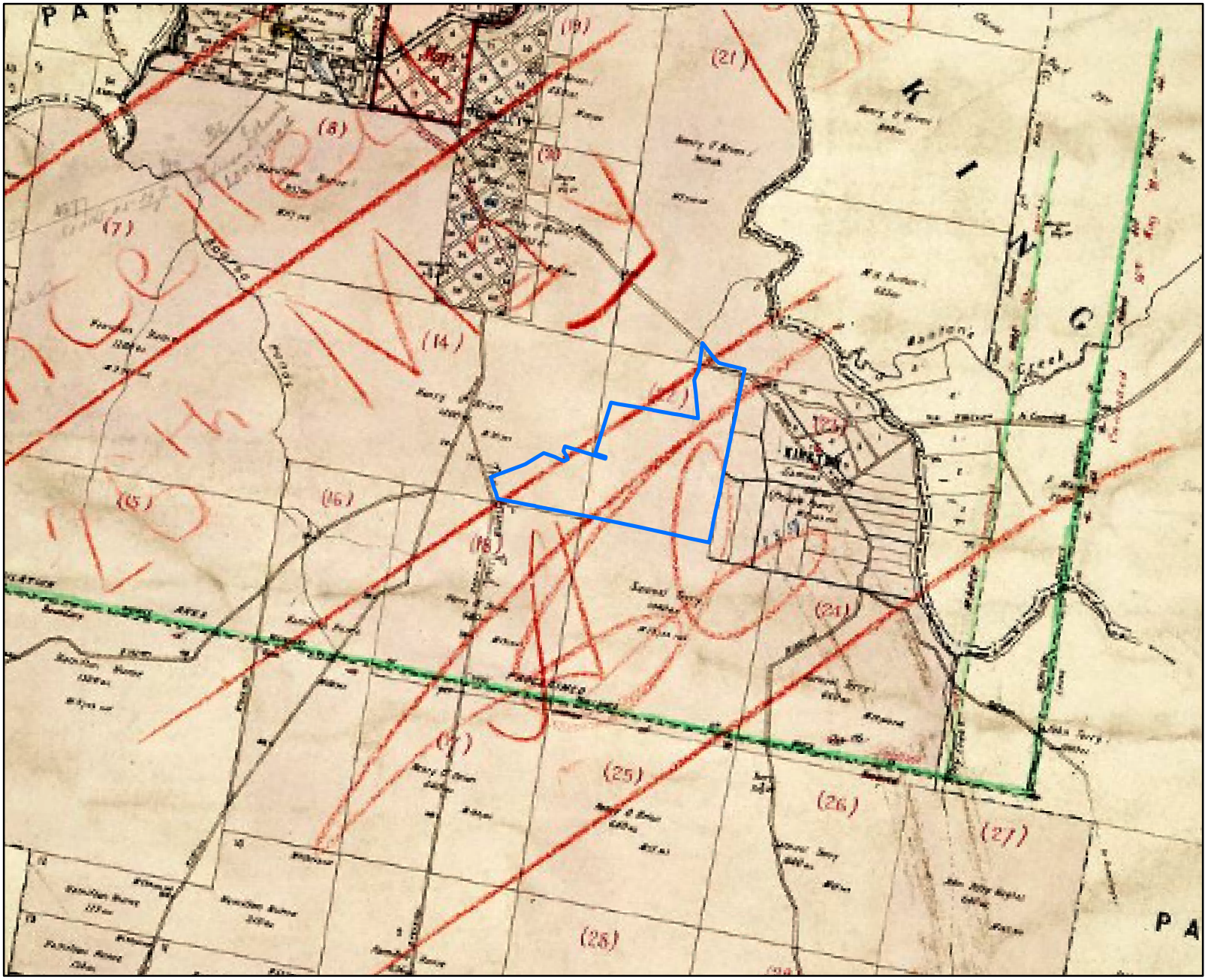

Figure 4: Parish Plan 1st Edition

Legend

Study Area

N

1:50,000

0 305 610 1,220 1,830 2,440

Meters

Coordinate System:
GDA 1994 MGA Zone 55

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3 LANDSCAPE CONTEXT

3.1 GEOLOGY AND SOILS

The project area lies on the eastern edge of the Yass Township within an area of the Douro and Hawkins Volcanics. These formations date to the early Silurian period consists of coarse porphyritic rocks, rhyolitic to dacitic ignimbrites and various tuffaceous materials with siltstone, shales, sandstones and limestone (Hird 1991). The geology of the project area is shown on Figure 5.

Two soil landscapes are present within the project area – the Boorowa and Binalong Soil Landscapes. The distribution of these soil landscapes is shown on Figure 6.

Boorowa Soil Landscape.

The majority of the soils in the study area consist of the Boorowa Soil Landscape (Hird 1991:39) located on gently undulating rises. The Boorowa Soil landscape consists of yellow to light reddish duplex soils on crests and simple slopes. Brown and Yellow Solodic soils are present along minor drainage lines. Subsoils consist of alkaline grey yellow mottled medium to heavy clay.

These soils are acidic with moderate permeability. These soils are thin, moderately erodible and overlay the base shales, tuffs and gravels. The substrate will degrade into the yellow/grey clay level before reaching the base bedrock.

Binalong Soil Landscape

On the eastern edge of the project area the Binalong Soil Landscape is present. The Binalong Soil Landscape consists of moderately deep yellowish brown to red duplex soils on crests and side slopes. Red Earths, Brown soils and Solodic soils are present on foot slopes and drainage lines. Subsoils consist of alkaline grey clays (Hird 1991: 30). Soils are thin (<50cm) highly acid and erodible. Sheet and wind erosion are significant features within this soil landscape along with gullying of drainage lines.

Summary

From an archaeological perspective, these thin, highly erodible soils will result in a conflation of artefacts on the underlying clay pan amidst gravels and overlaying shales. The contemporary nature of all artefacts within an exposure cannot be assumed in these exposed surface situations. Subsoils are expected to be shallow or non-existent in these locations and to expose artefacts onto the surface.

3.2 LANDFORM AND DISTURBANCE LEVEL ASSESSMENT

The landforms within the project area consist of level to gentle undulating hillslopes. Water sources are present in the form of a central 3rd order tributary creek line (O'Brien's Creek) and three 1st order creeklines which feed into O'Brien's Creek which then flows north and joins the Yass River.

The project area has been impacted by European settlement from the early nineteenth century. The project area has as a result been under continual grazing and pastoral regimes over a lengthy period of time. These past use impacts are typical for Yass region and consist of the following:

- Vegetation and tree clearance
- Stock impacts
- Fencing

- Vehicle tracks – some consisting of minor roads, other of impact trails
- Extensive impacts in areas of housing including landscaping
- Construction of sheds, outbuildings and yards
- Ploughing of topsoils for pasture improvement or light cropping.

All of these impacts are present throughout the project area, in particular the majority of the project area has been routinely subject to ploughing and cropping.

These landscape and soil impacts reduce the potential for archaeological or heritage sites to remain intact within the landscape. Confined areas of disturbance are present at gates and along fence lines. Exposed ground is present in areas of stock impact, vehicle traces, fence lines, under trees and areas of erosion.

Review of previous sites located in the vicinity indicates a site location model based on level areas in proximity to water resources such as creek lines with smaller sites located on hilltop ridgelines. The study area consists of undulating hill slopes classified by Fuller as holding low overall low potential for heritage sites. The study area does contain one 3rd order tributary creek line which flows north into the Yass River but crop cultivation has occurred along all the slopes overlooking the creek line, removing potential for site location. A hilltop ridgeline is present in the northern section which is assessed to hold moderate potential for unrecorded heritage sites based on predictive modelling. Sections of the hilltop ridgeline have been impacted by the placement of a power transmission line across the crest.

As a result of the landform assessment the study area contains low potential to contain any unrecorded heritage sites or areas of PAD and has suffered a high to moderate degree of previous assessment.

3.3 FLORA AND FAUNA

The natural vegetation across the proposal area has been totally cleared and is now considered as a modified environment. Paddock coverage appears to have been subject to pasture improvement and regular cropping and planting. Aerial photos reveal plough lines and areas of high disturbance. Imported tree species (Pines and willows) are present along the creek lines and fence lines. The natural vegetation of the area would most likely have consisted of grassy woodland prior to clearing with native grasses under an understory of Eucalypts (Hird 1991). Tree species would have included Apple Box, Blakely's Redgum, Red Stringybark and Yellow Box. An understorey of native grasses and forbs would have been present.

The grassy woodland environment supported a wide range of edible plant and fauna species. Fauna present would range from small marsupials (i.e. possums), to avian species and macropods. A range of lizards also inhabit this environment that would have been utilised by Aboriginal groups. The NSW OEH lists over 200 flora and fauna species as present within these woodlands, the majority of which had some utilisation in traditional Aboriginal lifeways.

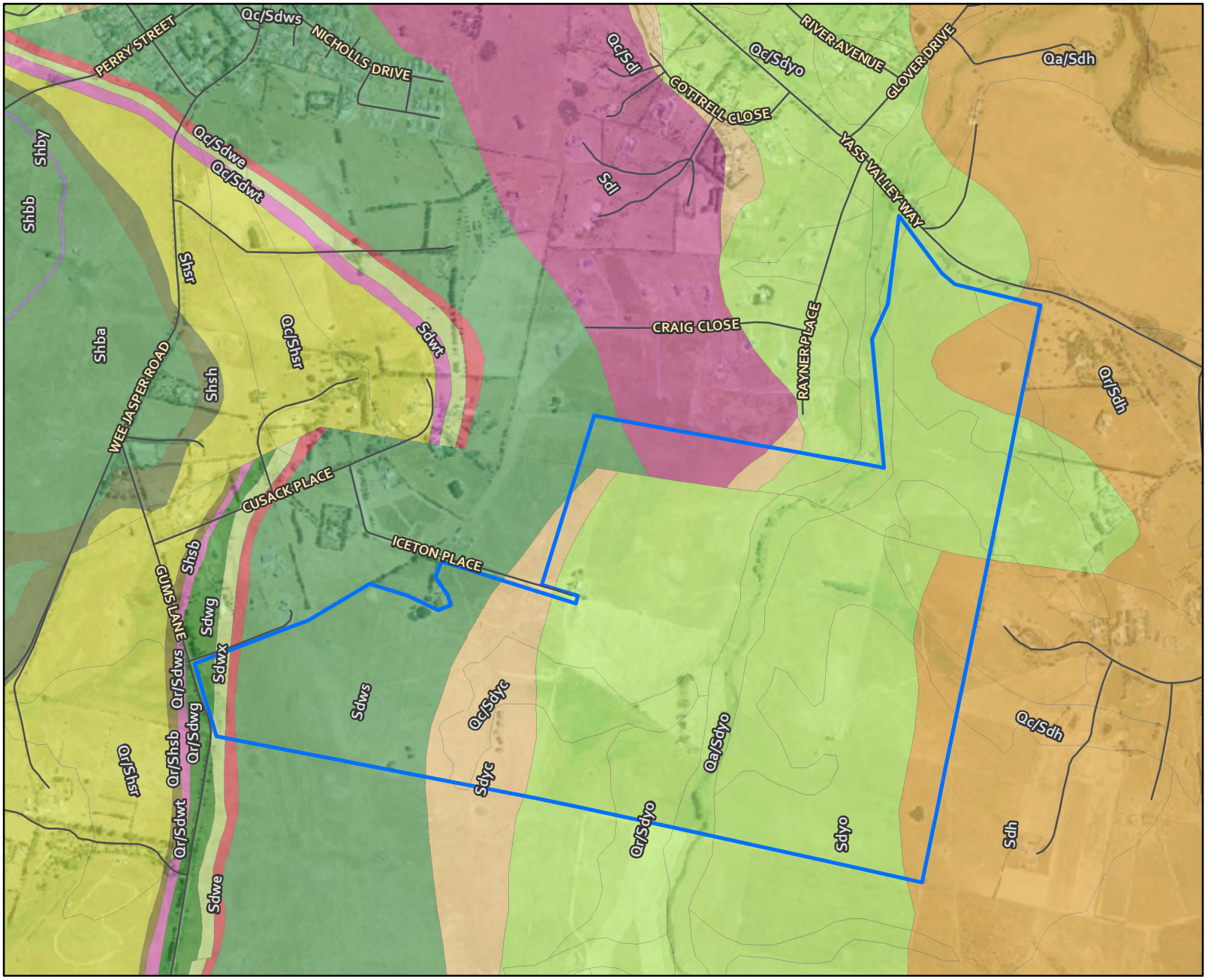

Figure 5: Geology

Legend

- Study Area

Geology - Unit

- Shba - Hattons Corner Group
- Barrandella Shale Member
- Bowspring Limestone Member
- Cliftonwood Limestone
- Euralie Limestone Member
- Excursion Creek Sandstone
- Gums Road Limestone Member
- Hawkins Volcanics
- Hume Limestone Member
- Laidlaw Volcanics
- O'Briens Creek Sandstone
- Tullerah Sandstone Member
- Yarwood Siltstone Member

N

1:15,000

0 90 180 360 540 720

Meters

Coordinate System:
GDA 1994 MGA Zone 55

PastTraces Heritage Consultants

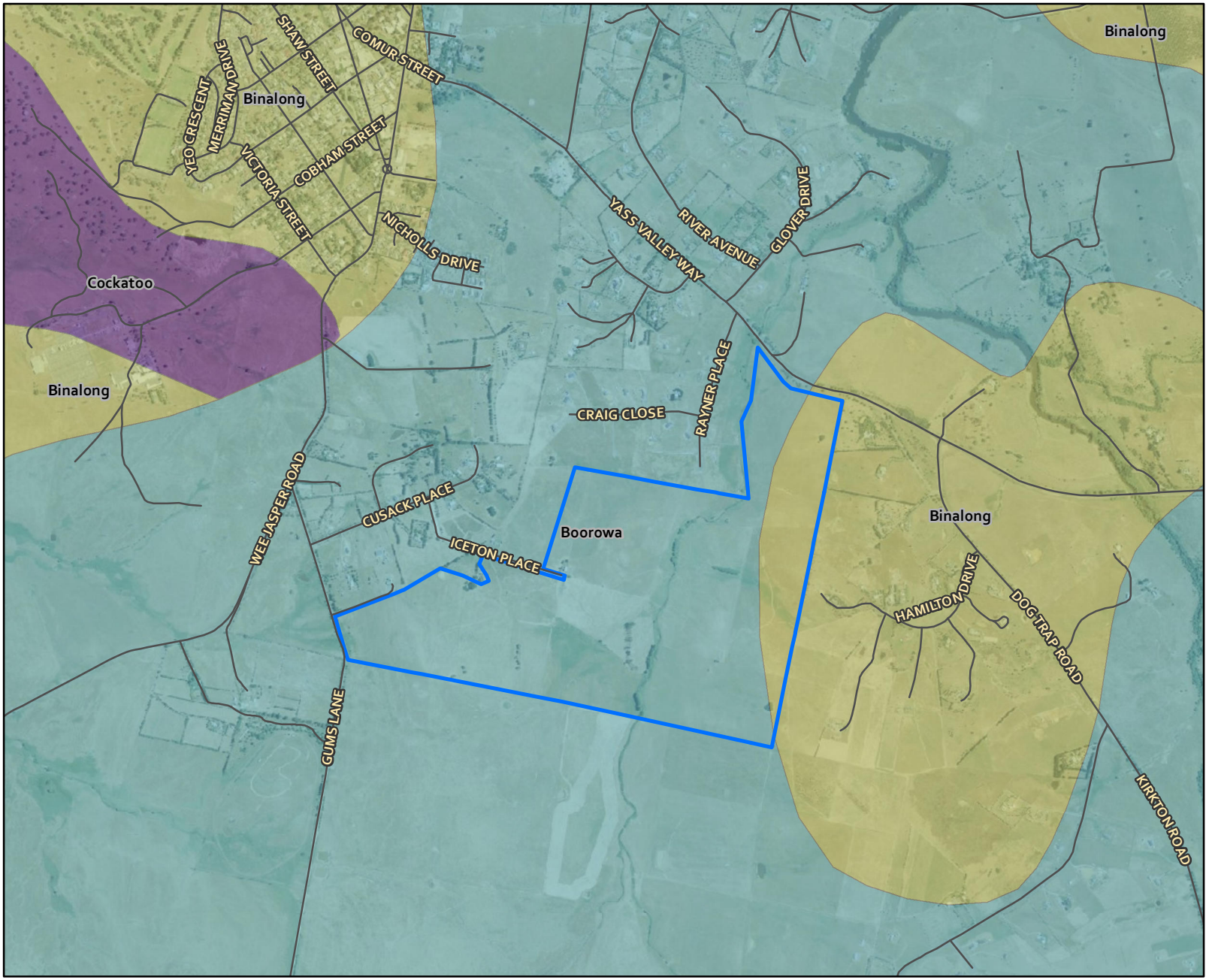

Figure 6: Soil Landscapes

Legend

Study Area

Soil Landscape

Binalong

Boorowa

Cockatoo

N

1:25,000

0 0.15 0.3 0.6 0.9 1.2

Kilometers

Coordinate System:
GDA 1994 MGA Zone 55

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3.4 LANDSCAPE CONTEXT

Most archaeological surveys are conducted in a situation where there is topographic variation and this can lead to differences in the assessment of archaeological potential and site modelling for the location of Aboriginal archaeological sites. The project area ranges over creek flats and simple slopes across broad ridge crests and descending spurlines.

The broad ridgelines running northeast across the study area would enable travel down the eastern side and along the gentle to level lower slopes along O'Brien Creek. It is suggested by the mapping of previous sites and the ease of movement across the project area that the round crests on the ridgelines would be a focus of utilisation providing access and views across landscape.

The landforms for the survey based on topographic mapping are determined to be stable landforms, with an aggrading landscape on the creek flats and floodplains.

The landscape would indicate that it would have been traversed and utilised by Aboriginal people but the lack of large scale water resources or known locality resources (such as ochre or stone materials) would render it less suitable for large scale gatherings or long term camping sites.

3.5 PREDICTIVE MODEL

Based on the previous assessments completed through the region site locations and types can be summarised as follows:

- the majority of sites are open artefact scatters
- most scatters are located near major water resources, creek lines, particularly on reasonably level, elevated ground and low gradient basal slopes
- large artefact scatters occur most frequently within 100-150m of waterways with a possible preference for creek confluences,
- artefact scatters occurring away from major creek lines tend to be small and sparse,
- scarred trees may occur wherever old growth trees of sufficient age have survived.

Based on the data from the previous assessments, the following predictive model has been developed for the project area (Table 2). This site prediction model is based on:

- Site distribution in relation to landscape features within the project area
- Probability of site type to be present within the project area
- Natural resources that may have been present and of use to Aboriginal people within the project area

Table 2 Site Prediction Model

Probability	Site Type	Definition	Landform
Moderate to low	Isolated finds and surface scatters of stone artefacts	Stone artefacts ranging from single artefact to high numbers	Creek lines and spur crests. Features are present within the study area.
Moderate to low	Potential Archaeological Deposits (PADS)	Area considered on landform to hold higher potential for unidentified subsurface deposits	Varies, but most frequent on elevated terraces along creek lines and spurlines
Nil	Culturally Modified Trees (CMTs)	Trees which have been modified by scarring, marking or branch twining	None remaining
Nil	Rock Engravings	Images engraved on flat rock surfaces	Escarpments, rock platforms or rock shelters - not present
Nil	Stone arrangements	Arrangements of stones by human intention, including circles lines or patterns.	Crest lines or large ceremonial areas on creekflats, - not present
Nil	Stone quarries/Ochre sources	Quarry sites where resources have been mined.	Any landform that has not been disturbed – not present
Nil	Axe grinding grooves	Grooves in stone caused by the grinding of stone axes	Usually in creek lines, as water is used as abrasive with sand - not present
Nil	Burials	Burials of Aboriginal persons	Usually requiring deep sandy soils on eastern facing slopes – not present

4 ARCHAEOLOGICAL FIELD SURVEY

A field survey of the Project Area was undertaken in October 2016 with representatives of the RAPs (Corroboree, Muragadi, Murrabidgee Mullangarri and Karlari Ngunnawal Pajong Wallabalooa Descendants). The field survey aims and sampling strategy are provided below.

4.1 ARCHAEOLOGICAL SURVEY AIMS

The principle aims of the survey were to:

- Provide the RAPs an opportunity to view the project area
- To undertake a systematic survey of the project area targeting areas with the potential for Aboriginal heritage.
- Identify and record any heritage sites visible on the ground surface.
- Identify and record areas of potential archaeological deposits (PADs).

4.2 FIELD SURVEY SAMPLING STRATEGY

The survey identified five landform units in the project area: creek flats surrounding O'Brien's Creek running northwest to southeast, and simple (lower, middle and upper) slopes of the undulating hills and the broad crest of the ridgelines located within the project area. Landforms are based on Speight 1990.

Survey units (SU) were defined based on the paddock fencing within the project area. As a result the project area was divided into 21 survey units with differing landforms within each SU. This distribution of SU and landforms is shown in Figure 7.

The predictive model developed for the project indicates a significant difference in the potential of landforms within the project area. The area of lower slopes in association with the creek line and the spur line crests are predicted to hold higher potential then the simple slopes. However the aim was to achieve the greatest coverage possible of all landforms. As a result, all landforms were sampled during the field survey though ground surface visibility (GSV) varied due to grass length and erosional exposures at the time of survey. All survey units were sampled with spaced pedestrian transects. A detailed discussion of survey coverage and results of the pedestrian survey is provided in Section 5.4.

4.3 FIELD SURVEY METHODS

The archaeological survey was conducted on foot with a field team of six members. Each field member was spaced at approximately 10m from other team members. Transects were then completed on foot across the survey unit, generally following the undulating terrain and terminating at the opposite fence line. Transects continues until all areas were completed. Recording during the survey followed the archaeological survey requirements of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). Information that recorded during the survey included:

- Survey Units and landforms.
- Aboriginal objects or sites present in the project area during the survey.

- Ground surface visibility and rate of exposures
- Past levels of disturbance

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

4.4 ARCHAEOLOGICAL SURVEY RESULTS

Field survey was conducted on the 14-16 of October 2019 with six team members (2 x Past Traces staff and 4 RAPs) walking parallel transects at an average spacing of 10m in accordance with the methodology. The survey was undertaken at a time when ground surface visibility (GSV) was moderate across the project area. Sheet erosion and low grass coverage was noticeable in the eastern portion providing higher rates of GSV throughout this section.

Regular exposures were present across the project area consisting of the following:

- Vehicle access tracks –vehicle access tracks were present across the project area providing long areas of linear exposure across all the main landforms.
- Stock tracks – various confined stock impact tracks across the grassed areas.
- Creek line – limited creek line exposures were present along both banks.
- Erosion – areas of erosion and sparser grass coverage were present throughout the project area particularly on crest slopes.

Transects were positioned to cover all landforms present within the project area. Landforms consisted of Crests and upper slopes, simple slopes (middle and lower) and open creek flats in the vicinity of O'Brien's Creek which bisects the project area. The field survey allowed for pedestrian transects to be completed across all landforms. The project area was divided by fence lines into discrete paddocks. Each of these paddocks was allocated as a separate survey unit and details of the survey visibility, landform and disturbance for each survey unit recorded.

The location of pedestrian transects are shown in Figure 8.

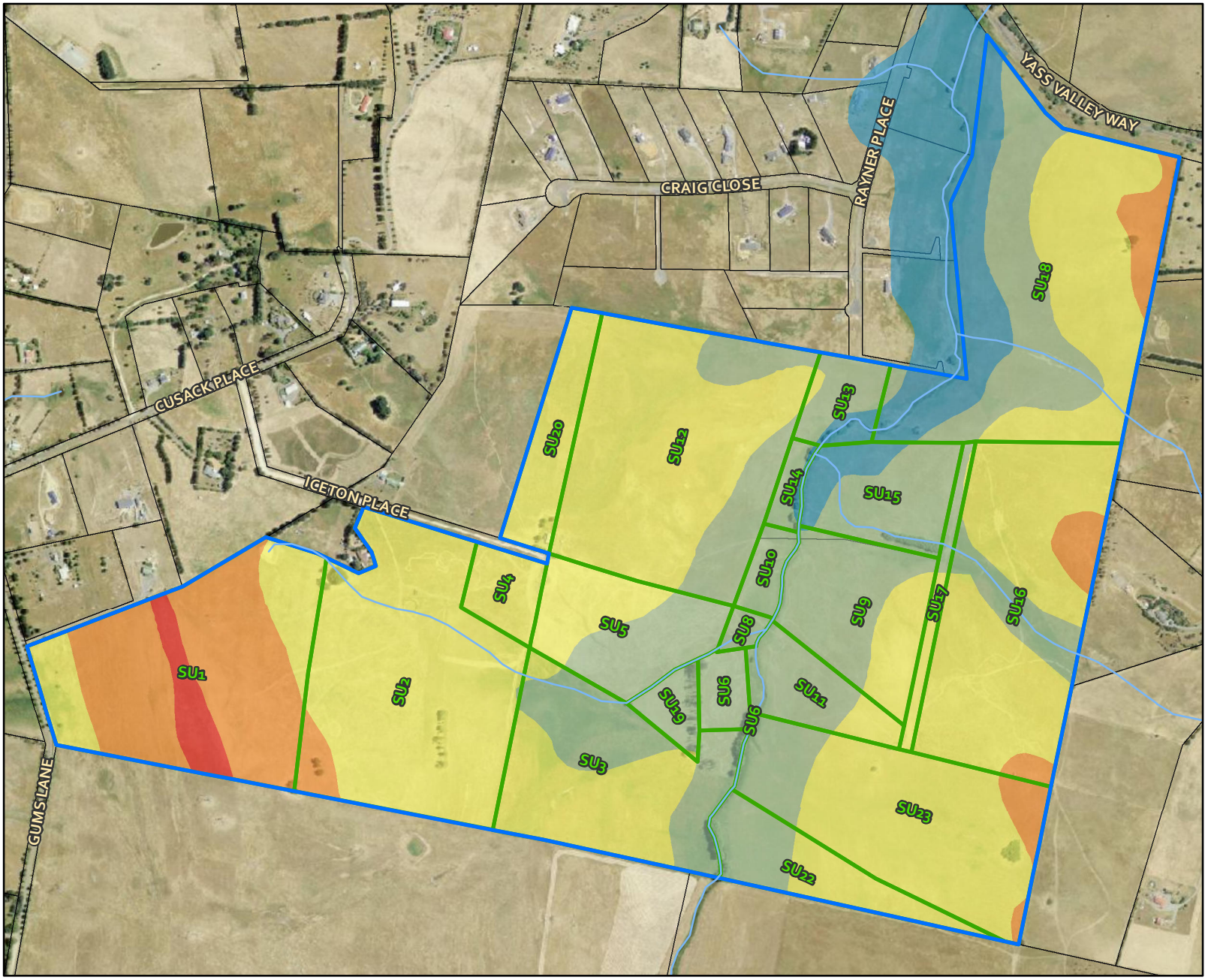

Figure 7: Survey Units and Landforms

Legend

- Study Area
- Survey Unit

Landform

- Creek Flat
- Lower Slope
- Mid Slope
- Upper Slope
- Crest
- Lot

N

1:11,000

0 65 130 260 390 520

Meters

Coordinate System:
GDA 1994 MGA Zone 55

PastTraces Heritage Consultants

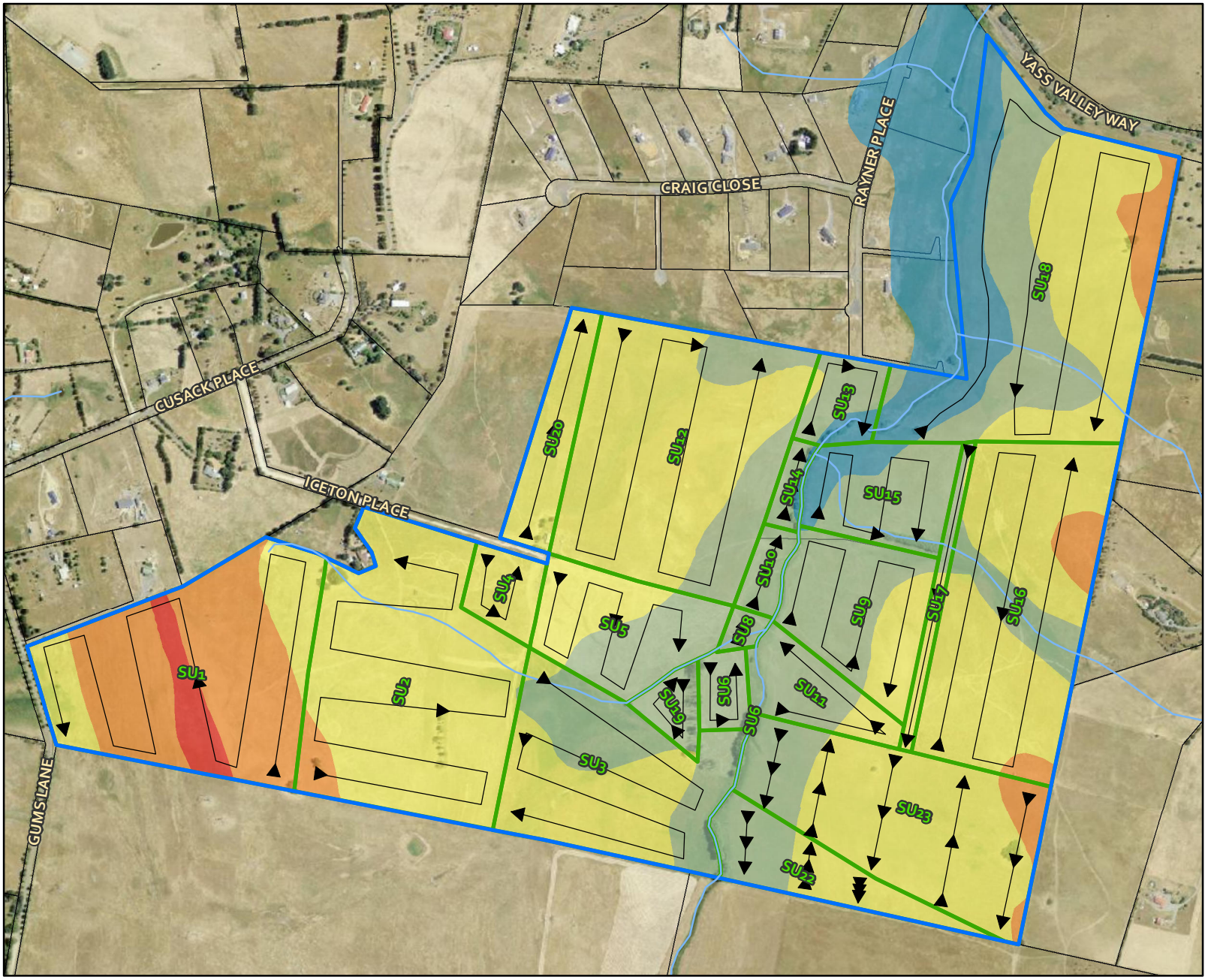

Figure 8: Pedestrian Transects

Legend

- Pedestrian Transect
- Study Area
- Survey Unit

Landform

- Creek Flat
- Lower Slope
- Mid Slope
- Upper Slope
- Crest
- Lot

N

1:11,000

0 65 130 260 390 520

Meters

Coordinate System:
GDA 1994 MGA Zone 55

PastTraces Heritage Consultants

4.4.1 Ground Surface Visibility (GSV) and Levels of Disturbance

Ground Surface Visibility (GSV) is the percentage of ground that can be visibly assessed. GSV varies by the degree of grass coverage across the ground surface, presence of leaf litter, branches and the presence of natural gravels. Exposures are areas that provide high levels of GSV and usually result from erosion, stock impacts, clearing, previous construction or vehicle trails. The higher the rate of exposures and the background GSV of a survey unit (SU) the higher the effectiveness of the field survey.

Background GSV varied through the project area, with differing levels of grass coverage for the different landforms within SU. Crests and spurlines generally held lower levels of grass coverage (higher background GSV) and increased rate of exposures. This was a result of the crest and upper slopes erosion, soil type and increased rock outcrops. GSV was lower across the simple slopes and creek flats due to increased grass coverage. GSV was highest in the south eastern section where stock has been recently grazed (80%) and the Binalong soil landscape resulted in a higher rate of exposures. Plates 1 to 6 show indicative areas of landforms and exposures within the project area.

Plate 1. Survey Unit 1 – crest landform

Plate 2.Survey Unit 12 – Middle Slopes

Plate 3. Survey Unit 17 & 18 – middle slopes

Plate 4. Survey Unit 2 – Lower slopes

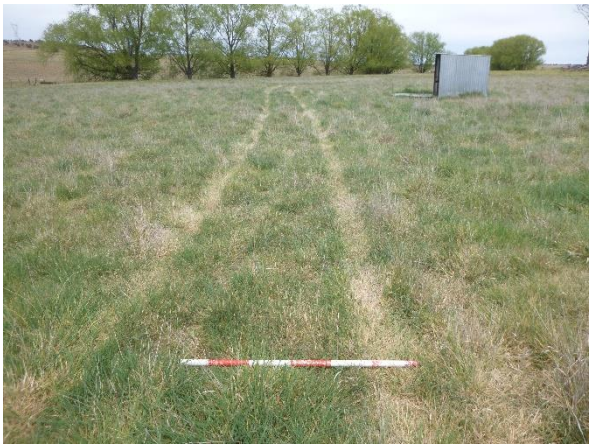

Plate 5. Survey unit 6 – creek flats

Plate 6.Survey unit 23 – upper slopes

Plate 6. Survey unit 23 – lower slopes

Plate 7. Survey unit 18 - undulating slopes

Soils and landforms within the project area were examined to assess the presence of erosion within the Project Area and whether soil structures were stable, aggrading or eroding across the project area. No large areas of active erosion were present despite areas having been impacted in isolated scours on slopes. This would concur with Hird's (1991) description of the soils of the area as being stable. It is concluded that the soils within the landforms appear to have not been stripped away though having suffered levels of disturbance with potential for soil deposits to remain within the project area.

4.5 SURVEY COVERAGE

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

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

The landform summary and a summary of effective survey coverage for the Project Area is provided in Table 3 and 74. These calculations are based on the formula provided in Requirement 10 of the Code of Practice.

Table 3. Survey Coverage

SU Number	Landform	SU Area (m2)	GSV%	Exposure %	Effective Coverage Area (SU area x GSV% x Exp%)	Effective coverage % (Eff coverage area/SU Area x 100)
1	Crest	19647	80%	35%	5501.16	28
	Middle slope	40513	20%	10%	810.26	2
	Upper slope	122605	50%	25%	15325.625	12.5
2	Middle Slopes	186348	10%	10%	1863.48	1
	Upper slopes	9232	10%	5%	46.16	0.5
3	Lower slopes	58704	5	5	146.76	0.25
	Middle slopes	68259	5	10	341.295	0.5
4	Middle slopes	21351	60	25	3202.65	15
5	Lower slopes	37143	25	10	928.575	2.5
	Middle slopes	30180	40	10	1207.2	4
6	Lower slopes	14768	5	5	36.92	0.25
8	Lower slopes	5564	10	60	333.84	6
9	Lower slopes	50744	20	15	1522.32	3
	Middle slopes	23424	40	20	1873.92	8
10	Lower slopes	12697	80	90	9141.84	72
11	Lower slopes	29139	20	15	874.17	3
	Middle slopes	8100	20	15	243	3
12	Lower slopes	46328	10	30	1389.84	3
	Middle slopes	154085	5	30	2311.275	1.5
13	Creek flat	5899	20	15	176.97	3
	Lower slopes	17331	20	15	519.93	3
	Middle slopes	1172	10	15	17.58	1.5
14	Creek flat	1825	5	30	27.375	1.5
	Lower slopes	7432	5	20	74.32	1
15	Creek flat	14418	5	5	36.045	0.25
	Lower slopes	40647	5	5	101.6175	0.25
16	Lower slopes	22795	35	40	3191.3	14
	Middle slopes	140492	40	15	8429.52	6
	Upper slopes	15953	60	10	957.18	6
17	Lower slopes	5304	80	60	2545.92	48
	Middle slopes	9588	80	60	4602.24	48
18	Creek flat	57985	5	5	144.9625	0.25
	Lower slopes	79836	5	5	199.59	0.25
	Middle slopes	100951	5	5	252.3775	0.25
	Upper slopes	17531	5	5	43.8275	0.25
19	Lower slopes	14440	45	5	324.9	2.25
20	Middle slopes	37595	20	10	751.9	2

SU Number	Landform	SU Area (m2)	GSV%	Exposure %	Effective Coverage Area (SU area x GSV% x Exp%)	Effective coverage % (Eff coverage area/SU Area x 100)
22	Lower slopes	22527	30	10	675.81	3
	Middle slopes	24478	60	10	1468.68	6
23	Lower slopes	24047	20	10	480.94	2
	Middle slopes	110407	40	20	8832.56	8
	Upper slopes	11621	60	20	1394.52	12

Table 4. Landform Summary

Landform	Area (m2)	effective coverage area (m2)	% of landform surveyed
Creek flat	80284	385	0.48%
Lower slope	489360	22488	5%
Middle slope	956887	36207	4%
Upper slope	177035	17767	10%
Crest	19647	145	28%

4.6 RESULTS OF FIELD SURVEY PROGRAM- ABORIGINAL HERITAGE SITES

No areas of Aboriginal heritage were identified during the field survey despite moderate rate of exposures and short grass length in the south eastern paddocks. As a results of the field survey, no known heritage sites will be affected by the proposed development.

Areas of PAD are defined as landforms that hold higher potential than their surrounds to contain subsurface deposits of past Aboriginal occupation. Based on a review of previous studies completed for the region, areas of PAD would be located in association with waterways (1st or 2nd order streams) on level ground or along spur crest and ridge lines.

These landforms are present within the project area with the field survey identifying a high to moderate level of disturbance in these areas and as a result, no areas of PAD were identified within the project area.

4.6.1 Summary of Archaeological Survey Results

Archaeological survey was undertaken across the project area in October 2019, with the following findings:

- No heritage sites were identified by the field survey.
- No areas of Potential Area of Deposit (PAD) were identified by the field survey.
- High levels of disturbance have occurred through the majority of the project area through the past impacts of pasture improvement and cropping.
- The Project Area is situated on a gently undulating series of low crests and rises, which is some areas is practically level, down to the creek flats along the drainage line. A broad low ridgeline is present in the south western area running northwest and providing a level access route through the landscape. It is thought that the area prior to European settlement would have supported a temperate grassland community on the middle and lower slopes with scattered woodlands on the mid and upper slopes (Hird 1991).

As a result of the field survey it is concluded that it is unlikely that any unidentified cultural heritage sites are located within the project area, due to the moderate level of GSV present at the time of field survey and the degree of past impacts.

5 IMPACT ASSESSMENT

5.1 DEVELOPMENT IMPACTS

The proposed residential development consists of the project area being divided into housing lots requiring a high level of disturbance within the project area. The proposed residential infrastructure will cause disturbance in the form of soil excavation, grading of access roads, heavy vehicle and plant movement across the site and placement of underground piping, cables and the installation of overhead road lighting and infrastructure.

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

- the excavation for infrastructure, such as drainage, sewerage, and communications;
- construction of access roads;
- construction of roads, street verges and
- foundation trenches for residential structures.

Activities that will potentially cause less impact on sub-soils include the establishment of boundary fencing, landscaping, vegetation and gardens.

As a result of the desktop assessment and field survey, the proposed subdivision and development into residential housing will impact on no known heritage sites or areas of identified archaeological potential. As a result there are no known heritage impacts resulting from the project and the potential to impact on unidentified heritage is considered to be low.

5.2 SUSTAINABLE DEVELOPMENT PRINCIPLES

5.2.1 Intergenerational equity

Intergenerational equity is maintained by the continued dissemination of cultural knowledge and ability to visit cultural sites into the future. It is considered detrimental to future generations if cultural knowledge is lost by the current generation. Any destruction of cultural heritage sites runs the risk of negatively impacting in the future. The location of the project in an area of no known heritage sites or potential removes any detrimental impacts from the project on intergenerational equity or access to heritage sites.

5.2.2 Cumulative Impacts

Developments are occurring at a rapid pace in the Yass region – the project area is surrounded by housing developments under construction. Cumulative impacts by the continued destruction of sites is of concern to the community and should be addressed by continued assessments and focus on preserving sites that are either intact, contain many artefacts, or are significant to the community.

The cumulative impact of future developments at East Yass, based on this heritage assessment would appear to be limited, due to the scarcity of Aboriginal heritage sites in this area. However, all future developments will need to be assessed for their heritage impacts and consultation with the Aboriginal community undertaken.

6 MANAGEMENT RECOMMENDATIONS

Based on results of the archaeological program and consultation with the RAPS, the following recommendations have been developed in regards to Aboriginal Cultural Heritage values within the project area.

The management recommendations for the project are:

- No registered heritage sites (Aboriginal or historical) are located within the project area.
- No areas of potential archaeological deposits or heritage sites have been identified within the development area and the potential for Aboriginal heritage objects to be present within the development area has been assessed as low.
- As there are no known heritage impacts from the project, the project can proceed without further investigation or heritage assessment.
- All Aboriginal objects are protected under the *NSW National Parks and Wildlife Act 1974*. It is an offence to disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.
- In the unlikely event that human remains are discovered during the construction, all work must cease. DPIE, the local police and the appropriate LALC should be notified. Further assessment would be required to determine if the remains are Aboriginal or non-Aboriginal.
- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation.

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A.1 AHIMS SITE SEARCH

A.2 ABORIGINAL CONSULTATION