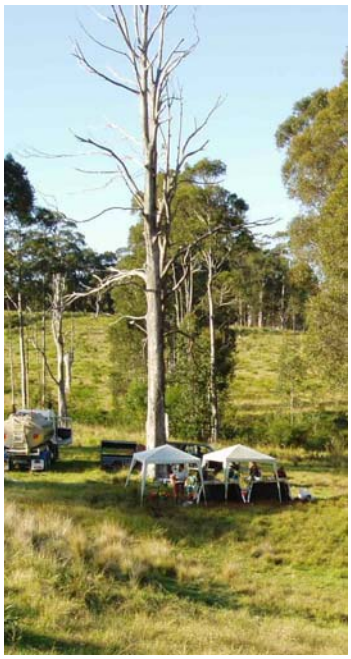

Bevian Road Concept Application
Rosedale, South Coast, NSW

Cultural Heritage Assessment

November 2007

A Report to Marsim Pty Ltd
trading as
Nature Coast Developments Pty Limited

Navin Officer

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1. EXECUTIVE SUMMARY

The Development Proposal

- The Marsim Group (trading as Nature Cost Developments Pty Ltd) proposes to construct a variety of residential developments according to the Bevian Road Concept Approval Plans, at Rosedale on the NSW south coast. The subject area comprises approximately 174 ha (including road reserves) of moderate to gently sloping coastal hinterland, located northeast of Tomakin, which has been mostly cleared and is currently used primarily for grazing. The development will comprise 806 residential lots.

Cultural Heritage Assessments

- A cultural heritage assessment of the subject land was conducted in 2002. This assessment included background research, comprehensive archaeological field survey, consultation with the Mogo Local Aboriginal Land Council (MLALC), participation of a MLALC representative in the field survey, and an assessment of cultural heritage significance values for all sites and features identified.

- Following from this assessment, in 2004 a program of archaeological subsurface testing of known and potential Aboriginal archaeological deposits was conducted. A geomorphological and pedological assessment of the subject land was also conducted.

- As a result of these studies, Three surface Aboriginal archaeological sites (stone artefact scatters), and eight subsurface archaeological deposits were identified. In addition, seven European historical sites were identified. These consist of three prospector's pits, a series of agricultural ditches, two unidentified circular pits, a piece of disused farm machinery, and the former Rosedale cheese factory building.

- All of the sites and features which were found to have significant cultural heritage values were all considered to have values under various criteria, within a local context only.

Summary of Subsurface Archaeological Findings

- With regard to the Aboriginal archaeological resource, sixty eight (68) archaeological test pits were excavated across the study area. The pits sampled five broad landform categories, areas of archaeological potential, and a recorded surface site.

- Five hundred and nine (509) Aboriginal stone artefacts were retrieved from test pits within the study area. Artefacts came from 53 of the 68 pits excavated.

- Artefacts were found in all of the sampled landforms with the exception of upper slopes. Approximately half of all artefacts were located in pits along the valley floor. A further 27.3% were located on basal slopes, 15.9% on spurlines, and 6.1% on midslopes. Only four artefacts were recovered from pits on watershed crests.

- Quartz artefacts account for just over 68% of the assemblage total, followed by silcrete (19%), volcanics (8%), and chert (1%) – quartzite, volcanics and unidentified other materials account for the remaining 4%. Artefacts were recovered to a maximum depth of 67 cms.

- Flakes are the dominant technological component, accounting for 487 artefacts, or 95.7% of the assemblage total. Cores and flaked pieces each account for four artefacts, or 0.8% each. Heat shatter, both in the form of potlids and heat fractured rocks, accounts for nine pieces, or 1.8% of the total. Three hammerstones or hammerstone fragments were located, along with two grindstone fragments.

- A number of activities are represented by the Bevian Road (Rosedale) assemblages. These include:

- artefact production (as indicated by flake length and the presence of hammerstones),
- tool maintenance;
- infrequent core reduction (as indicated by the small number of bipolar flakes located, and the absence of bipolar cores); and
- the use of grindstones (both the grindstone fragments located at Rosedale were top-stones, or mullers, showing signs of use polish, implying use in seed grinding).

- The study area does not appear to have been a major focal point for local Aboriginal occupation. None of the evidence indicates the presence of major residential campsites from which forays into the surrounding areas were undertaken.

- The archaeological materials at Bevian Road (Rosedale) appear to relate to mobile hunting and foraging, and short-term logistical camping activities. Some short-term residential camping may have occurred, but the evidence for this is not strong. Some of the occupation clearly relates to the mid- to late Holocene, but how much cannot be clarified, given the lack of temporal control.

- The archaeology of study area may be explained in part by the occupational signature at Barlings Beach. The entire study area falls within 4 km of the large site complex at Barlings Beach, which contains, among other things, evidence of extended residential occupation. A plausible hypothesis that can be derived from the evidence is that Rosedale was incorporated into extractive tasks such as hunting and foraging conducted from, or as part of, a subsistence cycle related to the nearby Barlings Beach complex.

- The subsurface archaeological deposits investigated in this study are assessed as having a general scientific significance at the lower end of the spectrum within a local context. However, some aspects of the archaeological resource provide a higher level of significance according to individual criteria. These are: representativeness within a local context and relative to the nearby Barlings Beach sites, status as one of the few hinterland samples in the region subject to subsurface investigation, and the albeit limited potential for further archaeological investigation.

- The results of this investigation indicate that Aboriginal artefacts (Aboriginal Objects) can be expected to occur in varying density throughout the development area. The density of this material will vary from relatively low to very low levels, (1 artefact per square metre or less), to relatively higher densities (more than 10 artefacts per square metre).

Aboriginal Stakeholder Consultation

- A program of consultation with a range of local Aboriginal stakeholder groups has been conducted throughout the course of the various cultural heritage assessments for the Rosedale/Bevian Road study area.

- This program has culminated in a series of written responses from each stakeholder group (which are reproduced in this report) and present general concordance with the development proposal, subject to a variety of conditions, including the opportunity to monitor ground disturbance and to conduct various salvage actions.

- As per the Director General's requirements for the submission of a concept approval application, procedures for the invitation to register a stakeholder interest were conducted as per the guidance referred in the draft *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation,* produced by the DECC in 2005.

- Perhaps because of the continued engagement of established stakeholder groups throughout the various and preceding cultural heritage assessments for this study area, there were no requests for registration as a consequence of the invitation to register. As a consequence, the conduct of the referred *Guidelines,* to the extent that they are compatible with Part 3A proposals, were deemed to have been completed.

Potential Development Impacts and Conservation Management Opportunities

- A review of potential construction impacts associated with the Bevian Road Concept Approval Plans found that one Aboriginal isolated surface find (RUR IF1), and part of a known archaeological deposit (AD3) would be directly impacted, along with four historical recordings (HS1, 6, 7 and 8). Of the historical recordings subject to impact, only one (HS1) was found to have significance above the threshold of the assessment criteria.

- It is concluded The Bevian Road Concept Application Plan allows for the effective conservation management and/or impact mitigation for of all the identified cultural heritage items with assessed levels of significance above the threshold of the assessment criteria.

- The pattern of open space defined in the Plan allows for the reservation of both the higher significance areas, and a representative sample of the known and predicted Aboriginal archaeological resource within the application area.

Recommended Management strategies

- The report proposes detailed conservation management and impact mitigation strategies for inclusion within a Statement of Commitments.

- These strategies include:

    - *In situ* conservation of sites and deposits within open space areas;

    - Conservation of archaeological deposits within defined archaeological conservation areas;

    - Collection of surface artefacts where necessary;

    - Consideration of conducting limited salvage excavation within a number of select areas prior to construction works;

    - Conservation and adaptive reuse of the former Rosedale Cheese Factory building, and;

    - Public access and interpretation of selected sites and features.

    Please refer to section 16 for a detailed outline of the recommended management strategies.

2. INTRODUCTION

2.1 Background to this Assessment Report

In 2002 the Marsim Group secured an option to purchase land within the Rosedale Urban Expansion Zone on the NSW south coast. The land was the subject of Eurobodalla Shire Development Control Plan (DCP) No. 160. EDAW Pty Ltd was appointed by the Marsim Group to lead the master planning and design phases for the replanning of the Rosedale Urban Release Area. The Release Area comprised 220 ha of moderate to gently sloping land that had been mostly cleared and was currently being used primarily for grazing.

In 2002 EDAW commissioned Navin Officer Heritage Consultants to conduct a cultural heritage assessment and surface archaeological survey of the Release Area to form the cultural heritage component of a Rosedale Urban Release Area Planning Study. This assessment included background research, comprehensive archaeological field survey, consultation with the Mogo Local Aboriginal Land Council (MLALC), participation of a MLALC representative in the field survey, and an assessment of cultural heritage significance values for all sites and features identified. This report was completed in October of 2002 (Navin Officer Heritage Consultants 2002).

Subsequent to this report, meetings were held between the development proponent and the Yuin Elders Council and the Djuwin Women's Lore Council.

The 2002 Navin Officer report recommended that a program of archaeological subsurface testing should be conducted within all of the recorded Aboriginal sites and potential archaeological deposits in which it is anticipated that development impact may occur.

Following a review of the 2002 report, the then National Parks and Wildlife Service (NPWS), now the Department of Environment and Climate Change (DECC), specified that in addition, a program of subsurface testing should also be conducted within a representative sample of the landforms present within the study area. A sampling and excavation methodology which would meet the DECC requirements for this program was developed between the consultants and Ms Julie Dibden of the Southern Aboriginal Heritage Unit (SAHU), NPWS and subsequently agreed to, in principal, at a meeting at the Department of Infrastructure Planning and Natural Resources, Sydney 5/2/2004.

A Preliminary Research Permit (PRP) was granted by the DECC on the 11 March 2004, under section 87 of the National Parks and Wildlife Act 1974 (as amended), to conduct the subsurface testing program. The program was subsequently conducted in that year.

A report of the subsurface testing program was originally prepared in June of 2004 and submitted to the (then) Department of Environment and Conservation (DEC) in July. Based on their review of that report, a revised version of the report was completed in February 2005 incorporating additional information or clarification as requested in the DEC review. A detailed response to the DEC review was provided separately to the 2005 report.

Following revision of the proposed development by Candalepas Associates, and a decision to seek concept approval under Part 3A of the Environmental Planning & Assessment Act (1979), Navin Officer Heritage Consultants was commissioned by Marsim Pty Ltd (trading as Nature Cost Developments Pty Ltd) to prepare this report. This report combines and presents the methodologies, analyses and results of the two previous 2002 and 2005 cultural heritage assessment reports, and applies this information to the Director General's Requirements for the submission of a concept approval application.

The study area for this report consists of the Bevian Road Concept Application area which consists of 187.62 hectares (including road reserves) and proposes a yield of 799 residential lots (Figure 2.1 and 2.2).

The application seeks approval under Part 3A of the Environmental Planning & Assessment Act (1979) of two specific plans, being the "Concept Approval Plans". These are:

a) a plan of the Net Developable Area – referred to as the "The Constraints Map"; and

b). an 810 lot Residential Subdivision – generally in accordance with the layout proposed by the "Plan of Subdivision".

Director General's Requirements specific to cultural heritage were:

- Address the draft *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005).*
- Identify whether the site has significance in relation to Aboriginal cultural heritage and identify appropriate measures to preserve any significance.
- Identify any other items of heritage significance and provide measures for conservation of such items.

2.2 Project Personnel

Fieldwork was conducted by archaeologists Rebecca Parkes, Matthew Barber, Lindsay Smith, Kelvin Officer and Kerry Navin. Field assistance was provided by Daniel Powell and Tom Taverner.

Lithic analysis was conducted by Mr Alex Mackay.

A geomorphological assessment was provided by Dr Peter Mitchell.

Plant was provided by MJ & D Bayley Pty Ltd and operated by Mick Bayley.

The report was written by Kelvin Officer, Kerry Navin, Alex Mackay and Peter Mitchell.

Figure 2.1: General Location of Bevian Road Concept Application Area
(Mogo 1:25,000 topo map 3rd edition)

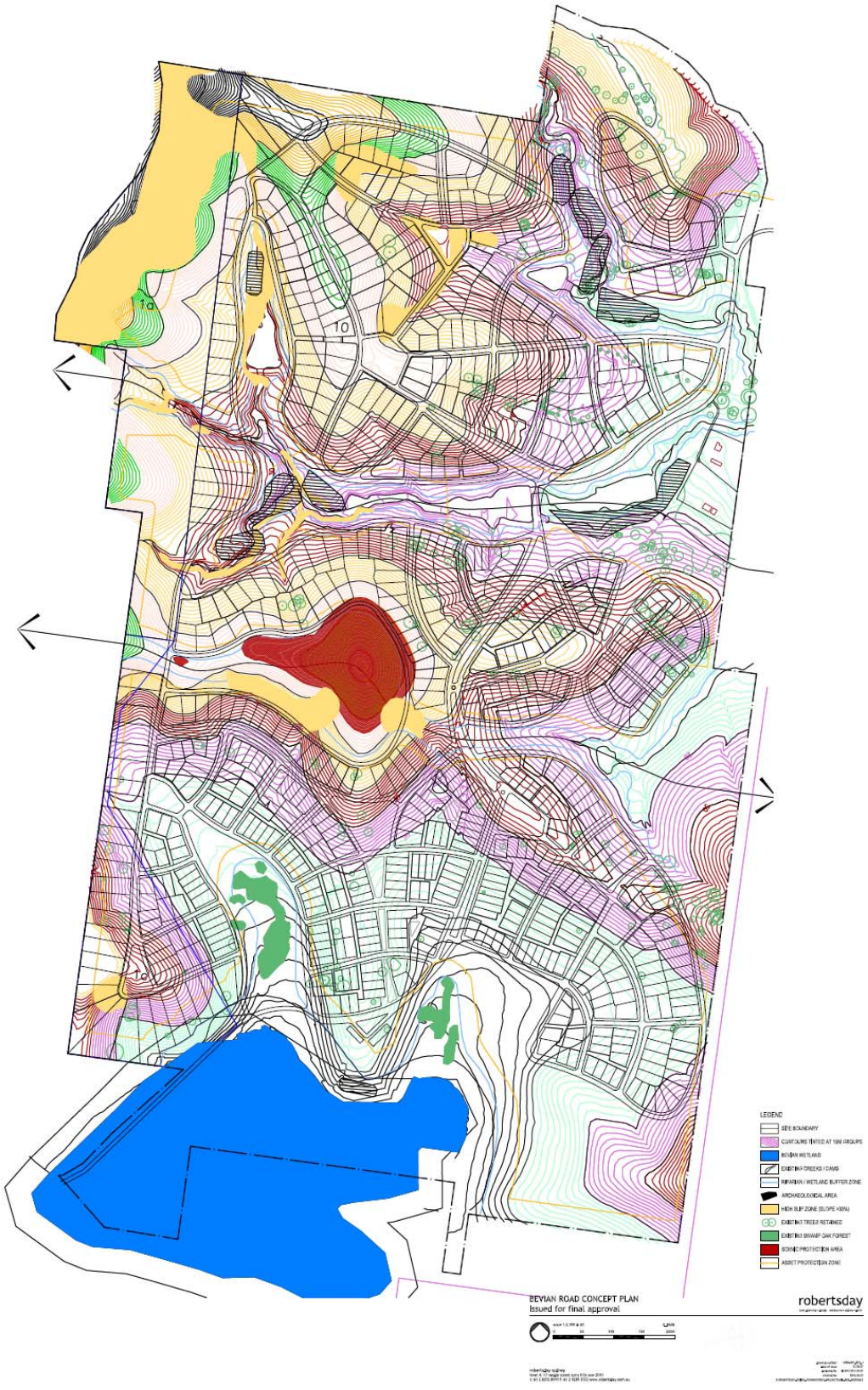


Figure 2.2: The Bevian Road Concept Plan) showing proposed layout of development areas (provided by robertsday).

3. ABORIGINAL STAKEHOLDER LIAISON, PARTICIPATION AND FEEDBACK

The Bevian Road Concept Approval study area, formerly referred to as the Rosedale Urban Expansion Area, is located within the boundaries of the Mogo LALC (MLALC). It is also situated within the area of custodial interest to the Yuin Elders Council and the Djuwin Women's Lore Council.

3.1 Consultation Relating to the Surface Survey Program (2002)

The Mogo LALC (MLALC) was contacted prior to the field survey and a representative was invited to participate in the heritage study of the area. Mr Peter Combo, representative of the MLALC subsequently joined the archaeologists in the field survey of the study area. The project was also discussed with Mr Joe Carriage and Ms Laurel McKenzie of the MLALC.

Records of Aboriginal Participation were provided in Appendix 1 of the 2002 report (Navin Officer Heritage Consultants 2002).

The recommendations arising from the assessment were discussed with the MLALC representative in the field. Copies of the archaeological report were forwarded to the Mogo LALC for review and comment. A response was commissioned from the Land Council that documented their views regarding the proposed urban release area and the results of the cultural heritage assessment. Requests were also subsequently canvassed from the Yuin Elders Council and the Djuwin Women's Lore Council.

3.1 Consultation Relating to the Subsurface Testing Program (2004)

All of the Aboriginal stakeholder groups were contacted as part of the application process for a s87 preliminary research permit from the DECC to conduct the subsurface testing program.

The Land Council was contacted prior to the subsurface investigation field program and a representative was invited to participate in the subsurface testing program.

Mr Joe Carriage and Mr Keith Nye, representatives of the MLALC, participated in the majority of the fieldwork at Rosedale. Marc Jessop, Robert Jessop and Lance Nye also represented the MLALC.

Records of Aboriginal Participation are provided in Appendix 2 of this report.

Following the production of the June 2004 version of the subsurface testing report, a full copy of the report was provided to the Mogo Local Aboriginal Land Council, the Yuin Elders Council, and the Djuwin Women's Lore Council. Subsequent to the June 2004 report, a 'plain English' version of the report was also prepared (in August 2004). The plain English report is included in this report as Appendix 8. The plain English report was also provided to the above listed three Aboriginal organisations. The client (Mr Peter Best on behalf of Marsim Pty Ltd), variously conducted a number of face to face and telephone consultations with each the three groups in association with the provision of the full and plain English versions of the report. This consultation included an invitation to provide written comment on the report findings, to provide an assessment of the Aboriginal cultural significance of the area, and any suggested management strategies.

Letters in response to this invitation were received from each of the Aboriginal organisations consulted and these are presented in Appendix 9 of this report.

In a letter dated 22 August 2003, the Yuin Elders Council responded to the results of the original surface survey assessment of the study area (Navin Officer Heritage Consultants 2002) and the PRP application. The letter states that the Council could see no problems with the development proposal 'as long as local Koori people are consulted and Koori site's officers are employed during the construction'. Following the production of the subsurface investigation report the Council provided a letter dated the 12 August 2004. The letter states that in relation to a 'Notice of Destruction' the Council requires that a Koori sites officer be in attendance for ground disturbance accompanying the

development. The purpose of this attendance is to ensure that 'all care be taken' and for the salvage of artefacts and their removal to an appropriate place within the Mogo Local Land Council area.

In a letter dated 13 August 2004, the Mogo Local Aboriginal Land Council made the following recommendations regarding the Rosedale Urban Expansion Development:

- no development to occur within the archaeological conservation areas as recommended in the Navin Officer report;
- at least two sites officers be on site during all ground disturbing works, (funded by the developer);
- the developer consider use Aboriginal names when naming the streets and reserves in the development.

The Djuwin Women's Lore Council provided two letters, the first in response to the original surface survey assessment of the study area (Navin Officer Heritage Consultants 2002), and a second in response to the subsurface testing reports. The first letter dated 25 August 2003 expressed satisfaction that proper consultation took place and that the wishes of the Mogo LALC were incorporated into the report. The recommendations made in the original report are supported. In addition the Council insist that all ground disturbance be monitored by both male and female representatives of the Mogo LALC (funded by the developer). In relation to site RUR2, further archaeological study and monitoring was recommended prior to the development. In the event development proceeds, the Council insist that impact to this site be minimal, with perhaps the provision of a buffer zone.

In their second letter dated 5 November 2004, the Council make the following comments:

- The study area is of high cultural significance (as are all Aboriginal sites) due to its proximity to Barlings Beach;
- The recommendations made in the subsurface testing report are supported by the Council;
- In addition the Council insist that as a condition of a Consent to Destroy 'any and all ground disturbance be monitored by Mogo LALC sites officer and representative at the expense of the developer';
- A recommendation is made that the developer in good faith provide for the establishment of an Aboriginal Keeping Place within the development, in consultation with the Mogo LALC.

3.2 Implementation of the DECC Interim Guidelines

Subsequent to the completion of archaeological works for this project in 2004 the Department of Environment and Climate Change issued *Interim Guidelines for Aboriginal Community Consultation – Requirements for Applicants* in 2005*.* These policy requirements relate to applications for s87 and s90 permits or consents to disturb or destroy Aboriginal objects under the National Parks and Wildlife Act 1974. The guidelines do not apply to projects where a Planning Focus Meeting was conducted prior to January 2005.

Despite the fact that the archaeological works for this project were conducted and completed in 2004 (prior to the issue of the guidelines) there is now a requirement to implement some of the requirements specified in the *Interim Guidelines*. This arises from one of the (Department of Planning) Director General's requirements for the submission of a concept approval application. This states that the application must address the draft *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation,* produced by the DECC in 2005. This policy document outlines guidelines relevant to Part 3A proposals but significantly refers back to the *Interim Guidelines* to be used as a guide when conducting Aboriginal stakeholder consultation. Although it is not specified in the *Guidelines*, that the actual procedures defined the *Interim Guidelines* must be followed, it is conventionally assumed that where possible, this is the intention of the document referral.

The *Interim Guidelines* were implemented for this project as follows:

Letters were sent to the following organisations with an invitation to register as an interested party:

- Mogo Local Aboriginal Land Council
- The Secretary - Register of Aboriginal Owners, Department of Aboriginal Affairs
- The Secretary - Native Title Services
- The Secretary - Eurobodalla Shire Council (ESC)
- Executive Director Operations - Department of Environment and Climate Change

Advertisements were placed in the following newspapers inviting registration from interested Aboriginal groups and individuals in relation to this project:

- Koori Mail
- The Bay Post – Moruya Examiner

Responses were received from:

- Ron Nye, Aboriginal Sites Officer with Eurobodalla Shire Council. Mr Nye indicated that the Council 'do not wish to register as an interest group as this Development was on file in this office' (correspondence ESC to Navin Officer 28 June 2007).

- Megan Mebberson, Senior Project Officer, Office of the Registrar, Aboriginal Land Rights Act. Ms Mebberson indicated that the subject land had registered Aboriginal Owners pursuant to Division 3 of the Aboriginal Land Rights Act 1983 and that the registered Aboriginal Owners elected two Boards of Management (BoM) who represented Aboriginal Owners in the wider study area and should be consulted with regards to [the Rosedale] project.

  The reference to registered Aboriginal Owners by the Office of the Registrar does not relate specifically to the Bevian Road study area, but rather to land situated elsewhere within the Eurobodalla Shire (which served as the search area for the inquiry.

No other formal responses or registrations of interest were received. Given that no Aboriginal stakeholders sought registration as a consequence of the *Interim Guidelines* procedure, the conduct of the *Interim Guidelines,* to the extent that they are compatible with Part 3A proposals, were deemed to have been completed.

Mr Peter Best (on behalf of Marsim Pty Ltd) has continued to consult with local Aboriginal stakeholder groups throughout the Rosedale/Bevian Road project.

Correspondence from the Mogo LALC to Peter Best (29 March 2007) indicates support for the recommendations contained in the Navin Officer 2006 review of the proposed subdivision at Rosedale relative to the known cultural heritage constraints.

Correspondence from Mr David Tout (Yuin Elders Council) to Peter Best (24. May 2007) indicates that the Yuin Elders see no reason to oppose the development under its present state. In follow up consultation, David Tout advised that the Yuin Elders Council was no longer functioning and that the seal had been returned.

Correspondence from Mary Duroux (Djuwin Women's Lore Council) indicates that the Council were satisfied that 'the current subdivision proposal provides better potential to avoid direct impact to known Aboriginal sites and establishes a more effective management regime for their management. Consultation with Mary Duroux is consistent with the suggestion by Megan Mebberson to consult with Aboriginal Owners.

Copies of correspondence referred to above are provided in Appendix 10.

4. ENVIRONMENTAL CONTEXT

4.1 Site Description

The Bevian Road Concept Plan Area consists of an approximately 174 ha rectangular portion of the immediate coastal hinterland northeast of Tomakin at Rosedale, on the New South Wales South Coast. (Refer Figure 2.1). The land includes Bevian Swamp (SEPP 14 Wetland No 197 - Bevian Wetland), a wetland basin and surrounding flats, at the southern end, and extends northward for two kilometres to include a series of generally east-west orientated low to moderately graded interfluve spurlines and upper tributaries. The northwestern boundary of the study area approximates the crest of the watershed ridgeline between the catchment of the Tomago River that drains to the west, and Saltwater Creek that drains to the east. The highest point in the study area is situated on the watershed at the northwestern corner of the study area, at an elevation of around 120 m AHD. The lowest point occurs within the Bevian Swamp basin, at less than 2 m AHD.

The northern half of the study area falls within the upper catchment of Saltwater Creek, which drains eastward to Rosedale Beach, some 1.5 km downstream. The southern half generally drains south into the Bevian Swamp basin. The swamp is a permanent source of freshwater except in extended dry periods. The basin is known to have dried up 10-15 years ago when it was used for grazing (pers. comm. Bill Mann 19/7/2002). The wetland is valued as a source of eels and is commercially fished. In prehistory this zone would have been a rich source of fish, bird and plant resources for the local Aboriginal inhabitants.

The wetland basin has formed behind a major Holocene sand barrier that extends to the south of George Bass Drive. The current seaward edge of the barrier forms the embayment of Barlings Beach – a sandy shoreline sheltered at either end by the rocky promontories of Barlings Island and Melville Point. Bevian Swamp has an intermittent overflow at its southwestern end into a minor tributary that traverses the barrier and currently discharges at the eastern end of Barlings Beach.

Bedrock geology in the study area is the Wagonga Beds, a complex turbidite sequence of phyllite, chert, quartzite and inter-bedded basic volcanic rocks with tight folds, well-developed cleavage and minor faults. Exposures on the coastal rock platforms and road batters show near vertical beds with strikes in the range 155^{o} to 180^{o} magnetic (Figure 4.1). The age of the rocks ranges from late Cambrian to early Ordovician (Bischoff and Prendergast 1987, Etheridge *et al*. 1973). The coastal rock platforms and headlands are structurally controlled features but there is no obvious structural control in the topography of the Rosedale area. It should be noted that the mapping of these beds on the Ulladulla 1:250,000 geology sheet is unreliable. Rock outcrop within the study area is confined to deeper creek sections and limited exposure of more resistant features such as quartz veins on ridge crests. Some of these veins have been prospected for gold and remnants of shallow excavation are evident.

The Bevian Swamp basin and its fringing lowlands have formed on Quaternary sediments. It is probable that these include former estuarine sediments at depth, which grade to freshwater facies towards the surface, and variably interface with the marine and aeolian sand deposits of the Holocene barrier. Prior to the formation of the barrier, the Post Glacial Marine Transgression would have extended the former shoreline to the edge of the bedrock slopes which now form the northern, eastern and western margins of the swamp basin. As a consequence, a small coastal embayment would have occupied the current Bevian Swamp basin, with small headlands at the ends of the descending spurlines. There is now, however, no obvious remnant fossil-shoreline morphology along this contour. The sea would have reached this area at around 6000 years ago when the sea level stabilised at approximately its current level. From 6000 years ago an offshore coastal barrier is likely to have developed, probably extending from the bedrock slopes to the east, and consequently formed an estuary behind it. This developed, through infilling, into the freshwater basin present today. The shoreline would have prograded southward from the original barrier, through episodic depositional events, culminating at around 3000 years ago with a shoreline at approximately the current position (McKeown 1990).

Quaternary sediments also occur as narrow and linear valley floor deposits along most of the tributary streamlines in the study area. These have the appearance of alluvial and colluvial sediments deposited in terrace and fan formations.

4.2 Landform Units

For the purposes of selecting test pit locations across a representative sample of the landforms within the study area, the following landform units were recognised. The location of these units is shown in Figure 4.1.

Landform Unit	Description/comments
Watershed ridgeline crests	The low gradient ground on the crest of the main watershed ridgelines
Spurline crests	The low gradient ground on the crest of all other spur and ridgelines. This unit overlaps with basal slopes in some locations
Middle and upper valley slopes	Sloping ground situated between crests and basal slopes, including moderate or high gradients on crests
Basal slopes	Low gradient slopes and locally elevated ground adjoining the valley floor and creek/swamp flats
Valley floor	Generally low gradient or level ground making up alluvial landforms on the valley floor (flats, terraces etc, including streamlines, wetland basins and poorly drained ground

4.3 Vegetation

The study area is dominated by agricultural grasslands. Small and mostly discontinuous areas of sparse woodland and remnant forest also occur as a minor vegetation component. A small area of remnant Eucalypt forest vegetation occurs on steep gradients on the western margin of the study area. Remnant forest trees and regenerating Eucalypt open forest also occurs as a discontinuous narrow margin along some tributary streamlines. The riparian margin around Bevian swamp includes remnant and regenerating *Eucalypt*, *Casuarina* and *Melaleuca* forest. Vegetation on and around the swamp is in good condition and although the water level was low because of current drought conditions the swamp supported a high population and variety of water birds.

4.4 Landuse

The study area has been subject to the following landuse impacts and types of ground surface disturbance:

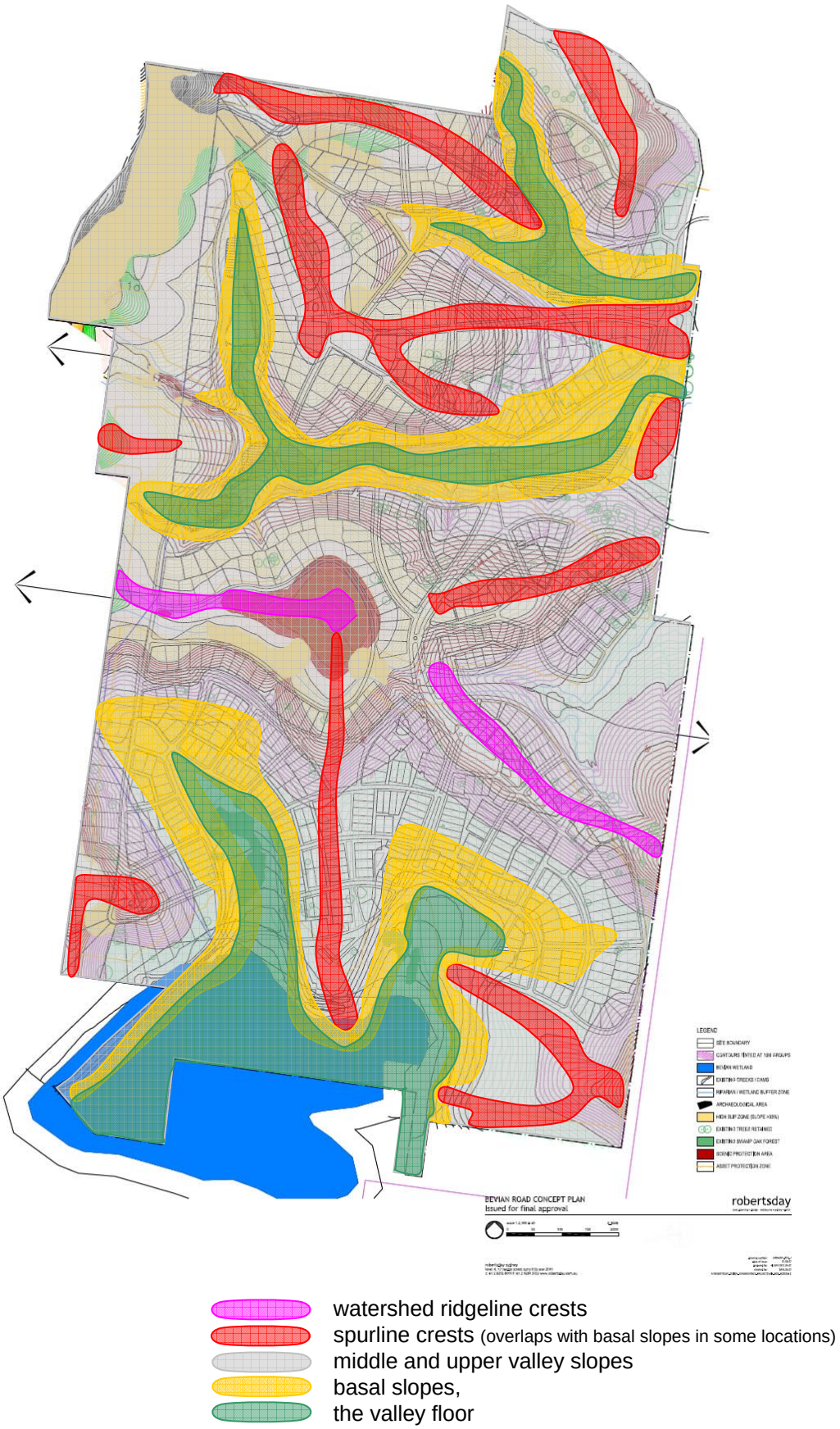
- late nineteenth century and twentieth century clearance of native forest vegetation
- road and track construction
- fence construction
- limited nineteenth century agricultural cropping on the valley floor
- limited gold prospecting
- drainage of flood prone flats
- establishment of introduced pasture grasses for dairy cattle

- widespread erosion and topsoil and subsoil disturbance from rabbit infestation and eradication practices (including warren formation and destruction)
- disturbance from wild pig foraging
- construction of agricultural dams
- limited areas of flower cultivation (latter twentieth century)
- construction of underground service easements (1980s water main and telecommunication cables)
- construction of successive overhead powerline easements

Such disturbance activities are common on most rural lands in NSW and in this case have not been so great that they would destroy any Aboriginal archaeology except where soil has been excavated along roads, within dams, and along pipeline or cable trenches.

Plate 4.1 General view of Bevian Swamp at the southern end of the study area, looking east (2002).

Plate 4.2 General view of the southern portion of the study area, looking west from the eastern boundary (2002).



watershed ridgeline crests
spurline crests (overlaps with basal slopes in some locations)
middle and upper valley slopes
basal slopes,
the valley floor

Figure 4.1 Landform units within the Rosedale Urban Expansion Zone, (2004 masterplan) as identified for archaeological sampling (boundaries are approximate and subject to confirmation).

5. ARCHAEOLOGICAL CONTEXT

5.1 Regional Overview

The New South Wales south coast and its hinterlands have been the subject of extensive archaeological research over the last thirty years, much of it concentrated along the coastline and estuaries. This includes excavations of Aboriginal sites, mainly shell middens and rock shelters, and detailed and systematic regional surveys.

The majority of archaeological sites located in this region date to the last 6,000 years, when sea levels stabilised to approximately the present level (the Holocene stillstand). Sites older than 6,000 years are rare, as most sites dating to this period were submerged by the rising seas. Two coastal sites, Bass Point and Burrill Lake, provide evidence of Pleistocene Aboriginal occupation dating to 17,000 and 20,000 BP (Before Present) respectively. Prior to the rise in sea levels these sites would have been located some 14 km inland.

In a review of South Coast coastal and hinterland sites with radiocarbon dates, Boot documents seven sites with dates of Pleistocene ages, and a further 56 with later ages. The earliest date in over 80% of sites is less than 4000 BP and younger than 2000 BP in over half (Boot 1996).

The broad region around Batemans Bay/Rosedale has been the subject of numerous archaeological investigations and surveys undertaken by both professional archaeologists and students of the Australian National University (ANU).

On the northern side of Batemans Bay a large number of sites have been recorded within and adjacent to the Cullendulla Creek estuary and its associated sedimentary flats (Farrington n.d., Coates 1989, Boot 1990, Navin 1994). This regional suite of sites includes coastal and estuarine middens, as well as open artefact scatters situated on adjacent spurline crests. The known site distribution around Cullendulla Creek indicates that the crests and basal slopes of spurlines, which are adjacent to, or dissect valley floor sediments, have considerable archaeological potential within the immediate coastal hinterland. Other investigations conducted north of Batemans Bay include Feary (1991), Hall (1988), Knight (1996), Lance (1986, 1987), Navin and Officer (1997) and Williams (1992).

To the south of Batemans Bay surveys and investigations have mostly been development-driven and include assessment of road corridors, proposed urban areas, sewage treatment plant sites and service easements. Studies have been conducted by Appleton (1995), Barber (1995, 2003a and b), Barber and Williams (1997), Barz (1979), Gollan (n.d.), Hughes (1983b, 1984),Kuskie, (1995, 1996), Lance (1984, 1988), Navin (1995), Officer (1997, 1998), Navin Officer Heritage Consultants (1999), Officer and Navin (1995), Officer (1997, 1998), Pardoe (1987, 1991a & b) and Winston-Gregson (1991).

Barz (1979) located three isolated finds and three open artefact scatters in the course of a survey of the route of a proposed 66kV transmission line from Mossy Point to Batemans Bay.

Hughes (1983b) conducted a survey of the proposed extension to George Bass Drive from Glenella Road south to near Lily Pilly. One site, a small artefact scatter (NPWS Site #58-4-152) comprising a quartz core and three silcrete flakes, was located on the bank of Short Beach Creek. The site density was estimated to be about 1/10 m^2 (0.1/m^2). Fractured quartz pieces at a density of about 1/m^2 were also noted but no definitive human flaking was noted.

A cranium, presumably from a disturbed Aboriginal burial, was found at Corrigans Beach, however the source of the skeletal material remains unknown (Pardoe 1987).

Lance (1988) surveyed a proposed residential subdivision area between Vista Avenue and Glenella Road and located two isolated finds and one site (NPWS Site #58-4-626), an artefact scatter comprising a broken backed blade (fine grained siliceous) and a flaked piece (quartz porphyry beach

pebble). The site was located 'on a gentle slope beside a small ephemeral creek which flows into marshland draining into Joes Creek' (Lance 1988:6).

Archaeological investigations by Boot, including survey recording predominantly north of Batemans Bay has provided information on 410 open artefact scatters, 1 midden and 294 isolated finds (Boot 1994).

A 1 x 1 m pit excavation conducted by Boot (1994, 1996), within a large open site known as 'PK20' in the lower Buckenbowra Valley revealed occupation deposits dating to 4000±580 BP (ANU-8762) (Boot 1994, 1996, 2002). This date is based on a radiometric determination from 'diffuse charcoal' recovered from spit 8 of the excavation. Boot associates this age with the basal occupation of the site and cites it as further evidence for the occupation of the South Coast hinterland since the mid-Holocene. Site PK20 is located approximately 15 km northwest of the Rosedale study area.

Boot has concluded from his investigations of the South Coast hinterland that the favoured areas of Aboriginal occupation were the major river valleys and broad well watered ridgelines of the forested ranges. He found that most hinterland open sites are small and probably represent short-term campsites. Larger sites which probably represent repeated occupation for long periods were found to occur in areas of high resource availability, such as the river valleys (Boot 1994:337). Occupation of these areas seems to have been based on the efficient use of local resources, with little evidence for long distance movement of stone resources. Boot theorises that occupation of the hinterland during the Pleistocene was probably widespread but sparse. The rate of occupation may have decreased in the early Holocene and become widespread and 'very dense' during the last 4000 years, and particularly from 3000 BP (Boot 1994:337).

Officer and Navin (1995) surveyed the road construction envelope for an arterial road between the Princes Highway and Batehaven Bypass road, immediately south of Batemans Bay township (the South Batemans Bay Bypass). The study area was approximately 32 ha and consisted of coastal hinterland ridgeline crests and basal valley slopes adjacent to the Joes Creek valley floor. Four Aboriginal sites (open artefact scatters SBB1-4) and four Isolated Finds (IF1-4) were located in the course of the survey. Three sites were located on basal valley slopes fringing the flats of Joes Creek and one site was on a low knoll and adjacent ridge crest saddle. Artefacts were collected from these sites in 1997 (Officer 1997).

Navin (1995) identified a low density, dispersed artefact scatter comprising four artefacts, Ridge Road 1, at the intersection of The Ridge Road and Burri Road in the course of a survey of the intersection in 1995. Subsequent survey of an approximately 1600 m long easement extending from just east of the Burri Road intersection through to George Bass Drive at Malua Bay located an additional artefact scatter (Ridge Road 2) on a hinterland ridgeline crest and associated slopes at approximately 90 m AHD (Officer 1998).

5.2 The Rosedale Area

To date around 100 Aboriginal sites are listed on the DEC Aboriginal Heritage Information System (AHIMS) as occurring in an 82 km^2 area around the Bevian Road Concept Plan Area. Site types include middens (60%), artefact scatters (27%), isolated finds (5%), scarred trees (5%) and burials (3%).

Typically for a coastal area, (shell) midden deposits are the most common site types to have been recorded. These sites are generally limited to the coastal and estuarine zone. Further inland, scatters of stone artefacts (sometimes referred to as open campsites) are the most commonly occurring Aboriginal site types.

Possibly the earliest archaeological survey conducted in the Rosedale area was carried out by Sullivan in 1974 as part of a survey for Aboriginal sites along the stretch of coastline from Bermagui in the south to Durras in the north and west to Majors Creek (Sullivan 1976, Sullivan & Gibney 1978). Two hundred and eleven sites were located during the survey (which was biased towards coastal areas), including

'many minor relics such as shield or canoe trees, localised surface campsites and axe grooves as well as stratified occupation deposits such as extensive open shell middens and occupied rock shelters' (Sullivan & Gibney 1978:197).

It appears that Sullivan recorded a number of sites in the vicinity of Rosedale in the course of this survey; however minimal locational data is available for these sites. The data is limited to dots on a large-scale map in the published articles (Sullivan 1976, Sullivan & Gibney 1978) and a few words on the DEC Aboriginal Site Cards. Sullivan's sites do not occur in the Urban Release study area.

It is interesting to note that Aboriginal middens on the NSW south coast were first documented in the late nineteenth century by the Geological Surveyor William Anderson (Anderson 1890). He described the shorelines of bays and estuaries along the south coast as very irregular, consisting of deep bays, sandy beaches and rocky promontories and he noted that shell heaps occurred more frequently on the promontories and beaches than on the steep shores (Sullivan 1983:81).

Anderson observed that shell heaps were associated with the availability of molluscs and that on long narrow promontories the entire surface was covered with midden shells to a variable depth, while distinct heaps of shells were present on sandy spits.

In 1995 Appleton undertook an archaeological survey of the margins of the Illawong Sand Quarry, approximately 4 km southwest of the present study area. This area comprised a back barrier sand dune zone mid-way between Waldrons Swamp and Bengello Beach. Within an area of approximately 9.2 ha Appleton recorded four sites including two isolated finds ('Illawong 1a and 1c'), a large extended artefact scatter containing hundreds of artefacts ('Illawong 1b') and a cluster of three knapping floors (('Illawong 1d'). These exposures were seen to be potentially linked as components of a single discontinuous artefact scatter (Appleton 1995:22). Artefacts included cores and flakes manufactured from chalcedony, quartz, quartzite and silcrete. Kuskie (1995), in another survey on the same sand body, recorded two isolated finds and a scatter of two artefacts on low dune ridges.

Barber (1995) located one artefact scatter and an isolated find during a survey of a gravel extraction area west of Longvale Swamp. The artefact scatter was situated on a 'slight rise above the edge of the wetland' (Williams Barber 1997:15).

No Aboriginal sites were identified by Kuskie in 1996 during a survey for a proposed subdivision near Mossy Point. The surveyed area was 22 ha.

In 1999 Navin Officer Heritage Consultants conducted a cultural heritage assessment for the proposed widening of Princes Highway from Mogo to Moruya, about six kilometres southwest of the present study area. A small artefact scatter and an area of potential archaeological deposit (PAD) were identified in the road corridor. The artefact scatter was located on a low ridgeline about 700 m north of Waldrons Swamp.

5.2.1 Barlings Beach

Barlings Beach, located immediately to the south of the present study area (south of George Bass Drive), has, since the early 1980's, been the subject of a number of archaeological assessments and an anthropological study.

In 1981 Klim Gollan examined the route of a proposed sewerage scheme for the Broulee, Mossy Point, Tomakin area. He identified several exposures of cultural material in the Barlings Beach area, including midden shell, stone artefacts, and a piece of human skeletal material. Lance (1984) conducted a subsequent survey of the sewerage scheme to locate and record the sites found by Gollan. Colin Pardoe (1991) documented an Aboriginal burial from the area – the remains were of a female about 30 years of age who had been buried some 900 years previously. (The burial was associated with probable grave goods and was about one metre below ground level). There are a number of other reports of human skeletal material being unearthed in the Barlings Beach area.

Winston-Gregson (1991) conducted a reconnaissance survey of the Barlings Beach area in order to identify archaeological sites in relation to a proposed subdivision. He noted midden material in most ground exposures in the area. He identified a difference in the sites compared to the middens on the

Tomaga River. The Barlings Beach middens were shallower than those on the river, which were up to 1m deep. He suggested this was because people were using Barlings Bach in a different way, where they were just eating meals over a number of different days and therefore forming scattered middens.

In 1996 Sue Wesson conducted an anthropological investigation relative to the nomination of Barlings Beach as an "*Aboriginal Place*" under the NPW Act (Wesson 1996). This study principally involved conducting and transcribing oral histories from local Aboriginal families. Her study found that there were a number of stories associated with the general Barlings Beach area including the possible presence of the following site types:

- ceremonial ground/initiation site
- Inter tribal meeting place
- Marriage arrangement place
- Food increase ceremony site
- Pre-contact burial site
- Inter tribal battle site
- Pre-contact camp site
- Tool preparation site
- Post-contact camp site
- Post-contact burial site (Wesson 1996:58-60).

No precise locations were provided for any of the ceremonial grounds except for a potential initiation site on Barlings Island. The other activities could have occurred anywhere in the general area of Barlings Beach, including the caravan park and possibly Tomakin. The study also found that the main Aboriginal camping areas in the more recent historic times were behind the foredunes in the south eastern section of the area.

In 1997 Williams Barber Archaeological Services conducted a detailed archaeological investigation of a 47 ha area at Barlings Beach defined by George Bass Drive, the beach, the north-south fenceline of Barlings Beach Caravan Park and Red Hill Parade. The study included surface surveys and subsurface testing (126 holes arranged within a 50 m x 50 m grid), and revealed that Aboriginal cultural material was present throughout much of their Barlings Beach study area. The material was 'generally spread throughout the study area but there were areas of significantly higher concentrations, which indicate a preference of certain areas for campsite locations' (Barber & Williams 1997:33). Higher concentrations were found to occur along the creekline and in the northern part of the study area. The most common lithic raw material was quartz, while silcrete, volcanics, quartzite, rhyolite, chert and meta-sedimentary material were also identified in the assemblage.

Fifteen shell species were identified in the midden material, comprising nine rock platform species, three estuary/rock platform species and three estuarine only species. Midden material was found to be scattered across the whole study area. There were no large concentrated bands of shell but rather isolated concentrations of midden, mostly along the creek and to a lesser extent in the central part of the study area.

Barber and Williams concluded that, based on the results of their subsurface testing program, the caravan park which formed the eastern boundary of their study area was probably the prime location of prehistoric Aboriginal occupation, however all the occurrences of cultural material found during their investigation formed 'one large site within the sand flats, with differing concentrations' (ibid:34).

Some of the area was heavily disturbed, however the authors considered that 'the association between prehistoric and historic Aboriginal sites is rare and it is argued that additional protection in the form of Aboriginal Place declaration is warranted' (Williams Barber 1997).

The recommendations of the Williams Barber report were partly acknowledged by the DEC and the Service subsequently declared a part of the study area as an Aboriginal Place. The gazetted area, encompassing the highest density of archaeological middens and artefacts along the creek and extending into the central portion of the study area.

In 2003, Barlings Beach Community proposed to develop the areas adjacent to the declared Aboriginal Place. The DEC deemed that additional archaeological assessment was required and as a consequence Matthew Barber was contracted to conduct more extensive archaeological investigations (2003a and 2003b). This took the form of 630 mechanical auger holes and 44 hand excavated pits, situated 10 m apart along traverses arranged along an extension of the original 50 x 50 m grid pattern. The analysis involved data from a total of 800 new or previously conducted test holes. In brief the results of the investigation were as follows:

- 302 holes (39.7%) contained shell midden material, with 16 different shell species represented
- 16 different shell species were represented. The most common were oyster and mud whelk, probably sourced from the Tomaga River. A range of other species probably came from the rocky shore.
- Oyster and whelk where more common in the upper deposits. There was also more shell found in the upper 30cm than in the lower levels.
- Shell middens were concentrated to some degree close to the creekline, although there were also other areas of concentrated shell midden. This indicated that people were prepared to carry their food up to a kilometre in order to consume it next to the creek.
- The creek was considered to have been a focus for Aboriginal occupation.
- 32 test holes contained bone material. Two contained fish, and a number of the bones were clearly rabbit. However, kangaroo/wallaby, lizard and possum were also found showing that people were eating a broad range of food.
- 238 of the test holes (31.3%) contained a total of 986 artefacts. At least 10 different raw materials were identified along with a range of artefact types. Utilised or retouched tools accounted for about 3% of the total.
- Like shell, there appeared to be a change in the use of raw material through time, with quartz more common in the upper levels than the porphyritic volcanic and silcrete artefacts.
- Silcrete and porphyritic volcanic rocks were found to be the preferred material for making retouched and utilised artefacts. This suggested that other materials were used for more general flaking.
- The investigation identified several locations where artefact manufacture and tool maintenance were carried out.
- Stone artefact distribution was heavily concentrated along both sides of the creekline. Very few were located within the central part of the development area.
- Three dates were obtained from the shell within the excavations. The most recent was about 540-670 years old (953$\pm$45 BP Wk 12416), another was 1220-1390 years old (1715$\pm$47 BP Wk 12417) and the oldest was 2080-2280 years old (2979$\pm$50 BP Wk12415). The latter is one of the older dates recorded in this part of the South Coast and demonstrates a long occupation by Aboriginal people of the Barlings area.

The investigation by Barber found that although a large part of the study area contained archaeological material, there were differences in value in terms of research potential for these areas. Management recommendations were provided that sought to preserve the most important elements of the archaeological sites in addition to the declared Aboriginal Place area. Salvage excavation was recommended for additional areas outside of proposed reserves.

Following Barber's findings, the DEC commissioned Kamminga to review the findings of the previous Barlings Beach archaeological investigations (Kamminga 2003). Kamminga presented an argument which supported a more inclusive conservation strategy for the area. This rested primarily on the status of the area as a cultural landscape, situated on a rare and surviving example of a calcareous

sand body. Kamminga argued that the calcareous nature of the deposits would be more likely to conserve archaeological material.

5.3 Aboriginal Site Location Criteria

Most of the Aboriginal archaeological sites recorded along the NSW south coast and immediate hinterland occur at the boundaries of several ecological zones. This suggests that a key factor in site location was the efficiency of resource access and the optimum exploitation of more than one resource zone. Access to fresh water is often an important site location criterion, and many sites in this area are situated adjacent to creeks. Food resources associated with wetlands would also have been very important.

Available evidence points to a definite preference for locally elevated and well-drained ground. The large proportion of sites recorded as occurring in these contexts seems to reflect a cultural preference for areas away from low-lying, probably flood prone zones.

Based on the local and regional site database, Aboriginal settlement models, and the results of studies both in the Batemans Bay/Rosedale area and elsewhere on the NSW South Coast, the following predictive statements regarding Aboriginal site location can be made for the Rosedale Urban Release Area:

- With the exception of resource-rich Bevian Swamp located in the southern part of the area, the Rosedale Urban Release Area represents a comparatively marginal coastal hinterland landscape.

- The concentration of Aboriginal occupation (both prehistoric and historic) and resultant deposits of cultural material in the Barlings Beach locale has ramifications for the Aboriginal archaeological potential of the Rosedale Urban Release Area. The Barlings Beach sites indicate that, although all landscape units were exploited by Aborigines in prehistory, longer-term, large campsites in the Rosedale area appear to be concentrated along the immediate coastal margin.

- Small sites may occur at varying densities in all broad topographic zones in the study area. However a range of micro-topographic variables can effectively predict topographies which are archaeologically sensitive. These include: relatively level ground without significant surface rock, proximity to a freshwater source, and locally elevated and well-drained ground.

- Sites will tend to be situated at, or close to, ecotones – the areas at which different environmental zones meet (for example around Bevian Swamp, near creeklines).

- Artefact scatters (also termed open campsites) are most likely to occur on level, well-drained ground adjacent to sources of freshwater and wetlands. They are likely to be the most common site types within the Rosedale Urban Release study area.

- Isolated finds can occur anywhere in the landscape and may represent the random loss or deliberate discard of artefacts, or the remains of dispersed artefact scatters.

- Burial sites are generally found in landforms characterised by a relatively deep profile of soft sediments such as aeolian sand and alluvium. Burials on the NSW south coast characteristically occur in the deposits of occupation sites such as middens. Burials have been found at Barlings Beach and the presence of burials in the study area cannot be discounted in the sandy deposits around Bevian Swamp.

- Scarred trees may occur in all topographies where old growth trees survive, either as isolated trees or as part of remnant or continuous forest.

- The survival of open sites dating to the Pleistocene and early Holocene appears to be rare. Those that have been located are characterised by a rapid sedimentary regime and subsequent protection from erosion by burial.

5.4 The Bevian Road Concept Plan Area

Prior to the conduct of the 2002 surface archaeological survey, no Aboriginal sites had been previously recorded as occurring within the Bevian road concept plan area.

6. HISTORICAL CONTEXT

6.1 Regional Overview

The discovery of Australia's eastern coast by Europeans began with James Cook's voyage of 1770. His ship passed the stretch of coastline near Rosedale in April 1770 – at dawn of April 22 they were abreast of Mount Dromedary and subsequently passed Montague Island which Cook mistakenly thought was part of the mainland and named it Cape Dromedary. That afternoon the ship passed what Cook described as an 'Open Bay wherein lay 3 or 4 Small Islands', naming it Bateman Bay on his chart, 'in honour of Nathaniel Bateman, Captain of the *Northumberland*, a ship in which Cook had served as master' (Pleaden 1990:4).

Although early colonial Governors Phillip and Grose were too preoccupied with matters at Port Jackson to consider exploration of the southeast coast, apparently as early as 1794 there were reports of people taking fishing and sealing trips as far south as Bateman Bay (Pleaden 1990:10).

South coast exploration really began in December 1797 when George Bass left Sydney and travelled south in a whaleboat with six other seamen. Bass passed Batemans Bay around noon on December 15th. On his return, Bass' account of the south coast stressed the lack of suitable harbours (except Jervis Bay) and the absence of rivers with navigable entrances, and settlement of the region was effectively deferred in preference for the Hawkesbury and Hunter Valley areas (Pleaden 1990:20).

Cook's initial disinterest in Batemans Bay, Bass' passing of the bay almost without comment, an incident in 1808 when three men in a watering party from a small vessel '*The Fly'* were killed by Aborigines at Batemans Bay, and the difficult bay entrance gave the bay a bad reputation. This resulted in a lack of exploration of the bay for many years.

In 1822 Alexander Berry, a wealthy trader, sailed south from Sydney and, after travelling up the Clyde River, sailed south from Batemans Bay for about twenty miles. On their return, his party attempted to 'enter an opening - seven or eight miles to the southward of the Bay' but were prevented by a receding tide. This was the entrance to the Tomaga River. They landed outside the mouth of the river and 'walked inland, finding a salt lagoon extending back into the hills' (Pleaden1990:45).

In 1827, Thomas Florance, Assistant Surveyor, was instructed to make a trigonometric survey of the coastline south of Jervis Bay. He surveyed Batemans Bay in June and further south he named Burrewarra Point, Tomaga River and Broulee. His work, which resulted in the proclamation of the County of St. Vincent in 1829, accelerated the movement of white settlers to this part of the south coast.

By 1837 the township of Broulee was listed as 'Browley' or 'Browlee' rather than Bhrouhlee as Florance had named it, and the town and Broulee Island were surveyed for future streets. In 1838 Broulee, Ulladulla and Kiama were defined as the official market outlets to the south of Sydney (Warry 1991:9).

By the early 1840's timber cutting and clearing was well underway in the region. Broulee had become a popular port for shipping but '1841 saw the safety of the port as a harbour being questioned, when a schooner, the *Rover* was wrecked near Candlegut Creek' (Johnson 1980:26). Despite an Australia-wide depression during 1840 Broulee continued to prosper – the first town blocks were sold, a post office was opened and the Broulee Police District was proclaimed. Broulee had a white population of 46, two stores and an inn (Wesson 1996:54). However by 1850 the white population of Broulee was down to one and although vessels continued to call at the harbour through the 1860's the harbour was effectively destroyed in 1873 when the spit of land between the mainland and Broulee island

was cleared and the sea breached the spit (Warry 1991:31). All lots were withdrawn from sale at Broulee township in 1881. By 1926 Broulee was a 'ghost town'.

The earliest European settlement adjacent to the study area lands were Richard Barling's 1863 selections on the dune fields and flats behind Barlings Beach (Portions 5, 6 & 7 Parish of Bateman). Figure 6.2. The Barling's farmhouse was located just outside of the northeastern corner of this selection, at approximately the current location of the sewerage treatment works ponds, just north of the present George Bass Drive (Portions 5, 6 & 7 Crown Survey Plan 1863 (379.787), Parish of Bateman, County of St Vincent). This building, or one in approximately the same location, was later lived in by Laurie Innes and included farmland which extended into the study area (pers. comm Bill Mann 19/7/02).

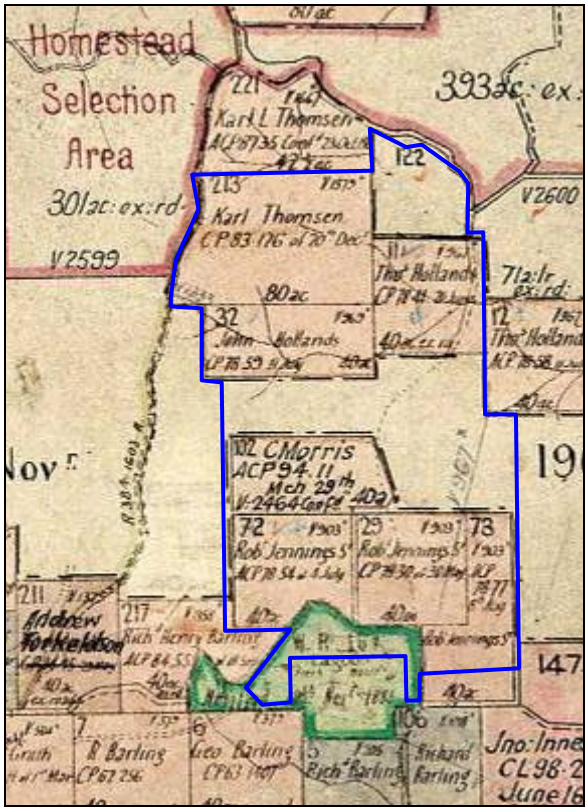
Alluvial gold was discovered at Mogo Creek in 1857, and by 1871 between forty and fifty men were working the gravels of the valley floor. Mogo evolved from a village of huts and tents to a township in the late 1860's with three stores, a school and thirty two hotels or wine shanties (Warry 1991:17). The Mogo Gold Field was declared in August of 1870, the boundary of which extended to the western edge of the study area. Shaft mining followed, and exploitation of the reef continued into the first decade of the twentieth century. By 1913 all the Mogo and Bimbimbi mines had closed (NSW HO & DUAP 1996b:171).

The village of Tomakin grew at the mouth of the Tomago River to accommodate workers at sawmill processing timber from the Mogo Forest. This settlement had a small shipyard that built wooden ships (Warry 1991:32). Shipping activity continued from Tomakin and Broulee through the 1890s.

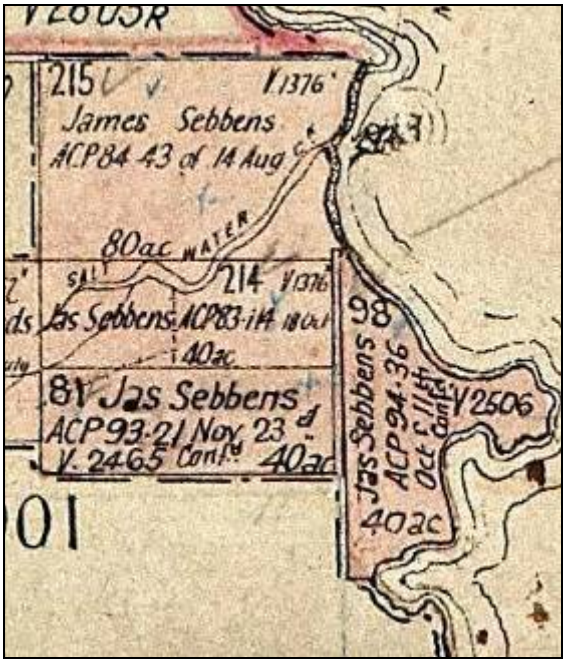
By the 1880s dairy farming was emerging as an important local agricultural industry in parallel with the forestry industry. The creation of pastureland for dairy cattle further promoted the clearance of forest vegetation on freehold and conditional purchase selections. Valley floor blocks were preferentially selected for this purpose, leaving the steeper country forested. The alienation of Crown lands was in relatively small portions, typically from 40 to 80 acres, following the philosophy of the Robertson Land Acts, which attempted to provide lands for small selectors. However, many of the original selectors failed to complete their conditional purchases and freehold title was gained by better-funded individuals and larger or adjacent property holders. These larger farms supported a series of local private dairy and cheese factories, each with small provider catchments, some working in opposition to each other. Some local cheese factories operating in the first half of the twentieth century were located at Rosedale (within the present study area – refer below), on Dunns Creek (Woodlands), and Runnyford (Buckenbowra River).

The first permanent white settler at the present location of Rosedale is said to have been James (Jimmy) Sebben, who was born in Tomakin, one of a large family, and married a Thomsen (pers. comm. Ian Harrison 6/8/02). Sebben took up 200 acres of land under Conditional Purchase around the Rosedale Beach hinterland and the lower reaches of Saltwater Creek in the early 1880. Figure 6.2. His occupation of these lands is likely to have been considerably earlier however, possibly in the early to mid 1870s. This is indicated by Thomas Holland's adjoining and upstream selections that were made in 1878 and were less desirable than Sebben's lower catchment lands (refer section below). Sebben commenced dairying and cropping on his selection and became a highly respected local breeder of pigs, dairy cows, and draught and riding horses (pers. comm. Ian Harrison 6/8/02). His landholding is said to have increased to around 450 acres and extended to Burrewarra Point, however freehold title to his Rosedale selections was gained by a partnership between John Henry Charles Bartels and Herman Nibbe in the early 1900s (between 1901 and 1912). A large portion of the lands further south was gained by John Innes.

Parish of Bateman County of St Vincent 2nd Ed (cancelled by new map 1902)



Land selections in the study area prior to 1902



Land selections by James Sebbens, east of the study area, prior to 1902

Figure 6.2 Extracts from Parish map of Bateman, County of St Vincent, 2nd Ed (cancelled by new map 1902)

6.2 The Bevian Road Concept Plan Area

The Rosedale Urban Release Area consists of ten original land portions (or part thereof) in the Parish of Bateman, County of St Vincent. Figures 6.2 & 6.3. These lands were originally selected between the 1870s and 1900s and finally alienated in the first decade of the twentieth century. None of the original 1870s selectors, however, succeeded in converting their conditional purchases into freehold title. It is probable that most, if not all, selections and subsequent purchases formed dairy farm and small scale agricultural enterprises.

The original 1870s selectors (Figure 6.2) consisted of:

- Robert Jennings (senior) in the south, who selected 120 acres in three portions adjoining the northern edge of the wetland in 1878 (portions 29, 72 and 73);

- Thomas Hollands who selected portions 11 & 12 in 1878, two adjoining 40 acre portions situated along the valley floor around the confluence of two tributary streams of Saltwater Creek (only portion 11 occurs within the study area); and

- John Hollands who selected portion 32 in 1879, 40 acres situated immediately upstream of Thomas' portion 11 holding

The 1878 Crown survey plan for Thomas Holland's portions 11 and 12 shows no structures or improvements, but indicates a 'track' along the current alignment of Bevian Road (Crown Survey Plan 14 Sept 1878, v 962 967.2013). Figure 6.4. The 1879 Crown survey plan of John Holland's neighbouring selection shows a 'hut' situated west and upslope of a tributary confluence. Figure 6.5. Portions 11 and 32 may have been worked as a single farm but financially spread across two members of the Holland family.

The Crown survey plan for portions 29, 72 and 73 was created in September of 1878. Figure 6.6. It shows the following features:

- a 'track' which approximates the current alignment of Bevian Road

- a square and fenced-off 'orchard' in the southwestern corner of portion 29 (valued at £30)

- a 'hut' located on basal slopes near the southeastern boundary of portion 29 (valued at £5)

- a 'house' located some 150 m to the east of the western boundary of portion 73 on the crest of the southern spurline (valued at £10); and

- a 'cleared and ploughed' area downslope of the portion 73 house (valued at £30).

It is probable that the first European residential structures in the study area were Robert Jennings' hut and house on portions 29 and 73, and John Hollands' hut on portion 32.

In 1883, 80 acres to the west of Thomas Holland's holding was selected by Karl Ludwick Thomsen under conditional purchase (portion 213), and in 1894 40 acres was selected to the north of Jenning's holdings by a C. Morris (portion 102). Morris' selection was under an Additional Conditional Purchase, suggesting that he never resided on this land, however Karl Thomsen's portion 213 may have included a residence, for he subsequently gained freehold to the adjoining portions to the north and south (portions 221 and 32). Karl was the son of Adolph Joseph Thomsen who had substantial land holdings one kilometre to the west. Adolph selected the only remaining available unselected land in the study area in 1905 (portion 118). He then substantially increased this holding when he gained freehold title to all of Jennings' selections (portions 29, 72 & 73), along with Morris' (portion 102). Karl is said to have run his land as a separate farm to Adolph's holdings (pers. comm. Ian Harrison 6/8/02).

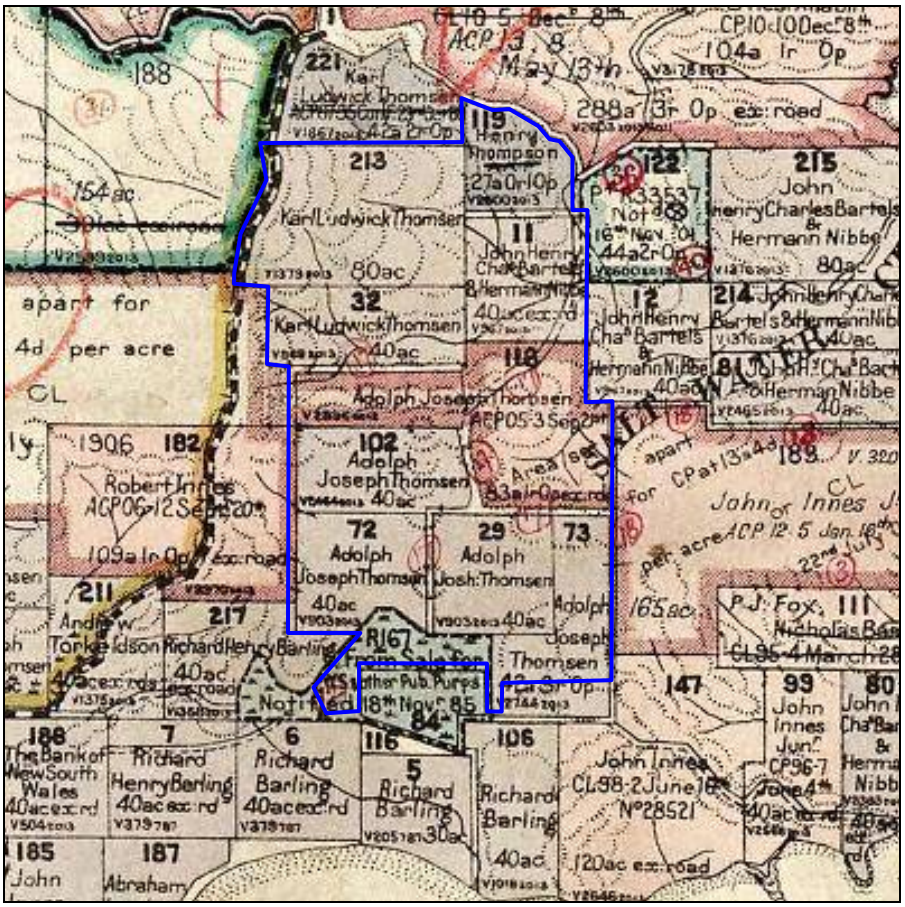


Figure 6.3 Original freehold title owners within the study area
(Parish map of Bateman, County of St Vincent 4th Ed, base map dated 1912).

Another of Adolph's sons, Henry, acquired portion 119 at the northwestern corner of the study area at around the same time as Adolph's purchase of Jennings' selections, and he later purchased portion 257 at the southern end (this was a former water reserve - WR 167).

By the early twentieth century the majority of the study area was owned by various members of the Thomsen family, Karl's holdings being run separately to his fathers'. Hollands' portion 11 selection was purchased by John Henry Charles Bartels & Hermann Nibbe, also around this time. This holding adjoined other substantial downstream, valley floor lands, held in freehold by this partnership.

The freshwater wetland located at the southern end of the study area was originally reserved as a crown land water reserve in 1885 (WR 167). (Plate 1). This wetland basin is noted on early mapping as 'the only freshwater in the neighbourhood' (1863 Crown survey plan for portions 5, 6 & 7). The importance of this resource as a community asset for the neighbouring holdings is recognised by a petition to declare the area a Common in 1910. The petition was refused (LB 10-5457). In 1902 a rectangular portion of land consisting of 20 acres in the southeastern corner of the wetland was subject to a Special Lease by Richard Barling. This land was subsequently revoked from the reserve and became the subject of an Additional Conditional Purchase by John Innes in 1926, who later gained freehold title (portion 84). The remainder of the original reserve was the subject of a Special Lease to Henry Thomsen in 1924. He subsequently gained freehold in 1935 after selection as an Additional Conditional Purchase in 1934 (portion 257).

Karl Thomsen died in 1914, however his widow subsequently became a substantial shop owner in Batemans Bay. His property was eventually passed to Fred Sellick, a butcher by trade whose wife

was a Thomsen family member. Later owners of the land could not detect where Karl's farm residence had been located (pers. comm. Ian Harrison).

The following table traces the pattern of early land tenure up to freehold title, in chronological order.

Table 1: Early European land tenure, up to freehold title, within the study area.

Portion No.	Area (acres)	Original selector/lessee	Date and Type of purchase	Freehold gained by	Date of freehold
11	40 acres	Thomas Hollands	1878 Conditional Purchase	John Henry Charles Bartels and Hermann Nibbe	between 1901 and 1912
29	40 acres	Robert Jennings Senior	1878 Conditional Purchase	Adolph Joseph Thomsen	between 1901 and 1912
32	40 acres	John Hollands	1878 Conditional Purchase	Karl Ludwick Thomsen	between 1901 and 1912
72	40 acres	Robert Jennings Senior	1878 Additional Conditional Purchase	Adolph Joseph Thomsen	between 1901 and 1912
73	40 acres	Robert Jennings Senior	1878 Additional Conditional Purchase	Adolph Joseph Thomsen	between 1901 and 1912
213	80 acres	Karl Thomsen	1883 Conditional Purchase	Karl Thomsen	between 1901 and 1912
102	40 acres	C. Morris	1894 Additional Conditional Purchase	Adolph Joseph Thomsen	between 1901 and 1912
84 formerly part of Water Reserve 167	about 25 acres	Richard Barling	1902 Special Lease	John Innes	(Additional Conditional Purchase) 1926
118	83 acres	Adolph Joseph Thomsen	1905 Additional Conditional Purchase	Adolph Joseph Thomsen	between 1901 and 1912
119 (formerly portion 122)	27 acres	-	-	Henry Thomsen	between 1901 and 1912
257 formerly part of Water Reserve 167	about 25 acres	Henry Thomsen	1924 Special Lease	Henry Thomsen	(Additional Conditional Purchase) 1934

Ian Harrison, a former owner of the property, relates that around 1930-31, the property, which included portion 11, was the subject of foreclosure or resumption by a bank mortgager and subsequently sold to a man who is remembered to have worked as an engineer for the Moruya Shire Council. This man built a cheese factory on portion 11 in around 1934-35 (pers. comm. Ian Harrison 6/8/02).

Mrs Helga Shepherd, then a child growing up at Mosquito Bay (now Malua Bay), remembers the first owner and builder of the Rosedale cheese factory to be a Mr Aitkin. Following the destruction of the

Mosquito Bay cheese factory (and local school) by fire in around 1929, she remembers that their farm milk was sent to Aitkin's factory at Rosedale. Her brother, Peter Nielson, remembers delivering the milk to the factory in 1939. They used a horse drawn 'sledge' - a forked tree branch fitted with a ring and on which the 'cream cans' were fastened. He remembers the factory to be a dilapidated building of timber with a loading bay. It was known as the Rosedale cheese factory, or as Aitkin's cheese factory (pers. comm. Helga Shepherd and Peter Nielson 29/8/02).

Much of the original fabric of the cheese factory building remains today. The main walls of the building were constructed using hand-moulded concrete bricks. The original structure included a main factory room (approximately two storeys high) with a gable roof and a cheese store and maturing room (to the south). The latter was ventilated by way of a hardwood 'tunnel' which vented to a concrete chimney some 250 yards to the east (pers. comm. Ian Harrison 6/8/02).

Ian Harrison relates one story that the original cheese factory owner, who remained single, volunteered for the Second World War and was lost in Borneo or New Guinea. However Helga Shepherd remembers Mr Aitkin as an elderly man. She says that he moved to Rosedale from Moruya in around 1930.

In the late 1930s (possibly 1937-38), Mrs Shepherd relates how Albert Sebbens and his wife lived at the farm and that the cheese factory was operated by Albert's father Joseph Sebbens. Joseph had formerly made cheese at the Mosquito Bay factory. The factory probably stopped producing cheese around 1940. The property was sold to the Kings who established a flower farm. A Dr McKenzie owned the property after the Kings.

Mr Neilson relates how the late 1930s and early 40s saw the demise of most of the local dairy farms, with economic returns failing to meet costs. Local dairy farms, such as those run by the Simmons, Christensen and Lavers families stopped producing milk and this consequently forced the closure of the cheese factory, if low economic returns had not already forced its closure.

The Harrison family bought the property in 1955, and purchased adjoining blocks to the west in 1960-61 (Karl Thomsens' holdings). During the Harrison ownership, Henry Thomsen owned the property to the south (Adolph's Thomsen's former holdings).

In the mid 1950s the old cheese factory building stood idle, but in 1958 the building was partially converted into living quarters for two share crop farmers who rented from Ian Harrison's father. In 1960 Ian Harrison married Beverley and moved to his father's property and further converted the former cheese factory building as a cottage residence. Harrison constructed a kitchen in the main room, and divided the former cheese maturing room into two bedrooms with the addition of ceilings. Bevian swamp and Bevian Road are named after 'Ian' and his wife 'Bev'.

Bill Mann (87 years old in 2004) has lived in the converted cheese factory since his wife died in 1982. Mr Mann's family has used the property as a plant nursery, and most of the camellias surrounding the former cheese factory were planted by Bill and describe his passion for their propagation. This includes a variegated camellia (Japonica) created by Bill and developed by another nurseryman who named it after Bill Mann.

Bill has added a mezzanine floor in the main room, and a new septic system. Most of the other building features remain as they were following the Harrison's conversion.

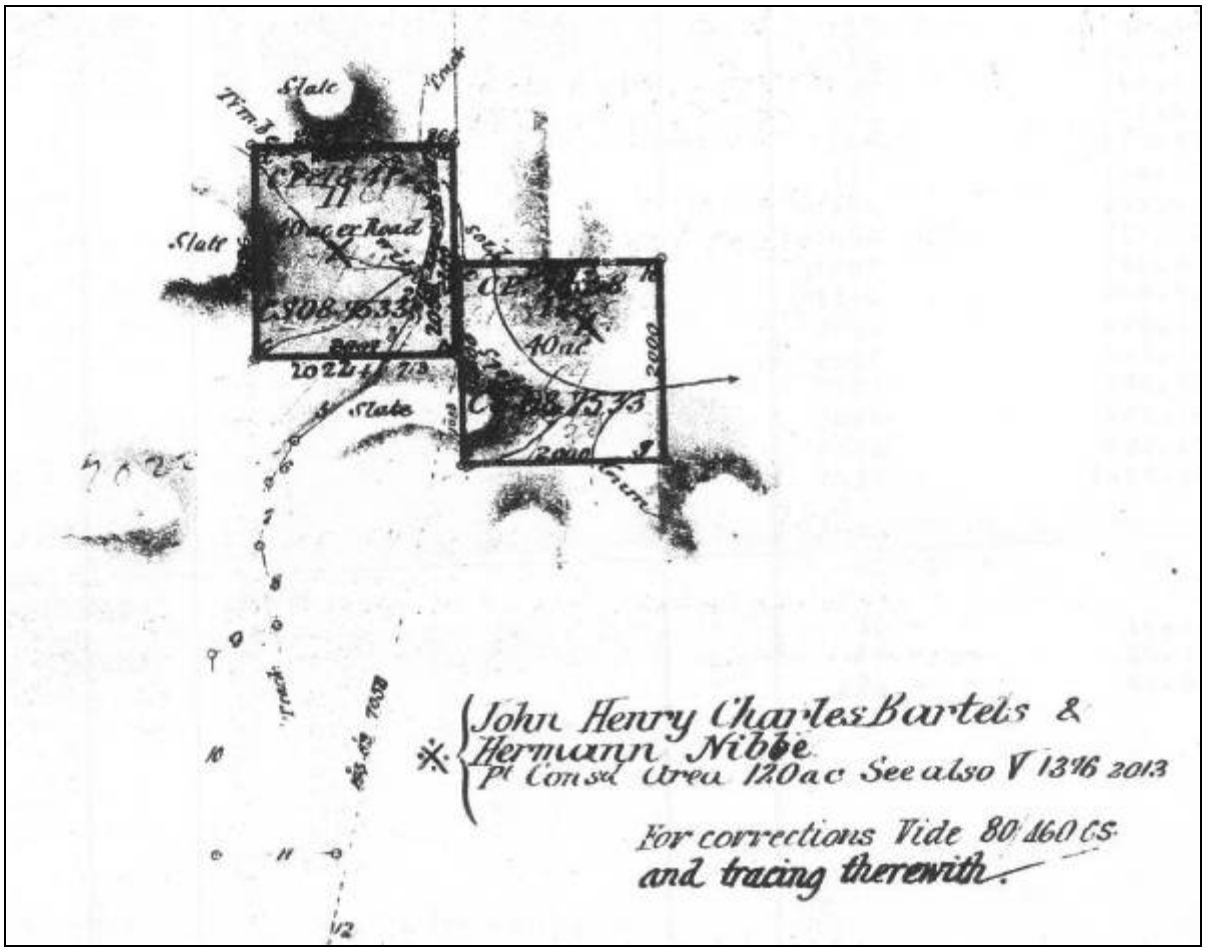


Figure 6.4 Extract from 1878 Crown survey plan for Thomas Holland's selections, portions 11 and 12, 14 Sept 1878, v 962, 967.2013

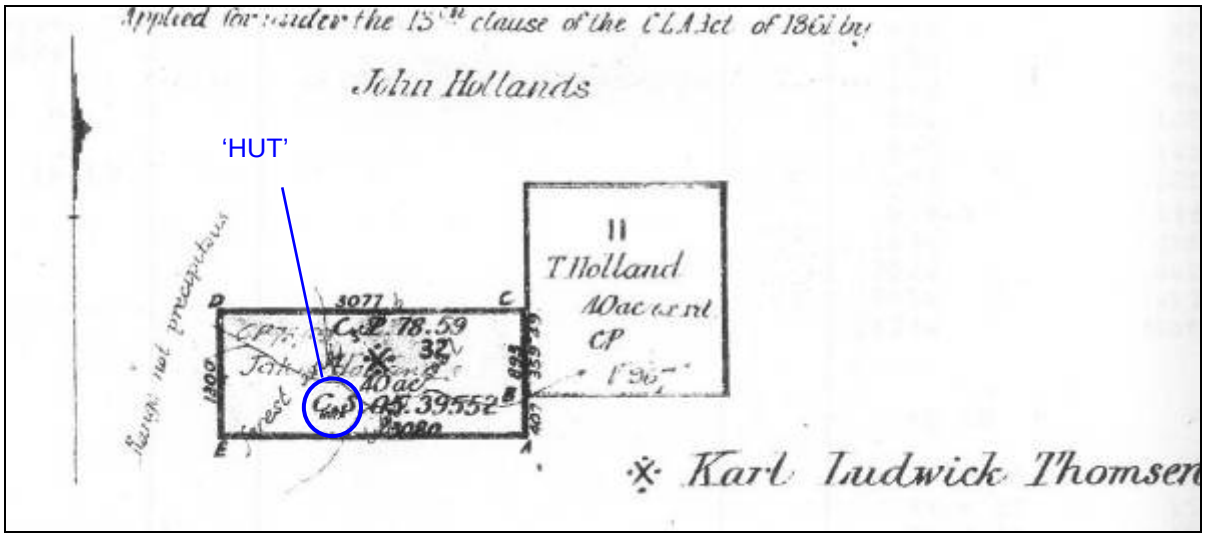


Figure 6.5 Extract from 1879 Crown survey plan for John Holland's selection, portion 32, 25 Nov 1879, v 969, 969.2013

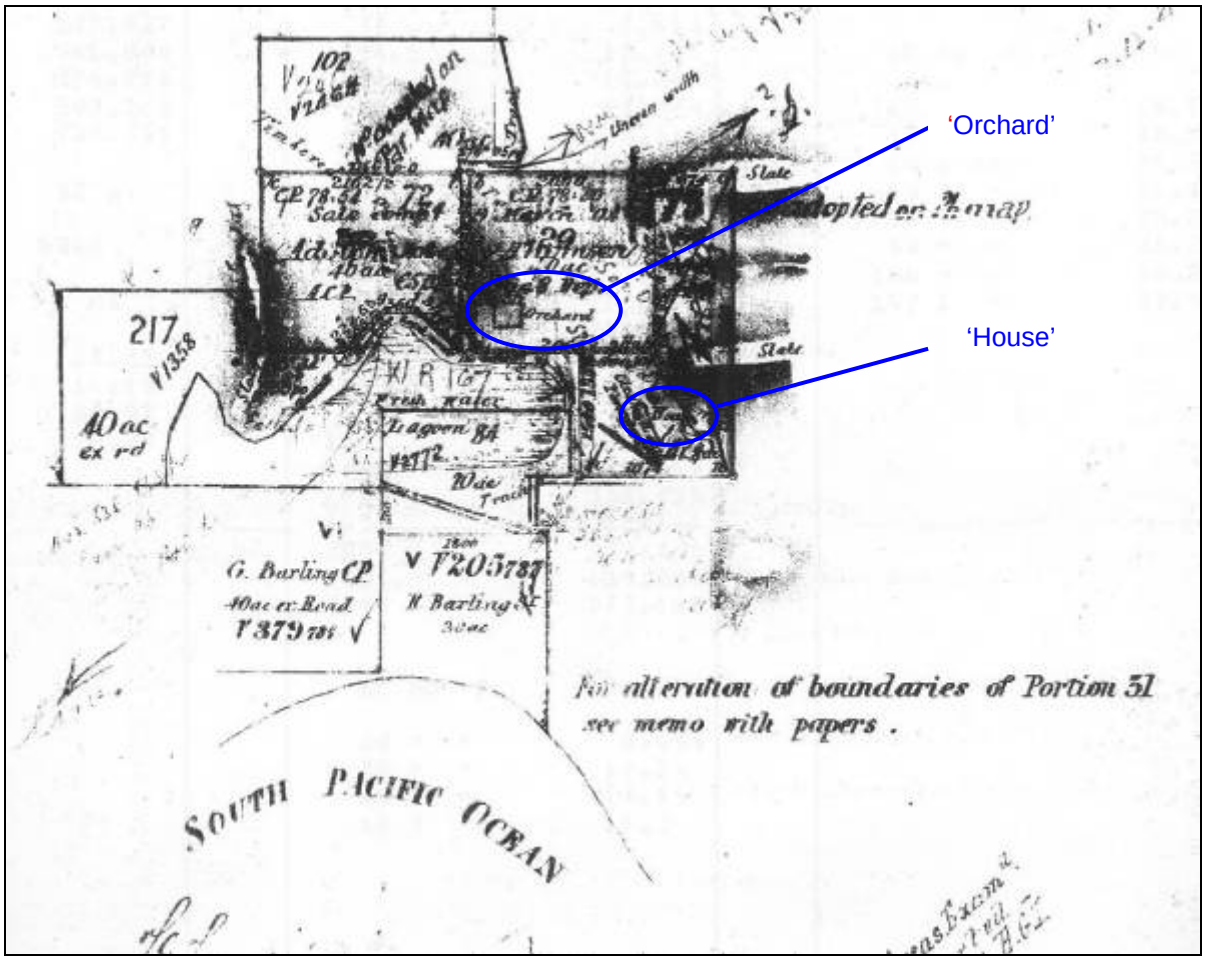


Figure 6.6 Extract from 1878 Crown survey plan for Robert Jennings' selections, portions 29, 72 and 73, 26 Sept 1878, v 903, 903.2013

7. SURVEY PROGRAM METHODOLOGY

7.1 Review of Existing Documentation

A range of documentation was used in assessing the state of archaeological and historical knowledge for the Rosedale area and the surrounding region. This background research was used to determine if known Aboriginal and historic sites were located within the area under investigation, to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and research management context.

The following information sources were accessed and reviewed for this study:

- the then NSW National Parks and Wildlife Service Register of Aboriginal Sites (AHIMS)
- Relevant archaeological reports and files held in the NSW NPWS Aboriginal Heritage Unit (Queanbeyan)
- Theses held in the library of the Department of Archaeology and Anthropology, Australian National University
- State Heritage Inventory and Register (NSW Heritage Office)
- Register of the National Estate (Australian Heritage Commission)
- Register of the National Trust 1998 (National Trust of Australia)
- Parish maps for Bateman (www.lpi.nsw.gov.au/maps/p.maps)
- Eurobodalla Shire Council Local Environment Plan
- Mogo 1:25,000 topographic maps - 2nd and 3rd editions

Local informants also generously provided information about the history of, and landuse within, the Rosedale study area.

7.2 Field Survey

Archaeologists Kerry Navin and Kelvin Officer conducted a field survey of the Release Area in July 2002. Mr Peter Combo (Mogo LALC) also participated in the survey.

Survey involved the field team walking through the study area in systematic and opportunistic survey traverses. A majority of areas of ground disturbance and surface visibility were inspected. Creeklines, ridgelines and locally elevated areas near wetlands were systematically surveyed. All accessible old growth eucalypt trees were inspected for possible Aboriginal scars.

Ground exposures included:

- erosion features
- creek channels
- unformed and formed vehicle tracks
- underground service easements
- stock trails
- tree stumps and the base of standing trees
- exposures resulting from animal burrowing and activity

A graphic representation of the survey coverage achieved is provided in Figure 8.3.

8. RESULTS OF THE SURFACE SURVEY

8.1 Aboriginal Sites

Two Aboriginal sites (scatters of lithic artefacts) and one isolated find (single lithic artefact) were identified in the course of field surveys of the Rosedale Urban Release Area. Eight areas of archaeological potential (PADs) were also identified in the study area. The sites and PADs are described below, and locations are shown in Figure 8.1.

RUR1 – Artefact Scatter

AMG: 247434.6031963 (Hand held GPS)

This site comprises three stone artefacts located on partially cleared ground on moderate to low gradient slopes at the end of a spurline adjacent to the Bevian Swamp wetland basin. Two artefacts (#1 and #2) are located in sporadic ground exposures about 60 m from the current waters' edge. Exposure incidence in the area was 20%. Visibility in the exposures was 15%. Taking account of the shallow soils on these slopes the potential for undisturbed archaeological deposit to be associated with these artefacts is low.

Artefact # 3 is located about 60 m southeast of artefacts #1 and #2 and is located on a disused vehicle track platform, about 10 m north of the current Bevian Swamp waters' edge. Exposure incidence in the area was 30%. Visibility in the exposures was 20%.

Artefacts:

1. milky quartz flake, 17 x 8 x 4 mm
2. milky quartz flake, 8 x 5 x 1 mm
3. coarse-grained red/orange mottled silcrete blade core, blade flakes removed, one platform, 5% pebble cortex, 45 x 27 x 19 mm

RUR2 – Artefact Scatter

AMG: 247947.6032938 (Hand held GPS)

This site is a low-density scatter of stone artefacts visible in exposures on a shallow vehicle track (c.3.5 - 4 m wide) and ground exposures on northwest facing basal slopes adjacent to an agricultural dam constructed across a tributary of Saltwater Creek (Plate 3). The artefacts extend for approximately 100 m along the track. Natural quartz fragments are ubiquitous in the area. The potential for more artefacts to be associated with the site is high. The potential for relatively undisturbed sub-surface archaeological deposits at this site is considered to be moderate. Some parts of the site have been impacted by sheet erosion, gullying and track construction.

Artefacts:

1. blue/green banded rhyolite broken pebble fragment, 30% alluvial pebble cortex, 53 x 33 x 27 mm
2. grey/green rhyolite core fragment, 25% alluvial pebble cortex, 80 x 28 x 30 mm
3. grey/green rhyolite flake, recent edge damage, 32 x 26 x 7 mm
4. quartzite(?) alluvial pebble fragment, possible grindstone fragment, 50% alluvial pebble cortex, 36 x 32 x 17 mm
5. milky quartz bipolar flake, 23 x 17 x 6 mm
6. brown quartzite(?) fragment of top grindstone, 65% alluvial pebble cortex, 47 x 36 x 33 mm
7. grey/green rhyolite flake 'scraper', some edge retouch (possible vehicle damage?) around distal end which has some steep edge retouch, 57 x 46 x 14 mm
8. grey/green rhyolite broken pebble fragment, 40% alluvial pebble cortex, 47 x 27 x 21 mm
9. grey silcrete microblade core, two platforms, 15 x 13 x 10 mm
10. grey/green rhyolite flake portion (distal and proximal end missing), 30 x 212 x 10 mm

11. broken portion of top grindstone, worn top and bottom convex surfaces present, pitting and bruising along one edge, 45 x 32 x 25 mm
12. pink/grey silcrete backed blade portion, probably basal portion of bondi point, backing along base and one margin, 15 x 16 x 7 mm
13. grey/brown silcrete flake, retouch or edge damage along distal edge, 24 x 26 x 7 mm
14. grey/green rhyolite broken pebble fragment, 25% alluvial pebble cortex, 36 x 35 x 17 mm
15. dark grey silcrete flake, 22 x 14 x 6 mm
16. green/brown rhyolite microblade core, one platform, 30% alluvial pebble cortex, 56 x 50 x 28 mm
17. broken hammerstone, indeterminate stone type, 51 x 57 x 41 mm
18. grey/brown rhyolite core, two platforms, 15% alluvial pebble cortex, 45 x 40 x 26 mm
19. grey silcrete microblade core, one platform, 21 x 18 x 15 mm
20. grey/brown rhyolite core, one platform, 35% alluvial pebble cortex, 42 x 29 x 31 mm
21. dark grey silcrete flake portion, 18 x 16 x 6 mm
22. grey/green rhyolite microblade core, two platforms, 29 x 23 x 9 mm

Plate 8.1 The northeastern end of site RUR 2, looking southwest. Artefacts occur along the track exposure (2002)

RURIF 1 - Isolated Find

AMG: 247119.6031950 (Hand held GPS)

This artefact was located on the eastern edge of the Bevian Road, in graded track spoil, approximately 15 m north of an intersecting driveway (to Lot 3 DP575765), and 15 m from the edge of Bevian Swamp.

1. milky quartz core fragment, platform preparation along one edge, 25 x 18 x 11mm

Potential Archaeological Deposits (PADs)

Eight areas of archaeological potential were identified in the study area. All of these consist of locally elevated alluvial and slope deposits situated in or adjacent to the valley floors of the tributaries of Saltwater Creek. All of these topographies are consistent with the predictive site location criteria which have been developed for the region (refer Section 5.3 above).

It should be noted that at the time of the assessment, minimal archaeological subsurface investigation had occurred on open sites in this region and it was consequently difficult to further quantify the potential of these deposits. There are many unknown variables, such as past vegetation, hydrology and sedimentation regimes, which could influence the likelihood of sites occurring and surviving in these deposits. The only means of accurately determining the nature and significance of these deposits is to conduct an archaeological program of subsurface testing.

The following table provides a description of each PAD. PAD locations are presented in Figure 8.1.

Table 8.1 Potential Archaeological Deposits recorded within the study area

PAD #	Location	Approximate Size (m)	AMG Reference (Hand-held GPS)	Archaeological Potential
1	spur crest adjacent to creekline & alluvial flats	100 x 50	247340.6032940	moderate
2	alluvial terrace	100 x 60	247378.6032944	moderate
3	low rise between main tributary creek and small side tributary	70 x 40	247253.6032857	low - moderate
4	low terrace adjacent to western side of tributary creekline (upper catchment context)	70 x 25	247268.6033308	low - moderate
5	terrace, basal slope areas adjacent to creek tributary and just before creek intersection on eastern side of creek	100 x 50	247850.6033260	low - moderate
6	western side of tributary, valley floor and terrace sediments on eastern side of creek	100 x 30	247824.6033295	low - moderate
7	eastern side of tributary, valley floor and terrace sediments on eastern side of creek	80 x 40	247825.6033398	low - moderate
8	western side of tributary, valley floor and terrace sediments on eastern side of creek	100 x 40	247778.6033436	low - moderate

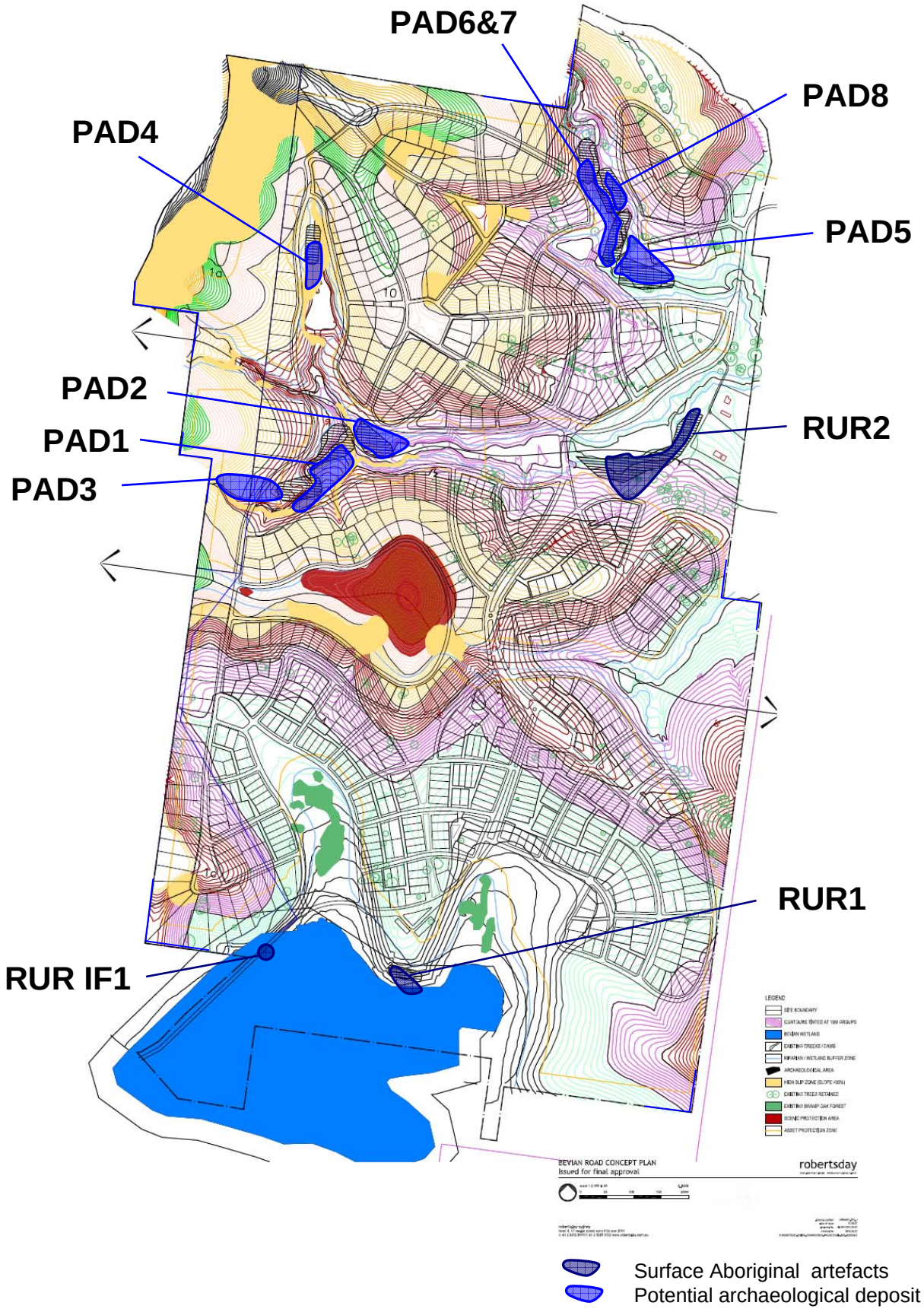


Figure 8.1 Location of Aboriginal sites and areas of archaeological potential recorded during the surface survey program, relative to the Bevian Road Concept Plan (base map provided by robertsday).

8.2 European Historic Sites

8.2.1 Field recordings

Seven historic recordings were made as a result of the surface archaeological survey within the study area. These consist of three prospector's pits, a series of agricultural ditches, two unidentified circular pits, a piece of disused farm machinery, and the former Rosedale cheese factory building. Map grid references and summaries of these recordings are presented in Table 8.2, and locations are shown in Figure 8.2.

Prospectors Pits (HS1, HS2 & HS3)

All of these features consist of rectangular pits and adjacent spoil, located on or near ridge and spurline crests. (Plates 4 and 5). All are now relatively shallow (c.30 cm deep). The shape and location of these features are consistent with the gold prospecting practise of sinking shallow pits along ridges to determine the nature of the bedrock and to test for likely ore bearing deposits. This practice was a precursor to sinking shafts or adits. It is probable that these features date to somewhere between the 1870s to the early 1900s when the prospecting focus in the Mogo Gold Field changed away from the alluvial deposits to the search and exploitation of reef gold.

Plate 8.2 A shallow rectangular pit, interpreted as a prospectors pit (site HS1), looking southwest (2002).

Plate 8.3 A prospectors pit (site HS2), in the foreground, located on a ridge crest in the middle of the study area, looking north (2002).

Agricultural Ditches (HS4)

At least three shallow linear ditches were noted on the valley floor flats to the northeast of Bevian Swamp. (Plate 6). They are at least 175 m long, are aligned approximately north-south and are spaced 25 and 12 m apart. Some appear to have been recolonised by Casuarina trees. The location of these features coincides with the recorded location of Robert Jennings' 1878 orchard (refer section 7.2, Figure 6.6). It is considered probable that they served a drainage function for either this original orchard, or a subsequent agricultural development on this plot.

Plate 8.4 general views to the south, showing the flats fringing Bevian Swamp and a group of trees in the middle distance which are associated with a series of parallel agricultural drainage ditches (site HS 4). (2002)

Former Rosedale Cheese Factory Building (HS5)

This recording consists of the standing structure, now used as a residence by Mr Bill Mann, which was originally constructed and utilised as a cheese factory, together with its immediate yards and surrounds. (Plates 8.5 and 8.6).

Based on the oral history, (refer section 6.2) the original structure was purpose built as a cheese factory in around 1934-35 by a Mr Aitkin, formerly of Moruya. The factory, known as the Rosedale Cheese Factory or Aitkin's Cheese Factory, utilised milk produced and delivered from the surrounding local dairy farms. The factory appears to have changed ownership in the late 1930s and was run by the Sebbens family, Joseph Sebbens being the cheese maker. The Factory appears to have stopped production around 1940 when local dairy farm production became uneconomic. After a period of disuse, the structure was converted first in 1958 into living quarters for share crop farmers, and subsequently as a family home by the Harrisons.

The building consists of the following main elements:

- a core (originally two, now three room) building, constructed from hand moulded concrete bricks; roughly rendered walls; various window types including paired swing window frames, each with two panes of glass; a corrugated iron gable roof without eaves; (possibly a stamped earth floor) and a subsequent concrete floor in the [now] side bedrooms). The main former cheese factory room now includes a kitchen along the 'front' (west) wall, and a recently constructed mezzanine level. A side room that reportedly originally served as a cheese maturing room has been converted into two bedrooms and includes a ceiling of later age.

- A wooden frame and skillion roofed extension along the western side of the original building and partially along the northern side. The extension includes a room at the northern and southern end, and a high verandah in the middle, situated between each room, and which doubles as the current entrance landing to the building. The northern room includes horizontal weatherboard cladding, currently serves as a laundry, and does not have windows on its western and northern sides. The southern room is clad in fibro sheeting and includes two west-facing windows, one with a sheet metal awning.

- A pergola extends from the verandah on the western side of the building.

- A round corrugated iron tank is located at the northwestern corner of the building.

A rectangular wooden frame and corrugated iron shed and garage complex is situated to the south of the residential building.

The immediate yards include:

- front and side lawns
- a large Spotted Gum at the southwestern corner of the building,
- a large cypress tree on the northern side,
- extensive vegetable garden plots on the eastern side (at rear of house), and smaller plots at the front,
- a chook run and coop to the southwest,
- ornamental garden beds and plantings along the front (adjacent to Bevian Road) and side boundaries, which include an extensive range of Camellia species, and a variety of fruit trees.

There are traces of no longer extant outbuildings in the form of concrete slabs and foundations in the area of the current sheds, to the south of the residential building. Former structures reportedly included a loading bay and covered ventilation flu and chimney/vent (refer section 7.2).

Plate 8.5 The southwest aspect of the former Rosedale cheese factory building (site HS 5) (2002).

Plate 8.6 The northwest aspect of the former Rosedale cheese factory building (site HS 5) (2002).

Other Features

Site HS6 consists of two shallow, roughly circular pits with fringing spoil piles on their downslope sides. (Plate 8.7). The pits are 6 m apart, constructed on the same level, and are situated on north facing basal slopes, approximately 80 m south of a tributary streamline. The streamline includes agricultural dams constructed up and downstream of the pits.

Both pits contain a single wooden fence post lying on their side, and one also contains some old folded corrugated iron. The pits have dimensions 3 x 3 m and 4 x 5 m and are approximately 30 to 40 cm deep. A ruined corrugated iron round water tank occurs opposite in the creek bed.

The original purpose and function of these pits is not known. Possible explanations include the site of a water pumping wind vane or 'windmill', dug out water soaks, borrow pits, or prospectors pits.

Site HS7 consists of a dilapidated piece of agricultural machinery that appears to have functioned as a seed spreader, amongst other uses. It includes metal gearing connected by chain belts, rubber tyres and a wooden frame box-like housing. (Plate 8.8). No trademarks or other distinguishing

lettering was noted. It is located outside of an agricultural shed and yards and has been used to store/dump fencing wire and other debris.

Plate 8.7 Two shallow pits with associated spoil, located in the northern half of the study area. The exact origin and function of these pits has not been determined (site HS6), looking east (2002).

Plate 8.8 Abandoned agricultural machinery and associated dumped fencing materials (site HS 7), looking northwest (2002).

8.2.2 Sites Identified From Documentary Sources

Three sites (HS8, HS9 & HS10) have been identified based on documentary sources. No clear surface evidence or artefactual material relating to these sites has been found at these locations.

Site HS8 consist of the approximate location of John Holland's selectors 'hut', which is identified on the 1878 Crown survey plan for portion 32. Figure 6.5.

Site HS9 consist of the approximate location of Robert Jennings' selectors 'hut' which is identified on the 1878 Crown survey plan for portion 29 and estimated at the time to have a value of £5. Figure 6.6.

Site HS10 consist of the approximate location of Robert Jennings' selectors 'house' which is identified on the 1878 Crown survey plan for portion 73 and estimated at the time to have a value of £10. Figure 6.6.

Each recording should be considered as a potential archaeological deposit, where no obvious surface manifestation remains. Depending on the extent of subsequent soil profile disturbance, these sites may contain variously disturbed subsurface archaeological remains such as foundations, remains of building materials, and occupational relics.

A program of archaeological subsurface testing may be required to determine the nature and extent of any subsurface deposits.

Based on the contemporary values of the structures, and the absence of remembered buildings in these locations in the mid- to late twentieth century, it is a reasonable assumption that these sites are the locations of relatively ephemeral structures. The 'huts' at sites HS8 & HS9 were probably single room, earth floor, round timber frame buildings with bark sheeting walls, roof and possibly also chimney. The surviving traces of such structures may amount only to post holes, and scattered hearth and occupation debris. The 'house' site (HS10) is likely to have utilised similar types of materials, but may have been larger, included multiple rooms, and used vertical wooden slab for walls, or stone or brick for a hearth and foundations.

Table 8.2 Summary of historic sites recorded within the study area.

HS No.	Site Type	Location	Description	AMG Reference (hand-held GPS)
1	prospectors pit	on spurline crest	rectangular in shape, 2 x 1 m, c.30 cm deep	247428.6032113
2	prospectors pit	on spurline crest	pit c.3 x 1.5 m	247157.6032669
3	prospectors pit	on northern upper slopes of middle study area knoll	pit c.4 x 2 m orientated NW-SE	247463.6032669
4	agricultural drainage ditches	north of Bevian Swamp	series of at least three parallel ditches on valley floor flats, (at least 175 m long), probably remains of Robert Jennings' 1878 orchard	247542.6032050
5	former cheese factory building	on basal slopes adjacent to creek and Bevian Road	small building complex constructed of hand-made concrete bricks, and wooden frame and weatherboard cladding, operated as cheese factory from c.1934 – c.1940, and subsequently as a residence.	248050.6033020
6	undefined	on north-facing basal slopes approx. 80 m from tributary creekline	two circular pits located 6 m apart with old fence posts in them	247655.6033303
7	old farm machinery	next to yards and old shed on spurline crest	seed spreader with metal frame and chassis, rubber tyres and wooden sides; no trademarks visible; in poor condition	247494.6033146
8	1870s selectors hut site	spurline crest on east facing basal slopes adjacent to creekline.	approximate location of John Holland's hut, presence of surviving remains unconfirmed	247260.6032950 (approx. only)
9	1870s selectors hut site	locally elevated rise on valley floor	approximate location of Robert Jennings' hut, presence of surviving remains unconfirmed.	247710.6031920 (approx. only)
10	1870s selectors house site	spurline crest	approximate location of Robert Jennings house, presence of surviving remains unconfirmed.	247990.6031800 (approx. only)

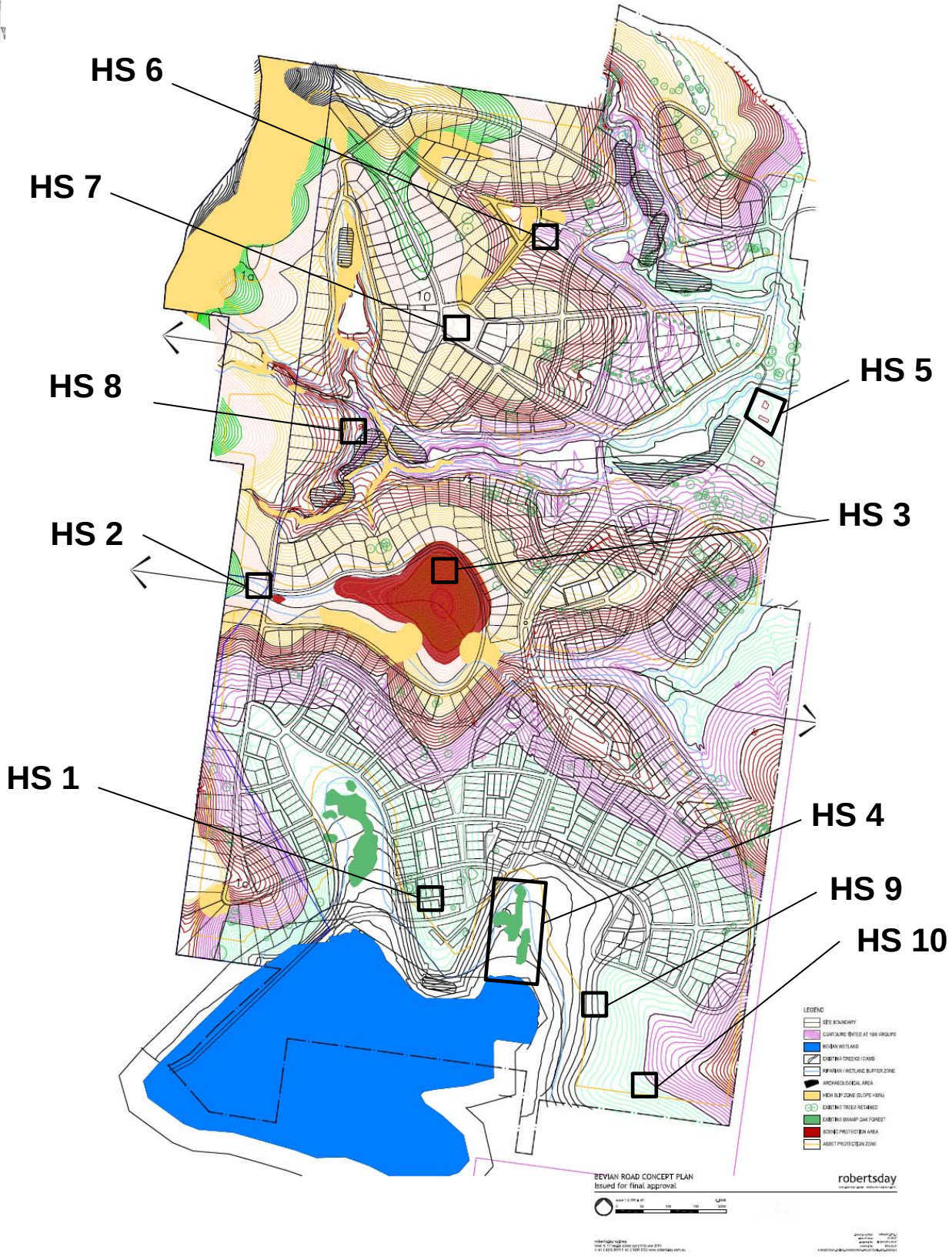


Figure 8.2 Location of Historical sites recorded during the surface survey program, relative to the Bevian Road Concept Plan (basemap provided by robertsday).

8.3 Survey Coverage and Visibility Variables

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

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

- a percentage estimate of the total area of ground inspected which contained useable exposures of bare ground

- a percentage estimate of the average levels of ground surface visibility within those exposures. This is a net estimate and accounts for all impacting visual and physical variables including the archaeological potential of the sediment or rock exposed.

The obtrusiveness of different site types is also an important factor in assessing the impact of visibility levels. For example, artefacts made from locally occurring rock such as quartz may be more difficult to detect under usual field survey conditions than rock types that are foreign to the area. The impact of natural gravels on artefact detection was taken into account in the visibility variables estimates outlined above.

The natural incidence of sandstone platforms suitable for grinding grooves or engraving, together with the incidence of old growth trees, are important considerations in identifying both survey effectiveness and site location patterns outside of environmentally determined factors.

The following table summarises estimates for the degree to which separate landforms within the study area were examined and also indicates the exposure incidence and average ground visibility present in each case. A total of 37% of the ground area in the study area was subject to detailed and close inspection during the survey, with 3% providing useable archaeological exposures.

Taking into account survey coverage, archaeologically useable exposures, and visibility variables, the effective survey coverage (ESC) was 2% of the total survey area. The ESC attempts to provide an estimate of the proportion of the total study area that provided a net 100% level of ground surface visibility to archaeological surveyors.

The ESC calculation is defined and required by the NPWS and stated to be of use in assessing and cross comparing the adequacy of archaeological surface surveys. The actual utility of the ESC calculation however is challenged by many archaeologists. The limitations of the ESC calculation are emphasised by differences in the subjective assessment of exposure and visibility levels, variations in how survey units are defined and measured, and differences in how and which variables are estimated and combined. In reality, ESC results tend only to be meaningful when compared across surveys conducted by the same surveyors and ESC measurers.

An ESC value of 2% is comparable with other Navin Officer results on the coastal plain of the New South Wales South Coast. ESC values tend to be low within the agricultural grasslands of the coastal hinterlands due to relatively high rainfall and consequential dense grass cover. The lack of significant grazing from stock animals in the recent past in the study area has also promoted dense grass cover (refer Plates).

An ESC of less than 5% generally suggests that surface visibility may not have been adequate to fully assess the archaeological potential of some landforms. This introduces a requirement to identify potential archaeological deposits where necessary, and to recommend archaeological subsurface testing when development impact to these areas can be anticipated.

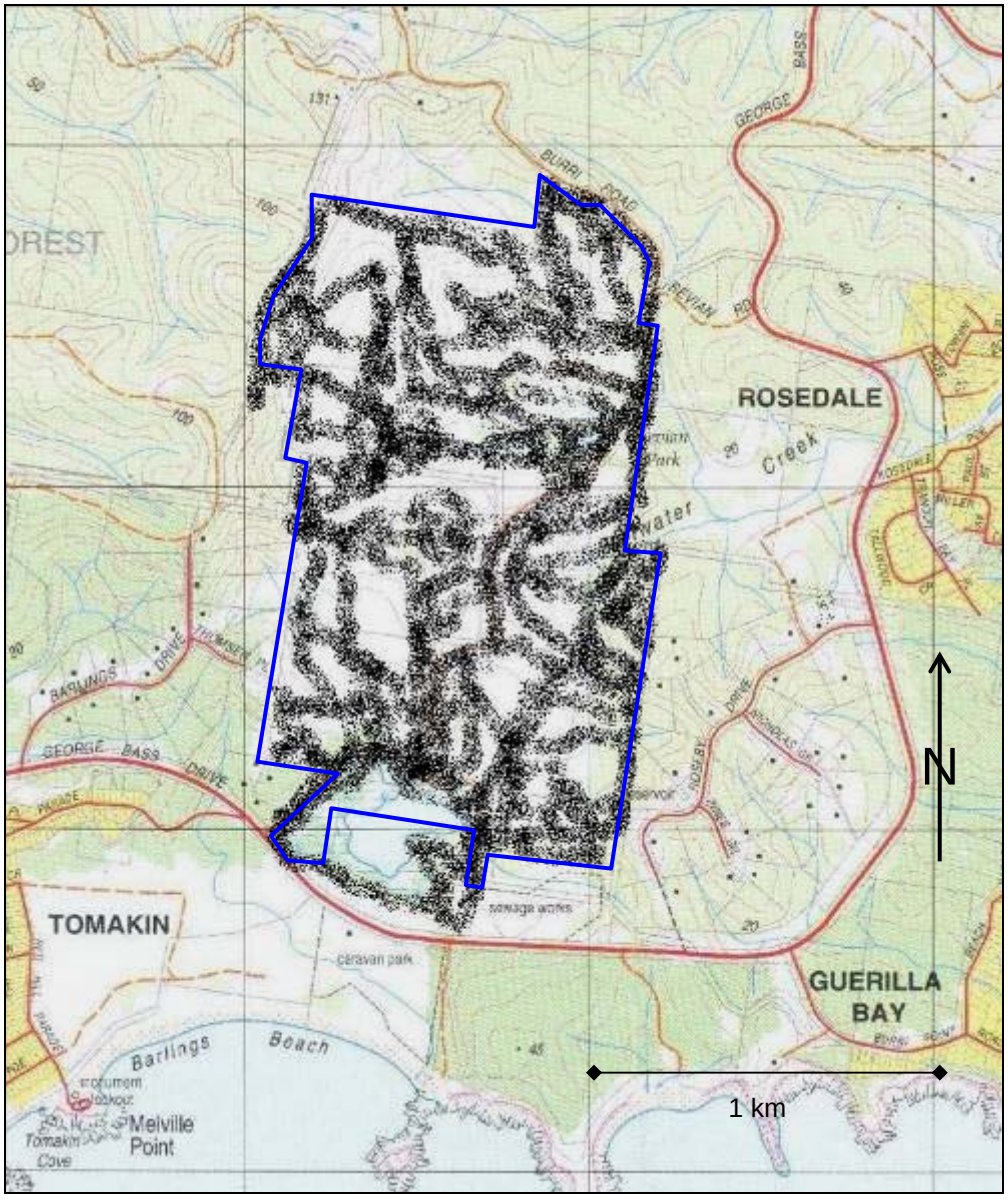


Figure 8.3 A graphic approximation of the surface survey coverage achieved within the study area (Mogo 1:25,000 topographic map 3rd Ed, enlarged).

Table 4: Survey Coverage Data

Survey division	*Survey unit*	*Landform*	*Survey mode*	*Main exposure types*	*Unit area (c.ha)*	*Proportion of unit surveyed %*	*Exposure incidence %*	*Average exposure visibility %*	*Net effective exposure (ha)*	*Effective survey coverage of survey unit %*	*Archaeological recordings*
	1	ridge and spurline crests	foot	vehicle tracks, animal digging and tracks, pipeline easement, base around trees	35	60	5	60	0.630	1.80	RUR1
	2	ridge and spurline slopes	foot	animal digging and tracks, vehicle tracks, pipeline easement, sheet and gully erosion, base around trees	76	10	5	30	0.114	0.15	
	3	valley floor and fringing basal slopes	foot	vehicle tracks, animal digging and tracks, pipeline easement, base around trees, gullying	40	25	10	60	0.600	1.50	RUR2
	4	riparian zone	foot	vehicle tracks, animal digging and tracks, agricultural dams, creek banks and gullies, stock trampling under trees	60	70	10	75	3.150	5.25	RURIF1, PAD1-8
	5	Bevian swamp	not surveyed	none (water covered)	9	0	0	0	0	0	
Totals	***5***		***100% foot***		***220 100%***	***81 37%***	***6.63 3%***		***4.494 2%***	***ESC = 2%***	***3 Aboriginal sites and 8 PADs***

9 SIGNIFICANCE ASSESSMENT OF SURFACE SITES

9.1 Aboriginal Heritage

9.1.1 Assessment Criteria

The Burra Charter of Australia defines cultural significance as 'aesthetic, historic, scientific or social value for past, present and future generations' (Aust. ICOMOS 1987). The assessment of the cultural significance of a place is based on this definition but often varies in the precise criteria used according to the analytical discipline and the nature of the site, object or place.

In general, Aboriginal archaeological sites are assessed using five potential categories of significance:

- significance to contemporary Aboriginal people,
- scientific or archaeological significance,
- aesthetic value,
- representativeness, and
- value as an educational and/or recreational resource.

Many sites will be significant according to several categories and the exact criteria used will vary according to the nature and purpose of the evaluation. Cultural significance is a relative value based on variable references within social and scientific practice. The cultural significance of a place is therefore not a fixed assessment and may vary with changes in knowledge and social perceptions.

Aboriginal significance can be defined as the cultural values of a place held by and manifest within the local and wider contemporary Aboriginal community. Places of significance may be landscape features as well as archaeologically definable traces of past human activity. The significance of a place can be the result of several factors including: continuity of tradition, occupation or action; historical association; custodianship or concern for the protection and maintenance of places; and the value of sites as tangible and meaningful links with the lifestyle and values of community ancestors. Aboriginal cultural significance may or may not parallel the archaeological significance of a site.

Scientific significance can be defined as the present and future research potential of the artefactual material occurring within a place or site. This is also known as archaeological significance.

There are two major criteria used in assessing scientific significance:

1. The potential of a place to provide information which is of value in scientific analysis and the resolution of potential research questions. Sites may fall into this category because they: contain undisturbed artefactual material, occur within a context which enables the testing of certain propositions, are very old or contain significant time depth, contain large artefactual assemblages or material diversity, have unusual characteristics, are of good preservation, or are a constituent of a larger significant structure such as a site complex.

2. The representativeness of a place. Representativeness is a measure of the degree to which a place is characteristic of other places of its type, content, context or location. Under this criteria a place may be significant because it is very rare or because it provides a characteristic example or reference.

The value of an Aboriginal place as an educational resource is dependent on: the potential for interpretation to a general visitor audience, compatible Aboriginal values, a resistant site fabric, and feasible site access and management resources.

The principal aim of cultural resource management is the conservation of a representative sample of site types and variation from differing social and environmental contexts. Sites with inherently unique features, or which are poorly represented elsewhere in similar environment types, are considered to have relatively high cultural significance.

The cultural significance of a place can be usefully classified according to a comparative scale which combines a relative value with a geographic context. In this way a site can be of low, moderate or high significance within a local, regional or national context. This system provides a means of comparison, between and across places. However it does not necessarily imply that a place with a limited sphere of significance is of lesser value than one of greater reference.

9.1.2 The Rosedale Urban Release Area

Site RUR1 consists of a small number of recorded surface artefacts within a largely cleared context on shallow spurline crest soils. There is low potential for undisturbed archaeological deposit to be associated with these artefacts. Given the small size and low potential of this site, the scientific value is consequently low. However, this site is suggestive of the likely potential of the Bevian Swamp riparian zone to contain undetected Aboriginal sites, some of which could potentially have greater scientific significance.

The site has a limited degree of educational value based on its location next to the wetland and the implication of the exploitation of the wetland resources. In a similar context, the site has local Aboriginal cultural value as evidence of past occupation of the swamp margin.

In general, site RUR1 is considered to have low significance in a local context.

Site RUR2 consists of a low-density scatter of over twenty stone artefacts situated in a context that was assessed as having moderate potential to contain relatively undisturbed sub-surface archaeological deposits (refer subsurface testing results in section 12). It is the largest surface Aboriginal site detected to date within the study area. The site includes evidence for a range of activities including tool manufacture, and the use of retouched stone tools and grind stones. Whilst this type of site is characteristic of those found within the coastal hinterland elsewhere along the mid NSW South Coast, the number of similar sites currently known from the Tomakin, Rosedale area is low. This site therefore has a degree of representative value within a local context.

Based on the number and range of surface artefacts, and the potential for more and subsurface artefacts, this site was assessed as having moderate scientific significance within a local context, prior to the conduct of the subsurface testing program.

Similarly to RUR1, this site is likely to have Aboriginal cultural value as a record of past occupation of the coastal hinterland. It has a limited degree of educational value which could be realised through public interpretation, provided that the risk of damage or artefact collection is minimised through appropriate management.

In general, site RUR2 is considered to have moderate significance within a local context.

Site RUR IF1 is an isolated find within a disturbed context and is not considered to have scientific, representative or educational value.

9.2 European Heritage

9.2.1 Assessment Criteria

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

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

An item will be considered to be of State (or local) heritage significance if, in the opinion of the Heritage Council of NSW, it meets one or more of the following criteria:

Criterion (a) an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);

Criterion (d) an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;

Criterion (e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (g) an item is important in demonstrating the principal characteristics of a class of NSW's

- cultural or natural places; or
- cultural or natural environments.

(or a class of the local area's

- cultural or natural places; or
- cultural or natural environments.)

An item is not to be excluded from the Register on the ground that items with similar characteristics have already been listed on the Register. Only particularly complex items or places will be significant under all criteria.

In using these criteria it is important to assess the values first, then the local or State context in which they may be significant.

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

Table 9.1 A guide to ascribing relative value in the assessment of cultural heritage significance in historic sites and features

Grading	Justification	Status
Exceptional	Rare or outstanding item of local or State significance. High degree of intactness Item can be interpreted relatively easily.	Fulfils criteria for local or State listing.
High	High degree of original fabric. Demonstrates a key element of the item's significance. Alterations do not detract from significance.	Fulfils criteria for local or State listing.

Grading	Justification	Status
Moderate	Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item.	Fulfils criteria for local or State listing.
Little	Alterations detract from significance. Difficult to interpret.	Does not fulfil criteria for local or State listing.
Intrusive	Damaging to the item's heritage significance.	Does not fulfil criteria for local or State listing.

9.2.2 The Rosedale Urban Release Area

Prospectors pits (Sites HS1, HS2 & HS3)

These items are substantially infilled but retain enough of their original shape to indicate their former purpose. They are representative of an exploratory stage of gold prospecting and are likely to be a common feature within the Mogo region. Examples are likely to occur within the adjoining crown lands. The pits provide a localised link with the larger regional dynamic of gold prospecting which vitalised the region in the late nineteenth century. As such these features have some limited significance within a local context under *criterion g.*

Agricultural drainage ditches (Site HS4)

This site is demonstrative of late nineteenth century selector agricultural practice and valley floor drainage works. It is not known however, how rare this type of feature may be in a local or wider context. Such features are likely to have survived where subsequent ploughing and cropping have not obliterated them. This site appears to be only partially preserved and has some limited educational and scientific value.

This site is considered to have limited heritage significance within a local context under *criterion g.*

Former Rosedale Cheese Factory Building and Precinct (Site HS5)

This site is representative of a small scale, pre Second World War cheese factory which occupied a local catchment economic niche, prior to the development of the larger regional cheese factories and markets. The production of cheese from such locally based factories was an important historical stage in the evolution of the NSW dairying industry.

Based on a limited review of local oral sources, this site type, as a standing structure, now appears to be rare. Most, if not all, similarly aged and scaled local cheese factories are no longer extant. Whilst the site no longer contains internal machinery of apparatus which relates to its original function, much of the original building fabric remains and can be effectively interpreted. It is unlikely that any sites of this type remain unaffected by structural changes that were required to adapt them to new uses.

The site is associated with two locally significant family names, Aitkin and Sebbens, the latter having particular importance in the history of agricultural development in the local region.

In summary, this site has high heritage value within a local context under *criteria a, b, f and g.*

Pits of unidentified origin (Site HS6)

Given the lack of historical information and absence of an identified function associated with this item, the significance of this site is considered to fall below the threshold of the specified assessment criteria.

Farm machinery (Site HS7)

Due to the poor condition of this feature, and the lack of a clear identificatory marks, this feature is considered to fall below the threshold of the specified assessment criteria.

Location of former 1870s Selector's Hut and House (Sites HS8, HS9 & HS10)

The former locations of late nineteenth century selector's huts are unlikely to be a rare site type within a local or regional context. The preservation of such locations within a non-urban and rural context, and with potential for public interpretation, is likely to be a lot rarer, especially along the coastal margin.

Given the likely ephemeral nature of these original European structures, and the extent of subsequent agricultural and landuse impacts at their former locations, it is considered unlikely that archaeological deposits of substantial scientific value will have survived.

Despite this, the location of Robert Jennings' 'house' (HS10) has representative and educational value, given its location on a spurline overlooking the valley floor, Bevian Swamp, and the dune field and Broulee Bay further to the south. This landscape context is evocative of the local constraints and opportunities of residences on small portion land selectors in the late 1800s. Comparable site locations in the local area have been significantly impacted by residential development. The location of Bevian Swamp, and the buffer requirements around the neighbouring Sewerage treatment plant mean that the southern and westerly open-space landscape vistas from this site are likely to remain.

Based on the absence of surface evidence and the limited scope for archaeological remains, the significance of sites HS8 (former location of John Holland's 1878 selectors 'hut'), and HS9, (former location of Robert Jennings' 1878 selectors 'hut'), is considered to fall below the threshold of the specified assessment criteria.

Based on the potential educational values associated with the undeveloped landscape context of Robert Jennings' 'house' (HS10), this site is assessed as having limited significance within a local context according to criteria f and g.

10. SUBSURFACE TESTING PROGRAM METHODOLOGY

10.1 Background to the Methodology

During the course of the 2002 archaeological survey two Aboriginal archaeological sites, both scatters of lithic artefacts, (RUR1 and RUR2) and one isolated find (RURIF1, a single lithic artefact) were identified. Eight areas of archaeological potential, PAD1-PAD8 were also identified. All of the PADs were situated along alluvial flats and basal slopes adjacent to tributary streamlines. (Figure 8.1)

Site RUR2 included 22 recorded surface artefacts and was considered to have moderate potential to contain relatively undisturbed subsurface archaeological deposits.

The 2002 assessment recommended that:

- If development impact was anticipated in the area of Aboriginal site **RUR2**, then a program of subsurface testing should be conducted to determine the nature and significance of subsurface deposits. Depending on the results of this program, it may be necessary to conduct a further program of salvage excavation, along with a surface collection of artefacts prior to the development.
- A program of archaeological subsurface testing should be conducted within all of the recorded potential archaeological deposits (**PAD1-PAD8**) in which it is anticipated that development impact may occur. This is required to determine the nature, extent and significance of any archaeological material that may be present. If significant archaeological deposits are detected, then the preferred strategy is likely to be *in situ* conservation of the deposit within reserved open space. (Navin Officer Heritage Consultants 2002)

The then National Parks and Wildlife Service (NPWS), now the Department of Environment and Climate Change (DECC), also required a program of subsurface testing within a representative sample of the landforms present. A sampling and excavation methodology which would meet the DECC requirements for this program was developed between the consultants and Ms Julie Dibden of the Southern Aboriginal Heritage Unit (SAHU), NPWS and subsequently agreed to, in principal, at a meeting at the Department of Infrastructure Planning and Natural Resources, Sydney 5/2/2004.

Five broad landform categories were recognised within the study area for archaeological sampling purposes (Figure 4.1). These were:

- watershed ridgeline crests
- spurline crests
- middle and upper valley slopes
- basal slopes, and
- the valley floor.

With regard to the scope of the excavation program, it was also agreed that:

- approximately five test pits should be conducted per identified PAD and site areas; and
- a minimum of five test pits should be conducted within each of the five recognised landform units.

10.2 Objectives of the Subsurface Testing Program

The objective of the subsurface testing program at Rosedale was to gain enough information to enable the drafting of appropriate management strategies within the future context of the surrounding residential development. The program also aimed to ascertain the nature, extent and integrity of Aboriginal relics/objects (as defined by the NP&W Act) within the areas subject to archaeological testing.

Specific aims were to:

1. Characterise the nature of any archaeological deposits encountered (within the limitations of the sampling and processing methodology).

2. Identify the need for any further archaeological work, such as salvage excavation.

3. Provide informed mitigative measures and management recommendations for the Aboriginal cultural resource.

10.3 DEC s87 Permit

A DEC s87 Permit (Preliminary Research Permit – [PRP]) was applied for by the consultants (16 February 2004) and issued by the DEC (Permit #1863, 11 March 2004) prior to the commencement of subsurface investigations.

A special condition of the permit stated that:

> "The proposed methodology will require all material recovered in each spit to be sieved and analysed" (Special Condition No.4 PRP No. 1863).

Following verbal clarification from Garry Currey, Manager of the Southern Aboriginal Heritage Unit, it was agreed that this condition did not apply to

- sediments recovered from the pit in a mixed or contaminated state (ie where the material was sourced from more than one spit level – such as from 'clean-up' and preparatory actions prior to excavating the next spit),
- or to clay dominated sediments from below the interface with the upper soil profile, and which were excavated for the purpose of investigating site geomorphology.

This special condition required a modification in the standard Navin Officer methodology submitted in the permit application which proposed sieving a sample of 8 x 10 litre buckets of recovered sediment from each spit (or the total amount of excavated sediment if this amounted to less than 8 buckets). The actual number of buckets sieved per spit ranged from 3 to 20, with most recovered spit material being significantly larger than 8 buckets. All excavated material, excepting that specified in the above dot points was recovered and sieved. A consequence of this modification to the methodology was a substantially longer period of field time to complete the required number and spread of test pits.

10.4 Excavation Methodology

10.4.1 Test Pit Locations

The areas in which test pits were conducted are shown in Figure 10.1. Detailed plans of pits within those locations are provided in Appendix 11. The test areas consisted of:

- Five areas (Areas 3, 4, 5, 6 and 7), selected to provide a sample of the five broad landform categories recognised within the study area:
  - watershed ridgeline crests
  - spurline crests
  - middle and upper valley slopes
  - basal slopes, and
  - the valley floor.

  (Areas 1, 2 and 8 were identified as potential test pit areas in the permit application but were not required to fulfil the required DEC sample regime)
- Eight previously identified potential archaeological deposits (PAD1, 2, 3, 4, 5, 6, 7 and 8).

Following in-field review, PAD6 and 7 were combined and treated as a continuous area termed PAD6 and 7.

- One previously recorded site with surface artefacts (RUR2).

The permit methodology allowed for:

- the conduct of approximately 5 test pits per identified PAD area. The exact number would be dependant on micro-topographic considerations and on-going interpretation of field results. The total number of test pits conducted in identified PADs would be around 40;

- the conduct of approximately 5 test pits within that part of site RUR2 that may be impacted by development;

- the conduct of a minimum of five test pits within each of the five recognised landform units (see above). Test pit locations would be selected in areas considered to have greatest relative archaeological potential within areas subject to development impact (but not including the test pits in the identified PADs). The minimum number of required test pits would be 25. More than five test pits may be required within a given landform unit, where the field interpretation of artefact incidence patterns indicates that a larger or more diverse sample is necessary.

Table 10.1 shows the actual number and location of pits conducted across the study area. Four test pits were conducted in PAD1, 2, 4, 6, 7 and 8. Five test pits were conducted in PAD3 and 5. A total of thirty four test pits were conducted within PADs. The arrangements of pits in each test location are shown in Appendix 11.

Six test pits were conducted within previously recorded site RUR2.

In addition to the test pits conducted within PADs or previously identified sites, twenty nine test pits were conducted within sample areas within the five landform categories. This is four more than the anticipated minimum. Between five and seven test pits were conducted within each of the landform categories.

A total of 68 test pits were conducted.

Table 10.1 The location and topographic context of test pits conducted within the Rosedale development area.

Test Pit Nos.	Location	Landform Category	Micro-topography
1-3	Area 3	watershed ridgeline	crest
4-5	Area 4	watershed ridgeline	crest- slopes adjacent to saddle
6-7	Area 7	spurline	crest
8	Area 7	basal slopes	
9-10	Area 7	valley floor	creek flats
11-12	Area 7	basal slopes	
13-14	Area 7	midslopes	
15	Area 6	valley floor	flats around wetland
16-18	Area 6	basal slopes	
19	Area 6	spurline	crest – basal slopes (relative to spurline)
20	Area 6	spurline	crest – downslope end of spurline shoulder
33	Area 6	spurline	crest – shoulder
34	Area 6	spurline	crest – shoulder

Test Pit Nos.	Location	Landform Category	Micro-topography
27	Area 5	basal slopes	
28	Area 5	mid slopes	
29	Area 5	mid slopes	
30	Area 5	upper slopes	
21-22, 24-25	RUR2	basal slopes	
23, 26	RUR2	basal slopes	adjacent to drainage line
31-32	Area 6	valley floor	flats around wetland
35-36	PAD2	valley floor	
37	PAD2	valley floor	adjacent to creek, and lower than pits 35-36
38	PAD2	basal slopes	
39	PAD1	valley floor	low rise between tributary drainage lines (closest to main valley floor creek)
40-42	PAD1	valley floor	low rise between tributary drainage lines
43-45	PAD3	basal slopes	
46	PAD3	valley floor	
47	PAD3	valley floor	low rise between drainage lines
48	PAD4	basal slopes	
49	PAD4	valley floor	
50,51	PAD4	valley floor	on low rise adjacent to intersection of tributary with main valley creekline
52, 59	PAD6&7	valley floor	on low rise adjacent to intersection of tributary with main valley creekline
53-55	PAD6&7	valley floor	
56-57	PAD6&7	spurline	crest – basal slopes (relative to spurline)
58	PAD6&7	valley floor	adjacent to creekline
60	PAD8	valley floor	closest to main creekline
61-63	PAD8	valley floor	
64-68	PAD5	valley floor	all adjacent to creekline

10.4.2 Test Pit Excavation and Sieving

The following excavation methodology was followed for backhoe pits (Plates 10.1 - 10.6).

1. Mark out and record the required location of backhoe pits.

2. Excavate backhoe pit.

Sixty eight (68) pits were excavated by a backhoe using a straight-edged 100 cm bucket, with a toothed 60 cm bucket being employed in more consolidated sediments.

Spit depths had an interval range of between 5 m and 20 cm.

Pits had a final length of around 1 m to 1.5 m depending on the final depth achieved.

The following excavation sequence was followed:

- excavation of spit one along an interval averaging 1.0 m in length;
- excavation of spit 2 (and all subsequent spits), beginning approximately 200-300 mm from the far end of the previous spit. This will be done in order to create a 'clean' end-wall and prevent contamination from sediments from upper levels;
- following removal of spit 1 (and after all subsequent spits), one side of the pit would be extended approximately 2 to 5 cm, (effectively removing this width of deposit from the last spit level). This was done so that the sides of the backhoe bucket, when excavating the next spit, would not rub against the sides of the pit and pull material in from upper levels.
- following spit 2 (and after all subsequent spits), the near end of the pit was extended by up to 300 mm in order to remove any fallen sediment from upper levels and to provide a 'clean' end point for the backhoe bucket; and

Excavation ceased according to an on-site appreciation of testing requirements, generally this meant encountering massive clay.

3. Sieve all deposit excavated from undisturbed contexts (ie excluding sediments removed from the pit from 'clean up' and preparatory actions for the next spit excavation (such as near end extension of the pit and removal of the side margin)).

All sieving was conducted with the aid of pressurised water from a water truck. All material was sieved through 3 mm and 5 mm mesh.

All identified or suspected cultural material recovered from sieving was retained, bagged and labelled.

4. Following cessation of excavation, the soil profile and characteristics were described and checked with the separately documented incremental spit descriptions. pH measurements were taken from representative pits at various locations in the profile.

5. All pits were backfilled with the remaining excavated and sieved spoil.

10.4.3 Potential Issues Arising from Artefact Recovery Methods

Issues related to mechanical excavation

It was noted during excavation that materials such as shales, quartz and chert were naturally present as gravels, with pieces of quartz up to 200 mm observed. Both quartz and chert are used for artefact manufacture in the study area, and thus the combination of their presence with the use of heavy machinery for excavation had the potential to result in the production of fresh flakes and cores during excavation. This process was noted to take place by the archaeologists in the field, who observed flakes being produced by the backhoe bucket from a quartz cobble in Pit 57.

A further problem with this excavation technique is the potential for the damaging and/or destruction of artefacts in subsurface contexts. Both of these problems have the capacity to inflate the number of artefacts recorded during analysis. To account for this, the 'recentness' of fracture surfaces was noted during analysis. Flakes resulting from recent fracture tend to demonstrate far 'cleaner' surfaces and sharper edges than artefacts. These can usually be distinguished with a reasonable degree of certainty during the analysis.

A final problem relating to the use of mechanical excavation tools is the lack of stratigraphic control. Variability in the consolidation of sediments can make it difficult for the backhoe operator to achieve consistency in spit depth, a problem that is marked in soils with variable clay content, such as those at Rosedale. Furthermore, such a technique makes it relatively difficult to stop at stratigraphic boundaries during excavation. Variable spit depth complicates comparisons during analysis, which may be partially overcome by using approximations of depth rather than actual depths, and by accounting for the potential effects of variable volume. This is discussed in Section 12.3.1.

Issues related to sampling

As with depth control, sampling regimes are seldom consistent. This problem arises from the difficulty of calculating, in the field, the exact amount of sediment that would need to be sieved from each scrape to provide a consistent sampling ratio. Detailed field notes from the Rosedale excavations provide good data from which both the volume of excavated sediment and the volume of sieved sediment can be calculated. Thus, some control can be gained over variation in sampling. Unfortunately the two volumes cannot be compared directly, as sediments are much less compact after excavation than while still in the ground. In consequence, sampling is calculated simply as the ratio of buckets sieved to volume of material excavated.

A second concern related to sampling is the concentration of excavations in areas of sensitivity. While this is consistent with good archaeological practice, differences in the amount of sediment excavated and sieved in different areas need to be accounted for when discussing spatial variation in the distribution of artefacts. Both of these issues are addressed in Section 7.2.3.1.

Issues in identifying quartz on the sieve

As noted above, quartz is used in artefact manufacture in the research area. It is also naturally present in local gravels from small pieces up to quite large cobbles. This, allied to the fact that quartz is among the most difficult materials on which to recognise classic artefactual features, makes it possible that artefacts were rejected during initial sorting on the sieve. In consequence there is some possibility that the assemblage analysed under-represents the total number of artefacts present.

This issue is approached by looking at a sample of the rocks rejected during the present analysis, and their relationship to those that were deemed to be artefacts. If the initial sorting was not cautious enough, then we would expect that most of the rocks that passed through this phase would be accepted during the analysis, from which we would infer the discard of artefactual material. If initial sorting were cautious we would expect to see high rates of rejection in the analysis stage. To test this, a sample of rocks rejected during the analysis were measured to see how they related to those accepted as artefacts. If those rejected cover the range of those accepted then it would be reasonable to argue that initial sorting was sufficiently cautious to provide a “buffer” against the probability of discarding artefacts unintentionally. This issue is addressed in Section 12.3.1.

Plate 10.1: Excavating the deposit

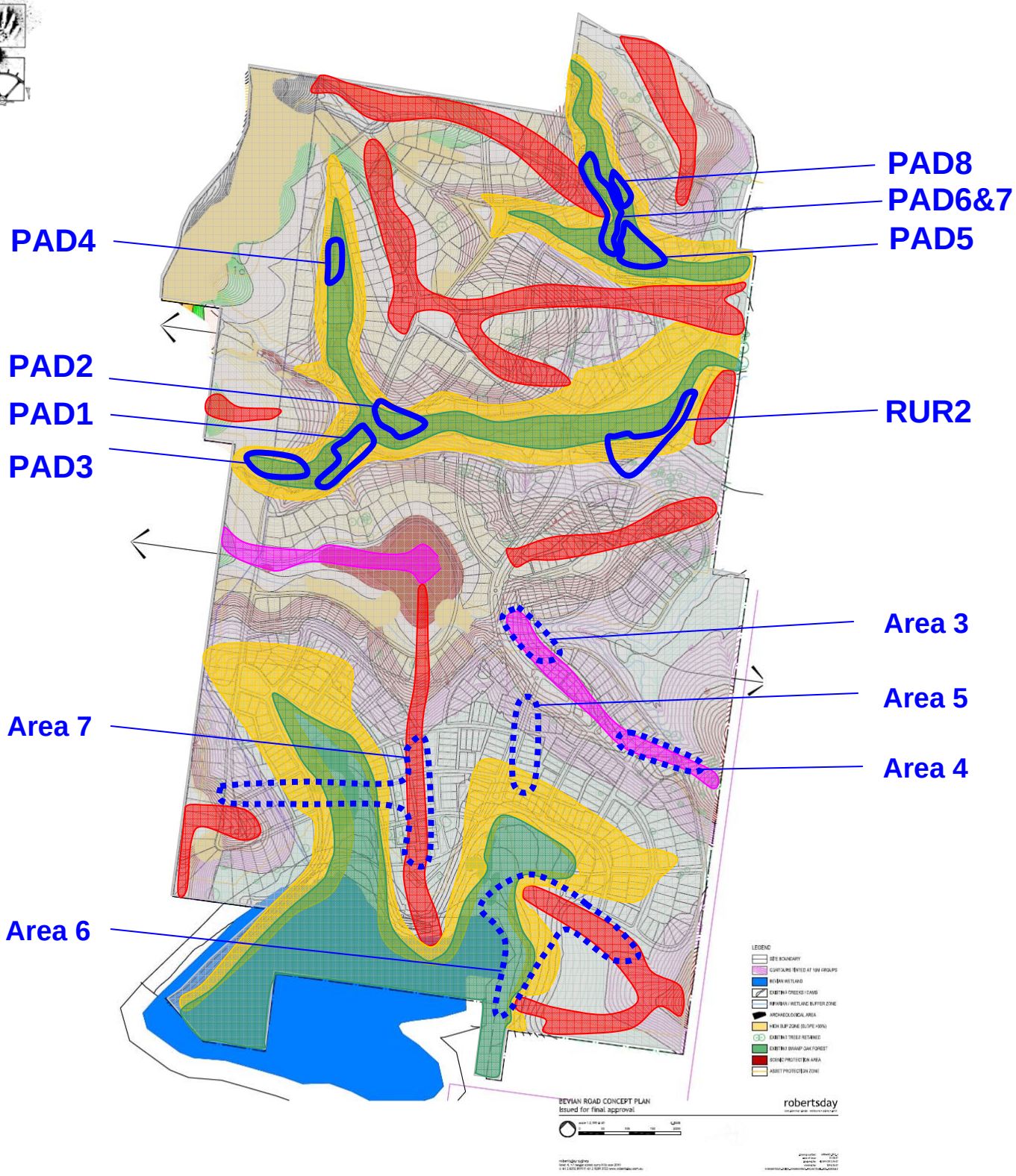
Plate 10.2: Marking buckets prior to transporting to sieving station

Plate 10.3: Transporting excavated material to the sieving station

Plate 10.4: Sieving station

Plate 10.5: Wet sieving

Plate 10.6: Uninvited field assistants - Glove-eating calves.



Area with surface artefacts (RUR) or previously identified archaeological potential (PAD)

Test area selected to sample different landform units

watershed ridgeline crests

spurline crests (overlaps with basal slopes in some locations)

middle and upper valley slopes

basal slopes,

the valley floor

Figure 10.1 Areas in which test pits were conducted relative to landform units and the Bevian Road Concept Plan (concept plan base map provided by robertsday).

10.5 Lithic Analysis

10.5.1 Methods of Artefact Identification

Lithic analysis was conducted by Alex Mackay. In keeping with the terms of the PRP, the identification of artefacts was undertaken with the assistance of a low-magnification stereo microscope with incident light, a 20x hand lens and a 10x hand lens, and a florescent magnification lamp.

The basic artefact categories employed were:

- flake (retouched and unretouched)
- flaked piece (discussed further below)
- core
- core fragment
- hammerstone (fragment)
- grindstone (fragment)
- heat shatter
- potlid

Definitions of each are provided in Appendix 3.

All rocks meeting the criteria of these definitions were included in the analysis. A sample of those excluded was also measured for the comparative purposes discussed earlier. Due to the ambiguities sometimes associated with the recognition of quartz artefacts, a partial second pass (25% sample) was made after the initial analysis to examine whether interpretation would change. The sample chosen was the first quarter of the assemblage to undergo analysis, reasoning that this was likely to contain the highest frequency of errors as the new material was adapted to by the analyst. The result was a 5% revision, including 3% discard and 2% reinterpretation. Given that this was likely to represent the highest error rate it was concluded that reanalysis of the remainder of the assemblage would be unlikely to produce any significant alteration.

Identification of artefacts was also complicated by the presence of quartz as a natural rock type in the subsurface testing area. The local quartz contains abundant natural fracture planes, and is likely to have been broken up over time by a number of natural and anthropogenic factors, including weathering, treadage, heat shatter, and more recently, ploughing and vehicular land use. Thus, unlike silcretes or volcanics, the presence of fractured quartz is not necessarily indicative of any kind of human agency in itself. In consequence, it was necessary to apply the strictest definitions of the term “artefact” during the identification phase of analysis.

All artefacts exhibiting a clear point of initiation or bipolar crushing were included. As a result, complete, proximal, and longitudinally split flakes are likely to be well represented in the assemblage. Medial and distal fragments, however, are likely to be under-represented – these were only included when clear dorsal scars provided corroborating evidence, both of the flaked nature of the stone and, in most cases, consistent with the direction of percussion implied by the apparent ventral face. A further consequence of this approach was that the category “flaked piece” – usually employed to denote an artefact with evidence of percussive alteration but on which a ventral and dorsal face cannot be distinguished – was not employed for quartz in this analysis. The reason was simply that all the requirements of this category could be met by rocks that had only ever been altered by natural processes. The flaked piece category was retained for those materials that could only have arrived on the site through human agency.

10.5.2 Methods of Artefact Analysis

A complete list of artefact attributes examined is included in Appendix 4. All measurements were taken using digital callipers sensitive to 0.1 mm. Weights were recorded using digital scales sensitive to 0.1 gram. Angles were taken using a goniometer, with measures rounded to the nearest degree.

The attributes recorded were selected for their capacity to tease out behavioural, technological and taphonomic variation across the research area. They were not strictly tailored to the requirements of

the PRP, but were considered capable of providing data that would allow all of these requirements to be met.

10.5.3 Artefact density

All artefact densities presented in this report are calculated as if the artefacts occurred in two dimensions only, that is in metres squared. This is in contrast to, conventional density calculations which require a three dimensional measure, such as metres cubed. This method provides the most effective measure for the comparison of artefact incidence across different test locations.

In conventional density calculations, the depth of the test pit will have a significant impact on the density value. The depth achieved in each of the project test pits was mostly depended on the depth of the A-horizon, which varied significantly across the study area. The depth of the A-horizon does not relate to cultural variables and its effect in increasing or decreasing conventional artefact density calculations is unwanted and misleading. An example would be where two test pits have the same total number of recovered artefacts but significantly different conventional density values due a shallow soil in one and a deep soil in the other. In this example conventional densities would erroneously suggest that the shallow deposit represented a higher intensity of occupation (or artefact discard), than the deeper deposit. Rather than pair every conventional density calculation with the required additional data of pit depth and total number of artefacts, this report adopts an alternative convention by ignoring the volumetric context of the artefacts. The 'density' of archaeological material is calculated as a product of an areal measure of space, that is, as if all recovered artefacts were present on the area represented by the material taken from each spit.

In the absence of significant stratigraphic differentiation, volumetric analysis of excavated artefact density will only reveal information relevant to the geomorphic processes of the biomantle. Such trends are cannot be related to the cultural variables which resulted in the discard of the artefact(s). In such contexts, subsurface artefacts are best treated as the net accumulation of potentially numerous occupation or discard events – that is, as if they were a surface lag deposit. The use of an areal 'density' measure effectively accommodates this limitation in the archaeological data. The boundary between the A and B horizons across the study area soil profiles tends to act as a below-ground *de facto* 'surface' because it forms a clay barrier where most artefacts settle after downward movement through the A-horizon due to bioturbation.

10.6 Curation of the Lithic Artefact Collection

After measurement and examination, all lithic items were individually stored in standard resealable plastic bags. In accordance with NPWS (now DECC) best-practice guidelines (Byrne 1997), each item's unique identifying number was labelled on each plastic bag with permanent black ink. The small sealed bags were then stored in larger sealed bags that have the details of provenance, such as site, test pit and spit.

It is anticipated that all stored artefactual material will be returned to the Mogo Local Aboriginal Land Council following the completion of the Barlings Beach Aboriginal cultural centre.

10.7 Geomorphic and Pedologic Assessment

Dr Peter Mitchell of Groundtruth Consulting attended the archaeological excavations at Rosedale on 7 April 2004, and examined open pits and landscape features for the purpose of placing the Aboriginal artefacts being recovered in the test pits in a geomorphic and pedologic context.

Dr Mitchell subsequently provided a report to Navin Officer. Dr Mitchell's report has been incorporated into this report.

11. RESULTS OF THE GEOMORPHOLOGICAL AND PEDOLOGICAL ASSESSMENT

For the purpose of archaeological testing, Navin Officer had differentiated five landform units on the basis of ground slope and location between the valley floors and ridgeline crests. Other than the swamp and creek lines there are no other obvious geomorphic features in the release area and this arbitrary division of the landscape into practical survey units was considered an acceptable approach.

Four discrete landforms were identified by Peter Mitchell (geomorphologist) in the Concept Approval Area:

I. Bedrock hill slopes.

II. Valley floors and low angle alluvial fans.

III. Swamp and lagoon.

IV. Coastal barrier and beach ridges.

Soil profiles were examined by Dr Peter Mitchell, in pits, road cuttings, or auger holes at more than ten locations within the study area and more superficially along a transect (C-F on Figure 11.1) across the barrier system.

A summary of pit data and soil profile descriptions (as documented by the Navin Officer field team) is provided in Appendix 6.

11.1 Bedrock hill slopes

Bedrock hill slopes in the study area are mostly cleared and have been used for grazing. The highest elevation is just over 60 m ASL and slope angles range from 1^{o} to 2^{o} on the crests, through 7^{o} to 9^{o} on the upper slopes, to 1^{o} to 3^{o} on the lower slopes.

Virtually all of the soils on the hill slopes have texture contrast profiles (duplex in the sense of Northcote 1971). In these soils the A-horizon is an active biomantle (Paton *et al*., 1995, Johnson 1989, 2002) of sandy clay loam to sandy loam overlying a pedal medium clay B-horizon formed by *in-situ* weathering of the bedrock. Profiles on the crests are very shallow, those on mid-slopes are deeper and those toward the lower slopes commonly have a bleached A_2-horizon as a result of lateral soil drainage and throughflow. B-horizon clays are all strongly structured and their colour varies from reddish brown 2.5YR4/8m to dull yellow 10YR6/4m depending on the rock type from which they are derived and their drainage status.

Most profiles have some degree of stone layer development at the base of the biomantle where clasts (and artefacts if present) have accumulated over time as a consequence of bioturbation. Such stone layers are an important part of the taphonomy of open sites and it should be noted that any artefact concentration found at this level is not usually stratified because artefacts of all ages can be conflated to that level over time. On slopes greater than about 3^{o} artefacts also tend to be redistributed down slope from their original position on the surface and it is unusual to be able to identify discrete discard events such as knapping floors. For a discussion of these issues see Dean-Jones and Mitchell (1993) and Balek (2002).

The following profile descriptions from Pits 29 and 26 are representative of upper and lower slope profiles.

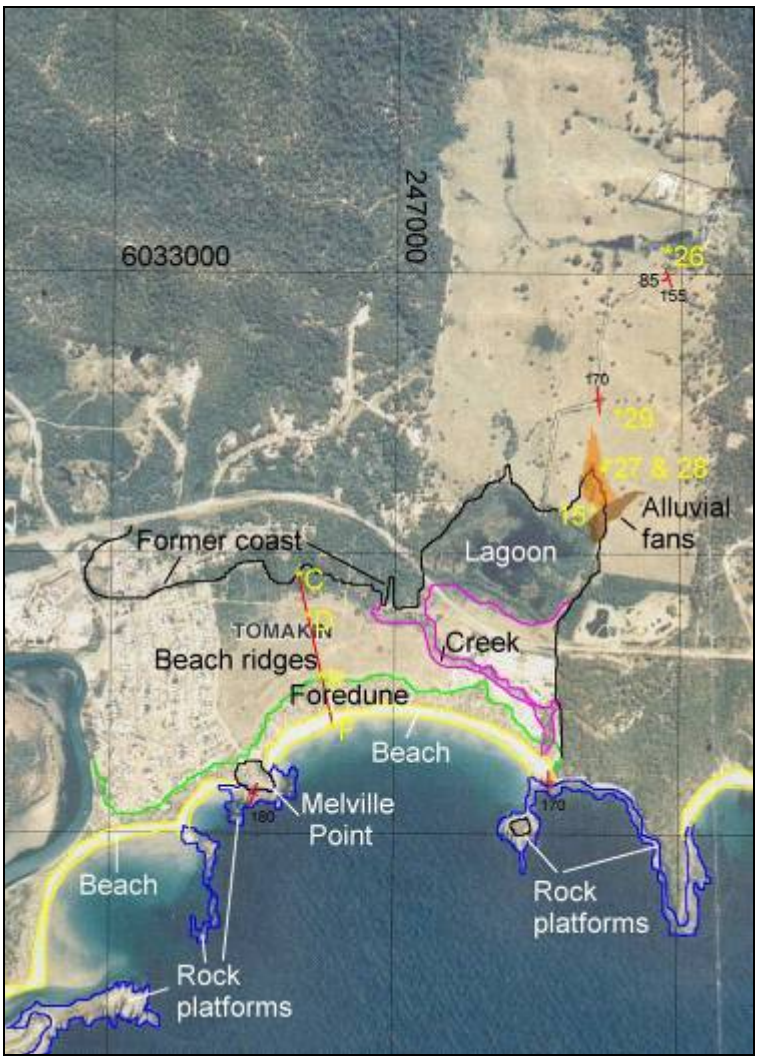


Figure 11.1 Barlings Beach barrier system and the Rosedale Urban Release Area showing geomorphic features and the location of the test pits and barrier transect discussed in this chapter Red lines identify strike and dip of bedrock geology; soil profiles examined are noted in yellow. The map gridlines are one kilometre apart. Source: Land and Property Information NSW. Mogo 8926-3N orthophotomap, photos taken in 1999.

Pit 29

Grassland with regenerating swamp oak and paperbark, on a 5^{o} slope at 6032505N 247775E (AMG 1984).

0-13cm pH6.2 Brownish black 10YR3/2m, gritty sandy loam with abundant worms and fine grass roots. Fabric is entirely biogenic. Gradual to:

13-40cm pH 6.0, conductivity 120 micro-Siemens/cm. Light grey 10YR8/1d, bleached A_2-horizon with a sandy loam matrix and a high gravel content. Clear to:

40-110cm Dull yellowish brown 10YR5/4m, prismatic to polyhedral clay. B-horizon weathered *in situ* from bedrock.

At 110cm Weathered phyllite bedrock

Pit 26

Partly cleared copse of spotted gum and stringybark with *Lomandra* tussock and kangaroo grass (*Themeda* sp.) on a lower slope of 3^{o} above the main channel of Saltwater Creek at 6033078N 247948E (Figure 11.2).

0-1cm Litter layer of leaves and twigs with some rain splashed gravel. Clear to:

1-12cm Brownish black 7.5YR3/2m, gritty sandy loam with fine roots and a fabric composed of faunal pellets. Gradual to:

12-26cm Light brownish grey 7.5YR7/2d, gritty fine sandy loam. Bleached A_2-horizon but with no stone layer evident but grit and small pebbles abundant throughout the bleached layer. Gradual to:

26-48cm Dark brown 7.5YR3/3m, similar material to above, but with the darker colour and a slight increase in clay content. Interpreted as a transitional horizon between the bleached A_2 and underlying B-horizon. An active part of the biomantle where worms appear to be common and have homogenised the usual sharp boundary. Gradual to:

48-100cm Dark reddish brown 2.5YR3/6m with patches of dull yellow orange 10YR6/4m, tough gritty clay with polyhedral fabric. Derived from phyllite.

Similar profiles were exposed along the adjacent road where soil depth and B-horizon colour varies according to bedrock type, deeper red brown profiles on phyllite and shallow dull yellow profiles on chert or quartzite.

Figure 11.2 Soil profile in Pit 26 (see Figure 11.1). A deeper than average gritty biomantle is developed toward the base of the slope without a clear boundary between the A and B-horizons.

11.2 Valley floors and low angle alluvial fans

Behind Bevian Swamp, second order streams have flat floors with ill-defined channels that to spread laterally onto low-angle alluvial fans at the former margin of the lagoon (Figure 11.3). Immediately behind the water truck in Figure 11.3 two parallel lines of swamp oak grow along excavated drains that were used lower water levels in the swamp. Comparable drainage work must have been undertaken along the un-named creek draining this swamp through the barrier toward the coast.

Soil profiles in the valley and on the fans are very similar to those found on the hill slope in that they are also texture contrast profiles with tough clay B-horizons and well developed bleached A_2-horizons. However closer examination reveals some important differences.

The biomantle (A-horizon) becomes finer and stone layers are less well developed with increasing distance from the hill slope / valley floor margin.

Valley floor and alluvial fan soils are subject to much higher shrink/swell potential and even under dense grass cover exhibited open cracks up to 2cm wide and 10-15 cm deep. Such cracks could allow the direct movement of artefacts to the base of the biomantle if discarded on the surface. The areas where these cracks were most obvious are within the 19th Century margins of the lagoon and were not likely to be occupied by Aboriginal people.

Subsoils or B-horizons in the valley floor and alluvial fan soils have a similar texture to *in situ* subsoils on the hill slope but have much stronger polygonal fabric, domed structure and drab gleyed colours associated with poor drainage

Figure 11.3 Hill slopes and valley floors showing the two low angle fans near the margin of Bevian Swamp looking along the section line through Pits 29 to 15 in Figure 11.1. Note the parallel lines of swamp oak (behind the water truck) that grow along excavated drains.

The following profile descriptions from Pits 27 and 28 are representative of valley floor and alluvial fan profiles.

Pit 27

On the alluvial fan in a grassland with regenerating swamp oak and paperbark at the foot of the hill with a slope angle of 1^{o} at 6032398N 247740E (Figure 11.4).

0-12cm Dark brown 10YR3/2m, gritty organic sandy loam with abundant grass roots and worm casts. Gradual to:

12-30cm Bleached A2-horizon light grey 10YR7/1d. Hardsetting sandy loam with a distinct stone layer at the base of the biomantle. Infilled worm burrows penetrate into the underlying B-horizon. Clear to:

30-50cm Brown 10YR4/4m, gritty clay with coarse prismatic pedlary and moderate development of 25 cm diameter domes with bleached tops. Gradual to:

50-80cm+ Brown with greyish yellow brown patches 10YR4/4m and 10YR 4/2m, harsh clay with little grit or gravel. The origin of this material was uncertain and another hole was excavated immediately downslope. This confirmed that the B-horizon was developed in alluvial clays and that the biomantle was a separate stratum crossing *in situ* weathered B-horizon on the hill slope and this alluvial material. Both the biomantle and the B-horizon in the lower hole contained bedded fine quartz gravel deposited by fluvial or colluvial processes.

Figure 11.4 Soil profile with an intensely bleached A_2-horizon exposed in Pit 27. The dome structure of the B-horizon is not evident because the clay is smeared by the backhoe

Pit 28

Slightly upslope from Pit 27 on a 3^o slope near the margin between the alluvial fan surface and a more confined valley floor and hill slope at 6032439N 247766E.

0-14cm. Brownish black 10YR3/2m, gritty loam with abundant worm and fine roots. Gradual to:

14-38cm. Light grey 10YR8/1d, gritty silty loam to light clay, harvesting when dry with fragments of quartz and chert in a discontinuous stone layer. Clear to:

38cm+. Dull yellowish brown 10YR4/3m tough prismatic clay with 25cm domes. This unit appears similar to *in situ* bedrock clays up slope.

The pit was deepened to 85 cm and passed through the clay into bedded gravel with a sticky clay matrix demonstrating again that this was an accumulation of colluvial sediments.

11.3 Swamp and lagoon

This area (Figure 11.5) was not examined in detail but the following observations are made:

- The lagoon and surrounding swamp is now an artefact of 20th century drainage works (Figure 11.3) the full extent of which is not known.

- The lagoon and swamp must always have been an important resource to Aboriginal people because of their high productivity and biodiversity. The nature of this resource will have changed over time and some of those changes should be evident in the archaeology known to be present on the coastal barrier.

- The bed of the present lagoon was exposed (Figure 11.5) at the time of the fieldwork and was seen to be highly organic peaty silt with very high shrinkage and wide, open cracks in the desiccated surface. This layer of organic sediment reflects contemporary sedimentation of suspended load fines and organic matter from the breakdown of plants and organisms living in and on the water body. No evidence was seen at the surface of bedlam materials from the catchment or aeolian materials from the barrier but both of these sources must be evident in deeper sediments.

- At the time when post-glacial sea level reached or slightly exceeded its present level (circa 3,500 years BP (see below) there was probably no lagoon but an open estuary. Sediments deposited during this time must be preserved beneath the present lagoon. The longevity of this feature is unknown but given that it existed within the time frame of Holocene Aboriginal occupation it is possible that some sites in the vicinity of Bevian Swamp might reflect an economy based on estuarine resources. No such site has yet been identified.

- The substantive changes in lagoon sediments that have accumulated over the past 3,500 years can be expected to yield a comprehensive record of environmental change if sampled and investigated.

- Whatever the future land use within the lagoon catchment it is important that sedimentation be kept at a minimum if the lagoon and surrounding swamp is to be maintained as a natural system.

Figure 11.5 Bevian Swamp at a low level at the time of the fieldwork because of drought conditions. Highly organic mud with wide shrinkage cracks is exposed on the lagoon floor. Note zoned vegetation patterns relating to variations in water depth

The following profile description from Pit 15 is representative of the swamp margin prior to drainage.

Pit 15.

On the flat of the alluvial fan within the margin of the swamp prior to engineered drainage. Adjacent to dense patches of regenerating swamp oak at 6032167N 247688E.

0-45cm Black 10YR2/1m, organic clay loam with very dense root mat from the swamp oak, iron staining along root channels and some ped surfaces indicate the soil was previously subject to poor drainage. Clear to:

45-100cm+ Heavy alluvial clays with coarse prismatic structure and variably coloured, yellow grey and grey with dull reddish brown mottles. Some evidence of pedogenic carbonate accumulation at depth and a complete absence of grit or gravel throughout the profile. It is likely that this clay accumulated in the lagoon bed. At greater depths estuarine clays may be present.

11.4 Coastal barrier and beach ridges

Given the archaeological sensitivity of this area the beach and dunes were examined by walking along the beach and across the barrier system on a transect marked C-F on Figures 11.1 and 11.6. Surface soil materials were inspected on ridges and in swales using available shallow exposures such as where the soil was excavated by rabbits and ants. The sequence is described below.

Point C was located below the Holocene/Pleistocene bedrock cliffs in dune sand supporting blackbutt and coastal banksia. The hill slope of the degraded cliff supported spotted gum and coast mahogany. Animal burrows in the sand indicated some degree of soil profile development and a 25 mm diameter core sample was taken to examine this.

Figure 11.6 Barlings Beach looking northeast from Melville Point across the barrier. A line of revegetated recent transgressive dunes lies behind the beach over-riding Holocene beach ridges that extend to the timbered bedrock hill slope. C-F is the transect in Figure 11.1. The location of the Rosedale study area is on the clear hills in the background.

0-18cm	pH 6.1, conductivity 130 micro-Siemens/cm. Brownish black 10YR2/3m, single grained sand with abundant fine roots and ant burrows, no visible shell fragments present. Clear boundary to:
18-20cm	pH 6.1, conductivity 120 micro-Siemens/cm. Light grey 10YR7/1d, single grained sand, with fine roots and no visible shell fragments. Interpreted as a very thin bleached A_2-horizon.Gradual to:
20-50cm	pH 6.1, conductivity 120 micro-Siemens/cm. Brown iron stained quartz sand with small patches of slightly cemented sand and no visible shell fragments.
50-100cm	pH 6.4, conductivity 150 micro-Siemens/cm. As above.
At 100cm	pH 6.8 As above but with weathered shell fragments visible with a hand lens.

Progressing across the barrier from C to F (Figure 11.1) it was observed that the organic A_1-horizon was slightly deeper in swales than on the ridges and that shell sand first became evident in small quantities in the surface soil at point D. Immediately behind the transgressive dunes at point E shell sand was abundant and where there was very little soil profile development other than a slight darkening of the thin topsoil caused by accumulating organic matter.

The whole sequence of minimal soil development from the beach inland to point C is consistent with the sequential age of the beach ridges established on geomorphic grounds. Only on the oldest ridges has carbonate leaching proceeded to the extent that an incipient podsol soil profile has developed, soil pH has moved to the acid side of neutral and all trace of shell fragments has been destroyed above 100 cm depth.

12. RESULTS OF THE SUBSURFACE TESTING PROGRAM

12.1 Assemblage Approaches to Artefact Analysis

Assessing the implications and significance of an artefact in isolation is difficult for two key reasons. The first is that meaning derives from context, both physical and cultural. As the cultural setting for these items has largely been lost, we rely on the physical context of the artefact, both within the landscape setting and within the broader population of artefacts, to provide meaning. The second is that artefacts commonly occur in large numbers, limiting the inferences that can be drawn from any one individual artefact to the broader population.

As a consequence, artefacts, while analysed as individuals, are most commonly explored as assemblages. Variation in the structure of assemblages through space and time can provide a robust basis for the interpretation of past behaviours and land use practices. However, behaviour is not the only factor that can impose structure on stone artefact assemblages. Taphonomic processes such as vehicular traffic, fire, erosion, bioturbation and recovery method can significantly alter the structure of assemblages in the period between initial deposition and interpretation.

This analysis will work regressively through those factors that may have structured the assemblage after deposition. The objective is to be able to account for the effects of non-behavioural factors, making it possible to approach the underlying behaviours associated with the manufacture, use and discard of the artefacts.

Once behavioural factors have been separated from taphonomic factors, the analysis will proceed to an assessment of past land use through assemblage structure. Prior to this, a basic description of the artefact assemblage is presented, to provide a context for the subsequent discussion.

12.2 Description of the Stone Artefacts Recovered from Rosedale

A total of 983 lithic items were retained for analysis after initial in-field sorting of wet sieved residues. Of these, 509 were determined in the analysis to be artefactual, with the remaining 48% rejected as non-artefactual. Refer to Appendix 5 for a table of recovered artefacts numbers per pit, and a complete listing of the recorded data for each artefact.

Artefacts came from 53 of the 68 pits excavated. Quartz artefacts account for just over 68% of the assemblage total, followed by silcrete (19%), volcanics (8%), and chert (1%) – quartzites, volcanics and unidentified other materials account for the remaining 4%. Artefacts were recovered to a maximum depth of 67 cms.

The artefacts tend to be small to medium in size, with a mean weight for all materials and all technological classes of 1.8 grams. Silcrete artefacts are the smallest on average, with a mean weight of 1.3 grams, followed by quartz, with a mean weight of 1.5 grams. Volcanic artefacts tend to be the heaviest, with a mean weight of 4.3 grams. Percentages of cortex on artefacts tend to be quite stable between material classes, with no clear division between locally available materials such as chert and quartz (4% and 7.7% respectively) and imported materials such as silcrete and volcanics (8.7% and 6.5% respectively).

Artefacts were found in all of the sampled landforms with the exception of upper slopes. Approximately half (254 artefacts or 49.9%) of all artefacts were located in pits along the valley floor. A further 139 (27.3%) were located on basal slopes, 81 (15.9%) on spurlines, and 31 (6.1%) on midslopes. Only four artefacts were recovered from pits on watershed crests. The most artefacts recovered from any one pit was 84 from Pit 64 on the valley floor. This pit contained a silcrete core and two backed artefacts. The next largest number of artefacts recovered was 44 from Pit 22. A total of seven pits contained 20 or more artefacts, while 13 pits contained more than 10.

Flakes are the dominant technological component, accounting for 487 artefacts, or 95.7% of the assemblage total. Cores and flaked pieces each account for four artefacts, or 0.8% each. Heat shatter, both in the form of potlids and heat fractured rocks, accounts for nine pieces, or 1.8% of the total. Three hammerstones or hammerstone fragments were located, along with two grindstone

fragments. Retouch was noted on 11 flakes (2%), of which eight were backed. Both unidirectional and bipolar backing was recorded, sometimes on the same artefact, with unidirectional backing slightly more common (5 of 8). Geometric microliths were the only backed artefacts to be recorded as complete – all other backed artefacts were broken. As a consequence, the typological nature of the other backed artefacts was difficult to ascertain, though two appear to be asymmetric points. It is possible that some of these backed artefacts were broken during the retouching process, as five of the six non-geometrics were only partially backed. One burin was recorded, with three clear burin scars oriented from distal to proximal on the left hand side of the flake. A total of three flakes show ambiguous signs of use damage.

Modern pieces, including glass, porcelain and a shotgun shell, were also noted. One of these, a piece of bottle glass, was recorded at a depth of 60 cms below surface. Three of the other pieces were recorded in spits with a maximum depth of 23 cms – 25 cms. The fragment of porcelain was recorded at between 6 cm and 10 cms.

12.3 Consideration of Factors Affecting Assemblage Structure

12.3.1 Aspects of Assemblage Structure Relating to Recovery Method

As noted in Section 10.4.3, there are several ways in which the recovery techniques may have determined the structure of the artefact assemblage;

i. Overestimation of the artefact population through the production of new artefacts by the interaction of the excavation bucket and cobbles of local material
ii. Overestimation of the artefact population through the production of new artefacts by the interaction of the excavation bucket and existing artefacts.
iii. Overestimation through increased fragmentation of artefacts as described in (ii).
iv. Lack of depth control related to inconsistent spit depths in inconsistent sediments.
v. Misrepresentation of artefact frequency through variability in sampling.
vi. Underestimation of the artefact population through the discard of artefacts during the initial sorting stage.

12.3.1.1 Issues of Overestimation

Potential overestimation derives from two processes – production and destruction. Destruction, or fragmentation of existing artefacts, can be observed and accounted for by recording the presence of fresh breaks on an artefact, and by applying a minimum numbers calculation (minimum number of individuals – MNI), first to the freshly broken artefacts and, second, to the assemblage as a whole. The reason for breaking the process into two parts is to arrive at a fragmentation index independent of recovery-related destruction. This is discussed further in the section on assemblage richness (Section 12.3.3.1).

Hiscock (2002) provides a method for assessing the minimum number of artefacts present within an assemblage. 63 of the artefacts analysed exhibited signs of recent destruction, of which 48 were broken. These broken artefacts provide an MNI of 24.

The remaining 446 artefacts which do not exhibit recent damage return an MNI value of 301. The ratio of Number of Individual Specimens (NISP) to MNI provides a value for the exaggeration of artefact numbers by fragmentation, or what might be termed the Fragmentation Index (FI). The Rosedale assemblage has an FI value of 1.48, which means that the number of artefacts recorded over-represents the number of actual artefacts by a maximum of 48% (remembering that MNI is a minimum figure). The overall MNI for the Rosedale assemblage is 340.

The second factor to be controlled for is the presence within the assemblage of recently produced artefacts. Due care was taken during the recording process to differentiate recently produced from not-recently produced flakes and cores. As a result a total of 12 flakes, complete and partial, were discarded during the analysis. Five of these came from Pit 57, in which it was observed that the backhoe blade had struck a local quartz cobble during excavation, and another five from Pit 62.

The other two came from Pits 25 and 64.

12.3.1.2 Issues of Depth Control

The use of mechanical excavation techniques in soils of variable consolidation is likely to lead to inconsistencies in depth of excavation, between spits in different pits, between spits in the same pit, and within individual spits. Excavation notes from subsurface testing program include depths at both ends of each pit for each spit.

The mean variance in depth between the two ends of the pit is 3.7 cms, with a standard error of 2.5 cms. The maximum variance was 11cms and the minimum 0 cms. This would appear to indicate a reasonable level of control within spits.

Average spit depth, calculated as half the sum of the depth at both ends of the pit, reveals large variation in spit depths within pits. Leaving aside spits of 30 cms or greater, which usually related only to the later and predominantly sterile spits, variation between spits of greater than 20 cms was recorded in 7 of the 53 culturally active pits. Variation of greater than 10 cms was recorded in 23 pits.

Figure 12.1 presents boxplots of average spit depths for all spits except spit 9 (which was only excavated in one instance) for all culturally active spits. The figure demonstrates that while spits 1 through 3 separate out quite nicely, there is heavy overlap of mean and interquartile ranges in spits from 4 onwards.

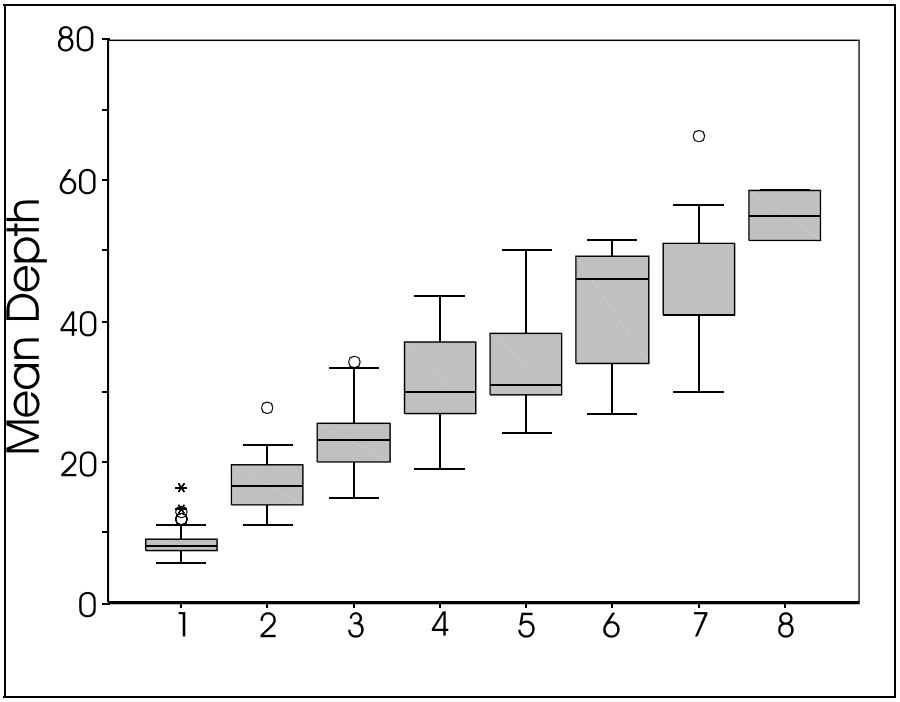


Figure 12.1 Variation in Spit Depth for All Culturally Active Spits.

The consequence of these depth control issues is that spit numbers, in particular those from spit 4 onwards are not a good consistent indicator of depth across all pits. As a result, spit depths and not spit numbers will be used in the analysis

12.3.1.3 Issues of Underestimation

As discussed previously, it is plausible that some artefacts were rejected during initial sieve sorting. If the sieve sorting process was reasonably cautious then we would expect quite a high discard rate during analysis. Furthermore, the spread of the pieces rejected during the analysis should cover the spread of those accepted. This would indicate that at all size ranges both artefactual and non-artefactual pieces were retained.

In relation to the first point, the discard rate of 48% seems to suggest quite strongly that initial sorting was not overly cautious. The vast majority of the rejected pieces were of quartz, in which material class the reject rate exceeded 53%. That alone would appear to suggest that few, if any, quartz artefacts were discarded.

Figure 12.2 addresses the second point with a three dimensional scatter-plot of length, width and thickness for all quartz artefacts and a sample of 100 quartz pieces rejected during the analysis.

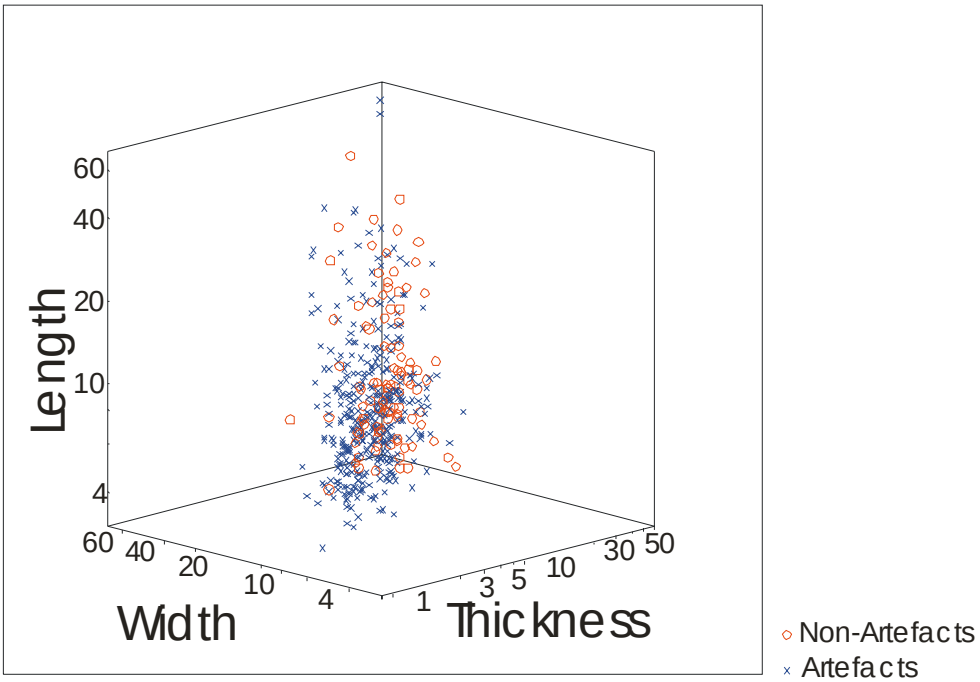


Figure 12.2 3D Scatterplot of Dimensions for Quartz Artefacts and Non-Artefacts

As the figure suggests, the rejected set falls within the same limits of length, width and thickness as the artefactual set. The reject set tends toward the upper limits of length and thickness, suggesting that longer and thicker pieces were more likely to be retained and less likely to be artefacts. At the smaller end of the scale, the reject set has lees attributes than the artefactual set, implying that some smaller artefacts may have been rejected during sieve sorting. Overall though, given the high rate of rejection and the overlap in size ranges of both reject and accepted sets, the results suggest a relatively cautious approach to sorting on the sieve, with the probable consequence being that a small number of artefacts at the smaller end of the spectrum were discarded.

12.3.1.4 Issues Related to Sampling

Regression tests demonstrate that there is no significant correlation between the number of artefacts recovered from a pit and the amount of sediment excavated (r^2 = 0.012, p = 0.15), between the number of artefacts and the relative sample of sieved material (r^2 = 0.001, p = 0.67) or between the number of artefacts and the number of buckets sieved (r^2 = 0.001, p = 0.73). Thus, sampling does not account for the variation in numbers of artefacts between spits or between pits.

As noted above, approximately half of all artefacts recovered during the subsurface testing program were found in pits along the valley floor. While this would initially appear to suggest that activities were concentrated in this area, accounting for sampling alters the picture substantially. Table 12.1 presents information on the relationship between the volume of sediment excavated, the numbers of buckets sieved, and the number of artefacts recovered, as well as the largest number of artefacts taken from any one pit, broken down into landform elements.

Table 12.1 Relationship between Volume Excavated, Buckets Sieved and Artefact Numbers

Landform	*Volume Excavated (cm^3)*	*# of Buckets Sieved*	*# of Artefacts Recovered*	*Ratio of Buckets to Artefacts*	*Most Artefacts in one Pit*
Valley Floor	23525600	2290	254	9 : 1	84
Basal Slopes	9927200	827	139	5.9 : 1	44
Mid Slopes	2880800	227	31	7.3 : 1	14
Upper Slopes	588000	35	0	0	0
Spurline	3282500	361	81	4.5 : 1	30
Watershed Crests	1846000	190	4	47.5 : 1	2
All	***42050100***	***3930***	***509***	***7.7 : 1***	***84***

Table 12.1 suggests that the greatest densities of artefacts were located on spurline crests and basal slopes, rather than the valley floor. This has implications for the assessment of spatial variation in behaviours discussed in Section 12.3.3.3.

12.3.2 Aspects of Assemblage Structure Relating to Taphonomy

12.3.2.1 Effects of Bioturbation and Ploughing[1]

An underpinning principle of archaeological investigation is that increasing depth means increasing age. However, in open sites in Australia this principle is demonstrably problematic. The effects of bioturbation in open sites are well documented, and can be summarised as the downward movement of archaeological materials through the soil profile as a result of root and insect activity. Bioturbation will commonly result in the clustering of archaeological materials either beneath the major root layer, or at the interface of soil sediments and underlying clays.

[1] Severe rabbit burrowing which has substantially affected some subsurface sediments was noted in the study area (K Officer, pers. comm., 2004). No rabbit burrows were noted to have affected any of the excavated pits, so it is not considered likely to have had a major effect on the vertical movement of artefacts within the pits examined.

The effect of ploughing has been argued to result in both the vertical clustering of artefacts within the plough zone and size sorting, in which the larger items appear towards the top. In a sense, this may be similar in manifestation to bioturbation, with perhaps the major difference being the depth at which the clustering would be found. Given that ploughing usually only effects the top 10 – 20 cms of the soil profile, we would expect related clustering to occur within that upper soil band. On the other hand, if bioturbation is operating we would expect clustering to occur as clay content within the soil increases, resulting in clustering beneath the root layer and a gradual tapering off of artefacts below.

If neither of these processes is operating, we would expect to see stochastic changes in density through depth and no evidence of size sorting. In this case we would have grounds to suggest that some culturally meaningful stratification was present. Evidence of stratification would have important consequences for the interpretability of the area.

Figure 12.3 presents a histogram of artefact numbers by depth for all landforms. Depths are derived from mean spit depths – the average of the two depths from the base of each spit.

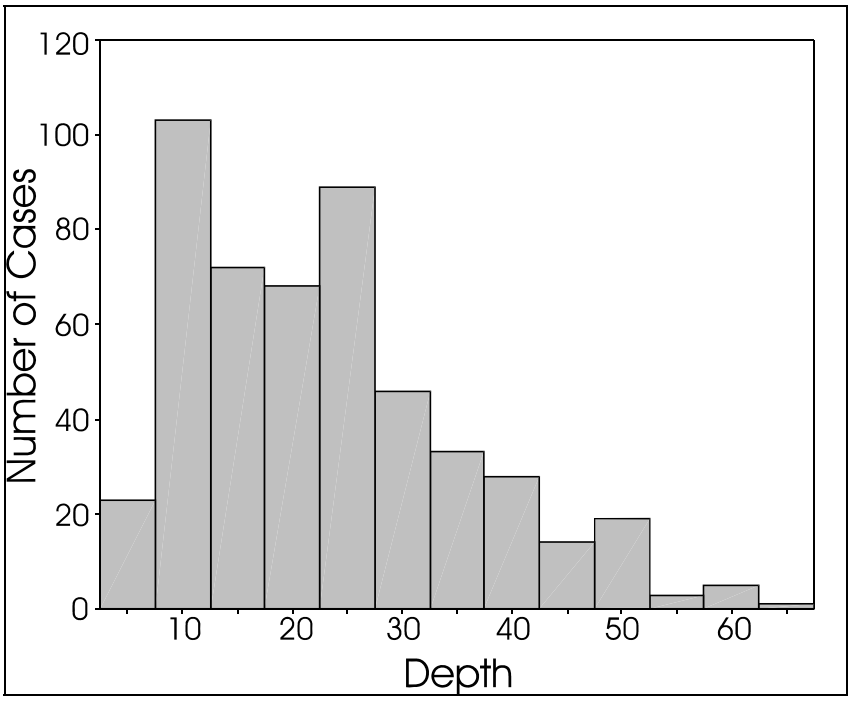


Figure 12.3 Histogram of Artefact Numbers by Depth Group

Figure 12.3 displays a slightly ambiguous pattern of clustering at depth, with notable peaks at 10 cms and 25 cms and a gradual decay below. This may indicate either that both ploughing and bioturbation are operating, that only one of these processes is in effect but the effects on depth are differential, or that the peaks are in fact behavioural. The pattern of gradual decay below the peaks would appear to support the operation post-depositional sorting factors, a point which can be clarified with reference to size sorting discussed below. If the peak at 10 cms is the result of ploughing, then we would expect this to be most marked in sites on the valley floor, where most of the ploughing is likely to have occurred. If it is not the result of ploughing then it may be that 10cms represents the soil / clay interface in areas with relatively shallow soils (specifically, those away from the valley floor). Using histograms for each individual landform it is possible to conclude that the valley floor pits do not peak at 10cms, but rather at 25 cms. The 10 cms peak relates to pits on the spurline and midslopes. Thus, ploughing appears unlikely to explain the observed pattern. If the pattern is the result of bioturbation only then we would expect to see size sorting through depth, with the heaviest items clustering at approximately 20 cms and the smaller items more common down below.

Figure 12.3 presents error bars at 95% confidence for vertical change in the weights of artefacts. The black dots represent the mean and the bars represent the spread. Weight is selected as the measure of size, both because it approximates volume, and because it is likely to be more important in

determining whether an artefact moves than length, width or thickness. Depths are divided into 10cm units in order to facilitate interpretation.

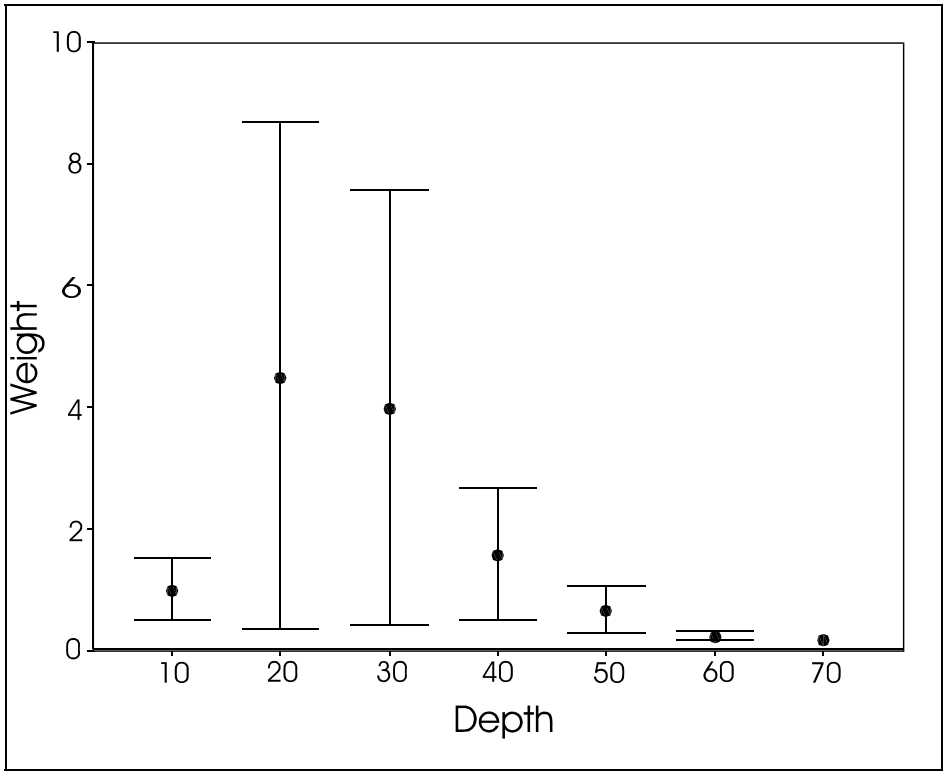


Figure 12.4 Error Bars (95% CI) of Weight (g) by Depth at 10 cm Increments

Figure 12.4 makes it reasonably clear that size sorting has been affecting the assemblages at Rosedale. Both the mean and range of artefact weights recorded decrease with depth. The peaks at 20 cms – 30 cms suggest that the process is being driven primarily by bioturbation, rather than by ploughing.

The evidence for stochastic distributions of artefact numbers or artefact weights through the profile is limited, suggesting that post-depositional sorting is responsible for the vertical distribution and arguing strongly against culturally meaningful stratification. Further support for the lack of stratification is derived from the vertical distribution of backed artefacts and European materials.

Most backed artefacts and burins date to the mid to late Holocene (backed artefacts do occur earlier, however only in rare cases). In a stratigraphically meaningful sequence their distribution would be expected to be limited to bands in the upper strata. At Rosedale, backed artefacts vary in depth from 9 cm to 58.5 cm below surface, with most occurring between 15 cm and 25 cm.

Similarly, European materials were noted at depths up to 60cm (bottle glass in Pit 7) and as shallow as 8 cm. In three other instances (Pit 7, Pit 37 and Pit 64), European materials were noted at approximately 20 cms - 25 cms below surface, similar in depth to the peak frequency of stone artefacts. Thus, both backed artefacts and European materials support the suggestion that items within the Rosedale profiles are vertically mobile and tend to cluster at between 15 cms and 25 cm in depth.

12.3.3 Aspects of Assemblage Structure Relating to Behaviour

12.3.3.1 Assemblage Richness

Clarkson (in Navin Officer 2003) presents a standardised approach to documenting the diversity of items within assemblages. The methods advocated prove a useful heuristic for displaying the

behavioural/technological variation present within an assemblage. They also allow the effects of sample size on assemblage diversity (see Hiscock 2001) to be considered. The approach as taken by Clarkson is not, however, without problems. As broken and taphonomically altered items (eg heat shattered rock), are included as distinct assemblage elements, assemblage richness will always be higher in those assemblages which have been more greatly effected by taphonomic process. This is likely to be particularly marked in the differences between surface and subsurface assemblages, where differential exposure to the effects of fire and traffic are certain to cause variation in the number of assemblage elements.

For this reason, taphonomically altered artefacts are not included as separate assemblage elements in this assessment, but are included in the relevant assemblage element category. The relationship between the number of elements and the number of artefacts overall should be considered with regard to the fragmentation index of 1.48, which suggests that the number of individual instances of any given element will likely represent a 48% exaggeration of the actual number.

Table 12.2 Assemblage Elements Present in Rosedale Assemblages

Assemblage Element	***Number***	***# Complete***	***# Broken***
unretouched flake	468	156	312
bipolar flake	6	4	2
retouched flake	2	0	2
geometric microlith	2	2	0
complete backed artefact	1	0	1
incomplete backed artefact	5	0	5
burin	1	1	0
redirection flake	2	1	1
flaked piece	4	na	na
multiplatform core	2	2	0
single platform core	2	2	0
grindstone	2	0	2
hammerstone	3	2	1
heat shatter (including potlids)	9	na	na
Total	***509***	***180***	***326***

Fourteen distinct assemblage elements are present in the Rosedale assemblage. This makes it roughly comparable with the number of elements present in the only available comparable data – the excavated component of the Dolphin Point assemblages – in which, accounting for taphonomic influence, 11 elements are present from a total population of 363 artefacts. In ratio terms, the excavated component of the Dolphin Point assemblage has 1 new element for every 33 artefacts (1:33) while the ratio at Rosedale is 1:36. These similarities highlight the robusticity of using sample size to predict the number of assemblage elements.

12.3.3.2 Activities Represented by the Rosedale Assemblages

It is evident that artefacts were produced on site at Rosedale. A histogram of flake lengths on complete flakes demonstrates a peak at between 6 mm and 10 mm. Flakes at this length are unlikely to have been transported into the area as ready-made tools, so it would seem reasonable to suggest that they were made at, or close to, the point of discard. The presence of hammerstones in the study area further supports this. Despite this, however, cores are relatively infrequent. Only four were recovered from the testing program, of which three were of quartz, and one silcrete. The silcrete core appeared to be related to a localised reduction event in Pit 64 (PAD5), which contained the largest number of artefacts of any Pit. The overall core to flake ratios for the study area were 1: 115 for quartz and 1: 89 for silcrete[2].

Three possible reasons can be advanced to explain these low ratios. The first is that the majority of artefacts on site were produced from retouch events and not from cores. The second is that cores were reduced in the area but not discarded there. And the third is that more cores are present but were not picked up in the sample. This third explanation is considered unlikely given the amount of material excavated and the number of artefacts recovered. Some further consideration is given to this in the following section.

The first two propositions can be tested by looking at the sizes of platforms for different material classes. We would expect flakes imported into the area as flakes, and those produced on site from cores to have larger platforms than those produced on site as a result of retouching events[3]. Figure 12.5 present histograms of flake platform area for the two largest material classes – quartz and silcrete.

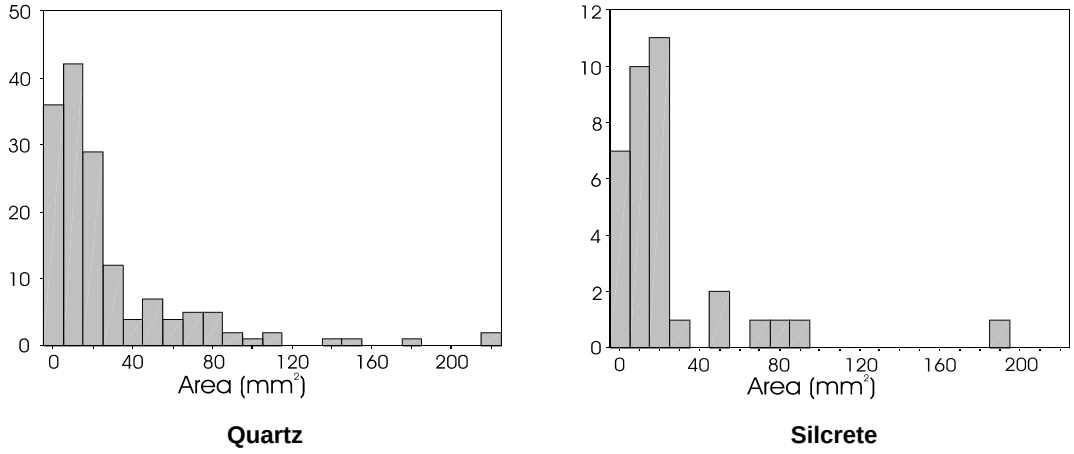


Figure 12.5 Histograms of Flake Platform Area for Quartz and Silcrete Flakes

[2] These figures are uncorrected for minimum numbers. The corrected ratios are 1: 77 (quartz) and 1: 55 (silcrete).

[3] This test has two potential confounding variables. The first is focalised platforms – platforms that are very small relative to the size of the flake. To account for this potential effect, regression tests were conducted to test the relationship between platform area and flake weight (the simplest approximation of volume within material classes). If focalised platforms were a significant proportion of the population we would not expect platform area to correlate with flake weight. Significant linear relationships were discovered for all complete flakes ($p < 0.001$) and for complete quartz flakes ($p < 0.001$). Insufficient numbers were available to test the proposition for complete silcrete flakes separately.

The second potential confounding variable relates to flakes produced from cores as a result of overhang removal. However, given that overhang removal was present on only 7% of flakes it is unlikely to account for a significant proportion of the artefact assemblage.

These two figures suggest a vaguely bimodal distribution of platform sizes, albeit with a very small second and a succession of large to very large outliers. In both cases the vast majority of flakes have small to very small platforms. Given the presence of cores in the study area we can be confident that some core reduction took place. The histograms would tend to imply that the production of large flakes from cores was a relatively minor contributor to the flake total. Most flakes are likely to result from retouch events and possibly some core preparation.

While tool maintenance activities can occur both at camp and foraging sites, cores and core reduction tend to be significant components only of sites in which groups spend large amounts of time. Key base camp areas can be occupied for extended periods, with large numbers of stone-using tasks being undertaken in the surrounding area, and where the harvested resources are commonly returned to the base camp for preparation and consumption. Such activities tend to require access to quantities of stone, sufficient to allow people to meet the range of tasks arising at and from the base camp. Instead of continually leaving the camp to get more stone to undertake more tasks, people are likely to respond by bringing large quantities of stone to the campsite in the first place, in preparation for an extended stay. The stone that is brought in is expected to come in the form of cores, as these provide the greatest flexibility in what can subsequently be manufactured.

The relative shortage of cores at Rosedale tends to imply that extended occupation of the area was not common. That most flakes appear to be derived from retouch events is consistent with this. Instead of bringing large quantities of stone in the form of cores, people appear to have been carrying and employing pre-prepared tools which they maintained while visiting and/or foraging at Rosedale. Cores were reduced on site, but not frequently or heavily. This is supported by the small number of bipolar flakes located (n=6), and the absence of bipolar cores. Bipolar reduction is used to extend the use-life of a core past the threshold at which it no longer has enough mass simply to be rested in one hand and struck with a hammerstone. Bipolar reduction is relatively common in quartz once cores become small, as it is a particularly hard material to work. The lack of significant bipolar reduction at Rosedale, coupled with the lack of discarded cores, suggests that cores were transported through and reduced within the area (and may even have originated there in the form of local quartz nodules), but that they were not heavily reduced or discarded there very often.

Some evidence for camping at Rosedale can be seen from the presence of incompletely backed artefacts. Backed artefacts are generally considered to be manufactured at camps as part of “gearing up” activities – preparation for hunting / foraging events. Due to the thinness of flakes generally selected for backing, breakage during manufacture is not uncommon. All of the (5) incomplete backed artefacts at Rosedale had been broken. That these five artefacts came from four different pits implies that in no instance did the “gearing up” represent intensive backed artefact manufacturing workshops of the kind associated with medium to long term point-of-return mid to late Holocene camps. Rather, they appear to represent isolated instances of on-site backed artefact manufacture, consistent with the duration of camping implied by the frequency and degree of core reduction discussed above. The only test location to contain more than one backed artefact was Pit 64 (PAD5), which also contained the only silcrete core located. This pit had the highest frequency of platform faceting, a platform preparation technique commonly associated with those mid to late Holocene reduction strategies from which backed artefacts are often derived. This pit thus represents the only clear evidence of core reduction and backed artefact production in the study area.

A further class of behaviours demonstrated by Rosedale assemblages is the use of grindstones. Both the grindstone fragments located were top-stones (or mullers) showing signs of use polish. Such polish is generally understood to be the result of grinding plant matter which includes significant quantities of biogenic silica (Kamminga 1982, Fullagar 1986). Based on the environmental context of these finds, it can be postulated that the observed polish may have been produced by the grinding of seeds and/or tubers. Seeds and tubers could have been sourced from both the nearby Bevian Swamp, and the adjacent slopes and crests. Given that grind stones are an uncommon, or even rare find, from the NSW South Coast (Boot 2004), it can be speculated that the swamp was the more probable source of the plant material. This is based on the expectation that grind stones should be more commonly encountered if they formed part of the tool kit associated with the exploitation of coastal margin slopes and crests, landform categories which are well represented in previous survey areas.

Both of the grind stone fragments appear to have been small and relatively portable, and would not be classified as "site furniture" (Binford 1979) in the sense used to denote infrequently moved assemblage components found in long term occupation sites. Both were broken, but whether the break occurred before or after discard is difficult to ascertain.

12.3.3.3 Spatial Variation in the Rosedale Assemblages

Spatial variation in assemblage structure is assessed relative to two sets of groupings. The first is the RUR2 and PAD test areas, which can be subdivided into four areas. The second is the landform units, sampling of which is specified in the PRP. The major focus will be on the landform units.

Spatial Variation Relative to Excavation Areas

Excavations were conducted in 14 different areas. Of these, five fall on or to the south of the watershed crests (Areas 3, 4, 5, 6 and 7). Four areas are clustered in the northeast corner of the study area (PAD 5, PAD 6, PAD 7 and PAD 8), and four in the northwest (PAD 1, PAD 2, PAD 3 and PAD 4). The fourteenth test area was site RUR2, at which six pits were excavated. Table 8.3 presents data on the density of artefacts recovered from these pits, divided into four excavation area groupings. Densities are considered relative to surface area, rather than volume. Having established that depth is not behaviourally meaningful, and that strata do not represent different inhabitation floors, surface area can be considered as a single 'atemporal' living surface.

Given that the objective is to assess behaviourally meaningful variation in space, non-sites (eg. pits which did not contain artefacts) will not be included. Table 12.3 therefore presents data on the average areal density of artefacts from culturally active pits in different excavated areas.

Table 12.3 Artefact Density by Area for Culturally Active Pits

Area by Grouping	***Surface Area of Active Pits (m^2)***	***Number of Artefacts***	***Density (artefacts /m^2)***
Northeast	21.4	204	9.5
Northwest	19.7	87	4.4
RUR 2	8	117	14.6
South	20.6	101	4.9
Total	***69.7***	***509***	***7.3***

Table 12.3 suggests that while an effective sample of artefacts was recovered from all excavated areas, density of artefacts within culturally active pits was variable between excavation areas. The greatest density of artefacts relates to the test pits excavated at the surface site RUR 2, while pits in both the south and northwest of the study area have the lowest densities. The pits in the northeast have an intermediate density. To put these data in context, subsurface testing at Dolphin Point, about 80 km to the north (near Burrill Lake) located areas with densities ranging from 30 to 90 artefacts/m^2 (Navin Officer Heritage Consultants 2003:82, 83). Thus, the densities at Rosedale may be considered comparatively low.

Within the context of land-use at Rosedale, however, it becomes interesting to explore the potential behavioural correlations of variable density. If high density sites equate to short-term residential camping, then we would expect items such as cores, grindstones, and evidence of gearing up (eg. backed artefact manufacture) to occur predominantly in pits from the RUR2 and the northeast. Table 12.4 presents data on relevant assemblage elements from the different areas.

Table 12.4 Assemblage Elements by Excavation Area

Assemblage Element	*Northeast*	*Northwest*	*RUR 2*	*South*
Flakes	190	87	105	94
Incomplete Backed Artefacts	3	2	0	0
Complete Backed Artefacts	2	0	1	0
Burin	0	1	0	0
Cores	2	1	0	1
Grindstones	0	0	0	2
Hammerstones	0	0	0	3
Other	7	1	6	1
Total	***204***	***92***	***111***	***102***

Two points are of most interest from Table 12.4. The first is the absence of any diagnostic indicators of residential campsite use at RUR 2. Neither cores nor incomplete backed artefacts were located in this area. The second is that all grindstones and hammerstones were located in the south of the study area.

With regard to the first point, diagnostic indicators of camping activities are present in all excavated areas except for RUR 2. This would appear to confound expectations given the high density of artefacts in the area. It is an area used exclusively for maintenance (eg., flake retouch) tasks would produce such a high density of artefacts. Sampling is unlikely to be the cause, given that cores have been located in all other areas, two of which have smaller samples. The explanation is likely to be that the excavation data does not take into account the presence of cores in the surface component of the site (Navin Officer Heritage Consultants 2002). While detailed information on these cores is not available, their identification is sufficient to suggest that at least some short term camping is likely to have occurred in this area.

Evidence for short term camping and / or gearing up activities is present in all of the other sampled areas. Both the Northwest and the Northeast contain incomplete backed artefacts and cores are present in all areas except RUR 2. These similarities can be taken to indicate either that there was little significant spatial separation of land-use activities, or that the rough geographical divisions used are incapable of teasing out any differences that may be present. This receives a fuller treatment in the following section of variation in landform units.

With regard to the second point, the presence of grindstone fragments exclusively in the south cannot be explained by sample size either. Sites in the north represent 80% of the artefact total. There are also geographical and resource-related reasons that the south of the study area may be distinct from the north. The two are separated by a watershed, with creeks in the north draining east to Rosedale, and those in the south draining into Bevian Swamp, which fringes the southern extent of the study. Given the differences in available resources (specifically those relating to the swamp in the south) and drainage patterns, it may be that different activities pertained in these two areas.

However, before inferring that this spatial incongruity represents the restriction of grinding activities to the south, there are two points worth considering. The first is that the grindstones were small enough to have been portable, so location of discard is not necessarily location of use. The second is that all three of the hammerstones recovered were also found in this area. Two of these were made of a type of river rock (possibly quartzite), as were the grindstones. It is clear from the broken incomplete

backed artefacts that stone artefact manufacture was occurring in the north. Thus, the presence of hammerstones in the south only does not indicate that manufacturing activities were limited to this area. As with the grindstones, the hammerstones were small enough to have been easily portable. An alternative hypothesis is that all of these rounded, river stones were discarded here because replacement rock was available nearby. Table 12.5 presents limited supporting evidence for this second hypothesis in the form of data on raw material prevalence by excavation area.

Table 12.5 Raw Material Use by Excavation Area

Raw Material	*Northeast*		*Northwest*		*RUR 2*		*South*	
	n	%	n	%	n	%	n	%
Quartz	132	64.7	78	84.8	71	64.0	69	67.6
Silcrete	65	31.8	3	3.2	14	12.6	15	14.7
Volcanic	6	2.9	4	4.3	21	18.9	10	9.8
Chert	0	0	2	2.1	3	2.7	1	1
Quartzite	0	0	0	0	2	1.8	4	3.9
Other	1	0.5	5	5.4	0	0	3	2.9
Total	***204***		***92***		***111***		***102***	

The notable aspect to this table is the relative prevalence of quartzite in the south of the study area. Again, the numbers are too small to go beyond a tentative inference, but they do cast some doubt on the suggestion that the location of the grindstone fragments relates to grinding activities only.

Other points of interest in this table are the very high frequency of silcrete in pits in the Northeast, and the high frequency of quartz artefacts in the Northwest. To a large extent, the frequency of silcrete in the Northeast appears to be driven by Pit 64 (PAD5), from which 54 of the 65 silcrete artefacts were recovered. As discussed above, Pit 64 appears to represent a small silcrete core reduction and backed artefact manufacturing event. Along with the silcrete core and two incomplete backed artefacts, more than 18% of silcrete flakes in Pit 64 which retain part or all of their platforms show signs of faceting.

The heavy emphasis on local materials in the Northwest of the study area suggests that relatively little high quality local raw material was transported into or reduced there. While there is evidence for camping and on-site artefact manufacture in the form of two incomplete backed artefacts, it is notable that the single core located here was on local quartz, as was one of the backed artefacts. Furthermore, this area has the lowest artefact density in culturally active pits of any of the areas examined, suggesting that occupation was somewhat less intensive here. The implications of differences in raw material prevalence are discussed further in the following section on landform units.

Spatial Variation Relative to Landform Units

On the basis of the evidence provided in Table 12.1 there appears to be evidence of differential use of landform units at Rosedale. Valley floor pits contain the largest number of artefacts, and also most of the artefacts that can be associated with camping-related activities (such as core reduction and backed artefact manufacture), including the only clear evidence of backed artefact production in the study area (Pit 64). All four of the cores located during the study were located in pits on the valley floor. Similarly, of the five incomplete backed artefacts located, four were in valley floor pits, and the fifth on a basal slope.

However, as noted in Section 12.3.3.3 when artefacts are considered in terms of densities rather than numbers, it becomes less clear whether or not valley floors were the foci of inhabitation. Table 12.6 presents data on the density of artefacts in culturally active pits divided into landform units.

Table 12.6 Areal Densities of Artefacts by Landform Unit

Landform Unit	*Surface Area of Active Pits (m^2)*	*Number of Artefacts*	*Density (artefacts/m^2)*
Valley Floor	35.8	254	7.1
Basal Slopes	13.8	139	10.1
Mid Slopes	7.4	31	4.2
Spurlines	9.0	81	9.0
Watersheds	3.7	4	1.1
Total	***69.7***	***509***	***7.3***

The table suggests that sites are densest in the basal slopes landform unit, which returns an overall density of 10.1 artefacts per m^2. Spurline and valley floor units have the next most dense sites, with midslope and watershed sites having the least. There are two implications of this assessment. The first is that the large number of artefacts recovered from the valley floor appears to be a consequence of sampling rather than behaviour. The second follows from the work of Hiscock (2001) and Clarkson (in Navin Officer Heritage Consultants 2003), who have both demonstrated that increased samples will yield increased numbers of assemblage elements. Thus, it may be that the shortage of cores, backed artefacts and grindstones in spurline and basal slope sites is a consequence of sampling regimes and not behavioural differences between the units. In order to assess whether the differences between landform units are behavioural or a product of sampling, a few more tests can be carried out.

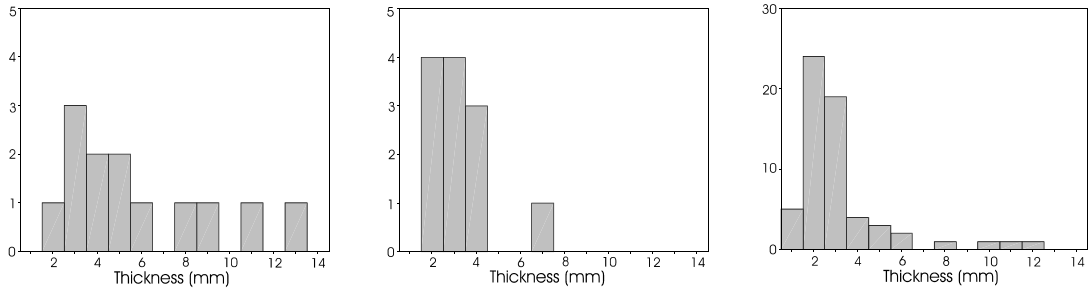
The first test is for variation in raw material prevalence. In areas where camping occurred we might expect to see an array of raw materials in use, a result of flake production using local materials and maintenance (and possibly production) tasks carried out on imported tools.

Table 8.7 Raw Material Prevalence in Different Landform Units

Raw Material	*Basal Slopes*		*Spurline Crests*		*Valley Floor*		*Midslopes*		*Watershed*	
	n	%	n	%	n	%	n	%	n	%
Quartz	99	71.2	58	71.6	165	64.9	27	87	1	25
Silcrete	11	7.9	12	14.8	68	26.8	3	9.7	3	75
Volcanics	22	15.8	9	9.4	10	3.9	0	0	0	0
Chert	3	2.2	0	0	3	1.2	0	0	0	0
Other	4	2.9	2	1.4	8	3.1	1	3.2	0	0
Total	*139*		*81*		*254*		*31*		*4*	

In keeping with expectations, all of the landform units with relatively high densities of artefacts in sites also exhibit a diversity of raw materials. The presence of silcrete in all units indicates that silcrete items were commonly transported and maintained throughout the study area. The most obvious differences from Table 12.7 are in the relative prevalence of quartz and silcrete artefacts between basal slope, spurline crest and valley floor sites. Both the basal slope and spurline sites exhibit a high frequency of quartz and a low frequency of silcrete relative to the valley floor sites. There also appear to be an inverse correlation in the frequency of silcrete and volcanic artefacts.

The high relative frequency of quartz would tend to indicate an emphasis on local raw materials, which might in turn imply limited availability of quality imported materials, and their husbanded use. In this case we would expect that the silcrete flakes from the basal slope and spurline crest pits would mostly result from maintenance tasks (eg. retouching), and not from core reduction. Histograms of flake thickness may help to clarify this. Flake thickness is used in these tests for two reasons. The first is that core reduction is likely to allow for the production of thicker flakes than retouch, so the measure should help to separate the two populations. The second is that thickness is the size measure that is least affected by breakage, and thus allows the largest sample to be used. Figure 12.6 presents histograms of flake thickness for silcrete flakes from basal slopes, spurlines and the valley floor pits.

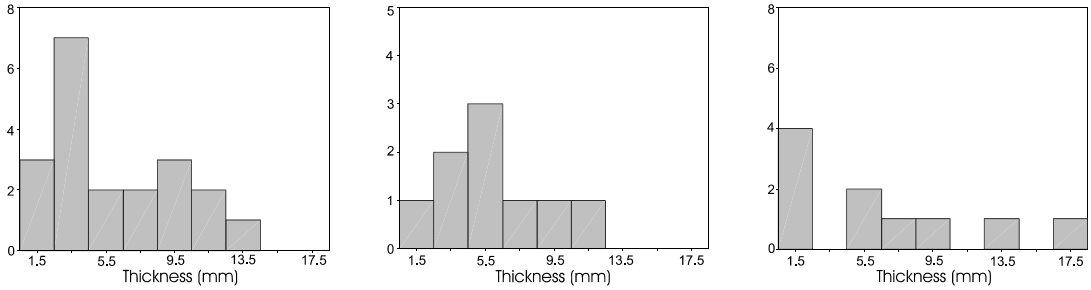


Basal Slopes **Spurline** **Valley Floor**

Figure 12.6 Histograms of Silcrete Flake Thickness (mm) from Basal Slope, Spurline Crest and Valley Floor Pits

Thick flakes are relatively common in basal slope and valley floor pits, markedly less so in spurline pits. While the differences between valley floor and spurline pits may be a product of sample numbers (61 compared to 12), the evidence from the basal slope pits (n = 13) suggests that the root cause is behaviour rather than sampling. The one instance of a 'thicker' flake from the spurline pits was broken longitudinally and transversely, implying that it was manufactured on site, rather than brought in as a complete flake. What the evidence appears to suggest is maintenance tasks account for the majority of silcrete flakes in most pits, and almost all of the silcrete flakes in the spurline crest pits.

Similar comparisons for volcanic flakes return similar results, presented in Figure 12.7.



Basal Slopes **Spurline** **Valley Floor**

Figure 12.7 Histograms of Volcanic Flake Thickness (mm) for Basal Slope, Spurline Crest and Valley Floor Pits

Sample sizes for all landform units shown in Figure 12.7 are relatively similar (though small in all cases). As with silcrete flakes, both the basal slope and valley floor pits show slightly more thick flakes than the spurline pits, though the differences are minor. The results would tend to infer maintenance activities again accounting for the majority of cases, with some on-site core reduction, most markedly in the case of the valley floor pits.

Due to the low numbers of samples available and the fact that they are not normally distributed, t-tests for mean differences in the flake assemblages could only be carried out on quartz flakes. That the results were not significant is likely to relate to the limited size range of quartz flakes, and their tendency in all cases to lie at the small end of the range.

Given the issue of sample size in all cases, it is difficult to make strong distinctions between landforms. The available evidence suggests short-term residential camping activities on valley floors and basal slopes, and probably to a limited degree on the spurline crests as well. The presence of a silcrete reduction event in Pit 64 (PAD5) on the valley floor, combined with the relatively low percentage of quartz use in this area might tentatively be taken to suggest that camping in this area was more commonly of a residential, rather than logistic nature. Occupation of midslopes and watershed crests appears to have been largely ephemeral.

12.3.4 The Study Area Compared to Barlings Beach

Immediately to the south of the study area, on the other side of Bevian Swamp, is Barlings Beach. Archaeological investigations of the extensive cultural deposits in this area are on-going, however, some summary data has been made available for comparative purposes by the archaeologist involved (Matt Barber).

Consistent with the characterisation of this area as a focal point for habitation, we find relatively high core to flake ratios in quartz and silcrete. Uncorrected for minimum numbers, quartz has a core to flake ratio of 1: 62, almost half that of the Rosedale assemblages. Similarly, silcrete has a core to flake ratio of 1: 36, compared with 1: 89 at Rosedale.

Another notable distinction between the two areas is the relatively low proportion of quartz at Barlings Beach. While quartz remains the most common material overall, it represents only 49% of the artefact assemblage at Barlings Beach, compared with 69% at Rosedale. This would appear to suggest that large quantities of high quality imported material were being brought to Barlings Beach, while at Rosedale these materials are present but are being heavily supplemented through the use of inferior, less predictably fracturing local raw materials. Barber also notes that no quartz artefacts were retouched or showed signs of use at Barlings Beach, out of a total of 370 flakes. In comparison, 7% of silcrete flakes were backed, and a further 3% showed signs of use. Volcanic materials showed near identical proportions, with retouch on 7% of flakes, with signs of use on a further 3%. No grindstones were recorded, which, given the overall sample of 986 pieces, supports the contention that these artefacts were associated with exploitation of the Bevian swamp and not the sand barrier landforms of Barlings Beach.

While further data on this site complex is not presently available, the data presented seem to indicate that Barlings Beach was a preferred location for extended duration and possibly return-visit camping. Furthermore, it seems reasonable to suggest that the assemblage at Barlings Beach is quite different to that at Rosedale, only one kilometre to the north.

13. INTERPRETATION OF SUBSURFACE TEST RESULTS

13.1 Discussion

Using the information presented it is possible to formulate a broad interpretation of past Aboriginal land use at Rosedale.

Rosedale does not appear to have been a major focal point for local occupation. None of the evidence located points to major residential campsites from which forays into the surrounding areas were undertaken. Manufacturing and maintenance tasks were carried out at Rosedale, probably as part of short-term single visit camps. Pit 64 (PAD5) appears to be the clearest example of this kind of activity. Other activities are likely to have included hunting and foraging tasks and some grinding-related tasks. Many of the sites located are likely to be related to these kinds of brief extractive tasks only. In particular, sites on midslopes and on the watershed crests appear to relate to minor maintenance activities carried out during hunting and/or foraging forays.

Evidence suggests that the northeast of the study area (including RUR2) was the most heavily occupied area, although evidence for camping and artefact manufacture is not exclusive to this area. The highest density site within the study area is Pit 64 (PAD5), which has approximately 80 artefacts/m^2 based on surface area rather than volume. Overall the density of artefacts across the entire study area including both active and inactive pits is 5.8 artefacts/m^2.

Most of the camping that did occur at Rosedale appears to have been limited to areas of relatively flat land, such as basal slopes, spurlines, and the valley floor. Neither volumetric nor areal densities suggest that the valley floor was preferentially used in camping. The fact that artefact frequencies overall and within sites were higher on basal slopes and spurlines may reflect the selection of slightly elevated camp sites. This may possibly relate to higher rates of ground moisture and possibly the presence of pests such as mosquitoes on the valley floors.

Sites in these elevated landform units exhibit higher frequencies of local stone than valley floor sites, which may tentatively be used to suggest that their occupation was related to slightly more mobile landuse. While people were certainly carrying higher quality imported items in these areas, they seem to have been less inclined to reduce them there than when occupying valley floor sites. This sort of husbanding behaviour is commonly associated with higher mobility land use (eg. Kuhn 1995).

Basal slope sites appear to be somewhat more like valley floor sites than spurline crest sites, given the thickness of the flakes discarded there. Some limited support for this, and for the notion of differential husbanding, is provided by the presence of incompletely backed artefacts in several of the valley floor pits and in one of the basal slope pits. As noted previously, flakes often break during the backing process, thus, backing is not a particularly frugal use of transported stone. Undertaking backing infers that sufficient quantities of quality stone were available to allow for loss through breakage during manufacture. These kinds of gearing-up activities may indicate either high mobility residential camping or low mobility hunting parties.

The indicators of potential variation in camping mobility, considered with the suggestion of selection for elevated camp sites on some occasions, could possibly be associated with seasonality of use, though with the small samples available this is no more than conjecture.

The presence of backed artefacts and a burin make it possible to suggest that some of the occupation of Rosedale occurred during the mid- to late Holocene. As noted previously, the clearest example of a mid- to late Holocene occupation and backed artefact production site is Pit 64.

The absence of grindstones in the north of the study area is unlikely to relate to sampling. This is reinforced by the data available from Barlings Beach, where no grindstones were returned from a sample of almost 1000 artefacts. The presence of grindstone fragments in the south of the study area is likely to be a consequence either of food processing tasks or discard and replacement activity. Both are likely to be related to Bevian swamp and its riparian margin which could have been a potential source of plant tubers and seeds during prehistory.

The archaeology of Rosedale may be explained in part by the occupational signature at Barlings Beach. The entire study area falls within 4 km of the large site complex at Barlings Beach, which contains, among other things, evidence of extended residential occupation.

Given that much of the land-use at Rosedale appears to relate to hunting/foraging forays and short term occupation, it is reasonable to suggest that many of these events may have been undertaken either from the larger residential base nearby, or on the way to/from Barlings Beach to other locations along the coast or hinterland.

13.2 Conclusions

The key aims of the Preliminary Research Permit, as discussed in Section 10.2, were to determine the nature, extent, integrity and significance of archaeological materials present within the study area.

13.2.1 Nature of the Archaeological Materials

The archaeological materials at Rosedale appear to relate to mobile hunting and foraging, and short-term logistical camping activities. Some short-term residential camping may have occurred, but the evidence for this is not strong. Some of the occupation clearly relates to the mid- to late Holocene, but how much cannot be clarified, given the lack of temporal control.

Almost all of the artefacts recorded are likely to relate to the relatively casual reduction of locally available raw materials and maintenance of transported items on higher quality exotic materials, predominantly silcrete. There is some evidence for grinding activities in the area, with grindstone fragments located in the south of the study area, close to Bevian Swamp. Whether the location of these items reflects the location of use or simply location of discard is unclear.

A plausible hypothesis that can be derived from the evidence is that Rosedale was incorporated into extractive tasks such as hunting and foraging conducted from, or as part of, a subsistence cycle related to the nearby Barlings Beach complex. The lack of grindstones at Barlings Beach adds weight to the proposal that grinding activities, and not simply artefact discard, were conducted near to Bevian Swamp

13.2.2 Extent of the Archaeological Materials

Archaeological materials were located in all sampled landforms with the exception of upper slopes. Artefacts occurred from the surface to a depth of almost 70 cms. The areas of highest artefactual density were located in the northeast of the study area, in relation to PADs 5-8 and site RUR2. The highest density of materials was in culturally active pits from RUR 2. Overall density in these pits was 14.6 artefacts/m^2. This is a substantially lower density than has been identified in comparable excavations carried out at Dolphin Point, further north near Burrill Lake (Navin Officer Heritage Consultants 2003).

An overall density figure for artefact occurrence across the corpus of the Rosedale test areas is 5.8 artefacts/m^2. (Based on test pits with recovered artefacts).

13.2.3 Integrity of the Archaeological Materials

Given that all of the cultural materials were recovered from subsurface contexts, they have not been greatly affected by destructive post-depositional processes such as fire and traffic. The degree of fragmentation noted in section 12.3.1.1 is likely to be a close approximation of the amount of fragmentation at the time of deposition. This has only been moderately affected by the excavation techniques employed. In this sense, the artefacts themselves retain a high degree of integrity. In regard to the sites that they form, however, the artefacts have clearly been subject to vertical movement post-deposition. This significantly affects their integrity as sites, removing the temporal component from their informative potential. Thus, while the items themselves retain a high degree of integrity, the integrity of the sites has been compromised.

13.2.4 Potential for Further Archaeological Investigation

The current subsurface testing program at Rosedale has provided sufficient data to make a general assessment of past land use in the area. An increased sample size would help to improve the resolution of this picture, however, the lack of cultural stratification in the area puts an upper limit on the amount of new information that could reasonably be expected to be recovered through further work.

If further work were to be undertaken, it might aim to increase the sample sizes from low valley context spurline crests and locally elevated basal slopes, and to clarify questions about the presence of grindstone fragments in the south of the study area and their potential association with the exploitation of Bevian Swamp.

13.3 Significance of the Subsurface Archaeological Deposits

13.3.1 Aboriginal Cultural Significance

The Aboriginal cultural significance of the archaeological deposits in the study area can only be determined by local Aboriginal communities who have a cultural association with the country. None of the Aboriginal representatives who participated in the excavations communicated a view that the area had specific or special cultural significance (such as a known burial ground, historic encampment, or story place). Following a review of a draft of the subsurface investigation report (June 2004), together with the plain English version, the Djuwin Women's Lore Council, made the following observations regarding the cultural significance of the study area:

> 'The study area is of high cultural significance to the local Aboriginal community (as are all Aboriginal sites) due to its proximity to Barlings Beach:
>
> - Where it provided for concurrent occupation and spillover in times of large gatherings.
> - In relation to the hunting and gathering of resources and
> - for the access to water and grinding activities.' (Letter to Peter Best from Mary Duroux

Both the Mogo Local Aboriginal Land Council and the Yuin Elders Council reviewed a draft of the subsurface investigation report (June 2004) and did not express opposition to its findings or recommendations (Refer section 3. and Appendix 9). In recognition of the cultural value of the archaeological material present in the study area, all of the Aboriginal organisations have requested monitoring of ground disturbance by sites officers.

13.3.2 Scientific and Representative Significance

The scientific values of the archaeological material within the Rosedale subsurface testing area have been assessed according to the following archaeological criteria:

Extent of deposit disturbance

The archaeological deposits tested in this investigation display the characteristics of significant bioturbation. The deposits do not have any significant vertical integrity. There is no reliable relationship between age and the depth of archaeological finds.

There remains a degree of areal integrity in archaeological deposits situated outside of high disturbance areas such as tracks, dams, erosion and building areas. In this way areas which were subject to increased levels of habitation can be distinguished from areas utilised to a lesser degree.

Stratigraphic integrity

There appears to be no temporal differentiation within the deposit. The observed vertical distribution of lithic items can best be explained as the consequence of bioturbation factors.

Presence of cultural features

No evidence of Aboriginal cultural features, such as hearths, pits, lenses of shell or other cultural organic material, or micro-stratigraphy was detected.

Potential for dating

No potentially datable material, relative to the Aboriginal cultural occupation of the area, was encountered in the excavations.

Rarity of archaeological material

The Rosedale study area is a typical example of the immediate hinterland of the South Coast rangelands.

The distribution of artefactual material across the topographic variation within the study area is likely to be repeated elsewhere and frequently throughout comparable the South Coast landscapes.

The presence of top grind stones in the southern portion of the study area is an uncommon or rare characteristic within a local and regional context. With this exception, the archaeological material encountered at Rosedale does not contain particularly rare or unique characteristics. It is typical of open sites displaying evidence of microlith manufacturing and late Holocene occupation. It falls within the most common category of site types and open context archaeological deposits within southeastern Australia.

Representativeness

The archaeological deposits within the Rosedale study area have a degree of scientific value based on their location in an area where there is little information from excavated sites in immediate coastal hinterland contexts. The Rosedale archaeological material has value as a contrasting assemblage to that documented at Barlings Beach.

The deposits have representative value within the context of the local and regional landscape.

Density of artefacts

Artefact densities encountered at Rosedale, are comparatively low when compared to other open context sites excavated along the South Coast, such as at Barlings Beach and Dolphin Point.

13.3.3 Conclusion

Based on the above outline, the Rosedale subsurface archaeological deposits investigated in this study are assessed as having a general scientific significance at the lower end of the spectrum within a local context. However, some aspects of the archaeological resource provide a higher level of significance, according to individual criteria. These are: representativeness within a local context and relative to the nearby Barlings Beach sites, status as one of the few hinterland samples in the region subject to subsurface investigation, and the albeit limited potential for further archaeological investigation.

13.4 Implications of the Archaeological Testing Methodology

The methodology followed by this subsurface testing investigation can best be understood as the result of a transition by the then Department of Environment and Conservation (DEC) to a new approach in assessing the archaeological resource. This can be characterised as a change from a site-specific and surface-survey dominated approach, to one based on landform modelling and subsurface testing results.

The original cultural heritage assessment for the development area was conducted according to established standards and methods current at the time (Navin Officer Heritage Consultants 2002). Management recommendations were based on the results of surface archaeological survey and a

predictive analysis of landform. Recommendations for subsurface testing were made on the basis of encountering archaeological deposits with relatively high heritage value. These areas were identified as potential archaeological deposits (PADs) and were justified by a regional dataset substantially based on surface survey results.

When assessing the application for a section 87 permit for the subsurface testing program, the DEC determined that the scope of the program should be expanded to include testing of a representative sample of landforms outside of identified PADs. This represented a substantial departure from previous routine DEC requirements. In addition, the DEC specified that the sample size of test pit spoil subject to sieving should be maximised rather than standardised to an upper limit (as is the preferred practice of Navin Officer Heritage Consultants).

The DEC justified these changes in part by referring to the cultural and management sensitivity of the Barlings Beach area situated outside of the study area and 500 m to the south of Bevian Swamp.

Conventional archaeological methodology has previously sought to evaluate the resource in terms of 'sites', being a unit of classification which can be variably defined, but in most cases excludes low to very low artefact distributions which cannot be reliably related to a behavioural event or geographically related foci. Where surface archaeological surveys are conducted outside of high visibility regions (such as semi-arid and desert regions), the boundary of a site recording is mostly predetermined by the extent of ground surface erosion. Previous DEC management strategies have been consistent with this 'site' based approach, with section 90 permits being linked to site-based spatial definitions, and deposits which had been subject to direct assessment.

Challenging this conventional approach has been an increasing recognition over the last three decades that Aboriginal artefacts are distributed at varying densities throughout most of Australia's continental landforms and that surface site boundaries do not accurately reflect subsurface distributions. The actual artefact distribution can be conceived as having a wide spectrum of occurrence per unit area, such that a very low incidence, may be one artefact per 50 m^2 and a relatively high incidence could be 500 artefacts per square metre. The majority of this artefact distribution is situated below the present land surface and is undetectable by surface survey methodologies. Once there is a shift in analysis away from surface recordings and toward subsurface data, (as is inherent in the current DEC requirements for the study area) the conventional understanding of sites, and site-specific artefact occurrences, becomes largely obsolete. The finding that artefacts occur at varying densities across the majority of the study area, necessitates either a conventional classification of the whole study area as a site, or a new approach which recognises zones of artefact occurrence closely related to disturbance and landform variability. Recognition must now be given to the validity of predictive archaeological assessment of landform units based on the test sampling of those units, not necessarily situated within the areas subject to a proposed impact.

The expanded subsurface testing approach conducted for this investigation substantially vindicated the previous conventional PAD identifications. It is also fair to state that the expanded approach advanced our understanding of the archaeological resource beyond that possible from the original conventional approach supported by the consultants and their client. The role of locally elevated landforms adjacent to the valley floor was perhaps not fully recognised by the conventional PAD identifications.

14. STATUTORY OBLIGATIONS[4]

The archaeological subsurface testing program documented in this report was conducted under Part 5 of the National Parks and Wildlife Act 1974.

Application for concept approval is now being prepared under Part 3A of the Environmental Planning & Assessment Act 1979.

14.1 Environmental Planning & Assessment Act (1979)

The Environmental Planning & Assessment Act 1979 (EP&A Act) and its regulations, schedules and associated guidelines require that environmental impacts are considered in land use planning and decision making. Environmental impacts include cultural heritage assessment. The Act was recently reformed by the passage of the *Environmental Planning and Assessment Amendment* (Infrastructure and other Planning Reform) Act in June 2005.

There are four main areas of protection under the Act:

- Planning instruments allow particular uses for land and specify constraints. Part 3 governs the preparation of planning instruments. Both Aboriginal and Historic (Non-Indigenous) cultural heritage values should be assessed when determining land use.

- A separate streamlined and integrated development assessment and approvals regime for major infrastructure and other projects of significance to the State is defined by Part 3A.

- Section 90 lists impacts which must be considered before development approval is granted. Part 4 relates to the development assessment process for local government authorities. Impact to both Aboriginal and Historic (Non-Indigenous) cultural heritage values are included.

- State Government agencies which act as the determining authority on the environmental impacts of proposed activities must consider a variety of community and cultural factors in their decisions, including Aboriginal and Historic (Non-Indigenous) cultural heritage values. Part 5 relates to activities which do not require consent but still require an environmental evaluation, such as proposals by government authorities.

Under the *Environmental Planning & Assessment Act (1979*) the Minister for Planning may make various planning instruments such as regional environmental plans (section 51) and local environment plans (section 70). The Minister may direct a public authority such as a Local Council, to exercise certain actions within a specified time, including the preparation of draft Local Environmental Plans and appropriate provisions to achieve the principles and aims of the Act (section 117).

These planning instruments may identify places and features of cultural heritage significance and define various statutory requirements regarding the potential development, modification and conservation of these items. In general, places of identified significance, or places requiring further assessment, are listed in various heritage schedules that may form part of a Local Environmental Plan (LEP) or a Regional Environmental Plan (REP). Listed heritage items are then protected from certain defined activities, normally including demolition, renovation, excavation, subdivision, and other forms or damage, unless consent has been gained from an identified consent authority. The consent authority under a LEP is normally the local Shire or City Council.

In addition to the development of these environmental planning instruments, the Director of the Department of Planning (DoP) or a local Council may prepare a Development Control Plan (DCP), where it is considered that more detailed provisions or guidelines are required over any part of land covered by an REP, LEP or their Drafts (sections 51A and 72).

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[4] The following information is provided as a guide only and is accurate to the best knowledge of Navin Officer Heritage Consultants. Readers are advised that this information is subject to confirmation from qualified legal opinion.

Recent amendments to the Act require a single LEP to be prepared according to a standard template, for each local government area within the next five years

In determining a development application (DA), a consent authority, such as a local Council, must take into consideration any of the following which are relevant to the subject application (section 79C(1) Potential Matters for Consideration):

- the provisions of any environmental planning instrument, or draft environmental planning instrument (which has been placed on public exhibition); any development control plan; and the regulations;
- the likely impacts of that development on the natural and built environments, and the social and economic impacts on the locality;
- the suitability of the site for the development;
- any submissions made in accordance with the Act or the regulations; and
- the public interest.

Best Practice Guidelines have been issued by DoP on the use of section 79C(1) and include an assessment of how the proposed development will affect the heritage significance of the property, or adjacent properties, in terms of the historic, scientific, cultural, spiritual and archaeological of Aboriginal, non-Aboriginal and natural heritage.

If a development consent is required from council under the provisions of a LEP and a permit or license is also required from a State Government Agency an integrated development must be submitted to the consent authority. A development is an 'integrated development' if it requires an approval under section 90 of the *NSW National Parks & Wildlife Act, 1974* or if the Director General of DEC is of the opinion that consultation with an Aboriginal group or organisation should be consulted prior to a determination being made. Any development approval issued for an integrated development of this kind must be consistent with the general terms of approval or requirements provided by the relevant State Government Agency.

The *Environmental Planning & Assessment Act, 1979*, as amended, provides for the listing of heritage items and conservation areas and for the protection of these items or areas through environmental planning instruments (like LEPs and REPs) at the local government and State planning levels. These statutory planning instruments usually contain provisions for the conservation of these items and areas as well as an assessment process to reduce the impacts of new development on the heritage significance of a place, building or conservation area.

Part 3A of the Act is a recent amendment and establishes a separate streamlined and integrated development assessment and approvals regime for major State government infrastructure projects, development that was previously classified as State Significant development, and other projects, plans or programs declared by the Minister for Planning.

Part 3A removes the stop-the-clock provisions and the need for single-issue approvals under eight other Acts, including the National Parks and Wildlife Act 1974 and the Heritage Act 1977. Environmental planning instruments such as the heritage provisions within LEP and REPs, (other than State environmental planning policies) do not apply to projects approved under Part 3A.

Where warranted the Minister may declare any project subject to Part 3A to be a critical infrastructure project. These projects only require a concept approval in contrast to other Part 3A projects which require project approval. In most circumstances, a concept approval will be obtained to establish the environmental performance requirements and consultation requirements for the implementation of the subsequent stages of the project.

Under the provisions of Part 3A, proponents of major and infrastructure projects must make a project application seeking approval of the Minister. The application is to include a preliminary assessment of the project. Application may be for concept plan approval or full approval. Following input from relevant agencies and council(s), DoP will issue the proponent with requirements for the preparation of an Environmental Assessment and a Statement of Commitments. The Statement of Commitments

will include how the project will be managed in an environmentally sustainable manner, and consultation requirements.

Following submission of an Environmental Assessment and draft Statement of Commitments to DoP, these documents are variously evaluated, reviewed, circulated and exhibited. The proponent may modify the proposal to minimise impacts in response to submissions received during this process. The proponent then provides a Statement of Commitments and, following any project changes, a Preferred Project Report. An assessment report is then drafted by the Director-General and following consultation with relevant agencies, a final report with recommendations for approval conditions or application refusal is submitted to the Minister. The Minister may refuse the project, or approve it with any conditions considered appropriate.

The EP&A Act, 1979, and its regulations, schedules and associated guidelines require that environmental impacts are considered in land use planning and decision making. Environmental impacts include cultural heritage assessment. The Act was recently reformed by the passage of the *Environmental Planning and Assessment Amendment (Infrastructure and other Planning Reform) Act* in June 2005.

14.2 The National Parks and Wildlife Act 1974

The following summary is based on:

- The provisions of the current National Parks and Wildlife Act 1974 (NP&W Act) as amended. It should be noted that amendments to this Act were passed by both houses of the NSW State Government in 2001 (no.130, assented 19/12/2001). Some of these amendments are yet to be proclaimed; and

- Department of Environment and Conservation policy as presented in the 1997 Standards and Guidelines Kit for Aboriginal Cultural Heritage provided by the (then) NSW NPWS, and as communicated orally to the consultants on a periodic basis. The guideline documents presented in the 1997 Standards and Guidelines Kit were stated to be working drafts and subject to an 18 months performance review. The Standards Manual was defined not to be a draft and subject to periodic supplements.

With the exception of projects subject to the provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act), the National Parks and Wildlife Act 1974 (as amended) provides the primary basis for the legal protection and management of Aboriginal sites within NSW. The implementation of the Aboriginal heritage provisions of the Act is the responsibility of the Department of Environment and Conservation (DEC).

The rationale behind the Act is the prevention of unnecessary or unwarranted destruction of relics, and the active protection and conservation of relics that are of high cultural significance.

With the exception of some artefacts in collections, or those specifically made for sale, the Act generally defines all Aboriginal artefacts to be ‘Aboriginal objects’ and to be the property of the Crown. An Aboriginal object has a broad definition and is inclusive of most archaeological evidence The Act then provides various controls for the protection, management and disturbance of Aboriginal objects.

An Aboriginal object is defined as:

> ‘any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.’ [Section 5(1)].

In practice, archaeologists use a methodology that groups 'Aboriginal objects' into various site classifications according to the nature, occurrence and exposure of archaeological material evidence. The archaeological definition of a site may vary according to survey objectives, however a site is not

recognised or defined as a legal entity in the Act. It should be noted that even single and isolated artefacts are protected as Aboriginal objects under the Act.

The investigation, use or destruction of Aboriginal objects is managed through a system of Permits and Consents under the provisions of Sections 87 and 90 of the Act. Section 87 relates to actions which do not involve direct damage to Aboriginal objects, and Section 90 relates to damage or defacement of Aboriginal objects.

Under Section 87 of the Act, it is an offence to do any of the following without a Permit from the Director-General of the Department of Environment and Conservation: disturb or excavate any land for the purpose of discovering an Aboriginal object; disturbing or moving an Aboriginal object; take possession of or removing an Aboriginal object from certain lands; and erecting a building or structure to store Aboriginal objects on certain land (Section 86). The maximum penalty is $11,000 for individuals and $22,000 for corporations.

Under section 90 of the Act, a person who, without first obtaining the consent of the Director-General knowingly destroys, defaces or damages, or knowingly causes or permits the destruction or defacement of or damage to, an Aboriginal object or Aboriginal Place is guilty of an offence against the Act.

Where salvage actions (such as collection or re-positioning) are proposed in conjunction with an application to destroy Aboriginal objects, then an application for a section 87 permit must accompany the section 90 application. This is because a consent issued solely under section 90 of the Act is not considered to permit actions other than those which destroy, deface or damage Aboriginal objects.

In January of 2005, the DEC introduced Interim guidelines for Aboriginal Community Consultation with regard to the preparation of applications for a consent or permit under Part 6 (section 87 and 90) of the NP&W Act. The DEC anticipates that the guidelines will be replaced with a more detailed policy later in 2005 following consultation with the Aboriginal community and other stakeholders. The Interim guidelines include a required process of notification of intended applications in the local media, an invitation for stakeholder groups to register interest, and various time periods providing an opportunity for registered stakeholders to comment and review proposed methodologies and assessments. A transition phase has been specified for the application of the Interim guidelines. Any project where a Planning Focus Meeting was held before the 1st of January 2005, or where the proponent can demonstrate that cultural heritage assessment work commenced prior to this date, may continue to prepare Part 6 applications according to the former processes. Alternatively a proponent may choose to comply with the new guidelines.

It should be noted that section 75U of the EP&A Act 1979 (as amended) establishes an exemption to the application of sections 87 and 90 of the NP&W Act. It states that a Permit under section 87 or a Consent under section 90 of the NP&W Act 1974 is not required for an approved project subject to the provisions of Part 3A of the EP&A Act. Section 75U also extends this exemption to include 'any investigative or other activities that are required to be carried out for the purpose of complying with any environmental assessment requirements under this Part in connection with an application for approval to carry out the project or of a concept plan for the project' (section 75(U)4 EP&A Act 1979 (as amended)).

Section 175B of the NP&W Act outlines circumstances where corporation directors may be taken to have contravened these provisions, based on the acts or omissions of that Corporation.

The processing and assessment of Permit and Consent applications is dependent upon adequate archaeological review and assessment, together with an appropriate level of Aboriginal community liaison and involvement (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit).

The Minister may declare any place which, in his or her opinion, is or was of special Aboriginal significance with respect to Aboriginal culture, to be an Aboriginal place (Section 84). The Director-General has responsibility for the preservation and protection of the Aboriginal place (Section 85). An area declared to be an Aboriginal place may remain in private ownership, or be acquired by the Crown by agreement or by a compulsory process (Section 145).

The Director General may make an interim protection order and order that an action cease where that action is, or is likely to, significantly affect an Aboriginal object or Aboriginal place. Such an order is current for 40 days (Section 91AA, Schedule 3[10]). Such an order does not apply to certain actions, such as where they are in accordance with development consents or emergency procedures.

14.2.1 General Management Constraints and Requirements

Except where a project is subject to the provisions of Part 3A of the EP&A Act, the NP&W Act, together with the policies of the Department of Environment and Conservation provide the following constraints and requirements on land owners and managers:

- It is an offence to knowingly disturb an Aboriginal object (or site) without an appropriate permit or consent (Sections 87 and 90);

- Prior to instigating any action which may conceivably disturb an Aboriginal object (this generally means land surface disturbance or felling of mature trees), archaeological survey and assessment is required (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit);

- When the archaeological resource of an area is known or can be reliably predicted, appropriate landuse practices should be adopted which will minimise the necessity for the destruction of sites/Aboriginal objects, and prevent destruction to sites/Aboriginal objects which warrant conservation (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit) and

- Documented and appropriate consultation with relevant Aboriginal Community representatives is required by the Department of Environment and Conservation as part of the prerequisite information necessary for endorsement of consultant recommendations or the provision of Consents and Permits by the DEC (refer Standards for Archaeological Practice in Aboriginal Heritage Management in 1997 NPWS Standards and Guidelines Kit).

14.3 The National Parks and Wildlife Amendment Bill 2001

Although this Act was passed by both houses of the NSW parliament in 2001, a number of its provisions with regard to Aboriginal cultural heritage have yet to be gazetted and are not yet law. These include the following provisions:

- The requirement for a section 90 ‘Consent to Destroy’ from the Director General will be replaced by a ‘heritage impact permit’ (Schedule 3[1], 3[3-8]);

- The offence under section 90 of the Principal Act of ‘knowingly’ destroying, defacing or damaging Aboriginal objects and Aboriginal Places without Consent will be changed so that the element of knowledge will be removed (Schedule 3 [2]). The amended section 90, subsection 1 will read:

  ‘A person must not destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place.’

- Section 90 subsection 1 will not apply when an Aboriginal object or Aboriginal place is dealt with in accordance with a heritage impact permit issued by the Director-General (Schedule 3[3], Section 90(1B) in amended Act);

- It will be a defence to a prosecution for an offence against subsection 1 if the defendant shows that:

  (a) ‘he or she took reasonable precautions and exercised due diligence to determine whether the action constituting the alleged offence would, or would be likely to, impact on the Aboriginal object of Aboriginal place concerned, and

(b) the person reasonably believed that the action would not destroy, deface, damage or desecrate the Aboriginal object or Aboriginal place.' (Schedule 3[3], Section 90(1C) in amended Act)

- A court will be able to direct a person to mitigate damage to or restore an Aboriginal object or an Aboriginal place in appropriate circumstances when finding the person guilty of an offence referred to in section 90 of the Principal Act (Schedule 3[9]); and

- Schedule 4[8] of the Bill provides for the Director-General to withhold in the public interest specified documents in the possession of the DEC which relate to the location of Aboriginal objects, or the cultural values of an Aboriginal place or Aboriginal object.

14.4 The NSW Heritage Act (1977)

Overview

The purpose of the NSW Heritage Act 1977 is to ensure that the heritage of New South Wales is adequately identified and conserved. In practice the NSW Heritage Act has focused on items and places of non-indigenous heritage to avoid overlap with the NP&W Act, 1974 which has primary responsibilities for nature conservation and the protection of Aboriginal relics and places in NSW.

The *Heritage Amendment Act 1998* came into effect in April 1999. This Act instigated changes to the NSW heritage system, which were the result of a substantial review begun in 1992. A central feature of the amendments was the clarification and strengthening of shared responsibility for heritage management between local government authorities, responsible for items of local significance, and the NSW Heritage Council. The Council retained its consent powers for alterations to heritage items of state significance.

The Heritage Act is concerned with all aspects of conservation ranging from the most basic protection against damage and demolition, to restoration and enhancement. It recognises two levels of heritage significance, State significance and Local significance across a broad range of values. Some key provisions of the Act are:

- The establishment and functions of the Heritage Council (Part 2),
- Interim heritage orders (Part 3), the State Heritage Register (Part 3A),
- Heritage Agreements (Part 3B),
- Environmental planning instruments (Part 5),
- The protection of archaeological deposits and relics (Part 6), and
- The establishment of Heritage and Conservation Registers for state government owned and managed items (Part 7).

Generally this Act provides protection to items that have been identified, assessed and listed on various registers including State government section 170 registers, local government LEPs and the State Heritage Register. The Interim Heritage Order provisions allow the minister or his delegates (local government may have delegated authority) to provide emergency protection to threatened places which have not been previously identified.

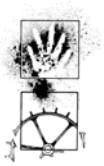
In addition, the Act includes provisions which relate to the definition and protection of relics.

Protection of Relics and Archaeological Deposits

Section 139 of the Act specifically provides protection for any item classed as a relic. A relic is defined as "...any deposit object or material evidence -

(a) Which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement; and

(b) Which are 50 or more years old."



Section 139 of the Act disallows disturbance of a relic unless in accordance with an 'excavation permit' from the Heritage Council. This section also allows the Heritage Council to create exceptions to the requirement for an excavation permit with respect to certain types of relic, contexts, or types of disturbance (refer below).

Section 146 of the Act requires that the discovery of a previously unknown relic be reported to the Heritage Council within a reasonable time of its discovery.

Current policy and interpretation by the NSW Heritage Office (Department of Planning) limits the scope of the 'relic' definition to exclude above ground structures and a range of ground features or 'works' which may include roads, embankments and other forms of constructed ground relief.

Permits and Approval Requirements

The Act includes two key approval requirements;

- A permit must be obtained for works which have the potential to interfere with a heritage item or place which is either listed on the State Heritage Register or the subject of an interim heritage order (Section 57); and

- A permit must be obtained to disturb or excavate land where it is known (or there is reasonable cause to suspect) that such action will or is likely to uncover or affect a relic (Section 139). This permit is known as an excavation permit and can be applied for under section 140 of the Act. Current interpretation of the Act by the Heritage Office indicates that excavation permits are only applicable to relics which are situated below the ground surface.

It should be noted that section 75U of the EP&A Act 1979 (as amended) establishes an exemption to the requirement for an excavation permit. It states that an approval under Part 4, or an excavation permit under section 139 of the Heritage Act 1977 is not required for an approved project subject to the provisions of Part 3A of the EP&A Act. Section 75U also extends this exemption to include 'any investigative or other activities that are required to be carried out for the purpose of complying with any environmental assessment requirements under this Part in connection with an application for approval to carry out the project or of a concept plan for the project' (section 75(U)4 EP&A Act 1979 (as amended)).

Exemptions for works requiring Heritage Council Approval

Certain activities which may be conducted on heritage item listed on the State Heritage Register are exempted from the Section 57 approval requirements. Such exemptions are granted by the Minister and fall into two groups, standard exemptions and site specific exemptions.

A schedule of section 57 standard exemptions has been formulated which includes activities such as certain types of maintenance and repair, minor excavations, changes of use, some temporary structures and 'anything which in the opinion of the Director is of a minor nature and will not adversely affect the heritage significance of the item'. In many cases notification of such proposed activities must be made by the applicant to the Director, and written notification from the Director received regarding his satisfaction that the exemption criteria have been met.

Exceptions from Excavation Permit Requirements

Certain activities are excluded from the 139 permit approval requirements.

A series of exceptions have also been established for Section 139 Permit approval requirements. This includes demolition and maintenance of bridges not listed on the State Heritage Register, some forms of excavation and maintenance of underground services, conservation and repair of monuments and grave markers, and the exposing of survey marks in the course of survey operations.

On the 5th March of 2003, the following section 139 exceptions were notified:

> Excavation or disturbance of the following land does not require an excavation permit under Section 139, provided that the Director is satisfied that the criteria in (a), (b) or (c) have been met and the person to undertake the excavation or disturbance has received a notice advising that the Director is satisfied:
>
> (a) Where an archaeological assessment has been prepared in accordance with Guidelines published by the Heritage Council of NSW which indicates that there is little likelihood of there being any relics in the land or that any relics in the land are unlikely to have State or local heritage significance;
>
> (b) Where the excavation or disturbance of land will have a minor impact on the archaeological resource; and
>
> (c) Where the excavation or disturbance of land involves only the removal of fill which has been deposited on the land.

A person proposing to excavate or disturb land according to the above criteria must write to the Director and describe the proposed excavation or disturbance and set out why it satisfies the criteria. The Director shall notify the applicant if he or she is satisfied that one or more of the criteria have been met.

The Heritage Council of NSW

The role of the Heritage Council is to provide the Minister with advice on a broad range of matters relating to the conservation of the heritage of NSW. It also has a role in promoting heritage conservation through research, seminars and publications. The membership of the Heritage Council is designed to reflect a broad range of interests and areas of expertise.

Interim Heritage Orders

Under the provisions of Part 3 of the Act, the Minister can make an interim heritage order (IHO). A recommendation with respect to an order can come from the Heritage Council, either based on a request for the Minister, or the Council's own considerations. The Minister can also authorise Local Councils to make IHOs within their area. An interim conservation order may remain in force for up to 12 months, until such time as it is revoked or the item is listed on the State Heritage Register. A heritage order may control activities such as demolition of structures, damage to relics, places or land, development and alteration of buildings, works or relics.

The State Heritage Register

Changes to the Heritage Act in the 1998 amendments established the State Heritage Register which includes all places previously protected by permanent conservation orders (PCOs) and items identified as being of state significance in heritage and conservation registers prepared by State Government instrumentalities. Sites or places which are found to have a state level of heritage significance should be formally identified to the Heritage Council and considered for inclusion on the State Heritage Register.

Heritage Agreements

Under Section 39 of the Act, the Minister can enter into an Agreement with the owner of a heritage item listed on the State Heritage Register to ensure its conservation. Such an Agreement can cover a range of responsibilities including financial or specialist assistance and can be attached to the title of the land.

Environmental Planning Instruments

Part 5 of the Act gives the Heritage Council the authority to request that an environmental planning instrument be prepared covering certain lands. It also directs that the Heritage Council shall be

consulted by others when preparing a draft planning instrument affecting land to which an interim heritage order applies or which includes an item listed on the State Heritage Register. In addition it gives the Heritage Council the authority to produce guidelines for the preparation of such planning instruments.

Heritage and Conservation Registers

Section 170 of the Act requires all state government instrumentalities to establish and maintain a Heritage and Conservation Register that lists items of environmental heritage. The register is to include items which are, or could potentially be, the subject of a conservation instrument, and which are owned, occupied or otherwise under the control of that instrumentality.

14.5 Implications for the Bevian Road Concept Application Area

The results of the archaeological survey and subsurface testing programs indicate that Aboriginal artefacts (Aboriginal Objects) can be expected to occur in varying density throughout the concept application area. The density of this material will vary from relatively low to very low levels, (1 artefact per square metre or less), to relatively higher densities (more than 10 artefacts per square metre). In most cases these artefacts will occur subsurface, although some surface exposures of artefacts are known across the study area.

It should be emphasised that this type and distribution of artefact incidence is likely to be typical of all similar immediate hinterland topographies in the Batemans Bay-Moruya area and most probably the wider surrounding region.

As a consequence of this finding, it can be predicted that most construction works proposed for the concept application area and which involve disturbance to the upper soil profile, will involve disturbance to a variable number and incidence of Aboriginal objects. Most of these will be subsurface and occur at low to very low densities. In the absence of an approval under Part 3A of the *Environmental Planning & Assessment Act 1979,* any such disturbance would only be lawful if consistent with the provisions of a section 87 and/or section 90 permit under the *National Parks and Wildlife Act 1974.*

Similarly, given the presence of non-indigenous relics and archaeological deposits within the concept application area, the provisions in the NSW *Heritage Act 1977* relating to relics and archaeological deposits would also need to be met in the absence of approval under Part 3A.

In the event that project approval is gained under Part 3A of the *Environmental Planning & Assessment Act 1979* for development within the Bevian Road Concept Application Area, then disturbance to, and the management of, items and places of indigenous and non-indigenous cultural heritage value will be subject only to the conditions and commitments associated with that approval.

It is anticipated that the conduct of the conservation and management strategies outlined in this report would form part of a Statement of Commitments submitted by a development proponent as part of the project approval process.

15. IMPACT ASSESSMENT AND MANAGEMENT CONSIDERATIONS

15.1 Aboriginal Surface sites

RUR1

This site occurs within the proposed buffer zone around Bevian Wetland. As such, the Concept Approval Plans allow for the conservation management of this site, and any associated potential archaeological deposits, within reserved open space around the wetland.

The location of this site is suggestive that other Aboriginal sites, currently obscured by vegetation or sediment, may also be present on locally elevated ground adjacent to the wetland.

The recommended management strategies for this site would aim to conserve as much as possible of the site according to the opportunities and constraints afforded by its location within a publicly accessible, open space, and multipurpose reserve. Surface artefacts may need to collected in order to avoid their damage, loss or unauthorised collection. Subsurface archaeological deposits should be protected from potential disturbance from erosion, and the installation of services or recreational facilities. The presence of an existing cut and benched, gravel vehicle track across this site provides an opportunity to locate new walking tracks or other such recreational facilities across the site area without promoting further damage to the archaeological resource.

RUR2

This is the largest surface scatter of Aboriginal artefacts within the concept application area. Subsurface testing across the site has confirmed the presence of associated subsurface archaeological deposits. Both the surface artefacts and subsurface archaeological deposits occur with proposed riparian buffer zone and adjoining undeveloped open space. As such, the Concept Approval Plans allow for the conservation management of this site.

The recommended management strategies for this site would aim to conserve as much as possible of the site according to the opportunities and constraints afforded by its location within a publicly accessible, open space, and multipurpose reserve. Surface artefacts may need to collected in order to avoid their damage, loss or unauthorised collection. Subsurface archaeological deposits should be protected from potential disturbance from erosion or the installation of services or recreational facilities.

RUR IF1

This surface isolated find was recorded on the shoulder of the existing gravel access track on the western side of Bevian Wetland. The proposed upgrading of this track to form the main southern vehicle access road for the development would directly impact this find and its immediate context.

The presence of this find on the dry land margin around Bevian Wetland is suggestive that similar finds will be present in the remaining margins of the wetland basin.

The low assessed significance of this find does not warrant *in situ* conservation or re-location of the planned access road.

The recommended management strategy for this site would be to collect the artefact (if still visible and on the surface) prior to the commencement of construction disturbance.

15.2 Aboriginal Archaeological Deposits

All of the identified potential archaeological deposits (PADs) within the study area were found to contain subsurface archaeological material and should therefore be considered as archaeological deposits (ADs). The subsurface test results from the additional test areas (TAs) indicated that the

presence of subsurface archaeological material was not limited to the PAD/AD areas and provided a basis for concluding that the archaeological resource extends in varying density and character across the whole of the concept application area. The density of this material will vary from relatively low to very low levels, (1 artefact per square metre or less), to relatively higher densities (more than 10 artefacts per square metre). In most cases these artefacts will occur subsurface, and have no surface manifestation.

It is noted that this type and distribution of artefact incidence is likely to be a normal and common occurrence across most Australian landforms and is not peculiar to the Bevian Road Concept Application Area. lt is probable that the characteristics of the stone artefact assemblages encountered during this project are typical of similar hinterland topographies in the Batemans Bay-Moruya area and most probably the wider surrounding region. The ability to apply subsurface testing results beyond the confines of site specific boundaries and according to a broader landform classification system, is afforded in this case by the methodology used and the testing of a representative sample of topographic contexts.

The findings of this report regarding the subsurface Aboriginal archaeological resource within the Bevian Road Concept Application Area urban are that:

- The resource has some limited scientific significance;
- The resource has a degree of representative value;
- The Aboriginal cultural significance of the study area and the archaeological material it contains has been variously acknowledged by each of the three Aboriginal organisations (refer sections 3, 13.3.1 and Appendices 9 & 10). The Djuwin Women's Lore Council state that the study area is of high cultural significance to the local Aboriginal community.
- There is scope for further limited archaeological investigation. This could involve the recovery of a larger sample from basal slope and low valley context spurline crests, and seek additional information regarding the presence of grindstones in the southern portion of the study area.

Based on this summation, an appropriate form of conservation management of the archaeological resource, commensurate with its significance, could be realised through the reservation and management of selected landforms within proposed open space reserves. The Bevian Road Concept Application Plans allow for this management strategy through the retention of substantial open space areas associated with streamlines and the Bevian wetland basin. Open space areas with recognised archaeological values could also have other landuse and recreational functions provided that they were compatible with the conservation of subsurface archaeological deposits. Figure 15.2 identifies five nominated *archaeological conservation areas* which could be managed for the conservation of their archaeological resource. In combination, they would provide an effective and representative sample of the significant components of the archaeological resource of the concept application area.

They include:

- sites RUR1 and RUR2
- all or part of the identified archaeological deposits (AD1-8)
- a substantial portion of archaeological deposits identified in test area 6
- areas of known and predicted low artefact density;
- areas of known and predicted higher artefact density;
- The majority of areas of greater scientific significance (as determined by this testing program);

The management of the nominated *archaeological conservation areas* could most effectively be realised as part of the overall management obligations for the open space lands within the

development. An indicative plan of management for the conservation areas is presented in Appendix 7.

The proposed conservation areas do not present high value opportunities for public interpretation of their heritage significance. Indeed the publication of their role as archaeological reserves may pose a risk of unauthorised or malicious disturbance to the deposits. It is relevant in this regard, to note that the current development of the adjacent Barlings Beach area is to include the establishment of an Aboriginal cultural and/or interpretation centre. Such an establishment would be an ideal location for any interpretation of the Rosedale conservation areas (if deemed necessary) and for the curation of the artefacts recovered during the subsurface investigation and any subsequent salvage collections.

In parallel with the establishment of the archaeological conservation areas, consideration could be given to undertaking a limited-scope salvage excavation program prior to, or during construction, on selected spurline crests and basal slope and low valley contexts. The results of this investigation indicate a degree of scientific benefit in gaining a larger artefact sample size from these contexts (Refer section 13.2.4). Such a salvage program could incorporate simpler, and therefore faster, methodologies than those adopted for the subsurface testing program. Given the finding that the surviving archaeological resource has no vertical (and therefore chronological) integrity, there is no consistent requirement to discriminate depth intervals in any recovered artefact sample. A salvage methodology could therefore focus on bulk sampling and processing of the higher density soil layers, potentially with the use of graders. Where appropriate the use of broad area grader excavation could be supplemented with pit excavations, including both backhoe and by-hand methods.

15.3 Historical Sites

HS1, 2 & 3 Prospectors' Pits

HS1 would be directly impacted by proposed development under the Bevian Road Concept Application Plan. HS2 and 3 occur in open space, the latter within a scenic protection area. All of these sites consist of shallow pits, up to 30 cm deep, and are interpreted as gold prospectors' pits. As such they are not a rare site type and examples are likely to be present in adjoining crown lands.

The Concept Approval Plans allow for the preservation and conservation management of HS2 and HS3, through retention within open space areas. One or more of these features could be interpreted for visitors through on-site signage and/or as one of several points of interest in a pamphlet guide. Based on the limited significance of these features, such an interpretive strategy should not be considered an essential requirement. If on the other hand, a walking trail were to be constructed through the scenic protection area, the incorporation of an interpreted historic ground feature such as these could be a positive addition.

HS4 Agricultural Drainage Ditches

This recording has been interpreted as evidence of the early European agricultural development of the concept application area. The site has limited significance value and its *in situ* conservation is not an essential or required strategy. Never-the-less, the Concept Approval Plans allow for the conservation of this site, given its location within a buffer zone and open space around Bevian Wetland. Given this context, the conservation of the site is considered to be a preferred strategy. In a similar situation to HS2 and 3, this site could be interpreted through on-site signage or a pamphlet and included within a walking track associated with the wetland.

If is anticipated that the ditches that constitute this site will be directly impacted by construction works, then it is recommended that a basic recording of their arrangement and form be made prior to impact. This would form an archival record of the site.

HS5 Former 1930s Rosedale Cheese Factory

This former cheese factory retains high heritage values within a local context. As such, the *in situ* conservation of this site has a high priority. Critical to a conservation strategy would be the adaptive reuse of the structure such that the upkeep and maintenance of the property can be maintained within an economically viable context. Other important factors would be the retention of an

appropriate open space curtilage around the property, and the identification and management of the significant elements and fabric of the site.

The Concept Approval Plans provide a high degree of opportunity to realise the long term conservation and management of this site. This is afforded through:

- the retention of substantial open space around the existing lot boundary, including the adjacent creekline;
- closing the adjacent (existing) road to through traffic; and
- proximity to a planned through - traffic road, and thus potential for an adaptive reuse of the site including some form of community, commercial and/or tourist related enterprise.

The preferred conservation management for this site would include the following strategies:

- The conduct of a detailed site recording and the creation of a conservation management plan with the aims of identifying the significant fabric of the site, defining an appropriate curtilage, and creating an archival record of the current form of the building prior to any modifications required for conservation management and adaptive reuse;
- The conduct of further historical research with the aim of clarifying and recording documentary and oral history relating to the site;
- The conservation and adaptive reuse of the site, which would conserve and maintain the significant components of the site, as part of a compatible, possibly private, community and/or commercial facility;
- The incorporation, within whatever adaptive reuse strategy is adopted, of a degree of public access and interpretation of the site's history and heritage significance.

HS6 Pits of unidentified origin

These features are included within proposed residential lots under the Bevian Road Concept Application Plan and would subsequently be vulnerable to direct impact from construction or other related residential lot disturbances.

The significance of this site is considered to fall below the threshold of the specified assessment criteria and specific actions to conserve this site are not considered to be warranted.

HS7 Farm machinery

This recording consists of the remains of portable farm machinery (possibly a seeder) and its potential conservation management is not dependent on in situ conservation.

The significance of this feature is considered to fall below the threshold of the specified assessment criteria. Despite this, and its poor condition, restoration could be an option, or alternatively the item could be collected and displayed as part of an interpretive feature (such as at the former cheese factory).

HS8 & HS9 Former location of 1878 Selectors Huts

Site HS8 would be directly impacted by the construction of a road defined in the Bevian Road Concept Application Plan. Site HS9 falls within open space.

The significance of these features is considered to fall below the threshold of the specified assessment criteria. The preservation or conservation management of these sites is therefore not warranted based on their level of significance.

Despite this it is recommended that consideration be given to monitoring initial construction work within the upper soil profile in these locations (when and if such disturbance is anticipated), and collecting any exposed artefactual material which could be effectively used in the interpretation of the local history of the area. This material could be incorporated into an interpretive display associated with the former Cheese factory (site HS5), or alternatively could be lodged with a local historical society.

Provided that this salvage action is identified in the statement of commitments and construction works gain approval under Part 3A of the EP&A Act, these salvage actions would not require an excavation permit of exception approval from the NSW Heritage Office.

HS10 Former location of Robert Jennings selector's house (1878-)

The location of Robert Jennings' house is considered to have representative and educational local significance values. These are based on its location on a locally elevated spurline overlooking the valley floor, Bevian Swamp, and the dune field and Broulee Bay further to the south. This site is situated within open space near the southern boundary of the Bevian Road Concept Application Plan Area. As a consequence, the retention of these significant values could be realised through the management of the surrounding open space and the provision of some form of public interpretation. The interpretation of this site could include on-site signage accessed by a walking track and/or be one of several points of interest in a pamphlet guide.

15.3 Conclusions

The Bevian Road Concept Application Plan allows for the effective conservation management and/or impact mitigation for of all the identified cultural heritage items with assessed levels of significance above the threshold of the assessment criteria. The pattern of open space defined in the Plan allows for the reservation of both the higher significance areas, and a representative sample of the known and predicted Aboriginal archaeological resource within the application area.

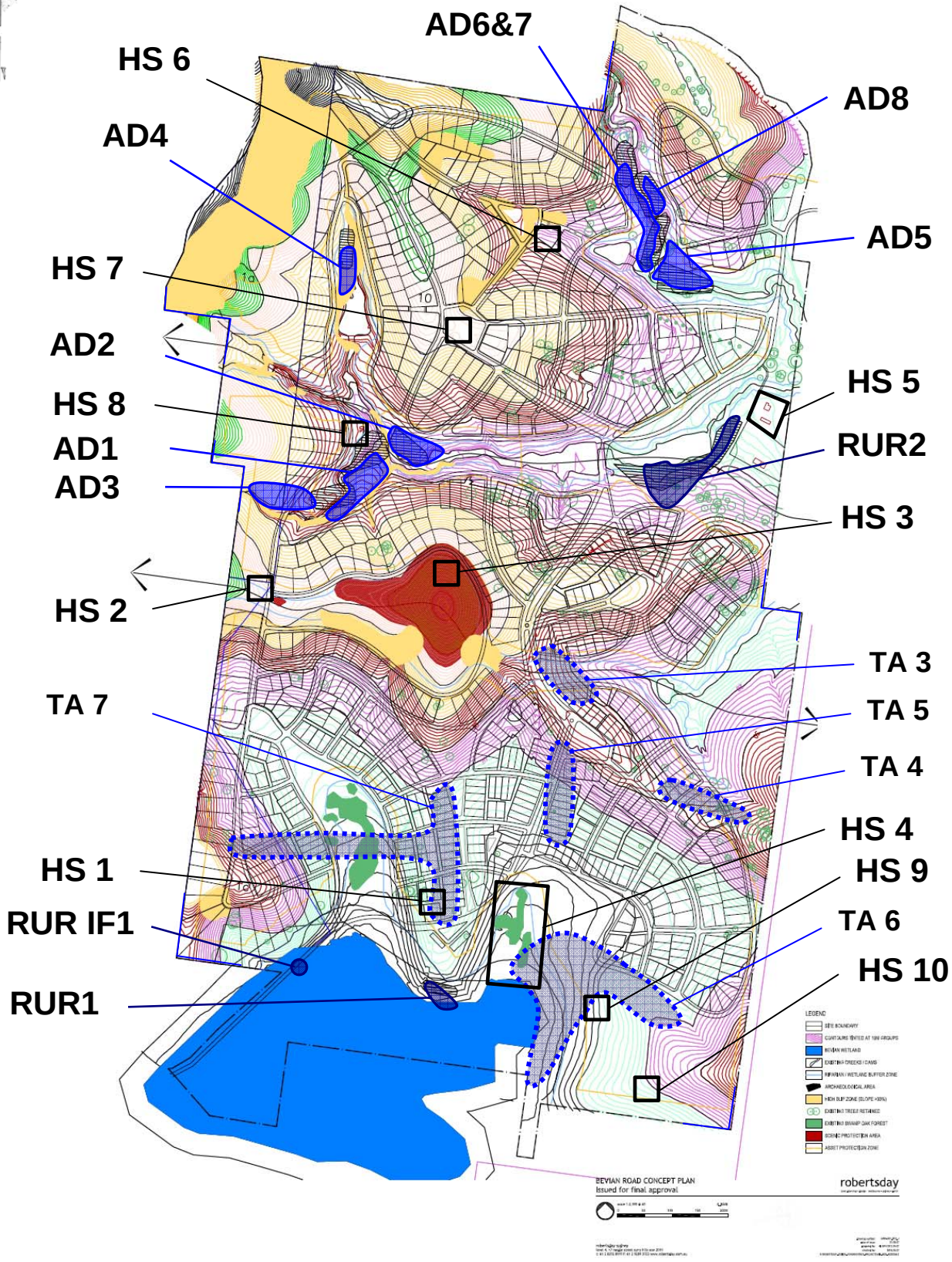


Figure 15.1 Location of all cultural heritage recordings and subsurface test areas relative to the Bevian Road Concept Approval Plan. Note that formerly classed potential archaeological deposits (PADs) are now termed archaeological deposits (AD).

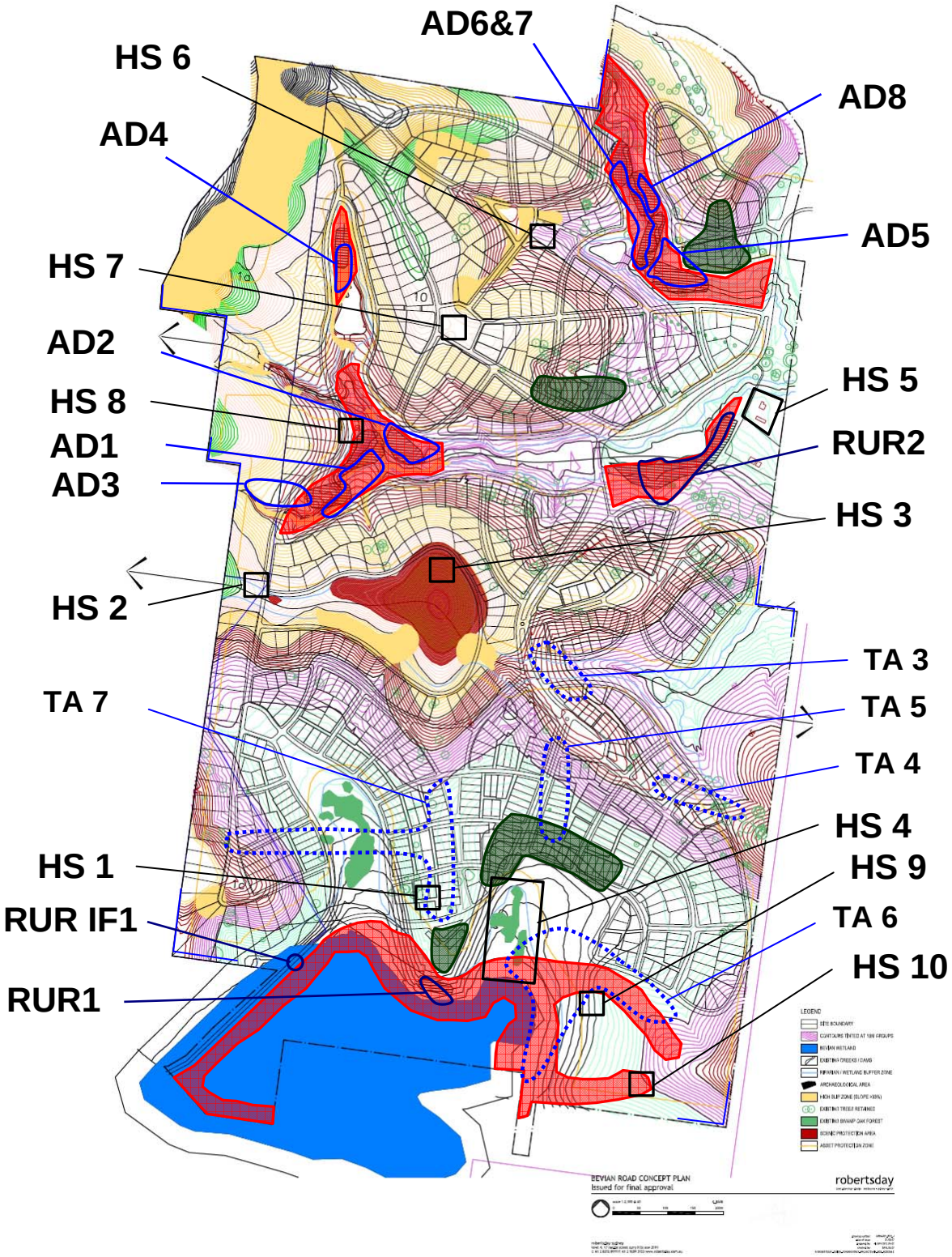


Figure 15.2 Nominated archaeological conservation areas and areas in which archaeological salvage could be considered prior to construction impact.

nominated archaeological conservation areas (open space areas to be managed for the conservation of subsurface Aboriginal archaeological deposits)

Areas in which archaeological salvage could be considered prior to construction impact

16. RECOMMENDED MANAGEMENT STRATEGIES

It is recommended that the conduct of the following management and impact mitigation strategies be included in the Statement of Commitments linked to any approval of the Bevian Road Concept Application Plan and consequential development approvals.

16.1 Site Specific Strategies

1. Conserve Aboriginal site **RUR1** within an open space reserve. The objective of this strategy is to conserve as much as possible of the site according to the opportunities and constraints afforded by its location within a publicly accessible, open space, and multipurpose reserve. This could be realized within the context of the proposed buffer zone reserve around Bevian Wetland. Except for the existing vehicle track which cuts across this site, the ground deposits associated with this locality should be protected from disturbance (such as from pedestrian traffic, erosion, or landscaping and gardening impacts). Ground disturbance, such as from the installation of walking tracks, or other recreational facilities, would be permissible if placed within the existing vehicle track which traverses this site. This site should not be publicized, sign posted or otherwise identified in the field. The collection and permanent storage of the surface artefacts present at this site may need to be conducted in the event of a perceived threat from damage, loss or unauthorised collection.

2. Conserve Aboriginal site **RUR2** within an open space reserve. The objective of this strategy is to conserve as much as possible of the site according to the opportunities and constraints afforded by its location within a publicly accessible, open space, and multipurpose reserve. This could be realized within the context of planned open space around the associated creekline and dam. Compatible landuses within such a reserve could include passive recreation and natural vegetation regeneration. Subsurface archaeological deposits should be protected from potential disturbance from erosion or the installation of services or recreational facilities.

3. Conserve Aboriginal archaeological deposits **AD1, 2, 4, 5, 6, 7 and 8** (formerly recorded as PAD1, 2, 4, 5, 6, 7 and 8), within open space reserves. The objective of this strategy is to conserve as much as possible of the deposits according to the opportunities and constraints afforded by its location within a publicly accessible, open space, and multipurpose reserve. This could be realized within the context of planned open space around the associated creeklines and valley floor spaces. Compatible landuses within such a reserve could include passive recreation and natural vegetation regeneration. Subsurface archaeological deposits should be protected from potential disturbance from erosion or the installation of services.

4. A portion of Aboriginal archaeological deposit **AD3** will be directly impacted by construction of an access road. The area of the archaeological deposit to the east of the roadworks will be incorporated into an archaeological conservation area, as outlined in Figure 15.2.

5. Prior to the commencement of development impact to the recorded location of isolated find **RURIF1** an attempt should be conducted to collect any visible surface artifacts.

6. Where feasible, conserve one or both of the prospector's pits **HS2 and 3** (prospectors pits) within reserved open space. These sites could be interpreted through public signage, pamphlets or other means, and could be included within a walking trail.

7. Where feasible, conserve at least that portion of the agricultural ditches **HS4** within reserved open space. This could be realized in the management context of the proposed buffer zone and open space around the Bevian Wetland. The conserved portion of this site would be suitable for public interpretation through public signage, pamphlet or other means, and could be included within a walking trail. In the event that all or a significant portion of this site is to be impacted by development activities, then a basic level archival recording should be generated, consistent with standards published by the NSW Heritage Office.

8. Conserve the former Rosedale Cheese Factory (**HS5**) within an appropriate open space cartilage. Prepare a Conservation Management Plan for the site and allow the adaptive reuse of the building and grounds, according to the objectives and priorities to be identified in the Plan. The Plan should identify the significant fabric of the site, an appropriate curtilage, and outline

conservation and management strategies to be followed. Further historical research is required to clarify and record the documentary and oral history of structure. The long term successful conservation and maintenance of the structure will depend upon establishing an economically viable function for the building. This could conceivably include community or commercial functions, provided that the heritage significance of the site are not significantly reduced or compromised. This site provides an excellent opportunity for public interpretation and controlled promotion.

9. An archival quality recording of the current form of the **HS5** structures should be conducted prior to conducting any modifications required for its conservation or adaptive reuse. Such a recording should be consistent with the recording standards published by the NSW Heritage Office.

10. No management or conservation actions are required regarding historic site **HS6**.

11. Consideration to be given to salvaging, restoring and displaying **HS7** (farm machinery) as part of a local community or museum feature (either in a ruined or restored condition).

12. If it is anticipated that construction works will directly impact either historic sites **HS8, and/or HS9** (1870s selectors occupation sites) then consideration will be given to monitoring initial construction work within the upper soil profile in these locations and collecting any exposed artefactual material which could be effectively used in the interpretation of the local history of the area. This material could be incorporated into an interpretive display associated with the former Cheese factory (site HS5), or alternatively could be lodged with a local historical society.

13. Conserve the location of historic site **HS10** (site of R. Jennings' 1870s selectors house) to be conserved within open space, with the visual vistas to the south and west maintained. This site could be interpreted through public signage, pamphlets or other means and included within a walking trail.

16.2 Archaeological Conservation Areas and Salvage

14. In order to conserve the scientific and Aboriginal cultural values of the known and predicted archaeological resource within the Bevian Road Concept Application Plan area, those areas nominated in Figure 15.2 would be reserved as archaeological conservation areas and managed as open space according to a plan of management. An indicative plan of management for archaeological conservation areas is presented in Appendix 6.

15. Consideration would be given to undertaking a limited-scope salvage excavation program prior to, or during construction, on selected spurline crests in basal slope and low valley contexts. The areas in which salvage actions could be conducted are shown in Figure 15.2. Such a program could include a variety of excavation methodologies including grader scrapes and mechanical/by-hand pit excavations.

16.3 Aboriginal Stakeholder Requests and Requirements

16. The proponent should take into consideration the requests and requirements documented in the correspondence and report provided by the various Aboriginal stakeholder groups and reproduced in this report in Appendices 9 and 10.

16.4 General

17. In the event that human remains are encountered during construction works, the protocol identified in Appendix 12 will be followed.

18. Where possible, development impact within the riparian zone around the Bevian Wetland basin should be avoided. It is considered likely that undetected Aboriginal archaeological sites occur within this zone (up to 100 m from the water edge).

19. Where appropriate, words and names derived from the ownership and landuse history of the study area would be used in the nomenclature of new streets and features forming part of the

proposed development. Examples could be taken from both the local Aboriginal and English language.

20. Any collected Aboriginal artefacts recovered during salvage or monitoring actions prior to or during construction works, should be recorded and analysed by a qualified archaeologist, prior to their return and curation according to the requirements of the local Aboriginal community. The planned Aboriginal cultural centre which will form part of the Barlings Beach development (currently under construction) would be an ideal keeping place for salvaged items of Aboriginal heritage significance.

21. One copy of this report should be forwarded to the Mogo Local Aboriginal Land Council for their information, at the following address:

    Chairperson
    Mogo Local Aboriginal Land Council Aboriginal
    Princes Highway
    MOGO NSW 2536

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APPENDIX 1

DESCRIPTION OF ABORIGINAL SITE TYPES

Open Artefact Scatter two or more artefacts, not located within a rock shelter, and located no more than 60 metres away from any other constituent artefact. This site type may occur almost anywhere that Aborigines have travelled and may be associated with hunting and gathering activities, short or long term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools, but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations that relate to activity areas.

Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low-density scatters may be indicative of 'background scatter' rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters commonly occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands.

Isolated find a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a radius of 60 metres. Isolated finds may be indicative of: random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter.

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

Scarred Tree a tree, or its remains, which contains a scar indicating the removal of bark (and sometimes wood) in the past by Aborigines. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting or bark removal. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any particular example of bark removal.

Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal in origin can be problematic because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginals for both their own purposes and for roofing on early European houses. Consequently the distinction between European and Aboriginal scarred trees may not be clear.

Potential archaeological deposit or PAD, is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape. Archaeological potential is assessed using criteria developed from the results of previous surveys and excavations relevant to the region. Potential deposits are, usually associated with actively aggrading landform features or rock shelter deposits and are identified by their context within, or association with, a landscape feature that was likely to have been exploited in prehistory.

Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials often occur in locally elevated topographies rather than poorly-drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.

On the NSW south coast burials characteristically occur in the deposits of occupation sites such as middens.

'Contact' Sites are sites which contain evidence of Aboriginal occupation during the period of early European occupation in a local area. The term 'contact' refers to the often poorly documented period when traditional Aboriginal society made initial social and economic contact with European society. This period is often characterised by increasingly rapid changes in Aboriginal social, economic and occupational patterns in response to European incursion. Evidence of this period of 'contact' could potentially be Aboriginal flaked glass, burials with historic grave goods or markers, and debris from 'fringe camps' where Aborigines who were employed by, or who traded with, the White community may have lived or camped. The most likely location for contact period Aboriginal occupation sites would be camp sites adjacent to permanent water, and located away from the focus of European town occupation or private landuse.

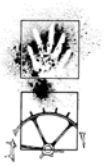
Estuarine Middens are defined as a concentration of artefactual debris that includes a significant percentage of estuarine shell species. They are located mostly in close proximity to estuarine environments and may be the result of an individual's meal or larger interim or base camp activity. This type of deposit may occur in open contexts or rock shelters.

Quarry Sites and Procurement Sites typically these sites consist of exposures of a geological raw material where evidence for human collection, extraction and/or preliminary processing has survived. Typically these involve the extraction of siliceous or fine-grained igneous and meta-sedimentary rock types for the manufacture of artefacts, or the removal of ochre. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations and ochre sources.

Stone Arrangements are defined as any arrangement of placed rocks that can be reasonably assigned to Aboriginal activity. Typically these include rock cairns and alignments of single or grouped stones. This site type is often located on high ridges and spurs but are difficult to predict and often limited in distribution. A European origin must first be discounted before identifying an Aboriginal site.

Bora Grounds or Earth Circles functioned as a prepared stage for initiation and other ceremonial activities which held a key role in the teaching and maintenance of the complex religious and social framework within southeast Australian Aboriginal society. Bora grounds consist mostly of one or more circular rings defined by mounded earth, sand and/or rocks. There may also be an associated depression within the ring. A pathway generally connected two rings and was often many hundreds of metres long. Typically one ring was associated with more public ceremonies and the second with restricted and sacred information. Bora grounds are most often located on river flats and low ridges.

This is a rare site type in southern NSW. Its soft sediment and surface relief makes it a relatively fragile site type and has not survived in areas of significant land clearing and agricultural development.



Carved trees consist of some form of Aboriginal design carved onto the surface of a tree. Designs were carved either directly into the bark or onto the exposed cambium layer following bark removal. The latter technique was more durable and lasted longer than the former. Carved trees were frequently created at ceremonial or burial grounds and characteristically included figurative and non-figurative motifs.

Carved trees are a rare site type and very few survive *in situ* on standing trees east of the Great Divide.

Mythological sites/ Story Places are frequently natural features, such as mountains and waterholes, which may not exhibit any material evidence that could indicate their importance to an uninformed person. Identification of this site type is dependent on information being available from informed Aboriginal people.

A Site Complex is usually a geographically discrete group of sites that can be shown to be inter-related according to their locational determinants. Site complexes are commonly identified in association with valuable sources of raw materials, food, and/or places of ceremonial significance.

APPENDIX 2

ABORIGINAL PARTICIPATION FORMS

Record of Aboriginal Representative Participation*

Project Name: Rosedale Subsurface Testing Program

Aboriginal Organisation Mega Local Aboriginal Land Council

Client Name & Address Marsim - 191 New South Head Rd Edgecliff NSW 2027

Archaeologist(s): name & address Kerry Davis 4/71 Leichhardt St, Kingston, ACT 2604

Name of Representative	Date	Type of Participation	Start time	Finish time
Joe Carriage	30.3.04	Excavation	9am	5pm
Keith Nye		"	11am	5pm
Joe Carriage	31.3.04	"	8am	3pm
Keith Nye		"	8am	3pm
Joe Carriage	1.4.04	"	8am	5pm
Keith Nye		"	8am	5pm
Joe Carriage	2.4.04	"	8am	5pm
Keith Nye		"	8am	5pm.

Issues raised:

Signed *(archaeologist)*: ..... *(Aboriginal representative)*: Joe Carriage Date 2.4.04

(Aboriginal representative): Keith Nye Date 2.4.04

(Aboriginal representative): ..... Date .....

(Aboriginal representative): ..... Date .....

Record of Aboriginal Representative Participation*

Project Name: ROSEDALE SUBSURFACE TESTING PROGRAM

Aboriginal Organisation: MOGO LOCAL ABORIGINAL LAND COUNCIL

Client Name & Address: MAGSIM, 191 NEW SOUTH HEAD Rd EDGECLIFF, NSW 2027

Archaeologist(s): name & address: REBECCA PARKES, 4/71 LEICHHARDT ST KINGSTON, ACT 2604

Name of Representative	Date	Type of Participation	Start time	Finish time
JOE CARRIAGE	5-4-04	Excavation	9.30AM	5PM
KEITH NYE		"	9-30AM	5PM
JOE CARRIAGE	6-4-04	"	8AM	5PM
KEITH NYE		"	8AM	5PM
JOE CARRIAGE	7-4-04	"	8AM	5PM
KEITH NYE		"	8AM	5PM
JOE CARRIAGE	8-4-04	"	8AM	5PM
KEITH NYE		"	8AM	3-30PM

Issues raised:

Signed *(archaeologist)*: R Parkes *(Aboriginal representative)*: Joe Carriage Date 8/4/04

(Aboriginal representative): Keith R Nye Date 8/4/04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

Project Name: ROSEDALE SUBSURFACE TESTING PROGRAM

Aboriginal Organisation: MOCO LOCAL ABORIGINAL LAND COUNCIL

Client Name & Address: MARSIM, 191 NEW SOUTH HEAD RD EDGECLIFF, NSW 2027

Archaeologist(s): name & address: REBECCA PARKES, 4/71 LEICHHARDT ST KINGSTON, ACT 2604

Name of Representative	Date	Type of Participation	Start time	Finish time
JOE CARRIAGE	13-4-04	EXCAVATION	9.30AM	5PM
KEITH NYE		"	9.30 AM	5PM
JOE CARRIAGE	14-4-04	"	8AM	5PM
KEITH NYE		"	8AM	5PM
JOE CARRIAGE	15-4-04	"	8AM	5PM
KEITH NYE		"	8AM	5PM
JOE CARRIAGE	16-4-04	"	8AM	5PM
KEITH NYE		"	8AM	5PM

Issues raised:

Signed *(archaeologist)*: R Parkes *(Aboriginal representative)*: Joe Carriage Date 16-4-04

(Aboriginal representative): Keith A Nye Date 16-4-04

(Aboriginal representative): Date

(Aboriginal representative): Date

Record of Aboriginal Representative Participation*

Project Name: Rosedale Subsurface testing Program

Aboriginal Organisation: Mogo Local Aboriginal Land Council

Client Name & Address: Marsim Pty Ltd. PO Box 574, Edgecliff NSW 2027

Archaeologist(s): name & address: Kelvin Officer, Navin Officer Heritage Consultants, Unit 4, 71 Leichhardt St. Kingston ACT 2604

Name of Representative	Date	Type of Participation	Start time	Finish time
Lance Nye	19-4-04	Excavation.	9:30 am	5:00 pm
Keith Nye.	19-4-04	"	9:30 am	"
Joe Carriage	20-4-04	"	8:00 am	"
Keith Nye.	20-4-04	"	"	"
Joe Carriage	21-4-04	"	"	"
Keith Nye.	21-4-04	"	"	"
Marc Jessop	22-4-04	"	"	"
ROBERT JESSOP	22-4-04	"	"	"
KEITH NYE	23-4-04	"	"	"
JOE CARRIAGE	23-4-04	"	"	"

Issues raised:

Signed *(archaeologist)*: R Pike *(Aboriginal representative)*: Date 22/4/04

(Aboriginal representative): Date 22/4/04

(Aboriginal representative): Keith R. Nye Date 23/4/04

(Aboriginal representative): Joe Carriage Date 23/4/04

Record of Aboriginal Representative Participation*

Project Name: ROSEDALE SUBSURFACE TESTING PROGRAM

Aboriginal Organisation: MOGO LOCAL ABORIGINAL LAND COUNCIL

Client Name & Address: MARSIM, 191 NEW SOUTH HEAD ROAD, EDGECLIFF, NSW 2027

Archaeologist(s): name & address: REBECCA PARKES, NAVIN OFFICER HERITAGE CONSULTANTS, 4/71 LEICHHARDT ST KINGSTON, ACT 2604

Name of Representative	Date	Type of Participation	Start time	Finish time
JOE CARRIAGE	3/5/04	EXCAVATION	10AM	5PM
KEITH NYE	3/5/04	"	10AM	5PM
JOE CARRIAGE	4/5/04	"	8AM	4.15 PM
KEITH NYE	4/5/04	"	8AM	4.15 PM

Issues raised:

Signed *(archaeologist)*: R Parkes *(Aboriginal representative)*: Joe Carriage Date 4/5/04

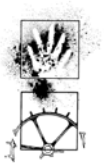
(Aboriginal representative): Keith R. Nye Date "

(Aboriginal representative): Date

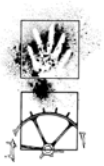
(Aboriginal representative): Date

APPENDIX 3

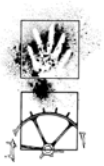
SUMMARY OF PIT DATA AND SOIL PROFILE DESCRIPTIONS



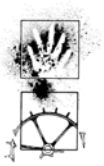
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
1	1	0-5/10	11		Dark brown gravelly loam, high gravel content including quartz and shales.
	2	5/10-10/14	5.5		As above, increasing gravel content (natural chert? noted), at around 13cm more yellow brown in colour.
	3	10/14-15	8		Predominantly yellow brown gravelly clay, high gravel content, old rotten tree roots, angular shale and quartz gravels increasingly compact.
	4	15-15/20	5.8		Yellow brown gravelly clayey gravel high content of eroded/weathered shale gravels, also quartz gravels, deposit has loam clay mottles, increasingly compact.
	5	20-35	8.5		Pit evened up to 20cm depth at both ends; grading quickly to light yellow brown clayey shale gravels, shale retains bedrock bedding alignment in places gravels up to 15cm in length
					NB areas of less compact more loamy areas of infill with charcoal flecks (near hard edges) indicative of root and stump areas.
2	1	0-10/12	13		Brown gravelly loam. Gravels are shale, chert and quartz, all relatively small in size to around 8-9cm then change to: yellow brown gravelly loam to loamy gravel, more compact. Increasing yellow is increasing clay content. Evidence of pit at west end of test pit.
	2	10/12-18	6		Evidence of 3 roughly eroded? Pits consisting of loamy brown less compact soil with wood fragments and rootlets, (each with its own ants nest) which extends? Into a yellow brown compact gravelly clay to clayey gravel, pits are around 30cm in diameter.
	3	18-20/25	8		As above, 4 distinct pits filled with friable brown and dark brown gravelly loam, with C14? Flecks, rootlets, decayed wood and ants nests. Surrounded by compact yellow brown clayey gravel and gravelly clay, shales and decayed shales predominant in gravels. These are almost certainly the result of burnt and decayed tree stumps.
	4	20/25-28/30	11		Pit features ?????? but reduced in diameter. As above matrix is more compact yellow brown clayey gravel
	5	28/30-35	8.5		All but the far western end pit feature now diminished to less compact brown to yellow brown loamy clay. Within compact clayey gravel, with some areas of yellow brown less compact loamy clayey gravel. The far western pit has charcoal lump (probably from trunks/roots), brown gravelly loam.
3	1	0-7/11	9		Brown gravelly loam, moderate amount of gravels; mainly shale and chert. Grading to lighter more yellow gravelly loam, increased gravels.
	2	7/11-12/15	9.5		Yellow/brown clayey gravelly loam. Increased gravel content; shale and chert gravels are angular. Small pockets (around 10cm diameter) of brown loam.
	3	12/15-16/19	5.5		Yellow loamy gravelly clay, very compact. Continuation of same gravels. Decrease in pockets of loam; 1 visible on northern half of trench and 1 in south half at the eastern end?
	4	16/19-20/23	6		Yellow loamy gravelly clay, continuation of above, becoming lighter and more yellow in colour. Also increase in clays that tend to be more yellow. Pocket of loam diminishes.
	5	20/23-24/27	7		Brown/yellow gravelly clay, continuation of same gravels. Noticeable increase in clay. Pockets of darker, more brown clay at bottom of spit. No more loam pockets.
4	1	0-6/8	8		Brown clayey gravelly loam, grading to light grey brown in colour. Gravels include chert, quartz and shale. Some small pockets of deeper loam.



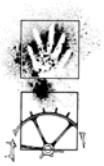
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
	2	6/8-9/15	5.5		Light grey brown loamy gravelly clay, deepest on southern side. Bottom of spit is more regular. Gravels are continuation of above. No more pockets of loam.
	3	9/15-18/20	5		Yellow grey gravelly clay. Gravel is mainly angular quartz and chert. Very compact. Pocket of charcoal in southeast corner, around 20cm across, possibly a stump.
	4	18/20-23/27	Not sieved		Continuation of same. Charcoal strip across centre possibly roots.
5	1	0-10/12	12.5		Brown silty gravelly loam. Quartz chert and shale gravels. Around 6-7cm loam changes to lighter yellow brown clayey gravelly loam. Gravels dominated by red/orange chert.
	2	10/12-13/17	12		Continuation of lighter soils, light yellow/grey silty gravelly clay. Pockets of orange clay at base.
	3	13/17-22/30	9.5		Continuation of silty gravelly clay. Flecks of charcoal. Increased pocket of red/orange clay in southeast corner of pit base. Increase in shale gravels, also an increase in size.
	4	22/30-30/37	6.8		Red/orange clay across 70% of pit base. Yellow/grey and red orange gravelly clay. Red/orange clay tends to be more compact and is concentrated on south half of trench.
	5	30/37-38/42	8		As above. Red/orange clay did not spread any further across. Yellow/grey gravelly clay becoming almost whit at base. Very high shale content. Pockets of brown loam visible in north wall at a depth of 25-35cm.
6	1	0-6/10	7.5	6	Grey brown silty gravelly loam. Very high gravel content, mainly chert. Size ranging from 2-5mm-90mm. Compaction is loose.
	2	6/10-15/18	11		Grey brown silty clayey gravelly loam, gravels same as above. Pockets of darker silty loam around 10cm across extending into base of spit. Small roots across pit. Grading to light yellow grey silty clay at base.
	3	15/18-22/24	9		Mottling of grey brown in yellow clayey gravelly silt. Gravel and shale nodules increasing in size to around 150mm. Roots less than or equal to 10cm in diameter across eastern half of pit. Brown clays tend to be less compact.
	4	22/24-2628	10		Grey yellow clayey gravelly silt. Gravels are a continuation of above. Sparse grey brown mottling especially in southwest corner. Some charcoal flecks. Less roots. Compaction still quite loose becoming more compact at base.
	5	26/28-30/37	10	6	Continuation of grey yellow, tending to silty gravelly clay. Same? Gravels, angular, varying sizes with slightly less gravel content. Southwest corner around 30cm diameter pocket that extends into west wall. Fine compact grey black loamy clayey silt. Tree stump.
	6	30/37-38/45	8		As above. Tending to orange more compact clay at base. Pocket in southwest continuing?, similar smaller pocket in southeast with root material in it.
	7	38/45-46/48	4		Continuation of same. Pit in southwest decreased slightly. Fragments of charcoal and numerous rootlets in the pocket/pit. Otherwise into decomposing shales and clay.
7	1	0-2/9	9	6	Medium to light grey brown silty gravelly loam. Gravel ranges from 2-5mm – 160mm angular nodules, mainly shale and chert. Pit deepest on east. (Ground slopes to the west).
	2	2/9-8/18	11		Grey yellow fine silty gravelly loam. Gravel is shale chert and some quartz. Pocket of darker loam in the centre.
	3	8/15-14/25	7		Yellow brown silty gravelly loam, pocket of loam continuing. Neck/finish? of light green 19th century bottle found in spoil.
	4	14/25-19/34	7.5		Yellow brown loamy gravelly silt, pocket of loam continues. Soils are very compact, particularly the yellow/orange clay that is beginning to come through.



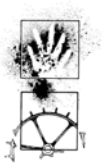
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
	5	19/34-20/38	8		Continuation of above. Some subangular gravels as well as angular of varying size. Occasional flecks of charcoal.
	6	20/38-25/42	7	6	As above but with increased yellow orange gravelly clay. Pocket of loam dissipated to mottling of darker loam.
					NB Fragments of same bottle glass found in east wall around spit 1.
8	1	0-10/15	13.5		Brown gravelly loam, overlaying yellow brown silty gravelly loam. Transition around 6-10cm, gravel content is low, angular quartz and chert around 5-19mm across.
	2	10/15-15/20	11		Yellow brown compact silty gravelly loam.
	3	15/20-21/25	7.5		As above but with mottling of orange brown silty clay and some brown silty loam, clay is more compacted. Gravels are angular and subangular. Flecks of charcoal.
	4	21/25-28/33	9		Orange brown silty gravelly clay with mottling of lighter grey silty loam. Root (around 30mm) in the west of the pit.
	5	28/33-34/38	9		As above but less mottling. Increased compaction, particularly in the more orange brown sediments.
	6	34/38-65	Not sieved		Used 600mm toothed bucket to cut down through clay, clay content increased and colour became darker orange red, relatively low gravel content. Gravels are around 2-10mm and rounded. Gradual increase in compaction.
9	1	0-9/10	15	6.5	Brown clayey loam, moderate to hard compaction. Numerous rootlets. No gravels.
	2	9/10-18/20	8.5		As above. Increase in size of roots, around 10mm.
	3	18/20-26/30	9		As above with mottling of grey brown sandy clay and intermittent orange concretions. Numerous worms, roots and rootlets.
	4	26/30-31/33	9.5		Continuation of same with increase in sandy clay. Very little sand. Mixture of orange and light grey brown. Less worms.
	5	31/33-35/37	5		Orange yellow clay with mottling of brown clay and grey brown sandy clay. Intermittent pieces of charcoal around 10-20mm. Isolated fragments of subangular quartz.
	6	35/37-39/40	5	6	As above. Increasing compaction. Decrease in sandy clay.
	7	39/40-120	Not sieved		Continuation of mottled clays, very compact, increasing orange brown colour with depth as well as some grey and red clays from around100cm onwards. Band of gravels around 90-100cm down.
10	1	0-9/20	16		Brown silty clayey loam, highly friable but becoming very compact at base of spit. Occasional chert nodules, angular around 60-100mm. Very soft patch in western third, bucket dislodged but did not collect soil from this part of pit.
	2	9/20-20/25	8		Brown loamy clay/peat, very compact. Numerous fragments of charcoal. Starting around 16cm occasional orange nodules, rounded around 20mm in diameter.
	3	20/25-32/35	9.5		Grey brown clay mottled with dark brown/black clay and charcoal.
	4	32/35-40/50	8		Yellow grey brown clay, almost no mottling or other inclusions from around30-35cm onwards. Very compact.
11	1	0-8/13	14		Brown clayey gravelly silty loam. Gravel is angular chert and quartz. Occasional orange and red rounded clay/sand nodules arouend20mm in diameter. Some worm activity.
	2	8/13-19/20	14		As above with gradual increase in clay content. Nodules increasing in size to around 70mm. Gravels are a mix of angular and subangular.
	3	19/20-27/28	10		Grey brown loamy gravelly clay, very compact. Isolated orange and red nodules of clayey sand. Mottling of dark brown clay.
	4	27/28-65	Not sieved		Yellow grey gravelly clay. Occasional orange/red nodules. Flecks of



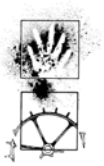
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
					charcoal.
12	1	0-9/15	10.5	5.5	Brown gravelly clayey loam. Gravels angular and subangular quartz and chert, average size around 50mm. Numerous roots.
	2	9/15-15/20	11		Grading to brown loamy gravelly clay that gives on to yellow brown gravelly clay with some orange nodules. Gravels dominated by angular to subangular quartz around 50-100mm.
	3	15/20-23/25	5.5		As above but increase in quartz gravels, also increase in shale and chert. Becoming more compact.
13	1	0-5/9	14		Brown clayey gravelly loam. Numerous roots. Gravels are angular quartz, shale and chert. Around 5cm gives onto brown gravelly clay, very compact.
	2	5/9-15/17	7.5		Continuation of grey brown gravelly clay. Gravels range from around 2-5mm – 150mm. Occasional red/orange nodules/concretions around 50mm.
	3	15/17-20/22	7		As above. Increase in nodules.
	4	20/22-25	5.5		Grading to a more yellow brown gravelly clay. Increase in nodules, ranging from 20-50mm. Intermittent charcoal flecks.
					NB Split pebble found in spoil and bagged.
14	1	0-9/13	17	6	Brown silty gravelly loam. Gravel consists mainly of shale, angular, around 50-100mm across. Around 8cm noticeable increase in clay, grading to yellow brown.
	2	9/13-23/25	13		Up to 18cm brown clayey gravelly loam. 18cm onwards yellow gravelly clay. Gravel dominated by shale ranging from 10mm-300mm pieces that are angular and subangular. Flecks of charcoal and intermittent red oxide concretions (around 10mm.).
	3	23/25-30/32	8	6	Orange to yellow gravelly clay, lots of shale, decomposing.
15	1	0-6/9	9		Brown peaty silty loam, very compact at base of pit. Bottom of spit becoming clayey loam, no colour change. Numerous rootlets.
	2	6/9-14/16	8.5		Brown gravelly silty clayey loam, cracking and coming out in clods. A couple of nodules around 60mm.
	3	14/16-24/28	13		Up to 20-22cm brown silty clayey loam. 20-22cm onwards brown grey silty clay, mottled with black brown, friable. Numerous roots around 20mm.
	4	24/28-30/32	6		As above, less roots, increasingly compact. 1 nodule of cream clay mottled with orange at base of pit on east side around 200mm. Across. Similar nodule in west, interior of nodule is black clay, very compact.
	5	30/32-90/100	Not sieved		Up to 35-48cm grey brown clay. Charcoal flecks. Roots cutting down through it. Irregular and somewhat indistinct boundary with grey clay with yellow mottling and flecks of linear rootlet patterns of red clay. Up to 70-80cm increasing compaction. 70-80cm onwards very compact grey clay with sparse mottling of red clay.
16	1	0-5/8	11	5.5	Light grey brown sandy gravelly silty loam. Angular chert and quartz gravels, average size around30mm. Charcoal flecks. Numerous worms.
	2	5/8-13/16	8.5		Light grey brown sandy gravelly loam, increasing compaction up to around 12cm. Overlies with sharp transition to light grey sandy gravelly silt, mostly subangular shale. Pockets of this visible in northeast and southwest corners. Northeast has loose compaction. Southwest very compact.
	3	13/16-18/20	4		Very compact (leached) light grey clayey gravelly silt, mottled with darker grey brown. Pocket of more friable gravelly silt in the northeast around 50cm across. Also has higher gravel content.
	4	18/20-21/22	4		Light grey clayey gravelly silt with a decrease in grey brown mottling. Pocket in northeast grading to more yellow grey. Flecks of



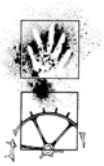
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
					charcoal across. Quartz gravel increasing, varying size.
	5	21/22-35/38	5		Indistinct transition to yellow grey silty gravelly clay, around 30cm. Very compact. Gravels are angular ranging from 5mm to around 70mm, chert shale and quartz. Flecks of charcoal.
	6	35/38-80	Not sieved		Grades to more yellow very compact clay. Decreasing gravel content. Same as clays in Pit 15.
17	1	0-6/9	11		Brown gravelly silty loam grading to yellow brown at base of spit. Flecks of charcoal. Gravel mainly subangular quartz, average size 30-40mm.
	2	6/9-16/18	10		Yellow brown silty gravelly loam grading to more compact yellow grey clayey gravelly silt. Pockets of light grey leached gravelly clay.
	3	16/18-20/23	7		Around 18cm sharp transition to compacted light grey gravelly clay mottled with brown silty gravelly clay.
	4	20/23-25/27	5.5		Continuation of same. Yellow staining coming in bottom 2-3cm of spit. Very compact.
	5	25/27-30/32	4		As above. Increasing yellow colouration.
18	1	0-4/6	10	6	Grey brown gravelly silty loam. Flecks of charcoal. Small orange and white clay peds around 10mm.
	2	4/6-11/13	9		As above. Increase in gravel content and size.
	3	11/13-18/22	7.5		Grey brown gravelly clayey silt with charcoal flecks. Yellow gravelly clay beginning to come through at base of spit.
	4	18/22-20/24	5		Around 19cm transition to yellow gravelly clay mottled with grey brown. Numerous charcoal. Increasing compaction and gravels, varying sizes of subangular ironstone and quartz.
	5	20/24-35/36	3	6	As above. Increasing compaction.
19	1	0-8/16	13		Brown clayey silty gravelly loam. Occasional clay peds (around 10mm) and charcoal. Gravels are angular chert and quartz less than or equal to 40mm. 12-13cm sharp transition to orange grey gravelly clay.
	2	8/16-20/22	11		Continuation of orange grey clay, relatively soft, mottled with dark brown clay.
	3	20/22-24/28	4		As above. Less mottling. One pocket of brown clayey loam around 10cm in diameter.
	4	24/28-34/37	6		Yellow grey clay with fine red mottling and charcoal flecks at top of spit (top 50mm).
20	1	0-10/13	13.5		0-5cm grey brown sandy loam. 5cm onwards brown gravelly loam grading to yellow brown clayey gravelly loam at base of spit. Gravels are chert, quartz and shale, angular less than or equal to 60mm.
	2	10/13-16/19	10.5		Yellow brown loamy gravelly clay. Increasing gravel content, particularly shale. Charcoal flecks.
	3	16/19-?	8		As above. Increasing shale deposits less than or equal to 150mm across. Decomposing bedrock layer.
21	1	0-6/8	8.5	4.5	Light grey brown gravelly silty loam. Numerous rootlets. Patches of lighter more compact soil at base
	2	6/8-15/20	7.5		Continuation of same. Some red/orange clay peds around 10mm, coming through at base.
	3	15/20-20/25	7		Light grey/brown clayey gravelly silt. Increasing compaction. Flecks of charcoal. Gravels increasing to around 50mm, angular quartz and chert. Pocket of brown clay in centre, associated with a number of roots.
	4	20/25-28/30	8	4.5	As above. Compact orange clay beginning to come through in centre at base of spit.
	5	28/30-30/32	5.5		As above. Orange clay extending across 50% of spit.
	6	30/32-	3.5		Orange brown silty gravelly clay. Pockets of grey brown clayey silt.



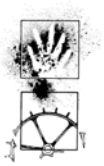
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
		35/37			
	7	35/37-40/43	3.5		Orange red clay, very compact.
					NB Transition to orange/red clay around 30cm is very sharp.
22	1	0-5/7	7		Brown gravelly silty loam.
	2	5/7-10/12	5		As above with orange red clay peds (around 10mm) starting to come through. Numerous tree roots around 20mm.
	3	10/12-14/16	6.5		Brown/grey gravelly silty loam mottled with orange gravelly clay, particularly in eastern half. Roots continue in pockets of intermittent charcoal (around 50mm). Gravels are quartz and chert, angular, equal to or less than 60mm.
	4	14/16-18/20	6		Orange grey clayey gravelly silt, very compact. Sharp transition to orange/red gravelly clay in eastern half. Charcoal flecks and pieces right across. Continuation of tree roots.
	5	18/20-28/30	6		Orange to red compact clay.
23	1	0-5/7	8		Grey brown silty sandy loam. Small amount of angular quartz gravels equal to or less than 30mm. Lighter grey sandy silt coming out at base of spit in southeast corner around 30cmx20cm.
	2	5/7-10/13	9	4	Yellow grey silty sandy gravelly loam. Flecks of charcoal. Brown organic silty loam in east half, around 30cm across. (Former tree remains?).
	3	10/13-15/17	6		Yellow grey gravelly silt. Pockets of brown loam around 100mm. Increase in gravels and charcoal flecks. Pit in east half, same size, numerous charcoal.
	4	15/17-18/20	6.5		As above.
	5	18/20-23/25	7		Orange/grey clayey gravelly silt. Brown loam continuing in east half 300mm. Charcoal flecks. Occasional orange clay peds. Two other brown loam pockets in west, around 200mm. (Former tree remains?)
	6	23/25-26/28	7		As above. Increasing gravels. Humic patch in east decreasing.
	7	26/28-28/32	3		Grading to a yellow grey silty gravelly clay. Charcoal flecks.
	8	28/32-35/38	8	5.5	Sharp transition around 32cm to red brown compact clay.
24	1	0-7/9	14		Brown silty loam up to 2-5cm, high organic content. Then yellow brown clayey gravelly silty loam. Broad mottling of brown clayey loam. Gravels mainly quartz, 2-10mm, angular.
	2	7/9-9/19	9		Continuation of yellow brown clayey gravelly silt. Increase in gravels and clay. Decrease in brown mottling. Charcoal flecks. Staining.
	3	9/19-20/23	5		Grading to more orange brown. Sandy silty gravelly clay. Two pockets of brown silty loam (20cm), in centre. (Probably former tree remains).
	4	20/23-28/32	7.5		Increasing compaction. Base of spit red brown clay beginning to come through. Pockets of loam/silt continuing, same size.
	5	28/32-33/38	10		Relatively sharp transition around 30-33cm to compact red brown clay. Decreasing gravel content. Brown pockets less distinct.
25	1	0-4/9	8.5	5	Yellow brown sandy clayey gravelly silt. Intermittent brown loam/mottling.
	2	4/9-15/16	12		Around 10-12cm, leached light grey clayey gravelly silt. 12cm onwards grading to grey silty gravelly clay. Numerous charcoal flecks. Red linear patterns, rootlets. Gravels range from around 2mm-70mm, quartz and chert.



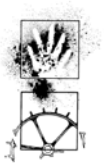
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
	3	15/16-18/22	11		As above. Increasing compaction. Occasional red clay peds.
	4	18/22-24/25	6		As above. Increase in gravel content. Patches of darker staining.(Unclear if soils are mixed as a result of dam construction?)
	5	24/25-27	7		As above. Increasing compaction.
	6	27-40/43	7		Grading to orange grey sandy gravelly clay. Clay content increasing with depth.
	7	40/43-47/50	6	5	Orange grey gravelly clay. Gravels decreasing. Compaction increasing.
26	1	0-6/12	14		Brown silty sandy loam up to 8cm. Indistinct and variable transition to more compact yellow/grey/brown silty sandy gravelly loam. Gravels are angular quartz around 30mm. Ants nest in east end. Roots and rootlets throughout.
	2	6/12-10/14	14		Yellow brown clayey gravelly silt. Increasing clay content and compaction at base of spit. Pocket (20-25cm) in southeast corner light yellow clayey gravelly silt surrounded by 2-5cm band of dark humic clayey loam. Fence post? Posts to northeast and southwest around 25m?
	3	10/14-20/23	8		As above. Increasing gravels, quartz up to 50mm. Lighter coloured pit increased to around 30cm across.
	4	20/23-25/26	8		Yellow brown silty sandy gravelly clay. Very compact. Charcoal and red clay nodules (10mm). Lighter pocket expanded to 30x40cm
	5	25/26-28/30	5.5		As above. Grading into brown gravelly clay. Pocket is more diffuse, less distinct.
	6	28/30-33/34	7		Yellow/brown silty sandy gravelly clay with pockets of brown clay.
	7	33/34-34/37	8		As above. Pockets of clay increasing.
	8	34/37-40/45	8		Brown gravelly clay. Gravels decreasing with depth
	9	40/45-85/90	Not sieved		Up to 60cm brown gravelly clay. Charcoal flecks. 60cm onwards, yellow grey gravelly clay mottled with red. Quartz gravels continue right throughout the spit.
					NB chicken wire from fence line in humic layer at north end of pit.
27	1	0-5/15	13	5.5	Brown clayey loam grading to grey brown sandy gravelly clayey loam (very little gravel). Charcoal flecks. Orange clay nodules up to 50mm diameter.
	2	5/15-15/23	14		Around 12-15cm quite distinct transition to grey silty sandy clay mottled with orange. Isolated roots. Numerous worms.
	3	15/23-25/27	11	5.5	As above. Pockets of dark brown clayey loam. Visible in west wall ends around the bottom. Isolated angular quartz gravels up to 50mm.
	4	25/27-30/33	11		Orange grey very soft sandy gravelly clay. Very compact pockets of grey clayey gravelly silt around 15 cm in diameter.
	5	30/33-35/36	7		As above. Increasing compaction and gravels.
	6	35/36-37/38	6		As above
	7	37/38-42	Not sieved		As above. Increasing clay content but still quite sandy. Linear patterns across base. Light grey clayey sand.
	8	42-80	Not sieved		Orange grey compact clay. Lens of red gravels in west wall at 45cm (possibly a former tree pit, around 25 – 50 cm wide and 10 cm thick).
28	1	0-2/10	10		Brown clayey loam. Pocket (around 10cm) of leached?? Grey gravelly sand in northeast corner. Numerous worms.
	2	2/10-12/24	15		Up to 14cm indistinct change to more compact grey brown clayey sandy gravelly loam.



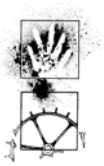
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
	3	12/24-28/35	13		Continuation of compact grey brown. Pocket of brown clayey loam on north, around 50cm. Charcoal, burnt stump. Red oxide nodules around 10-20mm throughout grey brown.
	4	28/35-37	8		Grey sandy clayey gravel, becoming more compact and grading to a darker yellow/orange grey. Clay beginning to come through at base.
	5	37-38/40	8		As above with patches of grey gravelly clay also coming through.
	6	38/40-42/46	6		Yellow grey gravelly clay, angular quartz up to 30mm. Numerous red oxide nodules up to 10mm, rounded. Charcoal flecks.
	7	42/46-100	Not sieved		Yellow grey compact clay. Lens of red gravels around 90cm down, 5cm thick.
29	1	0-12/14	13		Brown gravelly loam. Gravels are shale and quartz, angular, up to 60mm. Around 12cm, north end of pit, yellow grey silty gravelly clay coming through. Quite compact.
	2	12/14-18/22	5		Yellow grey gravelly clay with broad mottling of brown gravelly loam.
	3	18/22-26/29	6		Yellow grey gravelly clay. Charcoal flecks. Red clay nodules, around 10mm.
	4	26/29-34/40	9		As above. Very compact. Charcoal staying in east, around 20cm in diameter.
					NB dug down to around 70 cm. Yellow grey gravelly clay throughout. Very compact. Sharp transition to light grey shale bedrock at base.
30	1	0-10/15	8	5.5	Up to 10-12cm brown silty loam. Diffuse transition to yellow/brown loamy silty gravelly clay. Gravels are quartz, shale and chert, angular and subangular, up to 50mm.
	2	10/15-16/23	10		As above. Linear pit features (tree roots etc.) across pit base (brown loam)
	3	16/23-26/30	7		As above. Increasing clay content and compaction. Larger gravels appearing. Flecks of yellow and red/orange clay coming through at base. Intermittent charcoal.
	4	26/30-28/38	6		Yellow/grey silty gravelly clay. Increasing gravel content and size
	5	28/38-40/44	4		Light yellow grey gravelly clay, increasing compaction.
31	1	0-6/11	13	7	Black brown clayey loam. Increasing compaction to base.
	2	6/11-11/14	7		As above. Isolated quartz gravels, angular, around 10-30mm.
	3	11/14-15/23	15		As above. South end (40cm) at depth of 15cm yellow grey compact clay coming through. Occasional quartz nodules up to 80mm.
	4	15/23-25/27	9		As above. Yellow grey clay expanding right across pit base.
	5	25/27-64/66	Not sieved		27-35cm grey gravelly clay. 35cm onwards grey yellow compact clay, compaction increasing with depth.
32	1	0-4/7	11		Brown clayey silty sandy loam. Two yellow orange clay nodules at base in southwest, around 100-150mm.
	2	4/7-9/13	12.5		Brown clayey loam. Pockets of grey clay coming through at base. Clay nodules extending across an area of 30x70cm of southwest corner. One well rounded quartz pebble (around 80mm), found in base of spit.
	3	9/13-16/17	8		As above with grey and yellow grey clay coming through at base. Density of orange clay and gravels expanding and becoming more dense in southwest.
	4	16/17-25/30	10		Soft yellow grey clay. Patch of orange red clay in southwest, 70cm north to south, 40cm east to west. More compact.
					NB West wall, brown clayey loam pit separates yellow/grey clay in the north from red orange clay in the south.
33	1	0-7/9	11	5.5	Brown gravelly loam. Numerous roots up to 15mm. Angular gravels,



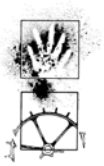
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
					shale and quartz.
	2	7/9-15/18	11		Grades to yellow brown clayey gravelly loam.
	3	15/18-20/22	11	5.5	Yellow brown gravelly clay. Lots of decomposing shale at base.
	4	20/22-30/35	8		As above
	5	30/35-38/41	5		Yellow brown gravelly clay mottled with brown clay. Tree pit visible in north wall at the west end, around 25cm across, at 25cm down it narrows to 5cm across at base and ends 2cm above base of spit.
34	1	0-9/11	15		Up to 5-7cm brown silty loam. 5-7cm onwards grey brown clayey gravelly loam. Gravel is mainly angular shale up to 100mm.
	2	9/11-15/17	10		Grades to yellow grey gravelly clay. Increasing gravel content.
	3	15/17-23/28	9		Yellow grey gravelly clay. Increasing compaction and gravels. Patches of orange staining.
35	1	0-6/10	16	5.5	Brown silty loam. Brown clay peds (5-10mm) coming out at base in east end.
	2	6/10-15/20	13		Brown clayey loam. Occasional red clay nodules around 5-10mm. Occasional charcoal.
	3	15/20-25/30	16		Grading to coffee brown loamy clay. Very small amount of gravels, angular, up to 80mm.
	4	25/30-31/37	14		Continuation of brown loamy clay. Red hardened and compacted clay extends for around 1metre along north wall and around 30cm south across pit (starts around 19cm down).
	5	39/48	18		As above (pH 5.0). Red clay continuing (pH 6.0). Numerous charcoal flecks.
	6	39/48-41/52	Not sieved		As above. Red clay becoming darker in colour.
	7	41/52-68/72	Not sieved		As above. Around 50-60cm down red clay extended across pit in two linear features (possible roots or burnt tree?).
	8	68/72-125	Not sieved		Cut down to gravelly layer. Clay continues quite uniformly to this point. Around 85cm relatively sharp transition to grey brown gravelly clay. Mainly quartz gravels, angular from 5-80mm. Gravels increasing with depth.
36	1	0-5/10	10		Dark brown silty loam. Nodules of rock, granite and quartz, angular and subangular, more than 100-150mm.
	2	5/10-15/22	11		As above. Increase in rock.
	3	15/22-23/28	11		Grading to coffee brown clayey loam. Decreasing rock. Red oxide nodules coming through (15mm).
	4	23/28-34/37	14		Coffee brown loamy clay. No gravels. Increase in red nodules.
	5	34/37-38/48	13		As above
	6	38/48-45/50	7.5		Coffee brown loamy clay. Increasing clay content. Decrease in red oxide nodules.
37	1	0-2/13	13		Ground slopes to south trench therefore around 10cm deeper in the north than in the south. Friable brown silty loam. Relatively loose, increasing compaction with depth. Intermittent roots less than or equal to 15mm.
	2	2/13-9/25	11		As above
	3	9/25-27/30	9		Brown silty gravelly loam. Gravel is shale and quartz, angular, around 2-50mm, beginning around 20cm down. Grey brown sandy silty gravelly loam coming through in east half.
	4	27/30-30/34	7		Grading to yellow brown clayey gravelly loam.



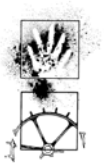
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
	5	30/34-34/44	14		Yellow brown clayey sandy gravelly loam, very friable. Pockets of looser gravelly loam.
	6	34/44-41/50	11.5		Yellow brown silty sandy gravelly loam. Increasing compaction and gravel.
	7	41/50-48/56	4		As above
	8	48/56-70/74	8		Around 55cm brown clay mottling coming through, increasing with depth. Around 60cm brown gravelly clay with mottling of yellow brown.
38	1	0-8/13	12		Dark brown silty gravelly loam. Gravels are angular quartz and shale, mostly around 50mm.
	2	8/13-18/24	15		As above. Increase in size of gravels, up to 100mm, including subangular granite pieces.
	3	18/24-27/31	7		As above. Increasing compaction.
	4	27/31-35/39	14		Dark brown clayey gravelly loam. Pocket of coffee brown loamy clay coming through in southeast 40-50cm across.
	5	35/39-40/45	14		As above. Pocket of coffee brown increasing (around 60cm). Red oxide nodules (10-15mm) coming through in the pocket.
	6	40/45-47/50	9		As above. Pocket expanding, around 80cm across south end to the west, around 70cm across to the north.
	7	47/50-52/55	11		As above. Clay grading to yellow brown and expanding slightly across the pit.
	8	52/55-55/61	9		As above. North wall is still essentially uniform gradation of dark brown silty loam to clayey loam. South wall expanding coffee brown to yellow brown clay with red nodules.
	9	55/61-59/64	7		Yellow grey sandy gravelly clay in southeast half. Red oxide nodules along margin with dark grey brown loamy gravelly clay in northwest.
	10	59/64-64/73	8		As above.
	11	64/73-75/80	8		Yellow grey sandy gravelly clay in the east. Dark grey brown sandy gravelly clay in west with yellow grey beginning to come through at base.
	12	75/80-85/93	6		Yellow grey sandy gravelly clay.
	13	85/93-100/110	Not sieved		As above with pockets of charcoal (50mm) in north half. Burnt red and grey clays in northeast. Lens of charcoal in north face at depth of 75-90cm, 50cm long. Burnt roots also exposed in northeast corner. North wall very confusing section, mix of gravels, clayey loam and sandy gravelly clay – probably caused by burnt tree. South wall continuation of yellow brown clays. Some charcoal.
39	1	0-5/12	16.5	5	Dark brown /grey silty loam. Very friable.
	2	5/12-15/25	10		Dark grey brown sandy gravelly silty loam, slightly more compact.
	3	15/25-26/37	10		Grading to grey brown clayey gravelly sandy silt. Occasional charcoal. Gravels are quartz, chert and shale, angular.
	4	36/37-38/41	10		Continuation of grey brown with mottling of dark brown clayey gravelly silt.
	5	38/41-42/47	11		Yellow to grey brown silty gravelly clay.
	6	42/47-45/50	Not sieved	5.5	As above. Grading to yellow grey compact clay.
40	1	0-10/12	20		0-6cm brown silty loam. Grading into yellow brown gravelly silty loam. Gravels are angular quartz chert and shale 5-50mm.
	2	10/12-18/20	12.5		Yellow brown clayey gravelly silt. Shale gravels increasing in size. Occasional charcoal flecks.
	3	18/20-	8		As above. Increasing gravel.



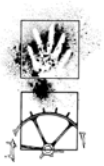
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
		25/31			
	4	25/31-32/38	8		As above. Increasing clay content, gravels tending to be smaller.
	5	32/38-39/41	6		As above. Increasing clay and compaction. Mottling of brown clay coming through at base.
	6	39/41-42/44	5		Yellow brown gravelly clay.
41	1	0-15/18	16		0-10cm brown silty loam. 10cm onwards yellow brown gravelly loam.
	2	15/18-26/30	12		Grading to yellow brown clayey gravelly silt, increasing gravels.
	3	26/30-35/43	12		As above with root (20-25mm) across centre of pit.
	4	35/43-43/46	9		As above. Increasing clay content.
	5	43/46-50/53	7		Increasing compaction. Pockets of brown silty loam. Increasing gravels, mainly shale.
	6	50/53-56/59	6		Yellow brown silty gravelly clay mottled with brown clay.
	7	56/59-?	Not sieved		Yellow brown gravelly clay mottled with brown gravelly clay.
42	1	0-5/10	11	5.5	Grey brown silty gravelly loam.
	2	5/10-12/15	12		Grading to yellow brown silty gravelly loam, more compact.
	3	12/15-26/30	10		Yellow brown clayey silty gravelly loam. Gravels increasing in size, few quartz nodules up to 100mm.
	4	26/30-33/36	8.5		As above
	5	33/36-40/41	9	5.5	Grading to yellow grey clayey gravelly silt.
	6	40/41-43/44	7		As above. Charcoal flecks.
	7	43/44-45/46	4		As above, becoming more grey in colour.
	8	45/46-50/58	6		As above to around 50cm then transition to yellow compact gravelly clay.
	9	50/58-85	Not sieved	5.0	Very compact yellow grey gravelly clay, decreasing gravel with depth.
43	1	0-11/14	11	6	Dark brown silty gravelly loam. Gravels are intermittent, shale and chert, angular and subangular 10-80mm.
	2	11/14-16/25	13		As above. Increasing gravel content. Quartz also coming through.
	3	16/25-26/32	12		As above up to around 27cm then sharp transition to yellow/brown gravelly clay. Very large nodules of rock coming out at base less than or equal to 250x150mm.
	4	26/32-35/38	10	5.5	Yellow gravelly clay with pockets of brown loam across centre. Pockets appear to be caused by dislodging of large rocks during excavation and by tree roots.
44	1	0-6/12	11		Dark brown silty loam. Gravels coming out at base.
	2	6/12-16/20	13		Grading to dark brown clayey gravelly loam.
	3	16/20-26/35	13		As above up to 24-27cm then sharp transition to very compact yellow grey gravelly clay intermittently mottled with brown clay.
45	1	0-6/9	12	6	Brown silty loam. Few pieces of quartz coming through at base.
	2	6/9-11/16	8		Around 8-10cm gradual transition to yellow brown sandy silty loam. Occasional chert and quartz gravels.
	3	11/16-	9		Grading to yellow grey clayey gravelly loam. Charcoal flecks. Pocket



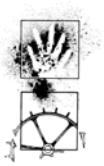
Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
		17/24			starting at a depth of around 20cm of coffee brown to yellow brown clay in northeast corner, 60x30cm.
	4	17/24-25/32	12	5.5	Yellow grey gravelly clay coming through anywhere between 22-26cm. Increasing compaction. Shallowest on east side. Pocket of grey clayey silty gravel in east around 10cm across.
46	1	0-8/13	17		Grey brown silty gravelly loam.
	2	8/13-16/20	14		As above, intermittent mottling of grey brown loam then at around 15cm grading to yellow grey silty gravelly clay. Gravels are quartz, chert and shale, angular and subangular, 10-40mm.
	3	16/20-29/30	8		Yellow grey sandy silty gravelly clay. Charcoal flecks.
	4	29/30-33/35	8		As above. Still quite silty. Lots of red shale gravels.
	5	33/35-36/40	9		As above. Increasing clay and decreasing gravels.
	6	36/40-44/46	8		Yellow gravelly clay, quite friable.
47	1	0-9/15	11		Up to 8cm brown silty loam. Grading into orange brown gravelly loam. Gravels are quartz and shale, angular and subangular, 10-100mm.
	2	9/15-18/21	11		Continuation of red brown gravelly loam. Looks like a mix of sediments. Gravel increasing.
	3	18/21-26/31	7		As above.
	4	26/31-31/36	11		As above. Compaction variable. Gravels are still a mix of sizes.
	5	31/36-44/48	8		Continuation of same with some clay coming through.
	6	44/48-85	Not sieved		As above to 65cm. Then an indistinct transition to grey clayey gravelly silt with mottling of orange to red brown gravelly clay. Increasing compaction.
48	1	0-4/13	7.5	6.0	Dark brown clayey silty gravelly loam. Gravels are a mix of subangular and angular quartz, chert and ironstone.
	2	4/13-11/20	10		Grading to brown clayey gravelly loam. NB 2 star pickets found in southeast corner.
	3	11/20-24/33	11.5		As above. Increasing gravels and clay.
	4	24/33-34/42	18		As above, except in southwest corner, around 30cm pocket of yellow clay around 30x40cm.
	5	34/42-44/47	12		Grading to yellow brown loamy gravelly clay with pocket of clay expanding. Numerous pieces of charcoal in west wall less than or equal to 50mm. Possible roots.
	6	44/47-47/55	8.5		Around 50cm, whole pit is down to yellow gravelly clay except for couple of linear features, brown clayey loam and charcoal roots.
49	1	0-12/15	20	6.5	Yellow brown silty gravelly loam. Gravels are quartz and shale, angular, less than or equal to 60mm.
	2	12/15-20/29	15		As above. Loose compaction.
	3	20/29-29/38	11		As above. Increasing gravel and size. Lots of quartz gravels, good quality.
	4	29/38-40/44	10		Grading to orange brown clayey gravelly loam. Increasing compaction.
	5	40/44-46/51	15		Orange brown loamy gravelly clay. Gravels decreasing in size.
	6	46/51-62/64	9	6.5	As above



Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
	7	62/64-66/67	9		Orange brown loamy gravelly clay. Increasing shale and increasing in size, less than or equal to 80mm.
	8	66/67-70/75	Not sieved		As above gravel size decreasing.
	9	70/75-81/83	Not sieved		As above
	10	81/83-85/90	Not sieved		Continuation of orange brown loamy gravelly clay. Gravel size decreasing. Increasing compaction. Charcoal flecks.
	11	85/90-93/96	Not sieved		As above with larger, less than or equal to 120mm, pieces of shale coming out again.
	12	93/96-98/99	Not sieved		As above. Increasing compaction. Gravel size decreasing.
50	1	0-7/9	12		Brown clayey silty gravelly loam. Clay is small peds less than or equal to 10mm. Couple of roots across centre, around 150mm.
	2	7/9-15/19	8.5		As above but grading to yellow brown in colour. Decreasing silt.
	3	15/19-28/30	10		As above. Gravel size increasing to around 80mm, angular and subangular, shale and some quartz.
	4	28/30-31/34	12		As above. Increasing compaction.
	5	31/34-37/40	8		Yellow/orange brown clayey gravelly loam. Lots of rounded gravels around 10mm, as well as angular and subangular less than or equal to 80mm.
	6	37/40-45/48	12		As above. Increase in large shale pieces, red quartz and ironstone.
	7	45/48-53/55	8		As above
	8	53/55-60/62	6.5		As above, increasing clay content.
	9	60/62-63/66	9		Grading to orange brown loamy gravelly clay.
	10	63/66-70/71	Not sieved		As above
	11	70/71-80/82	Not sieved		Orange brown, mottled with light yellow grey, loamy gravelly clay. High content of larger rocks less than or equal to 150mm.
	12	80/82-89/94	Not sieved		As above. Increasing compaction.
	13	89/94-99/110	Not sieved		Orange brown loamy gravelly clay. Increase in large rocks and compaction. Continuation of poorly sorted gravels.
51	1	0-5/7	8	5.5	Brown gravelly sandy silty loam, loose. Lots of roots less than or equal to 15mm.
	2	5/7-19/20	7		Up to around 10cm grading to yellow brown gravelly loam. Increase in gravel size, poorly sorted, angular and subangular chert shale and quartz, less than or equal to 80mm.
	3	19/20-28/30	12		Continuation of yellow brown gravelly loam. Increasing compaction. Decrease in roots.
	4	28/30-32/38	12		As above
	5	32/38-38/45	7		As above with pocket of brown gravelly loam in northwest, around 200mm.
	6	38/45-45/48	5		As above becoming more compact and lightening in colour. Some clay coming through.
	7	45/48-60/62	8	5.0	Grading to a lighter yellow grey/brown loamy gravelly clay.
	8	60/62-70/74	8		Compact light brown gravelly clay mottled with grey.
	9	70/74-	5		As above. Numerous large rocks.

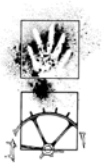


Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
		80/82			
52	1	0-4/10	13	5	0-5cm brown humic silty loam. 5cm onwards, yellow brown gravelly silty loam. Gravels are 5-40mm quartz, chert and shale, angular and subangular.
	2	4/10-10/20	10		Continuation of yellow brown gravelly silty loam. Occasional large angular quartz pieces of poor quality (around 60mm).
	3	10/20-22/26	10		As above with light mottling of brown loam, very friable.
	4	22/26-26/30	8		Grading to a slightly darker yellow brown colour. Increasing gravels, still a mix of gravel types and sizes.
	5	26/30-30/34	8		As above. Charcoal flecks. Increasing compaction. Mottling of brown continuing as well.
	6	30/34-34/37	8		As above.
	7	34/37-40/42	8		Grading to yellow brown clayey gravelly loam mottled with orange brown, very friable.
	8	40/42-47/48	8		As above. Tree roots coming through at base. Pocket of yellow grey gravelly loam in south, around 200mm across. Quite loose compaction.
	9	47/48-58/59	8	5.5	Grading to darker yellow brown sandy gravelly clay mottled with red brown. Roots continuing and pockets of grey loamy gravel.
	10	58/59-70/79	Not sieved		Grading to yellow gravelly clay with gravel decreasing.
53	1	0-6/10	18		Brown silty loam, gravels beginning to come through at base. Quartz and ironstone, angular, 10-50mm.
	2	6/10-20/25	11		Continuation of same. Gravels are chert, quartz etc, mainly 5-15mm. Grading to yellow brown around 15cm down, slightly more compact. (Soil came out in slabs and around half was lost).
	3	20/25-31/33	10		As above. Increasing compaction. Gravels increasing in size.
	4	31/33-35/37	11		Yellow brown loamy gravelly sand starts at 26cm. Numerous poorly sorted gravels, lots of quartz.
	5	35/37-40/44	9		As above, mottled with intermittent brown loam. Increasing compaction. On west wall a lens of leached grey gravelly sand, 5-10cm thick, about 35-40cm down.
	6	40/44-45/48	5.5		Yellow brown gravelly sand. Very compact.
	7	45/48-58/60	8.5		Up to 52 cm as above. Quite distinct transition to yellow brown sandy gravelly clay.
	8	58/60-73/77	10		Grading to darker yellow brown gravelly clay. Very compact.
54	1	0-7/12	12	5.5	Brown gravelly loam. Loose compaction.
	2	7/12-20/25	13		As above to around 16cm. Somewhat indistinct transition to yellow brown silty gravelly loam. Gravels are rounded and subangular mix of quartz and chert from 5-40mm.
	3	20/25-31/32	11.5		Continuation of yellow brown silty gravelly loam. Note gravel content is substantially less than previous two pits.
	4	31/32-35/42	12		As above, except gravels are increasing, poorly sorted larger than 80mm, mainly quartz and shale.
	5	35/42-37/45	9.5		Grading to darker clayey gravelly loam.
	6	37/45-47/55	11		Continuation of yellow brown clayey gravelly loam. Increasing clay but becoming lighter in colour.
	7	47/55-55/58	8		As above. Gravel sizes decreasing.
	8	55/58-	7		Grading to yellow brown sandy gravelly clay.



Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
		57/59			
	9	57/59-60/61	6	5.0	As above. Clay increasing.
55	1	0-2/5	11		0-2cm brown loam. Relatively sharp transition to orange brown gravelly loam. Some lighter features across it, brown loam, tree roots.
	2	2/5-10/15	10		Grades to orange brown clayey sandy gravelly loam, with pockets of grey sandy clay, very compact. Pieces of burnt clay in north wall, east end around 9cm down, (10-20cm across)
	3	10/15-22/25	11		As above with grey sandy clay expanding to 2 pockets of 20-30cm. Burnt clay extends 30 cm across pit and 30cm along wall with pieces of what appears to be burnt root (or burnt tree?) at western end.
	4	22/25-29/30	12		Red brown clay in northern 30cm. Remainder is grey compacted clay. Some gravels in the red clay, also a continuation of burnt clay at east end.
56	1	0-2/10	9		Grey brown silty loam. Lots of roots and rootlets.
	2	2/10-8/18	15		Around 8-10cmindistinct transition to yellow/grey brown clayey silty loam with some burnt clay in northwest corner.
	3	8/18-17/24	6		Continuation of same, with more burnt clay and some gravels, quartz and chert.
	4	17/24-20/27	10		As above. Burnt clay continuing in a concentrated patch (around15cm). Pieces of charcoal associated around it, no concentrations as such, dispersal right across pit base.
	5	20/27-27/33	10		As above. Increasing clay content and burnt clay extending across whole northwest end. Possible tree.
	6	27/33-24/42	9		Yellow/grey clay with burnt red clay and charcoal at northwest half.
57	1	0-4/12	14	6	Brown gravelly silty loam up to around 5cm, then indistinct transition to yellow brown, slightly more compact gravelly silty loam. Gravels are angular quartz less than or equal to 40mm.
	2	4/12-16/19	10		Continuation of yellow brown.
	3	16/19-19/24	10		As above with light grey (leached?) gravelly clay coming out in base, around 10cm across.
	4	19/24-26/28	8		Grading to yellow brown silty sandy gravelly clay. Large piece of quartz in base, around 200mm, damaged by excavator bucket, numerous pieces of recent fracture through the buckets. Increasing compaction.
	5	26/28-28/31	5	6.0	Yellow brown compact gravelly clay.
58	1	0-6/10	13		Brown silty gravelly loam. Angular quartz less than or equal to 40mm, sparse.
	2	6/10-20/24	15		Grading to yellow brown, increasing compaction.
	3	20/24-30/35	14		As above. Very friable. Marginal increase in gravels.
	4	30/35-42/45	16		Grading to more compact yellow brown clayey sandy gravelly loam.
	5	42/45-47/51	12		As above. Increasing compaction, clay and gravels, including shale and chert, less than or equal to 60mm. Linear brown clayey loam feature – root - (100x1000mm) across centre of pit.
	6	47/51-48/55	9.5		Grading to yellow brown sandy gravelly clay.
	7	48/55-53/60	7		As above.
	8	53/60-	9		As above. Increasing compaction. Tree root (30-40mm) across

Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
		56/63			centre.
	9	56/63-60/68	6.5		Yellow brown gravelly clay. Increasing compaction.
59	1	0-5/11	16		0-5cm is grey brown silty loam, root layer, loose compaction. 5cm onwards yellow grey brown silty gravelly loam, increased compaction.
	2	5/11-13/18	10		As above.
	3	13/18-24/27	16		As above.
	4	24/27-27/32	7		Yellow/grey brown silty loam mottled with brown loam. Charcoal flecks. Gravels increasing, quartz, ironstone and chert.
	5	27/32-32/36	7.5		As above. Decreasing loam, increasing compaction.
	6	32/36-33/39	5		Yellow grey sandy gravelly silt, very compact.
	7	33/39-42/45	9		Yellow grey clayey sandy gravelly silt. Pockets of darker yellow grey and leached – almost white – sandy gravels.
	8	42/45-58/62	9		Grading to yellow grey brown gravelly clay.
60	1	0-6/9	15	6.0	Brown silty loam to around 6cm. Indistinct transition to yellow brown more compact silty gravelly loam.
	2	6/9-13/19	14		Continuation of yellow orange brown. Increasing gravels, poorly sorted chert, shale and quartz, less than or equal to 50mm, angular and subangular.
	3	13/19-20/26	16		As above
	4	20/26-26/32	12		Grading to orange brown clayey gravelly loam, mottled with brown clayey loam. Some larger pieces of shale coming through (less than or equal to 150mm).
	5	26/32-35/40	16		As above. Increasing clay content.
	6	35/40-45/47	13		As above. Charcoal and burnt clay in northwest corner, linear, 8-10cm across, 30cm long. Tree root. numerous charcoal flecks at same position in east wall and indistinct humic, loamy pit.
	7	45/47-50/52	15		Grading to orange/red brown loamy gravelly clay. Tree root disappeared. Some charcoal still coming through across whole pit.
	8	50/52-57/60	16		Red brown gravelly clay, starts around 52-54cm. 20cm patch of charcoal and burnt clay adjacent to east wall, (possibly associated with tree roots and charcoal in spits 6 and 7?)
	9	57/60-60/64	8	5.5	As above. Charcoal pit continuing, same size.
61	1	0-2/10	16		Brown silty loam. Gravels coming through at base. Charcoal flecks.
	2	2/10-15/19	18		As above up to 10-12cm then sharp transition to yellow brown clayey gravelly loam. Gravels mainly angular quartz and shale less than or equal to 50mm.
	3	15/19-20/26	14		Yellow brown sandy clayey gravelly loam with brown silty gravelly loam in southeast corner, around 50x50cm (possible tree?).
	4	20/26-30/35	17		As above. Grading to yellow brown sandy gravelly clay. Brown loam in southeast expanding out with linear features – roots.
	5	30/35-40/45	Not sieved		Yellow brown gravelly clay, increasing compaction. Brown loam pit in southeast ends around 35cm down.
62	1	0-5/10	15		Brown to yellow brown silty loam. Angular quartz and shale at base, less than or equal to 100mm.
	2	5/10-15/23	19		Yellow brown silty clayey gravelly loam. Gravels are quartz, shale and ironstone, poorly sorted, less than or equal to 150mm. Distinct pockets of loose charcoal and black loam surrounded by red brown



Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
					in northeast corner. (Possibly a posthole or tree?).
	3	15/23-30/36	16		Pocket continues, same size, although patch of brown loam extends for around 25cm around it, boundary of loam is less distinct. Remainder of pit is yellow brown clayey gravelly loam.
	4	30/36-39/46	13		As above, gravel increasing. Posthole/pocket continues.
	5	39/46-47/53	15		Grading to yellow brown gravelly clay. Pocket of loam and ash continues with pieces of burnt root in it. Increasing compaction.
	6	47/53-55/56	12		Yellow brown gravelly clay.
63	1	0-6/8	12		Brown silty gravelly loam.
	2	6/8-9/13	10		Grading to grey brown clayey silty gravelly loam.
	3	9/13-14/17	15		Continuation of same. Gravel content relatively low, angular less than or equal to 40mm.
	4	14/17-20/23	12		Grading to grey/yellow brown clayey sandy gravelly loam.
	5	20/23-24/28	11		As above, increasing gravel.
	6	24/28-29/35	11		As above, increasing clay.
	7	29/35-37/45	13		Yellow grey gravelly clay. Pieces of rock, shale at base (bedrock?) less than or equal to 40cm. Increasing gravel.
	8	37/45	Not sieved		As above. Increasing shale, possibly decomposing bedrock?.
64	1	0-6/8	15	5.0	0-4cm grey brown silty loam. 4cm onwards yellow brown silty gravelly loam. Shale, ironstone and quartz, angular, less than or equal to 50mm.
	2	6/8-14/19	11		Continuation of silty gravelly loam.
	3	14/19-22/24	12		As above, increasing compaction. Lots of quartz gravels and nodules around 200mm.
	4	22/24-25/29	8		Grading to yellow brown sandy gravelly silt.
	5	25/29-30/31	7		As above, increasing compaction. Tree roots at base less than or equal to 20mm.
	6	30/31-33/39	8	5.0	As above. Very compact. Numerous roots.
	7	33/39-40/42	7		Grading to yellow brown clayey gravelly sand. Numerous roots
	8	40/42-50/53	10		Yellow brown sandy gravelly clay. Numerous roots.
	9	50/53-56/58	8		Yellow brown gravelly clay. Very compact. Numerous roots.
65	1	0-6/10	13		Brown silty loam. Numerous roots.
	2	6/10-14/18	15		As above, occasional red oxide peds less than or equal to 20mm.
	3	14/18-25/26	12		As above. Patch of burnt red clay in southeast corner, associated with tree roots.
	4	25/26-30/35	13		Grading to yellow brown silty gravelly loam. Charcoal flecks. Gravels are quartz chert and shale, angular, less than or equal to 40mm. No more burnt clay.
	5	30/35-38/40	14		Continuation of same with increase in charcoal and gravels.
	6	38/40-44/47	13		Grading to orange brown silty gravelly loam, increasing compaction. Grading to orange brown clayey gravelly loam at base.
	7	44/47-44/50	10		Continuation of orange brown clayey gravelly loam. Charcoal flecks.
	8	44/50-	9		As above. Couple of tree roots across centre of pit, around 10mm.

Pit #	Spit #	Depth (cm)	No of Buckets	pH	Description
		54/58			Intermittent mottling of yellow grey clay and charcoal.
	9	54/58-60/63	8		Grading to red brown gravelly clay.
66	1	0-8/10	16		Brown silty loam. Numerous rootlets.
	2	8/10-20/21	14		As above.
	3	20/21-30/35	19		Up to 28cm as above. Sharp transition to yellow grey clayey gravelly loam, only at west end, extends 50cm across pit.
	4	30/35-40/42	11		Continuation of yellow grey clayey gravelly loam. Gravels are angular quartz chert and shale. Charcoal flecks. Only just on transition to yellow brown at east end.
	5	40/42-47/52	13		Grading to yellow grey gravelly clay. Increasing compaction.
	6	47/52-?	Not sieved		Continuation of yellow grey gravelly clay. Lots of quartz gravels, poorly sorted.
67	1	0-5/9	14	5.5	Up to 2-4cm brown silty loam. 2-4cm onwards yellow brown silty gravelly loam. Gravel mainly quartz, angular, 5-50mm.
	2	5/9-17/18	13		Continuation of same, increasing compaction. Red clay nodules in north wall.
	3	17/18-22/25	14		Grading to yellow brown loamy gravelly clay.
	4	22/25-30/35	10	5.0	Yellow brown gravelly clay.
68	1	0-2/8	8.5		Brown to yellow brown silty loam. Quartz gravels coming out at base less than or equal to 50mm.
	2	2/8-13/17	13.5		Yellow brown silty gravelly loam.
	3	13/17-20/22	16		Continuation of same, increasing compaction.
	4	20/22-29/31	13		Grading to yellow brown gravelly clayey loam. Intermittent charcoal flecks.
	5	29/31-36/39	11.5		As above.
	6	36/39-39/45	11		As above.
	7	39/45-48/53	11		Increasing clay content.
	8	48/53-49/56	12		Grading to yellow brown clay, very compact.

APPENDIX 4

GLOSSARY

alluvial - pertaining to alluvium and fluvial processes.

alluvium - unconsolidated deposit of gravel, sand, mud etc., formed by water flowing in identifiable channels. Commonly well-sorted and stratified.

archaeological site - A site is defined as any material evidence of past Aboriginal activity which remains within a context or place which can be reliably related to that activity. Usually a site classification requires a minimum of two detected artefacts.

artefact - an object, normally portable, made or modified by human hand (see 'stone artefact').

assemblage - see lithic assemblage.

background discard - There is no single concept for background discard or 'scatter', and therefore no agreed definition. The definitions in current use are based on the postulated nature of prehistoric activity, and often they are phrased in general terms and do not include quantitative criteria. Commonly agreed is that background discard occurs in the absence of 'focused' activity involving the production or discard of stone artefacts in a particular location. An example of unfocussed activity is occasional isolated discard of artefacts during travel along a route or pathway. Examples of 'focussed activity' are camping, knapping and heat-treating stone, cooking in a hearth, and processing food with stone tools.

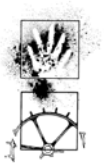
In practical terms, over a period of thousands of years an accumulation of 'unfocussed' discard may result in an archaeological concentration that may be identified as a 'site'. Definitions of background discard comprising only qualitative criteria do not specify the numbers (numerical flux) or 'density' of artefacts required to discriminate site areas from background discard.

background lithic material - natural stone (in the form of pebbles and/or fragments) of types used by Aborigines to make artefacts (such as quartz, tuff, silcrete, chalcedony and quartzite) and occurring in or near a prehistoric archaeological site.

background scatter - can be generally defined as manuport and artefactual material which is *insufficient either in number or in association* with other material to suggest focused activity in a particular location. However, a specific definition of 'background scatter' is inappropriate because it may imply more than simply a pattern of dispersed isolated finds.

backing (retouch) - abruptly angled flaking (retouch) which has shaped a thick back part to an implement such as an elouera or microlith. The process of flaking varies from bipolar impact (on some eloueras) to delicate application of pressure with a small stone ('chimbling' used to make microliths).

bending initiation - the commencement of a fracture by the application of a bending load or force, as in breaking a bar of chocolate, where the load is applied away from the point at which the object breaks. Bending initiation is common in the fracture of a tool's cutting edge during its use, and is commonly caused by human treadage at a site. It normally occurs on thin edges (see also 'snap fractures or flakes').



bioturbation - the process of mixing soil materials or sediments by living organisms.

bipolar core - A core (nucleus) that is supported on a stone anvil surface and struck repeatedly with a hammerstone from above. Diagnostic attributes of bipolar fracture damage are point or sinuous ridge type initiation platforms, crushing, cracks, and concentrated overlapping step fractures emanating from areas of hammer impact.

bipolar flake - (and broken bipolar flake) -a flake retaining evidence of bipolar fracture damage on at least one end. Some of these are 'compression flakes' formed by substantial compressive force. A broken bipolar flake has a transversely oriented breakage.

bipolar flaking - a method of making flakes or retouched flake tools by smashing a piece of stone, often a quartz pebble, rested on a stone surface and repeatedly striking the core from above with a stone hammer.

broken bipolar flake - Transversely broken flake from a bipolar core.

broken flake - A flake with two or more breakages but retaining its area of flake initiation.

burin - A flake from which elongate spalls are detached along one or more lateral margins. The use of this term relates to physical morphology only and is not meant to necessarily infer the function of the item as an engraving instrument - an implication associated with the original formulation of this category.

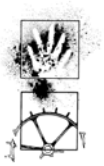
chalcedony - a compact variety of silica, formed of quartz crystallites, often fibrous in form and with sub-microscopic pores which contain water (about 1% of weight). Coloured varieties include carnelian (yellow brown), sard (brown), agate (varicoloured) and jasper (red). Chalcedony can form veins or can occur as pseudomorphs, resulting from silica-charged solution infiltrating voids or cavities in rock, sometimes by gradually replacing decaying organic matter. Chalcedony, like fine quality chert, was a valued stone tool material. Mohs hardness always registers within half a point of 7. Chalcedony appears very fine-grained to the naked eye and can be translucent, banded and include a wide variety of colours. This rock type breaks by the process of conchoidal (shell-like) fracture and provides flakes that have sharp durable edges.

chert - a highly siliceous rock type formed biogenically from the compaction and precipitation of the silica skeletons of diatoms. Normally there is a high percentage of cryptocrystalline quartz. This rock type breaks by the process of conchoidal (shell-like) fracture and provides flakes that have sharp durable edges.

clast - a grain or crystal with a finer grained matrix (usual in silcrete).

colluvium - an unconsolidated deposit of gravel, sand, mud etc., formed by water flowing across a hillslope surface (slopewash, sheetwash, rainwash) and/or by mass movement. Commonly poorly sorted and stratified.

cobble - waterworn stones of diameter greater than 64 mm (about the size of a tennis ball) and less than 256 mm (about the size of a basketball). Archaeologists often refer to cobbles as pebbles (see also 'pebble').



conchoidal flake - a flake created by Hertzian initiation (a cone crack). This is the most common type of flake produced by tool making, but occasionally also occurs in nature. It is distinguished by a partial or complete cone crack and a bulb of force; other fracture surface features are éraillure scar, lances and undulations (see these other glossary entries, and Cotterell and Kamminga 1987, 1992). The inside fracture surface of a well-formed conchoidal flake is similar to that of a bivalve shell, hence the term 'conchoidal'. 'Conchoidal fracture' refers to the process of this flake formation.

concretion and nodules - a mineral forming in isolated aggregates, sometimes as spherical or ellipsoidal forms. Concretions display a concentric zonation of matrix components, whereas nodules display an undifferentiated internal fabric.

cone crack initiation - a Hertzian cone initiation which leads to the formation of a conchoidal flake. A Hertzian cone is similar in shape to the neck of a milk bottle with the top of this cone being the initiation of the circular fracture. On a flake surface the cone is not fully formed and is represented by one side, because the fracture-initiating force was applied from above at an angle of about forty five degrees, not ninety degrees. Other terms in current usage are 'focussed initiation' and 'split cone'.

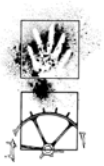
conjoin analysis - piecing together or 'conjoining' artefacts helps in reconstructing prehistoric 'events' (such as tool manufacture, tool use activities and cutting-edge rejuvenation), determining chronology and assessing site integrity.

core (synonymous with nucleus) - a piece of stone, often a pebble or cobble but also quarried stone, from which flakes have been struck for the purpose of making stone tools. (see also 'tabular nucleus'). The core (or core fragment) is generally amorphous in shape. Flakes removed from a core are called 'primary flakes' and may be further shaped by finer flaking, called 'retouch'. The term 'nucleus' refers to cores and flakes or cores that have been retouched.

core rotation - rotation of a core so that another surface is presented from which to initiate fractures that create flakes or blades. Usually this occurs when the previously flaked part of the core because unsuitable for further flake removals. Core rotation may be in any direction. The process may be opportunistic or planned, and is aimed at maximising the number of suitable flakes detached from the core.

cortex - cortex is the weathered exterior of rocks formed by long periods of exposure to chemical and physical weathering. The percentage of cortex remaining on either the dorsal (if limited to the dorsal), the platform (if limited to the platform) or both dorsal and platform (if occurring on both) is recorded in 10% increments. On flaked pieces, cortex is recorded as an estimation of the total surface area covered

cortex type - cortex type varies according to the environment in which it formed and the subsequent processes by which it came to be transported to its current position. Three types of cortex are recorded for all artefacts preserving a cortical remnant. These are angular, rounded and irregular.



debitage - commonly used French word for the stone refuse from flaking activity. Usually there is a large quantity of flaking debitage for every finished stone implement.

discard - when referring to lithic scatters the term discard means the incidental, intended and unintended scatter of artefacts on the ground surface or directly into a sediment.

distal portion or end - the end of a flake or microblade (the opposite end to the that of the point of fracture origin on the ventral (or inside) surface. Tabular cortex is the weathered surface of a tabular shaped nucleus (core).

dorsal face/facet - the outside surface(s) of a flake, the inside surface of the flake being one side of the fracture created during the formation of the flake. The speed at which these fracture formed ranges from about 200 m to over one kilometres a second (see also 'ventral face').

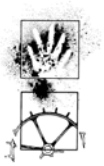
edge-ground axe - Implement shaped on at least one margin by grinding against another surface. Such implements are often shaped by flaking, pecking, flaking and pecking or grinding and/or burnishing around much of their exterior.

end scraper - A flake with a flat ventral surface and steeply retouched distal end.

Éraillure flake - a secondary flake, always very thin in cross-section, that usually remains attached by a fine bridge of stone to the bulbar surface of a conchoidal negative flake scar. The fine attachment is easily removed by applying a very small force. A negative éraillure scar is left on one side of the bulb of force, which is in the upper part of the ventral surface of the primary flake from which it was detached, and is often referred to as 'bulbar scar'. This flake type has no initiation platform, is round or ovoid in plan view, and is always very thin. This flake type is not significant for the purposes of analysis other than to indicate conchoidal flaking.

flake - (General) a piece of stone detached from a nucleus such as a core. A complete or substantially complete flake of lithic material usually with evidence of hard indenter initiation, or occasionally bending initiation. A general category for substantially complete conchoidal flakes, and rarely bending-initiated flakes.

The most common type of flake is called 'conchoidal flake'. In certain circumstances flakes (especially conchoidal flakes) may be the result of natural fracture of stone. The flake's primary fracture surface (the ventral or inside surface) exhibits features such as fracture initiation, bulb of force, and undulations and lances that indicate the direction of the fracture front. Very occasionally a conchoidal flake comprises only a bulb of force (see also 'core', 'fracture initiation', 'bulb or force', 'lances' and 'undulations', and specific flake types).



flake portion - multiple breaks/proximal, distal/longitudinal, indicting the portion of the original flake. Multiple breakages indicates a fragment of a flake exhibiting more than one breakage but still retaining at least some of its initiation area. Proximal portion of a flake is synonymous with 'step-terminated flake'. This variety of flake sustains a breakage at its distal end either because it was detached from the nucleus by a bending force that created a second, transverse break or was broken transversely by a bending force after it was detached (such as when it struck the ground during knapping or subsequently by treadage at the site).

flake fragment - A category comprising flake fragments without areas of fracture initiation but which display sufficient fracture surface attributes (normally conchoidal markings) for identification as a lithic artefact fragment.

flake rotation contact damage - the fine flake scars damage on the distal end of a flake (such as a microlith backing flake) a fraction of a second after it has been created and before it separates fully from the nucleus. This fracturing is caused by the continued application of load or force to the flake as its upper part moves outwards and away from the nucleus.

flaked piece - A flaked piece is defined as any piece of rock clearly derived from the process of conchoidal fracture, but for which no attributes exist to identify it as a core, a flake or any other identifiable technological category.

flake from bipolar core - A flake retaining evidence of bipolar fracture damage on at least one end. Some of these are 'compression flakes' formed by substantial compressive force.

flake portion - a proximal portion retains the area of flake initiation, a distal portion exhibits a flake termination. Longitudinally broken flakes and ones with an oblique break are also recognised.

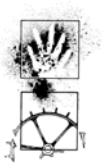
flat - a landform element which is planar or near horizontal; creek flat - flat adjacent to a creek usually a floodplain.

floodplain - valley floor flat adjacent to a stream which is flooded by the 'annual' flood (often considered to be the flood with a recurrence interval of about 1.6 years).

fluvial - pertaining to a stream or river.

fracture or flake initiation - the point or area defining the beginning of a flake-forming fracture (always found at the top of the top of the flake scar or ventral (inside) surface of the flake (see also 'initiation surface').

fresh breakage or fracture - fracturing of a lithic item during archaeological excavation or sieving. Such fracture, which has no adhering sediment or sediment stain, may be caused by trowel, pick, shovel or earth moving machinery.



heat fracture - fractures cause by heating the stone, either from natural causes, a campfire, or intentional heat treatment. Generally, these are undesirable effects though larger pieces of stone fractured by heat sometimes are used as cores or made into implements because of their convenient shape or size. Attributes indicating heat fracture include colour change, cracking, crazing, potlidding and creation of highly irregular fracture surface topography (often referred to as 'crenation' or 'crenulation'.

hammerstone /anvil - A piece of stone with such evidence of use in the form of diagnostic abrasion and other fracture damage.

heat treatment - the intentional slow heating of stone, such as silcrete, above 300°C to improve its flaking properties.

hinge termination - when the end of the flake or fracture continuously turns at ninety degrees to the surface of the nucleus or outside surface of the flake (see also 'retroflexed hinge termination').

indeterminate retouched piece in artefact or piece of an artefact with retouch along at least one margin. The purpose of this retouch cannot be determined, though some items are probably fragments of microlithic items, scrapers or utilised flakes listed above

implement (of stone) - synonym for a stone tool, usually denoting a tool that has been shaped by flaking (retouch).

initiation - see 'fracture or flake initiation'.

initiation platform - see 'initiation surface'.

initiation surface - the surface of a stone (sometimes called a platform) that is struck with a hammerstone at low angle for the purpose of detaching a flake. This surface is where a flake-forming crack commences; commonly part of it is retained on the flake. The load applied to this surface may be delivered by a hammerstone or by continuous increasing pressure with a length of dense wood or bone (a pressor or pressure flaking tool).

isolated find - a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a specified radius, such as 60 metres (depending on which archaeological convention is used). This term is normally useful only in the context of surface archaeological survey results and subsurface testing results. Isolated finds may be constituent components of background discard, or indicative of obscured, remnant and disturbed sites.

knapping episode - a series of flaking events (see also 'knapping event')

knapping event - a single act of flaking a piece of stone resulting in the *in-situ* deposition of stone flaking debris. Such an event may occur as part of a series of events

lamination - a fine layer within the matrix of a lithic material. This layer is less than 2 mm thick.

lateral margin (of a flake) - the edge along the side of a flake, running from the flake's initiation surface to its termination.

lithic - in an archaeological context, items of a hard, usually siliceous, stone of a type selected by Aborigines for tool making. These items are often nondescript fragments but some also finely shaped implements.

lithic assemblage (of stone) - a collection of whole and fragmentary stone artefacts and manuports obtained from an archaeological site, either by collecting items scattered on the present ground surface (see lithic scatter) or by controlled excavation (see also 'stone artefact').

lithic fragment - a nondescript lithic item that does not have sufficient morphological attributes to identify it as a complete artefact or a portion of an artefact. The lithic fragment category comprises items which are identified only to the level of manuport fragments, even though it contains nondescript flaking shatter and fragments of flakes not individually identifiable as such. Some fragments exhibit attributes characteristic of heat stress, such as occurs during bushfire, hearth fire or intentional heat treatment. Evidence of heat fracture on lithic fragments (and identifiable artefacts) has been recorded in the comments for each entry. Depending on the nature of the cultural sediment and non-Aboriginal land-use practices this group may also contain a small number of non-artefactual fragments exhibiting fresh fracture surfaces.

lithic item - a piece of stone exhibiting fracture surfaces and not identified as a natural piece of stone.

manuport - an object or fragment of an object (called item in this report) carried by human agency to the locality in which it is found.

margin - the surface immediately adjacent to an edge, the letter being the intersection of two margins.

microdebitage - flaking waste or debris (debitage) up to 10 mm in maximum size. There is no uniform metrical definition of micro-debitage and some archaeologists specify a maximum size of 5 mm.

microlith (synonym 'backed blade') - a variety of small, delicately retouched implements of various shapes such as asymmetric (bondi) point, segment, crescent, triangle, trapeze, rectangle and oblique ended. These implements are commonly thought to have been spear barbs.

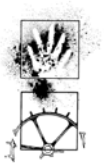
microlith preform - a microblade with some degree of initial backing retouch, often along the distal end. Recognised portions are proximal, distal and fragment.

mottles (on stone surface) - masses or blotches of subdominant colours in an area of stone surface.

mottles (in soil/sediment) - masses or blotches of subdominant colours within a soil mass. Often evidence of poor drainage or extensive bioturbation.

nondescript core or core fragment A core (or core fragment) of generally amorphous shape.

nucleus see 'core', 'polyhedral core', 'tabular nucleus'.



outrépasse termination - a flake ending that turns inwards within the nucleus taking off part of its base. This occurs when the fracture front approaches the bottom of a nucleus and must turn in one direction or the other, as the stresses on either side of the fracture front cannot be equal. If the fracture front turns sharply towards in the other direction the flake will terminate in a hinge. A modest to pronounced outrépasse termination is common on microlith backing flakes and occasionally is seen on microblades.

pebble - by geological definition, a waterworn stone less than 64 mm in diameter (about the size of a tennis ball). Archaeologists often refer to waterworn stones larger than this as pebbles though technically they are cobbles.

pH - acidity or alkalinity of soil or water. Expressed in logarithmic units either side of 7 which is neutral, <7 = acid, >7 = alkaline.

pit - a below ground level ('subsurface') testing location, either excavated by hand and sometimes referred to as a *spade pit* or *shovel pit*, or excavated by machine, such as with a backhoe or machine auger and sometimes referred to as a *trench*.

porphyry - An igneous rock rich in phenocrysts. The term 'porphyritic' refers to ones in which relatively large crystals are set in a fine-grained or glassy groundmass.

potlid - A piece of lithic material that has a generally convex or dome-shaped ventral surface, often with evidence of fracture initiation from a location within the surface and not from the edge.

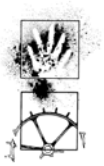
preform - a flake or blade selected for shaping by retouch into an implement. For inclusion in this category an artefact must have some degree of retouch (see also 'retouch' and 'blank').

primary fracture surface One of the two conjoining fracture surfaces created on a nucleus and flake after the flake has detached. The primary fracture surface on the flake is called the ventral surface.

proximal - the top part of a flake beginning with the initiation surface or ridge. It is the same for an implement (or tool). The opposite end of flake is called the distal end.

quarry - a site where stone was obtained by excavation from bedrock with extraction tools of simple design (see also Stone procurement site or place).

quartz - a mineral composed of crystalline silica SiO^2. Quartz is a very stable mineral that does not alter chemically during weathering or metamorphism. It is hard, usually colourless or white ('milky'). In its massive form quartz occurs as geodes or veins, from which pebbles are formed by weathering. Despite the often unpredictable nature of fracture in quartz the flakes often have sharp cutting edges. Quartz is common and abundant, and the Aborigines used it throughout Australia to make convenient light-duty cutting tools.



quartzite - A hard, silica rich stone formed from a sandstone that has been recrystallised by heat (meta-quartzite) or strengthened by slow infilling of silica in the voids between sand grains (orthoquartzite). The essential difference between sandstone and quartzite is that major fracture will propagate around the larger grains in sandstone and through the grains in quartzite.

Quaternary - The most recent geological time period. Divided into the Holocene and the Pleistocene. Began 1.8 million years ago (see also 'stone procurement site').

reduction process - the process of removing flakes from a core, or of manufacturing an implement by flaking and/or grinding, or progressively rejuvenating a tool's working edge.

reduction strategy - strategy of flaking and/or grinding a piece of stone in predetermined stages to produce an implement.

residues on stone tools - residue analysis concerns the identification of tool use activities from preserved organic and inorganic residues of worked materials. These residues may be compacted into small flake scars on the edges of utilised artefacts or adhere strongly to their surfaces. Routine examination of residues is aided by low-magnification microscopy.

retouch or retouching - an area of flake scars on an artefact resulting from intentional shaping, resharpening, or rejuvenation after wear or breakage. In resharpening a cutting edge the retouch is invariably found only on one side (see also 'indeterminate retouched piece', retouch flake' etc).

sandstone - a cemented or compacted rock consisting of detrital grains which range in size from 2 mm. Because of its chemical stability quartz often comprises the majority of the grains. The nature of the cement is denoted by terms such as argillaceous (clayey), calcareous, ferruginous and tuffaceous sandstone.

sieve damage - fracture damage on lithic items caused by abrasive contact with the sieve mesh during the process of sieving. This occurs more commonly with wet sieving of clayey sediment.

silcrete - (also known as 'porcellanite' and 'grey billy') A hard, fine grained siliceous stone flaking properties similar to quartzite and chert. It is formed by the cementation and/or replacement of bedrock, weathering deposits, unconsolidated sediments, soil or other material by a low temperature physico-chemical process.

Silcrete is essentially composed of quartz grains cemented by microcrystalline silica (SiO^2). Mineral composition is highly variable, but it comprises more than 85% silica, and includes aluminium, iron and titanium in small but significant amounts. The bonding matrix is often composed of microcrystalline quartz or chalcedony. Clasts are most often quartz grains but may also include chert or chalcedony or some other hard mineral particle. Mechanical properties and texture are equivalent to the range exhibited by chert at the fine-grained end of the scale to silcrete at the coarse-grained end. Silcrete is used by Aborigines for stone tool manufacture throughout most of Australia.

site any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity.

site integrity - the degree of post-depositional disturbance to a site.*

spit - an arbitrary interval of excavated depth in an archaeological excavation, such as in: spit 2 was the layer of deposit excavated between 10 and 20cm below ground level.

stone artefact - a piece or fragment of stone showing evidence of intentional human creation or modification.

stone layer - a sheet or layer of gravel sized materials found within a body of soil material. Commonly formed at the lower limit of bioturbation and often contains a concentration of artefacts.

stone material - (synonymous with 'lithic material', 'stone type' and 'raw material' which is a less specific but commonly used term).

stone procurement place (or site) - a place where stone is obtained for making into artefacts. As a prehistoric site type in Australia, stone procurement places range on a continuum, from pebble beds in watercourses (where there may be little or no archaeological evidence of human activity) to extensively quarried outcrops of bedrock where there is clear evidence of procurement activity, such as quarry pits, discarded hammerstones and large consolidated cultural deposits of primary flaking debris. (See also quarry)

stone tool - a piece of flaked or ground stone used in an activity or fashioned for use as a tool. A synonym of stone tool is implement, which is more often used by archaeologists to describe a flake tool fashioned by more delicate flaking (retouch).

technological attributes analysis - methods of reconstructing reduction sequences in stone technology (see reduction sequence). Discrete and metrical attributes of artefacts are identified, recorded and examined mathematically.

termination (of a flake) - the distal end

use fractures - breakages on the edges of stone tools resulting from tool use (see also 'use-wear').

use-wear - microscopic and macroscopic damage to the surfaces of stone implements resulting from its use. Routine examination for use-wear is aided by low-magnification microscopy. Major use-wear forms are edge fractures, use-polish and smoothing, abrasion, and edge rounding and bevelling.

ventral face - the inside surface of a flake created during the flake's formation. The speed of the fracture ranges from about 200 metres to over one kilometres per second (see also 'dorsal face').

volcanic stone - rock types formed by volcanic activity display a wide range of mechanical and flaking properties. Freshly fractured volcanic stone tends not to have fine, durable edges suitable for cutting. Only a few types are utilised for making stone tools, often ones that are shaped by grinding.

working edge - the edge of a tool in contact with the worked substance or material during its usage.

APPENDIX 5

LITHIC DATABASE

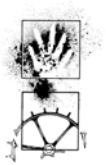
Table of total number of recovered artefact numbers per pit

Pit No	Test Area	No recovered artefacts
1	TA3	0
2	TA3	1
3	TA3	2
4	TA4	0
5	TA4	1
6	TA7	2
7	TA7	0
8	TA7	0
9	TA7	0
10	TA7	0
11	TA7	0
12	TA7	2
13	TA7	1
14	TA7	0
15	TA6	0
16	TA6	0
17	TA6	0
18	TA6	2
19	TA6	20
20	TA6	1
21	RUR2	6
22	RUR2	44
23	RUR2	26
24	RUR2	26
25	RUR2	7
26	RUR2	2
27	TA5	7
28	TA5	14
29	TA5	3
30	TA5	0
31	TA6	2
32	TA6	8
33	TA6	30
34	TA6	5
35	PAD2	6
36	PAD2	13
37	PAD2	18
38	PAD2	3
39	PAD1	4
40	PAD1	4
41	PAD1	5
42	PAD1	2
43	PAD3	0
44	PAD3	6
45	PAD3	5
46	PAD3	0
47	PAD3	4
48	PAD4	16
49	PAD4	5
50	PAD4	1
51	PAD4	1
52	PAD6&7	3
53	PAD6&7	4
54	PAD6&7	8

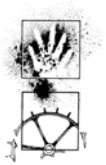
No recovered artefacts	Pit No
0	1
0	4
0	7
0	8
0	9
0	10
0	11
0	14
0	15
0	16
0	17
0	30
0	43
0	46
0	55
1	2
1	5
1	13
1	20
1	50
1	51
2	3
2	6
2	12
2	18
2	26
2	31
2	42
2	67
3	29
3	38
3	52
4	39
4	40
4	47
4	53
4	59
5	34
5	41
5	45
5	49
5	58
5	63
5	65
6	21
6	35
6	44
6	61
6	66
7	25
7	27
7	68
8	32
8	54

Pit No	Test Area	No recovered artefacts	No recovered artefacts	Pit No
55	PAD6&7	0	9	62
56	PAD6&7	10	10	56
57	PAD6&7	13	13	36
58	PAD6&7	5	13	57
59	PAD6&7	4	14	28
60	PAD8	33	16	48
61	PAD8	6	18	37
62	PAD8	9	20	19
63	PAD8	5	26	23
64	PAD5	84	26	24
65	PAD5	5	30	33
66	PAD5	6	33	60
67	PAD5	2	44	22
68	PAD5	7	84	64
Total		509	509	

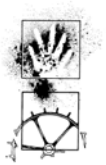
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
1.	25	1	1	qtz c	fl		n	pr	0			htz	0.1	6.6		7.1			2	
2.	25	3	1	vol g	fl		n	p	0			htz	1.2	6.3		16.6			7.1	
3.	25	5	1	vol g	fl		n	d	0				11.6	36.3	24	20.7	19.3	7.6	10.4	7.1
4.	25	5	2	vol g	fl		y		5	rounded	dorsal	htz	5.4	22.9	26.8	26	10.4	10	6.6	3.4
5.	25	5	3	qtz c	fl		n	pl	0			htz	0.1	7.6		5.4			3.3	
6.	25	5	4	qtz c	fl		n	pr	0			htz	0.1	5.9		5.9			2.7	
7.	25	5	5	qtz m	fl		n	p	0			htz	0.1	5.7		4.9			1.1	
8.	23	1	1	qtz c	fl		n	d	0				0.1	7.5		6			1.3	
9.	23	1	2	qtz m	fl		n	d	0				0.4	10.8		8.6			3.3	
10.	23	1	3	qtz c	fl		n	m	0				0.2	7.8		8.9			2.9	
11.	23	2	1	sil g	fl		y		60	rounded	dorsal	htz	1.6	14.5	10	15.5	8.6	8.3	6	3.3
12.	23	2	2	vol gg	fl		y		0			htz	10.9	39.7	19.9	21.5	12.9	9.5	9.9	8.2
13.	23	2	3	qtz c	fl		y		0			htz	1.7	10.3	13.8	13.5	7.6	6.6	7.5	5.6
14.	23	2	4	qtz c	fl		n	d	0				0.3	10.8		10			2.2	
15.	23	2	5	sil g	fl		n	m	0				0.4	7.4		13.1			3.1	
16.	23	2	6	sil g	pl				0				0.1	9.1		7.2			1.4	
17.	23	2	7	vol g	fl		y		10	unknown	dorsal	htz	2.4	27.6	17.1	15.2	13.6	3.1	4.6	4
18.	23	3	1	sil g	fl		n	d	0			htz	0.2	12.1		7.3			2.7	0
19.	23	3	2	sil g	fl		n	d	100	rounded	dorsal		1	11		14.6			5.4	
20.	23	3	3	qtz m	fl		y		0			htz	3.5	22.1	17	13.3	10.9	8.4	6.3	4.6
21.	23	3	4	qtz c	fl		n	pl	0				0.2	10.8		7.8			3.2	
22.	23	4	1	sil g	fl		y		0			ben	1.5	13.1	11.4	9.7	8.9	11.1	9.1	4.9
23.	23	4	2	sil g	fl		n	pl	0			htz	0.6	11.6		7.5			4.3	
24.	23	4	3	qtz c	fl		n	dl	0				0.1	7.7		6.5			1.5	
25.	23	4	4	qtz m	fl		n	r	0			htz	0.4	9.3		9.5			5.1	
26.	23	5	1	vol g	fl		n	pr	40	rounded	platform	htz	7.6	13		28.3			11.4	
27.	23	5	2	qtz m	fl		n	p	0			htz	0.2	9.2		6.6			2.3	
28.	23	5	3	qtz m	fl		n	p	0			htz	0.6	8.5		11.3			5.4	
29.	23	6	1	vol g	fl		y		0			htz	15.8	31	29.1	35	29.5	8.3	14.3	4.8
30.	23	6	2	qtz m	fl		y		0			bip	3.9	20.7	11.9	20.5	19.5	4.5	7.5	5.4
31.	23	6	3	qtz m	fl		n	m	0				0.1	5.8		5.6			2.6	
32.	23	6	4	qtz m	fl		n	p	50	rounded	dorsal	htz	0.3	13.1		4.5			4.1	
33.	23	7	1	vol b	fl		n	r	0			htz	1	23.6		9.8			3.2	
34.	24	1	1	vol g	fl		n	m	0			htz	2.3	21.6		19.9		4.3	3.3	3.3
35.	24	1	2	vol g	fl		n	d	0				0.4	10.3		13			2.6	
36.	24	1	3	che r	fl		n	l	0			htz	1.1	15		11.4			4.6	
37.	24	1	4	che r	fp				0				1	12.7		7.9			5.2	
38.	24	1	5	qtz c	fl		n	d	0				0.1	6		4.8			1.9	
39.	24	1	6	qtz c	fl		n	pl	0			htz	1	7.8		12.8			6.1	



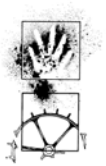
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
40.	24	1	7	qtz c	fl		n	m	0			htz	0.6	11.6		10			3.9	
41.	24	1	8	qtz c	fl		n	r	0			htz	0.3	14.5		6.8			3	
42.	24	1	9	qtz c	fl		y		10	unknown		htz	0.1	7.2		8.6			2	
43.	24	2	1	vol g	fl		n	pr	0			htz	1.2	20.4		12.6			2.7	
44.	24	2	2	che r	fl		y		0			htz	1.7	14	18.1	25	19.7	4.6	3.8	1.7
45.	24	2	3	qtzt	fl		n	p	30	rounded	dorsal	htz	1.6	15.5		19.7			4.6	
46.	24	2	4	vol g	fl		n	m	0				0.3	10.3		9.8			2.3	
47.	24	2	5	vol g	fl		n	m	0				0.2	7.1		11.2			1.5	
48.	24	2	6	vol g	fl		n	ml	60	rounded	dorsal		1.9	21.1		15.7			4.3	
49.	24	2	7	qtz c	fl		y		0			htz	0.1	12	4.5	6.7	5.6	1.1	1.4	1.5
50.	24	2	8	vol g	fp				0				3.9	20.7		16.2			9.1	
51.	24	2	9	qtz m	fl		n	l	0			htz	3	19.9		15.2			6.2	
52.	24	2	10	vol g	fl		n	r	0			htz	5.2	32.2		15.5			11.5	
53.	24	3	1	vol b	fl		y		0			htz	0.6	4.6		8.9			10	
54.	24	3	2	qtz c	fl		n	m	0				0.2	10.2		5.6			3.5	
55.	24	3	3	qtz c	fl		n	p	0			htz	0.1	8.9		6.7			2.4	
56.	24	3	4	qtz c	fl		n	pl	0			htz	0.1	5.1		6.9			3.6	
57.	24	3	5	qtz c	fl		n	p	0			htz	2.9	17.1		21.3			4.6	
58.	24	4	1	qtz c	fl		n	d	0			htz	0.3	11.9		10.3			2.8	
59.	24	4	2	qtz c	fl		y		20	unknown	dorsal	htz	0.2	7.1		10.4			2.2	
60.	32	1	1	qtz m	fl		y		0			htz	0.7	12.4	12.2	13.3	12	3.4	3.4	2.7
61.	32	1	2	qtzt	fp				10	rounded			3.9	19.8		15.5			8.2	
62.	32	1	3	qtz c	fl		n	d	0				0.1	7.1		5.5			1	
63.	32	1	4	qtzt	fl		n	pr	0				2.9	24.8		15.3			2.7	
64.	32	3	1	qtz c	fl		y		0			htz	0.1	4.5		5.1			1.8	
65.	32	3	2	qtz c	fl		n	m	0				0.2	6.9		10.5			2.6	
66.	32	3	3	qtz c	fl		n	pl	0			htz	0.5	8.6		9.1			3.9	
67.	32	2	1	qtz c	hm		y		100				164.8	57.6		49.1			43.9	
68.	22	1	1	vol g	fp				0				6.1	18.2		14.5			11.6	
69.	22	1	2	qtz c	fl		n	pr	0			htz	0.1	6.5		3.5			2.4	
70.	22	1	3	qtz c	fl		n	p	0			htz	0.1	4.7		4.7			1.7	
71.	22	1	4	qtz c	fl		n	p	0			htz	0.1	4.9		6.5			1.7	
72.	22	1	5	qtz c	fl		y		0				0.2	10.9	5.3	6.7	3	2.9	3.2	1.4
73.	22	1	6	qtz c	fp				0				0.1	10.1		5			1.9	
74.	22	2	1	vol b	fl		n	p	0			htz	0.2	13.5		6			2.4	
75.	22	2	2	vol g	fl		n	pr	20	rounded	platform	htz	0.8	12.7		7.6			5.8	
76.	22	2	3	qtz c	fl		n	d	0				0.2	8.6		9.4			2.6	
77.	22	2	4	qtz c	fl		n	l	0			htz	0.5	11		11			2.7	
78.	22	2	5	qtz c	fl		n	pr	0			htz	0.2	8.5		8.1			2.5	



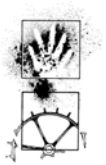
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
79.	22	2	6	qtz c	fl		n	pl	0			htz	0.1	6.5		8.2			1.7	
80.	22	2	7	qtz m	fl		y		0			htz	0.5	8.3		9.9			4.2	
81.	22	2	8	qtz c	fl		n	p	0			htz	0.2	4.3		11.1			2.9	
82.	22	2	9	qtz c	fl		n	p	0			htz	0.1	7.8		6.7			2.7	
83.	22	2	10	qtz c	fl		n	p	0			htz	0.1	4.9		8.7			2.9	
84.	22	2	11	qtz c	fl		n	r	0			htz	0.1	8.3		4			2.6	
85.	22	2	12	qtz c	fl		y		0				0.1	5.6		3.9			2.2	
86.	22	2	13	qtz m	fl		n	l	0			htz	9	29.1		21.8			14.4	
87.	22	2	14	qtz c	fl		y		0			htz	2.6	19.2	14.2	16.6	8.8	4.9	5.7	5.6
88.	22	2	15	qtz c	fl		n	r	0			htz	0.8	16.8		10.8			3.9	
89.	22	3	1	sil g	fl		y		0			htz	0.6	10.7		13.8			3.4	
90.	22	3	2	sil g	fl		n	l	0			htz	0.5	15.3		6.3			4.5	
91.	22	3	3	qtz c	fl		y		0			htz	0.2	17.7	4.5	6.6	3.1	1	1.1	1.4
92.	22	3	4	qtz m	fl		y		0			htz	0.6	15.2	8.7	8.3	5.5	3.7	3.2	2.8
93.	22	3	5	qtz c	fl		y		0			htz	0.1	9.2		5.6			1.3	
94.	22	3	6	qtz c	fl		n	d	0				0.1	5.3		6.2			1.4	
95.	22	3	7	qtz c	fl		n	p	0			htz	0.1	5.1		8.3			1	
96.	22	3	8	qtz c	fl		y		0			htz	0.1	7.9		8			1.5	
97.	22	3	9	qtz c	fl		n	p	0			htz	0.1	4.8		5.5			1.2	
98.	22	3	10	qtz c	fl		n	p	0			htz	0.1	8.6		7.8			2.2	
99.	22	3	11	qtz c	fl		n	d	0				0.3	11		5.8			4.9	
100.	22	3	12	qtz m	fl		y		0			htz	0.1	5.6		8.3			2	
101.	22	3	13	qtz c	fl		n	ml	0				0.1	7.5		6.5			2.8	
102.	22	3	14	qtz c	fl		y	p	0			htz	0.1	5.4		7.6			3.2	
103.	22	3	15	qtz c	fl		n	p	0			htz	0.2	9.8		5.6			2.6	
104.	22	3	16	qtz c	fl		n	d	0				0.1	4.7		3.9			1.6	
105.	22	3	17	qtz c	fl		n	p	0			htz	0.4	10.4		7.6			4.3	
106.	22	3	18	qtzt	fl		n	m	0				2.3	17.1		25.7			3.9	
107.	22	4	1	sil r	fl		n	pr	0			htz	2.9	10.8		15.9			11.4	
108.	22	4	2	qtz m	fl		n	m	0				0.4	10.5		10.8			3.3	
109.	22	4	3	qtz c	fl		y		0			htz	0.1	8.3		4.2			1.6	
110.	22	4	4	qtz c	fl		n	d	0				0.1	6		5			1	
111.	22	5	1	qtz c	fl		y		0			htz	0.1	8.1		6.9			2	
112.	31	1	1	che r	fl		n	mr	0			htz	0.1	10.7		4.9			1	
113.	31	3	1	qtz c	co		y		30	irregular	all	htz	226.5	62.3		54.6			50.6	
114.	26	1	1	sil g	fl		n	p	0			htz	2.6	24.4		12.3			7.7	
115.	26	1	2	vol b	fl		y		25	rounded	platform	htz	0.3	7.3					3.1	
116.	33	1	1	vol b	fl		y		20	rounded	dorsal	htz	1.8	19.5	11.1	15.3	9.9	5.4	3.3	3.2
117.	33	1	2	vol g	fl		y		0			htz	1.1	8.8		19			5	



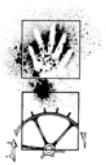
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
118.	33	1	3	qtz c	fl		n	p	0			htz	1.7	10		22.9			5.7	
119.	33	1	4	qtz c	fl		y		0			htz	0.6	14.2	9.7	8.5	5.3	5.4	4.5	1.4
120.	33	1	5	sil p	fl		n	p	0			htz	0.2	13.7		5.1			2	
121.	33	1	6	qtz c	fl		y		0			htz	0.4	9		13.3			2.3	
122.	33	1	7	qtz c	fl		n	d	0				0.2	7.9		5.8			2.6	
123.	33	1	8	qtz m	fl		n	p	0			htz	0.7	14.7		8.7			3.9	
124.	33	1	9	qtz c	fl		n	pr	0			htz	0.2	10.2		6.6			2.5	
125.	33	1	10	qtz c	fl		n	pr	0			htz	0.1	7.2		7			2.9	
126.	33	1	11	qtz c	fl		y		30			htz	0.1	4		7.2			2	
127.	33	1	12	qtz c	fl		n	pr	50	irregular	platform	htz	0.5	9.7		6.8			4.8	
128.	33	1	13	qtz c	fl		n	p	0			htz	0.1	4.9		6.6			1.5	
129.	33	1	14	qtz c	fl		n	pl	0			htz	0.3	10.2		7.4			3.2	
130.	33	1	15	qtz c	fl		n	d	0				0.1	8.6		6.3			2.3	
131.	33	2	1	vol b	fl		n	r	0			htz	2.1	18.8		14.1			5.8	
132.	33	2	2	vol b	fl		y		50	rounded	dorsal	htz	0.3	11.7		7.5			3.9	
133.	33	2	3	qtz c	fl		y		0			htz	0.1	3.4		6.8			1	
134.	33	2	4	qtz c	fl		n	d	0				0.1	5.2		4.6			0.9	
135.	33	2	5	qtz c	fl		y		0			htz	0.1	5.9		5.7			2.5	
136.	33	3	3	vol g	fl		n	p	0			htz	13	31		31.1			9.3	
137.	33	3	2	qtz m	fl		y		0			htz	1	8.3	7.5	10.1	7.6	4.6	4.6	2.7
138.	33	3	1	qtz c	fl		n	d	0				0.1	6		6.8			1.8	
139.	33	3	4	qtzt	fl		n	pl	10	irregular	dorsal	htz	2.9	20.4		18.2			7.7	
140.	33	3	5	vol g	fl		n	dr	0				0.2	9.6		7.3			2.1	
141.	33	3	6	qtz c	fl		n	p	0			htz	0.1	6.8		5.7			2.1	
142.	33	3	7	qtz m	fl		y		10	irregular	platform	bip	4.3	25.9	20.1	15.5	11	9.2	8.4	4.6
143.	33	4	1	qtz c	fl		y		0			htz	0.1	10.5		4.3			2.2	
144.	33	4	2	qtz m	fl		n	pr	50	irregular	both	htz	0.6	9.3		9.7			6.6	
145.	33	4	3	qtz m	fl		n	p	50			htz	1.7	7.7		12.5			5.3	
146.	21	2	1	qtz c	fl		y		40	irregular	dorsal	htz	0.1	9.1		3.2			2.3	
147.	21	4	1	sil g	fl		n	p	10	irregular	platform	htz	18	29.3	25.1	32.8	25.8	19.4	13	5.2
148.	21	4	2	sil g	fl		n	r	0			htz	0.3	11.2		6			3.6	
149.	21	5	1	sil g	fl		n	p	0			htz	0.1	8.7		9.7			1.6	
150.	21	5	2	qtz c	fl		n	p	0			htz	0.1	5.9		6.5			2	
151.	21	5	3	qtz c	fl		n	ml	0				0.1	7.1		5			2.4	
152.	20	2	1	sil p	fl		n	r	0			htz	0.6	15.3		7.5			4.1	
153.	29	1	1	qtz c	fl		n	d	0				0.2	11.5		7.6			2.7	
154.	29	4	1	qtz c	fl		n	l	0			htz	0.2	7.1		9.1			2.6	
155.	29	4	2	qtz m	fl		n	d	0				0.1	7.9		5.2			2	
156.	27	3	1	qtz m	fl		y		0			htz	0.1	5.3		5.1			1	



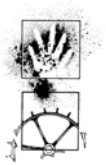
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
157.	27	3	2	qtz m	fl		n	pl	10	irregular	platform	htz	3.6	23		19			6.2	
158.	27	3	3	qtz c	fl		n	d	0				0.1	5.3		5			1.9	
159.	27	5	1	qtz m	fl		n	r	0			htz	10.3	23.4		15.1			13.4	
160.	27	5	2	qtz c	fl		n	l	0			htz	0.3	9.5		8.1			4.2	
161.	27	5	3	qtz c	fl		y		0			htz	0.3	6.9		8.8			3.5	
162.	27	5	4	qtz m	fl		y		0			htz	0.1	6		6.3			1.7	
163.	19	1	1	qtz m	fl		n	d	0				0.1	9.7		7.4			2.1	
164.	19	1	2	qtz c	fl		y		50	irregular	dorsal	htz	0.3	9.6		7.2			4.3	
165.	19	1	3	qtz m	fl		n	l	0			htz	0.2	11.4		5.8			2.2	
166.	19	1	4	vol g	fl		y		10	rounded	dorsal	htz	2.2	28.4	8.5	8.2	10.5	5.2	4.7	8.7
167.	19	2	1	sil g	fl		n	pr	0			htz	4.2	20.3		18.3			7.3	
168.	19	2	2	sil g	fl		n	pl	0			htz	0.4	10.8		8.7			2.7	
169.	19	2	3	sil g	fl		n	p	0			htz	0.5	17.3		7.8			3.1	
170.	19	2	4	sil g	fl		n	p	0			htz	0.4	12.4		5.6			3	
171.	19	2	5	sil g	fl		y		0			htz	0.1	13.3		6.7			1.9	
172.	19	2	6	qtz m	fl		n	m	0				0.3	10.4		10.4			2	
173.	19	2	7	qtz c	fl		n	p	0			htz	0.1	10.2		5.4			2.3	
174.	19	2	8	qtz c	fl		n	p	0			htz	0.1	6.5		5.3			1.1	
175.	19	2	9	sil g	fl		n	d	0				1.5	15.9		14.6			3.8	
176.	19	2	10	qtz m	fl		n	p	0			htz	0.4	10.6		14.6			2.6	
177.	19	2	11	qtz m	fl		n	pr	0			htz	3.9	18.8		13.3			8.5	
178.	19	2	12	sil g	fl		n	r	0			htz	0.6	15.3		8			4.3	
179.	19	2	13	qtz c	fl		n	p	40	irregular	dorsal	htz	0.1	8.7		5.1			2.1	
180.	19	2	14	qtz m	fl		y		0			htz	0.1	5		5.7			1.8	
181.	19	2	15	sil g	fl		n	pr	0			htz	0.1	5.9		4			1.5	
182.	19	3	1	vol g	fl		n	dl	20	rounded	dorsal		16.3	26		30.1			12.3	
183.	28	1	1	qtz m	fl		y		0			htz	0.1	5.4		6.9			1.5	
184.	28	1	2	qtz c	fl		n	d	20	irregular	dorsal		0.1	8.8		4.7			1.7	
185.	28	3	1	qtz c	fl		n	m	0				0.1	7.3		8.6			1.7	
186.	28	3	2	qtz m	fl		y		0			htz	0.9	8.9		10.2			5.6	
187.	28	3	3	qtz m	fl		n	m	0				0.2	8.1		8.3			2.2	
188.	28	3	4	qtz m	fl		n	p	0			htz	0.1	4.8		9.4			2.1	
189.	28	3	5	qtz c	fl		n	r	0			htz	0.4	11.2		6.3			4.8	
190.	28	4	1	qtz m	fl		n	d	0				0.1	7.2		7.8			1.8	
191.	28	4	2	qtz c	fl		n	d	0				0.1	5.7		5.7			2.7	
192.	28	4	3	qtz c	fl		n	rp	0			htz	0.3	5.2		9.6			3	
193.	28	4	4	qtz c	fl		n	p	0			htz	1	11.4		6.5			6.1	
194.	28	4	5	qtz m	fl		n	p	0			htz	0.1	7.1		7.5			1.8	
195.	28	4	6	qtz m	fl		y		10	irregular	platform	htz	0.3	7.5		10.2			3.3	



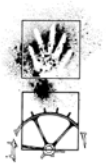
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
196.	28	4	7	qtz m	fl		y		30	irregular	dorsal	htz	2.2	15.9	15.9	11.5	5.1	6.3	5.5	3.3
197.	64	8	1	vol g	fl		n	pl	0			htz	0.3	8		10.8			1.8	
198.	64	8	2	vol g	fl		n	d	0				0.2	8.1		10			1.8	
199.	64	8	3	sil g	fl	backed	n	d	0				0.4	18.7		6.6			2.9	
200.	64	8	4	qtz c	fl		n	l	5	irregular	dorsal	htz	0.3	10.4		7.8			2.1	
201.	68	2	1	sil p	fl	geome	y		0				0.2	9.9	4	6.4	3.8	3.4	3.9	2.3
202.	68	2	2	qtz c	fl		n	pr	0			htz	1.1	15.1		10.4			5.5	
203.	64	7	1	sil g	fl		n	p	0			htz	0.2	10.8		6.2			1.8	
204.	64	7	2	sil g	fl		n	p	0			htz	0.2	17.7		6.3			2.2	
205.	64	7	3	sil g	fl		n	p	0			htz	0.1	9.2		4.1			1.4	
206.	64	7	4	sil g	fl		n	p	0			htz	0.1	6.9		7.4			1.5	
207.	64	7	5	sil g	fl		n	l	0			htz	0.1	9.8		3.5			1.5	
208.	64	7	6	sil g	fl		n	ml	0				0.1	7.7		5.2			1.6	
209.	64	7	7	qtz c	fl		n	r	0			htz	0.1	5.7		5.3			1.6	
210.	64	7	8	qtz m	fl		n	d	0				0.1	6.9		5.9			1.3	
211.	64	7	9	sil g	fl		n	pr	0			htz	0.2	13.1		5.2			3	
212.	64	7	10	sil g	pl				0				0.1	10.9		6.9			1.5	
213.	66	3	1	qtz m	co		y		10	irregular	distal	htz	16.1	22.5		23.1			17.6	
214.	66	3	2	qtz c	fl		n	d	0				0.1	8.3		6.2			2	
215.	67	2	1	qtz c	fl		y		40	irregular	dorsal	htz	0.3	11		6.6			3.4	
216.	67	2	2	qtz m	fl		y		10	irregular	platform	htz	0.3	13.7	5.8	6.2	4.2	2.9	2.7	2.9
217.	64	1	1	sil g	fl		n	p	30	rounded	dorsal	htz	1.1	17.3		12.6			3.4	
218.	64	1	2	sil g	fl		n	m	0				5.4	19.1		19.1			8.2	
219.	64	1	3	qtz m	fl		n	p	0			htz	0.4	11		6.6			3.4	
220.	64	1	4	qtz c	fl		n	p	0			htz	0.1	6.9		5.3			1.1	
221.	64	1	5	qtz m	fl		n	d	0				0.2	9.5		6			2.3	
222.	64	1	6	qtz c	fl		n	d	0				0.1	10.2		5.2			1.5	
223.	65	4	1	qtz m	fl		n	l	0				4.5	28		19			7.9	
224.	63	6	1	qtz c	fl		n	m	0				0.3	10.1		7			3.3	
225.	64	5	1	sil g	co		y		65	irregular	all	htz	31.9	38.1		32			26.6	
226.	64	5	2	sil g	fl		n	m	0				0.1	5.2		4.9			2.1	
227.	64	5	3	sil g	fl		n	mrg	0			htz	0.5	15.4		6.8			3.4	
228.	64	5	4	sil g	fl		n	d	0				0.1	14.5		4.3			1.7	
229.	64	5	5	sil g	fl		n	p	0			htz	0.1	9.6		5.7			1.3	
230.	64	5	6	sil g	pl				0				0.1	10.9		7			2.3	
231.	64	5	7	qtz c	fl		n	dl	20	irregular	dorsal		0.1	6.6		6.4			2.4	
232.	64	5	8	sil g	fl		n	l	0			ben	0.7	14.3		7.2			6.1	
233.	68	3	1	qtz m	fl		n	d	20	irregular	dorsal	htz	0.2	9.5		4.8			2.5	
234.	68	3	2	qtz c	fl		n	p	10	irregular	platform	bip	0.2	8.6		9.4			2.5	



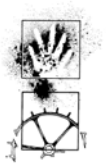
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
235.	65	2	1	vol g	fl		y		0			htz	6.4	29.7	8.2	13.1	14.2	4.5	13.2	9
236.	65	2	2	qtz m	fl		n	d	0			htz	0.1	8.4		6.5			2.3	
237.	65	2	3	qtz c	fl		n	pr	0			htz	0.4	12.3		11			2.9	
238.	65	2	4	qtz c	fl		n	l	0			htz	0.2	9.3		8.1			2	
239.	64	4	1	sil g	fl		n	p	0			htz	0.7	14.5		12.4			2.7	
240.	64	4	2	sil g	fl		n	p	0			htz	0.3	8.7		12			1.9	
241.	64	4	3	sil g	fl		n	d	10	unknown	dorsal		0.7	9.6		12			4.7	
242.	64	4	4	sil g	fl		y		30	irregular	dorsal	htz	0.5	9.3		13.7			3.3	
243.	64	4	5	sil g	fl		y		35	irregular	dorsal	htz	0.1	10.1		4.9			1.7	
244.	64	4	6	sil g	fl		n	p	0			htz	0.3	8.7		7			3.9	
245.	64	4	7	sil g	fl		n	p	0			htz	0.1	12.4		4.8			2.8	
246.	64	4	8	sil g	fl		n	p	0			htz	0.1	8.9		4.9			1.6	
247.	64	4	9	sil b	fl		n	p	0			htz	0.1	10.5		6.6			2	
248.	64	4	10	sil g	fl		n	p	0			htz	0.1	5.9		9.6			1.5	
249.	64	4	11	sli g	hs				0				0.2	13.6		5.9			2.9	
250.	64	4	12	sil g	fl		n	pl	0			htz	0.1	7.5		5.2			2.5	
251.	64	4	13	sil g	fl		y		70	irregular	face	htz	5.3	31.7	9.1	16.9	6.4	3.6	9.8	9.2
252.	64	4	14	qtz c	fl		n	mrg	10	irregular	dorsal		0.1	8.1		5.3			1.7	
253.	64	4	15	qtz m	fl		n	r	80	irregular	dorsal	htz	0.2	13.1		5.4			2.9	
254.	64	4	16	qtz c	fl		n	pl	0			htz	0.2	12		5.9			3.2	
255.	64	4	17	qtz m	fl		n	p	30	irregular	dorsal	htz	0.1	6.3		5.2			3.4	
256.	64	4	18	qtz c	fl		n	p	0			htz	0.1	7.2		5.6			1.8	
257.	64	3	1	vol gg	fl		n	bl	0			htz	3.4	16.7		34.9			5.5	
258.	64	3	2	sil g	fl		n	pl	0			htz	2.7	21.3		18			3.6	
259.	64	3	3	sil g	fl		n	m	0				1.8	15.7		16.2			4.6	
260.	64	3	4	sil g	hs				0				0.3	11.6		10.5			1.6	
261.	64	3	5	sil g	fl		n	m	0				0.2	13.5		5.3			2.6	
262.	64	3	6	sil g	fl		n	p	0			htz	0.3	11.7		6.5			2.7	
263.	64	3	7	sil g	fl		n	p	0			htz	0.2	9.5		6.4			2.6	
264.	64	3	8	sil g	fl		y		0			htz	0.1	11.7		6.5			1.4	
265.	64	3	9	sil g	fl		y		0			htz	0.1	6.5		9.2			1.6	
266.	64	3	10	sil g	fl		n	p	40	irregular	dorsal	htz	0.1	4.9		9.1			1.7	
267.	64	3	11	sil g	fl		n	m	0				0.1	5.7		7.9			2.1	
268.	64	3	12	sil g	fl	backed	n	m	0				0.1	9.3		5.9			1.8	
269.	64	3	13	sil g	fl		n	dl	0				0.1	8.9		3.1			1.3	
270.	64	3	14	sil g	fl		n	pl	0			htz	0.6	14		8.3			4.8	
271.	64	3	15	sil g	hs				0				0.4	9.7		7			5.2	
272.	64	3	16	sil g	fl		n	m	0				0.1	4.9		9.5			3	
273.	64	3	17	sil g	fl		n	p	20	unknown	dorsal	htz	0.3	10		8.9			2.5	



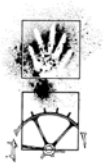
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
274.	64	3	18	sil g	pl				0				0.1	8.6		4.9			1.4	
275.	64	3	19	qtz m	fl		y		20	irregular	dorsal	htz	2.4	19	13	14.4	12	8.7	6.2	4.3
276.	64	3	20	qtz m	fl		y		40	irregular	both	htz	10.9	22.8	26.8	35.2	25.7	10.9	8.5	4
277.	64	3	21	qtz m	fl		n	r	0			htz	4.7	25.3		10.1			11.9	
278.	64	3	22	qtz g	fl		n	p	0			htz	0.2	7.2		9			2.6	
279.	64	3	23	qtz m	fl		n	l	10	irregular	dorsal	htz	3	19.9		11.4			8.8	
280.	64	3	24	qtz c	fl		n	l	0			htz	0.2	10.5		5.1			3.6	
281.	64	3	25	qtz m	fl		n	d	0				0.1	5.1		6.5			1.8	
282.	64	2	1	qtz m	fl		n	p	0			htz	0.1	5.3		8.6			1.8	
283.	64	2	2	qtz c	fl		n	d	0				0.4	14.4		7.4			2.9	
284.	64	2	3	qtz m	fl		n	d	20	irregular	dorsal		0.1	12.2		5			2.1	
285.	64	2	4	qtz m	fl		n	p	0			htz	0.2	6.7		10			2.5	
286.	64	2	5	sil g	fl		y		50	irregular	both	htz	4.1	16	31.6	31.9	20.1	7.1	5.7	3.1
287.	64	2	6	sil g	fl		n	m	0				0.4	16.5		8.2			2	
288.	64	2	7	sil g	fl		n	p	0			htz	0.1	8.4		10.6			1.5	
289.	64	2	8	sil g	fl	backed	n	m	0				0.4	9		11.2			3.3	
290.	64	2	9	sil g	fl		n	pr	40	irregular	dorsal	htz	0.4	18.6		8.1			3.7	
291.	64	2	10	vol p	fl		n	d	10	irregular	dorsal		2	18.2		18.3			5.8	
292.	68	4	1	qtz m	fl		y		20	irregular	platform	htz	1.4	16.3	11	13	8.9	6.5	6.1	4.3
293.	68	4	2	qtz c	fl		n	l	30	irregular	both	htz	2.2	19.4		11.6			5.8	
294.	64	6	1	sil g	fl		n	m	0				0.1	13.9		3.9			2.1	
295.	64	6	2	qtz m	fl		n	r	0			htz	0.8	14.3		9.9			6.3	
296.	64	6	3	qtz c	fl		n	p	0			htz	0.4	9.7		12.2			4.5	
297.	63	5	1	qtz m	fl		n	p	0			htz	0.7	13.9		10.6			3.1	
298.	63	5	2	qtz m	fl		n	mrg	0			htz	0.5	11.5		11.5			3.6	
299.	63	5	3	qtz c	fl		n	r	0				0.1	8.9		3.8			1.4	
300.	68	7	1	qtz m	fl		y		0			htz	0.4	8.7		10.6			3.1	
301.	66	1	1	qtz c	fl		n	pr	0			htz	1.8	13.6		11.6			7.1	
302.	63	3	1	qtz c	fl		n	d	0				1.4	4.5		4.6			0.9	
303.	66	2	1	sil r	fl		n	pl	10	rounded	platform	htz	5.9	24		18			10.5	
304.	66	2	2	qtz m	fl		y		0			htz	1.3	12		13.8			5.3	
305.	66	2	3	qtz m	fl		n	pr	0			htz	3	16.6		10.1			5.8	
306.	6	5	1	qtz c	fl	geome	y		0			htz	0.5	13.1	5.7	9.1	5.4	3.1	3.8	3
307.	18	2	1	vol b	fl		y		0			htz	0.7	25.4	7.4	10.6	6.3	2.6	2.7	1.8
308.	5	1	1	sil g	fl		n	dr	30	irregular	dorsal		3.2	14.1		18.7			9	
309.	3	1	1	sil g	fl		n	dr	0				0.1	6.5		6.3			3.1	
310.	3	1	2	sil g	fl		n		0			htz	0.3	10.9		5.5			4.1	
311.	12	3	1	uk	hm		y		95	rounded	all		251.1	84.4		57.2			27.2	
312.	6	3	1	qtzt	hm		n	split	60	rounded	all		106.2	58.7		56.6			22.6	



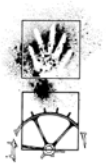
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
313.	2	3	1	qtz c	fl		n	dl	0				0.2	10.1		9.3			1.7	
314.	13	spo	1	uk	grst		n	split	80	rounded	all		579.1	90.2		84.7			40.5	
315.	12	2	1	uk	grst		n	split	50	rounded	all		15.5	52.6		35.7			15.6	
316.	44	4	1	qtz c	fl		n	m	0				0.2	6.8		7.7			2.6	
317.	44	4	2	qtz c	fl		y		10	irregular	dorsal	htz	0.2	9.3		5.5			3.8	
318.	44	4	3	qtz m	fl		y		20	irregular	dorsal	htz	0.9	9.4		16			4.4	
319.	36	3	1	vol	fl		y		60	rounded	dorsal	htz	30.4	47.6	20.1	35.2	17.5	10.2	16.9	7.7
320.	36	3	2	uk	fl		y		100		all	htz	4.8	18	20.2	14	4.7	12	8	1.8
321.	36	3	3	vol b	fl		n	p	0			htz	0.3	8.8		11.7			1.9	
322.	36	3	4	che r	hs				0				0.6	15.6		8.9			6.7	
323.	36	3	5	qtz c	fl		n	d	0				0.1	6.2		3.9			0.9	
324.	45	1	1	qtz m	fl		n	d	0				0.1	13.4		7.1			2	
325.	45	1	2	qtz c	fl		y		0			htz	0.2	9.8		8			2.9	
326.	45	1	3	qtz g	fl		y		0			htz	0.1	8.8		7.4			2.4	
327.	45	1	4	qtz c	fl		n	d	0				0.1	7		4.1			1.8	
328.	45	1	5	qtz c	fl		y		0			htz	0.1	7.7		6			1.3	
329.	42	1	1	qtz c	fl		n	d	0				0.1	8.9		5.1			1.3	
330.	36	2	1	vol g	fl		y		0			htz	0.1	6		12.5			1.8	
331.	36	2	2	qtz m	fl		y		20	irregular	dorsal	htz	3.1	27.8	15.4	17.7	9	7.9	5.4	3.8
332.	36	2	3	qtz c	fl		n	m	20	irregular	dorsal		0.2	8		10.3			2.5	
333.	36	2	4	qtz c	fl		y		0			htz	0.1	5.2		6.3			1.8	
334.	42	4	1	qtz m	fl		n	m	0				0.3	10.4		6.3			2.8	
335.	39	3	1	sil g	fl	burin	y		0			htz	7.2	27.3	18.2	18	13.5	8.9	12.3	10.9
336.	37	2	1	qtz g	fl		n	p	0			htz	0.5	4.6		14.5			4.8	
337.	37	2	2	qtz c	fl		n	d	10	irregular	dorsal		0.1	6.5		7.7			1.8	
338.	37	2	3	qtz c	fl		n	d	10	irregular	dorsal		0.1	7.9		8.5			2.7	
339.	37	2	4	qtz m	fl		n	mrg	10	irregular	platform	htz	0.1	4		5.9			1.4	
340.	34	1	1	sil g	fl		n	m	0				0.3	12.4		7.5			2.9	
341.	34	1	2	vol g	fl		n	l	0			htz	5.5	26.3		19.4			7.9	
342.	34	1	3	qtz m	gfl		n	p	0			htz	0.2	7.3		10.9			2	
343.	34	1	4	sil p	fl		n	p	0			htz	0.1	7.5		4.5			1.7	
344.	34	1	5	qtz m	fl		y		0			htz	1.1	11.5		11.7			5.7	
345.	37	3	1	uk	fl		n	l	10	irregular	dorsal	htz	0.4	12.5		8.6			2.3	
346.	37	3	2	qtz g	fl		y		80	irregular	dorsal	htz	1.7	16.1	21.2	17.4	2.9	5.2	4.9	2.4
347.	37	3	3	che r	fl		n	l	20	irregular	platform	htz	6.5	28.3		12.3			12.2	
348.	36	5	1	qtz m	fl		n	m	0				0.2	7.1		8.9			17.1	
349.	36	5	2	qtz c	fl		n	p	0			htz	0.1	6		4.3			1.7	
350.	44	1	1	qtz m	fl		n	p	0			htz	0.1	6.9		7.5			1.8	
351.	44	1	2	qtz m	fl	backed	n	m	0				0.2	12.7		7.7			1.8	



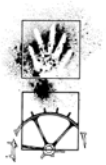
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
352.	44	1	3	qtz m	fl		n	p	0			htz	0.1	6.3		5.7			0.9	
353.	36	4	1	qtz c	fl		n	p	0			htz	0.1	5.5		4.1			1.2	
354.	37	1	1	qtz m	fl		n	l	0			bip	0.3	10.8		4.8			3.8	
355.	37	1	2	qtz c	fl		y		10	irregular	dorsal	htz	0.2	6.5		7.1			2.4	
356.	37	1	3	qtz c	fl		y		0			htz	0.1	5.8		5.4			2.2	
357.	37	4	1	qtz c	fl		n	pmrg	20	irregular	dorsal	htz	3.8	27.5		23.5			4.9	
358.	37	4	2	qtz c	fl		y		0			htz	0.1	12.4	4	5.7	2.8	0.9	1.2	0.8
359.	37	4	3	qtz m	fl		y		0			htz	0.7	9.2		11.1			5	
360.	37	4	4	qtz m	fl		y		10	irregular	platform	htz	0.2	10		6.6			2.8	
361.	37	4	5	qtz clr	fl		n	r	10	irregular	dorsal	htz	0.2	9.8		4.4			3.2	
362.	38	3	1	qtz m	fl		n	p	0			htz	0.1	5.4		6.7			1.1	
363.	40	1	1	qtz g	fl		n	l	0			htz	0.3	7.6		9			3.5	
364.	40	1	2	qtz m	fl		y		0			htz	0.1	7.3		7.7			1.7	
365.	40	1	3	qtz c	fl		n	l	30	irregular	r	htz	0.1	6		4.9			1.7	
366.	39	1	1	sil b	fl		y		0			htz	0.9	18.9	8.9	13.4	11.7	4.6	2.9	1.9
367.	36	1	1	vol g	fl		n	r	10	rounded	dorsal	htz	8.3	46.4		17.7			8.8	
368.	37	5	1	qrz clr	fl		n	pr	0			htz	0.2	10.7		6.4			2.9	
369.	37	5	2	qtz c	co		y		10	irregular	distal	htz	11.1	23.1		18.5			16	
370.	37	5	3	qtz m	fl		n	ml	0				0.2	6.3		7			2.9	
371.	41	2	1	qtz c	fl		y		0			htz	0.3	8.4		9.2			2.7	
372.	38	7	1	qtz c	fl		n	p	0			htz	0.1	5.7		6.4			1.2	
373.	38	7	2	qtz c	fl		n	p	10	irregular	platform	htz	0.1	6.4		6.3			2.3	
374.	41	1	1	sil b	fl	backed	n	m	0				0.3	19.1		6.2			2.7	
375.	41	1	2	uk	fl		n	r	50	irregular	dorsal	htz	55.2	60		46.1			15.6	
376.	41	1	3	qtz m	fl		n	pr	50	irregular	both	htz	0.1	7.9		5.6			2.8	
377.	39	4	1	qtz m	fl		y		0			htz	0.1	6		5.9			1.7	
378.	39	4	2	qtz g	fl		n	d	0				0.1	5.9		8.6			2.4	
379.	40	3	1	qtz g	fl		y		50	irregular	dorsal	htz	0.9	21.1	6.9	9.6	9.7	3.4	4.2	4.4
380.	41	1	4	qtz c	fl		n	d	0				0.1	5.6		7.8			1.2	
381.	35	1	1	uk	fl		n	d	0			htz	0.3	14		8.7			2.8	
382.	35	1	2	qtz m	fl		y		0			htz	0.9	10.6		9.6			7.6	
383.	35	1	3	qtz c	fl		y		20	irregular	dorsal	htz	0.1	10.5		4.2			3.2	
384.	35	2	1	uk	fl		y		80	irregular	dorsal	htz	1.2	14.6		20.1			2.7	
385.	35	2	2	qtz c	fl		y		0			htz	0.3	8.5		7.3			2.8	
386.	35	spo	1	qtz m	fl		n	pl	0			htz	0.2	9.9		7.6			1.3	
387.	50	1	1	qtz c	fl		n	l	0			htz	0.1	10.4		4.5			3.2	
388.	56	5	1	qtz m	fl		n	mrg	0			htz	0.4	11		9.5			3.1	
389.	56	5	2	qtz c	fl		y		0			htz	0.3	8		8.4			3.3	
390.	56	5	3	qtz c	fl		n	p	40	irregular	dorsal	htz	0.3	8.1		7.2			3.6	



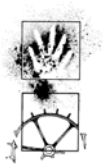
Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
391.	56	4	1	qtz c	fl		y		0			htz	0.1	4.8		6.4			2.3	
392.	56	4	2	qtz m	fl		y		0			htz	0.2	7.5		6.8			3.3	
393.	56	4	3	qtz m	fl		n	dl	0				0.1	7.8		4.4			1.7	
394.	56	4	4	qtz m	fl		n	p	0				0.1	6.1		6.5			2.5	
395.	48	3	1	qtz c	fl		n	d	60	irregular	dorsal		0.7	11.6		10.1			5.4	
396.	48	3	2	qtz c	fl		y		20	irregular	platform	htz	1.4	17	9.7	9	7.9	5.6	5.8	4.2
397.	48	3	3	qtz c	fl		y		30	irregular	dorsal	htz	0.1	6.7		5.3			2.4	
398.	47	3	1	qtz c	fl		y		0			htz	0.1	4.8		7.7			1.9	
399.	47	3	2	qtz m	fl		y		0			htz	0.1	5.1		7.4			2	
400.	52	4	1	qtz c	fl		n	d	0				0.1	8.9		8.5			1.9	
401.	48	2	1	qtz c	fl		n	p	0			htz	0.1	5.9		5.8			1.5	
402.	48	1	1	qtz c	fl		y		20	irregular	both	htz	19.9	34.3	27.9	32.2	26.2	10.4	9.3	12.6
403.	48	1	2	qtz c	fl		y		10	irregular	dorsal	htz	0.1	7.8		7.6			2.4	
404.	48	1	3	qtz c	fl		n	r	0			htz	0.1	8.1		3.2			3.2	
405.	48	1	4	qtz c	fl		n	p	10	irregular	dorsal	htz	0.1	7.5		5.3			1.4	
406.	48	1	5	qtz m	fl		y		0			htz	5.7	26.8	13.8	16	8.9	4.8	11.7	5
407.	48	1	6	qtz c	fl		y		10	irregular	dorsal	htz	0.1	5.2		6.3			1.1	
408.	60	1	1	qtz c	fl		n	mrg	0			htz	0.1	8.4		4.9			1.6	
409.	60	1	2	sil g	fl		y		0			htz	0.2	6.9		8.7			3.2	
410.	60	1	3	sil g	fl		n	p	0			htz	0.1	5.6		6.9			1	
411.	60	1	4	qtz c	fl		n	l	20	irregular	platform	htz	0.3	10.1		6.4			3.8	
412.	60	1	5	qtz m	fl		n	r	0			htz	0.1	8.2		4.4			3.1	
413.	60	1	6	qtz m	fl		y		10	irregular	dorsal	htz	2.1	16.5	10.5	13	6.9	8.3	9.1	2.7
414.	60	1	7	qtz c	fl		n	d	0				0.1	4.8		7.7			1.1	
415.	60	1	8	qtz m	fl		y		50	irregular	dorsal	htz	0.8	10.8		10			5.9	
416.	57	1	1	qtz c	fl		n	mrg	20	irregular	dorsal	htz	0.4	14.8		9.4			2.2	
417.	57	1	2	qtz m	fl		y		0			htz	1.6	14.1		14.2			4.5	
418.	57	1	3	qtz m	fl		y		0			htz	0.2	8.2		6.5			2.4	
419.	60	3	1	qtz m	fl		n	p	0			htz	0.4	9.9		7.3			4.2	
420.	60	3	2	qtz c	fl		n	r	0			htz	0.1	9		3.9			2.3	
421.	60	3	3	qtz c	fl		n	p	0			htz	0.1	11.5		5.8			1.8	
422.	60	3	4	qtz c	fl		n	r	30	irregular	dorsal	htz	0.5	12.7		8.9			3.5	
423.	60	3	5	sil g	fl		n	p	0			htz	0.2	16.8		6.9			1.5	
424.	60	3	6	sil g	fl		y		0			htz	0.2	9.6		9.1			2.6	
425.	57	4	1	qtz m	fl		y		0			htz	0.1	6.7		5.7			2.2	
426.	57	4	2	qtz m	fl		y		30	irregular	dorsal	htz	1.7	13.1		16.2			5.8	
427.	57	4	5	qtz m	fl		n	p	10	irregular	platform	htz	0.3	9.9		8.8			2	
428.	57	4	6	qtz c	fl		n	l	0			htz	0.1	6.6		7			1.4	
429.	61	1	1	sil g	fl		y		0			htz	0.2	11.6		8.3			1.5	



Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
430.	61	4	1	qtz m	fl		y		40	irregular	dorsal	htz	0.1	6.4		9.7			2.2	
431.	61	4	2	qtz c	fl		y		30	irregular	dorsal	bip	0.2	11.7		8.3			2.7	
432.	61	4	3	qtz c	fl		y		0			htz	0.2	8.5		9.1			1.7	
433.	60	8	1	qtz c	fl		n	mrg	20	irregular	platform	htz	0.1	7.1		5.2			0.9	
434.	60	8	2	sil g	fl	backed	n	d	5	unknown	dorsal		0.2	8.7		7.3			2.5	
435.	60	8	3	qtz m	fl		y		0			htz	0.1	6.9		7.1			2.3	
436.	60	8	4	qtz m	fl		y		0			htz	0.1	8.6		4.8			1.1	
437.	58	1	1	qtz c	fl		n	p	0			htz	0.1	7.6		5.7			1.1	
438.	58	1	2	qtz m	fl		y		0			htz	0.6	12.6		11.2			3.1	
439.	60	6	1	qtz m	fl		y		0			htz	0.1	6.5		8.7			1	
440.	60	6	2	qtz m	fl		y		0			htz	0.1	9.1		6.5			1.9	
441.	60	6	3	qtz m	fl		n	pl	0			htz	0.1	11.4		7.3			1.9	
442.	60	6	4	qtz c	fl		n	d	20	irregular	dorsal	htz	0.1	7.9		5.5			1.7	
443.	60	6	5	qtz c	fl		n	mrg	0			htz	0.4	12.5		11.7			2.4	
444.	60	7	1	qtz c	fl		y		0			htz	0.1	6.8		4.7			1.9	
445.	60	7	2	qtz m	fl		y		0			htz	0.1	8.4		6.9			1.8	
446.	60	7	3	qtz m	fl		n	dl	0			htz	0.4	8.9		5.8			3.2	
447.	60	7	4	qtz c	fl		n	l	10	irregular	dorsal	htz	0.6	7		7.2			6.1	
448.	47	2	1	qtz m	fl		y		30	irregular	dorsal	htz	10.7	35.2	28.1	22	6.9	10.1	9	5.5
449.	47	2	2	qtz c	fl		y		0			htz	0.2	8		7.7			3.3	
450.	54	4	1	qtz c	fl		n	l	0			htz	0.1	5.5		7.6			1.2	
451.	54	4	2	qtz c	fl		y		10	irregular	platform	htz	0.1	7.8		6.2			1.8	
452.	59	5	1	qtz m	fl		n	p	0			htz	1	13.7		16.4			3.4	
453.	58	6	1	qtz c	fl		y		0			htz	0.2	11.8		6.8			1.6	
454.	58	6	2	qtz m	fl		y		50	irregular	dorsal	htz	0.3	12.6		5.5			3.6	
455.	59	3	1	qtz c	fl		y		10	irregular	dorsal	htz	0.5	11.8		9.1			3.1	
456.	57	3	1	qtz c	fl		y		25	irregular	dorsal	htz	0.2	6.5		13.8			2.8	
457.	57	3	2	qtz c	fl		y		0			htz	0.1	7.3		6.5			2.7	
458.	57	3	3	qtz c	fl		y		80	irregular	dorsal	htz	0.9	14.7		10			3.7	
459.	57	3	4	qtz m	fl		y		10	irregular	dorsal	htz	2.2	17.1	7.3	11.7	4.6	10.6	12.6	2.2
460.	62	5	1	qtz c	fl		y		20	irregular	platform	htz	1.2	16.9	12.6	12.6	3	6.3	4.1	2
461.	62	5	2	qtz c	fl		y		20	irregular	platform	htz	3.6	16.7		21.8			4.3	
462.	62	5	3	qtz m	fl		n	l	20	irregular	dorsal	htz	0.9	16.6		6.8			4	
463.	62	5	4	qtz c	fl		y		10	irregular	platform	htz	0.1	9		5.7			2.9	
464.	60	4	1	vol b	fl		n	p	0			htz	3.7	18.5		17.9			7.1	
465.	60	5	1	sil g	fl		y		0			htz	0.2	12.2		6.5			2.3	
466.	60	5	2	qtz c	fl		y		0			htz	2.6	24.3	7.9	14.1	15.6	5.4	6.6	4.2
467.	60	5	3	sil g	fl		n	p	10	irregular	platform	htz	0.1	6.1		7			1.7	
468.	54	7	1	qtz m	fl		n	p	20	irregular	platform	htz	0.1	5.4		6.5			1.6	

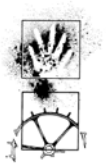


Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
469.	57	2	1	qtz c	fl		y		40	irregular	dorsal	htz	0.6	13.4		9.6			4.4	
470.	57	2	2	qtz m	fl		n	p	0			htz	0.1	5.5		6.9			1.9	
471.	61	3	1	qtz m	fl		y		10	irregular	dorsal	htz	0.2	11.2		5.9			2.6	
472.	60	5	4	qtz c	fl		n	p	0			htz	0.2	10.6		7.7			2.2	
473.	53	6	1	qtz c	fl		y		0			htz	3.8	18.9	23.3	24		4.9	4.9	5.3
474.	54	6	1	qtz m	fl		n	r	0			htz	0.7	11.9		9.5			3.3	
475.	61	2	1	qtz c	fl		y		50	irregular	dorsal	htz	14.5	35.4	16.6	23.3	19.2	8.2	9.9	4.4
476.	62	4	1	qtz c	fl		y		30	irregular	dorsal	htz	1.8	13		16.5			6.2	
477.	62	4	2	qtz m	fl		y		40	irregular	dorsal	htz	3.2	33.2	11.8	14.8	5.6	3.3	6.7	3.5
478.	62	4	3	qtz c	fl		n	p	0			htz	0.2	10.6		8.5			2.2	
479.	62	4	4	qtz c	fl		n	p	10	irregular	platform	htz	0.6	12.6		10.5			4	
480.	62	4	5	qtz m	fl		y		30	irregular	platform	htz	0.1	5.7		8.8			2	
481.	48	4	1	qtz c	fl		y		0			htz	0.2	13.3		5.1			3.1	
482.	48	4	2	qtz m	fl		y		20	irregular	dorsal	htz	0.1	7.9		6.3			1.8	
483.	48	4	3	qtz c	fl		y		40	irregular	dorsal	htz	1.6	15.1	13.4	13.7	7.2	3	4.4	5.7
484.	53	4	1	qtz c	fl		y		0			htz	2.9	25.7	11.8	13.1	12.5	5.6	7	4.6
485.	53	4	2	qtz c	fl		n	pr	0			htz	0.1	8.7		5.4			2.2	
486.	54	5	1	qtz m	fl		n	p	40	irregular	dorsal	htz	1.2	14.7		10.2			6.6	
487.	54	5	2	qtz c	fl		n	dr	30	irregular	dorsal	htz	0.4	10.3		8.1			3.3	
488.	52	7	1	qtz c	fl		n	mrg	0				0.1	8.2		3.9			1.3	
489.	49	1	1	qtz c	fl		y		50	irregular	dorsal	htz	3.9	19.1	11.7	13	10.8	8.4	10.3	7.9
490.	49	1	2	qtz m	fl		y		20	irregular	platform	htz	0.1	5.2		8.9			1.9	
491.	49	1	3	qtz c	fl		n	pr	60	irregular	dorsal	htz	0.1	7		4.9			2	
492.	54	3	1	qtz c	fl		n	l	50	irregular	dorsal	htz	0.2	10.5		5.9			3.3	
493.	54	3	2	qtz c	fl		n	r	0			htz	0.2	8.4		6.7			2.4	
494.	48	6	1	qtz c	fl		y		10	irregular	dorsal	htz	0.2	10		7.4			1.8	
495.	48	6	2	qtz c	fl		n	p	0			htz	0.1	9.4		7.9			1.8	
496.	56	3	1	qtz m	fl		y		0			htz	0.1	9.1		5			2.1	
497.	60	2	1	sil g	fl		n	p	0			htz	0.3	8.8		11.3			2.3	
498.	48	5	1	qtz m	fl		y		5	irregular	dorsal	htz	0.4	12.3		6.5			4.6	
499.	53	2	1	qtz c	fl		n	r	20	irregular	platform	htz	0.6	12.3		8.5			3.3	
500.	56	2	1	qtz c	fl		y		0			htz	1.4	13.5		12			5.6	
501.	59	2	1	uk	hs				10	irregular			1	19.3		14.2			3	
502.	59	2	2	qtz c	fl		y		0			htz	0.4	10.2		12.6			3	
503.	52	9	1	qtz c	fl		y		10	irregular	dorsal	htz	0.3	10.1		10.1			2.4	
504.	18	3	1	qtz	fl		n	d	0			htz	1.2	11		13.6			6.3	
505.	51	2	1	qtz	fl		y		20	irregular	dorsal	htz	1.9	17.3	13.8	19.9	19.5	4.9	5.8	2.2
506.	49	7	1	qtz	fl		n	r	10	irregular	dorsal	htz	0.2	10.2		8.2			2.1	
507.	56	6	1	qtz	fl		n	mrg	0			htz	0.1	6.3		6.2			2.7	

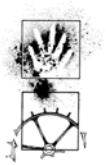


Item No	Pit No	Spit No	Aft No	Material	Tech Class	Type Class	Complete	Break	Cortex %	Cortex Type	Cortex Loc	Initiation	Weight	Length perc	Width p	Width m	Width d	Thick p	Thick m	Thick d
508.	49	3	1	qtz	fl		y		10	irregular	platform	htz	0.1	7.3		4.4			1.6	
509.	58	4	1	qtz	fl		y		0			htz	1.7	16	8.3	10.7	14.9	2.8	7.1	7.7
				qtz=quar	fl=flake		y=yes	p=proximal				htz=hertzian								
				sil=silcre	fp=flaked piece		n=no	m=medial				bip=bipolar								
				vol=volc	co=core			d=distal												
				che=che	grst=grindstone			l=left												
				qtzt=qua	hm=hammerstone			r=right												
				uk=unkn	pl=potlid			mrg=marginal												
				c=clear	hs=heat shatter															
				b=brown																
				g=grey																
				gg=greygreen																
				p=pink																
				r=red																
				m=milky																

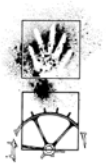
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
1.	25		2.3	1		86	0	1	0	0	0	0		y	n	y	n	2		0
2.	25	14.4	5.8	2		77	0	2	0	0	0	0		n	n	n	pl	3		0
3.	25							7	4	2	1	1	f	n	n	n	n	6		0
4.	25	26.6	9.5	1		53	0	3	2	1	0	0	f	y	n	n	c	8		0
5.	25		4.1		cr			1	0	0	0	0	f	n	n	n	n	4		0
6.	25				cr			1	0	0	0	0		n	n	n	n	2		0
7.	25				cr									n		n	n	0		0
8.	23							2	0	0	0	0	f	y	n	n	n	5		0
9.	23							5	2	0	1	1	o	n	n	n	n	3		0
10.	23							3	1	0	0	0		n	n	n	n	2		0
11.	23	8.8	7.8	1		67	0	2	0	0	1	0	f	n	n	n	n	8		0
12.	23	19.1	7.3	4		80	0	6	2	0	2	0	h	y	n	y	n	8		0
13.	23	12.7	4.9	1		93	0	3	2	0	1	0	s	n	n	n	n	8		0
14.	23							3	0	0	0	1	f	n	n	n	n	5		0
15.	23							4	0	0	0	0		y	n	n	n	2		0
16.	23																pl			



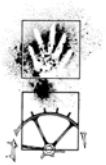
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
17.	23	8.3	2.4	2		85	0	3	3	1	0	0	o	y	n	n	c	7		0
18.	23	0						3	0	0	0	0	f	y	n	y	g	7		0
19.	23							0	0	0	0	0	f	y	n	y	g	3		0
20.	23	9.3	2.8	1		68	0	4	1	1	0	0	f	y	n	y	n	8		0
21.	23	6.7	0.6	1				3	2	1	1	0		n	n	n	n	3		0
22.	23	11.5	7.7	1		43	0	3	1	0	1	0	o	y	n	y	n	8		0
23.	23		6.5	1		63	0	1	0	0	0	0		n	n	n	g	3		0
24.	23							3	1	1	0	0	f	n	n	n	n	3		0
25.	23	10.3	5.5	2		77	0	2	1	0	0	0	f	n	n	n	n	5		0
26.	23	30	15		cr	52	0	2	0	0	0	0		y	n	y	n	2		0
27.	23				cr		0	1	0	0	0	0		n	n	n	n	5		0
28.	23	8.9	4.7	1		107	0	2	0	0	0	0		n	n	n	n	3		0
29.	23		4.9	1		76	0	8	6	4	1	0	f	y	n	y	c	7		0
30.	23				cr		0	4	2	2	0	0	b	y	n		n	8		0
31.	23							2	0	0	0	0		n	n	n	n	2		0
32.	23		2.4	1		74	0	1	0	0	0	0		n	n	n	n	1		0
33.	23		2.9	1		83	0	3	0	0	0	0	f	y	n	y	c	5		0
34.	24	14.5	3.5	1		66	1	2	0	0	0	0	f	y	n	y	n	5		0
35.	24							2	1	0	0	0	f	n	n	y	n	3		0
36.	24		4.3	1		70	0	2	0	0	0	0	f	n	n	n	n	4		0
37.	24													n	n	n	g	0		0
38.	24							2	0	0	0	0	f	n	n	n	n	3		0
39.	24		4.1	1			0	3	0	0	0	0		n	n	n	n	2		0
40.	24	9.4	3.1	1		74	0	3	0	0	1	0	f	n	n	n	n	5		0
41.	24		3.5	1		110	0	4	2	2	1	0	f	n	n	n	n	5		0
42.	24				cr		0	1	0	0	0	0	f	n	n	n	n	8		0
43.	24		4.7	1		68	0	3	1	0	1	0		n	n	n	n	3		0
44.	24	15.4	5.6	1		50	0	2	1	0	0	0	h	y	n	y	n	8		0
45.	24	15.9	5.3	1		59	0	2	1	1	0	0		y	n	y	n	5		0
46.	24							3	1	0	0	0		n	n	y	n	2		0
47.	24							3	0	0	0	0		y	n	y	n	2		0
48.	24							1	1	0	0	0		n	n	n	n	2		0
49.	24	2.6	0.5	1			0	4	2	0	0	0	o	n	n	n	n	8		0
50.	24																			
51.	24	10.8	6.7	1		42	0	4	1	0	1	0	f	n	n	n	n	5		0
52.	24						1						f	n	n	n	n	5	yes	2
53.	24	9.3	9	1			0	5	0	0	1	0	f	n	n	n	n	8		0
54.	24							2	0	0	0	0		y	n	y	n	4		0



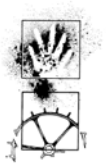
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
55.	24		2.4	1		84	0	1	0	0	0	0		n	n	n	n	1		0
56.	24		1.4	1			0	2	0	0	0	0		n	n	n	n	2		0
57.	24	12.5	5.4	1		94	0	2	0	0	0	0		y	n	y	n	7		0
58.	24							2	0	0	0	0	f	y	n	y	n	5		0
59.	24				cr			1	0	0	0	0	f	n	n	n	n	8		0
60.	32	10.4	2.8	1		0	0	3	1	0	0	0	f	n	n	n	n	8		0
61.	32																			
62.	32							3	1	1	0	0	f	n	n	n	n	7		0
63.	32							5	1	1	0	0		n	n	n	n	3		0
64.	32	3.8	1.9	1			0	2	0	0	0	0	f	n	n	n	n	8		0
65.	32							3	0	0	0	0		n	n	n	n	2		0
66.	32		4.1	1		72	0	2	0	0	0	0		n	n	n	n	2		0
67.	32													n	y	n	n			
68.	22																			
69.	22				cr			3	1	1	0	0		n	n	n	n	2		0
70.	22				cr			2	0	0	0	0		n	n	n	n	3		0
71.	22				cr			1	0	0	0	0		n	n	n	n	3		0
72.	22	3.8	2.8	1		85	0	1	0	0	1	0	f	n	n	n	n	8		0
73.	22																			
74.	22	4.6	1.2	1		109	0	2	0	0	0	0		y	n	y	n	4		0
75.	22		6.3		co	86	0	3	0	0	0	0		n	n	n	n	3		0
76.	22							2	0	0	0	0	f	n	n	n	n	3		0
77.	22		3.4	1		75	0	2	1	1	0	0	f	n	n	y	n	6		0
78.	22		2.7	1		67	0	2	0	0	0	0		n	n	n	n	2		0
79.	22		2.2	2		76	0	1	0	0	0	0		n	n	n	n	2		0
80.	22	10.9	4.2	1		81	0	3	1	0	0	0	s	n	n	n	n	8		0
81.	22	4.3	1.2	1			0	2	0	0	0	0		n	n	n	n	3		0
82.	22				cr		0	2	0	0	0	0		n	n	n	n	2		0
83.	22	5.7	1.8	1			0	2	0	0	1	0		n	n	n	n	3		0
84.	22		3.8	1			0	1	0	0	0	0	f	n	n	n	n	5		0
85.	22				cr		0	2	0	0	0	0	f	n	n	n	n	7		0
86.	22				cr			4	1	1	1	0	f	y	?	n	n	6		0
87.	22	13	5.2	1		75	0	3	1	1	0	0	cr	n	n	n	n	8		0
88.	22		2.2	1		80	0	3	2	1	1	0	f	n	n	n	n	5		0
89.	22				cr		0	3	0	0	0	0	s	y	n	n	n	7		0
90.	22							2	0	0	0	0	f	y	n	n	n	5		0
91.	22	2.4	0.8	1		86	0	3	0	0	0	0	o	n	n	n	n	8		0
92.	22	6.6	3.6	1		77	0	3	1	1	1	0	h	n	n	n	n	8		0



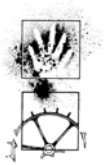
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
93.	22				cr		0	3	1	1	0	0	f	n	n	n	n	8		0
94.	22							2	0	0	0	0	f	n	n	n	n	2		0
95.	22				cr		0	1	0	0	0	0		n	n	n	n	3		0
96.	22	3.8	1.1	1			0	4	0	0	0	0	o	n	n	n	n	8		0
97.	22	3.9	1.1	1		86	0	2	0	0	0	0		n	n	n	n	4		0
98.	22				cr		0	2	0	0	0	0		n	n	n	n	3		0
99.	22							2	0	0	0	0	f	n	n	n	n	3		0
100.	22	4.8	1.6	2			0	2	0	0	0	0	o	n	n	n	n	8		0
101.	22							4	1	1	0	0		n	n	n	n	1		0
102.	22	4	3.4	1			0	1	0	0	0	0	cr	n	n	n	n	7		0
103.	22		1.6	1			0	1	0	0	0	0		n	n	n	n	1		0
104.	22							2	0	0	0	0	f	n	n	n	n	5		0
105.	22				cr			2	0	0	0	0		n	n	n	n	4		0
106.	22							2	1	1	0	0		n	n	n	n	2		0
107.	22		11.2	2			0	4	1	0	0	0		n	n	n	n	3		0
108.	22							3	0	0	0	0		n	n	n	n	6		0
109.	22	0.5	0.5	1			0	2	0	0	0	0	f	n	n	n	n	8		0
110.	22							2	0	0	0	0	f	y	n	n	n	5		0
111.	22	5.5	1.9	1			0	4	1	0	1	0	f	y	n		n	8		0
112.	31							1	0	0	0	0		y	n	y	n	3		0
113.	31																			
114.	26	9.2	5.5		fac	96	0	5	0	0	1	0		y	n	y	g	7		0
115.	26	11	4.3	1	co	65	0	2	1	1	1	0	f	n	n	n	n	8		0
116.	33	8.6	4.8	2		76	0	2	1	0	0	0	f	y	n	y	n	8		0
117.	33	18.8	4.9	2		74	0	2	0	0	0	0	f	y	n	n	n	8		0
118.	33	18.8	4.8	2			0	3	0	0	0	0		n	n	n	n	3		0
119.	33	10.9	2.2	1		74	0	2	0	0	0	0	f	n	n	n	n	8		0
120.	33		2.5	3			0	3	0	0	0	0		n	n	n	n	4		0
121.	33				cr		1	2	0	0	0	0	s	n	n	n	n	8		0
122.	33							2	0	0	0	0	f	n	n	n	n	5		0
123.	33				cr			4	0	0	0	1		n	n	n	n	5		0
124.	33				cr		1	2	0	0	0	0		n	n	n	n	3		0
125.	33				cr			1	0	0	0	0		n	n	n	n	2		0
126.	33	7.9	2.7	1			0	1	0	0	0	0	f	n	n	n	n	8		0
127.	33		6.3		co	57	0	1	0	0	0	0		n	n	n	n	4		0
128.	33	6	2.1	1			0	2	0	0	0	0		n	n	n	n	3		0
129.	33		3.5	1			0	1	0	0	0	0		n	n	n	n	3		0
130.	33							2	0	0	0	0	f	n	n	n	n	3		0



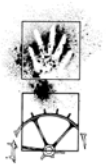
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
131.	33		9.2	1		59	0	1	0	0	0	0	f	n	n	n	n	5		0
132.	33	7.2	4.7	1		63	0	2	0	0	0	0	f	n	n	n	n	8		0
133.	33				cr			2	0	0	0	0	f	n	n	n	n	8		0
134.	33			0				2	0	0	0	0	f	n	n	n	n	3		0
135.	33	6.5	4.9	1				2	0	0	0	0	f	n	n	n	n	8		0
136.	33	23.8	7.1	1		71	0	3	0	0	0	0		y	n	y	n	6		0
137.	33	6.9	5	1		77	0	3	1	1	1	0	f	n	n	n	n	8		0
138.	33							1	0	0	0	0	f	n	n	n	n	3		0
139.	33	9.5	2.6	1			0	3	1	0	0	0		y	n	y	c	5		0
140.	33							4	3	2	0	0	f	n	n	n	n	3		0
141.	33				cr		0	2	0	0	0	0		n	n	n	n	4		0
142.	33				cr			3	0	0	0	2	b	y	n	n	n	8		0
143.	33	2.8	0.8	1			0	3	0	0	0	0	f	n	n	n	n	8		0
144.	33		6.4		co		0	3	0	0	0	0	f	n	n	n	n	7		0
145.	33	10.7	2.6	1		0	0	2	1	0	0	0		n	n	n	n	3		0
146.	21				cr		0	2	1	0	0	0	s	n	n	n	n	7		0
147.	21	24	17.6	3	co	62	0	3	0	0	0	0		y	n	y	n	7		0
148.	21		2.3	1				3	0	0	0	0	f	n	n	n	n	5		0
149.	21				cr			3	1	1	1	0		n	n	n	n	7		0
150.	21				cr		0	4	0	0	0	0		n	n	n	n	5		0
151.	21							2	0	0	0	0		n	n	n	n	2		0
152.	20		5.4	2			0	2	0	0	0	0	f	n	n	n	g	5		0
153.	29							3	0	0	0	0	f	n	n	n	n	5		0
154.	29		1.7	1				3	0	0	0	0	f	n	n	n	n	5		0
155.	29							2	0	0	0	0	s	n	n	n	n	7		0
156.	27	1.6	0.9	1			0	2	0	0	0	0	s	n	n	n	n	8		0
157.	27	14.8	5.4	1	co	82	0	3	1	0	0	0		y	n	n	n	4		0
158.	27							2	0	0	0	0	s	n	n	n	n	3		0
159.	27		14.6	1		80	0	5	2	2	0	0	o	n	n	n	n	5		0
160.	27		5.2	1			0	3	1	0	0	0	f	n	n	n	n	7		0
161.	27	6.2	2.2	1				4	0	0	0	0	s	n	n	n	n	8		0
162.	27	6.5	2.2	1				2	0	0	0	0	f	n	n	n	n	8		0
163.	19							3	1	0	0	0	f	n	n	n	n	5		0
164.	19				cr			3	1	1	0	0	f	y	n	y	n	8		0
165.	19							2	0	0	0	0	f	n	n	n	n	5		0
166.	19	7.8	6.9	1		62	0	2	0	0	0	0	f	n	n	n	n	8		0
167.	19		7.7	1		98	0	3	0	0	0	0		n	n	n	n	3		0
168.	19		2.7	1			0	3	0	0	0	0		n	n	y	n	3		0



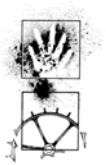
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
169.	19	7.3	2.7	1			0	4	1	0	0	0		n	n	n	n	7		0
170.	19		2.6	1				1	0	0	0	0		n	n	n	n	1		0
171.	19				cr			4	1	0	0	0	f	n	n	n	n	8		0
172.	19							3	0	0	0	0		y	n	y	n	4		0
173.	19				cr			2	0	0	0	0		y	n	n	n	5		0
174.	19	4.6	1.5	1			0	2	0	0	0	0		n	n	n	n	5		0
175.	19							3	1	1	1	0	h	n	n	y	pl	5		0
176.	19	8.6	1.2	2			0	4	2	2	1	0		y	n	n	n	5		0
177.	19		6.8	1			0	2	0	0	0	0		n		n	n	3	yes	2
178.	19		3.5	1		80	1	3	1	0	0	0	f	n	n	y	n	5		0
179.	19	1.7	1.6	1				2	1	0	0	0		n	n	n	n	5		0
180.	19	6	1.7	1			0	2	1	1	1	0	f	n	n	n	n	8		0
181.	19				cr			1	0	0	0	0		n	n	n	n	5		0
182.	19							3	2	1	0	0	f	n	n	n	n	3		0
183.	28	2.9	1.3	1			0	3	1	0	0	0	f	n	n	n	n	8		0
184.	28							3	0	0	0	0	f	n	n	n	n	5		0
185.	28							1	0	0	0	0		y	n	n	n	3		0
186.	28	9.8	4.5	1		94	0	3	0	0	0	0	s	n	n	n	n	8		0
187.	28							5	0	0	0	0		y	n	n	n	4		0
188.	28	7.5	2.3	1			0	2	0	0	0	0		n	n	n	n	3		0
189.	28		2.8	1			0	3	0	0	1	0	1	n	n	n	n	5		0
190.	28							2	0	0	0	0	f	n	n	n	n	3		0
191.	28							2	0	0	0	0	f	n	n	n	n	3		0
192.	28		3.8	1			0	2	0	0	0	0		n	n	n	n	2		0
193.	28				cr			1	0	0	0	0		n	n	n	n	1		0
194.	28	3.7	1.6	1			0	1	0	0	0	0		n	n	n	n	5		0
195.	28				cr			2	0	0	0	0	s	y	n	y	n	8		0
196.	28	17.7	6.1	1		80	0	2	1	1	0	0	f	n	n	n	n	8		0
197.	64	12.2	1.4	3		83	0	2	0	0	0	0		n	n	y	n	2		0
198.	64							1	0	0	0	0	f	y	n	y	g	3		0
199.	64							3	0	0	0	2	ret	n	n	n	n	5	yes	2
200.	64				cr			2	0	0	0	0	f	n	n	n	n	5		0
201.	68				ret			4	2	0	0	0	ret	n	n	n	g	8	yes	5
202.	68				cr			3	1	1	0	0		n	n	n	n	2		0
203.	64				cr			3	1	0	0	1		n	n	n	n	5		0
204.	64		1.6	1			0	2	1	0	0	0		y	n	y	g	2		0
205.	64	2.9	1.5	1				2	0	0	0	0		n	n	n	n	5		0
206.	64	5.5	1.7	1				2	0	0	0	0		n	n	n	n	5		0



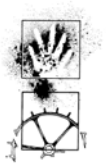
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
207.	64		1.2	1				1	0	0	0	0	f	y	n	y	n	5		0
208.	64							2	0	0	0	0		n	n	n	n	1		0
209.	64		1.8	1				2	0	0	0	0	f	n	n	n	n	5		0
210.	64							2	0	0	0	0	f	n	n	n	n	5		0
211.	64							1	0	0	0	0		n	n	n	n	3		0
212.	64							2						y	n	y	pl			
213.	66													y						
214.	66							3	1	0	0	0	f	n	n	n	n	5		0
215.	67	2.6	1.7	1			0	4	0	0	1	0	f	n	n	n	n	8		0
216.	67	4.4	2.1	1			0	4	2	1	0	0	f	y	n	n	n	8		0
217.	64	7.2	2.6	1		93	1	4	2	0	0	0		y	n	n	n	5		0
218.	64							5	3	1	1	1		y	n	n	g	3		0
219.	64				cr			3	1	1	0	0		n	n	n	n	5		0
220.	64				cr			1	0	0	0	0		y	n	n	n	5		0
221.	64							3	0	0	0	0	f	n	n	n	n	6		0
222.	64							2	0	0	0	0	f	n	n	n	n	5		0
223.	65		3.1	1				5	3	1	0	0	o	n	n	n	n	7		0
224.	63							2	0	0	0	0		n	n	n	n	4		0
225.	64																g, hs			
226.	64							3	0	0	0	0		n	n	n	g	2		0
227.	64						1	1	0	0	0	0		n	n	n	n	2		0
228.	64							4	0	0	0	0	f	y	n	y	n	7		0
229.	64	3.8	1.1	1				3	0	0	0	2		n	n	n	n	5		0
230.	64																pl			
231.	64							1	0	0	0	0	f	n	n	n	n	3		0
232.	64		5.6	1			0	2	0	0	0	0	f	n	n	n	g	5		0
233.	68							3	1	0	0	0	f	n	n	n	n	5		0
234.	68				cr			3	0	0	0	0		n	n	n	n	5		0
235.	65	3.9	2.5	1		94	0	7	0	0	2	0	o	n	n	n	n	8		0
236.	65							2	0	0	0	0	f	n	n	n	n	5		0
237.	65				cr			2	1	1	1	0		n	n	n	n	3		0
238.	65	2.8	1.3	1				2	0	0	0	0	s	n	n	n	n	7		0
239.	64	8.6	1.7	1			1	4	1	0	0	1		n	n	n	n	5		0
240.	64	5.8	1.7	1			0	3	0	0	0	0		n	n	n	g	7		0
241.	64							3	0	0	0	0	h	n	n	n	n	5		0
242.	64	4.7	1.2	1			0	4	0	0	1	3	o	n	n	n	g	8		0
243.	64	5	3	1			0	1	0	0	0	0	f	n	n	n	n	8		0
244.	64	5.3	2.7		fac		0	2	0	0	0	0		y	n	y	g	5		0



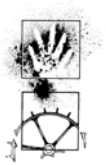
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
245.	64	3.6	2.4	2			0	2	0	0	0	0		n	n	n	n	5		0
246.	64				cr		0	3	0	0	0	0		n	n	n	n	5		0
247.	64		2.5	1			0	1	0	0	0	0	f	n	n	n	n	2		0
248.	64	6.5	0.5	2			0	3	0	0	0	0		n	n	n	n	3		0
249.	64																hs			
250.	64		3	1			0	1	0	0	0	0		n	n	n	n	2		0
251.	64	6.6	2.7	1		113	0	2	0	0	0	0	o	n	n	n	n	8		0
252.	64							2	0	0	0	0		n	n	n	n	3		0
253.	64		2.2	1			0	0	0	0	0	0	f	n	n	n	n			
254.	64		1.9	1				1	0	0	0	0		n	n	n	n	4		0
255.	64		2.6	1			0	2	0	0	0	0		n	n	n	n	2		0
256.	64	2.2	1.1	1			0	1	0	0	0	0		n	n	n	n	3		0
257.	64	19.3	3.1	2		77	0	3	1	1	0	1	f	n	n	n	n	6		0
258.	64	12.5	4.1	2			0	3	2	0	0	0		n	n	n	n	4		0
259.	64							4	2	1	0	0		n	n	n	n	4		0
260.	64																pl, hs			
261.	64							2	0	0	0	0		n	n	n	g			
262.	64	5.4	1.9		fac		0	3	0	0	0	1		n	n	n	n	5		0
263.	64	5.1	3		fac		0	3	0	0	0	0		n	n	n	n	5		0
264.	64	2.6	1	1			0	4	1	0	0	0	f	n	n	n	n	8		0
265.	64	8.3	2.3	2			0	2	0	0	0	0	h	n	n	n	g	8		0
266.	64	6.9	2.3	1			0	1	0	0	0	0		n	n	n	n	3		0
267.	64							2	0	0	0	0		n	n	n	n	2		0
268.	64							2	0	0	0	0		n	n	n	g	4	yes	2
269.	64							1	0	0	0	0	f	n	n	n	n	3		0
270.	64		2.4	1			0	3	0	0	0	0		n	n	n	g	3		0
271.	64																hs			
272.	64							3	0	2	0	0		n	n	n	g	2		0
273.	64				cr		1	3	1	1	0	0		n	n	n	n	7		0
274.	64																pl			
275.	64	9.8	8.9	2		78	0	2	0	0	0	0	s	n	n	n	n	8		0
276.	64	21.4	10.4	1	co	73	0	3	2	0	0	1	f	y	n	n	n	8		0
277.	64		5.8	1		0	0	3	1	0	0	0	f	y	n	n	n	5		0
278.	64	6.1	2.5	1			0	1	0	0	0	0		n	n	n	n	7		0
279.	64				cr		0	2	0	0	0	0	f	n	n	n	n	5		0
280.	64		2.3	1			0	1	0	0	0	0	s	n	n	n	n	5		0
281.	64								2	0	0	0	f	n	n	n	n	3		0
282.	64	6.9	2.1	1			0	3	0	0	0	0		n	n	n	n	3		0



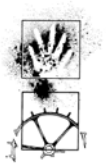
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
283.	64							3	0	0	2	0	f	n	n	n	n	5		0
284.	64							2	0	0	0	0	f	n	n	n	n	5		0
285.	64				cr			2	0	0	0	0		n	n	n	n	3		0
286.	64	30.4	6.2	1	co	64	0	4	1	0	0	0	f	y	n	y	n	8		0
287.	64							2	0	0	0	0		y	n	y	n	4		0
288.	64	2.8	0.7	1			0	3	0	0	0	2		y	n	y	n	5		0
289.	64							3	0	0	0	1		y	n	y	n	2	yes	1
290.	64		2.4	1				1	0	0	1	0		n	n	n	n	3		0
291.	64							2	1	1	1	0	f	y	n	n	n	5		0
292.	68	8.2	6	1			0	3	1	0	0	0	f	y	n	n	n	8		0
293.	68		6.6	1	co	75	0	2	0	0	0	0	f	n	n	n	n	5		0
294.	64							3	0	0	0	1		n	n	n	n	6		0
295.	64		3.3	1			0	2	0	0	0	0	f	n	n	n	n	7		0
296.	64				cr		0	2	0	0	0	0		n	n	n	n	5		0
297.	63	9.7	3	2			0	2	0	0	0	0		n	n	n	n	5		0
298.	63	7.8	2.4	1			1	3	2	0	0	0		n	n	n	n	5		0
299.	63							2	0	0	0	0	f	n	n	n	n	4		0
300.	68				cr			3	0	0	0	0	s	n	n	n	n	8		0
301.	66		3.8	1			1	2	0	0	0	0		n	n	n	n	3		0
302.	63							2	0	0	0	0	f	n	n	n	n	3		0
303.	66	7	3.5		co		0	5	0	0	0	0		y	n	y	n	4		0
304.	66	15.5	5.4	1		81	0	2	0	0	0	0	s	n	n	n	n	8		0
305.	66		6.5	1			0	1	0	0	0	0		n	n	n	n	2		0
306.	6				ret			2	0	0	0	0	ret	n	n	n	n	8	yes	5
307.	18	6.3	2.2		fac	91	0	3	0	0	0	1	f	y	n	y	n	8		0
308.	5							2	0	0	0	0	f	n	n	n	n	2		0
309.	3							3	0	0	0	0	f	n	n	n	n	3		0
310.	3	4.8	3.3	1		84	1	3	0	0	1	1	f	n	n	n	n	8		0
311.	12													n	y	n	n			
312.	6							1	1	0	0	0		y	y	y	n			
313.	2							2	0	0	0	0	f	y	n	y	n	2		0
314.	13							2	2	1	1	0		n	y	n	n			
315.	12													y	n	y	n			
316.	44							2	0	0	0	0		n	n	n	n	2		0
317.	44				cr			2	0	0	0	0	s	n	n	n	n	8		0
318.	44	11.6	4.9	1			0	4	0	0	0	0	f	n	n	n	n	8		0
319.	36	18.8	7.7	1		92	0	5	4	2	1	0	s	n	n	n	n	8		0
320.	36	17.8	10.9		co	47	0	0	0	0	0	0	f	n	n	n	n	8		0



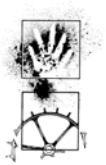
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
321.	36	3.7	1.3	1			0	1	0	0	0	0		y	n	n	n	5		0
322.	36													n	n	n	c, pl, hs			
323.	36							3	1	0	0	0	f	n	n	n	n	5		0
324.	45							2	0	0	0	0	f	n	n	n	n	5		0
325.	45				cr			2	0	0	0	0	f	n	n	n	n	8		0
326.	45	6.7	2.4	1			0	2	0	0	0	0	s	n	n	n	n	8		0
327.	45							3	0	0	0	0	o	n	n	n	n	5		0
328.	45				cr			2	0	0	0	0	f	n	n	n	n	7		0
329.	42							2	1	1	1	0	f	n	n	n	n	7		0
330.	36	10.2	2.2	1			0	1	0	0	0	0	f	y	n	y	n	7		0
331.	36	11.8	7.1	1	co	113	0	3	2	0	0	0	s	n	n	n	n	8		0
332.	36							3	1	0	0	0		y	n		n	4		0
333.	36	2.8	1.1	1			0	3	0	0	0	0	f	n	n	n	n	8		0
334.	42							3	1	0	0	0		n	n	n	n	4		0
335.	39	15.3	5.4	1		93	0	5	1	0	1	0	ret	y	p	n	g	8	yes	2
336.	37	13	3.5	1			0	3	0	0	0	0		n	n	n	n	3		0
337.	37							3	1	0	0	0	f	n	n	n	n	5		0
338.	37							2	0	0	0	0	f	y	n	y	n	5		0
339.	37	5.7	1.4		co		0	1	0	0	0	0	f	n	n	n	n	6		0
340.	34							2	0	0	0	0		n	n	n	n	4		0
341.	34		7	1		79	0	3	1	1	0	0	f	y	n		n	5		0
342.	34	6.9	2.2	1			1	3	0	0	0	0		n	n	n	n	5		0
343.	34	3.9	2	1			0	3	0	0	0	2		n	n	n	y	5		0
344.	34	7.1	2.5	1			0	3	2	0	1	0	f	n	n	n	n	8		0
345.	37		1.9	1			1	1	1	0	0	0	f	n	n	n	n	5		0
346.	37	20.1	4.9	1		83	0	1	0	0	0	0	h	y	n	n	n	8		0
347.	37		10.8	1		83	0	3	1	0	0	0	f	n	n	n	n	5		0
348.	36							2	0	0	0	0		n	n	n	n	2		0
349.	36	2.5	0.9	1			0	1	0	0	0	0		n	n	n	n	5		0
350.	44	4.9	1.6	1			0	2	0	0	0	0		n	n	n	n	5		0
351.	44							3	0	0	0	0		n	n	n	n	5	yes	2
352.	44	4	1	1			0	1	0	0	0	0		n	n	n	n	7		0
353.	36	4.8	1.7	1			0	2	0	0	0	0		n	n	n	n	7		0
354.	37		2.2	1			0	2	0	0	0	0	bip	n	n	n	n	5		0
355.	37	5.9	3.1	1			0	2	0	0	0	0	s	n	n	n	n	8		0
356.	37	5.8	2.7	1			0	2	0	0	0	0	f	n	n	n	n	8		0
357.	37				cr		1	1	0	0	0	0		y	n	n	n	5		0
358.	37				cr		1	2	1	1	1	0	f	y	n	n	n	8		0



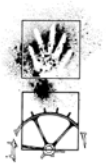
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
359.	37	9.6	4.7	1			0	4	3	0	1	0	f	n	n	n	n	8		0
360.	37	4.1	3.2		co		0	2	0	0	0	0	f	n	n	n	n	8		0
361.	37		1.9	1			0	2	0	0	1	0	o	y	n	n	n	5		0
362.	38	1	1.3	1			0	1	0	0	0	0		n	n	n	n	5		0
363.	40		4.2	1			0	2	0	0	0	0	f	n	n	n	n	6		0
364.	40	7.1	2.5	1			0	3	1	0	0	0	f	n	n	n	n	8		0
365.	40		1.4	1			0	1	0	0	0	0	f	n	n	n	n	5		0
366.	39	6.2	3.7	3		91	0	5	2	0	0	0	f	n	n	n	n	8		0
367.	36		3.6	1		96	0	1	1	0	0	0	f	y	?	n	n	5		0
368.	37							2	1	0	0	0	f	n	n	n	n	4		0
369.	37																			
370.	37							2	0	0	0	0		n	n	n	n	1		0
371.	41	6.9	2.5	1			0	1	0	0	0	0	f	n	n	n	n	8		0
372.	38	7.3	1.6	1			0	1	0	0	0	0		n	n	y	n	7		0
373.	38	5.6	2.8	1	co		0	2	0	0	0	0		n	n	n	n	7		0
374.	41							2	0	0	0	1		n	n	n	n	6	yes	2
375.	41		11.1	1		111	0	2	1	1	0	0	f	n	n	n	n	5		0
376.	41				cr			1	1	0	1	0		n	n	n	n	2		0
377.	39	4.6	1.6	1			0	3	1	0	0	0	f	n	n	n	n	8		0
378.	39							2	0	0	0	0	f	n	n	n	n	3		0
379.	40	4.4	3.2	1		90	0	2	1	0	0	0	f	n	n	n	n	8		0
380.	41							3	2	2	0	0	f	n	n	n	n	3		0
381.	35							2	0	0	0	0	f	y	n		n	5		0
382.	35	13.5	10.9	1		30	0	2	0	0	0	0	f	n	n	n	n	8		0
383.	35	1.1	0.6	1			0	3	1	0	0	0	f	n	n	n	n	8		0
384.	35	17.9	5.2	1		61	0	0	0	0	0	0	f	y	n	y	n	8		0
385.	35	7.3	3.6	1			0	2	0	0	0	0	f	n	n	n	n	8		0
386.	35		1.9	1			0	2	0	0	0	0		n	n	n	n	6		0
387.	50		1.5	1				2	0	0	0	0	f	n	n	n	n	5		0
388.	56		3.4	1			0	2	1	1	1	0	f	n	n	n	n	7		0
389.	56				cr			2	0	0	0	0	s	n	n	n	n	8		0
390.	56	6.6	3.5	2			0	2	0	0	0	0		n	n	n	n	5		0
391.	56	6.1	3.1	1			0	3	0	0	1	0	f	n	n	n	n			
392.	56	4.2	1	1			0	2	0	0	0	0	f	n	n	n	n	8		0
393.	56							2	0	0	0	0	f	n	n	n	n	5		0
394.	56	2.9	1.4	2			0	2	0	0	0	0		n	n	n	n	3		0
395.	48							1	0	0	0	0	f	n	n	n	n	3		0
396.	48	7.8	4.7		co	94	0	3	0	0	0	0	f	n	n	n	n	8		0



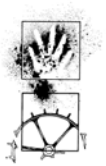
Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
397.	48	4.3	2.3	1			0	2	1	0	0	0	f	n	n	n	n	8		0
398.	47				cr		0	2	0	0	0	0	s	n	n	n	n	8		0
399.	47	2.2	1.4	1			0	3	0	0	1	0	f	n	n	n	n	8		0
400.	52							3	0	0	0	0	f	n	n	n	n	5		0
401.	48	5.4	1.3	1			0	2	0	0	0	0		n	n	n	n	5		0
402.	48	19.6	9.3		co	73	0	5	2	1	0	1	o	n	n	n	n	8		0
403.	48	6.3	2	1		0	3	0	0	0	0	0	f	n	n	n	n	8		0
404.	48		2.1	2			0	2	0	0	0	0	f	n	n	n	n	5		0
405.	48		1.3	1			0	1	0	0	0	0		n	n	n	n	5		0
406.	48	5.4	5	1		110	0	4	2	1	1	0	f	n	n	n	n	8		0
407.	48	2.8	0.7	1			1	0	0	0	0	0	f	n	n	n	n	8		0
408.	60		1.5	1			0	2	0	0	0	0	f	n	n	n	n	6		0
409.	60	8.6	3	2			0	2	1	1	1	0	h	y	n	y	g	8		0
410.	60	4.4	0.9	1			0	2	0	0	0	0		n	n	n	n	5		0
411.	60		2.4		co		0	2	1	0	0	0	f	n	n	n	n	5		0
412.	60		1.7	1			0	3	1	0	0	0	s	n	n	n	n	5		0
413.	60	9.8	5.7	1		87	0	3	2	1	0	0	f	n	n	n	n	8		0
414.	60							1	0	0	0	0	f	n	n	n	n	3		0
415.	60	2.6	0.9	1			0	2	1	1	0	0	s	n	n	n	n	8		0
416.	57	6.1	2.8	1		84	0	2	1	0	0	0	f	n	n	n	n	8		0
417.	57	10.4	4.6	1		83	0	3	2	0	0	0	f	n	n	n	n	8		0
418.	57	5.1	1.1	1			0	2	1	0	0	0	f	n	n	n	n	8		0
419.	60	8.9	2.8	1			0	2	0	0	0	0		n	n	n	n	5		0
420.	60		1.1	1			0	1	0	0	0	0	f	y	n	n	n	5		0
421.	60				cr		0	2	0	0	0	0		y	n	n	n	7		0
422.	60	4.7	2.6	1			0	2	2	0	0	0	f	n	n	n	n	6		0
423.	60	4.3	1.3	1		80	0	3	1	0	0	2		y	n	y	n	7		0
424.	60				cr		0	2	0	0	0	0	h	n	n	n	n	8		0
425.	57	4.9	2	2			0	2	0	0	0	0	f	n	n	n	n	8		0
426.	57	10.5	3.1	1		88	0	4	1	0	0	0	o	n	n	n	n	8		0
427.	57		1.8	1		77	0	3	1	0	0	0		n	n	n	n	5		0
428.	57		1.6	1			0	3	1	0	1	0	f	y	n	n	n	5		0
429.	61	2.9	1.3	1		63	0	3	1	0	0	0	h	n	n	n	g	8		0
430.	61	2.9	0.8	1			0	2	0	0	0	0	f	n	n	n	n	8		0
431.	61				cr			1	0	0	0	0	bip	n	n	n	n	8		0
432.	61	8.2	2.4	2			0	1	0	0	0	0	f	n	n	n	n	8		0
433.	60		1.2	1			0	2	0	0	0	0	f	n	n	n	n	7		0
434.	60							3	0	0	0	1	f	n	n	n	g	5	yes	2



Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
435.	60	6.3	2.7	1			0	2	0	0	0	0	f	n	n	n	n	8		0
436.	60	4	1.1	1			0	3	2	0	0	0	f	y	n	n	n	8		0
437.	58	3.9	1.2	2			0	2	0	0	0	0		y	n	n	n	5		0
438.	58	3.8	3.5	1		81	0	1	0	0	0	0	f	n	n	n	n	8		0
439.	60	9.4	1.5	1			0	1	0	0	0	0	f	n	n	n	n	8		0
440.	60	4.4	1.2	1			0	2	0	0	0	0	f	n	n	n	n	8		0
441.	60		1.3	1			0	2	0	0	0	0		y	n	y	n	6		0
442.	60							2	2	0	0	0	o	n	n	n	n	5		0
443.	60	4.4	1.4	1		86	1	2	0	0	0	0	f	n	n	n	n	7		0
444.	60	5.3	2	1			0	2	0	0	0	0	f	n	n	n	n	8		0
445.	60	7.8	2.4	2			0	2	0	0	0	0	f	n	n	n	n	8		0
446.	60							5	1	1	1	0	f	n	n	n	n	4		0
447.	60		5.7	2			0	2	0	0	0	0	f	n	n	n	n	4		0
448.	47	20.6	10.7	2		88	0	1	0	0	0	0	f	y	n	n	n	8		0
449.	47	3.8	1	1			1	2	0	0	0	0	f	n	n	n	n	8		0
450.	54		1.5	1			0	1	0	0	0	0	f	n	n	n	n	5		0
451.	54	3.1	1.5		co		0	2	0	0	0	0	f	y	n	n	n	8		0
452.	59	6.6	3.4	2		61	0	5	1	0	0	0		n	n	n	n	7		0
453.	58	2.3	1.2	1			0	2	0	0	1	0	f	n	n	n	n	8		0
454.	58				cr			2	2	0	1	0	f	n	n	n	n	8		0
455.	59	6.9	4	1			0	2	1	0	0	0	f	n	n	n	n	8		0
456.	57	9	1.4	2			2	0	0	0	1	0	f	y	n	n	n	7		0
457.	57	3.6	2.2	1			0	3	1	0	1	0	f	n	n	n	n	8		0
458.	57	9.6	5	1		87	0	1	0	0	0	0	f	n	n	n	n	7		0
459.	57	4.5	4.8	1		72	0	3	0	0	0	0	f	n	n	n	n	8		0
460.	62	13.1	5.3		co	74	0	2	0	0	0	0	f	n	n	n	n	8		0
461.	62	18.6	6.1		co	81	0	2	0	0	0	0	f	n	n	n	n	8		0
462.	62		1.9	1		111	0	2	1	0	0	1	o	n	n	n	n	7		0
463.	62	6.1	2.5		co		0	2	0	0	0	0	s	n	n	n	n	8		0
464.	60	17.5	7.9	1		50	1	5	2	1	0	0		n	n	n	n	7		0
465.	60				cr		0	3	1	0	0	2	f	n	n	n	g	8		0
466.	60	4.9	4.9	1		108	0	3	1	0	0	0	o	y	n	n	n	8		0
467.	60	4.7	1.8	1	co		0	2	0	0	0	0		n	n	n	g	3		0
468.	54	5.4	2.1		co		0	2	0	0	0	0		n	n	n	n	5		0
469.	57	2.6	1.3	1			0	1	0	0	0	0	f	n	n	n	n	8		0
470.	57	6.1	1.9	1			0	2	0	0	0	0		n	n	y	n	3		0
471.	61				cr		0	2	1	0	1	0	f	n	n	n	n	8		0
472.	60				cr		1	2	0	0	0	0		n	n	n	n	5		0



Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
473.	53	18	4.6	1		86	0	2	0	0	0	0	s	y	n	y	n	7		0
474.	54		3.1	1		84	0	3	1	0	0	0	o	n	n	n	n	6		0
475.	61	17.6	7.9	1		82	0	2	2	0	1	0	f	n	n	n	n	8		0
476.	62	12.1	5.5	1		102	0	1	0	0	0	0	s	y	n	n	n	8		0
477.	62	0.5	0.5	1			0	2	2	0	0	0	s	n	n	n	n	8		0
478.	62	2.3	1	1			0	3	1	0	0	0		y	n	y	n	5		0
479.	62				cr		0	2	0	0	0	0		n	n	n	pl	5		0
480.	62	7.2	3		co		0	1	0	0	0	0	f	n	n	n	n	8		0
481.	48				cr			2	0	0	0	0	f	y	n	n	n	8		0
482.	48	2.2	1.1	1			0	2	0	0	0	0	f	n	n	n	n	8		0
483.	48	7.9	2.4	1		85	0	1	0	0	0	0	o	n	n	n	n	8		0
484.	53	9.3	4.1	1		66	0	3	2	0	0	0	f	y	n	n	n	8		0
485.	53		2.1	1			0	1	0	0	0	0	s	n	n	n	n	5		0
486.	54	6.9	4.1	1			0	1	0	0	0	0		n	n	n	n	7		0
487.	54							1	0	0	0	0	f	n	n	y	n	3		0
488.	52							2	0	0	0	0		n	n	n	n	4		0
489.	49	9.9	8.3	1		95	0	1	0	0	0	0	o	n	n	n	n	8		0
490.	49	5.4	2		co		0	2	0	0	0	0	f	n	n	n	n	8		0
491.	49		1.5	1			0	1	0	0	1	0		n	n	n	n	3		0
492.	54						0	1	1	0	0	0	f	n	n	n	n	5		0
493.	54		2.6	1			0	2	1	0	0	0	s	n	n	n	n	5		0
494.	48				cr		0	2	0	0	0	0	f	n	n	n	n	8		0
495.	48	2.7	0.8	1			0	2	0	0	0	0		y	n	y	n	5		0
496.	56	3.2	1.2	1			0	2	0	0	0	0	f	y	n	n	n	8		0
497.	60	6.3	3.7	1			0	3	0	0	1	0		y	n	y	n	5		0
498.	48	6.2	3.4	1		84	0	2	0	0	0	0	o	n	n	n	n	8		0
499.	53		4.4		co	84	0	2	0	0	0	0	f	n	n	n	n	5		0
500.	56	5.4	3.5	1		81	0	2	0	0	0	0	f	y	n	n	n	8		0
501.	59																hs, pl			
502.	59	2	0.9	1			0	3	1	0	0	0	f	y	n	n	n	8		0
503.	52	4.5	1.6	1			91	1	0	0	0	0	f	y	n	n	n	8		0
504.	18							4	2	0	0	1	f	y	n	y	n	3		0
505.	51	11.6	4.4	1		84	0	2	1	0	0	0	f	n	n	n	n	8		0
506.	49		1.5	1		75	0	1	0	0	0	0	f	n	n	n	n	6		0
507.	56	5	2.7	1			0	2	0	0	0	0	f	y	n	y	n	6		0
508.	49	3.3	1.6		co		0	2	0	0	0	0	s	n	n	n	n	8		0
509.	58				cr		0	4	1	1	1	0	o	n	n	n	n	8		0
					co=cortical								f=feather	y=ye	y=ye	y=yes	pl=potlid			



Item No	Pit No	Pl Width	Pl Thick	Pl Scars	Pl Surf	Pl Angle x	OHR	Dr Scars	Dr Terms	Dr Abs	Dr Rots	Dr Pll	Termination	Edge Dam	Use	Recent Taph	Heat Affect	Segments	Retouched	Ret Segments
					cr=crushed								s=step	n=no	n=no	n=no	g=greasy lustre			
					fac=facetted								h=hinge				c=colour change			
													o=outrepasse				n=none			
													bip=bipolar				hs=heat shatter			
													ret=retouched							
													cr=crushed							

Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
1.	25																					
2.	25																					
3.	25																					
4.	25																					
5.	25																					
6.	25																					
7.	25																					
8.	23																					
9.	23																					
10.	23																					
11.	23																					
12.	23																				y	
13.	23																					
14.	23																					
15.	23																					
16.	23																					
17.	23																					
18.	23																					
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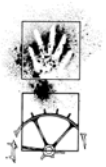
21.	23																					
22.	23																					
23.	23																					
24.	23																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
25.	23																					
26.	23																					
27.	23																					
28.	23																					
29.	23																					
30.	23																					
31.	23																					
32.	23																					
33.	23																					
34.	24																					
35.	24																					
36.	24																					
37.	24																					
38.	24																					
39.	24																					
40.	24																					
41.	24																					
42.	24																					
43.	24																					
44.	24																					
45.	24																					
46.	24																					24/II/5
47.	24																					24/II/4
48.	24																					
49.	24																					
50.	24																					
51.	24																					
52.	24	d	pr,	28.8	68	65	60														n	
53.	24																					
54.	24																					
55.	24																					
56.	24																					
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59.	24																					
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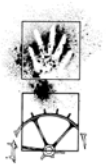
61.	32																					
62.	32																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
63.	32																					
64.	32																					
65.	32																					
66.	32																					
67.	32																					
68.	22																					
69.	22																					
70.	22																					
71.	22																					
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93.	22																					
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97.	22																					
98.	22																					
99.	22																					
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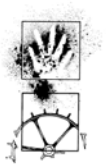

Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
101.	22																					
102.	22																					
103.	22																					
104.	22																					
105.	22																					
106.	22																					
107.	22																					
108.	22																					
109.	22																					
110.	22																					
111.	22																					
112.	31																					
113.	31																					
114.	26																				y	
115.	26																					
116.	33																					
117.	33																					
118.	33																					
119.	33																					
120.	33																					
121.	33																					
122.	33																					
123.	33																					
124.	33																					
125.	33																					
126.	33																					
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128.	33																					
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135.	33																					
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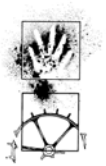
137.	33																					
138.	33																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
139.	33																					
140.	33																					
141.	33																					
142.	33																					
143.	33																					
144.	33																					
145.	33																					
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152.	20																					
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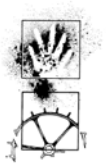
176.	19																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
177.	19	d	pr,	19.2	72	86																
178.	19																					
179.	19																					
180.	19																					
181.	19																					
182.	19																					
183.	28																					
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189.	28																					
190.	28																					
191.	28																					
192.	28																					
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194.	28																					
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199.	64	bb	d,	7.1	84																	
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203.	64																					
204.	64																					
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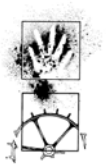

Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
215.	67																					
216.	67																					
217.	64																					
218.	64																					
219.	64																					
220.	64																					
221.	64																					
222.	64																					
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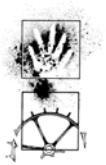

Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
253.	64																					
254.	64																					
255.	64																					
256.	64																					
257.	64																					
258.	64																					
259.	64																					
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265.	64																					
266.	64																					
267.	64																					
268.	64	ub	ml,	10.3	86	71																
269.	64																					
270.	64																					
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272.	64																					
273.	64																					
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279.	64																					
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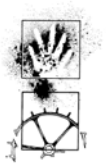

Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
291.	64																					
292.	68																					
293.	68																					
294.	64																					
295.	64																					
296.	64																					
297.	63																					
298.	63																					
299.	63																					
300.	68																					
301.	66																					
302.	63																					
303.	66																					
304.	66																					
305.	66																					
306.	6	bb	p,pl	22.5	81	90	83															
307.	18																					
308.	5																					
309.	3																					
310.	3																					
311.	12																					
312.	6																					
313.	2	0																				
314.	13																					
315.	12																					
316.	44																					
317.	44																					
318.	44																					
319.	36																					
320.	36																					
321.	36																					
322.	36																					
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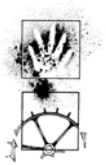
327.	45																					
328.	45																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
329.	42																					
330.	36																					
331.	36																					
332.	36																					
333.	36																					
334.	42																					
335.	39	d,	d,	41.1	83			3	dpl	12.9	h	87	dpl	12.1	f		dpl	26.5	f			
336.	37																					
337.	37																					
338.	37																					
339.	37																					
340.	34																					
341.	34																					
342.	34																					
343.	34																					
344.	34																					
345.	37																					
346.	37																					
347.	37																					
348.	36																					
349.	36																					
350.	44																					
351.	44	ub	dl,	7.3	86																	
352.	44																					
353.	36																					
354.	37																					
355.	37																					
356.	37																					
357.	37																					
358.	37																					
359.	37																					
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363.	40																					
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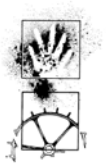
365.	40																					
366.	39																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
367.	36																					
368.	37																					
369.	37																					
370.	37																					
371.	41																					
372.	38																					
373.	38																					
374.	41	ub	dl,	10.5	88	83																
375.	41																					
376.	41																					
377.	39																					
378.	39																					
379.	40																					
380.	41																					
381.	35																					
382.	35																					
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384.	35																					
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386.	35																					
387.	50																					
388.	56																					
389.	56																					
390.	56																					
391.	56																					
392.	56																					
393.	56																					
394.	56																					
395.	48																					
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397.	48																					
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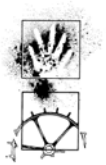
402.	48																					
403.	48																					
404.	48																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
405.	48																					
406.	48																					
407.	48																					
408.	60																					
409.	60																					
410.	60																					
411.	60																					
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413.	60																					
414.	60																					
415.	60																					
416.	57																					
417.	57																					
418.	57																					
419.	60																					
420.	60																					
421.	60																					
422.	60																					
423.	60																					
424.	60																					
425.	57																					
426.	57																					
427.	57																					
428.	57																					
429.	61																					
430.	61																					
431.	61																					
432.	61																					
433.	60																					
434.	60	ub	d,	9.7	88	81																
435.	60																					
436.	60																					
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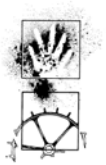
441.	60																					
442.	60																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
443.	60																					
444.	60																					
445.	60																					
446.	60																					
447.	60																					
448.	47																					
449.	47																					
450.	54																					
451.	54																					
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454.	58																					
455.	59																					
456.	57																					
457.	57																					
458.	57																					
459.	57																					
460.	62																					
461.	62																					
462.	62																					
463.	62																					
464.	60																					
465.	60																					
466.	60																					
467.	60																					
468.	54																					
469.	57																					
470.	57																					
471.	61																					
472.	60																					
473.	53																					
474.	54																					
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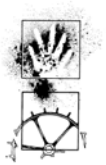
480.	62																					



Item No	Pit No	Ret Type	Ret Loc	Ret Length	Ret Ang 1	Ret Ang 2	Ret Ang 3	# Burinations	Burin Direct 1	Burin Leng 1	Burin Term 1	Burin Ang 1	Burin Direct 2	Burin Leng 2	Burin Term 2	Burin Ang 2	Burin Direct 3	Burin Leng 3	Burin Term 3	Burin Ang 3	Redirecting	Conjoins
481.	48																					
482.	48																					
483.	48																					
484.	53																					
485.	53																					
486.	54																					
487.	54																					
488.	52																					
489.	49																					
490.	49																					
491.	49																					
492.	54																					
493.	54																					
494.	48																					
495.	48																					
496.	56																					
497.	60																					
498.	48																					
499.	53																					
500.	56																					
501.	59																					
502.	59																					
503.	52																					
504.	18																					
505.	51																					
506.	49																					
507.	56																					
508.	49																					
509.	58																					

Item No	Pit No	Backing complete	Battering	Grinding Polish
1.	25			
2.	25			
3.	25			
4.	25			

Item No	Pit No	Backing complete	Battering	Grinding Polish
5.	25			
6.	25			
7.	25			
8.	23			
9.	23			
10.	23			
11.	23			
12.	23			
13.	23			
14.	23			
15.	23			
16.	23			
17.	23			
18.	23			
19.	23			
20.	23			
21.	23			
22.	23			
23.	23			
24.	23			
25.	23			
26.	23			
27.	23			
28.	23			
29.	23			
30.	23			
31.	23			
32.	23			
33.	23			
34.	24			
35.	24			
36.	24			
37.	24			
38.	24			
39.	24			
40.	24			
41.	24			
42.	24			

Item No	Pit No	Backing complete	Battering	Grinding Polish
43.	24			
44.	24			
45.	24			
46.	24			
47.	24			
48.	24			
49.	24			
50.	24			
51.	24			
52.	24			
53.	24			
54.	24			
55.	24			
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57.	24			
58.	24			
59.	24			
60.	32			
61.	32			
62.	32			
63.	32			
64.	32			
65.	32			
66.	32			
67.	32		yes	
68.	22			
69.	22			
70.	22			
71.	22			
72.	22			
73.	22			
74.	22			
75.	22			
76.	22			
77.	22			
78.	22			
79.	22			
80.	22			

Item No	Pit No	Backing complete	Battering	Grinding Polish
81.	22			
82.	22			
83.	22			
84.	22			
85.	22			
86.	22			
87.	22			
88.	22			
89.	22			
90.	22			
91.	22			
92.	22			
93.	22			
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110.	22			
111.	22			
112.	31			
113.	31			
114.	26			
115.	26			
116.	33			
117.	33			
118.	33			

Item No	Pit No	Backing complete	Battering	Grinding Polish
119.	33			
120.	33			
121.	33			
122.	33			
123.	33			
124.	33			
125.	33			
126.	33			
127.	33			
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146.	21			
147.	21			
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151.	21			
152.	20			
153.	29			
154.	29			
155.	29			
156.	27			

Item No	Pit No	Backing complete	Battering	Grinding Polish
157.	27			
158.	27			
159.	27			
160.	27			
161.	27			
162.	27			
163.	19			
164.	19			
165.	19			
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189.	28			
190.	28			
191.	28			
192.	28			
193.	28			
194.	28			

Item No	Pit No	Backing complete	Battering	Grinding Polish
195.	28			
196.	28			
197.	64			
198.	64			
199.	64			
200.	64			
201.	68			
202.	68			
203.	64			
204.	64			
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215.	67			
216.	67			
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224.	63			
225.	64			
226.	64			
227.	64			
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229.	64			
230.	64			
231.	64			
232.	64			

Item No	Pit No	Backing complete	Battering	Grinding Polish
233.	68			
234.	68			
235.	65			
236.	65			
237.	65			
238.	65			
239.	64			
240.	64			
241.	64			
242.	64			
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263.	64			
264.	64			
265.	64			
266.	64			
267.	64			
268.	64	n		
269.	64			
270.	64			

Item No	Pit No	Backing complete	Battering	Grinding Polish
271.	64			
272.	64			
273.	64			
274.	64			
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292.	68			
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298.	63			
299.	63			
300.	68			
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304.	66			
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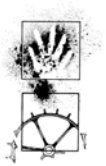

Item No	Pit No	Backing complete	Battering	Grinding Polish
309.	3			
310.	3			
311.	12		yes	
312.	6		yes	
313.	2			
314.	13			yes
315.	12			yes
316.	44			
317.	44			
318.	44			
319.	36			
320.	36			
321.	36			
322.	36			
323.	36			
324.	45			
325.	45			
326.	45			
327.	45			
328.	45			
329.	42			
330.	36			
331.	36			
332.	36			
333.	36			
334.	42			
335.	39			
336.	37			
337.	37			
338.	37			
339.	37			
340.	34			
341.	34			
342.	34			
343.	34			
344.	34			
345.	37			
346.	37			

Item No	Pit No	Backing complete	Battering	Grinding Polish
347.	37			
348.	36			
349.	36			
350.	44			
351.	44	no		
352.	44			
353.	36			
354.	37			
355.	37			
356.	37			
357.	37			
358.	37			
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367.	36			
368.	37			
369.	37			
370.	37			
371.	41			
372.	38			
373.	38			
374.	41	no		
375.	41			
376.	41			
377.	39			
378.	39			
379.	40			
380.	41			
381.	35			
382.	35			
383.	35			
384.	35			

Item No	Pit No	Backing complete	Battering	Grinding Polish
385.	35			
386.	35			
387.	50			
388.	56			
389.	56			
390.	56			
391.	56			
392.	56			
393.	56			
394.	56			
395.	48			
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416.	57			
417.	57			
418.	57			
419.	60			
420.	60			
421.	60			
422.	60			

Item No	Pit No	Backing complete	Battering	Grinding Polish
423.	60			
424.	60			
425.	57			
426.	57			
427.	57			
428.	57			
429.	61			
430.	61			
431.	61			
432.	61			
433.	60			
434.	60	no		
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454.	58			
455.	59			
456.	57			
457.	57			
458.	57			
459.	57			
460.	62			

Item No	Pit No	Backing complete	Battering	Grinding Polish
461.	62			
462.	62			
463.	62			
464.	60			
465.	60			
466.	60			
467.	60			
468.	54			
469.	57			
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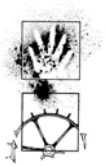


Item No	Pit No	Backing complete	Battering	Grinding Polish
499.	53			
500.	56			
501.	59			
502.	59			
503.	52			
504.	18			
505.	51			
506.	49			
507.	56			
508.	49			
509.	58			

Cores

Pit #	Spit #	Aft #	Material	Tech Class	Crtx %	Crtx Type	Crtx Loc	Init	Wgt	Length perc	Wdth m	Thick m	Edge Dam	Use	Recent Taph	Heat Affect	Rotat-ions	Prepar-ation	Termin-ations	# Scar	Lgt Scar 1	Lgt Scar 2	Lgt Scar 3	Pl Ang 1	Pl Ang 2	Pl Ang 3
31	3	1	qtz c	co	30	irregular	all	htz	226.	62.3	54.6	50.6	n	n	n		2	0	s	3	19.8	19.5	14.6	106	110	106
66	3	1	qtz m	co	10	irregular	distal	htz	16.1	22.5	23.1	17.6	y	n	n		1	0	f	2	18.8	9.9		86	86	
64	5	1	sil g	co	65	irregular	all	htz	31.9	38.1	32	26.6	n	n	n	g, hs	2	0	f,s	4	32	20.4		92	86	
37	5	2	qtz c	co	10	irregular	distal	htz	11.1	23.1	18.5	16	n	n	n		1	0	s	0	8.1	5.5	4.8	87	105	

APPENDIX 6

PIT PROFILES

Pit 1	Pit 2	Pit 3	Pit 4	Pit 5	Pit 6	Pit 7
						

Pit 8	Pit 9	Pit 10	Pit 11	Pit 12	Pit 13	Pit 14
						

Pit 15	Pit 16	Pit 17	Pit 18	Pit 19	Pit 20	Pit 21
						

Pit 22	Pit 23	Pit 24	Pit 25	Pit 26	Pit 27	Pit 28
						

Pit 29	Pit 30	Pit 31	Pit 32	Pit 33	Pit 34	Pit 35
						

Pit 36	Pit 37	Pit 38	Pit 39	Pit 40	Pit 41	Pit 42
						

Pit 43	Pit 44	Pit 45	Pit 46	Pit 47	Pit 48	Pit 49
						

Pit 50	Pit 51	Pit 52	Pit 53	Pit 54	Pit 55	Pit 56
						

Pit 57	Pit 58	Pit 59	Pit 60	Pit 61	Pit 62	Pit 63
						

Pit 64	Pit 65	Pit 66	Pit 67	Pit 68
				

APPENDIX 7

INDICATIVE PLAN OF MANAGEMENT FOR ARCHAEOLOGICAL CONSERVATION AREAS

A7. Indicative Plan of Management for Proposed Archaeological Conservation Areas

A7.1 Objectives

The conservation areas will be managed as open space reserves with the following objectives:

Primary objectives

- conserving heritage values for the benefit of present and future generations;
- managing archaeological deposits according to an appropriate balance of resource conservation and scientific investigation;
- (where appropriate) interpretation of the Aboriginal heritage values of the site to both generalised and specialist audiences.

Secondary objectives

- allow for community use of the conservation areas provided that this is compatible with the primary conservation objectives and with the residential values of the adjoining areas;

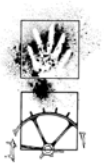
A7.2 Management strategies

Protection of archaeological deposits

- Prevention of ground surface disturbance except under the provisions of a Section 87 or 90 permit from the DECC, or an approved development under Part 3A of the EP&A Act.
- The creation of underground service easements, will not be allowed, except where no feasible alternative exists and a Section 87 and/or 90 permit from the DECC is approved or where the action is approved under Part 3A of the EP&A Act..
- Allowance will be made for a limited degree of ground surface disturbance (such as up to 20 cm in depth), for the installation of any required management or community facilities such as walking trails, tables/chairs and signage, subject to gaining a Section 87 and/or 90 permit from the DECC, or where the action is approved under Part 3A of the EP&A Act.
- All developments which require ground surface disturbance should be designed and constructed in such a way that necessary ground surface disturbance is minimised. This may be achieved through construction on imported fill, or the employment of above ground structures.
- Allowance of ground surface disturbance as a consequence of archaeological or scientific investigations, provided that the DECC and the Mogo Aboriginal Land Council are satisfied that the investigation is desirable, compatible with the objectives of the conservation areas, and will be conducted according to current best practice standards. Any archaeological or scientific investigations will be subject to gaining a Section 87 and/or 90 permit from the DEC, except when part of an action approvaed under Part 3A of the EP&A Act.
- All significant ground surface disturbance should be preceded by an appropriate level of archaeological salvage and recording.

Public Interpretation

- A public interpretation program could be developed for the reserves (if or when considered appropriate), which integrates the use of signage, and walking trails.
- The interpretation program could potentially seek to inform visitors about the Aboriginal cultural heritage of the reserve areas and the need to conserve and manage the archaeological deposits in the reserves.



- An interpretation program could also integrate information about the natural environment and the landscape history of the area. Interpretation of the European heritage of the area may also be included (especially with regard to the former cheese factory).

- The content, location and form of the interpretation program will be subject to the approval of the Mogo Local Aboriginal Land Council.

Ownership and Management

The DECC have stated that they are not in a position to take on the title or direct management responsibilities of archaeological conservation reserves, such as those proposed here.

The Bevian Road archaeological conservation areas could be managed as a sub-category of open space vested in community title or some other form of reservation.

- The day to day management of the conservation areas should be the responsibility of the authority or organisation that administer the other open space areas within the Bevian Road Concept Application Plan area.

- All decisions regarding the management of the archaeological resource within the conservation areas should be subject to approval by the Mogo Local Aboriginal Land Council, with input from the DECC, where appropriate.

- The status of the archaeological conservation areas should be appropriately recognised and defined by the Eurobodalla Shire Council, such as by being declared heritage items and placed on the Heritage Schedule of the Local Environmental Plan. This will require liaison with the Shire Council and may necessitate the passage of various Council statutory processes.

APPENDIX 8

PLAIN ENGLISH REPORT PROVIDED TO LOCAL ABORIGINAL ORGANISATIONS

Please note: Figure 1 shown in this appendix has since been superceded. Refer Figure 2.2 for current Concept Plan

Rosedale Urban Expansion Zone, South Coast, NSW

Archaeological Subsurface Testing Program

Plain English Report

August 2004

A Report to Marsim Pty Ltd

Navin Officer

heritage consultants Pty Ltd

acn: 092 901 605

102 Jervois St.
Deakin ACT 2600

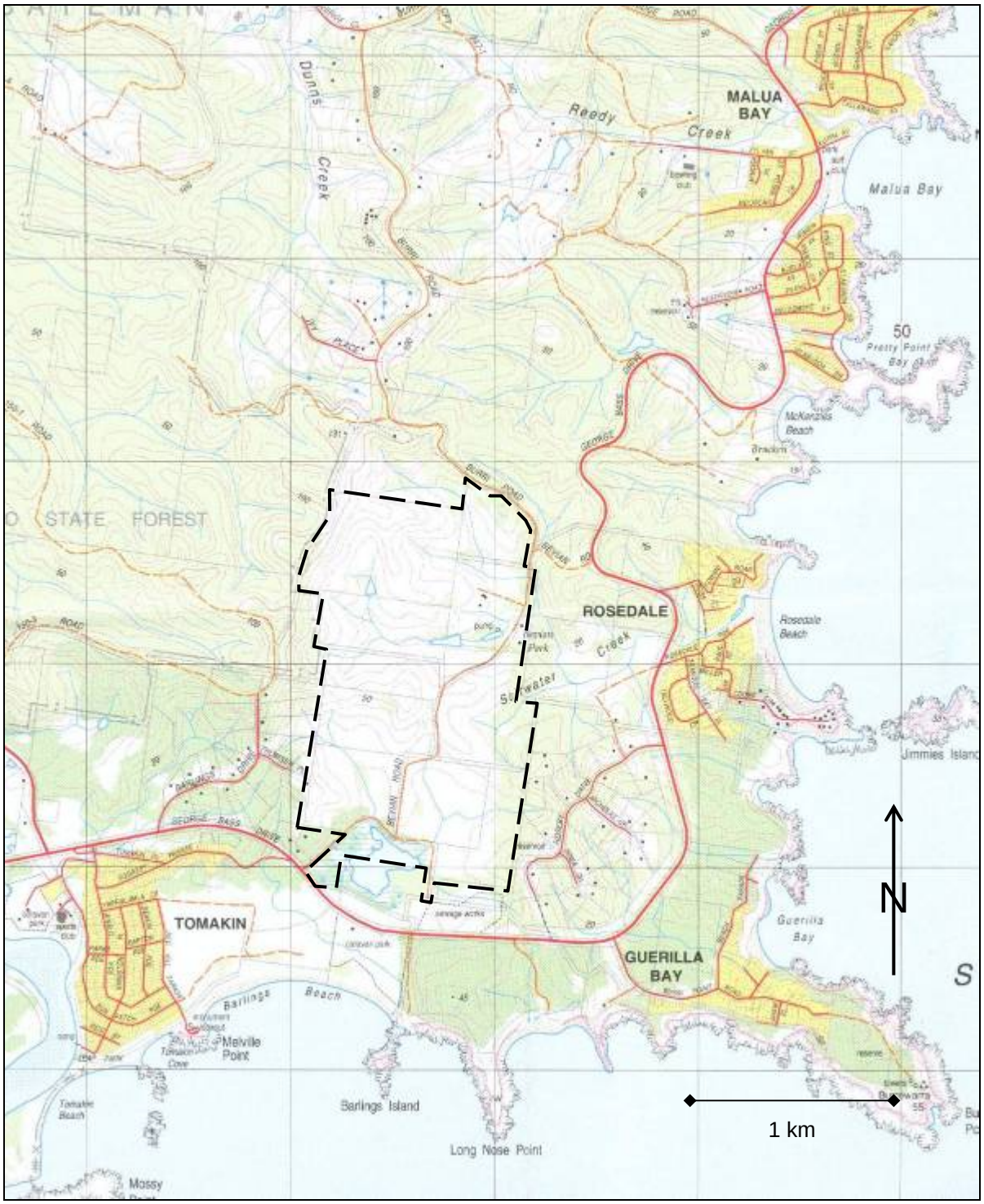
ph 02 6282 9415
fx 02 6282 9416

TABLE OF CONTENTS

1. What is the Proposed Development at Rosedale?

To the south of Batemans Bay and to the northeast of Tomakin there is an area called the '**Rosedale Urban Expansion Zone**'. The area covers about two square kilometres and is mostly gently sloping and cleared land used for grazing cattle. (See photos 1-4).

The Marsim Group, a company based in Sydney, proposes to construct houses in the area. The area would then change from pasture land to an urban area.



This map shows the location of the Rosedale study area

Photos 1-4 General Views across the Rosedale Urban Expansion Zone

Photo 1 General view of the southern part of the study area, looking west from the eastern boundary

Photo 2: Looking southwest across study area

Photo 3: Looking north across study area

Photo 4:General view to the south, showing the flats fringing Bevian Swamp

2. Why did we do an archaeological excavation in the Rosedale development area?

The development area was inspected for archaeological sites in 2002 by two archaeologists and representatives of the Mogo Local Aboriginal Land Council.

The 2002 study also included checking the National Parks and Wildlife Service records for the Rosedale area and the surrounding region. This told us whether Aboriginal sites had already been recorded in the study area, and where Aboriginal sites had been found elsewhere in the region.

Two Aboriginal archaeological sites, both scatters of stone artefacts, and one single stone artefact, were found when we did the survey in 2002.

Eight areas where we thought that there might have been artefacts that we couldn't see (that is, buried in the soil) were also identified in the study area. These areas are called PADs.

We recommended that a program of archaeological excavation (a 'dig') should be carried out in any of the PADs that might be affected by the proposed housing development. The National Parks and Wildlife Service also wanted us to dig in other areas across the study area.

We made the recommendation to dig in the Rosedale development area so that we could be as sure as possible where the Aboriginal sites in the area were, what they were, and to assist the developer in avoiding damage to Aboriginal sites wherever possible.

3. What did we do?

The archaeologists and Aboriginal representatives dug sixty eight (68) pits with a small backhoe (photo 5).

The pits were placed across the study area to test all the different sorts of landscapes that were in the area. These included flats, hillsides, hilltops, areas near creeks and so on. The test areas were chosen by the archaeologists and the NSW National Parks and Wildlife Service.

The pits, when they were finished, were about one to one and a half metres long and were sometimes over a metre deep. When the soil was dug up it was put into buckets (photo 6) and carried across the sieves (photo 7) where it was carefully washed through the sieves (photos 8 and 9). Sometimes there was unexpected help from the local cattle (photo 10).

Any Aboriginal stone artefacts, or stones that we couldn't be sure were artefacts, were bagged and labelled and taken back to Canberra. In Canberra the artefacts were inspected under a microscope and a hand lens (a small magnifying glass) by Alex Mackay, a person who is an expert on Aboriginal stone tools.

Photo 5: Excavating the soil

Photo 6: Marking buckets prior to taking them to be sieved

Photo 7: Transporting the soil to the sieving station

Photo 8: Sieving location

Photo 9: Wet sieving the soil

Photo 10: Uninvited visitors - Glove-eating calves.

4. What did we find?

- Five hundred and nine (509) Aboriginal stone artefacts were found in the test pits at Rosedale. Artefacts came from 53 of the 68 pits that were excavated in the area.

- About half of all artefacts were located in pits that were dug on the valley floor.

- Quartz artefacts made up over half (68%) of all the excavated artefacts. Other sorts of rocks that artefacts had been made from included silcrete (19%), volcanics (8%), and chert (1%).

- Artefacts were found to occur down to a maximum depth of 67 cms in the test pits.

- Four hundred and eighty seven (487) of the artefacts were flakes. These made up 97% of the total artefacts that were found at Rosedale. There were four cores and four flaked pieces. Three hammerstones or pieces of hammerstone were also found, along with two fragments of grindstone.

5. What does this mean?

The archaeological investigation that was carried out at Rosedale tells us a number of things about how Aboriginal people used this area.

- Aboriginal people made and looked after artefacts (stone tools) in the area;

- Aboriginal people used grindstones, probably for seed grinding, in the area.

- The area does not appear to have been a major camp site. Some short-term residential camping may have occurred, but the evidence for this is not very strong.

- The archaeological materials at Rosedale tend to tell us that the area was mostly used for mobile hunting and gathering, and short-term camping activities.

The investigation also tells us that:

- Aboriginal artefacts can be expected to occur in varying numbers throughout the Rosedale development area.

6. What has been recommended for the Rosedale Urban Expansion Zone?

The following recommendations were made based on the results of the archaeological test excavation program and on preliminary talks with local Aboriginal representatives.

- In order to conserve the limited scientific values of the surviving archaeological resource within the Rosedale Urban expansion study area, it is recommended that no development occur in the areas identified in Figure 1 as '*archaeological conservation areas'*.

- Application should be made to the Director-General of the DEC for a section 90 permit (Consent to Destroy) under the National Parks and Wildlife Act (1974 as amended), which will cover for the whole of the development area except for the proposed archaeological conservation areas.

  A condition to this permit may be that an archaeological salvage program is carried out and/or an archaeological site discovery protocol is implemented.

- Where appropriate, words and names from the history of the study area should be used in naming the new streets and features.

  Examples could be taken from both the local Aboriginal and English language.

- It is recommended that the Mogo Local Aboriginal Land Council consider applying to the DEC for a '*Care and Control'* permit for the care of the artefacts recovered during the excavations.

  Any future establishment of an Aboriginal cultural, interpretation and/or Keeping Place in the Barlings Beach area would provide an ideal base for the storage of this collection and any public interpretation of heritage values in the Rosedale area.

- It is recommended that copies of the detailed archaeology report, together with this brief plain-English version, be provided to the Mogo Local Aboriginal Land Council, the Yuin Elders Council and the Djuwin Women's Lore Council.

  The groups should be invited to:

  – provide written comment on the report findings;

  – provide an assessment of the Aboriginal cultural significance of the area; and

  – provide any suggested management strategies.

  This input will be required by the Department of Environment and Conservation prior to the processing of any application for a section 90 permit.

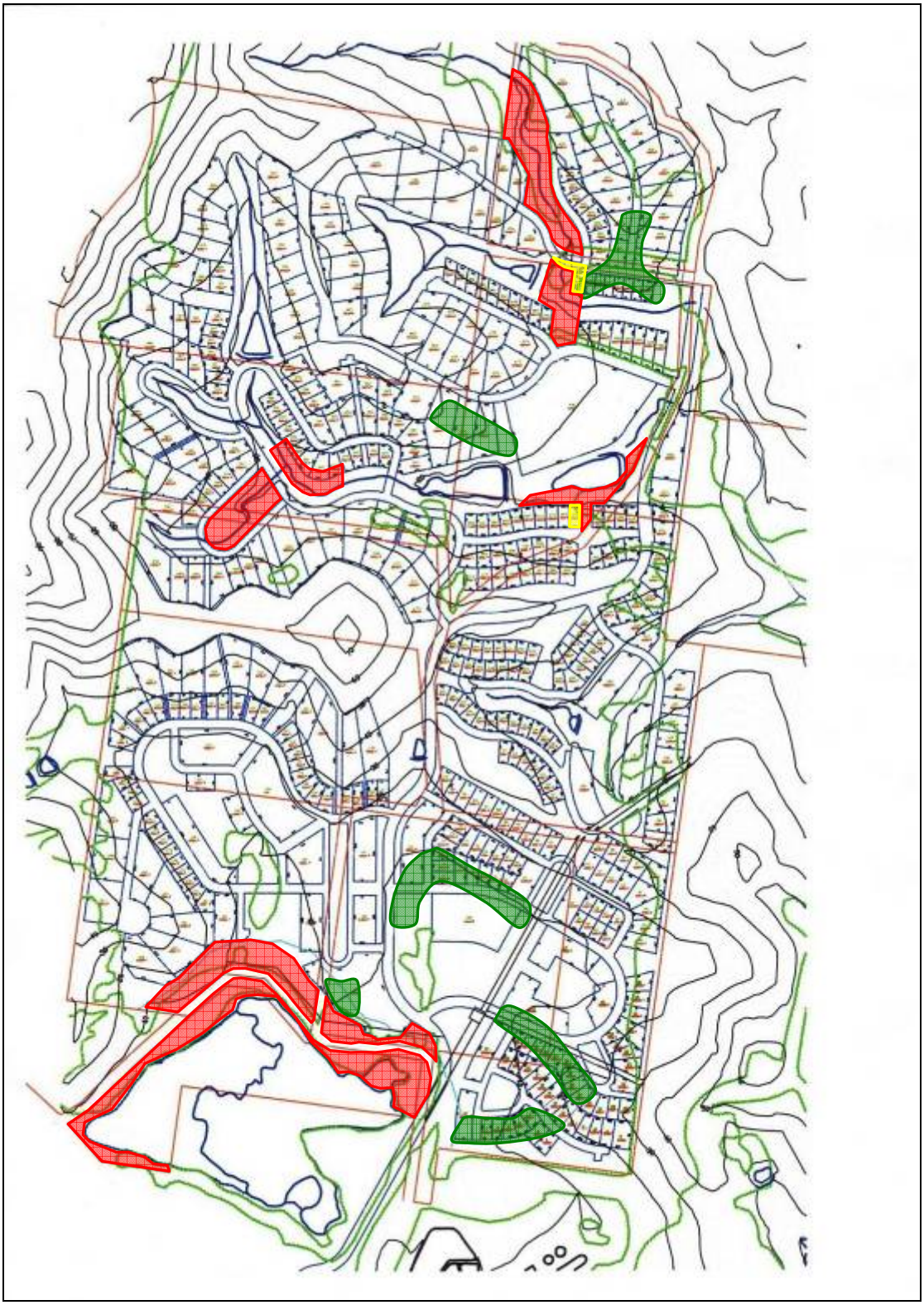


Figure 1 Areas subject to management considerations.

Recommended open space areas to be managed for the conservation of subsurface archaeological deposits

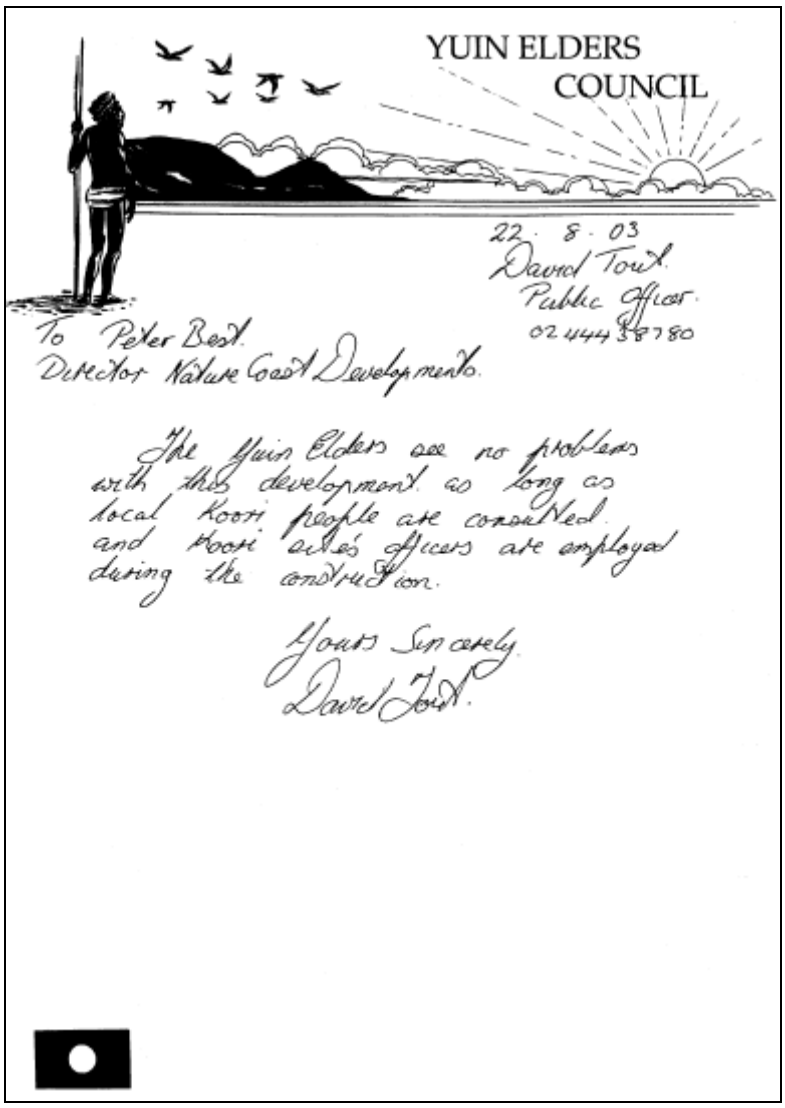
Formerly proposed residential allotments and road alignments required for inclusion within archaeological conservation reserves

Areas in which archaeological salvage could be considered

APPENDIX 9

LETTERS OF COMMENT PROVIDED BY

LOCAL ABORIGINAL ORGANISATIONS (2003-2004)



YUIN ELDERS COUNCIL

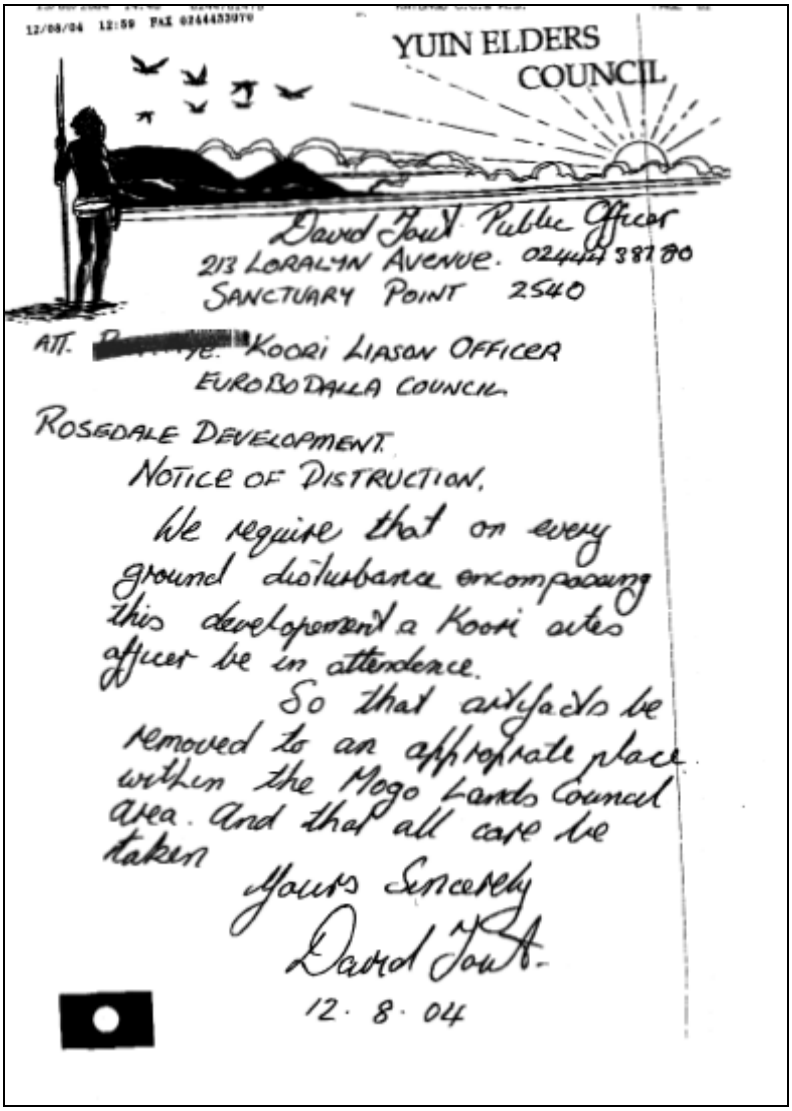
22. 8. 03

David Tout.
Public Officer.
02 4443 8780

To Peter Best.
Director Nature Coast Developments.

The Yuin Elders see no problems with this development so long as local Koori people are consulted and Koori sites officers are employed during the construction.

Yours Sincerely
David Tout.



12/08/04 12:59 FAX 0244439970

YUIN ELDERS COUNCIL

David Jowl Public Officer
213 LORALYN AVENUE. 02447 38780
SANCTUARY POINT 2540

ATT. [redacted] KOORI LIASON OFFICER
EURODODALLA COUNCIL

ROSEDALE DEVELOPMENT.

NOTICE OF DISTRUCTION.

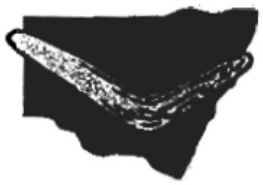
We require that on every ground disturbance encompassing this development a Koori sites officer be in attendence.

So that artifacts be removed to an appropriate place within the Mogo Lands Council area. And that all care be taken

Yours Sincerely

David Jowl

12. 8. 04



MOGO LOCAL ABORIGINAL LAND COUNCIL

Post Office Mogo, NSW 2536
Telephone: (02) 4474 5229
Facsimile: (02) 4474 5219
ABN: 25 184 322 074

13 August, 2004

D.I.P.N.R
20 Lee Street
SYDNEY NSW 2000

Attn: Ramiah Pradesh

Dear Ramiah

RE: ROSEDALE URBAN EXPANSION DEVELOPMENT

Mogo L.A.L.C would like to make the following recommendations to the above project:

1. That no development occurs within the Archaeological Conservation area's as recommended by Navin Officer Heritage consultants.

2. That at least two (2) sites officers be on site during all ground disturbing works and that the developer meet all associated costs.

3. That it be considered by the Developer that the naming of streets and reserves within the development use Aboriginal names.

If you have any problems with this please don't hesitate to contact this office on the above number.

Thank you

Patricia Russell
CHAIRPERSON

Djuwin Women's Lore Council

PO Box 610, Narooma. NSW 2546

Peter Best
Project Manager
Rosedale Urban Release Area

Monday August 25, 2003

Dear Peter,

Please note that, having met with you and Ron Nye of the Eurobodalla Shire Council on Monday August 18 in relation to the proposed development at Rosedale, We make the following comments on behalf of the Djuwin Women's Lore Council.

We are satisfied that proper consultation took place with the Mogo Local Aboriginal Land Council and that their wishes were incorporated into the report as prepared by Navin Officer Heritage Consultants.

We support the recommendations of Navin Officer Heritage Consultants in relation to the Aboriginal sites but must insist that all ground disturbance be monitored by both a male and female sites officer/representative of the Mogo LALC at the expense of the developer. In the event of further finds such representatives are to take appropriate action.

Where sites were identified as having archaeological potential (PAD1-8) we recommend further archaeological study and monitoring by representatives of the Mogo LALC, prior to development, to determine the extent of the site and provide for salvage should that be the chosen course of action for the Mogo LALC.

In relation to RUR2 we recommend further archaeological study and monitoring by representatives of the Mogo LALC prior to the development of this area to determine the extent of the site. Should development be an option we insist on minimal impact to this site perhaps by the provision of a buffer zone.

Thank you for including the Djuwin Women's Lore Council in the consultation process. We wish you success in your project but not at the expense of our sites.

Regards

Mary Duroux
Chairperson.

Djuwin Women's Lore Council

PO Box 610, Narooma. NSW 2546

Peter Best
Project Manager
Rosedale Urban Release Area

Friday 5th November, 2004

Dear Peter,

Please note that, having read the Archaeological Subsurface Testing Program Report to Marsim Pty Ltd in relation to the proposed development at Rosedale, We make the following comments on behalf of the Djuwin Women's Lore Council.

The study area is of high cultural significance to the local Aboriginal community (as are all Aboriginal sites) due to its proximity to Barlings Beach:

- Where it provided for concurrent occupation and spillover in times of large gatherings.
- In relation to the hunting and gathering of resources and
- for the access to water and grinding activities.

We support the recommendations of Navin Officer Heritage Consultants in relation to the Aboriginal sites but must insist that as a condition to a consent to destroy; **any and all** ground disturbance be monitored by Mogo LALC sites officer and representative at the expense of the developer. In the event of further finds such representatives are to take appropriate action.

We also recommend that the developer in good faith provide for the establishment of an Aboriginal Keeping Place within this development, in consultation with the Mogo LALC.

Thank you for including the Djuwin Women's Lore Council in the consultation process. We wish you success in your project but not at the expense of our sites.

Regards

Mary Duroux

Mary Duroux
Chairperson.

APPENDIX 10

LETTERS OF COMMENT PROVIDED BY

ABORIGINAL ORGANISATIONS (2007)

Djuwin Women's Lore Council

PO Box 610, Narooma. NSW 2546

Peter Best
Director
Nature Coast Developments
57 Yugura Street,
Malua Bay. NSW 2536

Monday 18th June, 2007

Dear Peter,

Please note that, having read the 'Review of proposed subdivision for Rosedale Urban Expansion Zone relative to known cultural heritage constraints' prepared by Navin Officer Heritage Consultants, We make the following comments on behalf of the Djuwin Women's Lore Council.

We are satisfied that the current subdivision proposal provides better potential to avoid direct impact to known Aboriginal sites and establishes a more effective management regime for their management.

We support the recommendations of Navin Officer Heritage Consultants in relation to the Aboriginal sites but must insist that any and all ground disturbance, be monitored by Mogo LALC Heritage officers, with both male and female representation on site, at the expense of the developer.

In the event of further finds work is to cease and the representatives are to notify the appropriate agencies.

Thank you for including the Djuwin Women's Lore Council in the consultation process. We wish you success in your project but not at the expense of our sites.

Regards

Mary Duroux
Chairperson.

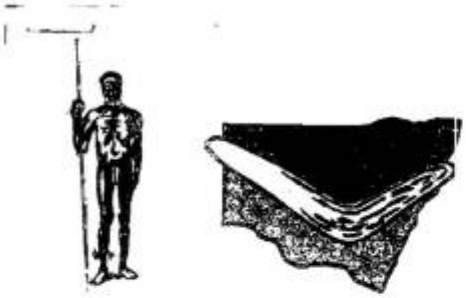
22 · 5 · 07

David Hunt
Public Officer
Yuin Elders.

To Peter Best

As on our previous letter dated 22 · 8 03 The elders are no longer to oppose this development under its present state

Yours Sincerely
David Hunt



MOGO LOCAL ABORIGINAL LAND COUNCIL

Post Office Mogo, NSW 2536
Telephone: (02) 4474 5229
Facsimile: (02) 4474 5219
ABN: 25 184 322 074

Nature Coast Developments PTY LTD
Post Office Box 2110
Malua Bay
NSW 2536

29th March 2007

Attention: Peter Best

Re: Rosedale Development

Dear Peter,

I would like to advise that members of the Mogo L.A.L.C met on 20th March 2007 to discuss and consider the October 2006 Navin Officer Review of the proposed subdivision at Rosedale relative to the known cultural heritage constraints.

We support the recommendations contained in the review in relation to Aboriginal sites but request in addition that the following be adhered to in regards to development of the site.

Mogo Local Aboriginal Land Council request that the following be adhered to in regard to your development:

1) That Marsim Pty Ltd has Sites /Heritage officers on site during all ground disturbing works.

2) That there be 2 Sites/Heritage Officers per machine during all ground disturbing works.

3) That if any Aboriginal Heritage items are discovered that works cease immediately and the relevant
authorities are contacted. Eg: Department of Environment & Conservation.

Regards

Angela Nye

Angela Nye
Secretary

EUROBODALLA SHIRE COUNCIL
Good Government, better living

In Reply
Please Quote: File No 93.5135.S

PO Box 99 Moruya NSW 2537
email: council@eurocoast.nsw.gov.au
website: www.esc.nsw.gov.au
DX 4873

28th June, 07

Navin Officer
ATT: Kerry Navin

Dear Kerry.

Re: Cultural Heritage Assessment of Rosedale Development Area

I wish to inform you that Eurobodalla Shire Council do not wish to register as an interest group as this Development is on file in this office.

Should you require further information, please do not hesitate to contact me on (02) 4474-1375.

Yours faithfully

Ronald Nye

Ronald Nye
Aboriginal Heritage Officer
Eurobodalla Shire Council
(02) 44741375

FAXED
28 JUN 2007
9:15 am

OFFICE OF THE REGISTRAR
ABORIGINAL LAND RIGHTS ACT 1983 (NSW)

CENTENNIAL PLAZA, TOWER B
LEVEL 13, 280 ELIZABETH STREET
SURRY HILLS NSW 2010
P. 02 9219 0720 F. 02 9219 0770

Kerry Navin
Navin Officer Heritage Consultants
Number 4 Kingston Warehouse
71 Leichhardt St
Kingston ACT 2604

Dear Kerry

Re: **Request - Search for Registered Aboriginal Owners**

I refer to your letter dated 12 June 2007 advising of your intention to engage in a consultation process with Aboriginal stakeholders with regard to cultural heritage of the Rosedale Development Area, NSW.

You should be aware that the subject land has Registered Aboriginal Owners pursuant to Division 3 of the *Aboriginal Land Rights Act 1983* (NSW). Recently, registered Aboriginal Owners elected two Boards of Management (BoM) representatives prior to the official hand back of the Biamanga and Gulaga National Parks. These BoMs represent the Aboriginal Owners in the wider study area and should be consulted with regard to your project. Their contact is:

Trisha Ellis
Aboriginal Project Officer
Park Service Division
Department of Environment and Conservation
PO Box 282
Narooma NSW 2546
Tel. 02 4476 0846
Fax. 02 4476 1793

To assist us in processing future searches, could you please include a location map of the development area in a regional (or state) context?

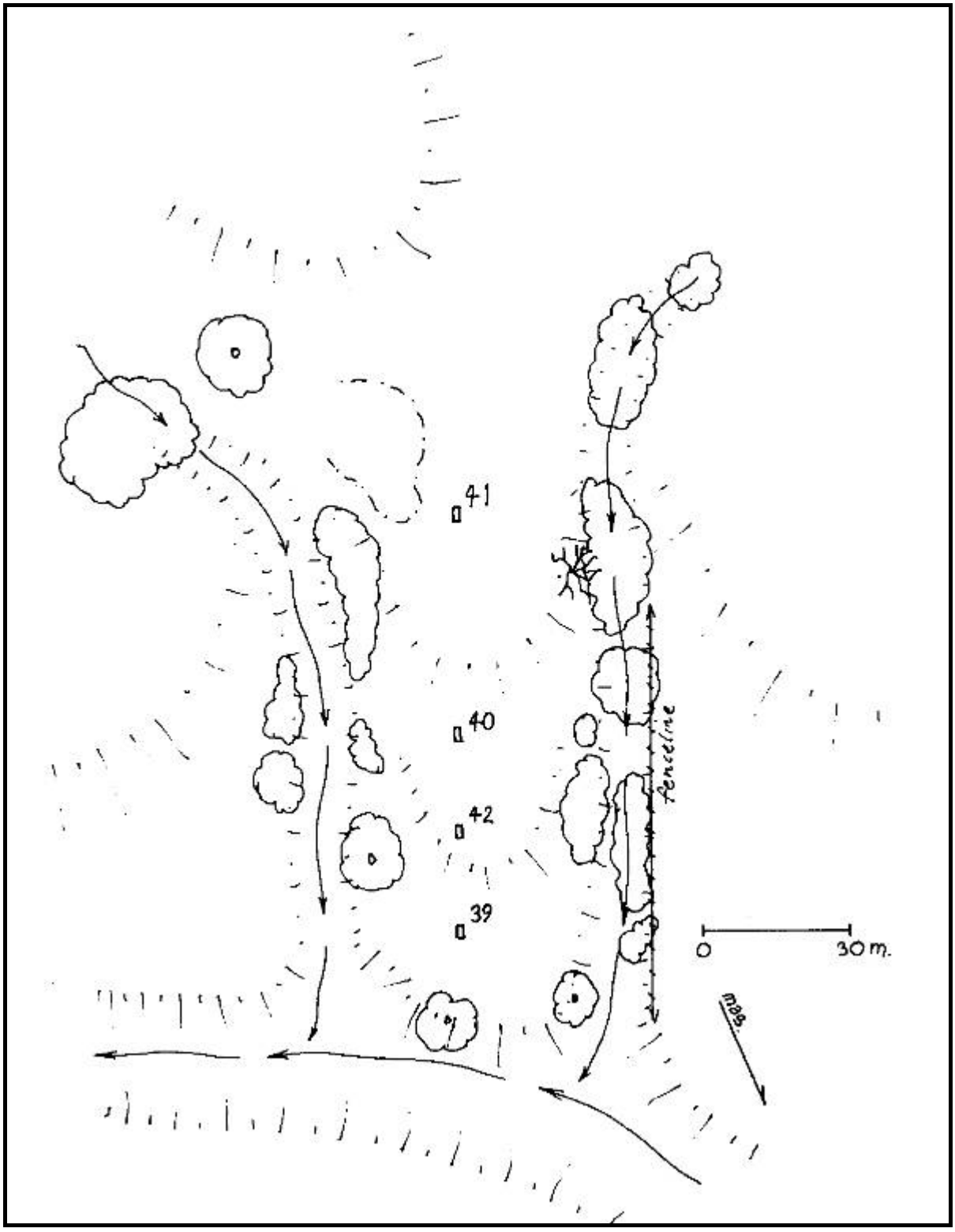
Regards

Megan Mebberson
Senior Project Officer (*Aboriginal Land Rights Act 1983*)
3 July 2007

APPENDIX 11

MAPS SHOWING TEST PIT LOCATIONS

IN PADS AND TEST AREAS



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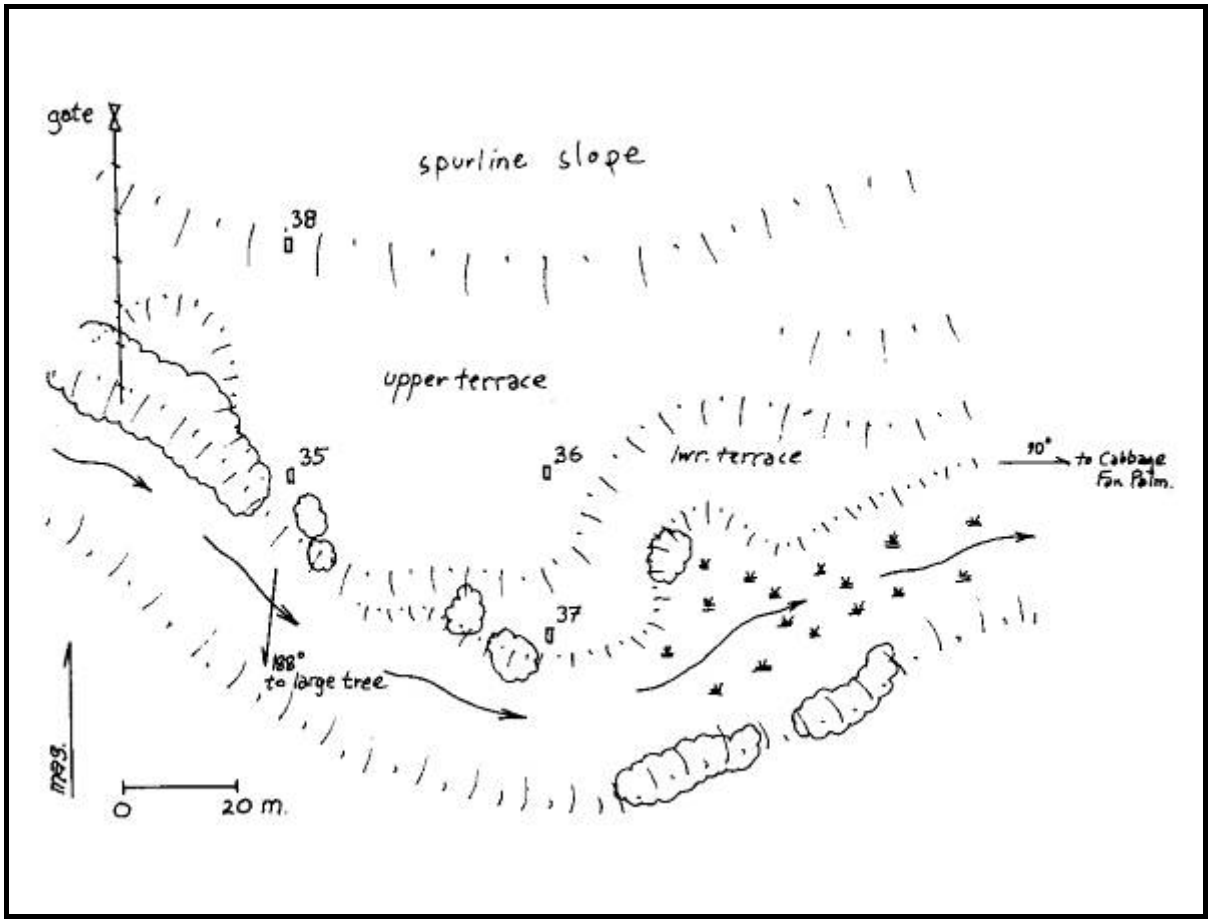
gate
spurline slope
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upper terrace
35
36
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90°
to Cabbage Fan Palm.
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188°
to large tree
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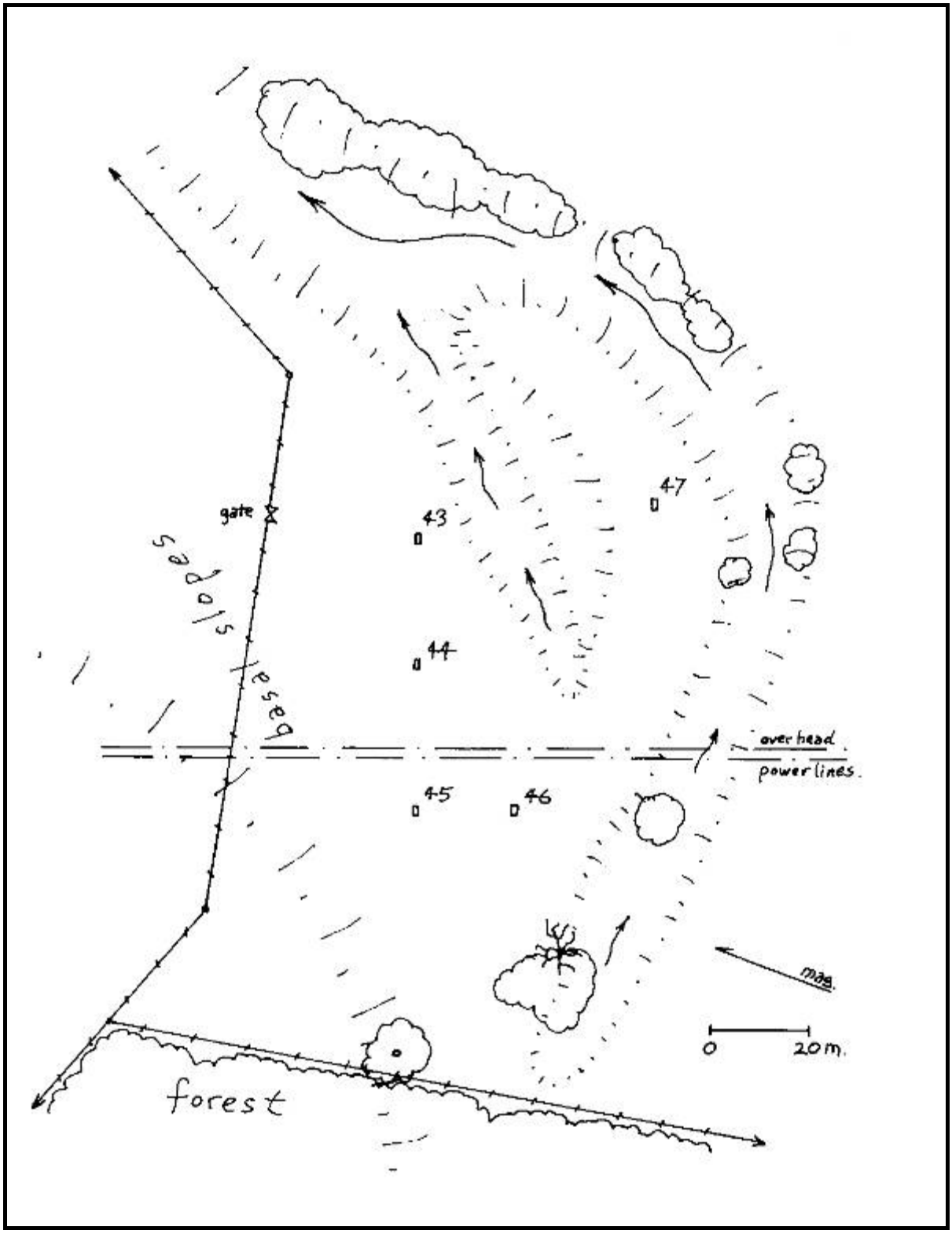
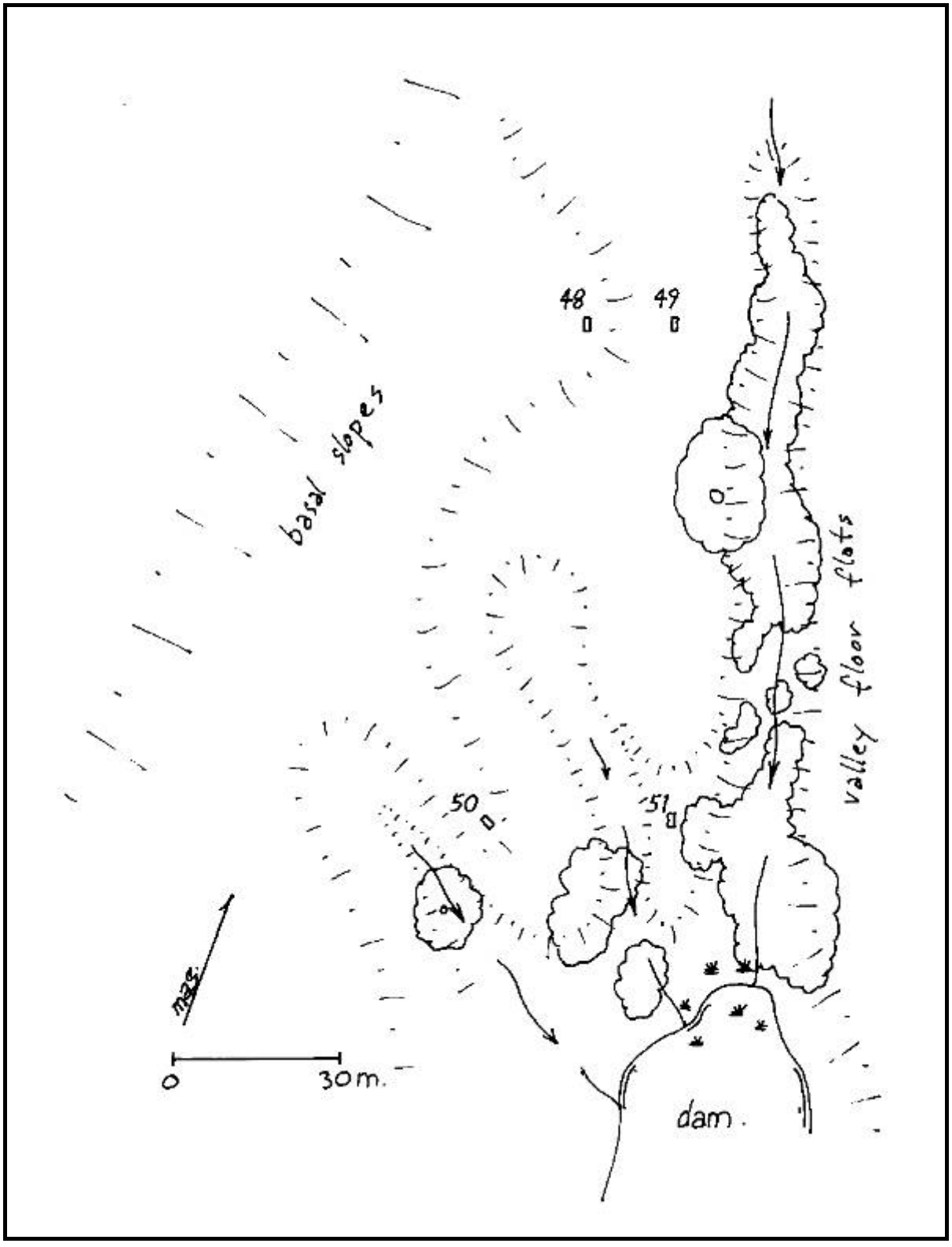
PAD2


gate
43
44
45
46
47
basal slopes
over head
power lines.
mag.
0
20m.
forest

PAD3



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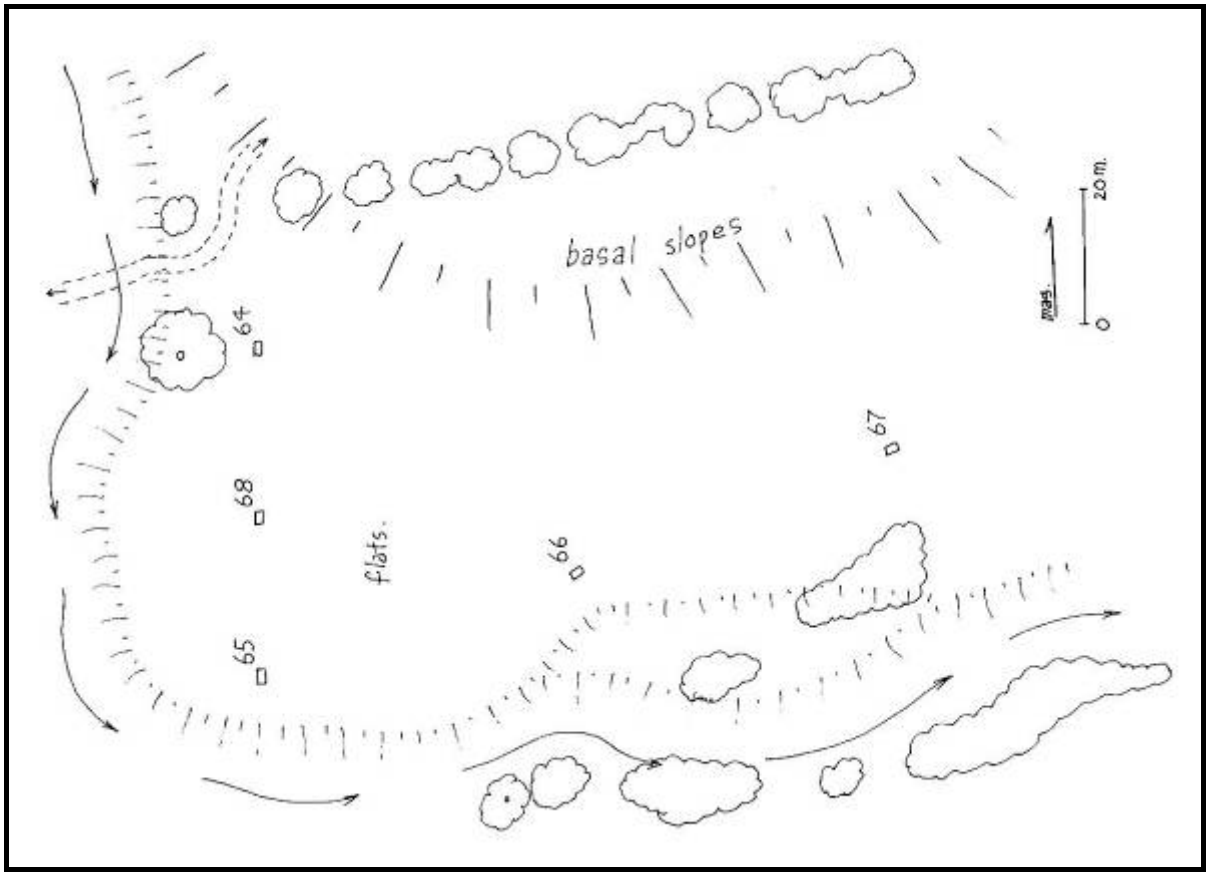

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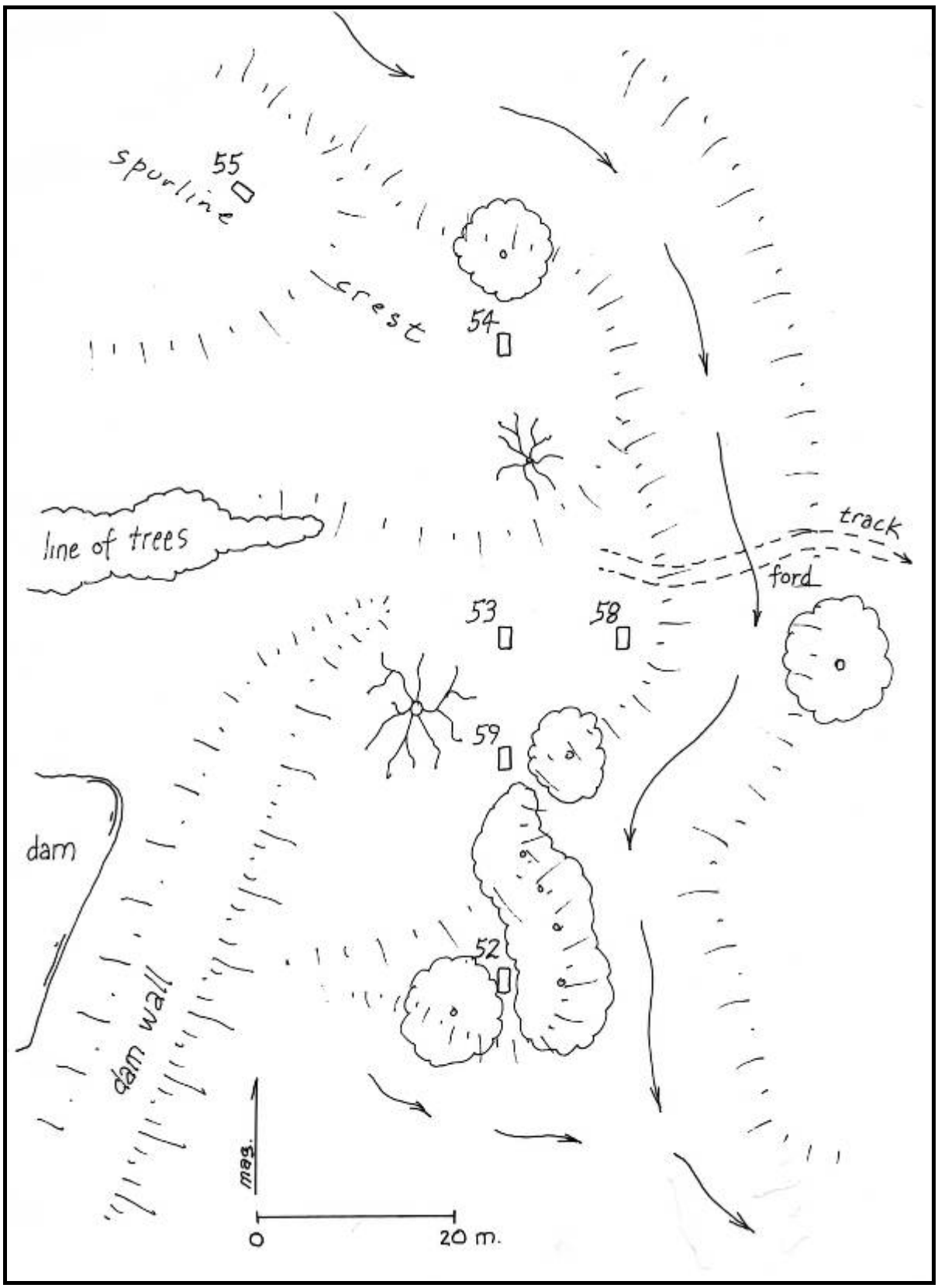
spurline
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crest
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track
line of trees
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58
59
dam
dam wall
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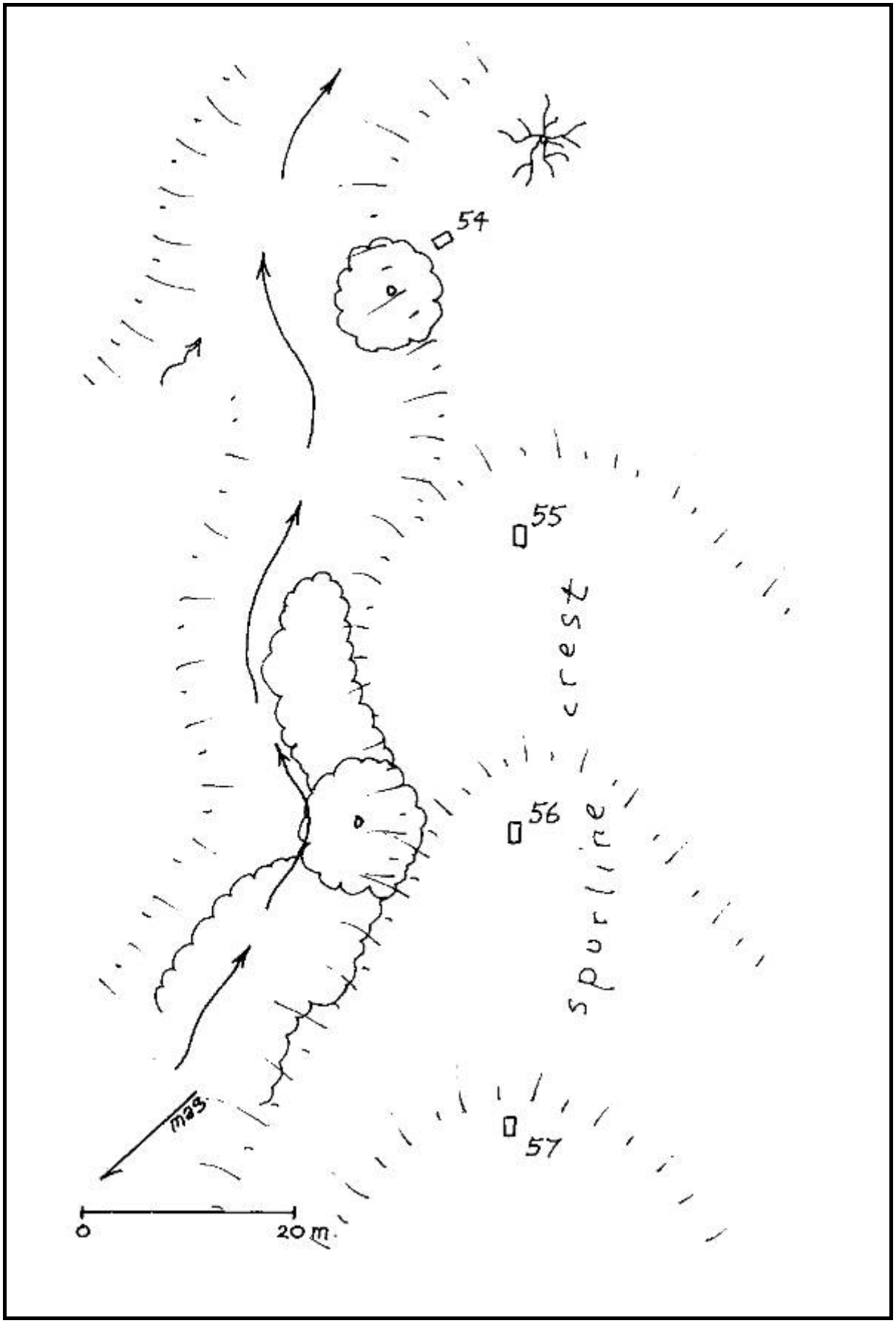
PAD6



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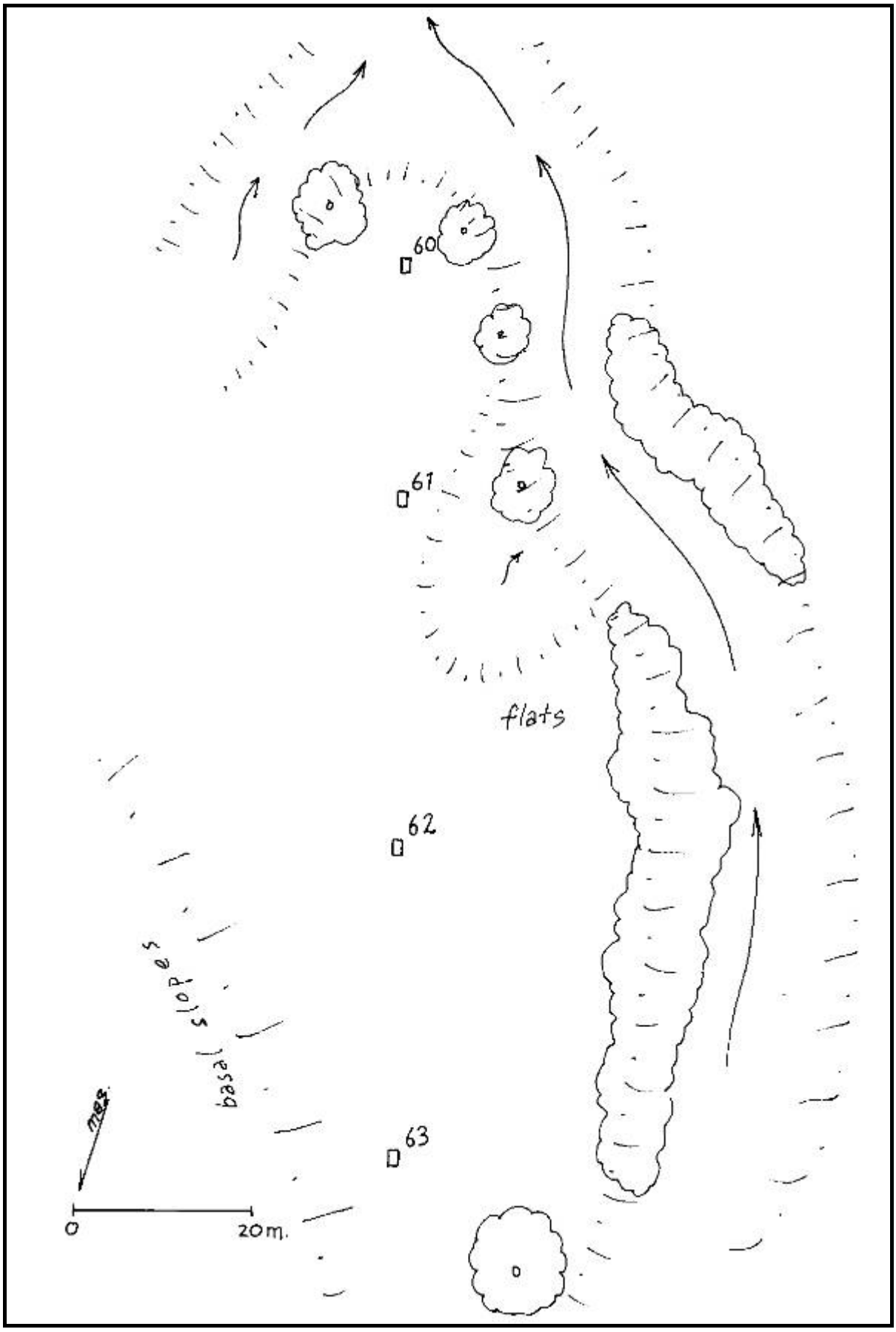

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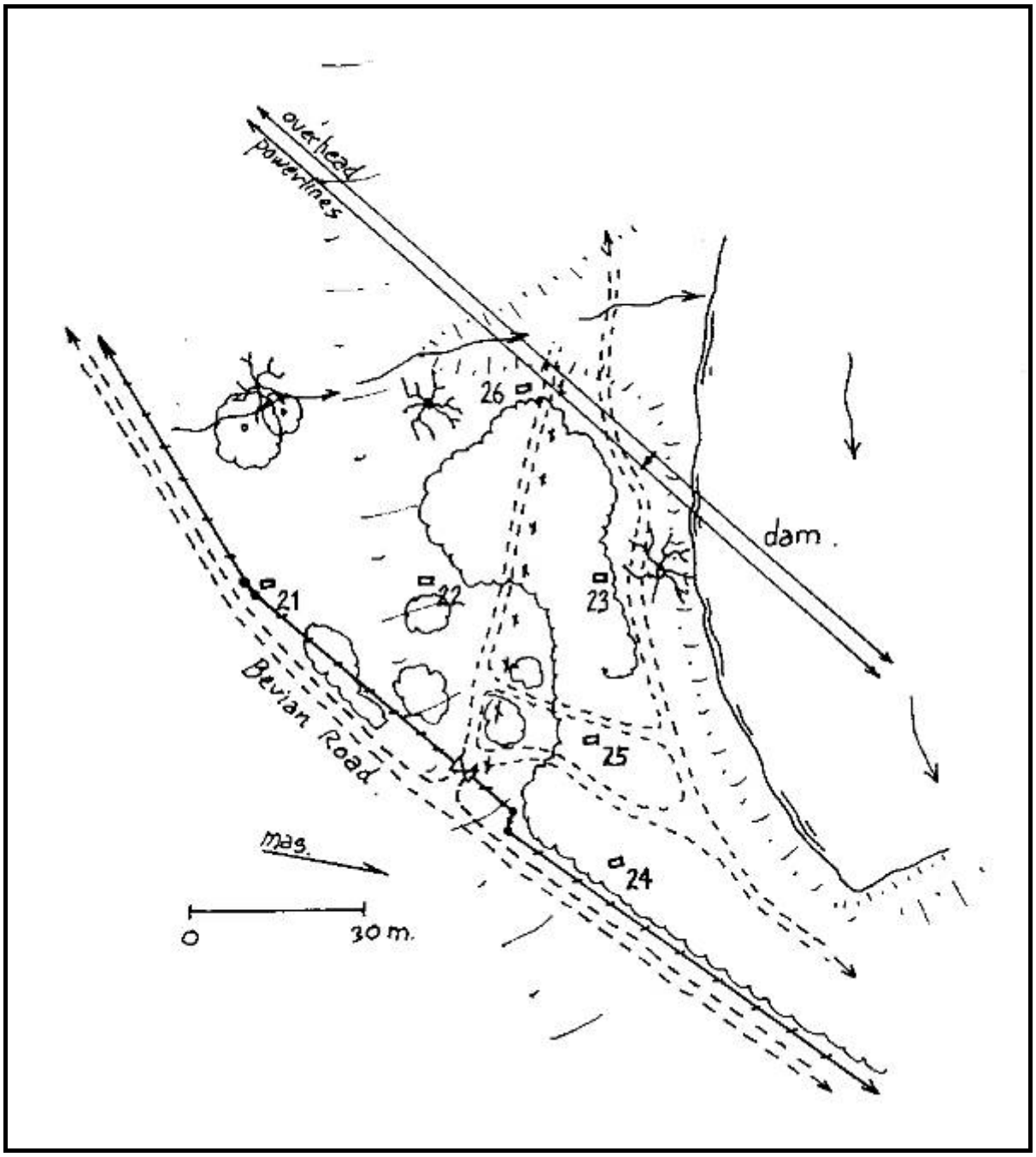
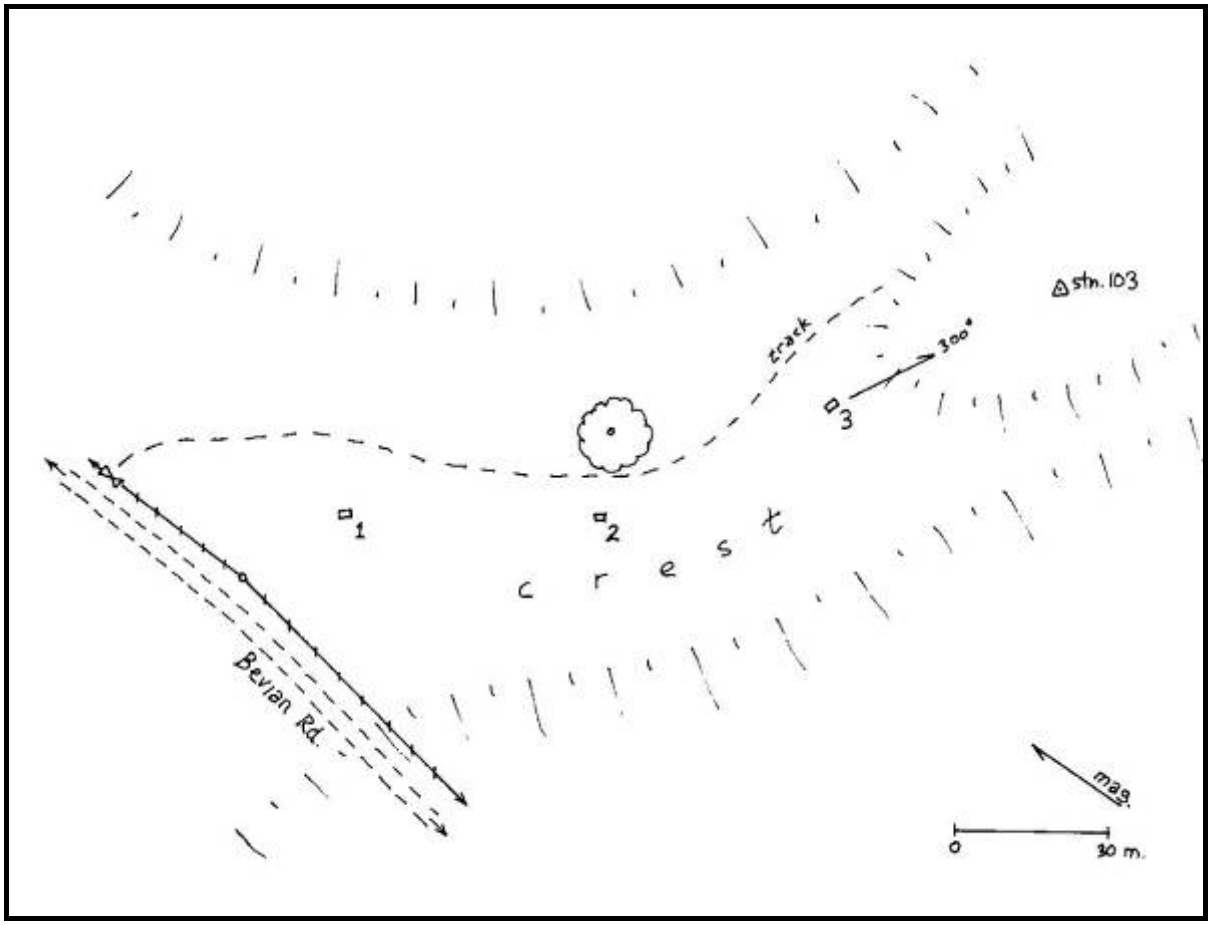
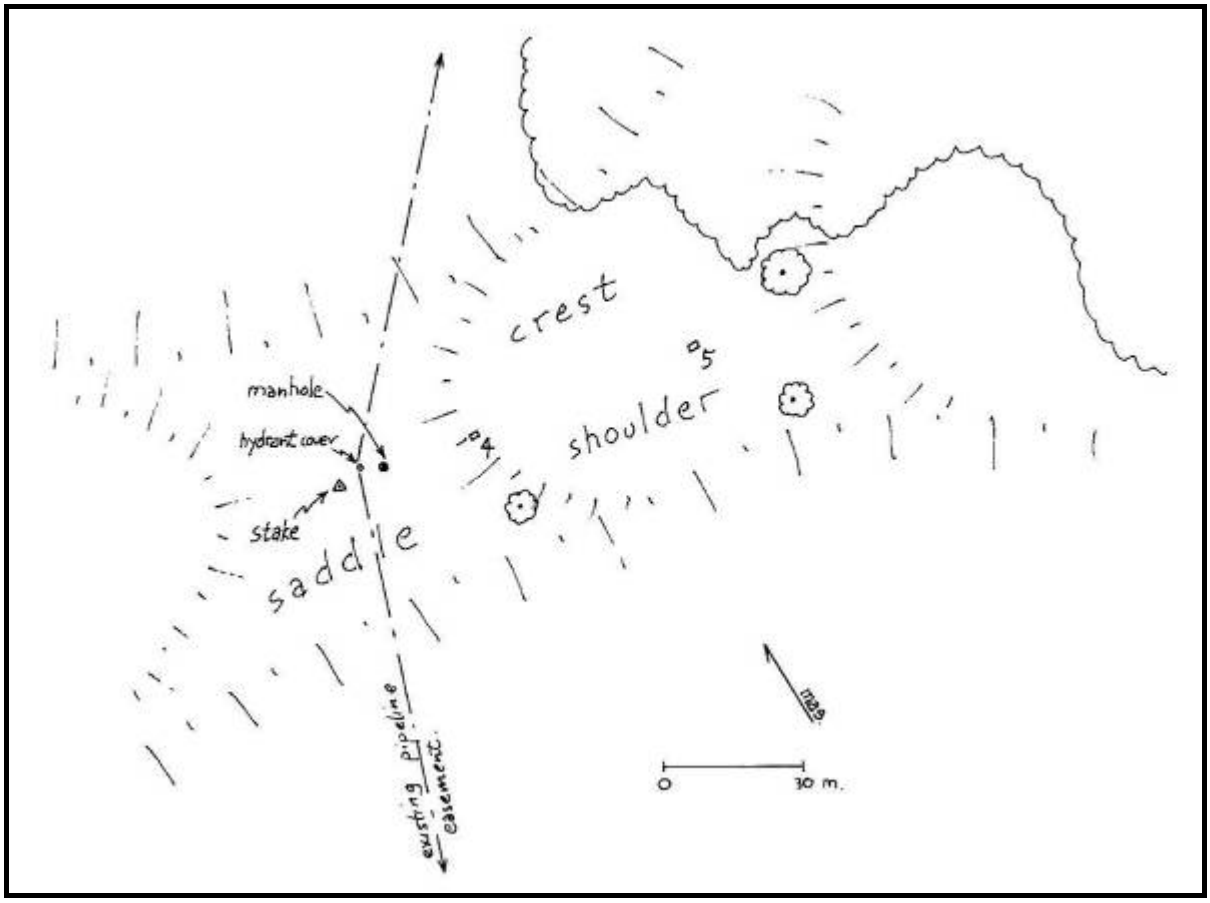

overhead
powerlines
dam
26
21
22
23
25
24
Bevian Road
mag.
0
30 m.

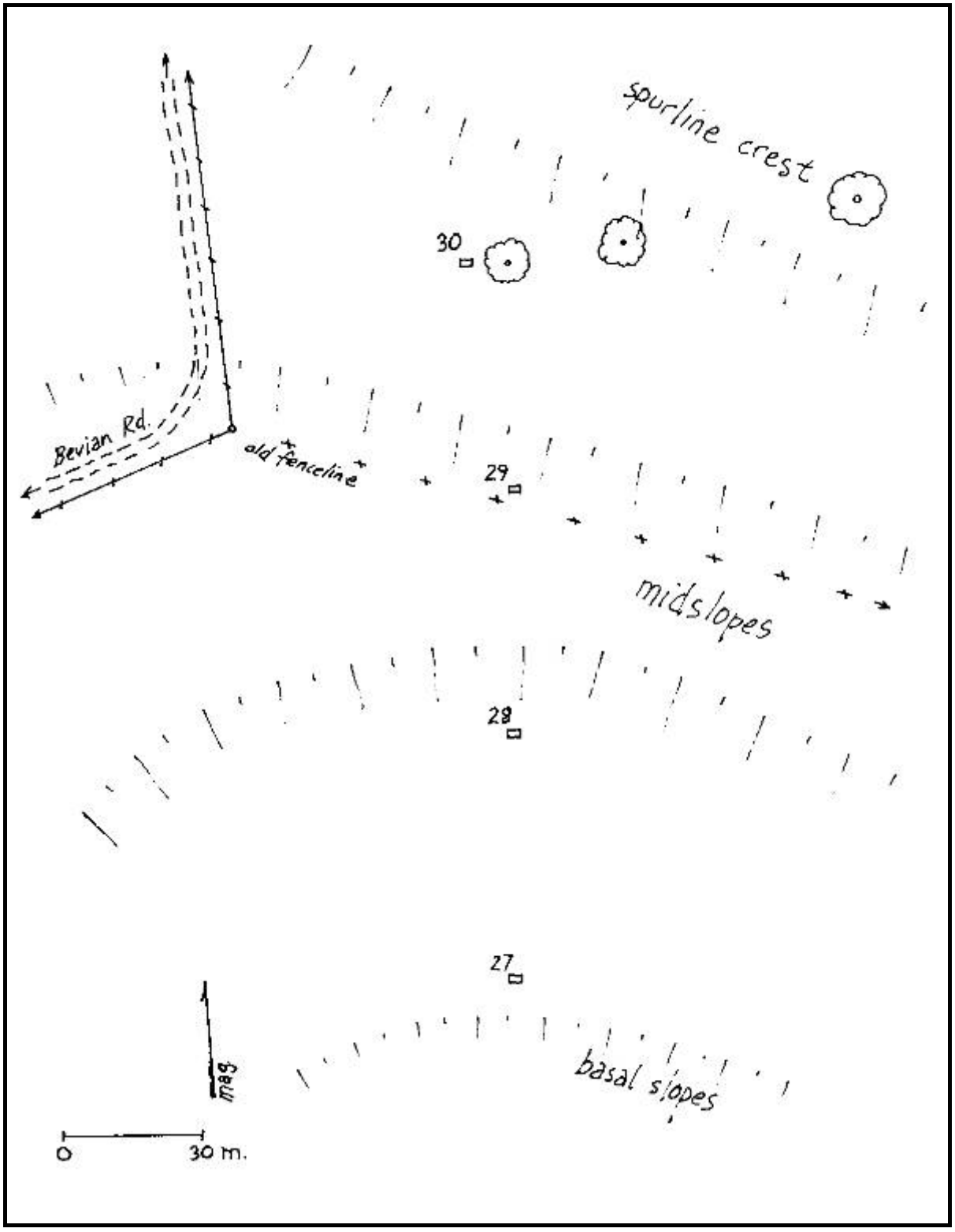
RUR2



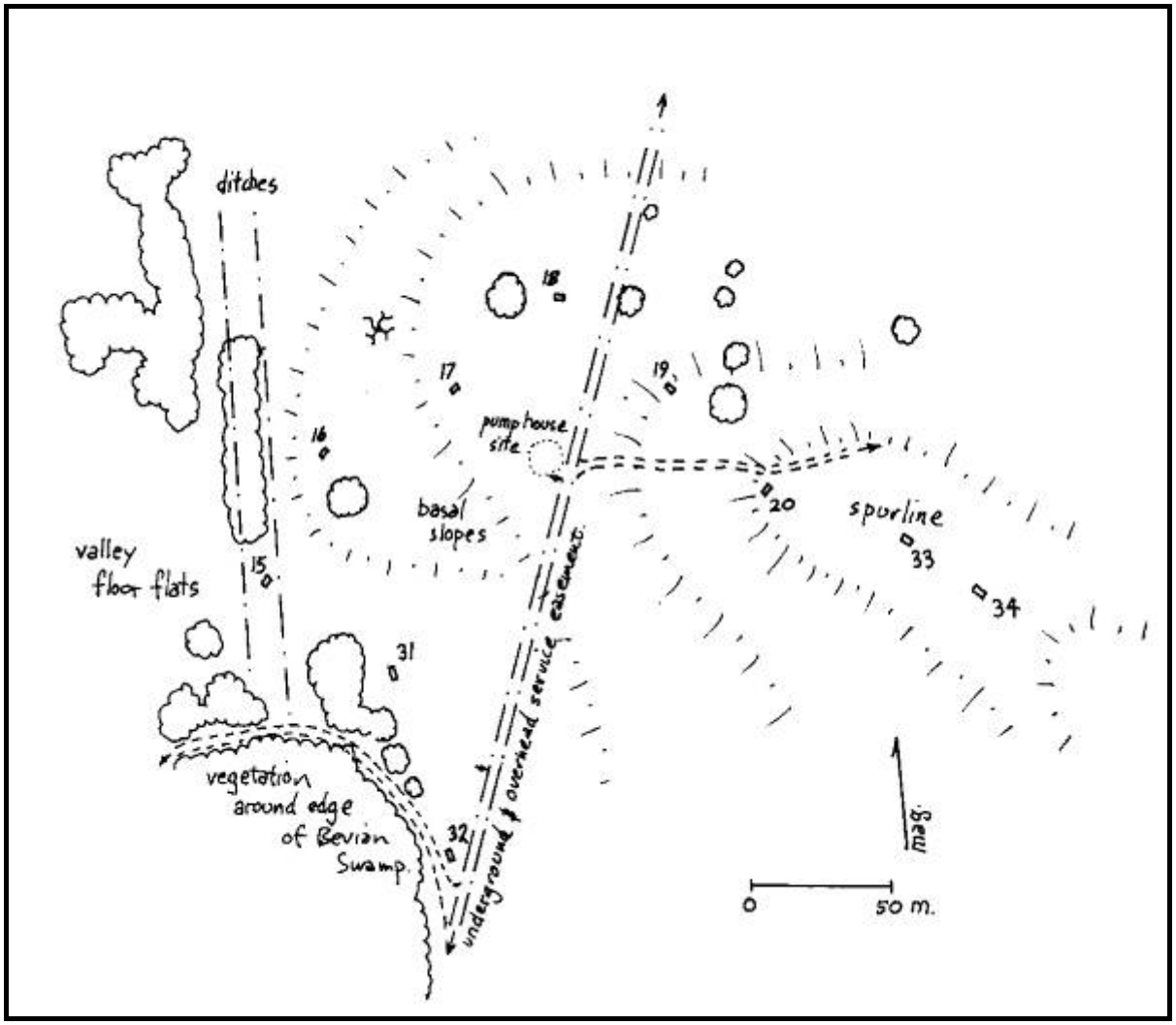
TA3


crest
shoulder
manhole
hydrant cover
stake
saddle
existing pipeline easement
0
30 m.

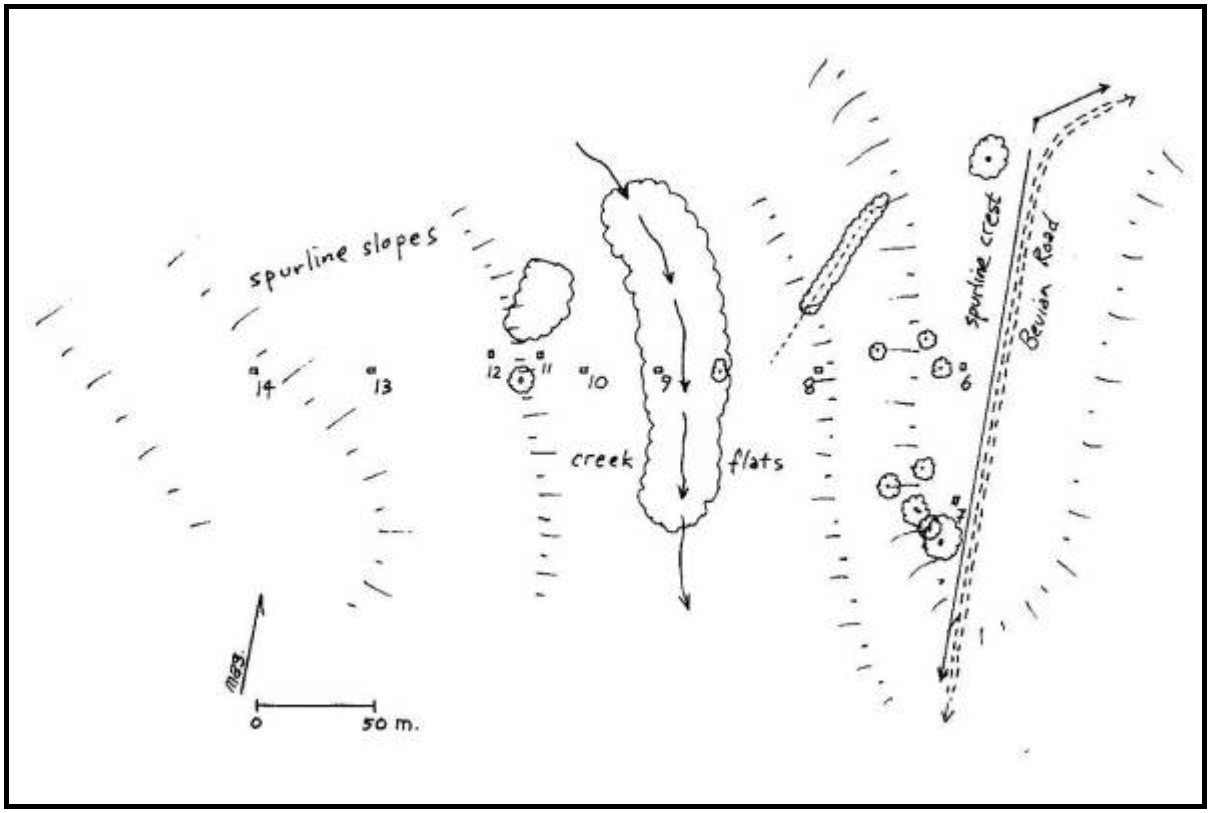
TA4


spurline crest
30
Bevian Rd.
old fenceline
29
midslopes
28
27
basal slopes
mag
0
30 m.

TA5


ditches
18
17
19
16
pump house site
basal slopes
20
spurline
valley floor flats
15
33
34
31
vegetation around edge of Bevian Swamp
32
underground & overhead service easement
mag.
0
50 m.

TA6


spurline slopes
14
13
12
11
10
9
8
6
creek
flats
spurline crest
Bevian Road
NORTH
0
50 m.

TA7

APPENDIX 12

PROTOCOL TO FOLLOW IN THE EVENT OF THE DISCOVERY OF HUMAN REMAINS

Protocol to be followed in the event that human remains are revealed within the development area

The potential for human remains to be uncovered when excavating in alluvial deposits or locally elevated sand bodies cannot be discounted.

The following protocol will be actioned if suspected human material is revealed during development activities (refer also to the flowchart):

1. If the remains are detected within or during an archaeological excavation, then no further excavation that involves the removal of *in situ* bones is to occur until the following are completed:

    a. The find is reported to the local Police;

    b. Local Aboriginal community and DECC representatives have been contacted;

    c. It is reliably determined that the remains are of an Aboriginal person who died more than 100 years ago;

    d. The remains are not consistent with the triggers specified in Step 5a; and

    e. Consensus is reached regarding the continuation of the excavation.

    If there is doubt that the remains are of an Aboriginal person who died more than 100 years ago, or if the remains are consistent with any of the triggers listed in Step 5a, then proceed with Step 5.

2. If the remains are detected within the context of development or construction-related activities, then all ground surface disturbance in the area of the finds should cease immediately the finds are uncovered.

    a. The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be temporarily halted; and

    b. The site supervisor and the Principal's Authorised Person will be informed of the find(s).

3. If there is substantial doubt regarding a human origin for the remains, then consider if it is possible to gain a qualified opinion within a short period of time. If feasible, gain a qualified opinion (this can circumvent proceeding further along the protocol for remains which turn out to be non-human). If conducted, this opinion must be gained without further disturbance to any remaining material and its context as possible (Be aware that the site may be considered a crime scene containing forensic evidence if the remains are found to be human and not of an Aboriginal person who died more than 100 years ago. If a quick opinion cannot be gained, or the identification is positive, then proceed to the next step.

4. Immediately notify the following people of the discovery:

    a. The local Police (this is required by law);

    b. A DECC archaeologist or Aboriginal Heritage Officer from the Southern Branch EPRD, Queanbeyan (6298 9700);

    c. A representative from the relevant local Aboriginal Land Council(s); and

    d. The project archaeologist (if not already present).

5. Facilitate, in co-operation with the appropriate authorities and Aboriginal representatives, the definitive identification of the material by a qualified person (if not already completed). This must be done with as little further disturbance to any remaining material and its context as possible.

a. If the remains are consistent with one or more of the following triggers, then a specialist in the identification of Aboriginal remains must be consulted to determine if the remains are of an Aboriginal person who died more than 100 years ago:

   i. The remains are those of a child;

   ii. Signs of recent disturbance or excavation at the burial site are found;

   iii. No cultural evidence of Aboriginal burial is evident;

   iv. Evidence of possibly fatal trauma such as a spear or bullet hole or fractures skull is noted;

   v. All of the hand, and foot bones as well as teeth (excluding Aboriginal tooth evulsion) have been removed or are absent;

   vi. If the skull is visible but does not appear to have clear Aboriginal characteristics;

   vii. If the skeleton is headless or the skull is present but smashed.

   A list of specialists is available in the DECC Aboriginal Skeleton Remains Manual (Donlan et al. 2002).

b. If the remains are identified as human, but not of an Aboriginal person who died more than 100 years ago, then further decisions and responsibilities regarding the remains rest with the NSW Police and Coroner.

6. If the remains are reliably identified as that of an Aboriginal person who died more than 100 years ago, (and this identification has been made by a specialist where the remains are consistent with one or more of the triggers listed in step 5a), then:

   a. Ascertain the requirements of the local Aboriginal organisations and the project archaeologist.

   b. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following:

      i. Avoiding further disturbance to the find and conserving the burial *in situ*, (this option may require relocating the development and this may not be possible in some contexts);

      ii. Conducting (or continuing) archaeological salvage of the finds;

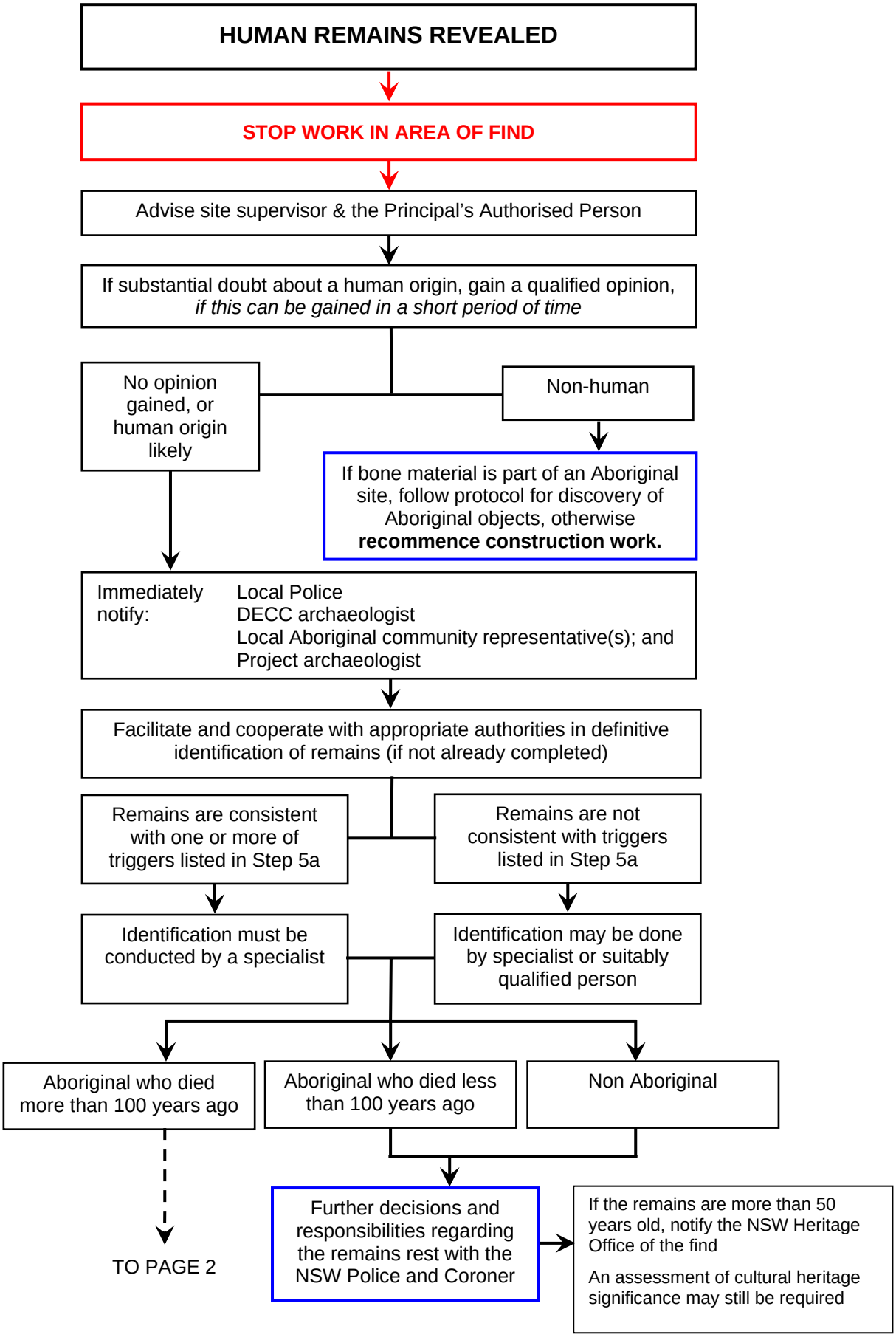
      iii. Scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial;

      iv. Recovering samples for dating and other analyses; and/or

      v. Subsequent reburial at another place and in an appropriate manner determined by local Aboriginal organisations.

7. Following the removal of the remains and associated burial material to the satisfaction of the project archaeologist and local Aboriginal organisation representatives, recommence the previously suspended construction activities.

Flowchart – Protocol for Human Remains Revealed during Construction Works (p1 of 2)



Flowchart – Protocol for Human Remains Revealed during construction Works (p2 of 2)