APPENDIX

I

ABORIGINAL HERITAGE

Aboriginal Cultural Heritage Due Diligence Assessment: Tripoli Way Bypass

FINAL REPORT

Prepared for Cardno

21 October 2021

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- Client: Zoe Wood and Mitch Blencowe, Cardno.

Biosis staff involved in this project were:

- Anne Murray and Astrid Mackegard for mapping.

Contents

Tables

Figures

Plates

Glossary

AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
Due diligence code	*Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
EES	NSW Environment, Energy and Science Group
EP&A Act	*Environmental Planning and Assessment Act 1979*
GSV	Ground Surface Visibility
Heritage NSW	Heritage NSW, Department of Premier and Cabinet (DPC_
ICOMOS	International Council on Monuments and Sites
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
OEH	NSW Office of Environment and Heritage (now EES)
PAD	Potential Archaeological Deposit
REF	Review of Environmental Factors
Study area	Part of – Lot 10 DP 1151689; Lot 1, 2, 3 and 4 DP 714125; Lot 25 DP 1237947; Lot 1 DP 1119325; Lot 1 DP 1069961; Lot 2 and 3 DP 605111; Lot B DP 38838; Lot 24 DP 1138317; Lot 11 and 12 DP 1205733; Lot 1 DP 559819; Lot 68 DP 253407; Lot 1182 and 1178 DP; 1202087; and DP 253407.
The Code	The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

Summary

Biosis Pty Ltd has been commissioned by Cardno to undertake an Aboriginal Cultural Heritage Due Diligence Assessment for the proposed Albion Park By-Pass (Tripoli Way extension) at Albion Park New South Wales (NSW). The concept design was developed by Shellharbour City Council and a preliminary environmental assessment carried out by Cardno identified that a Part 5 Review of Environmental Factors (REF) would be required.

The study area is 1.4 kilometres in length and runs parallel to Tongarra Road, commencing at Terry Street (the Illawarra Highway) in the east and running along Tripoli Way to Tongarra Road in the west. It crosses a number of private properties and along The Expressway and the existing Tripoli Way road alignments, both of which front existing house blocks. The alignment also follows the current entrance road into the Albion Park Landscaping Supplies. The alignment crosses Hazelton Creek and occurs mostly within the Macquarie Rivulet floodplain zone.

The assessment for areas that have low, moderate or high archaeological potential within the study area is based on a number of factors, including environmental conditions, geomorphological processes, past land use activities, results of previous archaeological studies, surveys and test excavations, and results of the current survey. The survey revealed that large parts of the study area had been subject to significant ground disturbance, such as the initial vegetation removal and construction of roads and residential dwellings throughout the study area. Although these processes would displace surface cultural material, it would not affect deeper buried archaeological deposits.

Furthermore, a review of previous archaeological studies, surveys, and test excavations within the vicinity of the study area indicated that archaeological deposits could occur within the study area. Both Eco Logical Australia's (2017) and Artefact Heritage's (2017) assessments support the predictive statements undertaken as part of the assessment, which suggested artefact sites are likely to be identified in raised landforms in close proximity to creeks and out of areas of frequent inundation. This is evidenced by the identification of one new Aboriginal site within the study area. Based upon the desktop assessment and archaeological survey Biosis has been able to identify three areas of archaeological potential.

1 Introduction

1.1 Project background

Biosis Pty Ltd has been commissioned by Cardno to undertake an Aboriginal Cultural Heritage Due Diligence Assessment for the proposed Albion Park By-Pass (Tripoli Way extension) at Albion Park NSW (the project). The concept design was developed by Shellharbour City Council and a preliminary environmental assessment carried out by Cardno identified that a Part 5 REF would be required.

An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a) has been undertaken for the study area in order to inform responsibilities with regards to Aboriginal cultural heritage in the area. In addition to the basic tasks required for a due diligence assessment, an extended background review, as well as an archaeological survey in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) (the Code) was conducted, in order adequately map areas of high, moderate and low archaeological sensitivity.

1.2 Location of the study area

The study area is located within the Shellharbour Local Government Area (LGA), Parish of Jamberoo, County of Camden (refer to Figure 1).

The study area is 1.4 kilometres in length and runs parallel to Tongarra Road, commencing at Terry Street (the Illawarra Highway) in the east and running along Tripoli Way to Tongarra Road in the west (Figure 2). It crosses a number of private properties and along The Expressway and the existing Tripoli Way road alignments, both of which front existing house blocks. The alignment also follows the current entrance road into the Albion Park Landscaping Supplies. The alignment crosses Hazelton Creek and occurs mostly within the Macquarie Rivulet floodplain zone (Figure 3).

1.3 Planning approvals

The proposed development will be assessed against Part 5 of the *Environmental Planning and Assessment Act 1979* NSW (EP&A Act). Other relevant legislation and planning instruments that will inform the assessment include:

- *National Parks and Wildlife Act 1974* (NSW) *(*NPW Act).
- *National Parks and Wildlife Amendment Act 2010* (NSW).
- *Shellharbour Local Environmental Plan 2013* (LEP).

1.4 Scope of the assessment

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

- Conduct background research in order to recognise any identifiable trends in site distribution and location, including a search of the Aboriginal Heritage Information Management System (AHIMS).
- Undertake archaeological survey as per requirement 5 of the Code, with particular focus on landforms with high potential for heritage places within the study area, as identified through background research.

- Record and assess sites identified during the survey in compliance with the guidelines endorsed by Heritage NSW, Department of Premier and Cabinet (Heritage NSW).
- Determine levels of archaeological and cultural significance of the study area.
- Make recommendations to mitigate and manage any cultural heritage values identified within the study area.

1.5 Aboriginal consultation

Consultation with the Aboriginal community is not a formal requirement of the due diligence process; however, preliminary consultation with the Illawarra Local Aboriginal Land Council (LALC) has been undertaken as part of this assessment to gain an understanding of cultural values of the proposed alignment.

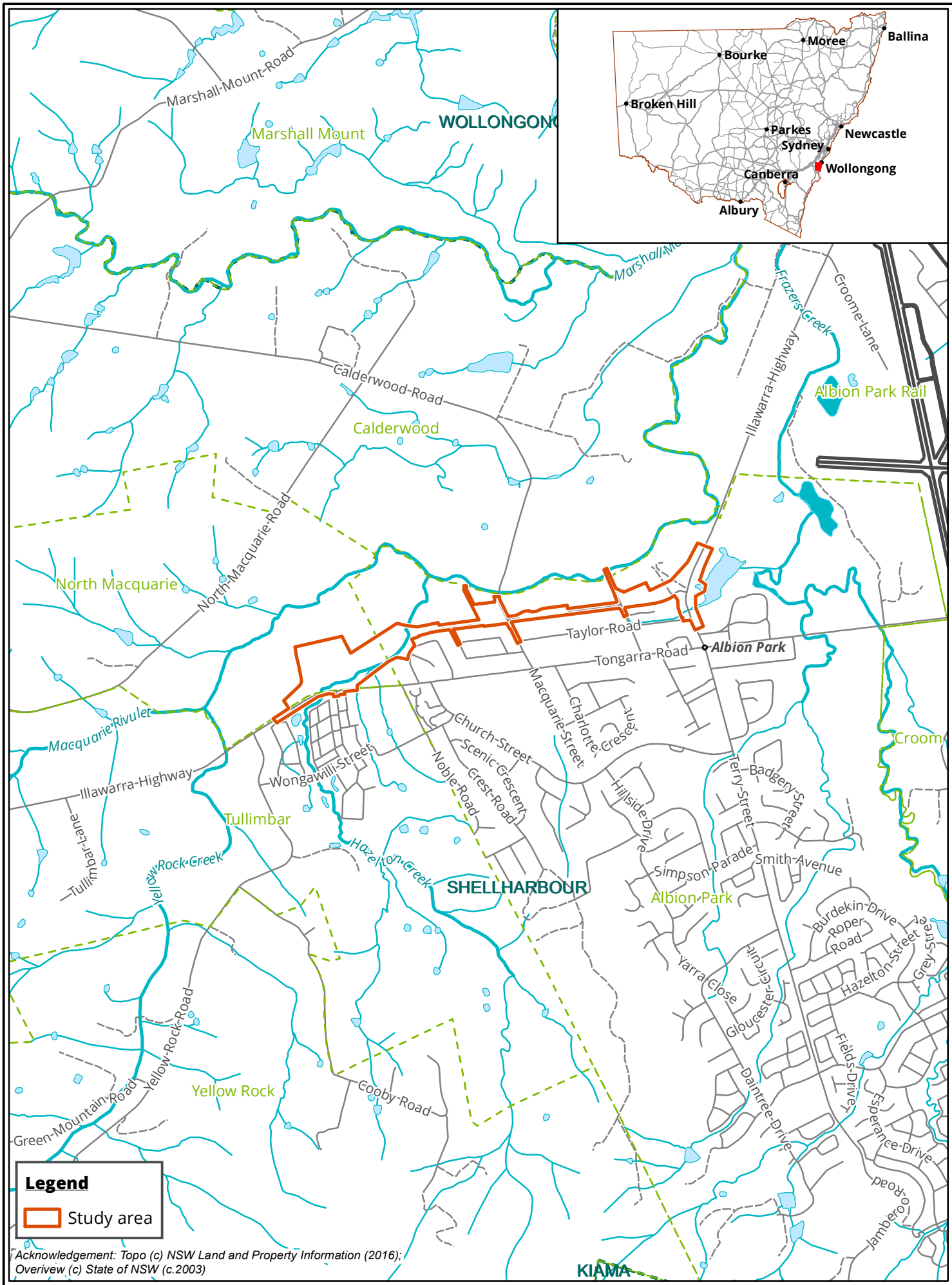

Figure 1 Location of the study area

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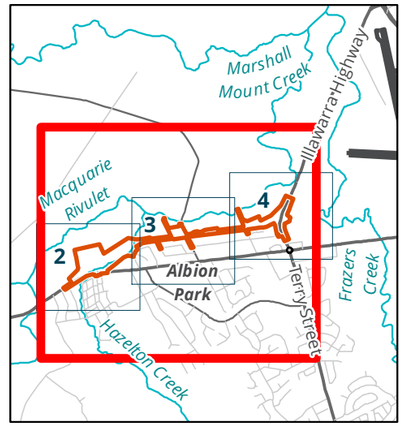

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Study area

Lot

Figure 2.1 Study area detail

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Metres
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Coordinate System: GDA 1994 MGA Zone 56

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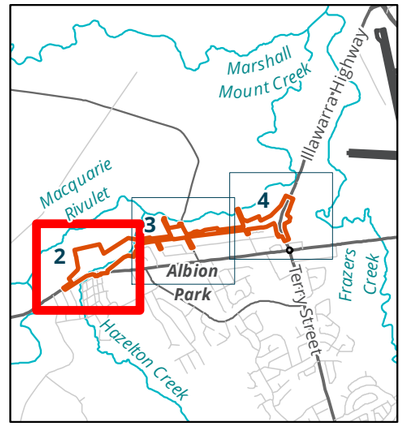

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Study area

Lot

Figure 2.2 Study area detail

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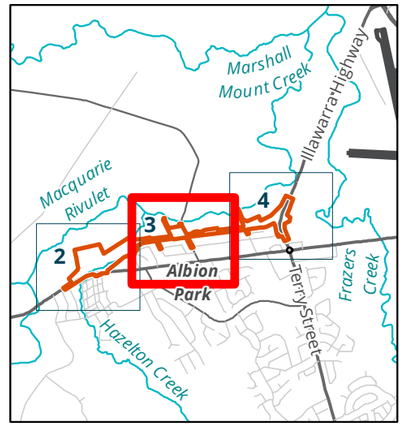

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Study area

Lot

Figure 2.3 Study area detail

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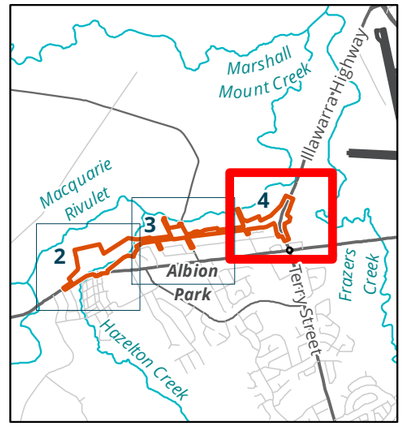

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Study area

Lot

Figure 2.4 Study area detail

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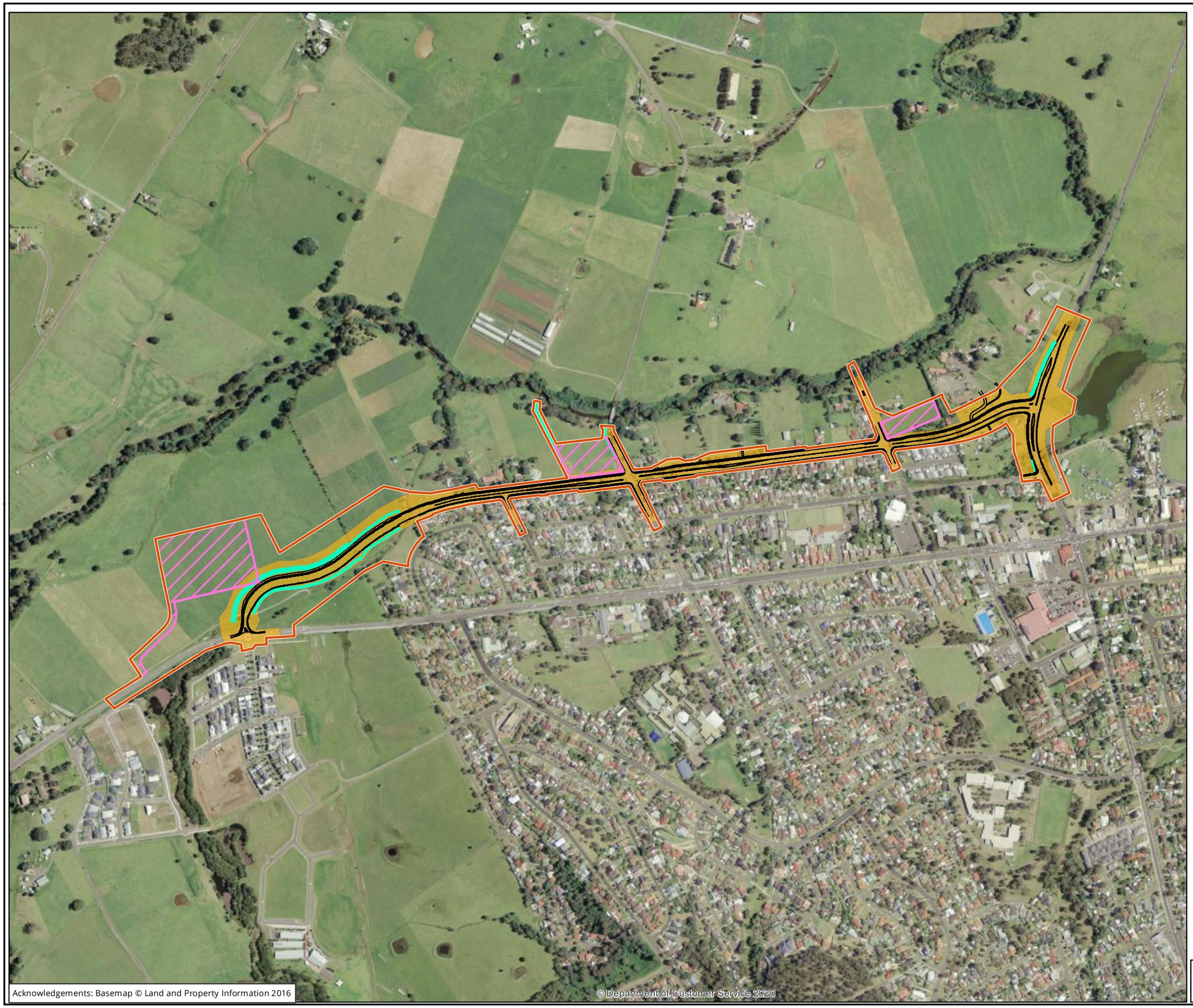

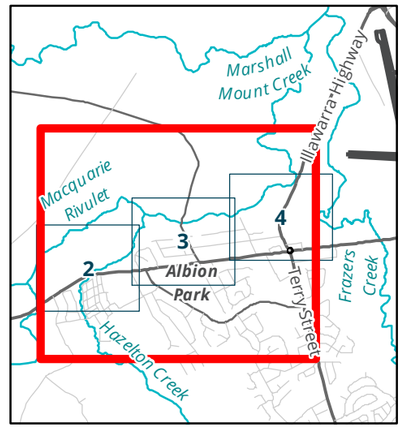

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- Study area
- Proposed stormwater network
- Proposed road alignment
- Potential ancillary sites
- Construction footprint

Figure 3.1 Proposed development

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Metres
Scale: 1:8,000 @ A3
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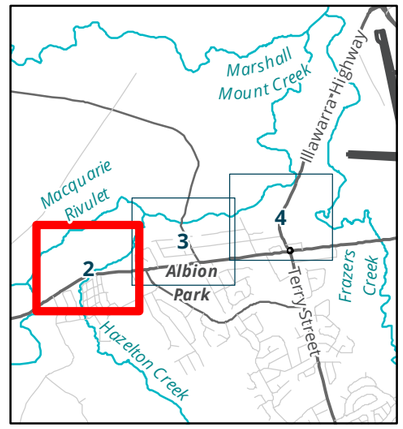

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- Study area
- Proposed stormwater network
- Proposed road alignment
- Potential ancillary sites
- Construction footprint

Figure 3.2 Proposed development

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Metres
Scale: 1:3,000 @ A3
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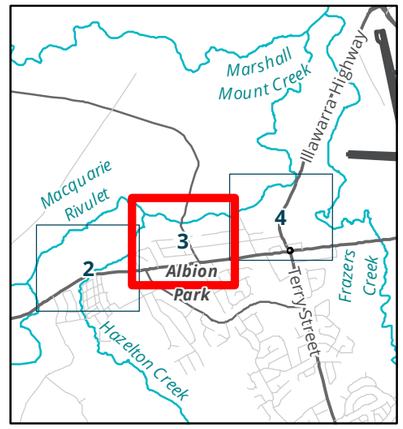

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- Study area
- Proposed stormwater network
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- Potential ancillary sites
- Construction footprint

Figure 3.3 Proposed development

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Coordinate System: GDA 1994 MGA Zone 56

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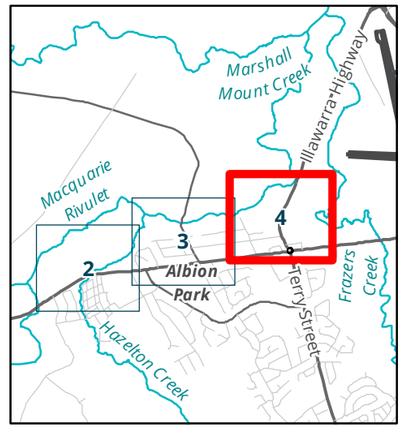

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- Study area
- Proposed stormwater network
- Proposed road alignment
- Potential ancillary sites
- Construction footprint

Figure 3.4 Proposed development

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2 Desktop assessment

A brief desktop assessment has been undertaken to review existing archaeological studies for the study area and surrounding region. This information has been synthesised to develop some Aboriginal site predictive statements for the study area and identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the Code.

2.1 Geology, soils and landforms

The study area lies within the Coastal Plain physiographic region that is located between the Illawarra Escarpment and the sea (Hazelton 1992, p.2). It consists of the gentle rises of the Illawarra Coal Measures, rolling to steep low hills of volcanic materials, moderate to steep slopes of Berry Siltstone and undulating Budgong Sandstone and Quaternary alluvium (Figure 4). The Coastal Plain is characterised as a mosaic of foothills, ridges, spurs, hillocks and floodplains with slopes varying from very gently inclined to steep with the occasional low cliff. It is dissected by easterly flowing streams at intervals that become more frequent towards the north (Fuller 1982, p.18). It is widest at the points where Macquarie Rivulet has entrenched into the Plateau at Macquarie Pass and where other waterways provide the catchment area of Lake Illawarra, such as Duck and Wollingurry Creek systems, have carved into the Escarpment (Bowman 1971).

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

There are two soil landscapes within the study area (Figure 5). The Fairy Meadow Soils Landscape is classed as swamp deposits (Hazelton 1992, pp.97–98), which occurs on gently undulating broad alluvial plains and floodplains that are typically subject to inundation and water logging. They comprise brown sandy loams, overlying heavy brown clays and very heavy west olive brown clay subsoils. The Albion Park Soil Landscape unit occurs in isolated sections of the study area (Hazelton 1992, pp.40–42). These 'erosional' soils occur on short steep upper slopes with long gentle foot slopes on the Berry Formation. Typically, they consist of a brown loam, overlying hard setting yellow brown loams, on a mottled heavy yellow orange clay base.

While swamp deposits are most likely to bury cultural material, the erosional soil landscapes have the ability to transport their sediment load. Since erosional soils are generally subject to movement of shallow soils, the result is poor preservation of the archaeological record. With little cover, archaeological material is likely to occur at shallow depths or it will be exposed where there is no or little vegetation cover. Therefore, topsoils that will have potential to contain archaeological material will occur on crests, upper and mid slopes, to depths of up to 400 millimetres (Hazelton 1992, p.41).

The current study area is located within the Macquarie Rivulet floodplain, with only minor undulations associated with the bottom of the foothills and the margins of the floodplain. The study area crosses Hazleton Creek (second order stream) at the western end and this flows north into the Macquarie Rivulet (third order stream) and subsequently into Lake Illawarra. No other water bodies, artificial or otherwise, occur within the remainder of the study area.

2.2 Flora and fauna

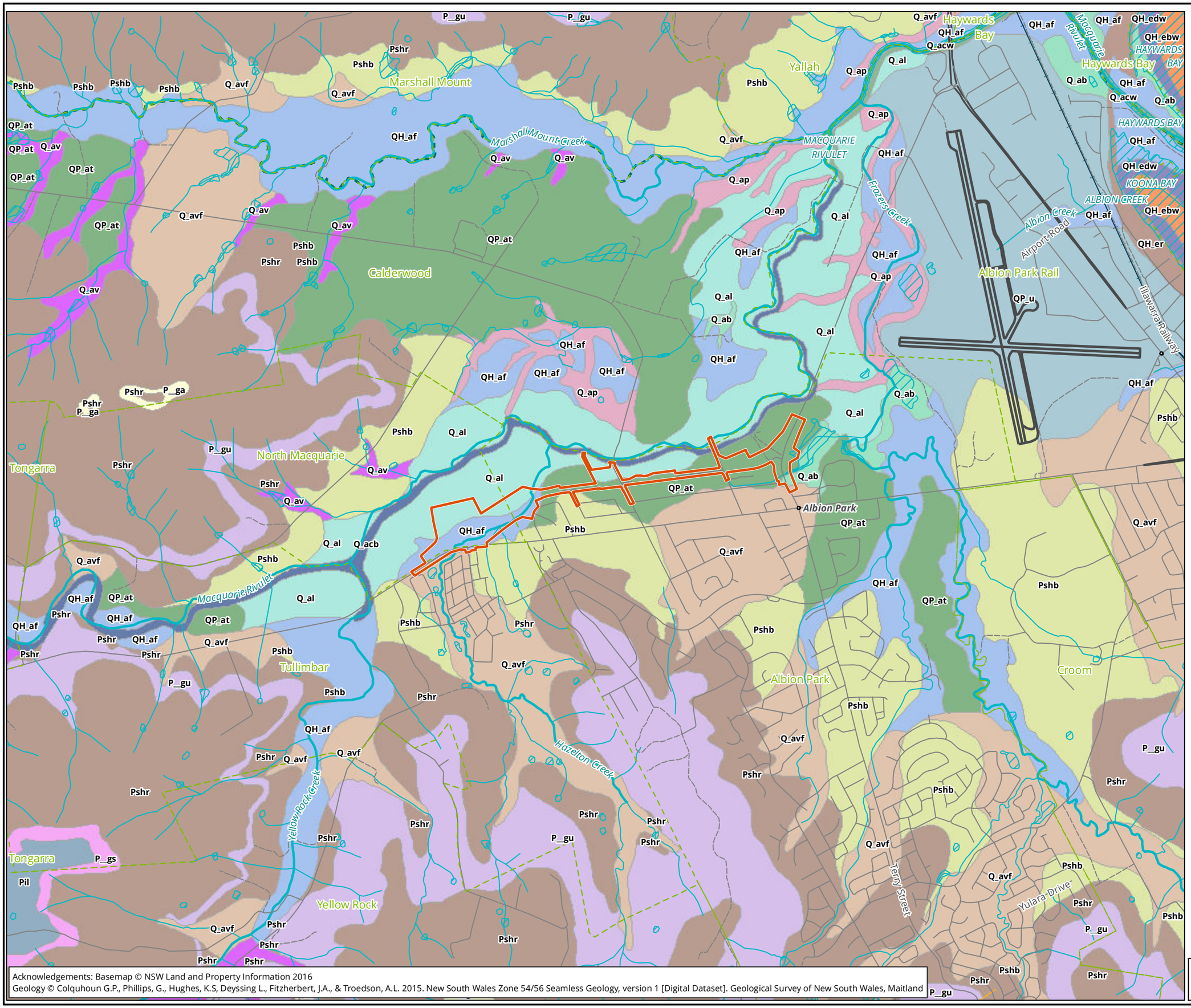
The wider Illawarra region includes distinct ecological zones, from tall forest and rainforests to frontal dunes closer to the coastline. Each ecological zone hosts a different array of floral and faunal species, many of which would have been utilised according to seasonal availability. The Lake Illawarra Alluvial Plains, and Kiama Coastal Slopes landscapes upon which the study area is located would have generally provided a number of resources used by Aboriginal inhabitants. However, both these soil landscapes have been heavily cleared of remnant vegetation.

The study area has been extensively cleared, consisting of primarily agricultural grasses, with some remnant trees scattered along the alignment, as well as introduced low vegetation, such as peppercorns or wattle. The Albion Park landscape typically supports species such as Thin-leaved Stringybark *Eucalyptus eugenioides*, Cabbage Gum *E. amplifolia,* Forest Red Gum *E. tereticornis*, and Decorative Paperbark *Melaleuca sp* (Hazelton 1992, pp.40–44).

Plant resources were used in a variety of ways. Fibres were twisted into string, which was used for many purposes, including the weaving of nets, baskets and fishing lines. String was also used for personal adornment. Bark was used in the provision of shelter; a large sheet of bark being propped against a stick to form a gunyah (Attenbrow 2002).

Aboriginal inhabitants of the Illawarra region would have had access to a wide range of avian, terrestrial and aquatic fauna and repeated firing of the vegetation would have opened up the foliage allowing ease of access through and between different resource zones.

As well as being important food sources, animal products were also used for tool making and fashioning a myriad of utilitarian and ceremonial items. For example, tail sinews are known to have been used to make fastening cord, while 'bone points', which would have functioned as awls or piercers, are often an abundant part of the archaeological record. Animals such as Brush-tailed Possums were highly prized for their fur, with possum skin cloaks worn fastened over one shoulder and under the other. Kangaroo teeth were incorporated into decorative items, such as head bands (Attenbrow 2002).



Legend

Study area

Geological Units

- P__ga - Cambewarra Latite Member
- P__gs - Saddleback Latite Member
- P__gu - Bumbo Latite Member
- Pil - Illawarra Coal Measures
- Pshb - Berry Siltstone
- Pshr - Broughton Formation
- Q_ab - Alluvial backswamp deposits
- Q_acb - Alluvial channel deposits-
- Q_acw - Alluvial channel deposits-
- Q_al - Alluvial levee/overbank deposits
- Q_ap - Alluvial palaeochannel deposits
- Q_av - Alluvial valley deposits
- Q_avf - Alluvial fan deposits
- QH_af - Alluvial floodplain deposits
- QH_ebw - Estuarine basin and bay (subaqueous)
- QH_edw - Estuarine- fluvial delta front (subaqueous)
- QH_er - Estuarine shoreline ridge and dune
- QP_at - Alluvial terrace deposits
- QP_u - Pleistocene undifferentiated regolith

Figure 4 Geological formations in the vicinity of the study area

0 200 400 600 800 1,000

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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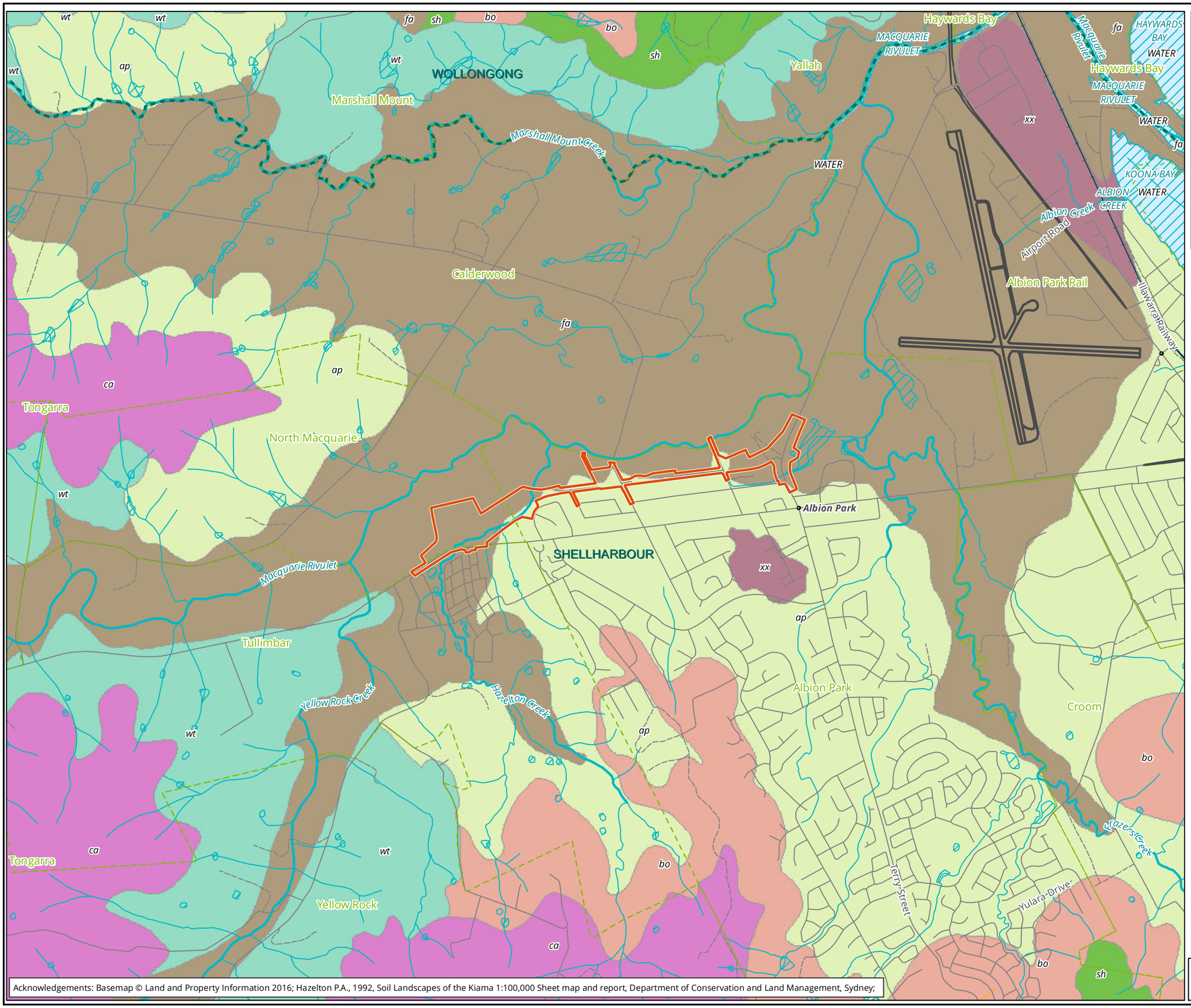

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Study area

Soil Landscape units

- ap - ALBION PARK
- bo - BOMBO
- ca - CAMBEWARRA
- fa - FAIRY MEADOW
- sh - SHELLHARBOUR
- WATER - WATER
- wt - WATTAMOLLA ROAD
- xx - DISTURBED TERRAIN

Figure 5 Soil landscapes in the vicinity of the study area

0 200 400 600 800 1,000

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA 1994 MGA Zone 56

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3 Aboriginal context

3.1 Ethnohistory and contact history

Recent research has identified the potential that Aboriginal peoples have inhabited Australia for at least 65,000 years and possessed a distinctive stone tool assemblage (Clarkson et al. 2017); however there is ongoing debate about the accuracy of this date.

Aboriginal people are known to have inhabited the south coast of NSW area for at least 20 000 years (AMBS 2006). Material from archaeological excavations of shell middens at Bass Point and a rock shelter at Burrill Lake are dated to 15,780 Before Present (BP) and 20,760 BP, respectively (Mulvaney 1975). At this time, the sites would have been situated approximately 14 kilometres inland from their contemporary coastal location, due to the change in sea level since the last glacial maximum. An additional two Pleistocene sites have also been recorded in the Illawarra hinterland, on a tributary of the Shoalhaven River (Feary & Moorcroft 2011)

The nature of Aboriginal occupation within the NSW South Coast region has long been debated by archaeologists. Various models considering the intensity of use and movement between coastal and hinterland have been proposed over the past 50 years (Bowdler 1970, Flood 1980, Byrne 1983). While the high concentration of recorded coastal sites initially seems to support a more intensive occupation of the coast, this is more likely a bias in archaeological investigation due to the greater development in this area.

The Illawarra region is the traditional land of the Wodi Wodi, a group of people who spoke a variant of the Dharawal language (Wesson 2009). The area occupied by this group extended from Botany Bay down the coast to around Nowra. To the north of the Wodi Wodi, the Darug are identified, to the west are the Gundanguura, and in the south the Thoorga are identified (Tindale 1974). The areas inhabited by each of the groups are considered to be indicative only and would have changed through time and may have been dependent on certain circumstances (i.e. availability and distribution of resources). Interactions between different types of social groupings would have varied with seasons and resource availability. Traditional stories tell of the arrival of the Wodi Wodi to Lake Illawarra, bringing with them the Dharawal or cabbage tree palm from which their language is named (Wesson 2009, p.5). Analysis of middens in the region has provided dates of occupation dating back 6000 to 7000 years on the coast and at Lake Illawarra (AMBS 2006).

The first recorded contact between Aboriginal and European peoples occurred in 1770, when Captain Cook sailed down the east coast of Australia in the Endeavour and observed cook fires and Aboriginal people carrying canoes along the coast (Organ 1990). The next recorded contact occurred in 1796, when Flinders and Bass travelled along the coast in the Tom Thumb (Organ 1990)An expedition from Jervis Bay by George William Evans, in which the expedition met several groups of Aboriginal people on the way through the Wollongong area in 1812, was also documented (Organ 1990).

Early historic references record Aboriginal groups moving frequently between the coast and the escarpment and travelling for special ceremonies, although camps were also noted along the coast and coastal plains (AMBS 2006). However, during the 19th and 20th centuries, the arrival of settlers to the Illawarra, created competition for resources, which restricted the movement of Aboriginal inhabitants and their traditional lifestyle was severely affected.

3.2 Regional context

A number of Aboriginal cultural heritage investigations have been conducted for the Illawarra region. Models for predicting the location and type of Aboriginal sites with a general applicability to the Lake Illawarra region

and thus relevant to the study area have also been formulated, some as a part of these investigations and others from cultural heritage investigations for relatively large developments.

Sefton (1980) undertook an archaeological survey of the proposed transmission line routes in the West Dapto-Yallah Area of the City of Wollongong, approximately 7 kilometres from the current study area. Two archaeological sites were identified during this survey. Registered site, Yallah Site 1 (AHIMS# 52-5-0123), consisted of one isolated artefact that was located on the northern bank of a tributary of Duck Creek, made from fossilised wood. Yallah Site 2 (AHIMS# 52-5-0122) was located within 150 metres of Lake Illawarra on a lower slope and is a sparse scatter of seven artefacts made from chert, jasper and rhyolite. The site was located on a gradual slope, and has been previously disturbed by quarrying, erosion and underground services (Sefton 1980, p.10). Both sites are within the close proximity to reliable, permanent sources of water on flat elevated grounds.

Sefton's (1984) study formed part of the Local Environmental Study prior to the Stage 1 of the West Dapto Release Area (WDRA) development in Horsley, north of the study area. A copy of the Sefton's report could not be obtained, but the review was revised from a study undertaken by AMBS study in 2006 (AMBS 2006).

The following key elements constitute Sefton's site predictive model for the WDRA:

- Archaeological sites at Bass Point provide evidence of Pleistocene occupation, and there is no evidence to suggest West Dapto could not have been occupied at this time.
- It is possible that stratified occupational deposit could be located in the Pleistocene sediments of the flood plains at West Dapto. Stratified occupational deposit of Holocene age is also likely (and more possible) to occur in the floodplain sediments.
- Ethnohistorical records suggest two major zones of exploitation: (1) the coastal zone, including the shoreline, off shore islands and Lake Illawarra; and (2) the inland zone, including undulating tablelands. Groups who used both areas were small, mobile, and associated with a locality, but also ranged over larger areas. On this basis, it could be expected that the West Dapto area could have been exploited from both east and west directions, in addition to tracks along ridgelines.
- The Lake Illawarra shoreline presents restricted areas for campsites relative to the concentrated resources. Midden sites may not represent base camps (occupation sites) but instead preferred sites for resource exploitation. These preferred sites are expected to occur within two kilometers of the Lake Illawarra shoreline, and would have been established around the lake shore.
- The resources of West Dapto (flora, fauna, available water) would have made the locality attractive to occupation and exploitation. However, resources would have been scattered and at low density in comparison to Lake Illawarra, and the locality was probably not economically self-contained. Base camps would not have been suitable for exploitation of these resources.
- Stone materials are not sourced within the area, with the exception of latite cobbles and occasional quartz pebbles. Consequently, stone would have been conserved at camp sites.
- Tracks connecting the coast to the interior would be expected through the West Dapto area, due to its geographic location between the two. Aboriginal tracks are usually along ridges, and consequently, sites could be expected in the saddles of ridges.
- Along the eastern coastal plain and the foothills of the escarpment to the west, sites are likely to occur on ridgelines or on dry level land within 100 metres of a creek line.
- In the foothills of the Escarpment to the west, sites may also occur further away from water on saddles of the Marshall Mount spur and on level areas of smaller ridgelines along the escarpment slopes and foothills.

- Extractive sites will also be located in West Dapto. These would occur as scarred trees, isolated large cores, tools of latite or small isolated stone artefacts. These sites may occur in all landform contexts, although scarred trees could only be identified in areas where trees have not been fired or cleared.
- It is not expected that latite quarry sites will occur at West Dapto. Although edge ground tools have been located in adjacent areas on the shores of Lake Illawarra, although those tools have been prepared from pebbles or cobbles and not from quarried materials (AMBS 2006, pp.87–88).

The following four areas were identified in WDRA as having high archaeological potential:

- All level areas of the Western foothills zone and the Coastal Plain within 100 metres of a creek located on:
  - Quaternary deposited flood plains.
  - Budgong Sandstone
  - Berry Siltstone.
- Saddles on the ridges of Marshall Point spur.
- Level areas in the Forest Creek Valley in the Escarpment Protection Zone.
- Level areas of the escarpment slopes on the topographic benches and bluffs.

Three main categories of sites being of potential significance were also identified:

- Stratified occupational deposits: may occur in the flood plain deposits of West Dapto, these deposits would have significant research potential and would be rare. Such a site may contain stone artefacts, food refuse and charcoal, which could be dated to establish a chronology of occupation of West Dapto. This would be significant to the public and be of educational significance. If the site were of Pleistocene age, it would be of major heritage significance to the Australian people, such as that identified at Bass Point.
- Surface camp sites: these unstratified deposits are likely to contain stone artefacts, and possibly, remnants of shell and charcoal. Bone is unlikely to have survived. These sites may provide information on settlement patterns, economic exploitation and stone tool manufacture and maintenance. These sites have research potential, but it is also predicted that they will be the most common site type at West Dapto.
- Scarred trees: although the identification of scarred trees is recognized to be problematical, any found in West Dapto will be of research potential (i.e. study of individual tree scars, relationship with other site types). Scarred trees are rare in the North Illawarra as in most areas, mature native trees have been burnt, and the rarity of scarred trees increases their significance (AMBS 2006, p.90).

Navin Officer(2000) generated a site prediction model for the Shellharbour City Council area. Sites were considered likely to occur in varying densities across a broad range of topographical zones. Areas of relatively level ground without significant amounts of surface rock, situated within close proximity to fresh watercourses, and well drained slightly elevated areas (spurs, crests and ridgelines) were deemed archaeologically sensitive. Areas where different plant communities would meet were also considered to be areas where sites would be potentially present. The most common site types to occur within the Shellharbour City Council area were isolated finds, artefacts scatters or potential archaeological deposits

AMBS (2006) conducted an archaeological survey in the West Dapto Area, which includes the Marshall Mount suburb and the current study area. Based on this work, they created a predictive model for broad site distribution in their "Landscape Model of Archaeological Sensitivity" of the region (Table 6).

Table 1 Summarised "Landscape Model of Archaeological Sensitivity" for the West Dapto region (AMBS 2006)

Archaeological Sensitivity, West Dapto
Areas of Low Archaeological Sensitivity
• Urban centres, areas of infrastructure and cemeteries.
Areas of Moderate Archaeological Sensitivity:
• Streams of upper creek catchments of West Dapto and the spur crests dividing these creek systems.
Areas of Moderate to High Archaeological Sensitivity:
• Sections of Dapto Creek, Sheaffes Creek, Forest Creek, Robins Creek, Mullet Creek and Duck Creek. • This includes stream banks, alluvial flats and undulating hillslopes.

AMBS subsequently undertook archaeological test excavations as part of a landform sampling strategy. These excavations resulted in the following:

- Recovery of 425 artefacts from 75 of the 136 excavated test pits.
- Dominant lithic materials consisted of chert and quartz with lesser amounts of silicified wood, quartzite, silcrete, silicified tuff and fine grained siliceous material.
- These artefacts were recovered from a variety of landforms including hillslopes, alluvial flats, stream banks, and spur crests.
- More specifically, this model was successful as it identified the Marshall Mount upper creek banks and the spur crests between the Duck Creek and Marshall Mount Creek systems as areas of moderate to high archaeological sensitivity.

As part of the assessment, AMBS also commissioned Philip Hughes to undertake geomorphic testing prior to the commencement of the larger sub-surface investigation program. The geomorphic testing revealed that while all landforms had the potential to contain artefact-bearing deposits, archaeological evidence for Aboriginal occupation and use of the Pleistocene terraces would be restricted to the Holocene period (AMBS 2006, p.176). Artefact bearing deposits across all landforms comprise soft to firm soils and sediment. The depth of deposits varies across landforms, with the shallowest sediments occurring on ridges and hill slopes, and the deepest sediments occurring on Holocene terraces. 'Richer' archaeological deposits could be expected within Holocene terraces, but they would be disturbed by floods and perhaps buried in deeper alluvium (AMBS 2006, p.177).

Biosis Pty Ltd (2011) undertook and Aboriginal Heritage Assessment and Impact Assessment on behalf of Sydney Water for the proposed water and waste servicing of West Dapto Urban Release Area and adjacent growth areas, that extended from Farmborough Heights to Tullimbar Village. Of the 50 sites previously registered within the area, seven were located within the proposed water and sewage corridor. A further three new Aboriginal sites were recorded. Biosis made specific recommendations in the advent that direct impact could not be avoided. It was recommended that sites of high archaeological potential and significance be further investigated and assessed. No further archaeological investigation of site of low significance in areas of high disturbance was required.

3.3 Local context

A number of Aboriginal cultural heritage investigations have been conducted within the region (within approximately 5 kilometres of the study area). Most of these investigations were undertaken as part of development applications and included surface and sub-surface investigations. These investigations are summarised below.

Dominic Steele (2000) was commissioned by SMEC Australia Pty Ltd to undertake an archaeological survey and assessment of the proposed upgrade to the Albion Park water supply system. Three survey units were assessed in order to efficiently cover the scope of the works. No Aboriginal sites or objects were identified during the survey effort. This may have been due to the poor level of visibility across the study area, and the fact that approximately 50% of the proposed pipeline route was located in heavily built-up urban residential areas. It was recommended that monitoring of earthworks be undertaken by the Illawarra Local Aboriginal Land Council, particularly in areas nearby Frazer's Creek, and at the Albion Park High Level Reservoir.

Navin Officer (2004) completed a cultural heritage assessment for Shellharbour Urban Fringe area that included the Dunmore area, and western portion of Albion Park including the current study area. The initial assessment in this report identified level ground on hill crests close to water as having moderate potential for artefact occurrences, particularly given the likely use of watershed crests as access routes for the rangelands and coastal plain. Grinding grooves were assessed as having a moderate potential to occur, if sandstone outcrops were present, and the same was said of scarred trees, if mature growth trees were present. The general assessment of the area stated that ' Areas of archaeological potential within this zone are generally level ground on ridge and spurline crests and benches, especially locally elevated landforms adjacent to freshwater' (Navin Officer 2004, p.19). The survey identified seven Potential Archaeological Deposits (PADs) in total, with two of these PADS being within 1 kilometre of the study area. The nearest (SUFA1) being approximately 400 metres to the south of the current study area. This PAD was identified on the gentle lower slopes of a steep mini spur and associate valley flats, and was to the west of Hazelton Creek. This site has not been recorded in AHIMS. It appears that the survey obtained extensive coverage in the corner of the site occupied by the current study area (Navin Officer 2004, p.28). It was noted that the ridgeline that the study area is located along would ordinarily have a moderate to high potential for sites to be present, however the level of disturbance, combined with the total lack of any artefacts being identified and the shallowness of the topsoil led to the conclusion that there was extremely limited potential for subsurface deposits (Navin Officer 2004, p.23). No Aboriginal sites were identified during the survey, and the report concluded that it was impossible to accurately assess the areas of PAD without further investigation.

Navin Officer (2005) completed an Aboriginal archaeological assessment for the Tullimbar Village Development in 2002 located approximately 1.5 kilometres south west of the study area. During the survey, two sites and four areas of potential archaeological deposits were identified. Subsequent mechanical test excavations were carried out at Tullimbar Village PAD 3 (AHIMS 52-5-0431). A total of 11 artefacts were excavated from 5 of the 14 test pits. A majority of the artefacts recovered were chert, though other raw materials included silcrete, tuff and volcanic rock. One volcanic flake was also recovered from the surface. Considering the low density of artefacts, the presence of a diverse range of raw materials, and the level of bioturbation and earthworks disturbance, it was concluded that the site is a background artefact scatter representing a low intensity occupation site or transient camp of low archaeological significance. No further archaeological excavations were recommended for the northern section of PAD3.

Kayandel (2008) conducted subsurface archaeological test excavations at PAD sites Tullimbar Village PAD 1 (52-5-0434), Tullimbar Village PAD 2 (52-5-0439) and Tullimbar Village PAD 4 (52-5-0440), located 1.5 kilometres south west. This assessment covered a portion of the current study area and the areas located immediately to the west, and to the north of the current study area. A total of 26 tests pits were excavated over the extent of the 3 sites. A total of 33 artefacts were recovered from 12 of the 26 test pits excavated via

mechanical means (backhoe). Of these artefacts 14 came from PAD 1, 16 from PAD 2 and three from PAD 4. A majority of the artefacts salvaged were of fine-grained siliceous, or tuff raw materials that are common within the landscape context of the study area. Other raw materials included chert, quartz, jasper, volcanic, jasper, silcrete and petrified wood. The results of the test excavations were consistent with Navin's excavations at PAD3. PAD1, PAD2, and PAD4 were assessed to be background artefact scatters of low significance. Kayandel recommended that no further archaeological investigations were required at PADs 1, 2, and 4. It was also recommended that a valid heritage impact permit (s.87 and s.90 permit), would be required prior to the commencement of works.

GML Heritage (2014) completed and Aboriginal Cultural Heritage Assessment (ACHA) for Lyndal Pty Ltd, on the Stage 3 development of Lot 12 DP 849162. A PAD site (SUFA3) had been previously recorded within the area by Navin Officer in 2004, as part of the Shellharbour Urban Fringe Lands Aboriginal heritage assessment. Test excavations were conducted at PAD site SUFA3 on two separate occasions. In 2011 a total of 35 test pits were excavated and 54 artefacts of varying types were recovered. The most common raw material present was fine-grained siliceous materials that is common to the area. Other raw material types included chalcedony, petrified wood, chert and silcrete. The second stage of test excavations was carried out in 2014. A total of 34 test pits were excavated and 38 artefacts and five non-diagnostic fragments were identified. The most common raw material type was Chalcedony. Other raw material types included silcrete, quartz, and silicified wood. The results of the test excavations identified PAD SUFA3 to be a consistent low density artefact scatter. The site was assessed to be of low potential. Following test excavation PAD SUFA3 was registered on the AHIMS Database as site 52-5-0648. A field survey was also conducted, and a total of 15 survey units were assessed. Two isolated finds were identified.

Biosis Pty Ltd (2015) provided Aboriginal due diligence advice for 225 Crest Road in Albion Park, approximately 1 kilometre south west of the current study are. The assessment concluded that ridgelines with associated upper slopes and spur lines would possess high archaeological potential, and were likely to have been used by Aboriginal people as a transient corridor between the hinterland and the coast. The most likely site types to occur were predicted to be low to moderate density artefact scatters and isolated artefacts. These sites would be the remnants of short-term camping places or would represent lost or discarded material along the transient corridor. The assessment also identified a small area within the eastern end of the area on the upper gentle slopes associated with the ridgeline and the small easternmost part of the entire as having moderate archaeological potential. Those areas are located within flat areas on spur lines in the vicinity of the watercourses. Areas of low archaeological potential were attributed to steep slopes that would not be suitable for occupation or movement across the landscape. Further assessment was recommended for the areas of high and moderate potential.

Biosis Pty Ltd (2017) were commissioned by Planit Consulting to provide Aboriginal due diligence advice for a proposed sewer and water pipeline to be installed at Pleasant View Close, Albion Park, NSW, approximately 1.5 kilometres south of the current study area. A site inspection was undertaken and the area was assessed to be of moderate to high archaeological potential. Site types most likely to occur within the area were assessed to be low to moderate density artefact scatters and isolated finds, which would most likely be present within the well-drained flat areas within the landscape located within close proximity to watercourses, upon the boundaries between different ecological zones, and upon ridgelines utilised as movement corridor from hinterland to coast. It was recommended that further investigations be undertaken due to the natural context of the area.

Navin Officer (2017) provided a desktop assessment of the cultural heritage of Tullimbar Village, approximately 2.7 kilometres south west, for Macquarie Bank who wished to pursue a Section 96 Amendment to the existing development consent approved in 2002. One previously recorded site was identified within the Tullimbar Village Southern Lands outside of the Southern Lands Section 96 amendment area. It was recommended that an Aboriginal Cultural Heritage Assessment following the Code should be

undertaken for the Tullimbar Village – Southern Lands Section 96 amendment area and for the remaining Tullimbar Village – Southern Lands to provide an up to date assessment of the archaeological potential of Tullimbar Village.

Artefact Heritage (2017) undertook an ACHA for the a proposed new dairy facility at 140-142 Calderwood Road Albion park located approximately 1.1 kilometre to the north east of the current study area. One Aboriginal site was identified within the study area (AHIMS 52-5-0848). The site is located on a crest landform unit which boarders the Macquarie Rivulet flood plain. A number of surface artefacts were noted within this crest landform unit during the field survey, the area was also assessed as having PAD. Test excavations were subsequently undertaken at the site in order to determine the extent and significance of the PAD. The test excavations identified a high density artefact deposit within the crest landform unit. The areas of highest density were noted within the highest points in the landform unit, while artefact density was noted to decrease as elevation within the landscape decreased .This supported the predictive modelling undertaken as part of the assessment which suggested artefact sites are likely to be identified in raised landforms out of areas of frequent inundation. Artefact recommended that an Aboriginal Heritage Impact Permit (AHIP) to salvage and impact on the site be sought from Heritage NSW prior to works commencing in the region.

Eco Logical Australia (2017) conducted an ACHA and archaeological test excavations for the Stage 3 residential development at Calderwood located approximately 1 kilometre to the north of the current study area. Eight AHIMS sites were previously recorded within the Calderwood development area. The archaeological survey did not identify any new archaeological sites. Four areas of archaeological sensitivity were identified during the survey. These areas were identified as archaeologically sensitive due to the landform unit present (lower slopes, creek banks, flats, and ridgelines), and the low levels of previous disturbance observed during the survey. Archaeological test excavations were undertaken within the areas of archaeological sensitivity and at one AHIMS site (52-5-0632) as part of the ACHA. The test excavations identified 366 aboriginal artefacts within 99 test excavation units. Over 95% of artefacts were identified within the lower slope and alluvial flat landform units. Test excavations within 52-5-0632 identified a low density, dispersed subsurface artefact deposit; however excavations along a dry gully terrace situated at the base of a slope within an alluvial plains landform associated with AHIMS site 52-5-0597 identified a moderately intact, moderate to high density subsurface archaeological deposit. The vast majority of artefacts identified during the test excavations (87.9%) were found within the area of sensitivity associated with AHIMS site 52-5-0597. Testing within this area of sensitivity identified a knapping floor, a cluster of heat treated lithics, and three geometric artefacts.

Biosis (2019) conducted an ACHA for the proposed Tullimbar Village Development at Lot 17 DP 1168920, Yellow Rock Road, Tullimbar located approximately 1 kilometre to the south of the current study area. One Aboriginal archaeological site (52-5-0440) was located within the study area, which was relocated and assessed during the field investigation in order to determine if any intact archaeological deposits remained. Observations made during the field investigation indicate that site 52-5-0440 has been subject to high levels of previous ground disturbance. This ground disturbance likely occurred during the historic creek modification activities, archaeological test excavations (Kayandel Archaeological Services 2008) which were undertaken at the site, and as a result of 10 years of disturbances such as erosion and farming activities. As the previous AHIP has expired, a new AHIP will be required before impacts to the site can occur.

Austral Archaeology (2019) conducted an ACHA for proposed relocation of high voltage transmission lines and realignment of an existing underground fibre optic cable owned by Optus (the project/proposed works) within Lot 4 DP 1223910, Lot 16 DP 1168920, Lot 17 DP 1168920, Lot 20 PD 1232597, Lot 21 DP 1232597, Lot 220 DP 1123859 and Lot 711 DP 1236947, approximately 1 kilometre to the south of the current study area. Archaeological test excavations were undertaken by Austral to investigate the extent of PAD 1 and PAD 2 and demonstrated that both areas represent low density background scatters of low archaeological significance. A total of two artefacts were identified in PAD 1 during test excavations from a total of 12 test pits. A total of 13 artefacts were identified in PAD 2 during the archaeological test excavations from a total of 18 test pits. The

test excavations also sought to investigate the extent of Tullimbar Village PAD 4 (#52-5-0440) and determine the level of historic disturbance. No artefacts were recovered from the investigations of Tullimbar Village PAD 4 (#52-5-0440) and the PAD demonstrated high levels of previous ground disturbance as a result of the modification of Hazelton Creek, agricultural activities such as ploughing, and the levelling of land for the construction of the adjacent farming property.

3.3.1 Identified Aboriginal archaeological sites

An extensive search of the AHIMS database was conducted on 3 August 2021 (Client service ID: 609910) The search identified 102 Aboriginal archaeological sites within a four kilometre search area, centred on the proposed study area (Table 2). One of these registered sites is located *within* the study area (AHIMS # (52-5-0961) (Figure 6). The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied where notable discrepancies occurred.

It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area.

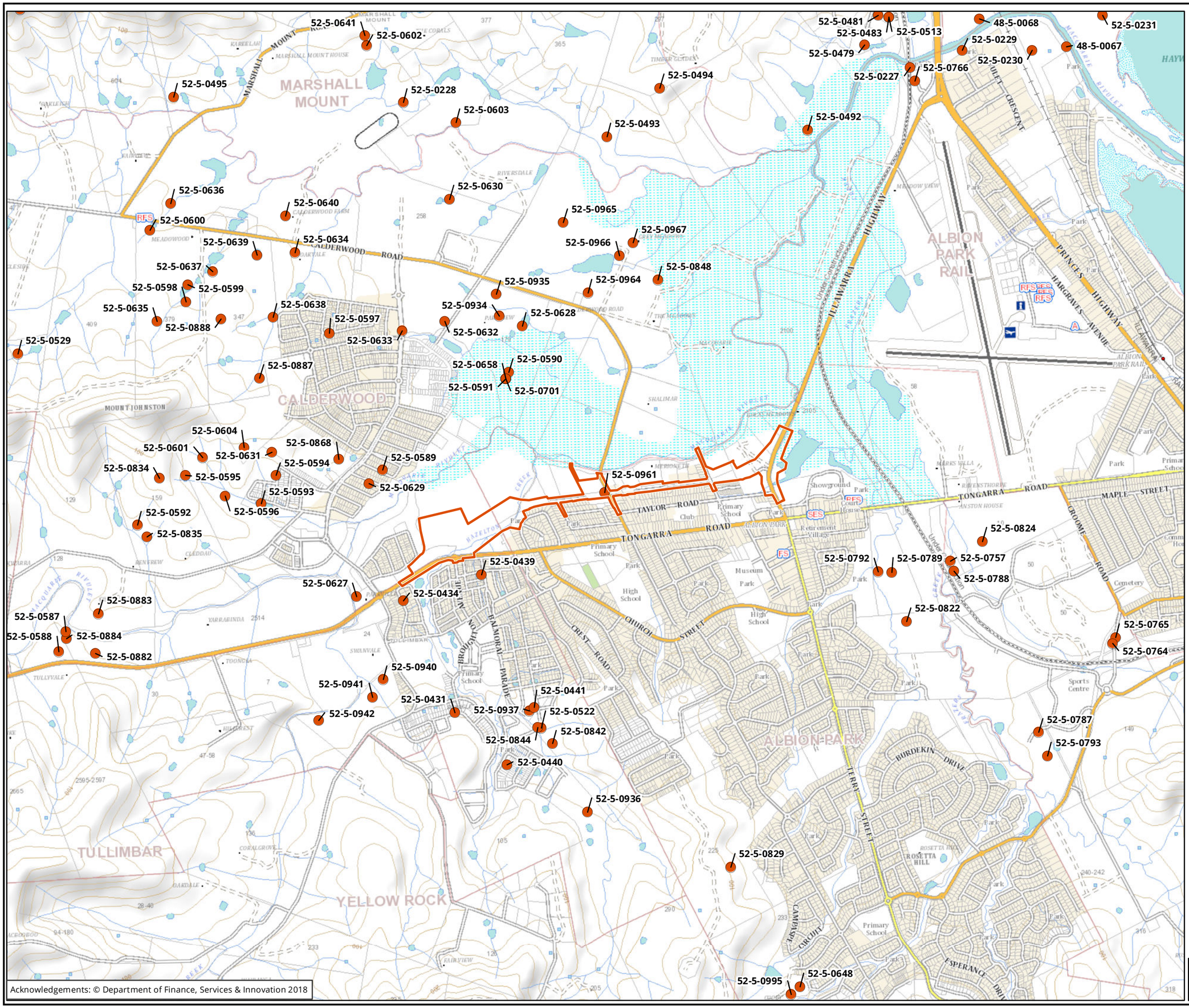
Table 2 AHIMS sites within the vicinity of the study area

Site type	Occurrences	Frequency (%)
Artefact	84	82
Shell	2	2
Artefact, PAD	4	4
PAD	12	12
Total	**102**	**100.00**

A simple analysis of the Aboriginal cultural heritage sites registered within 4km of the study area indicates that the dominant site type is artefacts, representing 82% (n=83), followed by PADs at 12% (n=12). All the sites were located within close proximity to the reliable sources of water and were likely exposed by the land clearing works (artefact scatters) or as the result of test excavations.

AHIMS 52-5-0961/Tulkeroo ISO

Tulkeroo ISO was recorded by Biosis in 2018 after the initial archaeological survey for the Tripoli Way Extension. The site is recorded as an isolated artefact with an associated area of potential. See Section 4.3 of this report for additional detail.



3.3.2 Predictive statements

A series of statements been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist throughout the study area and where they are more likely to be located.

This model is based on:

- Local and regional site distribution in relation to landform features identified within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a predictive model has been developed, indicating the site types most likely to be encountered during the assessment across the present study area (Table 3). The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 3 Aboriginal site prediction statements

Site type	Site description	Potential
Flaked stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	Moderate: Stone artefact sites have been previously recorded in the local area on level, well-drained topographies in close proximity to reliable sources of fresh water. Due to the distance from permanent fresh water resources, the potential for artefacts to be present within the study area is assessed as moderate.
Potential Archaeological Deposits (PADs)	Potential sub surface deposits of cultural material.	Moderate: PADs have been previously recorded in the region and local area across a wide range of landforms. PADs are likely to be present within areas adjacent to water courses or on high points in undisturbed landforms.
Grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: Suitable horizontal sandstone rock outcrops could occur along drainage lines.
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Low: Shell midden sites have not been recorded within the vicinity of the study area. Although shell middens are common in the Illawarra, there is a low potential for shell middens to be located in the study area as the first order drainage line is not permanent water source.

Site type	Site description	Potential
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding the study area and therefore low potential.
Modified trees	Trees with cultural modifications	Low: Due to extensive vegetation clearance only a small number of mature native trees have survived within the study area.
Burials	Aboriginal burial sites.	Low: Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area are not commonly associated with burials.
Rock shelters with art and / or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	Low: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present within the study area
Aboriginal Ceremony and Dreaming sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	Low: There are currently no recorded mythological stories for the study area.
Post-contact sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	Low: There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal Places	Aboriginal Places may not contain any 'archaeological' indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	Low: There are currently no recorded Aboriginal historical associations for the study area.

4 Archaeological investigation

An archaeological investigation of the study area was undertaken on 18 December 2019. The survey sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological survey aims

The principle aims of the survey were to:

- Undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of Aboriginal archaeological and cultural sensitivity.

4.2 Survey methods

The survey was conducted on foot. Recording during the survey followed the archaeological survey requirements of the code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform elements, distinguishable areas of land approximately 40m across or with a 20m radius (CSIRO 2009).
- Photographs of the site indicating landform.
- Ground surface visibility (GSV) and areas of exposure.
- Observable past or present disturbances to the landscape from human or animal activities.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, the identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, GSV 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 and the Map Grid of Australia (94) coordinate system.

4.2.1 Constraints to the survey

With any archaeological survey there are several factors that influence the effectiveness (the likelihood of finding sites) of the survey. The factors that contributed most to the effectiveness of the survey within the study area were GSV. The study area had low GSV due to the extensive grass coverage across the study area and relatively small areas of exposure.

4.2.2 Visibility

In most archaeological reports and guidelines visibility refers to GSV, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (DECCW 2010b). GSV across the study area was typically low (10%) due to extensive grass coverage (Plate 1). Small areas of GSV were present around along dirt tracks and where erosion had occurred (Plate 2).

Plate 1 East facing photo showing extensive grass coverage and low visibility

Plate 2 East facing photo showing extensive grass coverage and areas where GSV was present

4.2.3 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004, p.79, DECCW 2010b). Overall, the study area displayed areas of exposure of less than 10% due to extensive grass coverage. Areas of exposure were located along gravel roads (Plate 3), at the base of large trees, and where erosion had occurred (Plate 4).

Plate 3 West facing photo showing exposure along gravel roads

Plate 4 East facing photo showing exposure where erosion has occurred

4.2.4 Disturbances

Disturbance in the study area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring. Disturbances associated with recent human action are prevalent in the study area and cover large sections of the land surface.

There were a number of disturbances observed within the study area, which would have resulted in the removal of topsoil and its replacement with introduced materials of varying degrees. A large portion of the study area is located in existing road corridors (Plate 5), so there are large areas of disturbances, related to the construction of the roads themselves, their associated infrastructure and the residential properties which adjoin them. Other disturbances within the study area include deposition of fill (Plate 6), installation of services such as water and electricity (Plate 7 and Plate 8), modification of creek lines and land surface, and construction of culverts.

Plate 5 West facing photo showing disturbances created by the construction of Tripoli Way

Plate 6 West facing photo showing disturbances created by the deposition of fill

Plate 7 North facing photo showing disturbances created by the construction of an electrical easement

Plate 8 East facing photo showing disturbances created by the construction of a water pump station

4.3 Investigation results and discussion

The archaeological survey consisted of a meandering foot transect, which targeted all portions of the study area Figure 7). The assessment for areas that have low, moderate or high archaeological potential within the study area is based on a number of factors, including environmental conditions, geomorphological processes, past land use activities, results of previous archaeological studies, surveys and test excavations, and results of the current survey. Based upon the desktop assessment and archaeological survey Biosis has been able to identify three areas of archaeological potential (Figure 8).

The survey revealed that large parts of the study area had been subject to significant ground disturbance, such as the initial vegetation removal and construction of roads and residential dwellings. As discussed in section 4.2.4, the disturbances observed within the study area have had an influence on site integrity. Past human activities can cause spatial and stratigraphic movements of artefacts, and significant land modifications, such as excavations, would have caused the destruction and removal of cultural material. Vegetation clearance would have caused spatial, as well as stratigraphical movements of cultural material due the removal of trees, which would have originally been present within the study area. Following land clearance, erosion would have been extensive and caused post depositional displacement of artefacts. Although these processes would displace surface cultural material, it would not affect deeper buried archaeological deposits.

One new Aboriginal site was identified within the study area. Tulkeroo ISO (AHIMS 52-5-0961) consists of a basalt ground edge axe located within the historical property of 'Tulkeroo' and the Albion Park Butter factory. It measured 148.24 millimetres long by 84.77 millimetres wide by 40.67 millimetres deep (Plate 9) and had evidence of flaking or use as a hammerstone on one side (Plate 10).

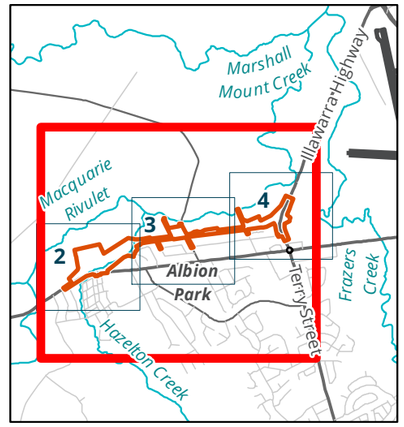
Plate 9 Ground edge axe, Tulkeroo ISO, recorded during the survey

Plate 10 Opposite side of Tulkeroo ISO showing evidence of flaking or use as a hammerstone

A review of previous archaeological studies, surveys, and test excavations within the vicinity of the study area indicate that archaeological deposits occur across much of the region. Eco Logical Australia's (2017) test excavations for the Stage 3 of a residential development at Calderwood, located approximately 1 kilometre to the north of the current study area, identified 366 Aboriginal artefacts within 99 test excavation units. Over 95% of artefacts were identified within the lower slope and alluvial flat landform units. Test excavations undertaken by Artefact Heritage (2017) for the proposed new dairy facility at 140-142 Calderwood Road Albion Park, located approximately 1.1 kilometre to the north east of the current study area, identified a high density artefact deposit within the crest landform unit. The areas of highest density were noted within the highest points in the landform unit, while artefact density was noted to decrease as elevation within the

landscape decreased. Both of these assessments support the predictive statements undertaken as part of the assessment, which suggested artefact sites are likely to be identified in raised landforms in close proximity to creeks and out of areas of frequent water inundation.

Acknowledgements: Basemap © Land and Property Information 2016



Legend

- Study area
- Survey tracks

Figure 7.1 Survey effort

0 150 300

Metres
Scale: 1:8,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 21559
Date: 16 January 2020,
Checked by: SJK, Drawn by: AEDM, Last edited by: amurray
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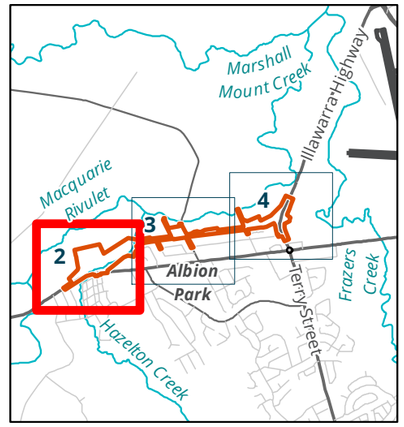

Legend

- Study area
- Survey tracks

Figure 7.2 Survey effort

0 150

Metres
Scale: 1:3,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 21559
Date: 16 January 2020,
Checked by: SJK, Drawn by: AEDM, Last edited by: amurray
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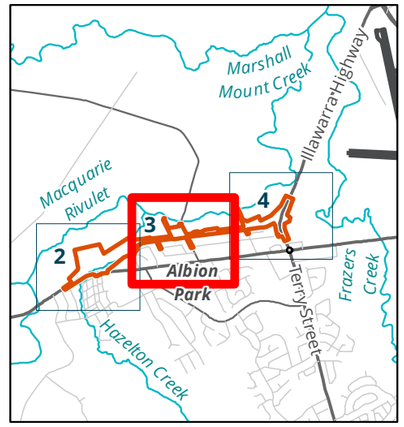
21559_ADDA_F7_SurveyEffort



Legend

- Study area
- Survey tracks

Figure 7.3 Survey effort

0 150

Metres
Scale: 1:3,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 21559
Date: 16 January 2020,
Checked by: SJK, Drawn by: AEDM, Last edited by: amurray
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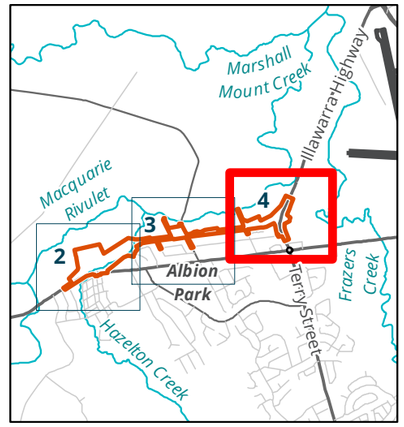

Legend

- Study area
- Survey tracks

Figure 7.4 Survey effort

0 150

Metres
Scale: 1:3,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 21559
Date: 16 January 2020,
Checked by: SJK, Drawn by: AEDM, Last edited by: amurray
Location:P:\21500s\21559\Mapping
21559_ADDA_F7_SurveyEffort

Legend

- Study area
- Surface artefact
- PAD

Archaeological potential

- Low

Figure 8 Survey results

0 150 300

Metres
Scale: 1:8,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 21559
Date: 20 January 2020,
Checked by: SJK, Drawn by: AEDM, Last edited by: amurray
Location:P:\21500s\21559\Mapping
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5 Conclusions and recommendations

5.1 Conclusions

The assessment for areas that have low, moderate or high archaeological potential within the study area is based on a number of factors, including environmental conditions, geomorphological processes, past land use activities, results of previous archaeological studies, surveys and test excavations, and results of the current survey. The survey revealed that large parts of the study area had been subject to significant ground disturbance, such as the initial vegetation removal and construction of roads and residential dwellings throughout the study area. Although these processes would displace surface cultural material, it would not affect deeper buried archaeological deposits.

Furthermore, a review of previous archaeological studies, surveys, and test excavations within the vicinity of the study area indicated that archaeological deposits could occur within the study area. Both Eco Logical Australia's (2017) and Artefact Heritage's (2017) assessments support the predictive statements undertaken as part of the assessment, which suggested artefact sites are likely to be identified in raised landforms in close proximity to creeks and out of areas of frequent inundation. This is evidenced by the identification of one new Aboriginal site within the study area, Tulkeroo ISO (AHIMS 52-5-0961). Based upon the desktop assessment and archaeological survey Biosis has been able to identify three areas of archaeological potential.

5.2 Recommendations

The following management recommendations have been developed relevant to the study area and influenced by:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practise, widely considered to include:
  - Ethos of the Australia ICOMOS Burra Charter (2013).
  - The code.

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: Application for an Aboriginal Heritage Impact Permit (AHIP)

It is recommended that that Council apply to Heritage NSW for an AHIP to impact the listed Aboriginal site, Tulkeroo ISO (AHIMS pending), within the study area which is currently protected under the NPW Act. It is recommended that the surface stone artefact associated with the site is collected prior to destruction.

Advice preparing AHIPs

An AHIP is required for any activities likely to have an impact on Aboriginal objects or Places or cause land to be disturbed for the purposes of discovering an Aboriginal object. Heritage NSW issues AHIPs under Part 6 of the NPW Act. AHIPs should be prepared by a qualified archaeologist and lodged with the Heritage NSW. Once the application is lodged processing time can take between 8-12 weeks. It should be noted that there will be an application fee levied by the Heritage NSW for the processing of AHIPs, which is dependent on the estimated total cost of the development project.

Where there are multiple sites within one study area an application for an AHIP to cover the entire study area is recommended.

Recommendation 2: Areas identified as having moderate archaeological potential

As three areas of moderate potential have been identified as part of this assessment, it is recommended that a program of test excavations is undertaken to determine if subsurface Aboriginal sites are present and whether an AHIP application will be required. This process will consist of an ACHA prepared in accordance with *the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011), an archaeological report prepared in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) and consultation with Aboriginal community in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010c).

Recommendation 2: No further archaeological assessment is required in areas of low potential

No further archaeological work is required in the remaining parts of the study area due to these areas being assessed as having low archaeological potential. Works can proceed in these areas, subject to recommendation 3.

Recommendation 3: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Heritage NSW. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the Heritage NSW and Aboriginal stakeholders.

Recommendation 4: Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and Heritage NSW Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by E Heritage NSW ES.

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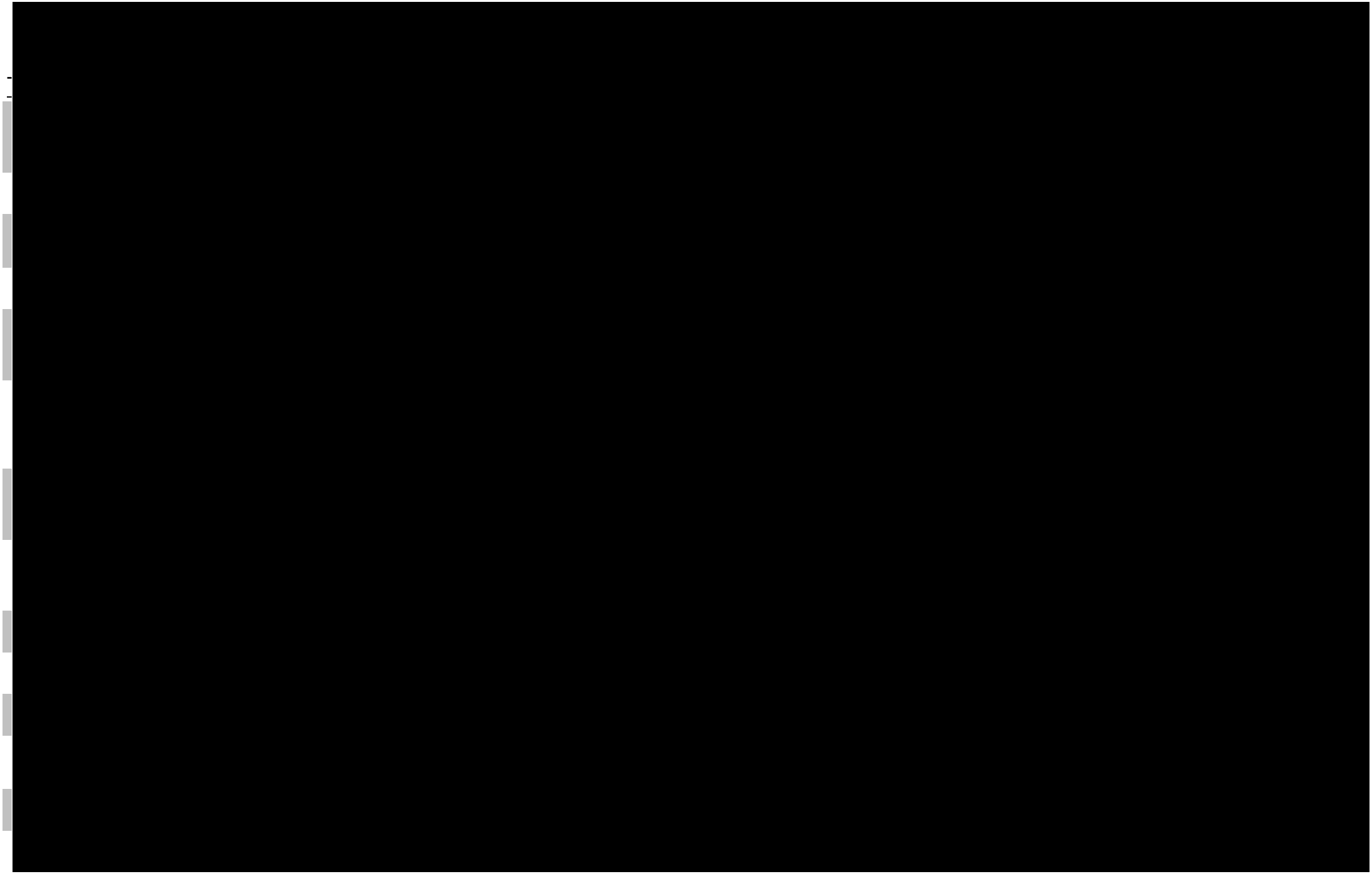
Appendices

Appendix 1 AHIMS search results

This Appendix is not to be made public.

Report generated by AHIMS Web Service on 03/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 291167.825 - 298393.752, Northings : 6169422.761 - 6175345.739 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 102



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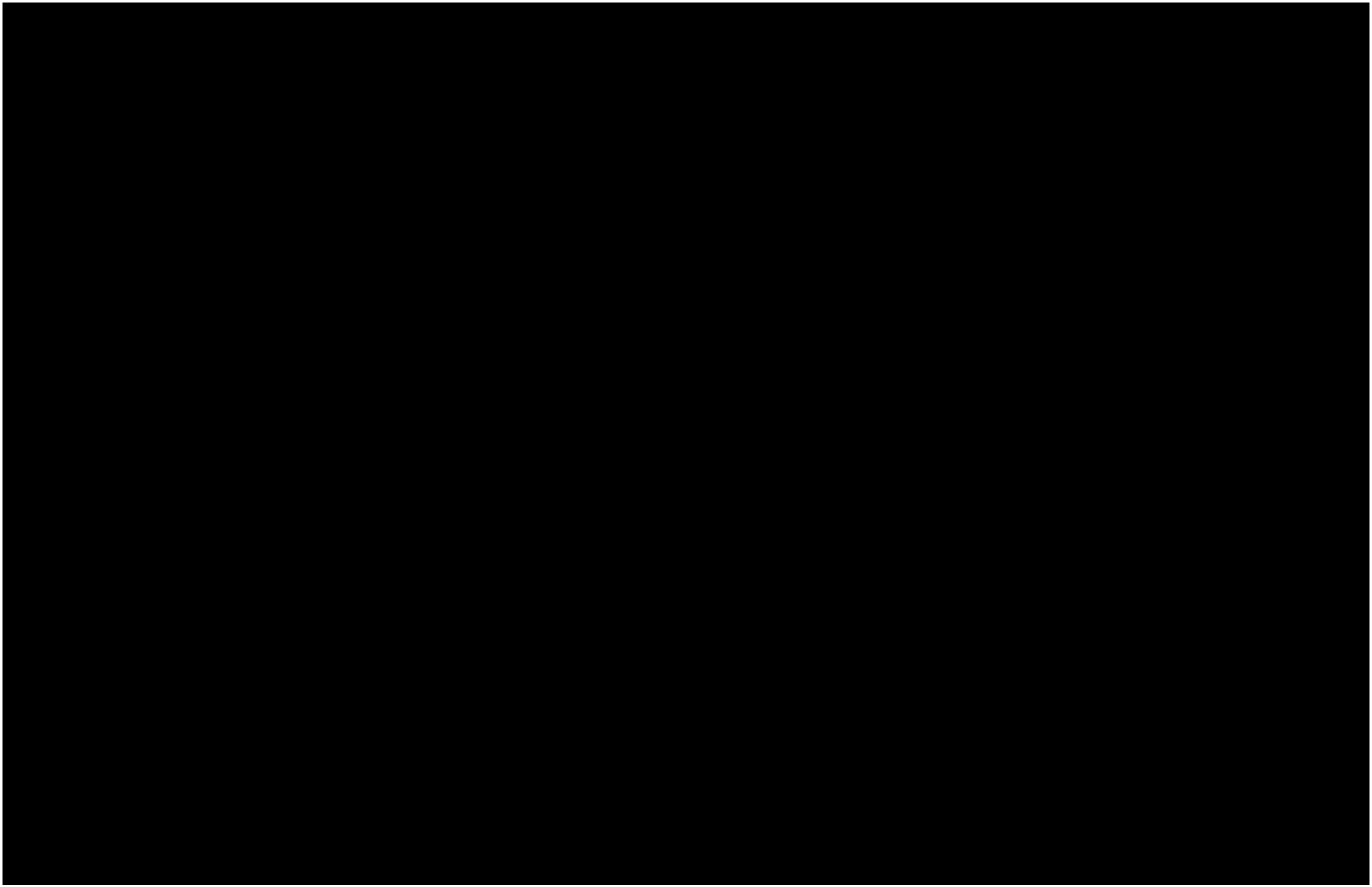

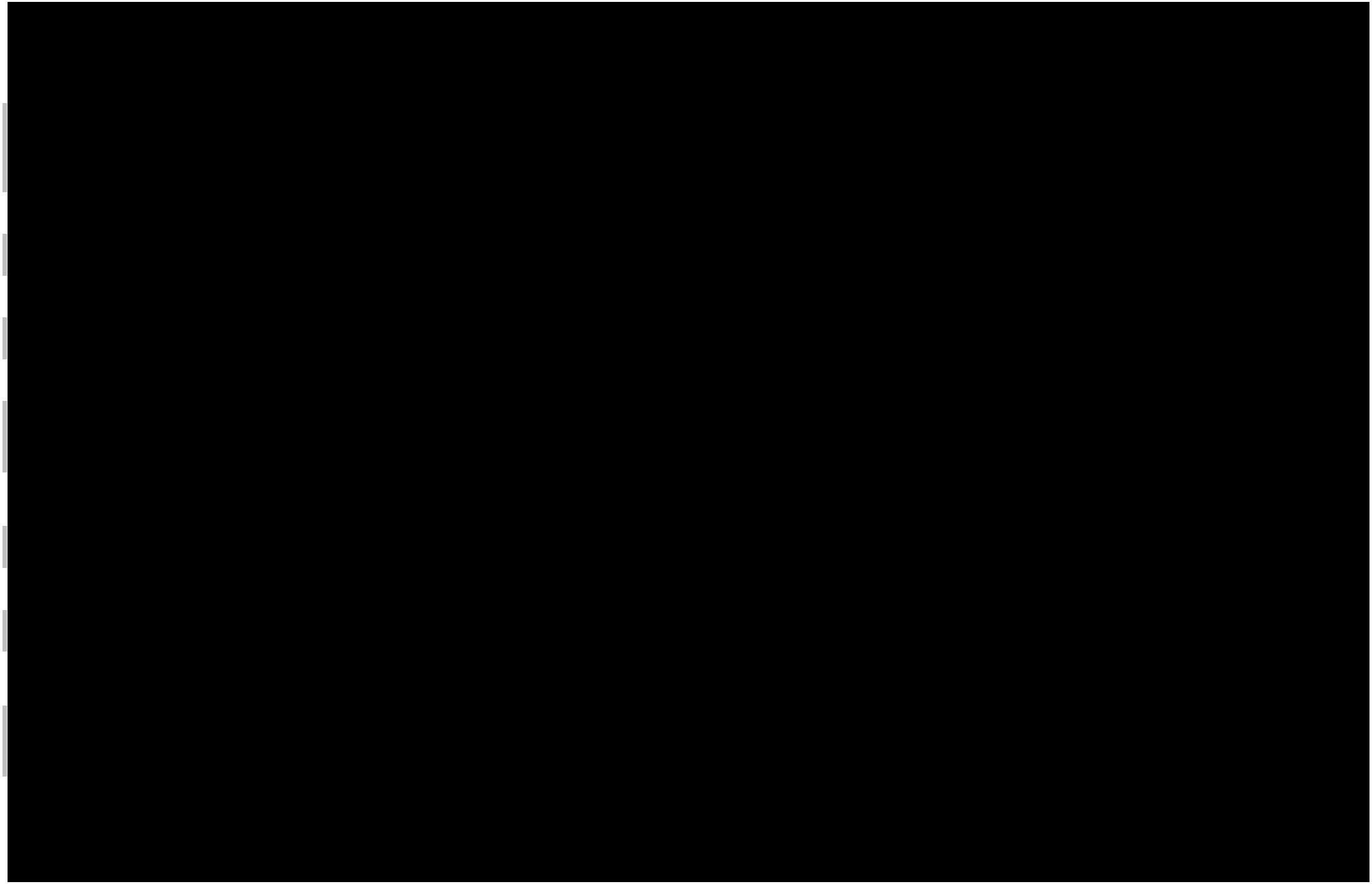

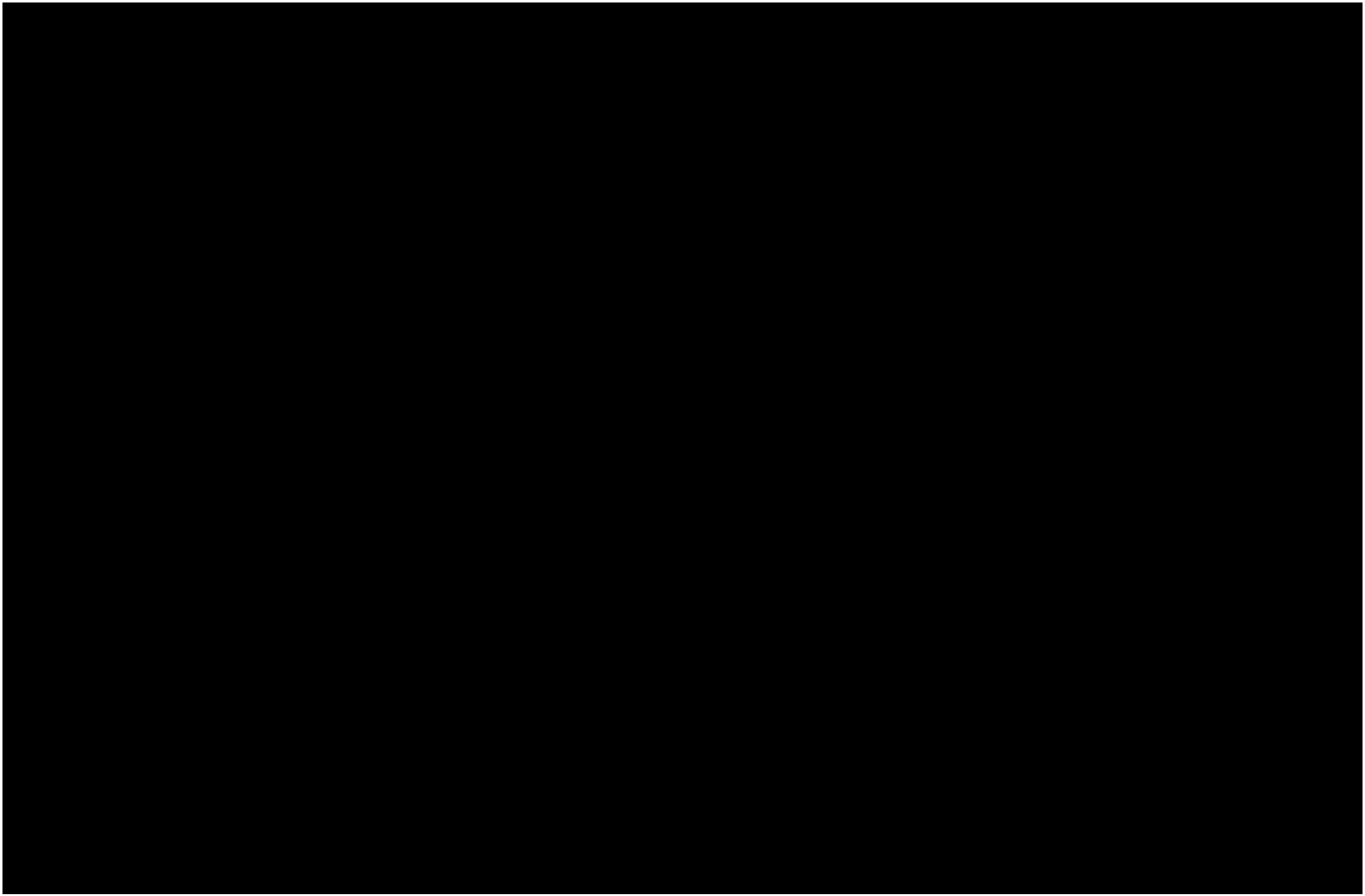

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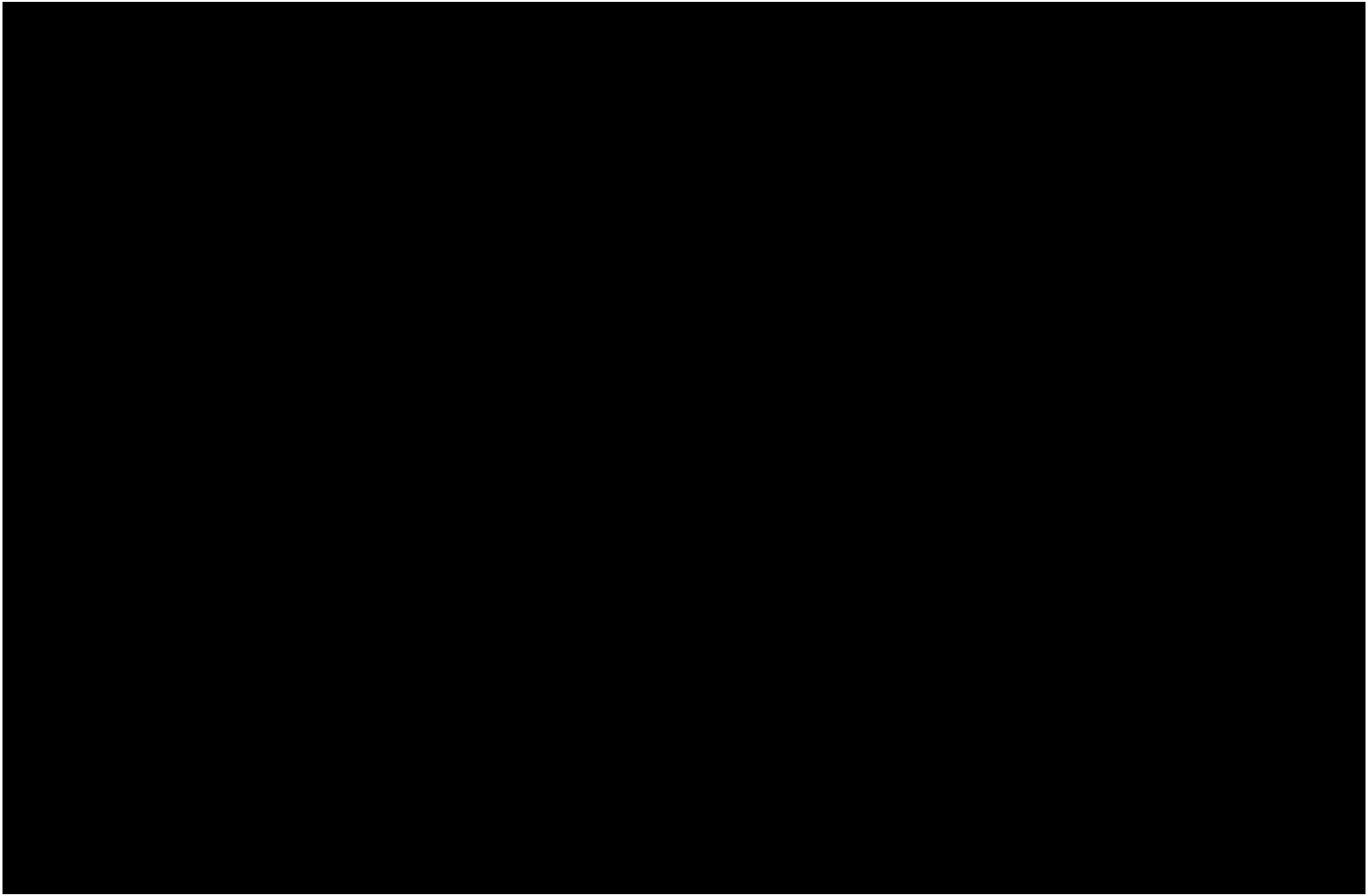
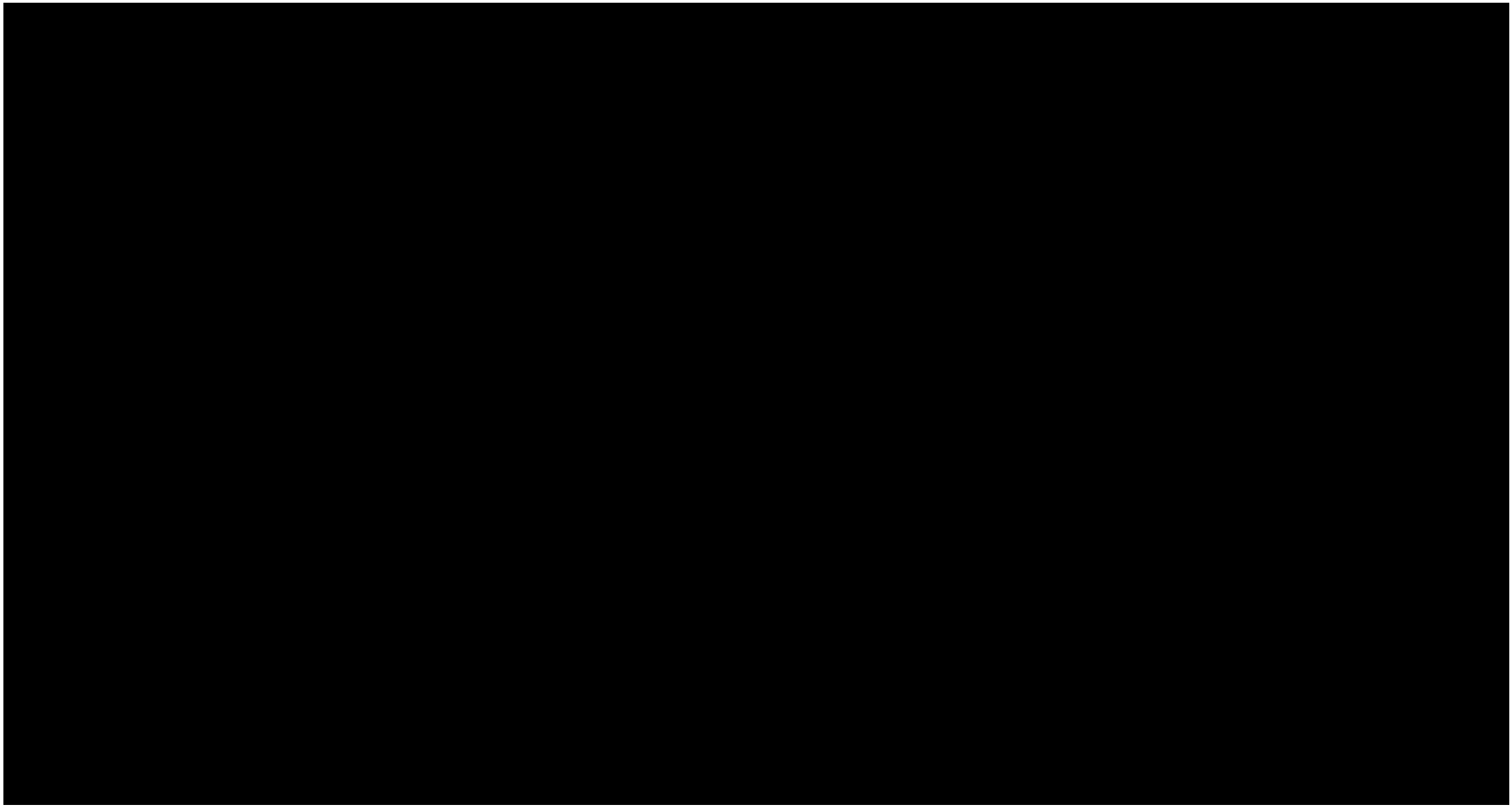


6175345.739 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 102



**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 03/08/2021 for Samantha Keats for the following area at Datum :GDA, Zone : 56, Eastings : 291167.825 - 298393.752, Northings : 6169422.761 - 6175345.739 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 102