Brou Waste Management Facility

Due Diligence Assessment

Report to Eurobodalla Shire Council

Draft – June 2022

Lantern Heritage

shining a light on people and place

Lantern Heritage Pty Ltd
PO Box 7039
TATHRA
NSW 2550

ACN: 620 582 658
ABN: 30 620 582 658
Phone: (02) 6494 5759
Mobile: 0402 831 291
Email: info@lanternheritage.com.au
Web: www.lanternheritage.com.au

Project Client
Eurobodalla Shire Council
PO Box 99
Moruya NSW 2537

Project Name
Brou Waste Management Facility

Project Reference Number
159

Local Government Area
Eurobodalla Shire Council

Report Authors
Conor McAdams

EXECUTIVE SUMMARY

Eurobodalla Shire Council are preparing to expand the area of Brou Waste Management Facility into an area of previously undeveloped ground. This study area (Figure 1) is located on the Far South Coast of NSW, near Narooma.

Lantern Heritage Pty Ltd has been commissioned by Eurobodalla Shire Council to conduct an Aboriginal Due Diligence Assessment of the proposed activity area (see Figure 1), in order to determine whether the proposed activity is likely to result in harm, or impacts, to Aboriginal cultural heritage.

This report documents the due diligence process that has been undertaken with respect to the work proposed by Eurobodalla Shire Council. It has been prepared in accordance with the Heritage, NSW Department of Premier and Cabinet (Heritage NSW – formerly DECCW) *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water, 2010a). This report has been compiled in accordance with the *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS, 2013).

The steps involved in the due diligence process are outlined in Figure 2. The result of Step 1 of the due diligence process was that the proposed activity is likely to cause ground disturbance. As such it was necessary to proceed to Step 2 of the due diligence process.

The result of Step 2 of the due diligence process was that the proposed activity area corresponds to landscape features likely to indicate the presence of Aboriginal objects (alluvial environment with perennial streams). As such it was necessary to proceed to Step 3 of the due diligence process.

Step 3 of the due diligence process determined that it is unlikely that harm can feasibly be avoided to all landscape features likely to indicate the presence of Aboriginal objects. As such it was necessary to proceed to Step 4 of the due diligence process.

Desktop assessment and predictive model

The desktop component of Step 4 concluded that, there are no known Aboriginal sites within the proposed activity area. However, it was also predicted that the activity area corresponds to a landform with:

- Moderate to high potential for stone artefact scatters;
- Low-moderate potential for stratified or intact subsurface archaeological deposits;
- low-moderate moderate potential for culturally modified trees, and
- low-moderate potential for midden to occur.

Visual assessment and field survey

The visual assessment component entailed a pedestrian survey by two. First the study area was organised into 4 survey units (survey areas 1-4; Figure 6), then all areas of ground exposure within and adjacent the proposed activity areas were inspected for the presence of stone artefacts, potential archaeological deposit (PAD) or other evidence of archaeological deposits.

Survey coverage was low throughout the study area, due to the extent of vegetation cover. Vehicle tracks, animal burrows, tracks and eroding slopes provided exposures, but archaeological visibility was virtually nil, due to the ubiquitous quartz gravels that were found throughout the study area. All survey units (1-4) showed evidence of historic and modern disturbance related to logging, including vegetations removal, tracks formation and sediment deposition.

Survey units 1 and 4 are assessed as having low archaeological potential: Survey unit 1 is highly disturbed, with little evidence of in-situ soils or sediments likely to contain Aboriginal sites or artefacts; Survey unit 4 is centred on a heavily vegetated, steep gully landform that was unlikely to be a focus of occupation. In addition, historic impacts to this area are visibly extensive, which further limits its archaeological potential.

Survey units 2 and 3 are assessed as having moderate-high archaeological potential. Although no Aboriginal sites or artefacts were found, survey coverage and archaeological visibility were virtually nil due to environmental factors. These survey units correspond to a low hill in a resource-rich area, which may have formed an attractive landscape feature for Aboriginal communities in the past. While historic impacts are clearly visible in these areas, persistence of old-growth vegetation, along with visible soil depth in exposed profiles, indicate that some areas retain the potential to preserve Aboriginal sites.

Summary and recommendations

On the basis of this due diligence assessment, it is concluded that there is potential for the proposed activity to result in harm to Aboriginal objects and/or landforms likely to contain Aboriginal objects. But work can proceed in Survey units 1 and 4, which are unlikely to contain Aboriginal objects.

The following recommendations were formulated, based on the results of the desktop review and visual assessment documented above:

a) The proposed activity can only go ahead, with caution, in the disturbed, open forest environments that correspond to survey units 1 and 4 (Figure 6).

b) Proposed works associated with the sensitive landform (low hill with older vegetation and in-situ soils) contained within survey units 2 and 3, are likely to cause harm to Aboriginal artefacts.

c) The areas contained within survey units 2 and 3 shall not be used for heavy vehicle access, stockpiling of materials or any other activity likely to cause ground disturbance, without first undertaking an ACHAR.

d) An ACHAR must be conducted to assess the extent and preservation of any archaeological remains in Survey units 2 and 3.

e) If during the course of the proposed activity, in the rest of the study area, any Aboriginal objects are found, stop work and notify OEH.

f) If human remains are found, stop work, secure the site and notify the NSW Police and OEH.

g) This due diligence assessment only covers the works outlined in section 2 of this report. If additional impacts or alternative alignments are proposed, further assessment will be required.

h) A copy of this report, and any subsequent due diligence investigations, should be kept on record, and if requested, supplied to the relevant government agency as proof of compliance with the *Due Diligence Code of Practice*.

i) A copy of this report should be forwarded to Ngambri LALC for their review and comment.

Eurobodalla Shire Council have initiated the ACHAR process for survey units 2 and 3.

Table of Contents

List of Figures

List of Tables

List of Plates

1 PROJECT OVERVIEW

1.1 Introduction

This report documents the due diligence process that has been undertaken with respect to the work proposed for the expansion of Brou Waste Management Facility (Figure 1). It has been prepared in accordance with the NSW Office of Environment and Heritage *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water, 2010a). This report has been compiled in accordance with the *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS, 2013).

1.2 Legislative Framework

1.2.1 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (as amended), administered by the Office of Environment and Heritage (OEH), is the primary legislation for the protection of Aboriginal cultural heritage in New South Wales. Part 6 of the NPW Act provides specific protection for Aboriginal objects and declared Aboriginal places by establishing offences of harm.

Table 1 summarises those offences and their associated penalties. However, if due diligence is exercised, this is a defence against prosecution for the strict liability offence, in the event that an Aboriginal object is later unknowingly harmed without an Aboriginal Heritage Impact Permit (AHIP).

Table 1: Offences and penalties for harming or desecrating Aboriginal objects and declared Aboriginal Places (DECCW 2010b)

Offence	Maximum Penalty: Individual	Maximum Penalty: Corporation
A person must not harm or desecrate an Aboriginal object that the person knows is an Aboriginal object.	2,500 penalty units ($275,000) or imprisonment for 1 year 5,000 penalty units ($550,000) or imprisonment for 2 years or both (in circumstances of aggravation)	10,000 penalty units ($1,100,000)
A person must not harm or desecrate an Aboriginal object (strict liability offence).	500 penalty units ($55,000) 1,000 penalty units ($110,000) (in circumstances of aggravation)	2,000 penalty units ($220,000)
A person must not harm or desecrate an Aboriginal Place (strict liability offence).	5,000 penalty units ($550,000) or imprisonment for 2 years or both	10,000 penalty units ($1,100,000)
Failure to notify DECCW of the location of an Aboriginal object (existing offence and penalty)	100 penalty units ($11,000). For continuing offences a further maximum penalty of 10 penalty units ($1,100) applies for each day the offence continues.	200 penalty units ($22,000). For continuing offences a further maximum penalty of 20 penalty units

		($2,200) applies for each day the offence continues
Contravention of any condition of an Aboriginal Heritage Impact Permit	1,000 penalty units ($110,000) or imprisonment for 6 months, or both, and in the case of a continuing offence a further penalty of 100 penalty units ($11,000) for each day the offence continues	2,000 penalty units ($220,000) and in the case of a continuing offence a further penalty of 200 penalty units ($22,000) for each day the offence continues

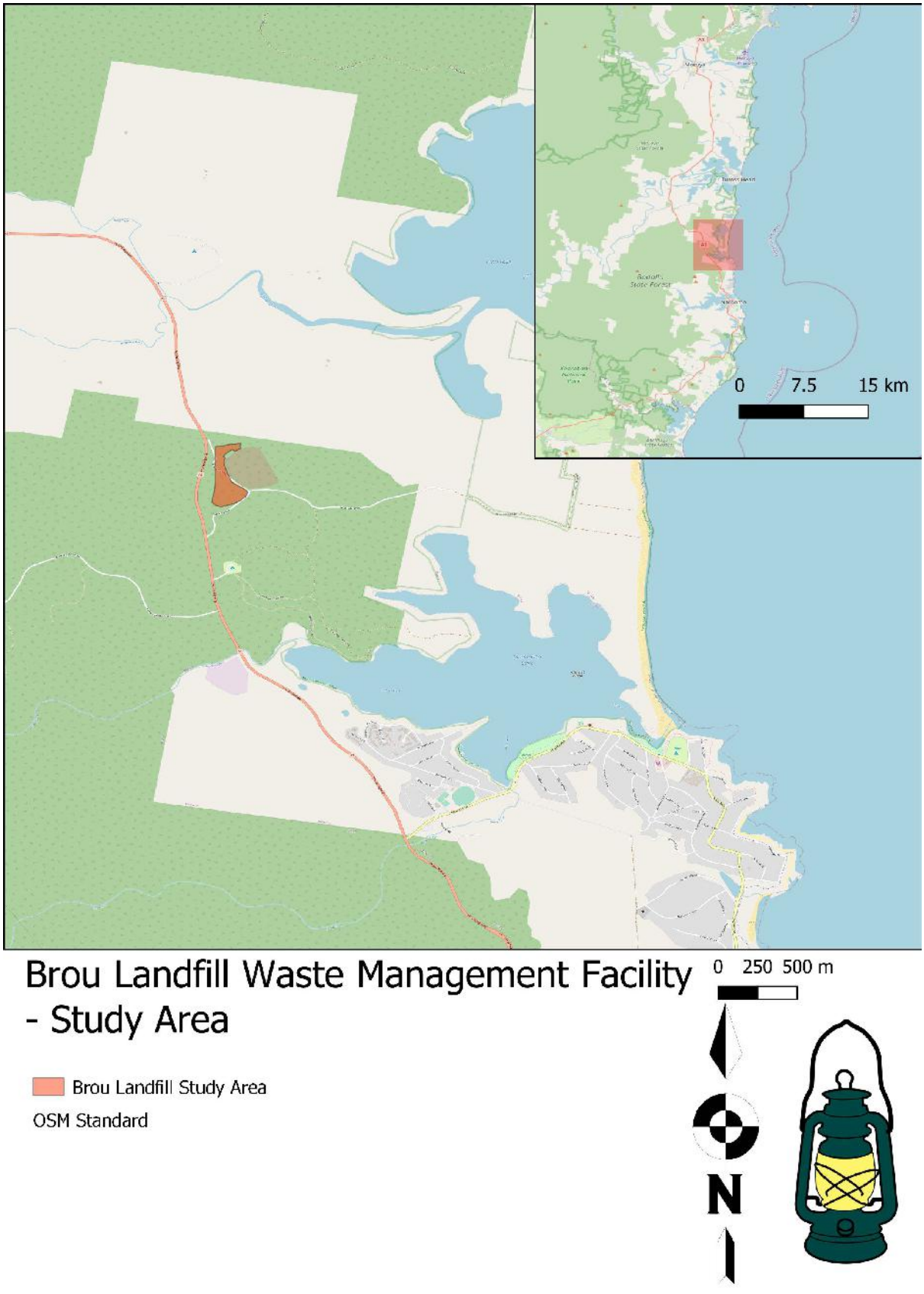

Figure 1: Location of the proposed activity area at Brou waste management facility.

1.2.2 Due Diligence Code of Practice

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010a) details the process that needs to be implemented in order to determine whether or not proposed activities may harm Aboriginal objects. The following is an excerpt from the *Due Diligence Code of Practice* (DECCW, 2010a) that outlines the purpose of the code.

The *National Parks and Wildlife Act 1974* (NPW Act) provides that a person who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later unknowingly harm an object without an AHIP.

The NPW Act allows for a generic code of practice to explain what due diligence means. Carefully following this code of practice, which is adopted by the National Parks and Wildlife Regulation 2009 (NPW Regulation) made under the NPW Act, would be regarded as 'due diligence'. This code of practice can be used for all activities across all environments.

> This code sets out the reasonable and practicable steps which individuals and organisations need to take in order to:
>
> 1. identify whether or not Aboriginal objects are, or are likely to be, present in an area
> 2. determine whether or not their activities are likely to harm Aboriginal objects (if present)
> 3. determine whether an AHIP application is required.
>
> If Aboriginal objects are present or likely to be present **and** an activity will harm those objects, then an AHIP application will be required.

By following the *Due Diligence Code of Practice* proponents can reach a reasonable determination as to whether or not Aboriginal objects will be harmed by their proposed activity, whether further investigation is warranted and whether or not an AHIP will be required.

1.2.3 Aboriginal Consultation

Consultation with the Aboriginal Community is not formally required as part of the due diligence process, but Lantern Heritage attempted to contact Bodalla LALC on a number of occasions(Rang 9.44 am on 13-05-22, no answer but left name and number on machine. Emailed via website on 16/05/22 @ 8.56 am). . The decision as to whether or not to implement consultation as part of the due diligence process lies with the proponent. However, if at any point an application is made for an AHIP, then the consultation must be undertaken in accordance with the requirements in cl.80C of the *National Parks and Wildlife Regulation 2009*.

1.3 Due Diligence Process

The due diligence process comprises up to five separate steps that will determine whether or not an AHIP is required for a given activity. Figure 2 provides an overview of the due diligence process. Additional details regarding each step are outlined below.

1.3.1 Step 1: Will the activity disturb the ground surface?

The first step in the due diligence process is to determine whether the proposed activity will disturb the ground surface or any culturally modified trees. Essentially, if there will be ground disturbance (e.g. digging, grading, bulldozing, scraping, ploughing or drilling), or if mature vegetation will be removed, then the potential exists for harm to Aboriginal objects, so the next step in the due diligence process should be implemented.

However, if the proposed activity will not disturb the ground surface or any culturally modified trees, then the activity can go ahead, with caution, without applying for an AHIP.

1.3.2 Step 2: Are there previously recorded sites, or landscape features likely to indicate presence of Aboriginal objects?

There are two components to the second step in the due diligence process: a) determining if there are previously recorded sites in the activity area, and b) determining if the activity area includes landscape features that are likely to indicate the presence of Aboriginal objects.

The first component of this step involves searching the OEH Aboriginal Heritage Information Management System (AHIMS) to check for the presence of previously registered sites within the activity area. It also involves checking for previous studies that have been conducted across the activity area, or part thereof. If there are previous investigations, then it is also necessary to check whether or not those investigations identified any Aboriginal objects, or the potential for such objects within the proposed activity area.

Regardless of the outcome of the searches for previously recorded Aboriginal objects, it is also necessary to review the landscape features present within the activity area, and assess whether or not Aboriginal objects are likely to be present within those features.

If the proposed activity is:

- within 200m of any part of: any river, stream, lake, lagoon, swamp, wetlands, natural watercourse, tidal waters (including the sea), or
- located within a sand dune system, or
- located on a ridge top, ridge line or headland, or
- located within 200m below or above a cliff face, or
- within 20m of or in a cave, rock shelter, or a cave mouth, and
- is on land that is not disturbed[1], then the next step in the due diligence process **must** be implemented.

However, if after completing a search of AHIMS, a review of previous investigations and a review of the landscape features in the activity area, it is concluded that there are no known Aboriginal objects and no landscape features likely to indicate the presence of Aboriginal objects, then the activity can go ahead, with caution, without applying for an AHIP.

[1] Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.

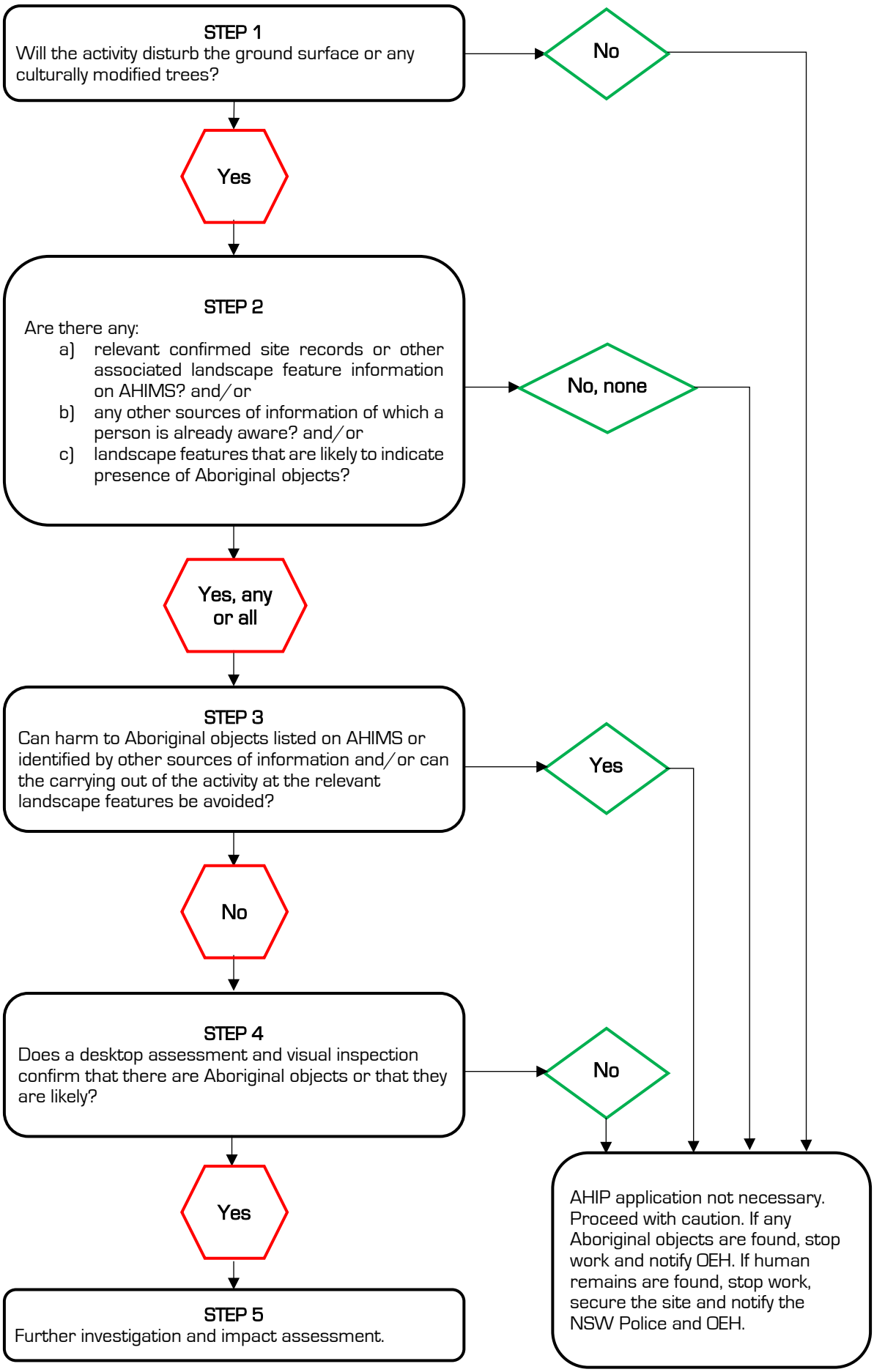

Figure 2: The generic due diligence process (DECCW, 2010a).

1.3.3 Step 3: Can harm be avoided to the object or disturbance of the landscape feature?

The third step in the due diligence process is implemented when there are known Aboriginal objects present in the activity area, and/or the activity area includes landscape features likely to indicate the presence of Aboriginal objects, on land that is not disturbed. This step involves an assessment of whether or not the activity area can be modified to avoid harm to known Aboriginal objects and/or landscape features likely to indicate the presence of Aboriginal objects.

For example, harm may be avoided through reducing the extent of the activity area, relocating the activity area, or modifying the proposed activity to avoid ground disturbance or vegetation removal.

If the activity cannot be modified in such a way as to avoid **all** harm to known Aboriginal objects and **all** disturbance to landscape features likely to indicate the presence of Aboriginal objects, then the next step in the due diligence process **must** be implemented.

However, if harm can be avoided to **all** known Aboriginal objects and landscape features likely to indicate the presence of Aboriginal objects, then the activity can go ahead, with caution, without applying for an AHIP.

1.3.4 Step 4: Desktop assessment and visual inspection

The fourth step in the due diligence process is implemented when harm cannot be avoided to known Aboriginal objects and/or disturbance to landscape features likely to indicate the presence of Aboriginal objects. This step involves a desktop assessment and a visual inspection of the activity area.

The desktop assessment involves collation and review of any readily available information from previous cultural heritage studies, archaeological investigations and previously recorded Aboriginal sites across the broader area. It must include the proposed activity as a whole, not just particular areas where Aboriginal objects have been recorded or areas where landscape features, likely to indicate the presence of Aboriginal objects, are located.

Visual inspection must also be conducted in order to determine if Aboriginal objects can be identified within the activity area, or if they are likely to be present below the surface. The visual inspection must be done by a person with expertise in locating and identifying Aboriginal objects (e.g. a consultant with appropriate qualifications and training).

If the desktop assessment or the visual inspection identifies the presence of Aboriginal objects in the activity area, **or** the likelihood of Aboriginal objects being present, more detailed investigation and impact assessment will be required. In which case, the next step in the due diligence process **must** be implemented.

However, if the desktop assessment and the visual assessment do not identify the presence, or likely presence, of Aboriginal objects, then the activity can go ahead, with caution, without applying for an AHIP.

1.3.5 Step 5: Further investigations and impact assessment

The fifth step in the due diligence process is the implementation of a detailed investigation and impact assessment. This step is implemented when the desktop assessment and visual investigation confirm the presence, or likely presence, of Aboriginal objects within the proposed activity area.

Detailed investigation and impact assessment must be conducted in accordance with OEH guidelines regarding archaeological investigations (DECCW, 2010b) and the process of

investigating and reporting on Aboriginal cultural heritage (Office of Environment and Heritage, 2011).

If the detailed investigation and impact assessment determines that harm will occur to Aboriginal objects, then an AHIP application **must** be made.

All AHIP applicants **must** undertake Aboriginal community consultation in accordance with clause 80C of the NPW Regulation (DECCW, 2010c). Consultation may also be followed when a cultural heritage assessment is undertaken and there is uncertainty about potential harm.

1.3.6 If the due diligence process does not identify that an AHIP application is necessary

If after completing the due diligence code of practice process it has reasonably been determined that an AHIP application is not necessary, because Aboriginal objects are not present or, if they are present, harm to those objects can be avoided, then the activity can go ahead with caution.

However, if an Aboriginal object is found while undertaking the activity, work **must** stop and OEH **must** be notified. In that instance, pending advice from OEH, an AHIP may be required before work can resume. Further investigation may also be required, depending on the type of Aboriginal object that is found.

In the event that human skeletal remains are found during the activity, work **must** stop immediately, the area **must** be secured, and the NSW Police and OEH **must** be notified.

As summarised in Table 1, if an Aboriginal object is found that is not already recorded on AHIMS, there is a legal obligation under s.89A of the NPW Act to notify OEH as soon as possible of the object's location. This applies to all people in all situations, including when following the due diligence code of practice.

2 STEP 1 – WHAT IS THE PROPOSED ACTIVITY?

2.1 Overview of the proposed activity

The expansion of Brou waste management facility aims to increase the area available for landfill at that site. While no detailed scope of works has been provided, the proposed works (Figure 1) are likely to include:

1. Removal of vegetation
2. Levelling of the ground surface
3. Digging large pits, penetrating to a depth of several metres
4. Use of heavy earth-moving machinery
5. Construction of infrastructure including access roads and hard standing

2.2 Will the proposed activity disturb the ground surface?

As outlined above, the proposed works will involve a large amount of ground disturbance and/or land surface modification in association with (tracked) machinery access and levelling/excavation processes related to waste management facility expansion.

2.3 Step 1 Summary

The result of Step 1 of the due diligence process is that the proposed activity is likely to cause ground disturbance. As such it is necessary to proceed to Step 2 of the due diligence process.

3 STEP 2 – REVIEW OF HERITAGE REGISTERS AND LANDSCAPE FEATURES

3.1 AHIMS site search

An extensive site search was conducted via AHIMS on 10 May 2022 by Conor Mcadams, from: -36.1789, 150.0394 – (Latitiude, Longitude) to: -36.1096, 150.163.

Forty eight (48) Aboriginal sites or objects and two (2) Aboriginal places were listed as being present within the search area. Table 2 provides a list of the sites, including site types and features present in the search area. The locations of the sites are shown in Figure 3, but none of the sites listed on AHIMS are within the proposed activity area. Table 3 provides an overview of the previously recorded sites according to site types and features. One Ceremony and Dreaming Site is located approximately two kilometres north of the study area, at Two Sisters Rocks (AHIMS#62-7-0021), while the rest of the sites are a mix of artefact scatters and midden.

Figure 3 shows that recorded sites tend to be located at the coast, and in built up areas around main roads. While there are few previously recorded sites close to the study area, it is important to note that the absence of any sites listed on AHIMS being present in the activity area does not mean that Aboriginal objects, or areas of archaeological potential, are not present. Sites are generally only added to the AHIMS database during surveys for research or cultural heritage assessment purposes.

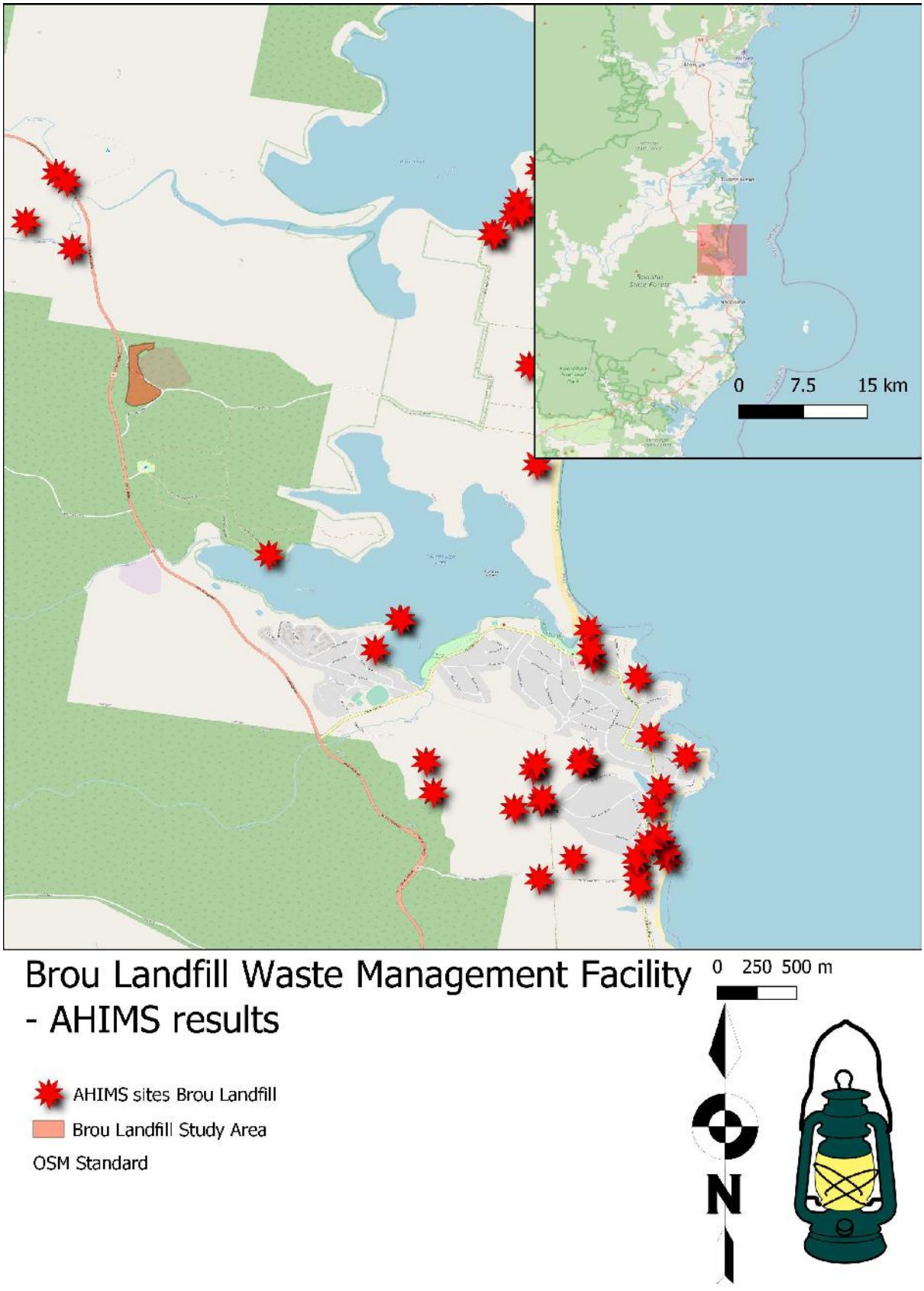

Figure 3 AHIMS sites in the vicinity of Brou waste management facility

Table 2: Summary of AHIMS search results near Brou waste management facility

AHIMS #	Site Name	Site Type/Feature
62-7-0021	Two Sisters Rocks	Open site
62-3-0120	Site 2 Narooma	Open site
62-7-0235	Barkala 2;Dalmeny Drive;	Open site
62-7-0421	Dalmeny Bikepath SU6	Open site
62-7-0418	Dalmeny Bike Path Survey Unit 1	Open site
62-7-0383	Mummuga Lk 1	Open site
62-7-0280	Lot 54 Dalmeny IF1	Open site
62-7-0302	Brou Lake Survey Unit 1 - Locale 1	Open site
62-7-0301	Brou Lake Survey Unit 1 - Locale 2	Open site
62-7-0479	Eucalyptus Drive 03 - Isolated Find	Open site
62-7-0382	Dalmeny P5	Open site
62-7-0420	Dalmeny Bikepath SU5	Open site
62-7-0300	Brou Lake Survey Unit 1 - Locale 3	Open site
62-7-0296	Brou Lake Survey Unit 3 - Locale 2	Open site
62-7-0071	Lake Mummuga 28/37;	Open site
62-3-0121	Site 3 Narooma	Open site
62-7-0236	Barkala 1;Dalmeny Drive;	Open site
62-7-0239	Barkala 3;Dalmeny;	Open site
62-7-0481	Eucalyptus Drive 01- Isolated Find	Open site
62-7-0067	Lake Brou 24/21;	Open site
62-7-0381	Dalmeny P4	Open site
62-7-0422	Barkala 1 and barkala 2:	Open site
62-7-0073	Dalmeny 28/52a;	Open site
62-7-0480	Eucalyptus Drive 02 - Artefact Scatter	Open site
62-7-0498	Duesburys Road Stone Adze 1	Open site
62-7-0426	Dalmeny Survey Unit 1/Locale 1	Open site
62-7-0240	Dalmeny Drive Isolated Find 2;Dalmeny Drive;	Open site
62-7-0419	Dalmeny Bikepath Survey Unit 2	Open site
62-7-0384	Mummuga Lke 2	Open site
62-7-0279	The Old Highway Dalmeny	Open site
62-7-0389	Mummuga Head Midden	Open site
62-7-0065	Lake Brou 24/111b;	Open site
62-7-0298	Brou Lake Survey Unit 1 - Locale 5	Open site
62-7-0378	Dalmeny P1	Open site
62-7-0297	Brou Lake Survey Unit 3 - Locale 1	Open site
62-7-0072	Lake Mummuga 28/48;	Open site
62-7-0425	Dalmeny Survey Unit3/Locale 1	Open site
62-7-0177	Two Sisters Rock	Open site

AHIMS #	Site Name	Site Type/Feature
62-7-0070	Lake Mummuga 28/42;	Open site
62-7-0281	Lot 54 Dalmeny IF2	Open site
62-7-0478	Eucalyptus Drive 04 - Isolated Find	Open site
62-7-0068	Lake Brou;Lake Mummuga 28/174a;	Open site
62-7-0069	Lake Mummuga 28/174b;	Open site
62-7-0379	Dalmeny P2	Open site
62-7-0449	3010/1	Open site
62-7-0299	Brou Lake Survey Unit 1- Locale 4	Open site
62-7-0463	Dalmeny Campground	Open site
62-7-0380	Dalmeny P3	Open site

Table 3 AHIMS Site types in the vicinity of Brou waste management facility

Site type	Count
Aboriginal Ceremony and Dreaming	1
Artefact/artefact scatter	31
Shell	2
Artefact and shell	14
Grand total	**48**

3.2 Review of landscape features

The study area is situated in the coastal hinterland of the South East Corner bioregion, approximately 2.5 km from the modern coastline, south of Brou Lake and north of Lake Mummuga (Figure 1). The are surrounding the study site was classified by Mitchell as the Bega Coastal Foothills landscape (Figure 5), but a range of other landscape types exist nearby. These include the Bodalla – Nadgee Coastal Sands and the Mount Dromedary Mumbulla Coastal Ranges. Within the study area is a low hill in the southern extent, with a gravel track separating that hill from a wooded ravine in the northern extent of the study area.

3.2.1 Geology, Geomorphology and soils

The Bega Coastal Foothills landscape is typified by hills that slope toward the coast, formed on Ordovician quartzite, slate, chert, phyllite, with areas on intrusive granite. Elevation ranges from 0 to 520m, with local relief of 250m. Thin, stony red and red-yellow texture-contrast soils are found on most landforms, but nearby landscapes related to Mount Dromedary – Mumbulla (Figure 5) are formed on Cretaceous monzonite, quartz syenite and diorite that intrudes Ordovician slate and phyllite, These areas may include large rounded tors and domed rock outcrops, with the potential to have provided diverse, valuable raw materials to Aboriginal communities.

Quaternary sediments in this area are associated with coastal, lacustrine and estuarine environments. The Bodalla-Nadgee Coastal Sands landscape is a complex of beach, dune

and lagoon deposits, These low-lying quartz sand formations have moderate carbonate content in frontal dunes, but simple podsols and diffuse iron pans form on the most inland dunes. Organic silty sands are found in lagoons and estuaries

Dendritic drainage channels are found throughout the area, but the nearest perennial stream, Whittaker's Creek, is approximately 1 km from the study area.

3.2.2 Vegetation

Natural vegetation is the area is typified by open forest of tall spotted gum (*Corymbia maculata),* grey ironbark (*Eucalyptus paniculata*), red bloodwood (*Corymbia gummifera*), white stringybark (*Eucalyptus globoidea*), blackbutt (*Eucalyptus pilularis*) with blady grass (*Imperata cylindrica*), bracken (Pteridium esculentum) and burrawang (*Macrozamia sp.*) in the understorey, shrubs limited. On headlands heaths of bushy needlewood (*Hakea sericea*), giant honey-myrtle (*Melaleuca armillaris*), coast rosemary (*Westringia friticosa*) and dwarfed red bloodwood occur in shallow soils subject to high salt spray input and frequent fire.

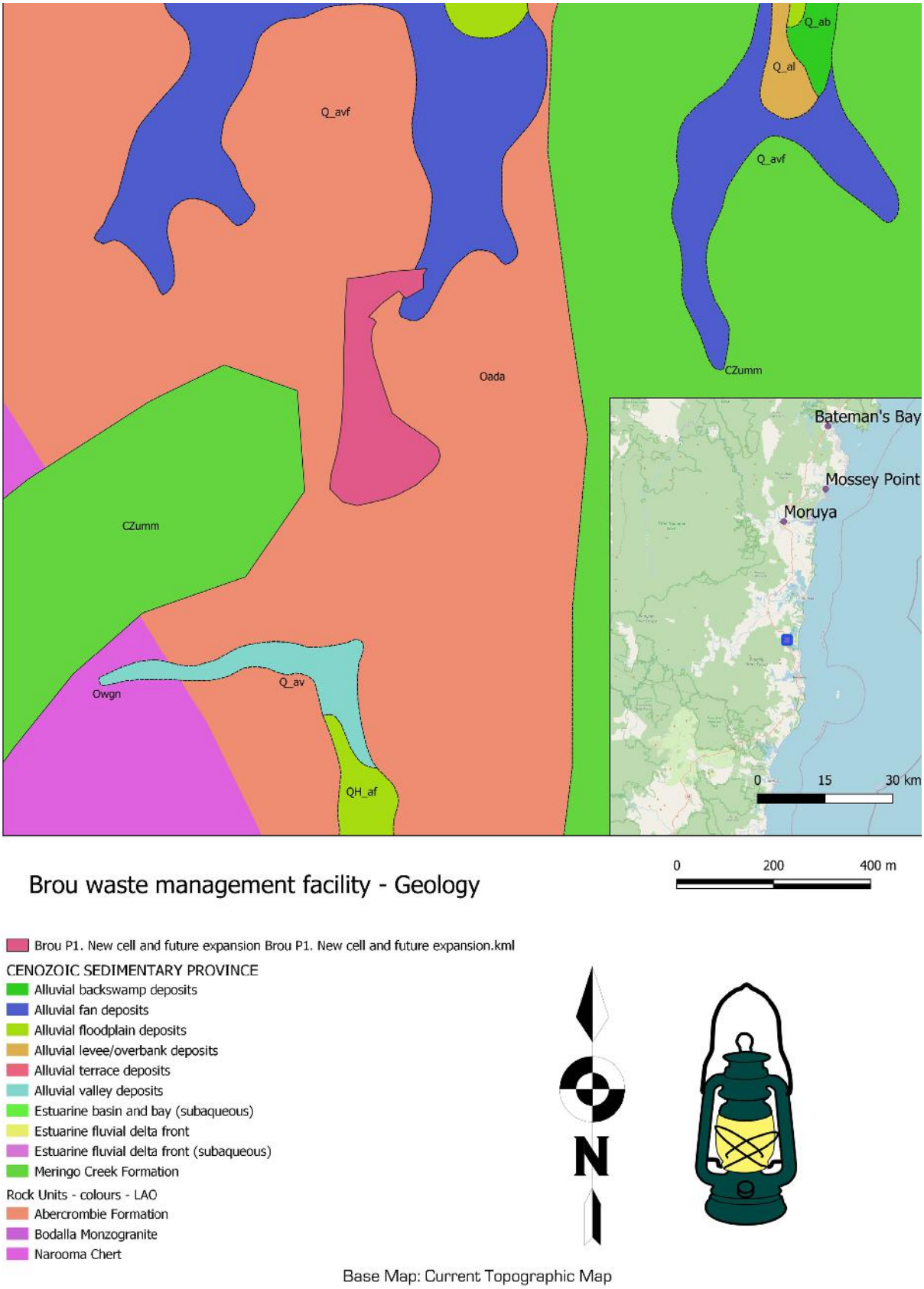

Figure 4: Geological setting of the Brou waste management facility

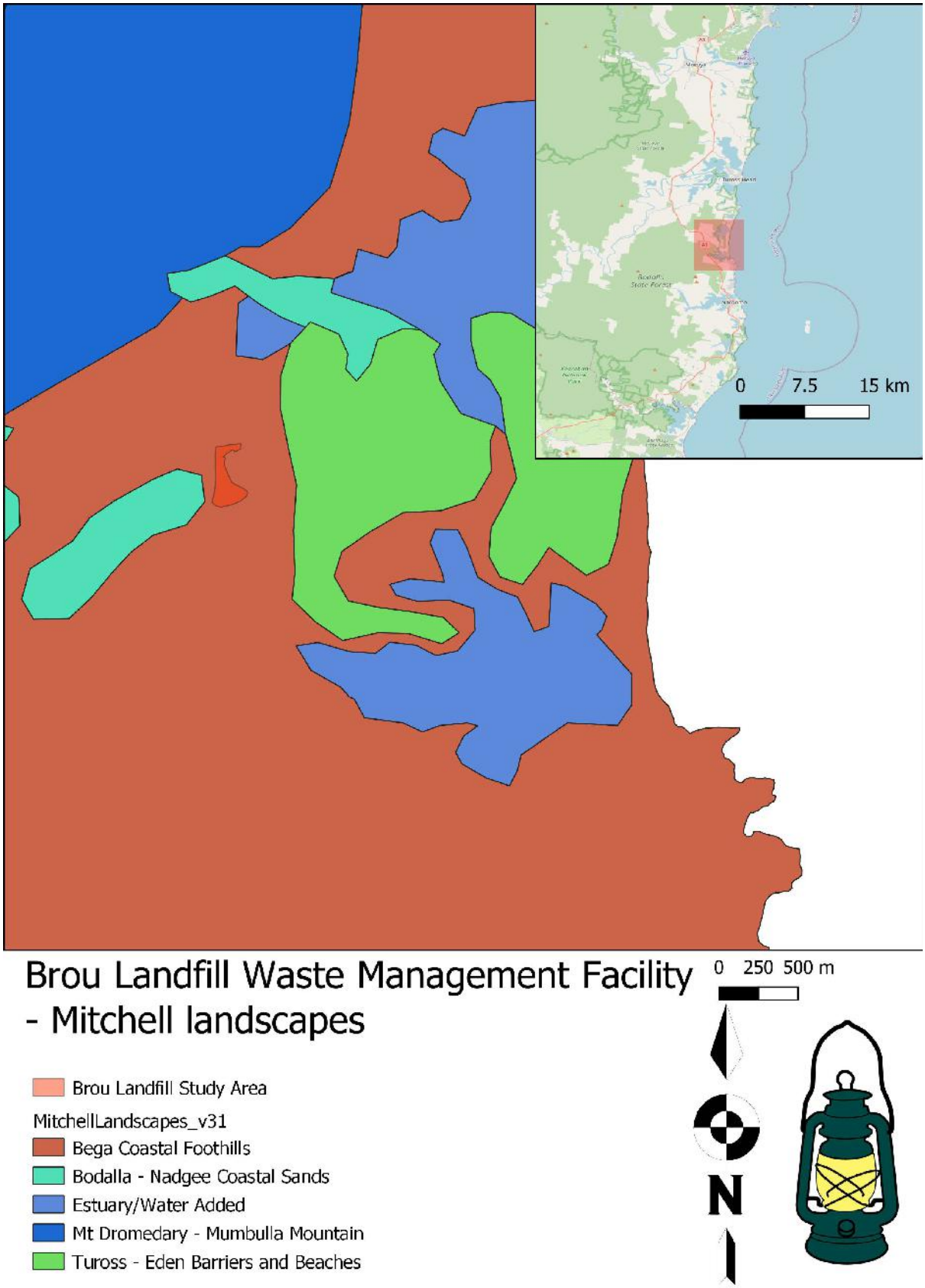

Figure 5 Mitchell landscapes in the vicinity of the Brou waste management facility

3.3 Step 2 summary

Although there are no previously recorded sites listed within the proposed activity area, landscape features across the activity area correspond to features that are likely to contain Aboriginal objects. Furthermore, subsurface disturbance or land surface modification across the activity area is variable and may include areas of low to moderate prior disturbance.

In addition, mapping of previously recorded Aboriginal sites in the area indicates that the area surrounding Brou Lake was relatively intensively occupied by Aboriginal people.

The result of Step 2 of the due diligence process is that the proposed activity area corresponds to landscape features likely to indicate the presence of Aboriginal objects, and. As such it is necessary to proceed to Step 3 of the due diligence process.

4 STEP 3 – CAN HARM BE AVOIDED?

The entire study area is situated in a landscape context that, based on a desktop assessment of known sites and sensitive landforms, has a likelihood of containing Aboriginal objects. Given the constraints regarding the proposed development and the nature of the topography and environmental context across the proposed activity area, it does not appear that harm can feasibly be avoided to all landscape features that are likely to contain Aboriginal objects. As such it is necessary to proceed to Step 4 of the due diligence process.

5 STEP 4A – DESKTOP ASSESSMENT

The desktop component of the assessment includes a review of previous archaeological and cultural heritage investigations in the local region, together with reviews of existing models of site locations for the study area. The results of this review are then presented in terms of the implications for the proposed activity area.

5.1 Aboriginal occupation of Australia

Aboriginal occupation of Australian extends back well into the Pleistocene. Current theories place the arrival of humans to Sahul between 47,000 years before present (BP) and 65,000 BP (O'Connell and Allen 2004, 2015; Allen and O'Connell 2014; Clarkson et al., 2017, O'Connell et al., 2018). While debate continues regarding the earliest arrival in Australia, there is general agreement that all environmental zones across the continent were colonised by around 35,000 BP (Mulvaney and Kamminga 1999). Since that time there has been substantial climatic variation, which has influenced choices people made regarding the locations they lived.

5.2 Previous investigations of Aboriginal archaeology

The far south coast of NSW has been the subject of investigation for various academic research projects and cultural heritage management studies. The following summary highlights some of the relevant research findings within the surrounding area.

Dibden 2015 – Installation and renewal of the water and sewer system in the Dalmeny Campground, via Narooma NSW – ACHAR – AHIMS#103463

This ACHAR was prepared for Eurobodalla Shire Council in advance of installation and renewal of sewer and water at the Dalmeny Campground, NSW. An Aboriginal site (stone artefacts) was known to be present and the ACHAR was required to support an AHIP application. In addition, despite a lack of permanent, higher-order streams nearby, Dibden believed the access to coastal resources meant that the study area had the potential to support intensive, complex occupation. An AHIMS search found 70 Aboriginal sites listed in the surrounding area, but none within the study area itself. Therefore, a new site was recorded for the stone artefacts that were known to be within the study area. Because of the levels of disturbance associated with the landform, and the low significance of the recorded site, no mitigation strategies beyond AHIP application were proposed.

Dibden 2005 – Proposed Camping Area and Road Upgrade at Brou Lake, near Narooma NSW. AHIMS#99389

This report detailed seven recorded artefact scatters on the southeast shore of Lake Brou, found during a survey conducted for the NSW National Parks and Wildlife Service during upgrades to the campsite there. Despite landform analysis that suggested the area, similar to our current study area, may be intensively occupied, artefact density was found to be low and explained in terms of the absence of a source of reliable fresh water.

Dibden 2014- Proposed water pipe installation, Dalmeny, via Narooma – ACHAR- AHIMS#103017

This ACHAR was prepared for Eurobodalla Shire Council in advance of a c. 250 metre long water pipe installation at Dalmeny, NSW. Two previously recorded Aboriginal sites were located in the subject area during an AHIMS search. This area is a hind dune context, and the access to varied resources (including rocks and minerals) that it would have provided made it a prime camp site location. Although an AHIP (#1082566) had been issued to ESC

previously for a proposed Shared Pathway development, but Council have been advised by the NSW OEH that a new AHIP is required. This study located the sites and determined that they were of insufficient value and significance to place any constraints on development other than necessitating an AHIP.

Dibden 2007 – An Archaeological Assessment of Two Sections of the Dalmeny to North Narooma Bike Path – AAR AHIMS#10757

This report details survey of two separate areas at Dalmeny, broken down into 6 survey units, carried out in advance of the Dalmeny to Narooma bikepath. Sparse scatters of stone artefacts and fragmented shell were found to be present within areas of five of the six survey units, concentrated on headlands, simple slopes and dune landforms.

Dibden 2008 – An Archaeological Assessment of the Dalmeny to North Narooma Bikepath – report 2 – AHIMS#101016

Subsequent to Dibden (2007), this report details subsurface excavation at three areas of PAD within the North Narooma bike path study area. Three Transects (24 Test Pits) were excavated and 141 stone artefacts were retrieved, with artefacts recovered from all three Test Transects and the majority of Test Pits. The average artefact density across the test excavation area was 23.5 artefacts per square metre, but artefact density in individual test transects ranged from as low as 14.5 artefacts per square metre to as high as 36 artefacts per square metre. As such, average artefact density was assessed to range from low to low/moderate and the archaeology of the study area was assessed to be of low/moderate archaeological significance.

Dibden, 2007b – Proposed Stairs at Mummunga Lake Entrance, Dalmeny NSW, Aboriginal Archaeological Assessment AHIMS#100670

This report provides details of a midden a found at the site of proposed beach access stairs at Mummuga Head. The midden is situated in a sandy dune deposit immediately adjacent to the south side of the Mummuga Lake, where shell and a stone artefact were recorded in an erosion exposure caused by pedestrian traffic. The erosion blow-out measures 7 m long by 3 – 4 m wide and the exposed midden is in a black sandy deposit which appears to be situated 500 mm below clean yellow sand, with a unit depth of approximately 300 mm. The shell was highly fragmented, but a range of species were identified. Observed shell species include nerite (*Melanerita melanotragus*), turban (*Ninella torquata*), cockle and Warrener (*Subninella undulata*). The stone artefact was a white quartz flaked piece measuring 28 x 18 x 12 mm.

Paton, 1986 – An investigation of the Moruya to Narooma Water Pipeline route AHIMS#896

This report presents a survey of an area proposed for the construction of a water pipeline between Moruya and Narooma, which was constructed as part of the Lower South Coast water supply augmentation scheme. The route followed existing road and power line easements and was characterized by high levels of disturbance. The author believed that any sites that had been present would have been entirely destroyed by historic impacts along the majority of the route. But three artefact scatters were located several hundred metres awar and they recommended employment of an indigenous officer to monitor the works as they progressed in potentially sensitive areas, in case further sites/artefacts were revealed.

5.3 Local model of Aboriginal occupation and site location

The archaeology of the Eurobodalla region and the far south coast of NSW, more broadly, is dominated by flaked stone, artefact scatters and shell middens, but also includes sites such as burials, ceremonial grounds, stone arrangements, quarries, rock shelters, ground stone (e.g. axes and grinding grooves), natural/mythological sites, modified trees and areas of PAD. While some of these site types, such as artefact scatters or ceremonial sites, can occur in any given location, the likelihood of finding midden, burials or PAD is determined by a range of factors including soil type and the extent of prior disturbance.

Stone artefacts are the most ubiquitous component of the archaeological record of Aboriginal occupation. Artefacts can be found on any landform. However, previous research along the south coast suggests that sites are more common along the coastal strip and around estuary margins, or at distances in excess of 12km from the coast (Hughes 1995). Stone artefacts and shell middens are a common site type around and along the coastline in New South Wales. Stone artefacts recorded in such locations are commonly identified in association with middens. The prevalence of surface ground exposure, together with erosional features that expose subsoils, will often dictate the likelihood of identifying the presence of stone artefacts during survey.

Both the site mapping from the AHIMS searches and the above review of previous investigations in the local area suggest that middens most commonly occur along the coastal shoreline and in association with estuary foreshores (e.g. spurlines leading down to estuaries, lakes and lagoons). Differentiation between Aboriginal middens, natural shell deposits and modern shell deposits can be problematic, especially where surface exposures have been subject to traffic and associated high levels of shell fragmentation. Aboriginal middens are typically characterised by weathered shell specimens within a given economic/edible size range and tend to be dominated by species such as *Cabestana*, *Anadara*, *Pyrazus ebeninus*, and *Ostrea*. The presence of stone artefacts and evidence of camp fires (e.g. charcoal lenses) can assist in determining the cultural nature of such shell deposits.

Areas of PAD are often identified in association with stone artefacts and/or midden, or on relatively undisturbed landforms with a high likelihood of containing stone artefacts, midden or other cultural deposits. PAD will normally tend to be identified on landforms that are geomorphologically stable, or subject to aggrading rather than eroding processes. Although, in situations where potential subsurface deposits are relatively deep (e.g. sands), PAD may still occur despite disturbance and erosional affects to the upper deposits.

The location of sites such as grinding grooves, quarries and rock shelters are all highly dependent upon the presence of suitable rock outcrops. They can occur anywhere that such outcrops are found. European quarrying and mining practices can often overlap with such areas, which means that Aboriginal sites may be obscured, damaged or effectively destroyed, thus hampering their identification during survey.

Sites such as modified trees will generally only be found in areas where older growth trees are present. Examples of such remnant vegetation are becoming increasingly rare, particularly given the extent of logging and associated forestry operations along the far south coast.

Burials are a site type that are more difficult to predict in terms of landform due to the fact that geographical and chronological variations in cultural practices for internment and treatment of the dead can result in a diverse range of burial types and locations. Broadly speaking, along the NSW coast as a whole, burials are often found in association with shell middens. There are also ethnohistorical references to burials being associated with large trees. However, burials tend to be most commonly identified during ground disturbance

activities (e.g. excavation), or as the result of erosional processes. It is rare for such sites to be identified during survey.

Similarly, sites such as ceremonial grounds, stone arrangements and mythological sites may occur anywhere in the landscape. Ethnohistorical records and oral histories often play an important role in identifying the potential locations of such sites. Farming practices such as ploughing may obscure or destroy such sites.

Information relating to Aboriginal occupation during the last 200 years indicates that contact and post-contact sites often coincide with locations that were traditionally used prior to European invasion. Continued Aboriginal use of such locations is more common in areas unsuitable for agricultural purposes. However, the employment of Aboriginal people on European farms means that potential also exists for such sites to occur in association with lands used for cultivation and pastoral activities.

Table 4: Summary predictive model for the area surrounding Brou waste management facility

Site Features	Predicted Potential	Sensitivity Within Activity Area
Stone artefacts	Moderate to high	Any landform. Increased sensitivity on low gradient landforms, particularly where prior disturbance is limited.
Midden	Low to Moderate	Any landform. Increased sensitivity on low gradient landforms near the coast or estuary margins, particularly where prior disturbance is limited.
Potential archaeological deposit(PAD)	Low to moderate	Increased sensitivity on low gradient landforms where prior disturbance isminor.
Ceremonial/Dreaming	Low to Moderate	Any landform.
Burial	Low to Moderate	Any landform. Increased sensitivity where deeper soil profiles and/or midden deposits occur.
Stone arrangements	Low to Very Low	Unlikely to occur, but presence cannot be completely discounted.
Culturally modified tree	Low to Moderate	Anywhere where mature trees remain.

6 STEP 4B – VISUAL ASSESSMENT

6.1 Methodology

Visual inspection of the project area was conducted on June 6th, 2022, by Conor McAdams and Jo Dibden of Lantern Heritage Pty Ltd. The visual inspection involved a pedestrian survey which focussed on 4 distinct survey units within the study area (Figure 6). It should be noted that dense vegetation across much of the study area impacted survey coverage. While existing access track exposures and areas of exposed or eroded ground provided the best archaeological visibility, this was also hampered by the large quantities of background quartz found throughout the study area.

6.1.1 Overview

The study area was assessed as a series of smaller survey units (survey units 1-4: see Figure 6), to provide a comprehensive assessment of the variety of landforms that exist across the study area.

No archaeological sites or objects were observed, but two survey units (Unit 2 and Unit 3) correspond to landforms which are likely to contain Aboriginal sites or objects. Because historic impacts were spatially varied, these landforms retained some soil depth. Survey coverage and archaeological visibility were impacted by environmental conditions and, as a result, these two landform units require further investigation to assess their archaeological potential. The two other survey units (Unit 1 and Unit 4) were assessed to be of low archaeological potential, due to the landform context, the extent of modern disturbance and the lack of soil depth likely to contain Aboriginal artefacts.

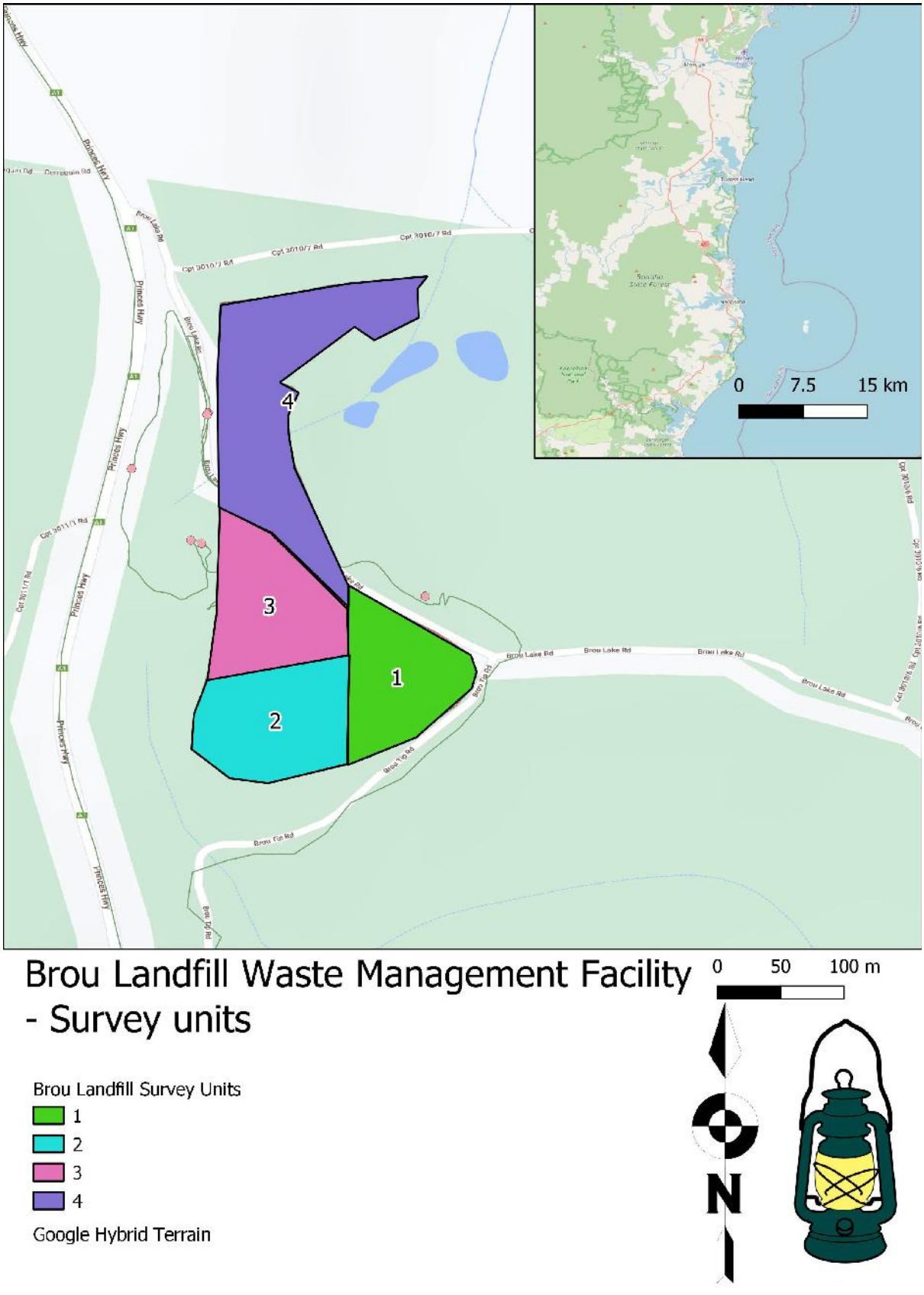

Figure 6 Overview of areas surveyed during visual assessment

6.1.2 Survey unit 1

Survey unit 1 is located in the southeastern extent of the study area (Figure 6), in an area of open, disturbed forest to the east of the current waste management facility (Plate 1). Survey coverage was negatively impacted by dense vegetation (Plate 2), but extensive disturbance and sediment transport was evident, with vehicle tracks, including earthwork 'speed bumps' (Plate 3), resulting in large areas of exposed quartz gravels, which restricted archaeological visibility in areas of higher survey coverage. Trees and vegetation in the area were young and there was little evidence of intact soil profiles. Archaeological potential is very low in this highly disturbed area (Plate 4).

Plate 1: Study area from current landfill site (looking west)

Plate 2: Disturbed woodland (Survey unit 1)

Plate 3: Exposed quartz gravel, indicating disturbance and limiting archaeological visibility (Survey unit 1)

Plate 4: Open forest, disturbed by logging (Survey unit 1)

6.1.3 Survey unit 2

Survey unit 2 is an area of disturbed woodland to the west of survey unit 1. It covers the gentle, southern slope of a low hill. Despite extensive historic impacts, evident from paths, borrow pits and uneven ground related to mechanical processes (Plate 5), areas with apparently intact soil are present, along with large tree stumps that indicate considerable depth of soil in some areas (Plate 6), including in some clearings. Dense vegetation limited survey coverage, particularly on the southern slope of the hill (Plate 7). Where paths and tracks provided exposures, archaeological visibility was limited by the ubiquitous background quartz (Plate 8). While no artefacts were observed, this area retains some archaeological potential and requires further investigation.

Plate 5: borrow pit (Survey unit 2).

Plate 6: Older stumps indicating some soil depth (Survey unit 2)

Plate 7: Dense vegetation on slope (Survey unit 2)

Plate 8: Fragmentary quartz gravels limiting archaeological visibility (Survey unit 2)

6.1.4 Survey unit 3

Survey unit 3 is located to the north of the survey unit 2 (Figure 6), on top of the low hill. Vegetation is open forest (Plate 9, Plate 10), but leaf litter provided little survey coverage across much of the area. The exposure created by the vehicle track that crosses the middle of the study area indicates that soil depth of several centimetres persists within this survey unit (Plate 11), but archaeological visibility was virtually zero because of the ubiquitous background quartz (Plate 12). On the north-facing slope there are several old-growth trees and stumps of similar trees. But while soil depth persists in some areas, erosion due to modern impacts is extremely spatially varied. Because of the north-facing, raised geomorphological setting of this unit, and the lack of survey coverage/archaeological visibility, it is impossible to rule out archaeological potential without further investigation.

Plate 9: clearing on top of hill (Survey unit 3,).

Plate 10: limited survey coverage top of hill (Survey unit 3)

Plate 11: Track exposure indicating soil depth top of hill (Survey unit 3, northern extent)

Plate 12: Archaeological visibility limited by gravels on track (Survey unit 3, northern extent)

6.1.5 Survey unit 4

Survey unit 4 is located in the northern extent of study area (Figure 6) and is dominated by a densely wooded ravine (Plate 13). The steepness of the slope and dense vegetation made ingress difficult and limited survey coverage, but the steepness of the slope is also a factor limiting archaeological potential. Extensive modern impacts further limit the archaeological potential of this area, visible as tracks (Plate 14), areas of deposited sediment (Plate 15, Plate 16) and rubbish that has been, presumably, dumped illegally.

Plate 13: Steep gully with dense vegetation (Survey unit 4).

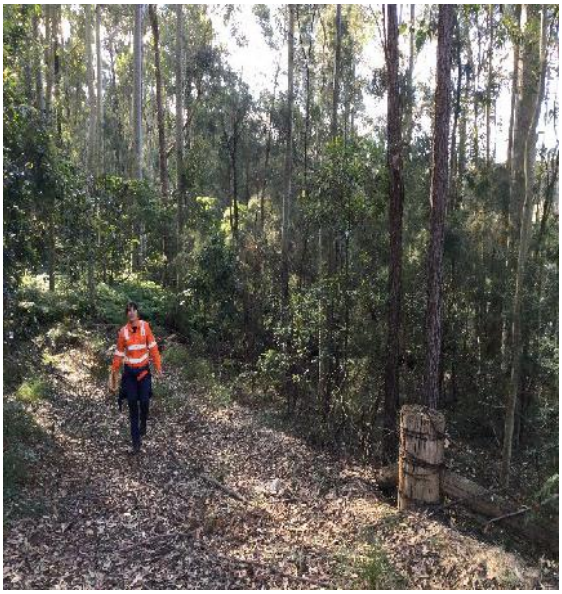

Plate 14: Vehicle tracks, dumping and disturbance (Survey unit 4)

Plate 15: Very disturbed, heavily vegetated area (Survey unit 4)

Plate 16: view across front (Survey unit 4)

6.2 Summary

Survey coverage was low throughout the study area, due to the extent of vegetation cover. Vehicle tracks, animal burrows, tracks and eroding slopes provided exposures, but archaeological visibility was virtually nil, due to the ubiquitous quartz gravels that were found throughout the study area. The archaeological potential of the study area was assessed as four separate landform units (Figure 6), all of which showed evidence of historic and modern disturbance related to logging, including vegetations removal, tracks formation and sediment deposition.

Survey units 1 and 4 are assessed as having low archaeological potential. Survey unit 1 is highly disturbed, with little evidence of in-situ soils or sediments likely to contain Aboriginal sites or artefacts. Survey unit 4 is centred on a heavily vegetated, steep gully landform that was unlikely to be a focus of occupation. In addition, historic impacts to this area are visibly extensive, which further limits its archaeological potential.

Survey units 2 and 3 are assessed as having moderate-high archaeological potential. Although no Aboriginal sites or artefacts were found, survey coverage and archaeological visibility were virtually nil due to environmental factors. These survey units correspond to a low hill in a resource-rich area, which may have formed an attractive landscape feature for Aboriginal communities in the past. While historic impacts are clearly visible in these areas, persistence of old-growth vegetation, along with visible soil depth in exposed profiles, indicate that some areas retain the potential to preserve Aboriginal sites.

Given that the visual assessment has identified two areas where Aboriginal objects are likely to occur, it is prudent to review the question posed at Step 3 of the due diligence process: Can harm to Aboriginal objects and/or can the carrying out of the activity at the relevant landscape features be avoided? This question is addressed below in Section 7.

7 STEP 5 - FURTHER INVESTIGATIONS AND IMPACT ASSESSMENT

7.1 Impact assessment

In survey units 1 and 4 (Figure 6), archaeological potential is considered low, and work in these areas is unlikely to cause harm to Aboriginal objects. This means that work can procees in these areas, with caution (see Section 8).

The visual assessment has identified two area of moderate-high sensitivity, corresponding to survey units 2 and 3 (Figure 6) where Aboriginal sites or artefacts are likely to be found. This area is focused on a low hill, with areas of intact soils that may correspond to PAD. As such, it is prudent to review the question posed at Step 3 of the due diligence process: Can harm to Aboriginal objects and/or can the carrying out of the activity at the relevant landscape features be avoided?

Avoiding harm to Aboriginal artefacts and landforms likely to contain Aboriginal artefacts would entail avoiding work on Survey units 2 and 3. Because of the nature of the proposed works, they cannot be adjusted to avoid harm in this fashion.

If harm cannot be avoided, moving forwards will involve undertaking an ACHAR to assess the extent and preservation of any Aboriginal sites or objects through a program of subsurface testing.

7.2 Summary

Parts of the study area's archaeological potential have been assessed as low. Proposed works are unlikely to harm Aboriginal artefacts within the disturbed, alluvial environments of survey units 1or 4 (Figure 6).

In Survey units 2 and 3, situated on a landform that is likely to contain Aboriginal sites or artefacts, archaeological potential persists despite extensive modern impacts because of areas of relatively intact soil, associated with older vegetation. No Aboriginal sites or artefacts were detected in these areas, but this is unsurprising given limited survey coverage and low archaeological visibility. Because of this, Eurobodalla Shire Council have agreed to proceed with an ACHAR in these areas, incorporating Aboriginal community consultation, further survey and test excavation to accurately assess the archaeological potential of these areas.

Attention is also drawn to the fact that the due diligence process is covered by the caveat that the proponent can "[p]roceed with caution. If any Aboriginal objects are found, stop work and notify OEH. If human remains are found, stop work, secure the site and notify the NSW Police and OEH" (DECCW, 2010a, 10).

8 CONCLUSIONS AND RECOMMENDATIONS

On the basis of this due diligence assessment, it is concluded that there is potential for the proposed activity to result in harm to Aboriginal objects and/or landforms likely to contain Aboriginal objects. But work can proceed in Survey units 1 and 4, which are unlikely to contain Aboriginal objects.

The following recommendations were formulated, based on the results of the desktop review and visual assessment documented above:

a) The proposed activity can only go ahead, with caution, in the disturbed, open forest environments that correspond to survey units 1 and 4.

b) Proposed works associated with the sensitive landform (low hill with older vegetation and in-situ soils) contained within survey units 2 and 3, are likely to cause harm to Aboriginal artefacts.

c) The areas contained within survey units 2 and 3 shall not be used for heavy vehicle access, stockpiling of materials or any other activity likely to cause ground disturbance, without first undertaking an ACHAR.

d) An ACHAR must be conducted to assess the extent and preservation of any archaeological remains in Survey units 2 and 3.

e) If during the course of the proposed activity, in the rest of the study area, any Aboriginal objects are found, stop work and notify OEH.

f) If human remains are found, stop work, secure the site and notify the NSW Police and OEH.

g) This due diligence assessment only covers the works outlined in section 2 of this report. If additional impacts or alternative alignments are proposed, further assessment will be required.

h) A copy of this report, and any subsequent due diligence investigations, should be kept on record, and if requested, supplied to the relevant government agency as proof of compliance with the *Due Diligence Code of Practice*.

i) A copy of this report should be forwarded to Ngambri LALC for their review and comment.

Eurobodalla Shire Council have initiated the ACHAR process for survey units 2 and 3.

9 REFERENCES

Allen, J. & O'Connell, J. F. 2014, Both half right: updating the evidence for dating first human arrivals in Sahul. *Australian Archaeology* 79: 86–108.

Australia ICOMOS (International Council on Monuments and Sites) 2013, The Burra Charter: the Australia ICOMOS charter for places of cultural significance 2013.

Clarkson, C., Jacobs, Z., Marwick, B., Fullagar, R., Wallis, L., Smith, M., Roberts, R.G., Hayes, E., Lowe, K., Carah, X., Florin, S.A., McNeil, J., Cox, D., Arnold, L.J., Hua, Q., Huntley, J., Brand, H.E.A., Manne, T., Fairbairn, A., Shulmeister, J., Lyle, L., Salinas, M., Page, M., Connell, K., Park, G., Norman, K., Murphy, T., Pardoe, C., 2017, Human occupation of northern Australia by 65,000 years ago. *Nature* 547, 306.

Department of Environment, Climate Change and Water, 2010a, Due diligence code of practice for the protection of Aboriginal objects in New South Wales. NSW DECCW, Sydney, N.S.W.

Department of Environment, Climate Change and Water, 2010b, Code of Practice for archaeological investigation of Aboriginal objects in New South Wales. DECCW, Sydney, N.S.W.

Department of Environment, Climate Change and Water, 2010c, Aboriginal cultural heritage: consultation requirements for proponents 2010 : Part 6 National Parks and Wildlife Act 1974. Dept. of Environment, Climate Change and Water NSW, Sydney.

Dibden, J. 2005, Proposed Camping Area and Road Upgrade at Brou Lake, near Narooma NSW. AHIMS#99389

Dibden, J. 2007, An Archaeological Assessment of Two Sections of the Dalmeny to North Narooma Bike Path – AAR AHIMS#10757

Dibden, J. 2007b, Proposed Stairs at Mummunga Lake Entrance, Dalmeny NSW, Aboriginal Archaeological Assessment AHIMS#100670

Dibden, J. 2008, An Archaeological Assessment of the Dalmeny to North Narooma Bikepath – report 2 – AHIMS#101016

Dibden, J. 2014, Proposed water pipe installation, Dalmeny, via Narooma – ACHAR-AHIMS#103017

Dibden, J. 2015, Installation and renewal of the water and sewer system in the Dalmeny Campground, via Narooma NSW – ACHAR – AHIMS#103463

Hughes, P. J. 1995 A Preliminary Archaeological Study of the Proposed Racecourse at Kalaru, NSW. Report to Kelley & Associates prepared by Kinhill Engineers Pty Ltd

Lampert, R. 1971, *Burrill Lake and Currarong*. Department of Prehistory. Research School of Pacific Studies: Australian National University.

Mitchell 2002, Descriptions for 2002. (Mitchell) Mitchell landscapes, NSW: Department of Environment and Climate Change.

Mulloon consulting (Irish P., McAlister B., Hazell P. with contributions from Pietsch R. (NSW DPIE) and D. Moore (Umwelt)) (2021). Carwoola Project Description

Mulvaney, D.J. & Kamminga, J. 1999, Prehistory of Australia, Washington: Smithsonian Institution Press.

NPWS NSW 2003, The bioregions of NSW, their biodiversity, conservation and history, Hurstville: NSW Parks and Wildlife service.

O'Connell, J. F. & Allen, J. 2004, Dating the colonization of Sahul (Pleistocene Australia–New Guinea): a review of recent research. *Journal of Archaeological Science*: 31, 835–853.

O'Connell, J. F. & Allen, J. 2015, The process, biotic impact, and global implications of the human colonization of Sahul about 47,000 years ago. *Journal of Archaeological Science*: 56, 73–84.

O'Connell, J.F., Allen, J., Williams, M.A.J., Turney, C.S.M., Spooner, N.A., Kamminga, J., Brown, G. and Cooper A. 2018, When did *Homo sapiens* first reach Southeast Asia and Sahul?, *Proceedings of the National Academy of Sciences*, 6 August 2018, 201808385; DOI: 10.1073/pnas.1808385115

Office of Environment and Heritage 2011, Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW: Part 6 National Parks and Wildlife Act 1974. Office of Environment and Heritage, Sydney South, N.S.W.

Paton, 1986 – An investigation of the Moruya to Narooma Water Pipeline route AHIMS#896

Sullivan, M. E. 1978, Archaeological sites, Chapter 12 In Austin, M.P. and Cocks, K.D. (eds.) *Land Use on the South Coast of New South Wales*, Vol. 4. Land function studies. CSIRO Aust., 196-201.