

Aboriginal cultural heritage
desktop assessment:
Albion Park Quarry

FINAL REPORT

Prepared for Cleary Bros (Bombo) Pty Ltd

21 February 2017

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Glossary

AHIMS	Aboriginal Heritage Information Management System
CBD	Central Business District
DoE	Department of the Environment
Due diligence code	<i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales</i> (DECCW 2010)
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GSV	Ground Surface Visibility
ICOMOS	International Council on Monuments and Sites
LEP	Local Environment Plan
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
Study area	Lot 1 DP 858245
The Code	<i>The Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW</i> (DECCW 2010)

Summary

Biosis Pty Ltd has been commissioned by Cleary Bros (Bombo) Pty Ltd to undertake an Aboriginal cultural heritage desktop assessment for the Albion Park Quarry (Dunsters Lane, Croom), in advance of the activation of Stages 5 and 6.

An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (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 in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the Code') was conducted. A site inspection was not undertaken as part of this assessment.

This report has assessed the study area and has determined there are no known Aboriginal sites within or in the vicinity of the study area which may be impacted upon by the proposed development. The review of recent Aboriginal cultural heritage assessments conducted in the Albion Park area found that the type and distribution of Aboriginal sites is strongly correlated with landform features, particularly level ground on ridge and spurline crests and benches adjacent to freshwater. The landform in the study area consists of a natural amphitheatre with two spurs extending towards the south along its eastern and western boundaries. Steep slopes drop from the spur lines to creeklines that flow south east towards Minnamurra River. The creeklines that transect the study area are tributaries of a first order creek, Rocklow Creek, which is located 2.7 kilometres south east of the study area. Considering the steep nature of the spur line slopes and the distance to a first order creek, the potential for Aboriginal sites to occur in the study area is assessed as low. In addition, an assessment of the study area in 2001 concluded there was low to minimal archaeological potential due to disturbance from exposed areas of bedrock and limited soil development.

Through an assessment of environmental conditions, ethnohistory, and the findings of previous assessments it has been possible to ascertain that the study area has a low potential of containing Aboriginal objects or places. As such, no further assessment is required in the study area under the due diligence code of practice.

1.1 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; and,
 - The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)

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

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area that has been assessed with both a detailed desktop assessment and two previous field assessments in 2000 and 2001 that all assessed the area as having low archaeological potential.

Recommendation 2: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and Places are protected under the NSW National Parks and Wildlife Act 1974. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). 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 OEH and Aboriginal stakeholders.

Recommendation 3: 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 OEH's 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 OEH.

2 Introduction

2.1 Project background

Biosis Pty Ltd has been commissioned by Cleary Bros (Bombo) Pty Ltd to undertake an Aboriginal Cultural Heritage Desktop Assessment for the Albion Park Quarry (Dunsters Lane, Croom), in advance of the activation of Stages 5 and 6.

An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (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 in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) ('the Code') was conducted. A site inspection was not completed as part of this assessment.

2.2 Location of the study area

The study area is located within the Shellharbour Local Government Area (LGA), Parish of Terragong, County of Camden (see Figure 1). The study area incorporates Lot 1 DP 858245 and is shown in Figure 2. It is bounded by Stage 1-4 quarry excavation to the east and farmland and patches of native vegetation to the north, south and west.

2.3 Planning approvals

The proposed activation of Stages 5 and 6 is being assessed as a Modification to Development Application 10639 of 2005 and will be assessed against Part 3A of the *Environmental Planning and Assessment Act 1979* NSW. Other relevant legislation and planning instruments that will inform the assessment include:

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

2.4 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).
- 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.

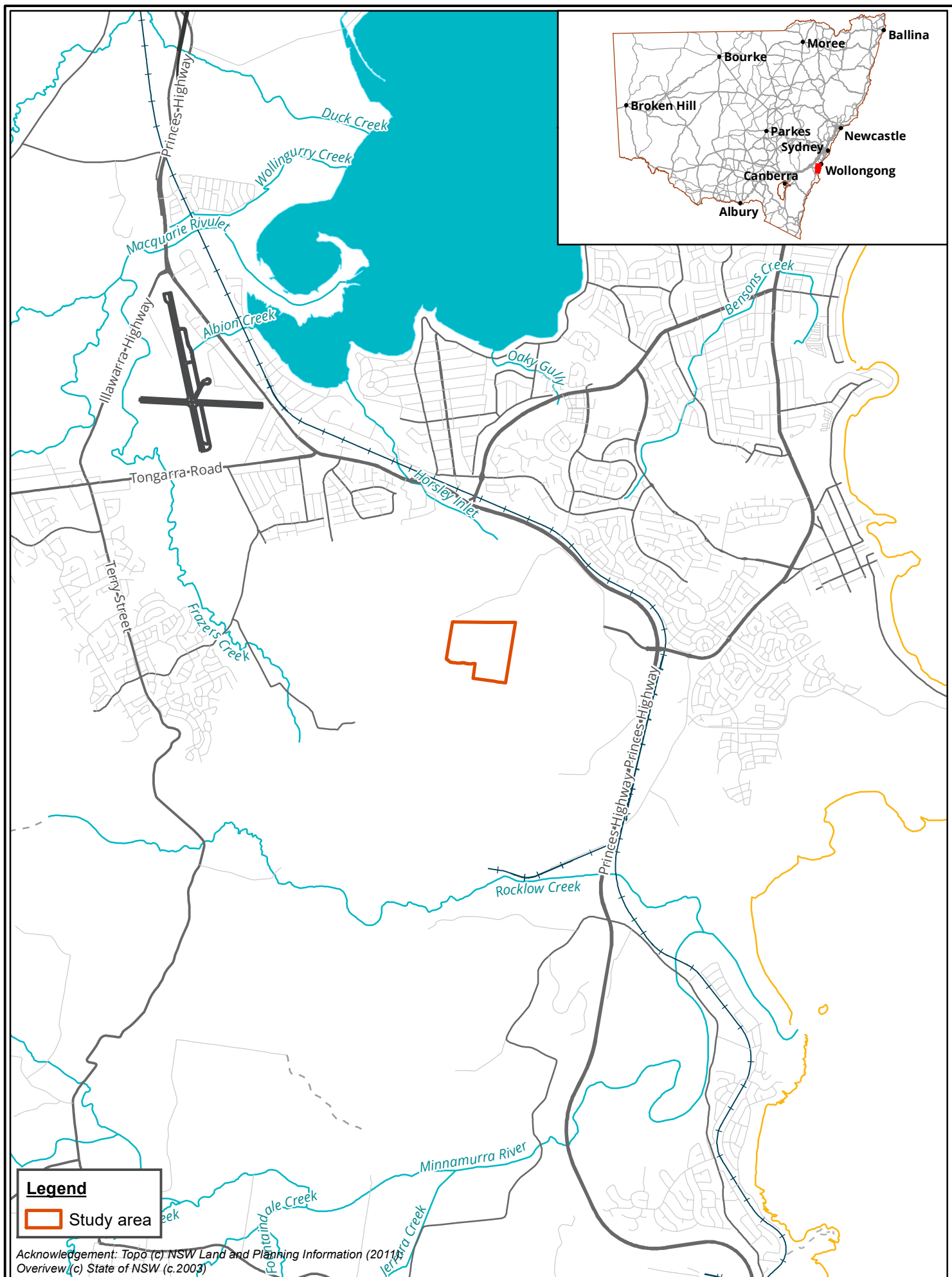


Figure 1: Location of the study area in a regional context



Legend
Study area

Figure 2: Study area detail

0 30 60 90 120 150
Metres
Scale: 1:3,000 @ A3
Coordinate System: GDA 1994 MGA Zone 55
biosis
Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne,
Sydney, Wangaratta & Wollongong

Matter: 24350,
Date: 10 February 2017,
Checked by: SJK, Drawn by: SSK, Last edited by: skumar
Location: P:\24300s\24350\Mapping\24350_F2_StudyArea.mxd

Acknowledgements: Imagery (c) Nearmap 2016; Topo (c) NSW Land and Planning Information

3 Desktop assessment

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

3.1 Landscape context

It is important to consider the local environment of the study area in any heritage assessment. The local environmental characteristics can influence human occupation and associated land use and consequently the distribution and character of cultural material. Environmental characteristics and geomorphological processes can affect the preservation of cultural heritage materials to varying degrees or even destroy them completely. Lastly landscape features can contribute to the cultural significance that places can have for people.

3.2 Geology, soils and landforms

The study area lies within the Coastal Plain physiographic region that is located between the Illawarra Escarpment and the ocean (Hazelton 1992: 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. 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 1982:18). 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 (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.

The Bombo Soil Landscape is present within the study area and is characterised as an erosional landscape that consists of rolling low hills with benched slopes and sea cliffs with extensive rock platforms on latite and basalt (see Table 1). The soils are relatively shallow (less than 50 centimetres) structured loams on the crests and moderately deep (50 – 100 centimetres) Krasnozems on the upper slopes and benches. Brown and red Padzolic soils occur on the mid and lower slopes (Hazelton 1992:43).

Table 1 Bombo soil landscape characteristics (Hazelton 1992).

Soil material	Description
Bombo 1 (bo1)	Friable brown sandy loam topsoil; high organic content; reddish brown in colour; inclusions consist of abundant roots.
Bombo 2 (bo2)	Hard setting sandy loam topsoil; colour ranges from brownish black to dark reddish brown; inclusions consist of 2-6mm stones (2-10%) and abundant roots.
Bombo 3 (bo3)	Light medium clay subsoil; colour is reddish brown; inclusions can be localised

Soil material	Description
	rounded basalt or latite stones of 20-60mm (2-10%).
Bombo 4 (bo4)	Sandy clay subsoil; reddish brown in colour; inclusions consist of many ex-ped roots.
Bombo 5 (bo5)	Strongly pedal medium clay subsoil; brown in colour; no inclusions.

The quarry is located near the crest of the Wentworth Hills in the upper catchment of the Minnamurra River. The land has an altitude ranging from 70 metres AHD in the south, to 140 metres AHD in the north. The extraction area is a natural amphitheatre with two spurs extending towards the south along its eastern and western boundaries. Steep slopes drop from the spur lines to watercourses, draining to an unnamed creek flowing through the 40-hectare property (MJM 2016, pp. 4).

3.3 Flora and fauna

The study area has been extensively cleared, consisting of primarily agricultural grasses, with some remnant stands of closed forest and open-tall forest. The Bombo landscape typically supports cabbage tree palm, bastard rosewood, red cedar, white cedar, brush cherry, Moreton Bay fig, turpentine, grey ironbark, and Sydney blue gum (Hazelton 1992, pp. 40-44).

This vegetation community supported a wide range of faunal resources that would have been utilised by Aboriginal peoples. Terrestrial and avian resources were not only used for food but also provided (and often continue to provide) a significant contribution to the social and ceremonial aspects of Aboriginal life. Several species of animal were utilised including molluscs, fish, birds and terrestrial animals.

3.4 Resource Statement

The wider Illawarra region includes distinct ecological zones, from tall forest and rainforests to frontal dunes closer to the coastline. Closer to the study area, sclerophyll forest would have been common, and is still present in patches today, along with remnant rainforest growth (Navin Officer 2002, p. 13). Each ecological zone hosts a different array of floral and faunal species, many of which would have been utilised according to seasonal availability. Aboriginal inhabitants of the 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.

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).

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).

4 Aboriginal context

4.1 Ethnohistory and contact history

Despite a proliferation of known Indigenous sites there is considerable ongoing debate about the nature, territory and range of pre-contact Indigenous language groups in the greater Sydney region. These debates have arisen largely due to the lack of ethnographic and linguistic information recorded at the time of European contact. By the time colonial diarists, missionaries and proto-anthropologists began making detailed records of Indigenous people in the late 19th Century; pre-European Indigenous groups had been broken up and reconfigured by European settlement activity. The following information relating to Indigenous people on the Illawarra is based on such early detailed records.

Despite conflicting views between historical sources of the exact boundaries of tribal groups in the region, the linguistic evidence does identify distinct language groups in the Illawarra at the time of European contact. Based on this information it appears that the study area was situated within the Tharawal (also Dharawal, Darawal, Carawal, Turawal, Thurawal) linguistic group. The named groups (often referred to as 'clans', 'bands' or 'tribes') belonging to the Tharawal/Dharawal language group included the following: Gweagal, Norongerraga, Illawarra, Threawal, Tagary, Wandeandegga, Wodi Wodi and Ory-ang-ora (Tindale 1974).

Ethnographic evidence considered by Sefton (1988: 22-29) indicates population mobility on the Woronora Plateau with frequent contact between the neighboring Gandangarra, Cobrakall (Liverpool and Cabramatta) and Wodi Wodi (Illawarra).

A variety of studies of the language groupings that made up the greater Sydney region have been summarised by Attenbrow (2010). The study area is in the vicinity of three language groups, Dharawal, Gundungurra and the hinterland Darug. Attenbrow (2010: 34) suggests:

- The Gundungurra covered "the southern rim of the Cumberland Plain west of the Georges River, as well as the southern Blue Mountains"
- The Dharawal covered "the south side of Botany Bay, extending as far as the Shoalhaven River; from the coast to the Georges River and Appin, possibly as far as Camden"
- The hinterland Darug covered the area "from Appin in the south to the Hawkesbury River in the north; west of the Georges River, Parramatta, the Land Cove River and Berowra Creek"

The areas inhabited by each of the groups are considered to be indicative only and would have changed through time and possibly also depending on circumstances (i.e. availability and distribution of resources). Interactions between different types of social groupings would have varied with seasons and resource availability. It has been noted that interactions between the groups inhabiting the many resource zones of the Sydney Basin (coastal and inland) would have varied but were continuous. This is reflected in the relatively homogenous observable cultural features such as art motifs, technology and resource use (McDonald 1992).

Since the arrival of European settlers the movement of Aboriginal hunter-gatherers began to be increasingly restricted. European expansion was swift and soon there had been considerable loss of land to agriculture. This led to violence and conflict between Europeans and Aboriginal people as both groups sought to compete for the same resources. At the same time diseases such as small pox were having a devastating effect on the Aboriginal population. Death, starvation and disease were some of the disrupting factors that led to a reorganisation of the social practices of Aboriginal communities after European contact. The formation of new social groups and alliances were made as Aboriginal people sought to retain some semblance of their previous lifestyle.

4.2 Regional context

Within the greater Wollongong area a number of Aboriginal heritage studies have been undertaken. These have been development-driven assessments or are research and site-management based investigations. Historically, investigations have been biased towards the coastal area and the occupation sites that frequently occur there. This is reflected in the location and pattern of sites recorded in the region. Aboriginal cultural heritage assessments have recently started to consider the forested hinterland and escarpment foot hills as a significant contributor to Aboriginal resource procurement. While not in the immediate vicinity of the study area, the following reports have clear parallels with the study area and are important in formulating models to predict the location and type of Aboriginal sites.

Aboriginal heritage management plan: West Dapto release area (AMBS 2006)

AMBS completed an Aboriginal Heritage Management Plan for the West Dapto Release Area (WDRA). From the initial survey program, a total of 24 archaeological sites; 13 open camp sites, 6 isolated finds, 5 scarred trees, were located within the boundaries of the WDRA project area. These were positioned on all landforms including creek lines (6), alluvial flats (3), spanning creek lines and alluvial flats (3), hillslopes (8) and spur crests (4). A second stage of assessment was a subsurface testing of a 100 square metres area (100, 1 metre by 1 metre test pits) undertaken across all representative landforms of the Mullet, Duck and Marshall Mount Creeks catchment area. A third stage of testing was carried out at Darkes Road Town Centre and Bong Bong Road Town Centre.

A total of 425 artefacts (353 from within < 20 centimetres of deposit) were recovered from the following landscape contexts:

- Hillslopes (158, of which 146 were from one test pit).
- Alluvial flats – Pleistocene and Holocene terraces more than 10 metres away from stream channels (118).
- Streams – edges of Pleistocene and Holocene terraces within 10 metres of stream channels (86).
- Spur crests (63).

A range of raw materials were represented including, chert, quartz, quartzite, silcrete, silicified tuff and fine-grained siliceous. Artefact types included broken flakes, flakes, flaked pieces and cores. The range of raw materials and artefact types is considered characteristic of the region. AMBS concluded that from known site patterning it is likely that additional archaeological sites may occur throughout all landforms of the WDRA – although at varying site and artefact densities – and subsequently all parts of the project area are considered to have some archaeological potential. In general, the highest artefact density was encountered along second-order streams, followed by the first order streams, spur crests and then hillslopes. Although artefact numbers recovered from individual test pit was low, high artefact recovery across all the landforms illustrate that the use of WDRA area was widespread, but not intensive. It was concluded that low density artefact scatters would be relatively common within the entire WDRA area (AMBS 2006: 245).

Shone Avenue Road re-alignment (Biosis 2012)

Biosis was been commissioned by the Wollongong City Council to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed realignment of Shone Avenue in West Dapto. A field survey identified three PADs and sub-surface testing was undertaken to assess these areas for presence of Aboriginal archaeological deposits and objects. Of the three PADs identified, PAD 1 contained areas of two previously recorded sites, low density artefact scatters Wongawilli, Camden (AHIMS 52-2-1033) and WDRA_AX_18 (AHIMS 52-2-3293). Sub-surface testing was completed in 2011, resulting in expanding the boundaries of 52-2-1033 and 52-2-3293 and indicating that these sites represented the same site. It was concluded that 52-2-1033 is of

low scientific significance as it is a low density artefact scatter that contains a limited range of artefact types, lacks stratified deposits and is a common site type within the local region. Site 52-2-1033 has some limited potential to provide new information about the exploitation of raw material and the site patterning across the region. An AHIP was issued by OEH (AHIP no. 1131695) to impact on parts of both Aboriginal sites.

Proposed residential subdivision at McPhail Lands on Bong Bong Road, West Dapto (AHMS 2012)

AHMS was commissioned by Stockland to undertake Aboriginal cultural heritage assessment for the proposed residential subdivision within two parcels of land, referred to as 'McPhail Lands', north of Bong Bong Road in West Dapto. The assessment followed up from the one completed in 2010 with the revision of the proposed subdivision. Two registered Aboriginal sites were located in the assessed area: WDSY1 (AHIMS 52-2-3779) and WDSY2 (52-2-3778). An additional survey was undertaken for both sites, and test excavations of site WDSY1. A total of 546 artefacts were recovered from 75 test pits. Most artefacts were located within the western part of the eastern terrace and it was determined that the site extended to the spur crest (AHMS 2012: 98). Division of the test excavation results according to AMBS landform definitions illustrate that the highest density of artefacts occur within alluvial flats, followed by hillslope and then spur lines. Site WDSY1 was assessed as having high archaeological significance due to its rarity in the area, high number of artefacts and its research potential for obtaining a maximum age for the deposit using the underlying fluvial deposits (AHMS 2012: 103). Salvage was recommended for site WDSY1 prior to ground disturbance works associated with the proposed development.

Vista Park, Wongawilli Master Plan (Biosis 2014)

Biosis has been commissioned by Cardno on behalf of RW Sheargold Pty Ltd to undertake an Aboriginal archaeological and cultural heritage assessment for the proposed large lot precinct for the Wongawilli Neighbourhood Master Plan development proposal. A survey was completed that resulted in mapping areas of high, moderate and low archaeological sensitivity. Areas deemed as having high archaeological sensitivity was a hill crest where a recorded Aboriginal site WDRA_AX_17 (AHIMS 52-2-3281) was identified during a program of sub-surface investigation by AMBS in 2006. Moderate sensitivity was determined for upper hill slopes, and low in other landforms due to the levels of previous disturbance (Biosis 2014: 46). Further archaeological testing was recommended that was completed by Biosis Pty Ltd (2014b) in 2013. The site extent of the site WDRA_AX_17 (AHIMS 52-2-3281) was determined and a new site, Wongawilli Village 1 (AHIMS 52-2-4103) was identified within the upper hill slope. Both sites were low density artefact scatters that are most likely remnants of people traversing the area or represent short-term camping grounds. The most suitable locations for short-term occupation for those travelling along the ridge line are likely to be on hill crest and gently sloped sections of the side slopes due to the more level gradient of these locations. Occupation within these landforms would have been transient, isolated events that might have been frequent in the hill crest as it offers the most expansive vista including views to the west that are not possible from the east of the crest (Biosis 2014b: 59). An AHIP was issued in order to impact on both sites prior to the proposed development.

20 Iredell Road and 51 Haynes Land, Horsley and Huntley, NSW (Biosis 2015)

Biosis was commissioned by MMJ Real Estate to undertake an Aboriginal heritage assessment, which was in support of a Neighbourhood Master Plan for two properties in the suburb of Horsley, NSW. The assessment identified two previously recorded sites (WDRA_AX_2-, 52-2-3283 and WDRA_AX_21, 52-2-3284) as well as four additional sites. The assessment identified areas of high and moderate potential associated with alluvial flats and ridgelines associated with Robins Creek. The assessment concluded that flat, levelled ground above flood level, as well as extensive views towards the Escarpment, would have made the place ideal for long-term occupation. Swampy soils across the alluvial flats are aggrading, indicating that any archaeological materiel would have been buried and retained. Recent land use activities in the area would not have resulted in

removal or displacement of soil layers, other than the very surface soils. Further assessment of high and moderate potential landforms was recommended as part of any future approvals.

4.3 Local context

A number of Aboriginal cultural heritage and archaeological assessments were undertaken in close proximity to the study area.

Aboriginal archaeological assessment: Albion Park water supply upgrade (Dominic Steele 2000)

The assessment for a water supply upgrade to Albion Park was undertaken by Dominic Steele in 2000 to the west of the study area. The initial assessment of the survey area noted that there were a number of tracks, buildings and paddocks which had caused disturbance in the area. The terrain varied between gently undulating and steep grassland, largely cleared of timber. The predictive modelling employed noted the potential for the discovery of middens and stone artefacts (Dominic Steele 2000, pp. 18-19).

The survey did not identify any artefacts or sites within the area studied; however, Survey Units I and II were determined to be areas of potential archaeological sensitivity. Within Survey Unit I, it was noted that there was greater exposure to the north, caused by vehicle and animal tracks (Dominic Steele 2000, p. 25). The southern portion of the survey unit was steeper and more heavily grassed. The conclusions of the report noted that this southern portion had moderate potential sensitivity (Dominic Steele 2000, p. 30), with some potential to retain intact deposits, unlike the area further to the north, which had been disturbed by recent land use practices.

Shellharbour Fringe Lands Urban Assessment (Navin Officer 2004)

This report assessed a series of fringe lands being considered for residential development and encompassed around 380 hectares of land around the outer fringes of Albion Park and Dunmore. 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 four of these PADS being within 2 kilometre of the study area: SUFA4 was identified on a gentle to flat section of ground between a deeply incised creek line and a shallow gully; SUFA 5 was located on a spur crest above a drainage line; SUFA 6 is part of a major spur leading from Shellharbour to the coast; and SUFA 7 is a crest on a major spurline upon which Shellharbour Road has been constructed. The sites have not been recorded in AHIMS.

Tullimbar Village Development Subsurface Archaeological Testing Program Part PAD3 (Navin Officer 2005)

This report details the results of test excavations conducted on part of a PAD (AHIMS no. 52-5-0431) to the west of the study area, on the eastern side of Hazelton Creek. The PAD (PAD3) consisted of two discontinuous areas of potential identified along the margins of Hazelton Creek. For the purposes of the assessment, only the northern portion of the PAD was subject to test excavation. The excavations identified a total of 12 artefacts, recovered from five of the 14 test pits excavated. All artefacts were identified in the pits excavated nearest the drainage lines, although none were identified in the pits excavated closest to the creek itself. Five of the artefacts identified were composed of chert, three of silcrete, three of a volcanic material, and one of tuff (Navin Officer 2005, p. 9).

Overall it was concluded that PAD3 was an area of low significance, partially due to the relatively low density of the finds and commonality of the site, but primarily due to the heavy disturbance in the top 20 centimetres of the soil profile, which was indicative of earthmoving activity nearby and within the site, limiting its future research potential (Navin Officer 2005, p. 13).

Tullimbar Village Development Subsurface Archaeological Testing Program (Kayandel 2008)

Kayandel (2008) undertook archaeological sub surface investigations on the archaeological sites registered as Tullimbar Village PAD 1 (52-5-0434), Tullimbar Village PAD 2 (52-5-0439) and Tullimbar Village PAD 4 (52-5-0440) located at Tullimbar, NSW. A total of 26 pits were excavated by backhoe over three identified PADs, with a sample of the deposit from each spit wet sieved. All potential stone artefacts were collected. Analysis of the potential stone artefacts revealed a total of 33 artefacts from 12 of the 26 test pits. The raw material types of the artefacts recovered are considered consistent with the wider Illawarra region. As such, PADs 1, 2, and 4 have been designated as background artefact scatters of low archaeological significance.

Calderwood Part 3A Project (Austral Archaeology 2010)

Austral Archaeology (2010) was commissioned by Eco Logical Australia Pty Ltd on behalf of Delfin Lend Lease Ltd to undertake the Aboriginal archaeological and cultural heritage assessment of the Calderwood Part 3A Project. An initial desktop assessment was followed by fieldwork, resulting in the discussion of the archaeological and Aboriginal cultural sensitivity of the Calderwood Project area, a 700 hectare area within the Shellharbour and Wollongong LGAs, NSW.

The Aboriginal archaeological and cultural heritage field assessment was undertaken over nine days in December 2009 and January 2010, involving representatives from the Illawarra Local Aboriginal Land Council (ILALC). Thirty-four new Aboriginal archaeological sites, containing at least 189 surface artefacts, were identified during field assessment. They consisted of 18 isolated finds (52.94%), 11 open artefact scatters (32.35%), four open artefact scatters with associated potential archaeological deposit (11.78%) and one potential archaeological deposit without surface material (2.94%). The dominant raw material was silcrete, followed by chert, mudstone, FGS, petrified wood, quartz, basalt and river cobble. Flakes or flake fragments were the most common artefact types, followed by cores, flaked pieces, and a single instance each of a hand axe, a milling stone or pestle, and a possible broken hammerstone.

Preliminary aboriginal and historic heritage assessment West Dapto urban release area (AHMS 2012)

Australian Museum Business Services (AMBS) were commissioned by PB+MWH on behalf of the Sydney Water Corporation (SWC) to undertake a preliminary Aboriginal and historic heritage assessment for the provision of proposed water and wastewater infrastructure for the West Dapto Urban Release Area. In 2009 an environmental constraints analyses identified areas of European and Aboriginal heritage as a noteworthy environmental factor and recommended further mapping of historic heritage items, aboriginal items and areas of archaeological potential to be assessed. The study area was focused on all areas around Horsley that could be potential impacted on by the water and wastewater infrastructure. In total 309 sites were recorded within the study area boundary, these consisted of middens (which were the most common), followed by open campsites and artefact scatters.

Albion Park Rail Bypass Project: Aboriginal Cultural Heritage Assessment Report (Artefact Heritage 2015)

Artefact Heritage (2015) was commissioned by Hyder Cardno Joint Venture to prepare an Aboriginal cultural heritage assessment for the Albion Park Bypass project, located west of the M1 Princes Highway. Following an archaeological survey in 2013, which identified two previously recorded Aboriginal sites and one new area of PAD, test excavations were recommended and carried out in 2014. One Aboriginal site (#52-5-0512) and six areas of PADs were excavated. Four PADs contained low density subsurface artefact scatters while the other two PADs have moderate density subsurface artefact scatters. A total of 99 artefacts were recovered with a

variety of raw materials; however, silcrete and quartz were the most abundant raw materials types. From this assessment, a predictive model was developed which stated that all levels of the Western foothills zone and the Coastal Plain within 100 metres of a creek situated on quaternary deposits (floodplains), Budgong Sandstone and Berry Siltstone are archaeologically sensitive.

4.4 Site context

The area of the proposed extension to the quarry has been subjected to two previous archaeological investigations.

An Archaeological Investigation of a Proposed Hard Rock Quarry Extension near Albion Park, New South Wales (Robert Paton Archaeological Studies 1998)

Paton undertook this investigation in support of Cleary Bros rezoning application and included the land subject to the current development along with part of an adjoining property to the east (Lot 7 DP 3709). The aims of the study were to: located and record any Aboriginal sites in the study area, consult with the local Aboriginal community, and identify any Aboriginal heritage constraints on the quarry expansion. A thorough field survey was undertaken that involved the systematic walking of all transects and areas where ground surface visibility was present. Areas of less visibility were also traversed and inspected in detail. No Aboriginal sites were discovered during the survey, although Paton noted that the ground surface visibility was very poor, being approximately 1-5 percent.

Paton developed a predictive statement based on previous archaeological studies and the local environment that predicted sites would occur on ridgelines, on flatter areas adjacent to creek lines, and large and more complex sites would occur in close proximity to permanent fresh water sources. Paton recommended that further archaeological investigation be undertaken to include test excavation of three areas of archaeological sensitivity (two ridge lines and the creek confluence) and some limited areas outside of these sensitive zones.

Aboriginal Archaeological Survey & Assessment Report, Albion Park Quarry Proposed Extension (Mary Dallas Consulting Archaeologists 2001)

This investigation was undertaken as part of the preparation of the local environmental study (LES) for Cleary Bros rezoning proposal. The aims of this study were to:

- Revisit the site with representatives from the Illawarra Local Aboriginal Land Council and initiate contact with the Wodi Wodi Tribal Elders Corporation to determine their interest in the study area.
- Survey the study area to identify and record any Aboriginal sites present and assess the likelihood for unrecorded sites to occur.
- Undertake background research and prepare a predictive model of the potential for unrecorded sites.

Dallas undertook a comprehensive survey accompanied by a representative from the Illawarra Local Aboriginal Land Council, who was also the spokesperson for the Wodi Wodi Tribal Elders Corporation. Poor surface visibility was evident in some parts of the study area; however, Dallas noted that locations most likely to contain Aboriginal sites had exposed surfaces with good visibility due to erosion, rock exposure, animal and vehicle tracks, cuttings and dam construction. Dallas also reinspected Paton's (1998) areas of archaeological sensitivity and found these to be disturbed with exposures of bedrock and little to no soil development. She also noted that Paton's (1998) description of his archaeologically sensitive ridgeline was in fact a spur and as such was reassessed to have low to minimal archaeological potential.

Dallas also noted that the poorly watered, steep rocky terrain and shallow soils of the Shellharbour and Dunmore latite hills strongly suggest that the landforms would have low archaeological potential and that

only low density artefact scatters may be present within the study area. Dallas concluded by stating that while the study area may contain evidence of past Aboriginal use, it is likely that it was sporadic use by people moving between the hinterland plateau and coast; therefore, no further archaeological investigation was recommended.

4.5 AHIMS site analysis

4.5.1 Identified Aboriginal archaeological sites

An extensive search of the AHIMS database was conducted on 8 February 2017 (Client service ID: 265693). The search identified 10 Aboriginal archaeological sites within a 5 kilometre radius of the search area, centred on the proposed study area (Table 2 and Table 3). None of these registered sites are located *within* the study area (Figure 3). 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.

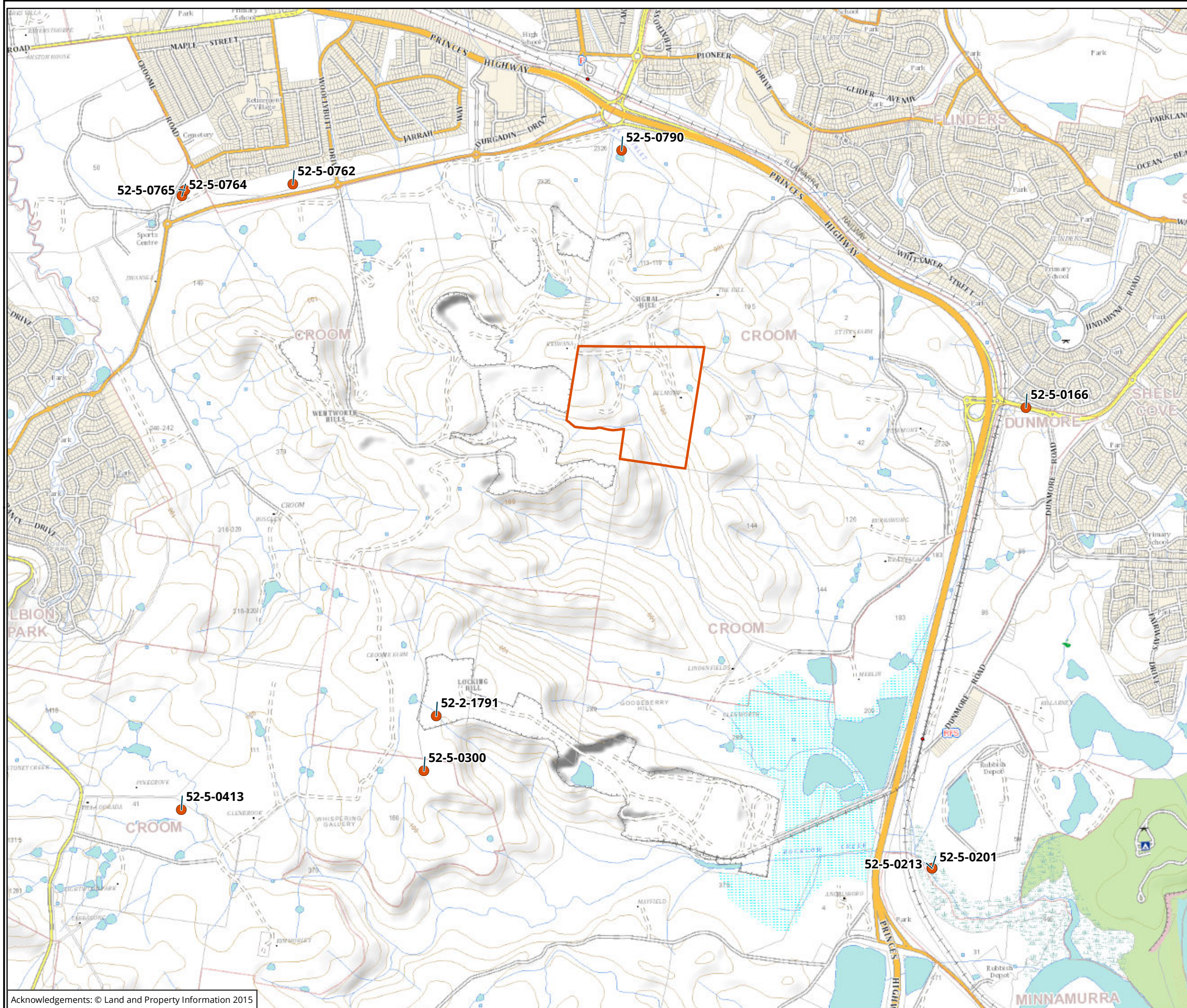
Table 2 AHIMS search results

AHIMS site no.	Site name	Site type
52-5-0166	Shell Harbour Shell Harbour 1	Open camp site
52-5-0300	DQ2	Scarred tree
52-5-0201	Dunmore Midden Shellharbour Waste Disposal Dump	Open camp site
52-5-0213	Dunmore Midden	Midden, open camp site
52-5-0413	Duke -9	Artefacts
52-2-1791	DQ1	Open camp site
52-5-0790	YTOF AS 6	Artefact
52-5-0762	Yallah to Oak Flats AS 1	Artefact
52-5-0764	Yallah to Oak Flats IF 2	Artefact
52-5-0765	Yallah to Oak Flats IF 3	Artefact

Table 3 AHIMS Sites within the vicinity of the study area

Site type	Occurrences	Frequency (%)
Open camp site	3	30%
Scarred tree	1	10%
Midden and open camp site	1	10%
Artefacts	5	50%
Total	10	100%

A simple analysis of the Aboriginal cultural heritage sites registered within 5 kilometres of the study area indicates that the dominant site type is artefacts representing 50% (n=5), with open camp sites representing 30% (n=3). Scarred trees and middens in association with open camps sites were represented by 10% each (n=1 each). All the sites were located within close proximity to the reliable sources of water, were either exposed by land clearing works (artefact scatters) or in areas with remnant native vegetation (scarred trees). The nearest recorded site to the study area (52-5-0790) is approximately 1.3 kilometres to the north of the study area and is a single artefact.



Legend

- Study area
- AHIMS Records

Figure 3: AHIMS sites within the vicinity of the study area

NOT TO BE MADE PUBLIC

0 200 400 600 800 1,000
Metres

Scale: 1:20,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56



Ballarat, Brisbane, Canberra, Melbourne,
Sydney, Wangaratta & Wollongong

Matter:
Date: 10 February 2017,
Checked by: skumar, Generated by: skumar
Location: P:\24300s\24350\Mapping\24350_F3_AHIMS.mxd

4.5.2 Predictive statements

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

The predictive statements are 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; and
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a series of predictive statements have been developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations 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 4 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 region 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.
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Low: Shell midden sites have been recorded within the vicinity of the study area; however, 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.
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding the study area.
Potential Archaeological Deposits (PADs)	Potential sub surface deposits of cultural material.	Moderate: PADs have been previously recorded in the region 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.

Site type	Site description	Potential
Scarred trees	Trees with cultural modifications	Low: Scarred trees have been recorded within the vicinity of the study area; however, due to vegetation clearance only a small number of mature native trees have survived within southernmost part of the study area.
Grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: Suitable horizontal sandstone rock outcrops could occur along drainage lines.
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 not present in 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.

5 Conclusions and recommendations

5.1 Conclusions

A site inspection was not undertaken as part of this assessment; therefore, the conclusions and recommendations are based on a desktop assessment only. The review of recent Aboriginal cultural heritage assessments conducted in the Albion Park area found that the type and distribution of Aboriginal sites is strongly correlated with landform features. Predictive modelling suggests that level ground on ridge and spurline crests and benches adjacent to freshwater would have moderate potential for artefacts to occur. The use of crests as access routes between the plateau and coastal plain would likely have been sporadic and therefore, the potential for artefacts to occur is low.

The landform in the study area consists of a natural amphitheatre with two spurs extending towards the south along its eastern and western boundaries. Steep slopes drop from the spur lines to creeklines that flow south east towards Minnamurra River. The creeklines that transect the study area are tributaries of a first order creek, Rocklow Creek, which is located 2.7 kilometres south east of the study area. Considering the steep nature of the spur line slopes and the distance to a first order creek, the potential for Aboriginal sites to occur in the study area is assessed as low. In addition, Dallas (2001) reassessment of the study area concluded there was low to minimal archaeological potential due to disturbance from exposed areas of bedrock and limited soil development.

Through an assessment of environmental conditions, ethnohistory, and the findings of previous assessments it has been possible to ascertain that the study area has a low potential of containing Aboriginal objects or places. As such, no further assessment is required in the study area under the due diligence code of practice (see Figure 5).

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; and,
 - The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)

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

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area that has been assessed with both a detailed desktop assessment and two previous field assessments in 2000 and 2001 that all assessed the area as having low archaeological potential.

Recommendation 2: Discovery of unanticipated Aboriginal objects

All Aboriginal objects and Places are protected under the NSW National Parks and Wildlife Act 1974. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). 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 OEH and Aboriginal stakeholders.

Recommendation 3: 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 OEH's 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 OEH.

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