

Report on
Aboriginal Heritage Investigations

Proposed GinGin Mineral Sands Mine
Shire of GinGin, Western Australia



Prepared for
URS Australia Pty Ltd
(on behalf of Iluka Resources)

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February 2003

Executive Summary

In May 2002, URS Australia Pty Ltd (on behalf of Iluka Resources) commissioned McDonald, Hales and Associates to undertake Aboriginal heritage investigations in relation to a proposed mineral sands project in the Shire of Gingin, Western Australia. The proposed project area (PPA) is located approximately 2.5 kilometres north-west of the Gingin town site and encompasses an area of approximately 328 ha bounded to the west by Brand Highway and to the south by Dewar Road.

K. Edwards and A. Murphy conducted the archaeological field survey in September 2002. T. Venz conducted the ethnographic survey and consultation process with the Yued native title claimant group and members of the Bibbulmun Tribal Group in September 2002.

During the course of the archaeological field survey, it is estimated that an area of approximately 26.4ha (or 52.8 linear kilometres), representing 9% of the PPA by area, was inspected. Unfortunately, *effective* survey coverage of this area was in many places reduced to 25% or less owing to a range of access and technical constraints obtained at the time of survey. These can be summarised as follows:

- Portions of Lot 2 on Diagram 15769 and Lot 3 on Diagram 17098 were either inundated or subject to heavy water sheeting at time of survey, reducing effective archaeological survey to nil.
- Portions of Lot 2 on Diagram 15769 had been cleared and landscaped to form a large dam for livestock and drainage purposes. The area encompassed by the dam and associated earthworks was unavailable for survey.
- The balance of the PPA generally supported a dense growth of field grasses, weeds or riparian vegetation that generally served to reduce effective archaeological survey coverage to 25% or less. The only significant exceptions to this were a small number of devegetated sandy exposures, cattle wallows and access tracks. Ground surface visibility across these areas was good to excellent (50% to 100%) overall.

No new or previously recorded archaeological sites were identified by survey within the PPA. Given the demonstrated archaeological potential of the wider study area, this outcome can most parsimoniously be attributed to localised patterns of land-use by Aboriginal groups and a range of technical factors that served to impose constraints on archaeological survey efficacy. While it is unlikely that those parts of the PPA subject to seasonal inundation were used by Aboriginal groups in an archaeologically detectable manner, there is nevertheless a potential for material (including sub-surface cultural deposits) to be present across the balance of the PPA. This potential will need to be evaluated by methods other than surface survey.

Given this, the proponent should implement appropriate procedures and protocols to ensure on-going compliance with the *Aboriginal Heritage Act (1972)*. Ideally, a suitably qualified archaeologist (in consultation with the Yued native title claim group) would be commissioned to undertake a programme of strategic archaeological evaluation, monitoring and (if warranted) detailed investigation across those areas considered to have a high potential for archaeological material. As indicated by previous research, such areas are likely to be contiguous with relatively well-drained and elevated areas adjacent to creeklines or other natural drainage features. Areas within the PPA that are considered to have a high archaeological potential can be taken to include land within 100m or so of unnamed streamlines on Lot 3 and Swan Location 506 and Lot 7, respectively.

The timing and nature of any such programme of archaeological evaluation will necessarily depend on the proposed development schedule and local ground conditions. Should archaeological material be identified within the PPA (as a result of archaeological evaluations/monitoring procedures or a report made by staff, contractors or sub-contractors associated the proposed Gingin Mineral Sands Mine, for example), it may be necessary for the proponent to a) undertake Aboriginal community consultation, and b) obtain permission to use the land on which that material is located in accordance with Section 18 of the *Aboriginal Heritage Act (1972)*.

In respect of those areas of the PPA not considered to have a high archaeological potential, a programme of periodic archaeological monitoring and/or inspections should be implemented during the early phases of vegetation clearance and ground disturbing activities. This should address concerns expressed by the Aboriginal consultants regarding the potential for sub- or near-surface archaeological material and/or burials within the PPA.

No ethnographic sites were identified by any of the Aboriginal consultants that would be impacted upon. The Yued consultants discussed a general spiritual significance of the Gingin area but were unable to pinpoint any specific sites as such.

The Yued consultants reported that they are opposed to mining of the subject land and would like to meet with Iluka and the South West Land and Sea Council in order to discuss compensation issues. It would be advisable for the proponents to consult their lawyers regarding their obligations.

The two Aboriginal consultants from the Bibbulmun Tribal group expressed concern that mining activities may detrimentally impact upon the drainage system. It may be prudent for the proponent to supply the Aboriginal consultants with environmental management plans in order to alleviate their concerns. The Aboriginal consultants also requested archaeological monitoring of the survey area in case of the existence of subsurface material. They further requested that native vegetation is retained or salvaged where possible.

Based on the findings of the Aboriginal heritage investigations, it is **recommended** that:

- The proponents consider the request of the Yued Working Party to meet with them and the South West Aboriginal Land and Sea Council to discuss compensation issues.
- The proponents supply the Aboriginal consultants with environmental management plans in order to alleviate their environmental concerns.
- The proponents consider the request of Aboriginal consultants to minimise impact to native vegetation and salvage where possible.
- A suitably qualified archaeologist (in cooperation with the Yued native title claim group) be commissioned to undertake the following works:
 - i.) Conduct archaeological evaluations and continuous monitoring across areas deemed to have a high archaeological potential; and
 - ii.) Conduct periodic monitoring of vegetation clearance and initial ground disturbance works across the balance of the PPA.

Should any additional archaeological material (including both surface and sub-surface archaeological material) be identified during the course of the evaluation and monitoring process, more detailed archaeological investigation and management may be required, including:

- i.) surface recording, mapping and collection of archaeological material;
- ii.) archaeological excavation and/or sub-surface sampling;
- iii.) radiometric dating (where possible or applicable);
- iv.) analysis of recovered material; and
- v.) provision of long-term storage of recovered archaeological materials.

These works would need to be undertaken by a suitably qualified archaeologist issued with a current permit under Section 16 of the *Aboriginal Heritage Act (1972)*. It is also important that Aboriginal community representatives be consulted and fully involved in the archaeological investigations. In particular, material should be returned to the Aboriginal community for storage (if so desired), with professional input being provided on issues such as curation and display.

- Staff, contractors and sub-contractors associated the proposed Gingin Mineral Sands Mine be briefed with respect to Aboriginal heritage issues. This should include, but not be limited to, the following:

- i.) Obligations under the *Aboriginal Heritage Act (1972)*;
- ii.) Identification of Aboriginal sites; and
- iii.) Protocols to be observed should Aboriginal heritage sites be encountered during the course of development.

Should any person (staff, contractor, sub-contractor) have reason to suspect the presence of a previously unreported Aboriginal site, this should be immediately reported to the Site Manager. Work in the vicinity of the site should cease immediately and an assessment made by a suitably qualified person. Depending upon the outcome of the assessment, further action may be required. This could take the form of further detailed recording, collection of material(s), and/or controlled archaeological test-excavation. Depending on the outcome(s) of the assessment it may be necessary for the proponent to submit an application to disturb the land on which the site(s)/feature(s) are located in accordance with Section 18 of the *Aboriginal Heritage Act (1972)*.

Should human skeletal material be encountered during the course of development, all work must cease immediately as, by law, the area becomes a crime scene. The following authorities must then be contacted: Police Department, State Coroner, Department of Indigenous Affairs, and the Western Australian Museum. Depending upon the nature and condition of the human skeletal remains, archaeological and/or forensic excavation may need to be undertaken. Given the highly significant nature of Aboriginal skeletal material, further action should largely be determined by the wishes of the Aboriginal community.

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1 Introduction and Background

1.1 Introduction

In May 2002, URS Australia Pty Ltd (on behalf of Iluka Resources) commissioned McDonald, Hales and Associates to undertake Aboriginal heritage investigations in relation to a proposed mineral sands project in the Shire of Gingin, Western Australia. The proposed project area (PPA) is located approximately 2.5 kilometres north-west of the Gingin town site and encompasses an area of approximately 328 ha bounded to the west by Brand Highway and to the south by Dewar Road. The location of the PPA, together with relevant cadastral information, is shown in Figure 1.

K. Edwards and A. Murphy conducted the archaeological field survey in September 2002. T. Venz conducted the ethnographic survey and consultation process with the Yued native title claimant group and members of the Bibbulmun Tribal Group in September 2002.

1.2 Aims and scope of the present works

The main objectives of the present investigations are to:

- Identify any known or potential Aboriginal heritage issues that may affect the proposed development.
- Undertake research and/or consultation that may be required to meet the requirements of the *Aboriginal Heritage Act (1972)*.
- Locate/record Aboriginal sites and any other Aboriginal heritage issues.
- Make recommendations regarding the management of the above sites, including any further research and/or consultation that may be required during or after the works component of the project.

1.3 Local environment

1.3.1 Climate

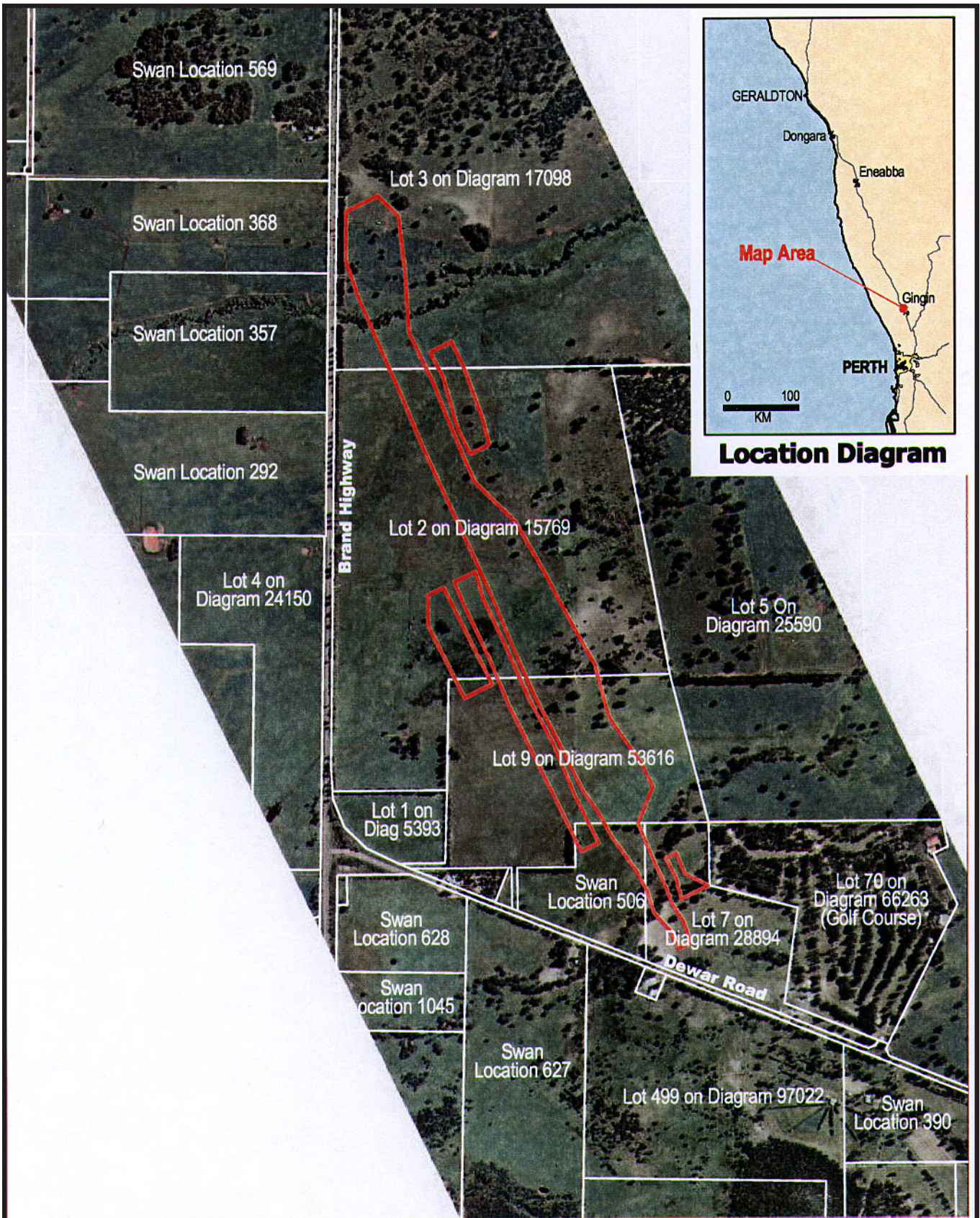
The climate of the Gingin area is characterised as Warm Mediterranean, having 5-6 dry months per year. Average annual temperatures range from a summer (December – February) high of 28°C, although temperatures above 30°C do occur, to a winter low of 17°C. Gingin lies toward the northernmost edge of the 750mm isohyet and thus has a variable annual rainfall of around this amount. Most precipitation occurs as winter rain, with the summer months (January and February particularly) often completely dry. During these months evaporation rates greatly exceed precipitation, leading to the depletion of surface waters.

1.3.2 Geology, Geomorphology and Soils

The Gingin area lies at the intersection of the Ridge Hill Shelf and Yoganup Formations that abut the foot of the Gingin Scarp. This scarp runs roughly parallel to, and west of, the Darling Scarp and represents a similar inactive fault line. The Ridge Hill Shelf and Yoganup Formations represent remnant shoreline deposits that arose during separate early Pleistocene high sea stands. The Ridge Hill Shelf comprises leached shoreline sand with a basal conglomerate that has been cemented/silicified into sandstone. Acidic yellow soils with ironstone gravels are characteristic. Hard setting loams are occasionally present across dissected areas. The Yoganup Formation is largely unconsolidated beach sand, also underlain by conglomerate, that contains laterised patches. Leaching has concentrated heavy minerals in the Yoganup Formation and the resulting mineral sands form the basis of the proposed Gingin Mine. Overlying these formations are Pinjarra Plain deposits that consist of minor alluvial deposits and outwash fans from the Darling uplands that coalesce at the scarp foot. These deposits consist predominantly of clays, deep friable loams and neutral red and yellow earths.

1.3.3 Vegetation

The proposed Gingin Mineral Sands Mine lies within the Drummond Subdistrict of the Southwest Botanical Province. The proposed mine lies within the northernmost portion of the Pinjarra Plain Vegetation System, which is confined to the scarp foot and alluvial zones of the Swan Coastal Plain. In the Gingin area species composition varies according to topographic situation and, more particularly, the degree of seasonal waterlogging individual areas experience. On more elevated, and hence drier, sandy sites, a Banksia low woodland develops. However, across interdunal swales and other swampy areas a jarrah (*Euclayptus marginata*) – marri (*E. Calophylla*) woodland is present, with a Banksia-Casuarina understorey. On the wettest sites a distinct swam community is present, with *Melaleuca raphiophylla* as the dominant tree species. Thickets of *M. preissiana* may also be present, along with sedgelands.



Location Diagram

LEGEND

 PI Limits



0 500 1000 Meters

MGA Coordinates, GDA94



ORIG : C.SYKES

DRAWN : JCH

SCALE : 1:20 000

DATE : 22 MAY 2001

GINGIN

"NOTICE OF INTENT"

**HM RESERVE
AERIAL PHOTOGRAPHY
22 SEP 2000**

DWG No : GGG0083A

FIGURE : 1

2 Archaeological Survey

2.1 Regional Archaeological Context

Evidence from the Upper Swan site on the alluvial terraces of the Swan River suggests that the South-west of Western Australia has a history of Aboriginal occupation spanning at least the past 40,000 years or so (Pearce and Barbetti 1981). Although aspects of the dating evidence from Upper Swan have recently been questioned (Bowdler, Strawbridge and Schwede 1991; cf. Allen 1989; Pearce 1992:60), the late Pleistocene antiquity of human occupation in the South-west has nevertheless been confirmed by research at several additional stratified sites (for example, Dortch 1984; Schwede 1983 a-c; Ferguson 1985; Smith 1992).

Despite the large number of known and dated archaeological sites in the Southwest, surprisingly few regional-scale surveys have been completed (C. Dortch 2000, J. Dortch 2000, Hallam 1977, Ferguson 1985, Smith 1993, McDonald, Hales and Associates 1994a, 1994b, Lilley 1991); indeed, most research to date has either focused on single sites or site complexes, or taken the form of short-term contract surveys. Unfortunately, little of the latter has been published or otherwise disseminated, and therefore remains somewhat intractable as a source of potentially exploitable data. As a consequence of these limitations in contemporary research, our understanding of the archaeology of the South West of Western Australia remains somewhat nebulous, with many questions and issues remaining to be adequately addressed. As noted by Smith (1993:41):

...there remain many unanswered questions, not least of which is the existence and/or nature of a distinctly South-west regional signature. Palaeoclimatic changes in the past 40,000 years, regional variation in site occupation patterns and presumably resource scheduling patterns, possible depopulation (or population decrease) in the mid-Holocene, restricted use of specific areas... remain to be clarified or established.

One of the most influential regional-scale studies undertaken in the Perth Metropolitan Region was Hallam's long-term Swan Area Archaeological Survey (Hallam 1972, 1977, 1983, 1987). This programme of research had as its focus an understanding of regional demographic patterns on the Swan Coastal plain and its hinterland over time. Towards this end Hallam integrated ethnohistorical data with that captured from an analysis of almost 400 open artefact scatters and several stratified sites within a 420 km² section of the Perth metropolitan area extending from the coast to the Ridge Hill Shelf.

A full topographic and assemblage analysis was drawn up for each site recorded during the course of the survey. This included details of site type (isolated artefact or artefact cluster), site size (divided into three categories - minor, normal and major), site location, geomorphic zone, distance from the sea, distance from a water source, estimate of surface artefact density and total artefact population. Information regarding site condition and site assemblage composition was also recorded.

From the analysis of assemblage characteristics, Hallam was able to develop a relative dating scheme that could be used to chart presumed demographic shifts over time. Hallam's dating scheme comprises four phases. Assemblages containing artefacts made of Eocene fossiliferous chert were classified as Early phase (pre-5,000 BP¹). Assemblages containing backed artefacts and other elements of the so-called 'Australian Small Tool Tradition' (Gould 1969) were assigned to a Middle phase (c. 5,000 –1,000 BP). Quartz-rich assemblages with high proportions of waste flakes were classed as Late phase, while those containing artefacts made on European materials such as glass and ceramics were classed as Final (post-Contact). Although it is now recognised that there are many difficulties and ambiguities involved in the application of this scheme (in particular, Schwede 1991:243-4, argues that Hallam's Early and Late phase allocations are untenable as originally formulated), it is one of the only methods available that allows a relative date to be assigned to open artefact scatters – an important fact given the general paucity on known stratified sites on the Swan Coastal Plain (Bowdler, Strawbridge and Schwede 1991).

On the basis of the data captured during the Swan Area Archaeological Survey, Hallam (1986:1-2) was able to advance a number of generalisations regarding site distribution over time. She notes:

In all periods there are barely any sites in the coastal dunes (QD) or coastal limestone (CL), and few in the sandhills around the lakes on the eastern margin of the limestone belt (KS). The bulk of sites lie around the lakes and swamps of the coastal sandplain (BS), the most extensive zone. The alluvial belt (PP, although limited in area, has many sites; and the small sample of the foothills carries its full quota. There are no sites on the scarp itself, and barely any on the uplands.

Thus archaeological data generally reflect the ethnohistorical sources - littoral resources and forest resources were little used, and reed rhizomes in sand plain swamps, and yams in alluvial and gravel, proved major staples.

The particular distribution and demographic characteristics of each phase needs to be related to environmental change over time. Whilst some of this change was the result of non-human factors, some undoubtedly reflected the impact of human populations on the environment.

Since the publication of Hallam's original archaeological survey data there has been a significant increase in the scope and intensity of Aboriginal heritage research in the Perth metropolitan area and adjacent areas (Anderson 1984; Bowdler, Strawbridge and Schwede 1991; Strawbridge 1988). As previously observed, owing to the constraints imposed by the framework within which many of these studies are conducted, it is something of a truism that much of this research remains uncoordinated and rarely proceeds to publication or analysis. Indeed, the situation in Western Australia is such that the only general synthesis of academic and contract-based archaeological research in the three contiguous environmental zones of the Swan Coastal Plain, Darling Range and Darling Plateau was published almost 20 years ago (Anderson 1984). In this study, June Anderson drew together

¹ The abbreviation 'B.P.' is used to denote 'years before present', the present being defined as A.D. 1950.

environmental, archaeological, ethnohistorical and ethnographic data in an attempt to reconcile or account for discrepancies that had led to differing, often contradictory, interpretations of Aboriginal settlement patterns, and from this develop a refined land-use model (Anderson 1984:1).

Drawing upon her own research, together with that of the Swan Area Archaeological Survey and three surveys in the jarrah forest to the south of the Canning River catchment area (Pearce 1981a, 1981b; Veth, Ward and Zlatnik 1983), Anderson was able to demonstrate that there are marked differences in the size, complexity and location of Aboriginal sites between the Swan coastal plain and the two environmental zones to the east of the Darling Scarp. For example, the relative proportions of major and minor sites and associated artefact scatters across the three zones indicated that site density on the Swan coastal plain was between three and six times as great as that estimated for the forested areas, and two to four times that for the headwaters of the Avon (Anderson 1984:34) (Table 1). Interzonal variations were also discerned in terms of site location and assemblage composition. Whilst archaeological sites in all areas tend to be located adjacent to water sources, minor differences occur between sites on the coastal plain and those on the Darling Range and inland plateau. Whereas sites in the latter areas tend to be situated on low-lying and gently sloping ground, those on the coastal sandplain are commonly situated on elevated dunes and/or sandy ridges.

Survey	Area (km ²)	Site density per km ²	Dominant site locations	Site size (%)		
				Major	Intermediate	Minor
South Canning	25	0.8	<100m from streams. Low ground	-	15	85
North Dandalup	8	1.3	Close to streams. Low ground	-	20	80
Collie (Pearce)	25	2.0	Near damp or swampy areas on gentle slopes	-	-	100
Collie (Veth)	10	5.0	Close to drainage channels on flat ground	-	<25	>75
Boddington	255	0.8	Near water courses or swamps on gently sloping ground	7	2	91
Perth Airport (Anderson)	6	6.5	Sand ridges near water	5	21	74
Perth Airport (Hallam)	14	3.0	Sand ridges near water	29	29	42
Avon	10	1.7	Close to river, tributaries and lake. Single large artefacts on slopes away from water	6	18	76

Table 1 Comparison of site data (after Anderson 1984: Table 2).

Variations in site size and location were mirrored also in terms of assemblage composition (Anderson 1984:25). On the Swan coastal plain a wide range of lithic raw materials was represented, although the relative proportions of each necessarily varied between sites. The majority of analysed assemblages were dominated by quartz, with some sites also containing fossiliferous chert, dolerite (usually in the form of large scrapers, hammerstones and grinding material), mylonite and silcrete. It is important to note that, with the exception of fossiliferous chert (which may have been quarried from sources lying off

the present coastline near Mandurah), all raw materials had to be procured or traded from the Darling Plateau or even further afield (Anderson 1984:25). Assemblages immediately to the west of the scarp are dominated by quartz, with other materials, particularly dolerite, present as a minor component. The absence of particular artefacts, such as grinding implements, is argued by Anderson (1984:34) to be a reflection of recovery bias, with the majority of such large and readily identifiable items being collected by landowners.

Whilst acknowledging the limitations of the archaeological and ethnohistorical data available, Anderson (1984:34-7) was able to propose a land-use model that involved a flexible but structured use of the resources of the Swan Coastal Plain, the central and northern jarrah forest, and the western plateaux. The key features of the model can be summarised as follows.

- Groups based largely on the Swan Coastal Plain and the adjacent Darling Plateau were associated with specific core territories within those zones. During summer and autumn Aboriginal groups on the coastal plain gathered in large numbers around the coast, estuaries, wetlands and other drainage features in order to exploit water-based food resources. The very large sites on the coastal plain were generated as the result of repeated visits to such areas.
- During winter and early spring coastally-based Aboriginal groups dispersed and ranged more widely in order to relieve pressure on the now less abundant water-based resources. People, either in small groups or individually, also moved into the jarrah forest of the Darling Ranges. The generally small size of sites in the forest zone is taken as evidence of high group mobility necessitated by less predictable resources and the pursuit of game animals. In spring, there was a gradual movement back towards the coastal areas.
- Aboriginal groups exploiting the western plateau area probably had a less structured pattern of movement. Groups may have had a higher degree of mobility over wider areas, taking advantage of the floral and faunal resources of the open woodlands.
- The eastern jarrah zone was used by groups, whose range extended well into the Darling plateau. Extensive swamps in the eastern jarrah zone may have allowed the area to be used throughout the year, especially if wells were excavated in order to exploit subsurface water sources.
- In addition to movement undertaken largely, but not exclusively, for the purposes of obtaining food resources, there was also a great deal of rapid and direct movement across the various environmental zones by individuals and groups for reasons of trade, ritual and social interaction.

The degree to which these statements remain applicable in the face of an increasing intensity of archaeological survey remains difficult to determine. As noted previously, the pace of archaeological research (in particular contract-based archaeological investigations) far exceeds publication – a situation that is exacerbated by an overall lack of co-ordination or prioritisation of archaeological research in the South-west. As in the present case, the timing, nature and intensity of archaeological investigation remains uneven and highly geographically biased (refer Section 2.2, below).

2.2 Previous Aboriginal heritage research in the vicinity of the PPA

As a preliminary to the archaeological field survey, the consultant conducted review of the following documentary and archival resources:

- Contract reports;
- Published and unpublished material;
- Interim and Permanent site registers maintained by the Department of Indigenous Affairs (DIA); and
- DIA GIS database

A review of the relevant documentary sources indicates that little systematic Aboriginal heritage research has been undertaken in the immediate vicinity of the PPA (refer McDonald, Hales and Associates 2001b). Characteristically, this has taken a number of forms, including:

- academic research undertaken by Hallam (1975);
- short-term contract surveys undertaken in relation to infrastructure and other developments in the Gingin area (McDonald, Hales and Associates 2000, 2001a; McGann 1997, 1998); and
- *ad hoc* reports made by members of the general public.

Of these, it would appear that only the research undertaken by Hallam (1975) in the early 1970s is likely to have encompassed parts of the PPA. This is clearly reflected in the number and disposition of known archaeological sites, of which only four (3187, 3320, 3321, and 3322) have been identified within a notional 10 km radius of the PPA (Table 2). Summary details of these sites are as follows.

Site id	Name	Status	Site type	Relationship to the PPA
3187	Gingin	Interim register	Artefact scatter	Location of site is listed as 'uncertain', and is plotted as a 1km ² region approximately 3km to the east of the PPA.
3320	Yarrimie A	Interim register	Artefact scatter	Location of site is listed as 'uncertain', and is plotted as a 1km ² region encroaching upon the eastern margin of the PPA.
3321	Werribie	Interim register	Artefact scatter	Location of site is listed as 'uncertain', and is plotted as a 1km ² region encroaching upon the eastern margin of the PPA. Archival information indicates that the site is located within Swan Location 128, and therefore outside the PPA.
3322	Poison Hill	Interim register	Artefact scatter	Location of site is listed as 'uncertain', and is plotted as a 1km ² region approximately 1.5km north-east of the PPA.

Table 2 Known archaeological sites recorded within a notional 10km radius of the PPA (Source: DIA Aboriginal Heritage Management System)

Site 3187 was reported by D.L. Cook, and is simply described as an artefact scatter. The site is plotted on the DIA Aboriginal Heritage Management System (AHMS) as a 1km² region, the south-west corner of which is located approximately 3km east of the PPA. No further details are available (DIA Site File note).

The remaining sites (i.e. 3320, 3321 and 3322) were formally reported by Hallam in the mid-1970s. The DIA site files currently only contain detailed information for Site 3321, that for the remaining sites either lost or misplaced. While discussions with Hallam (December 15, 2002) elicited some information regarding the nature of these sites, no further site documentation was forthcoming at the time of writing.

Site 3320 is described as an artefact scatter containing material characteristic of Middle, Late and Final phase assemblages. No further information is provided in the DIA site file. The location of the site is listed as 'uncertain', and is plotted on the DIA AHMS as a 1km² region overlapping the eastern boundary of the PPA. The site is of considerable extent and may contain a sub-surface component (S.J. Hallam personal communication December 15, 2002).

Site 3321 comprises at least two scatters of artefactual material contiguous with erosion surfaces on Swan Location 128, immediately west of Swan Location 104. Artefactual material was first observed during the Second World War, when the army excavated a series of slip trenches, that partially destabilised the ground surface and accelerated natural erosion. Several uncontrolled collections of material have been made over the years, some of which were donated to the Western Australian Museum (DIA File Note). Hallam inspected the site in 1979, when additional material characteristic of the Middle and Late phases was observed (DIA Site File note). As with site 3320, the site is of considerable extent, and may encroach upon the PDA although this will need to be determined by further investigation (S.J. Hallam personal communication December 15, 2002).

Site 3322 is described as an artefact scatter containing material characteristic of 'Early Phase' artefacts. No further details are provided (DIA Site File note). The available spatial data places this site approximately 2.5km to the south-east of the PPA.

In addition to identifying known Aboriginal heritage sites, the desktop research also highlighted the potential for historically reported cultural landscape features ("warren grounds") to exist in the vicinity of the PPA (McDonald, Hales and Associates 2001b: 15,17). 'Warren' is the Nyungar name for a species of edible yam (*Dioscorea hastifolia*) that is endemic to the southwest of Western Australia, where it grows in association with fissures and soils adjacent to granite rocks (Pate and Dixon 1982:103). These tubers constituted a major food staple for southwest Aboriginal groups (Hallam references). They were extracted with the aid of digging sticks, which frequently resulted in considerable ground disturbance. A contemporary observer wrote of the warren grounds in the Swan Valley as follows:

We visited George Fletcher Moore, the Advocate-General, at his farming establishment, and went with him to see a little of the country...A considerable number of the Blacks were assembled on one farm...We examined some holes where the Natives had been digging for roots of a *Dioscorea*, or Yam, for food. This plant climbs among bushes, in a strongish soil, and the Natives have a tradition, respecting its roots having been conferred upon them, in which there are traces of the deluge." (Bakehouse 1834:538-540 cited in Hallam 1984:122).

Accounts from the 1840s and 1850s describe the existence of warren grounds in the Gingin and Bindoon area. During the 1970s, examples were found to survive south of Cheriton and alongside

Lennards Brook, south of Gingin (Hallam 1975: 13, 72). These two pieces of information suggest that it is possible that landscape evidence of warren grounds may survive within parts of the PPA itself. If so, this is most likely to be in the form of "...vast disturbed areas that cannot be explained by other plausible mechanisms" (Cross 1995:87-88).

2.3 Method statement

2.3.1 Proposed archaeological field survey strategy

Prior to the commencement of the field survey, the archaeological consultants conducted a brief reconnaissance of the proposed Gingin Mineral Sands mine envelope in order to a) familiarise themselves with local ground conditions and b) to determine an appropriate survey methodology. The reconnaissance revealed that, apart from a number of stands of marri (*Eucalyptus calophylla*) and various melaleucas, the mine envelope has largely been cleared of native vegetation, and is currently used for grazing. Access to certain areas was limited by adverse field conditions, including waterlogging and dense vegetation cover.

At the time of the archaeological reconnaissance ground surface visibility was highly variable. Across much of the mine envelope, ground surface visibility ranged from 0% to 50% owing to a relatively dense ground cover of lupins, shrubbery, and pasture grasses. Ground surface visibility was more reasonable across perimeter firebreaks, access tracks, and devegetated sandy exposures (typically >75%). Given this, it was decided that the archaeological survey would proceed in the following ways:

- Systematic north-south oriented pedestrian transects spaced at 25 metre intervals across Lot 9 and part Lot 2
- Systematic east-west oriented pedestrian transects spaced at 25 metre intervals across part Lot 2 and part Lot 3
- Purposive inspection of creeklines, firebreaks, access tracks and other areas affording a reasonable degree of ground surface visibility; and
- Inspection of trees for evidence of past human modification.

Details of archaeological survey coverage are discussed in more detail in Section 2.4, below.

2.3.2 Proposed archaeological site recording methodology

Where identified, archaeological material will be recorded in accordance with the guidelines set out in *the DIA Draft Guidelines for Aboriginal Heritage Assessment in Western Australia* and *Aboriginal Sites Recording Draft Standard – Spatial Component*.

Information to be recorded for each site/feature will include:

- Field designation
- Site type
- Site location
- Site environment
- Dimensions
- Site boundary criteria (cultural/ environmental)
- Site contents
- Surface visibility
- Land integrity
- Site condition

The estimated boundaries and/or centroid of each site will be recorded using a 12-channel global positioning system (GPS) employing the MGA94 datum. With selective availability deactivated, the overall accuracy of the GPS readings is estimated at ± 10 metres.

2.3.3 Proposed stone artefact Identification and recording methods.

For the purposes of the present report, four main artefact categories are recognised. These are: (1) unmodified flaked pieces, (2) cores, (3) retouched/utilised artefacts, and (4) grinding/percussion material. Details of each of these classifications are as follows:

Unmodified flaked pieces

For the purposes of the present report, the term 'unmodified flaked pieces' is used in preference to the more commonly used 'debitage', as the latter term has a number of different, often conflicting, definitions. For example, the term 'debitage' is widely used to describe all lithic waste material generated during the production of stone tools or implements. In the context of South western Australia, where flakes themselves were often the desired outcome, this definition is obviously less than satisfactory in that no adequate distinction can be made between flakes removed for use as tools (i.e. as simple cutting flakes) and those removed as part of more specialised tool or core reduction processes (Van Pool, Van Pool, Antillón, Leonard and Harmon n.d.).

Following the classifications developed by Hiscock (1988:362) and Sullivan and Rozen (1985), unmodified flaked pieces will be classified as either complete flakes, broken flakes, or flaked pieces. Complete flakes are defined as pieces of rock struck from a core, and which exhibit attributes such as a ringcrack, a point of force application, a bulb or percussion, an erailure scar or any combination of these attributes. Broken flakes are flakes that have been broken during or after production either by transverse or longitudinal snapping. Flaked pieces are artefacts that cannot be classified as a complete flake or broken flake owing to the absence of defining attributes, and can include such material as flake fragments and angular shatter or debris.

Cores

These are nodules of stone from which fragments have been detached by blows from hard or soft percussors (i.e. pieces of stone, wood, or other material). Artefacts were classified as cores if they exhibited at least two negative flake scars and lacked a single interior surface. The following five classes of core are recognised:

- i.) Single platform cores (these are cores from which flakes have been detached from a single striking platform).
- ii.) Multi-platform cores (these are cores from which flakes have been detached from several different platforms. These may be natural surfaces or formed by negative flake scars, the latter indicating core rotation).
- iii.) Core fragments (these are cores displaying only partial negative flake scars lacking a discernible point of impact).
- iv.) Bipolar cores (these are cores exhibiting crushing on opposing ends, indicating the application of bipolar techniques).
- v.) Broken bipolar cores (shattered cores where only part of the crushing remains).

Retouched/utilised artefacts

Three main classes of retouched/utilised artefacts are recognised.

- i.) 'Retouched/utilised flakes' covers a wide range of amorphous flakes that display damage and/or deliberate reworking of one or more margins.
- ii.) 'Retouched/utilised cores' includes any core exhibiting edge retouch in the form of a row of contiguous flake scars. The presence of edge retouch on cores is a much-debated issue. Replicative studies have demonstrated that damage believed to result from utilisation is identical to patterns observed in platform preparation. Additionally, stepped or undercut edges are seen to be the result of attempts to remove flakes from a core when the angle between the platform and the exterior surface approaches ninety degrees (Flenniken and White 1985:140; Kamminga 1982). For this reason, cores with step-terminated flake scars were excluded from this category.
- iii.) 'Retouched/utilised pieces' includes artefacts displaying edge damage or retouch that have been broken during manufacture or through subsequent use or trampling.

Grinding/Percussion Material

For the purposes of the present report, this category is taken to include pieces or slabs of stone that exhibit:

- polishing or abrading on one or more surfaces in a manner consistent with their use as a grinding base or pestle (muller); or
- pitting on one or more surfaces in a manner consistent with use as a hammer or anvil in the production of stone artefacts or in the processing plant materials (e.g. nuts and seeds).

It should be noted, however, that stone implements were often used in an expedient manner and as such, equipment used in the processing of fruits and seeds may equally have been used as hammers or anvils in stone reduction activities.

Measurements and attributes recorded.

Flaked Stone Artefact Attributes

a). Metrical attributes (all categories)

- Length (mm)
- Width (mm)
- Retouch

b) Complete flakes

Flake size:-

- Length (mm)
- Width (mm)
- Thickness (mm)
- Flake surface area (mm²)

Flake Shape:-

- Elongation index (length divided by width)
- Parallel index (platform width divided by flake width)

Platform size:-

- Platform angle (exterior angle measured with a goniometer)
- Platform width (mm)
- Platform length (mm)
- Platform area (mm²)

c) Non-metrical attributes

Complete flakes only:-

- Platform type (cortical, flat/simple, faceted, crushed, focused)
- Termination (feather, hinge, step, snap)
- Platform attributes (overhang removal, crushing, none)
- Number of negative flake scars
- Medial or distal flake scars
- Cortex (all, part, none)
- Potlids (presence/absence)

Cores:-

- Length (mm)
- Width (mm)
- Thickness (mm)
- Number of platforms
- Number of flake removals

Grinding/percussion material:-

- Length (mm)
- Width (mm)

- Thickness (mm)
- Type of percussion, pitting or abrasion
- Location of percussion, pitting or abrasion
- Extent of percussion, pitting or abrasion.

2.4 Results of the archaeological survey

K. Edwards and A. Murphy conducted the archaeological survey in August 2002. Utilising the survey strategy outlined in Section 2.3.1, above, it is estimated that an area of approximately 26.4ha (or 52.8 linear kilometres), representing 9% of the PPA by area, was inspected (Figure 2). Unfortunately, effective survey coverage of this area was in many places reduced to 25% or less owing to a range of access and technical constraints obtained at the time of survey. These can be summarised as follows:

- Portions of Lot 2 on Diagram 15769 and Lot 3 on Diagram 17098 were either inundated or subject to heavy water sheeting at time of survey, reducing effective archaeological survey to nil (refer Plate 1 and Plate 2).
- Portions of Lot 2 on Diagram 15769 had been cleared and landscaped to form a large dam for livestock and drainage purposes. The area encompassed by the dam and associated earthworks was unavailable for survey.
- The balance of the PPA generally supported a dense growth of field grasses, weeds or riparian vegetation that generally served to reduce effective archaeological survey coverage to 25% or less. The only significant exceptions to this were a small number of devegetated sandy exposures, cattle wallows and access tracks. Ground surface visibility across these areas was good to excellent (50% to 100%) overall.

No new Aboriginal archaeological material was identified within the PPA. Similarly, there was no evidence to suggest that previously recorded sites 3320 and 3321 extend into the PPA. Nevertheless, it must be recognised that, owing to various technical constraints, the results of the archaeological field survey are potentially biased, and that there remains a potential for archaeological material within the PPA. This issue is discussed at more length in the following section.

2.5 Discussion

No new or previously recorded archaeological sites were identified within the PPA. As indicated above, this can be attributed to a range of inter-related factors, including:

- Past Aboriginal land-use practices: As outlined in Section 2.1, Aboriginal groups on the Swan Coastal Plain evolved structured social and economic responses to variations in the distribution, timing and abundance of resources across the landscape. These responses broadly correspond to what Binford (1980:10) has termed a “forager strategy”, in which “a group ‘maps onto’ resources through residential moves and adjustments in group size”. Thus, the distribution, absolute quantity and availability of resources would have influenced both the number of people present at any given location and the range of activities undertaken.

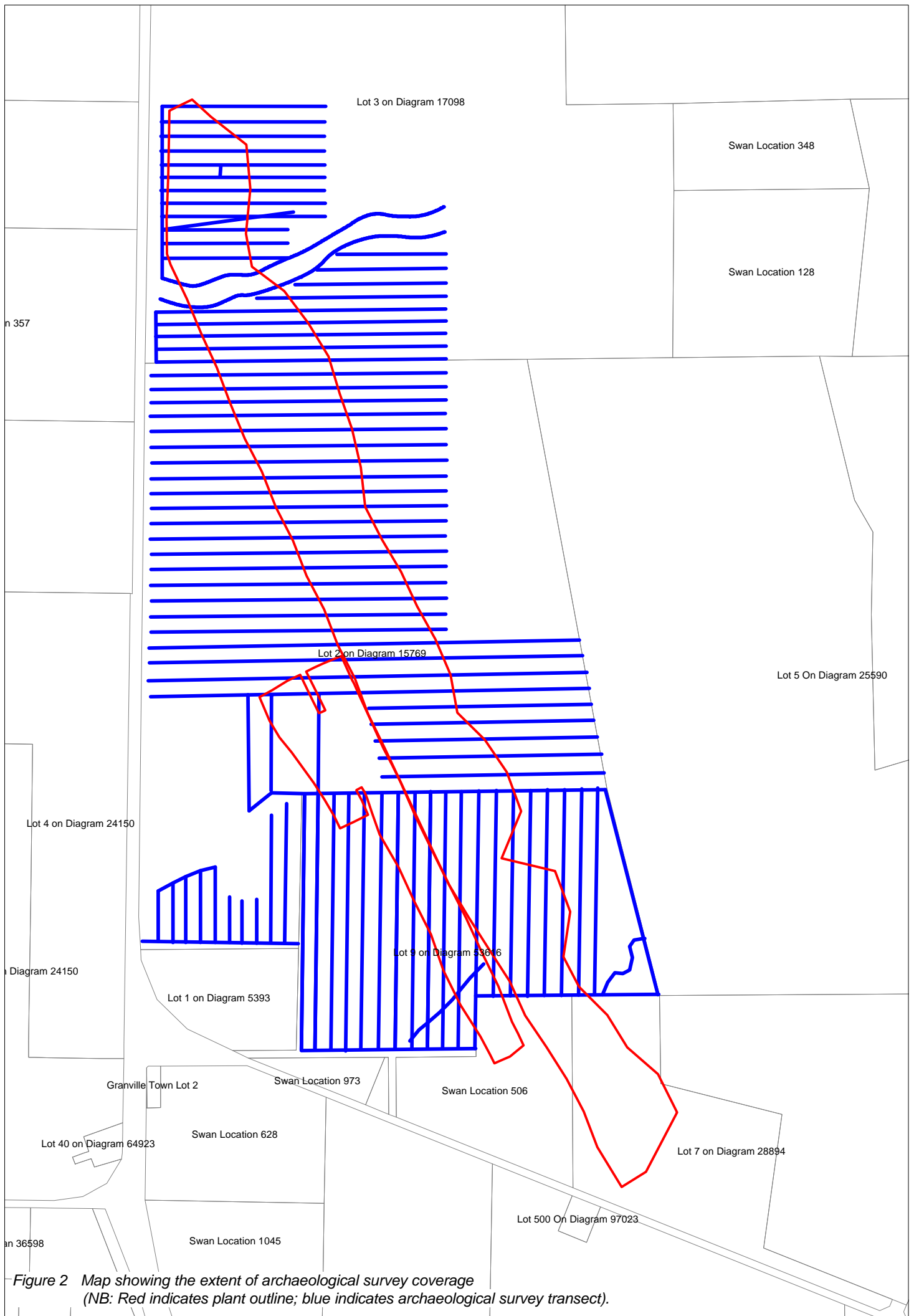


Figure 2 Map showing the extent of archaeological survey coverage (NB: Red indicates plant outline; blue indicates archaeological survey transect).



Plate 1 View looking east across paperbark swamp (Lot 2 on Diagram 15769).



Plate 2 View looking north-east across Lot 3 on Diagram 17098, showing extensive water sheeting.

Based on previous archaeological research undertaken across the Swan Coastal Plain, it is unlikely that the extensive seasonally inundated western portions of the PPA would have been used by Aboriginal groups in a manner that resulted in the generation of a recoverable archaeological 'signature'. Indeed, it would appear that the majority of large and internally complex sites (represented in this case by sites 3320 and 3321 located immediately to the east of the PPA) were coterminous with relatively elevated and well-drained topographic contexts adjacent to streamlines. While evidence suggests that such sites may have been repeatedly occupied over a considerable length of time, post-depositional and technical factors may have acted to remove or otherwise obscure any archaeological material present, requiring the adoption of techniques other than surface survey.

- Technical factors: The archaeological survey was constrained by a range of technical factors, including poor overall ground surface visibility, access constraints and ground disturbance that may have served to reduce the probability of intercepting any archaeological material present. While it is possible that European land-use practices may have destroyed any archaeological material present (as has been argued by McGann 1997, 1998), survey and experimentation in so-called 'plough zone' archaeology has demonstrated that such processes may actively reveal archaeological material without destroying information necessary for their analysis and interpretation (e.g. Francovich and Patterson 1999; Schofield 1991; Sullivan III, 1998). Indeed, as has been already observed, the existence of two known sites (3320 and 3321) in the immediate vicinity of the PPA was revealed only after ground disturbing activities had occurred.
- Sample size effect: The effects of sample size on archaeological interpretation have been given increasing recognition in recent years (see, for example, Frankel 1988). In the present case, the PPA encompasses an area of approximately 328ha of which less than 10% was effectively surveyed owing to low ground surface visibility and other technical factors. Given this, it is possible that the archaeological survey findings are a sampling phenomenon and that there is as yet undiscovered archaeological material within the PPA.

Having now reviewed the archaeological survey findings, consideration will now be given to the issue of ensuring on-going proponent compliance with the provisions of the *Aboriginal Heritage Act (1972)*.

2.6 Conclusions and Recommendations

No new or previously recorded archaeological sites were identified by survey within the PPA. Given the demonstrated archaeological potential of the wider study area, this outcome can most parsimoniously be attributed to localised patterns of land-use by Aboriginal groups and a range of technical factors that served to impose constraints on archaeological survey efficacy. While it is unlikely that those parts of the PPA subject to seasonal inundation were used by Aboriginal groups in an archaeologically detectable manner, there is nevertheless a potential for material (including sub-surface cultural deposits) to be present across the balance of the PPA. This potential will need to be evaluated by methods other than surface survey.

Given this, the proponent should implement appropriate procedures and protocols to ensure on-going compliance with the *Aboriginal Heritage Act (1972)*. Ideally, a suitably qualified archaeologist (in consultation with the Yued native title claim group) would be commissioned to undertake a programme of strategic archaeological evaluation, monitoring and (if warranted) further detailed investigation across those areas considered to have a high potential for archaeological material. As indicated by previous research, such areas are likely to be contiguous with relatively well-drained and elevated areas adjacent to creeklines or other natural drainage features (refer Sections 2.1 and 2.2, above). Areas within the PPA that are considered to have a high archaeological potential are delineated in Figure 3, and encompass land within 100m or so of unnamed streamlines on Lot 3 and Swan Location 506 and Lot 7, respectively.

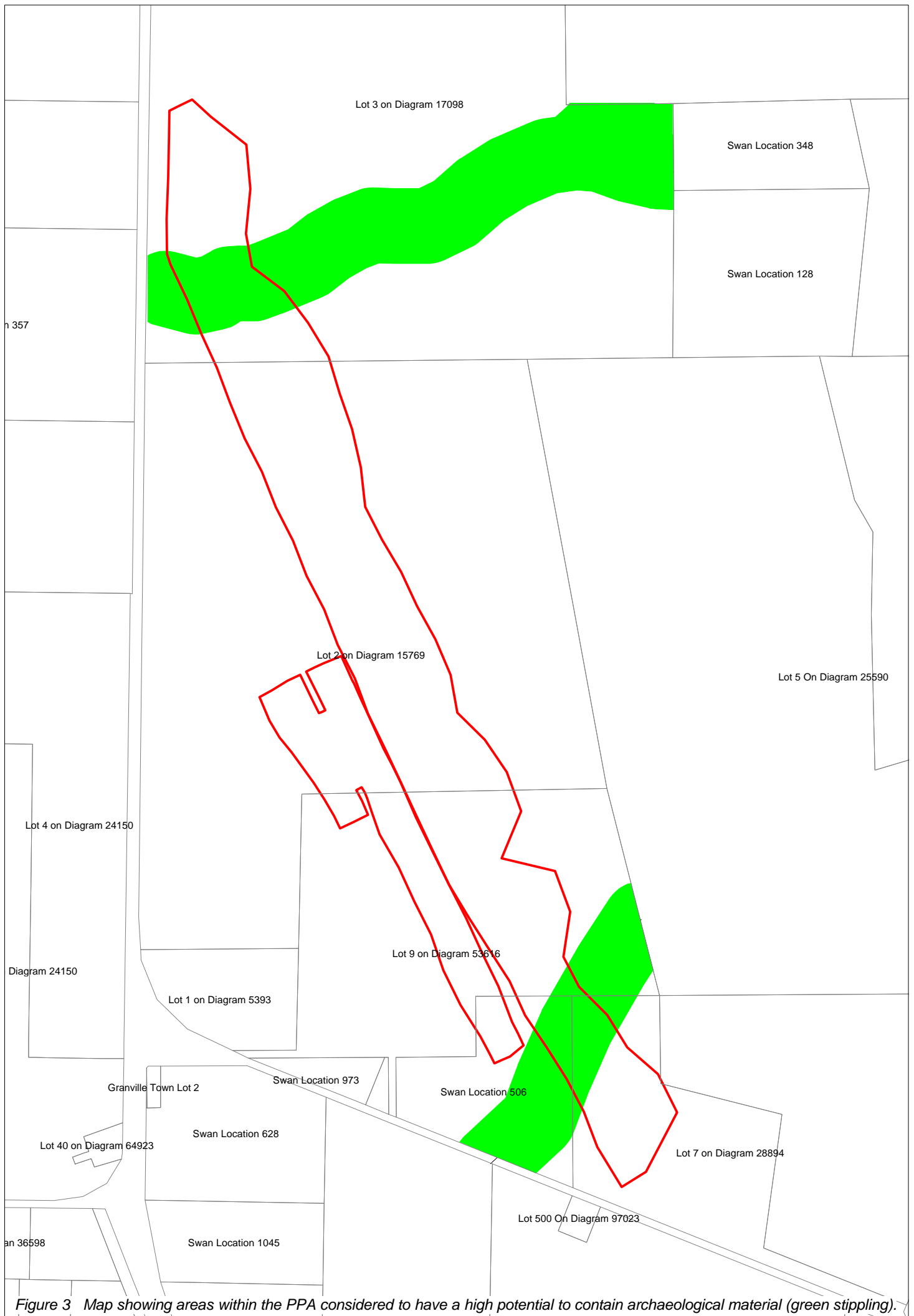
The timing and nature of any such programme of archaeological evaluation will necessarily depend on the proposed development schedule and local ground conditions. A provisional programme of such works is outlined in Table 3. Should archaeological material be identified within the PPA (as a result of archaeological evaluations/monitoring procedures or a report made by staff, contractors or sub-contractors associated the proposed Gingin Mineral Sands Mine, for example), it may be necessary for the proponent to a) undertake Aboriginal community consultation, and b) obtain permission to use the land on which that material is located in accordance with Section 18 of the *Aboriginal Heritage Act (1972)*.

Section 18 of the Act establishes a procedure by which such applications are made and empowers the Aboriginal Cultural Material Committee (ACMC) to consider such matters in the first instance. Depending upon the degree of importance the ACMC assesses a site to have, any application can be recommended for consent (i.e. permission is given for disturbance), consent with conditions or refusal. A decision made by the ACMC is presented to the Minister for Indigenous Affairs in the form of a recommendation only, and it is the Minister who makes the final decision. Other than in exceptional circumstances, Ministerial decisions generally reflect the recommendations of the ACMC. The ACMC generally meets every second month, with the agenda for the upcoming meeting closing five to six weeks in advance (i.e. in the non-meeting months of the year). The meeting schedule for the current year (2003) can be obtained from the DIA (Head and Regional Offices).

In respect of those areas of the PPA not considered to have a high archaeological potential, a programme of periodic archaeological monitoring and/or inspections should be implemented during the early phases of vegetation clearance and ground disturbing activities. This should address concerns expressed by the Aboriginal consultants regarding the potential for sub- or near-surface archaeological material and/or burials within the PPA (refer Section 3.5, below).

Stage	Task	Timeline	Notes
Stage 1	Preparation of S.16 permit to undertake archaeological evaluations across areas of high potential	At least four months prior to the commencement of ground disturbing activities.	In order to undertake archaeological monitoring and evaluation work, the appointed archaeologist will require a permit in accordance with S.16 of the <i>Aboriginal Heritage Act (1972)</i> .
Stage 2a	Preliminary near/sub-surface evaluations (including 'shovel scrapes' and 'shovel test-pits') across areas of high potential	At least three months prior to the commencement of ground disturbing activities.	If archaeological material is identified, proceed to Stage 2b; if not, proceed to stage 3a.
Stage 2b	Proponent submits application in accordance with S.18 of the <i>Aboriginal Heritage Act (1972)</i>	In accordance with APMC agenda.	If S.18 consent granted, proceed to Stage 2c.
Stage 2c	Archaeological mitigation	Upon receipt of S. 18 approval.	Undertake any archaeological mitigation stipulated under S.18 consent (if required); proceed to Stage 3a.
Stage 3a	Monitoring of vegetation clearance across areas of high potential	Initial vegetation clearance/ground breaking phase.	If archaeological material is identified, proceed to Stage 3b; if not, proceed to stage 4.
Stage 3b	Proponent submits application in accordance with S.18 of the <i>Aboriginal Heritage Act (1972)</i>	In accordance with APMC agenda	If S.18 consent granted, proceed to Stage 3c.
Stage 3c	Archaeological mitigation	Upon receipt of S. 18 approval.	Undertake any archaeological mitigation stipulated under S.18 consent (if required); proceed to Stage 4.
Stage 4	Reporting	Upon completion of archaeological evaluation/mitigation.	Compilation of report on archaeological monitoring and evaluation in order to comply with S.16/S.18 conditions within the timeframe(s) specified by DIA.

Table 3 Provisional archaeological monitoring/evaluation programme.



On the basis of the above discussion it is **recommended** that:

- A suitably qualified archaeologist (in cooperation with the Yued native title claim group) be commissioned to undertake the following works:
 - i.) Conduct archaeological evaluations and continuous monitoring across areas deemed to have a high archaeological potential (as delineated in Figure 3); and
 - ii.) Conduct periodic monitoring of vegetation clearance and initial ground disturbance works across the balance of the PPA.

Should any additional archaeological material (including both surface and sub-surface archaeological material) be identified during the course of the evaluation and monitoring process, more detailed archaeological investigation and management may be required, including:

- i.) surface recording, mapping and collection of archaeological material;
- ii.) archaeological excavation and/or sub-surface sampling;
- iii.) radiometric dating (where possible or applicable);
- iv.) analysis of recovered material; and
- v.) provision of long-term storage of recovered archaeological materials.

These works would need to be undertaken by a suitably qualified archaeologist issued with a current permit under Section 16 of the *Aboriginal Heritage Act (1972)*. It is also important that Aboriginal community representatives be consulted and fully involved in the archaeological investigations. In particular, material should be returned to the Aboriginal community for storage (if so desired), with professional input being provided on issues such as curation and display.

- Staff, contractors and sub-contractors associated the proposed Gingin Mineral Sands Mine be briefed with respect to Aboriginal heritage issues. This should include, but not be limited to, the following:
 - i.) Obligations under the *Aboriginal Heritage Act (1972)*;
 - ii.) Identification of Aboriginal sites; and
 - iii.) Protocols to be observed should Aboriginal heritage sites be encountered during the course of development.

Should any person (staff, contractor, sub-contractor) have reason to suspect the presence of a previously unreported Aboriginal site, this should be immediately reported to the Site Manager. Work in the vicinity of the site should cease immediately and an assessment made by a suitably

qualified person. Depending upon the outcome of the assessment, further action may be required. This could take the form of further detailed recording, collection of material(s), and/or controlled archaeological test-excavation. Depending on the outcome(s) of the assessment it may be necessary for the proponent to submit an application to disturb the land on which the site(s)/feature(s) are located in accordance with Section 18 of the *Aboriginal Heritage Act (1972)*.

Should human skeletal material be encountered during the course of development, all work must cease immediately as, by law, the area becomes a crime scene. The following authorities must then be contacted: Police Department, State Coroner, Department of Indigenous Affairs, and the Western Australian Museum. Depending upon the nature and condition of the human skeletal remains, archaeological and/or forensic excavation may need to be undertaken. Given the highly significant nature of Aboriginal skeletal material, further action should largely be determined by the wishes of the Aboriginal community.

3 Ethnographic Survey

3.1 Survey Methodology

The survey was conducted in the following stages:

- Archival research;
- Site inspection with Aboriginal consultants;
- Report preparation.

The survey area is encompassed by the Yued native title claim (WC97-071). Following consultation with the South West Aboriginal Land and Sea Council, the representative body for the Yued claimants, seven members of the Yued claimant group participated in the survey on the 24 September 2002. In addition two members of the Bibbulmun Tribal Group, who have known associations with the area, also inspected the survey area on the 26 September 2002.

3.1.1 Aboriginal consultant profiles

Yued Applicants

Aboriginal consultants #1-#7 are the applicants for the Yued native title claim group. They are also members of the Working Party.

Aboriginal consultants #1 and #2 are husband and wife. They were both born at the Moore River Native Settlement (now known as Mogumber), located approximately forty kilometres north of the survey area. They have lived all their life in the area and both now reside at Mogumber. Aboriginal consultant #1 reports that his maternal great grandmother and grandmother were born at Gingin in 1852 and 1883 respectively.

Aboriginal consultant #3 was born at New Norcia and has lived and worked all his life in the area. His mother was from New Norcia and his paternal grandfather was from Toodyay. He had extensive knowledge of this area and currently lives in Cataby where he is actively involved with the maintenance and revegetation of native bush and seed collection from the area. **Aboriginal consultant #4** is the wife of Aboriginal consultant #3. She was born in Carnarvon but removed from the town by Native Welfare when she was four and sent to Mogumber Mission. She also lives at Cataby with her husband.

Aboriginal consultant #5 is an elderly Nyungar woman. She lived at Jurien for thirty two years and now resides in Moora.

Aboriginal consultant #6 is a middle-aged Nyungar woman. She currently resides in Geraldton.

Aboriginal consultant #7 was born at Moora and most of her family still reside there. She claims connection to the survey area through her mother, whose traditional country, she reports, is around the Gingin and New Norcia area. She also reported that her father's traditional country is around Cataby and Eneabba.

Bibbulmun Tribal Group

Aboriginal consultant #8 was born on the Moore River Native Settlement. He reports he is extremely familiar with the country in which the survey area is located. He has extensive experience working in Aboriginal organizations in Perth and has been a member of the Aboriginal Cultural Materials Committee for over twenty years.

Aboriginal consultant #9 is the daughter of Aboriginal consultant #8. She regularly accompanies her father on heritage surveys.

3.2 Ethnographic Background

The ethnographic background for the survey area was previously outlined in the desktop report prepared by McDonald, Hales & Associates (2001), consequently, it will not be repeated here in detail. A summary is given below.

Tindale (1974) and Berndt (1979a and 1979b) identified thirteen socio-dialectal groups in the Southwest corner, extending in an arc from Geraldton in the north to just east of Esperance in the south. Specifically, they identified the country in which the survey area is located as the territory traditionally occupied by the *Juat* socio-dialectal group. According to Tindale (1974: 243) the *Juat* (Yued) were located:

At Gingin, Moora, New Norcia, Moore river and Cape Leschenault; north to about Hill River; inland to near Miling and Victoria Plains.

As can be seen in Figure 4, the Yued native title claim (WC97-071), though similar to that mapped by Tindale, is more extensive than the territory attributed by him to the *Juat* (Yued) and extends further north. However, this discrepancy is not surprising given that, although Tindale's research was wide-ranging and undertaken over an extensive period (1920s-1960s), it did not involve the kind of detailed mapping which Sutton (1995) suggests is necessary when identifying Aboriginal boundaries due to the complexity of overlapping rights and interests in country.

Bates (1985) presents a different picture to that of Tindale (1974) and Berndt (1979a & b) and notes that all of the people of the Southwest were known as Bibbulmun, though regional and local terms applied. Specifically, she reports (1985: 54) that the people in the Gingin area were known as the *Yabbaru* Bibbulmun [Yabbaru = north/northern] and that the local dialect was *Jabbun wongi* [jabbun=to fall down] (Bates 1985: 48).¹

¹ See McDonald & Christensen (1999) for a discussion on some of the discrepancies between Bates and other researchers.

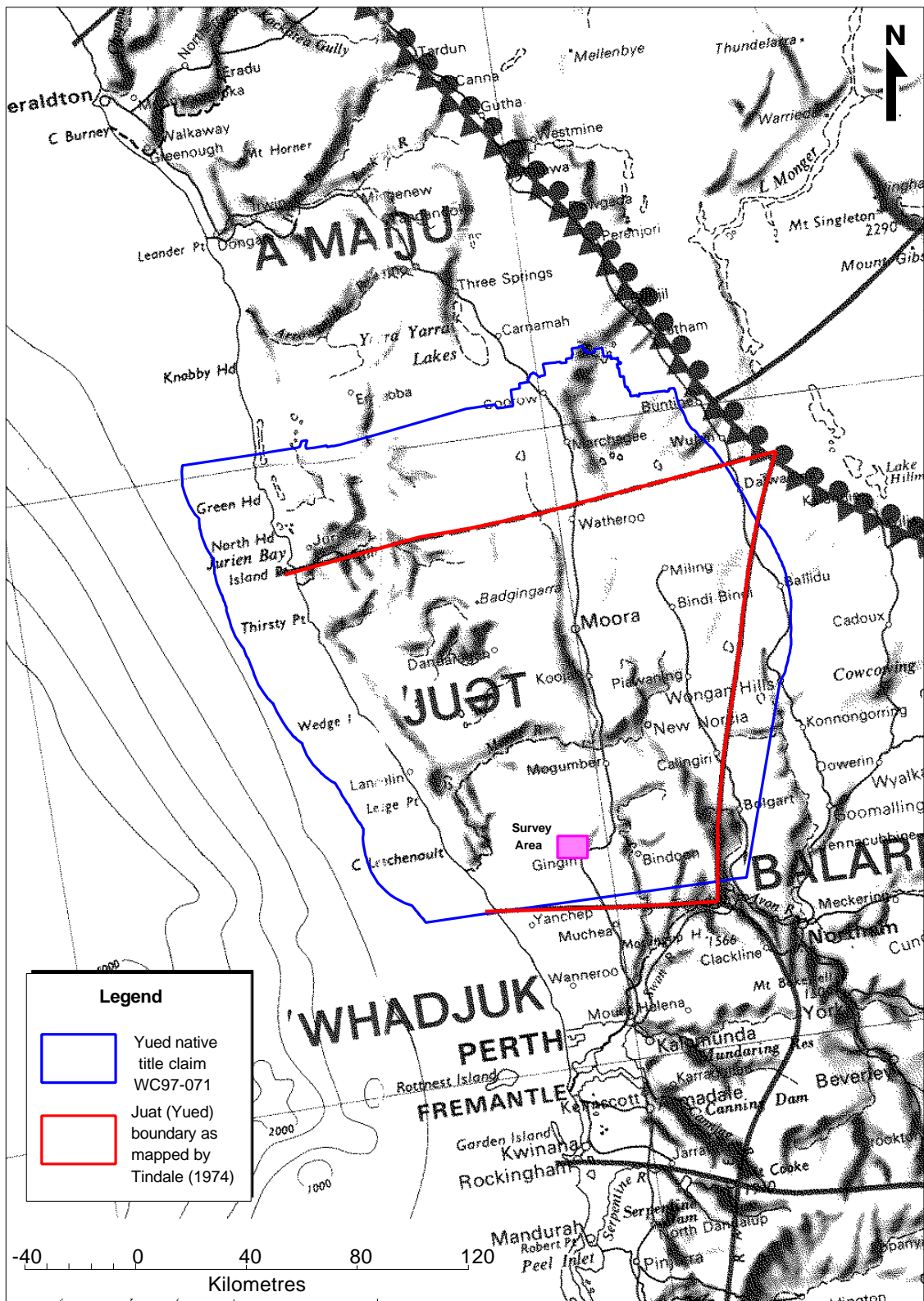


Figure 4 Comparison of Juat tribal boundary after Tindale (1974) and Yued native title claim.

From ethnohistorical research it appears that the Gingin-Bindoon area was resource rich and could support a relatively high carrying capacity – approximately 6 persons per 100km² (1975: 72). Hallam (1975; 1998) attributes the abundance of foods such as the native yam or warran (*Dioscorea hastifolia*) and typha which allowed for the concentration of Aboriginal populations. Early settlers and explorers in the region frequently commented upon the abundance of these foods (see Hallam 1975 and Udell 1980).

According to Bates (1985: 159), an initiation trail, the *Yabbaroo* ‘road’, ran past Gingin. Bates (Bates 1985: 159) records that a Swan River boy was taken from a camping place on the Swan River (*Wardawardong*), near Midland Junction to, via Gingin, and then westward to ‘a spot south of Cockleshell Gully’. From there the initiate travelled back to the Swan River.

Udell (1980: 107) reports that the last ‘corroboree’ was held at Gingin in 1889 and that Aboriginal people attended from as far away as Champion Bay and Guildford. However, Udell (1980: 227) goes on to note that “few people of Aboriginal descent appear to have lived or worked in Gingin after 1900: exceptions were Moke and Doolby who were often called on by the police to track persons lost in the bush”. Udell goes on to list a number of other individuals who were also employed on farms around the same time and notes that a number of others who were brought to the area from the North-West. However, the absence of Aboriginal people from the mainstream historical record after 1900 does not necessarily mean that Aboriginal people were not still living and working in the Gingin area. As Tilbrook (1987) highlights, Aborigines were often “shadows in the archives”. Many historians, especially when writing local histories, frequently fail to pay attention to Aborigines other than a review of their position as occupiers of the land when settlers originally moved into an area. Information we have obtained in the course of other heritage surveys in the region indicates that Aboriginal people continued to have associations with the Gingin area. Their absence from the historical records for the area after 1900, in part, may reflect restrictions Aboriginal people faced in respect of employment and movement because of the oppressive nature of the 1905 Aborigines Act (Haebich 1988).

3.3 Results of the Archival Research

Archival research included a search of the Register of Sites held at the Department of Indigenous Affairs and a review of published and unpublished material relevant to the area. The Register was previously reviewed in December 2001 for the desktop study. The Register was re-examined for the current study in case new sites had been reported in the interim. However, this search did not identify any previously recorded ethnographic sites within the survey area.

3.3.1 Sites outside the survey area

The search was expanded to include a ten kilometre radius of the survey area. This identified three ethnographic sites:

- DIA Site 16036 Honey Comb Road
- DIA Site 3928 Moondah Brook

- DIA Site 3929 Lennard Brook

Site 16036 Honey Comb Road contains a stand of Red Gums which reportedly have mythological and historical significance. This site is located over three kilometres southeast of the survey area.

According to information collected from an elderly local resident in the late 1970s historically an Aboriginal camp was located on Moondah Brook (Site 3928), though the precise location is not provided. This site is located over five kilometres southeast of the survey area.

The Lennard Brook site (Site 3929) was recorded in 1982 and reportedly comprises a number of components including a man made structure (stone arrangement), skeletal material (burial), camping area, 'meeting place' and a plant and water source for Aboriginal people. However, there is no further information in the file regarding these components. The reference to plant and water sources corresponds to Hallam's (1975) comments that the area contained evidence of native yam fields. This site is located over five kilometres southeast of the survey area.

3.4 Results of ethnographic field survey

The ethnographic field survey was conducted by 4WD vehicle, stopping at various areas of interest to the Aboriginal consultants.

No ethnographic sites were identified by any of the Aboriginal consultants that would be impacted upon if mining proceeds. The Yued Aboriginal consultants (#1-#7) reported that the Gingin area was of general spiritual significance but were unable to pinpoint any specific ethnographic sites. The Aboriginal consultants noted that a lot of Aboriginal people would have died in the area as they travelled through to the Moore River Native Settlement, now known as Mogumber, which is located approximately forty kilometres north of the survey area. Consequently, they reported that the Gingin area is known as a *jinga* [devil spirit] area by Aboriginal people throughout the Southwest due to the number of deaths which occurred throughout the area.

The Yued consultants also reported that they are opposed to mining of the subject land and would like Iluka to meet with them and their representative body, the South West Land and Sea Council, in order to discuss compensation issues. While there are no provisions under the *Aboriginal Heritage Act (1972)* for compensation, native title claimants, whose application has satisfied the conditions of the registration test, may have the 'right to negotiate' under the 'future act' terms of the *Native Title Act (1993 Cth)* (see www.nntt.gov.au). Although it is possible that native title has been extinguished as the survey area is, as far as McDonald, Hales & Associates have been informed, on freehold land, nevertheless, it would be advisable for the proponents to consult their lawyers regarding their obligations.

Aboriginal consultants #8 & #9 from the Bibbulmun Tribal Group expressed concern that mining activities may leech into the drainage system that runs through the mining area and detrimentally impact upon the water table. They reported that Aboriginal people would have used the creeks running through the mining area for fishing and for freshwater. It may be prudent for the proponent to supply the

Aboriginal consultants with environmental management plans in order to alleviate their concerns. The Aboriginal consultants further requested that the native vegetation be retained or salvaged where possible. Aboriginal consultants #6 and #7 from the Yued group also expressed similar concerns regarding retaining native vegetation.

3.5 Consultation regarding archaeological results

As noted in the archaeological section, no archaeological sites were identified during the field survey. The Aboriginal consultants from both groups were informed of the findings of the archaeological survey. The Aboriginal consultants all noted the potential for subsurface material, including burials, to exist and requested archaeological monitoring of the survey area as a precautionary measure. The Yued consultants further requested that two people from the Yued claimant group be involved in monitoring procedures.

3.6 Conclusions and Recommendations

The ethnographic field survey of the survey area was undertaken in September 2002 with nine Aboriginal consultants from two groups, representatives of the Yued native title claim (WC97-071) and the Bibbulmun Tribal Group.

No ethnographic sites were identified by any of the Aboriginal consultants that would be impacted upon. The Yued consultants discussed a general spiritual significance of the Gingin area but were unable to pinpoint any specific sites as such.

The Yued consultants reported that they are opposed to mining of the subject land and would like to meet with Iluka and the South West Land and Sea Council in order to discuss compensation issues. It would be advisable for the proponents to consult their lawyers regarding their obligations.

The two Aboriginal consultants from the Bibbulmun Tribal group expressed concern that mining activities may detrimentally impact upon the drainage system. It may be prudent for the proponent to supply the Aboriginal consultants with environmental management plans in order to alleviate their concerns. The Aboriginal consultants also requested archaeological monitoring of the survey area in case of the existence of subsurface material. They further requested that native vegetation is retained or salvaged where possible.

On the basis of the above discussion, the following **recommendations** are made:

- It is **recommended** that the proponents consider the request of the Yued Working Party to meet with them and the South West Aboriginal Land and Sea Council to discuss compensation issues.
- It is **recommended** that the proponents supply the Aboriginal consultants with environmental management plans in order to alleviate their environmental concerns.

- It is **recommended** that the proponents consider the request of Aboriginal consultants to minimise impact to native vegetation and salvage where possible.
- It is **recommended** that a suitably qualified archaeologist, with the assistance of Yued Claimants, be commissioned to undertake archaeological monitoring within the PPA.

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