The archaeological investigation for sites of Indigenous cultural significance on Part Lot 19669, TAHMOOR, NSW.

John Appleton

ASR

ARCHAEOLOGICAL SURVEYS & REPORTS PTY LTD

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For

URBIS

On behalf of

INGHAMS ENTERPRISES PTY LIMITED

**This report has been compiled in 'Plain English',
but presented in a format suitable for developing policies
for the management of the cultural resources,
and as a basis for scientific reference
in future research studies.**

Project No. 541/12

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EXECUTIVE SUMMARY

THE BACKGROUND

This report was produced for URBIS on behalf of Inghams Enterprises Pty Limited (Inghams). Inghams proposes to apply for rezoning of the property for subdivision into one-acre lots (average size). The irregularly-shaped survey area is located to the southeast of the residential area of Tahmoor, an expanding township, 3 km to the south of Picton, and 90 km southwest of Sydney. The survey area comprises an area of 120 ha, being Part of DP 19669 in the Shire of Bargo.

In 2006 Inghams Enterprises Pty Limited (Inghams) engaged Archaeological Surveys & Reports Pty Ltd (ASR) to undertake an investigation for Aboriginal sites in DP 19669, Tahmoor, in accordance with the 2005 guidelines. No sites were recorded.

In March 2012, URBIS, acting on behalf of Inghams, engaged ASR to review and update the 2006 report paying particular attention to the new requirements for Aboriginal consultation introduced in a series of changes to the National Parks & Wildlife Act 2010 which was accompanied by new guidelines and Codes of Practice (2010 and 2011).

THE BRIEF

The brief for the project required ASR to:

- Review "Wollondilly Growth Management Strategy 2011 – Assessment Criteria for Planning Proposals".
- Review ASR's 2006 report to ensure the document complies with "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010"
- Undertake a search of the "Aboriginal Heritage Information Management System" Sites Register to identify any sites recorded in the vicinity of the Project Site since 2006.
- Undertake the necessary Aboriginal Consultation, and
- Update the 2006 report to reflect compliance with the regulations.

THE 2006 REPORT

The Executive Summary of the 2006 report advised the following:
The findings of the 2006 investigation were that a potentially sensitive area previously identified by a consultant archaeologist in 1993 was not recorded on the AHIMS Site Register. As a consequence of

discussions between the developer and ASR the developer has stated that the drainage line/gully in which the potentially sensitive area occurs will be set aside as a reserve and that it will not be impacted upon by the proposed subdivision. The upper end of the potentially sensitive area was relocated for the purposes of defining the area to be set aside as a reserve. For the purposes of delimiting the boundaries of the reserve it is recommended that the reserve should be from the edge of the gorge to a point not south of E. 0279575 N.6209850 (Picton 9029-4S, 1: 25,000 Topographic map), and not narrower than 40 m to either side of the creek centreline.

Subject to the recommendations of Tharawal Local Aboriginal Land Council and Cubbitch Barta Native Title Claimants Aboriginal Corporation, no further action is necessary. However, if at some future date the developer should propose to undertake any activity that is likely to impact on the potentially sensitive area then it will be necessary for the developer to apply for an Aboriginal Heritage Impact Permit (AHIP) "Section 90 Consent to Destroy", for the subsurface investigation of the location as required under the National Parks & Wildlife Act 1974 (as amended).

ADDRESSING THE ISSUES IN THE 2012 BRIEF

In addressing the issues in the brief for the 2012 report ASR advises that,

1. The review of the "Wollondilly Growth Management Strategy 2011 – Assessment Criteria for Planning Proposals", found that there were no particular elements of the plan that impacted upon the archaeological assessment of the Project Site.

2. The results of the search of the "Aboriginal Heritage Information Management System" Sites Register showed that no new sites had been recorded in or in the vicinity of the Project Site since 2006.

3. Aboriginal consultation was undertaken in compliance with the guidelines and codes issued in 2010 and 2010, and resulted in no new cultural information that might be a constraint to the proposed subdivision.

4. This report is essentially the 2006 report updated to reflect the Aboriginal consultation and searches undertaken in accordance with the new guidelines and codes.

CONCLUSION

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there are no constraints on archaeological or Aboriginal cultural grounds to the proposed subdivision of Part DP 19669, Tahmoor. However the proponents are advised of the following provision which applies to all development projects in NSW.

NSW OE&H has made the following recommendations in relation to any earthworks operations as additional Statements of Commitment or as conditions of approval as appropriate.

1. If Aboriginal cultural objects are uncovered due to the development activities, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and Aboriginal community representatives must be contacted to determine the significance of the object(s). The site is to be registered in the AHIMS (managed by NSW OE&H) and the management outcome for the site included in the information provided to the AHIMS. It is recommended that the Aboriginal community representatives are consulted in developing and implementing management strategies for all sites, with all information required for informed consent being given to the representatives for this purpose.

2. If human remains are located during the project, all works must halt in the immediate area to prevent any further impacts to the remains. The NSW Police, the Aboriginal community and NSW OE&H are to be notified. If the remains are found to be of Aboriginal origin and the police consider the site not an investigation site for criminal activities, OE&H should be contacted and notified of the situation and works are not to resume in the designated area until approval in writing is provided by NSW OE&H. In the event that a criminal investigation ensues, works are not to resume in the designated area until approval in writing (*has been received*) from NSW Police and NSW OE&H.

3. All reasonable efforts must be made to avoid impact to Aboriginal cultural heritage values at all stages of the development works. If impacts are unavoidable, mitigation measures are to be negotiated with the Aboriginal community and NSW OE&H.

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1. INTRODUCTION

1.1 Background to the investigation

In 2006 Inghams Enterprises Pty Limited (Inghams) engaged Archaeological Surveys & Reports Pty Ltd (ASR) to undertake an investigation for Aboriginal sites in DP 19669, Tahmoor, in accordance with the 2005 guidelines.

In March 2012, URBIS, acting on behalf of Inghams, engaged ASR to review and update the 2006 report paying particular attention to the new requirements for Aboriginal consultation introduced in a series of changes to the National Parks & Wildlife Act 2010 which was accompanied by new guidelines and Codes of Practice (2010 and 2011), as listed below

- "Aboriginal Cultural Heritage Consultation Requirement for Proponents 2010".
- "Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW 2011".
- "Code of Practice for Archaeological Investigation in NSW 2010".
- "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010".

In addition the brief required ASR to:

- Review "Wollondilly Growth Management Strategy 2011 – Assessment Criteria for Planning Proposals".
- Review ASR's 2006 report to ensure the document complies with "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010"
- Undertake a search of the "Aboriginal Heritage Information Management System" Sites Register to identify any sites recorded in the vicinity of the Project Site since 2006.
- Undertake the necessary Aboriginal Consultation, and
- Update the 2006 report to reflect compliance with the regulations.

This report is essentially the 2006 report updated to reflect the Aboriginal consultation undertaken in accordance with the new guidelines and codes.

Hereafter in this report the area subject to the proposed subdivision is referred to as the **"Project Site".** It should also be noted that the currently proposed development area varies slightly from that proposed in 2006, but the changes are minimal and do not affect the results or the recommendations.

1.2 Scope of works (2006)

The scope of works in 2006 was for ASR to conduct an archaeological investigation of the Project Site with the assistance of representatives of the Tharawal Local Aboriginal Land Council (LALC), and Cubbitch Barta Native Title Claimants Aboriginal Corporation (Cubbitch Barta), to identify any Aboriginal sites and relics that might be present. The results of the investigation were to be presented in a report, which was to include an assessment of the significance of any cultural relics or places identified, an appraisal of the options and opportunities arising from the discoveries, and clear recommendations for the management of those cultural resources.

1.3 Report Objectives (2006)

The objectives of the report were to describe the archaeological investigation of the Project Site and to record any archaeological relics and sites that might be present. Further, the report documented the participation of Aboriginal representatives in the field survey, and their recommendations as to the future management of the Project Site. In addition, the report included a discussion of the results of the investigation in the context of other known sites in the area. Finally, the report included a statement as to the recommendations for the future development of the Project Site.

1.4 Report Format

The report is presented in the following format:

i Executive summary
ii Contents

2. Introduction
3. Aboriginal consultation

4. The environmental context
5. The archaeological record
6. Models for site location
7. The survey
8. The results
9. Discussion
10. Significance assessment
11. Management options
12. Recommendations.

1.5 The Project Site

The irregularly-shaped Project Site is located to the southeast of the residential area of Tahmoor, an expanding township, 3 km to the south of Picton, and 90 km southwest of Sydney. The Project Site comprised an area of 120 ha, being Part of DP 19669 in the Shire of Bargo.

The Project Site is bounded by the meanders of Bargo River Gorge along its southern and south-eastern boundaries, and by numerous shared property fencelines elsewhere, but including sections of River Road and Tahmoor Road along its northern boundary.

Figure 1 (2006) is detail from a Topographic map of the general area. The black diamonds indicate the locations of known Aboriginal sites in the area. **Figure 2** (2012) is an aerial photograph showing the Project Site in greater detail, and **Figure 3** (2012) is a copy of a "preliminary lot layout" of the proposed subdivision.

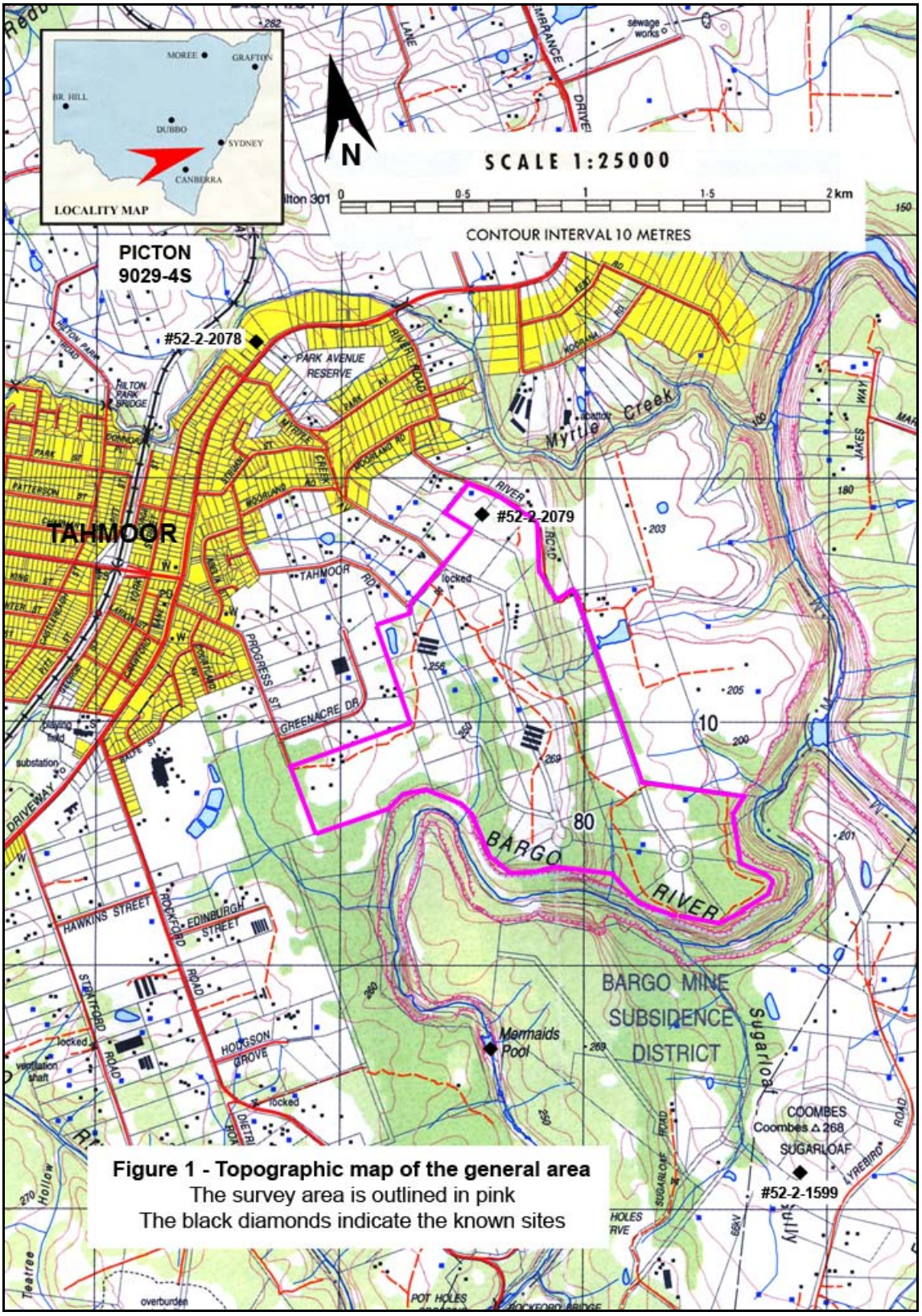


Figure 1 - Topographic map of the general area
The survey area is outlined in pink
The black diamonds indicate the known sites

FIGURE 2: Project Site.

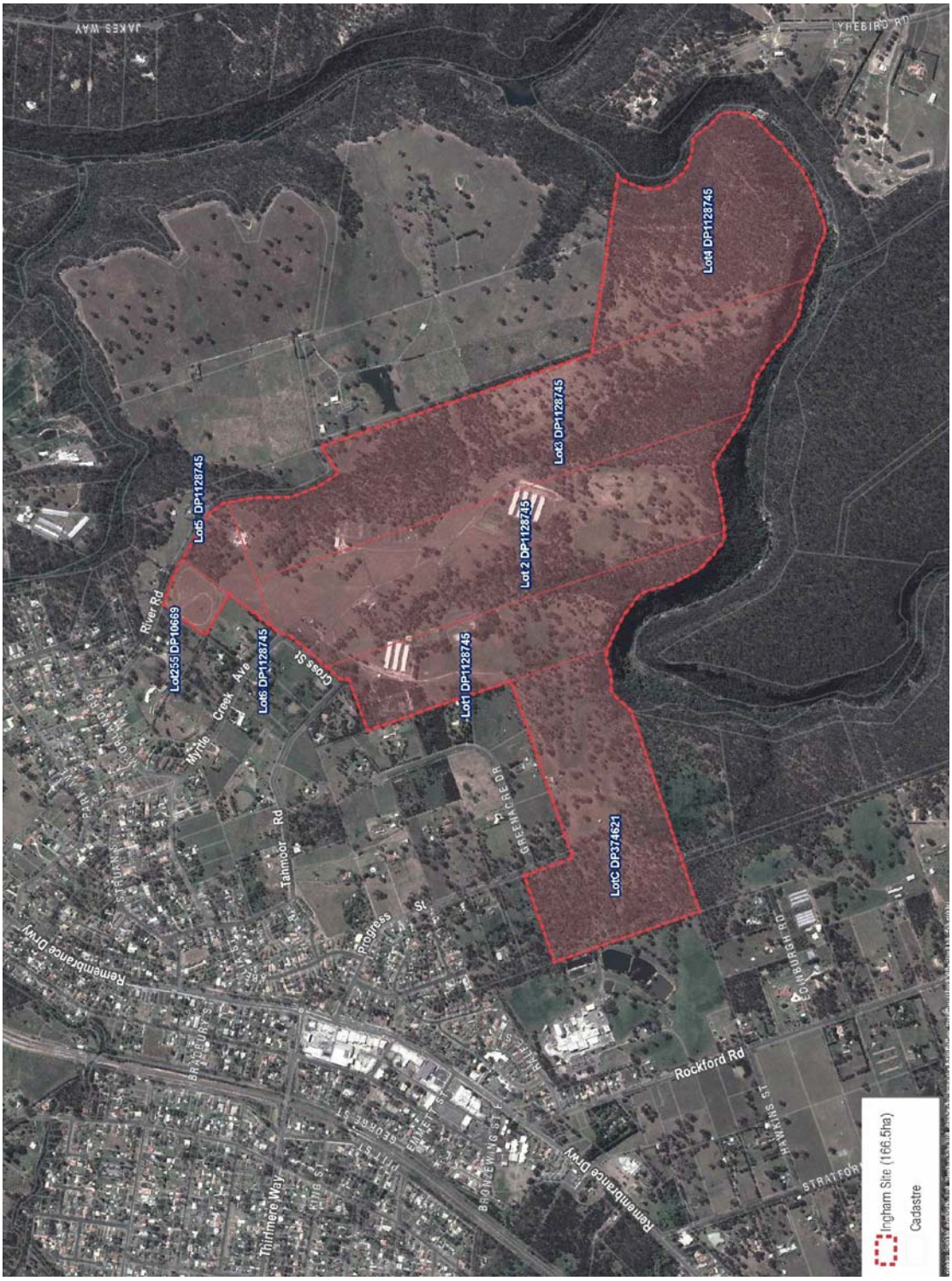
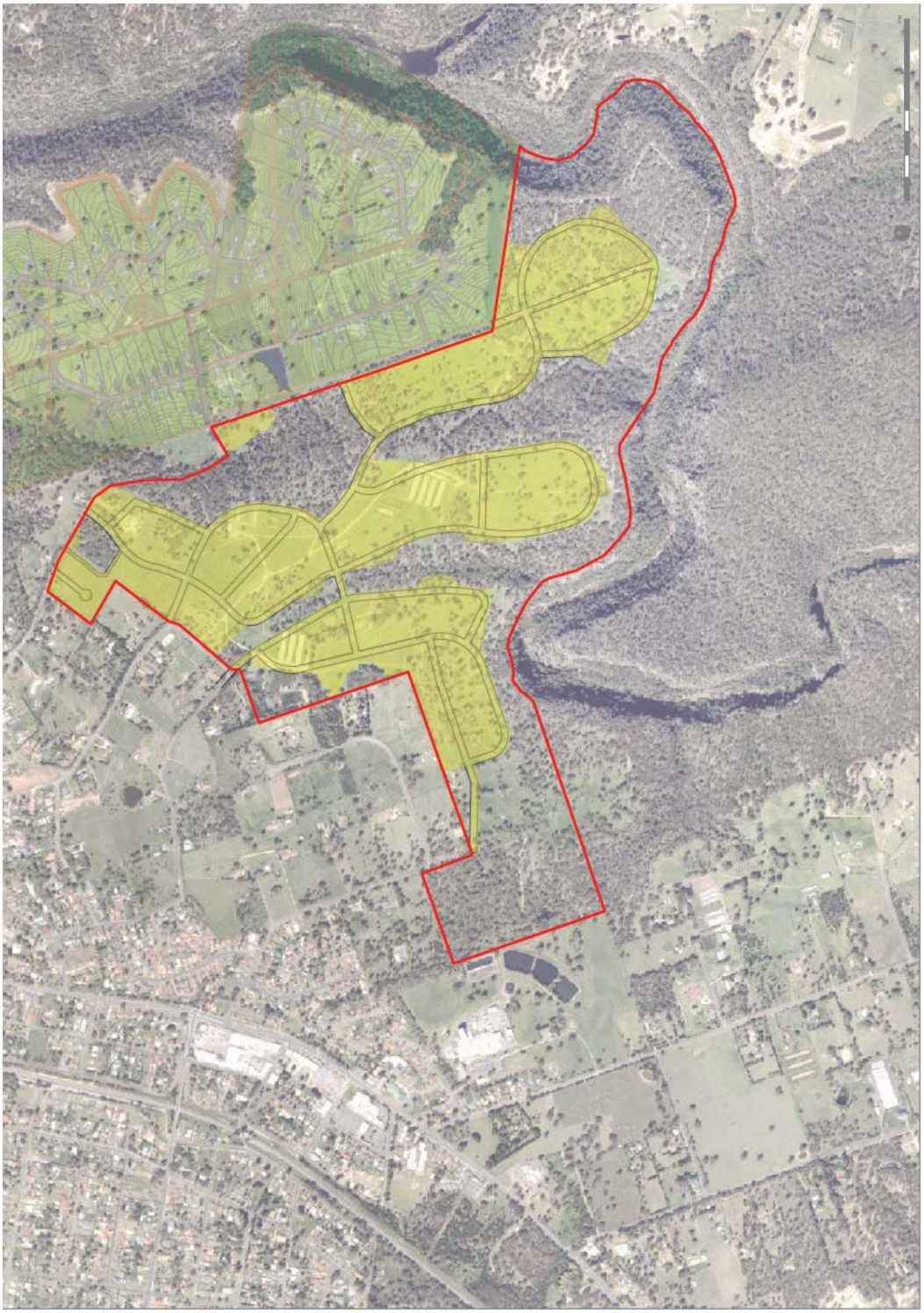


FIGURE 3: Indicative Development Footprint: Source AE Design Partnership, 2013.



1.6 Potential impact of subdividing the Project Site

The potential impact of subdividing the Project Site will be that any development is likely to disturb or destroy any archaeological material or depositional contexts within the impacted areas, either from earthworks for the construction of roads, or during the installation of in-ground services, or the clearing and landscaping of adjacent areas, or the construction of residences.

As a consequence of this survey it is unlikely that the same area will be re-surveyed, thus from an archaeological perspective, the survey provided an opportunity to observe and record any sites that might be present, and to propose a strategy for the management of any known or potential archaeological and/or cultural material in the future development of the area.

2. ABORIGINAL CONSULTATION

2.1 Consultation in 2006.

Prior to commencing the fieldwork ASR contacted Tharawal LALC and Cubbitch Barta requesting that they provide Sites Officers to assist in the field study. As a consequence Donna Whillock representing the Tharawal LALC, and Glenda Chalker representing Cubbitch Barta assisted in the survey, which was performed on 22nd, September 2006.

Glenda had participated in an earlier investigation of the Project Site in 1993, undertaken by Denis Byrne of Mary Dallas Consulting Archaeologists (see below) – (Mary Dallas Consulting 1993), and so was familiar with the area.

Throughout the survey Donna Whillock, Glenda Chalker and Appleton (ASR) discussed the survey strategy, the potential for sites to be present, and the results of the investigation. Following the survey the three discussed the results and the likely recommendations. At the conclusion of the discussion Donna and Glenda agreed to provide ASR with written statements on behalf of their respective groups, copies of which are included as **Appendix i** and **Appendix ii**.

2.2 Consultation in 2012.

In 2010 and 2011 with the introduction of the new guidelines and codes a number of changes were made to the investigative and consultation practices, the ones relevant to this investigation being:

- "Aboriginal Cultural Heritage Consultation Requirement for Proponents 2010".
- "Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW 2011".
- "Code of Practice for Archaeological Investigation in NSW 2010".
- "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010".

The procedure for Aboriginal consultation is to be applied to all archaeological investigations, however in this instance in which, from the results of the 2006 investigation, it was found that there were no Aboriginal sites and therefore no requirement to follow the procedure to obtain an Aboriginal Heritage Impact Permit (AHIP), the procedure can be reduced to the following steps:

1. The archaeologist is to place an **advertisement in the local press** inviting all Aboriginal stakeholders with an interest in the project site to register their interest (they have 14 days in which to respond), and

2. The archaeologist is to write to seven **nominated government departments and agencies** requesting that they provide a list of all registered Aboriginal stakeholders for the area.

3. The archaeologist is required to consult with each of the registered Aboriginal stakeholders to provide them with the opportunity to identify any cultural issues or constraints that should be considered and included in the archaeological report.

4. A copy of the **draft report** of the archaeological investigation is to be sent to each of the **registered Aboriginal stakeholders** for comment (they have a minimum of 21 days in which to respond).

Accordingly on 7th June 2012 Appleton wrote to each of seven departments – Office of the Registrar, ALRA; OE&H Parramatta; Wollondilly Shire Council; Tharawal LALC; NTSCorp; NSW & ACT Registry;

and Sydney Metropolitan CMA requesting that they provide any information they had on registered Aboriginal stakeholders for the Tahmoor area (an example of the letter is included as **Appendix iii**).

Subsequently responses were received from the government departments and agencies. Wollondilly Shire Council listed three Aboriginal stakeholders, and OE&H identified an additional nine stakeholders. In its response National Native Title Tribunal listed a **Registered Native Title Claim** lodged by Gundungurra Tribal Council Aboriginal Corporation (NNTT No. "NC97/7"). A copy of the Title Claim is included as **Appendix iv.** The Project Site occurs at the eastern margin of the area subject to the Land Claim, the Bargo River forming the eastern boundary of both the Project Site and the Land Claim area.

Also on 12th June 2012 an advertisement was placed in the "*Macarthur Chronicle*" inviting all Aboriginal stakeholders with an interest in the area to register their interest. A copy of the advertisement as it appeared in the press is included as **Appendix v**.

As a result of the advertisement and the letters to the government departments and agencies, the following stakeholders were identified.

STAKEHOLDERS	CONTACT	DETAILS
Tharawal LALC	CEO - Greg Bondar	Tel. 4681 0059 Email: Reception@tharawal.com.au
Cubbitch Barta Native Title Claimants Aboriginal Corp.	Glenda Chalker	55 Nightingale Road, Pheasants Nest 2574. Mob. 0427 218 425
Wollondilly Aboriginal Advisory Committee	c/o Aboriginal Engagement Officer – Denise Ezzy	Tel. 4677 8224
Darug Custodial Aboriginal Corp.	Leanne Watson	PO Box 81, Windsor 2756. Tel. 4577 5181. Mob. 0415 770 163

Darug Tribal Aboriginal Corp.	Sandra Lee	PO Box 441. Blacktown 2148. Tel. 9622 4081
Darug Aboriginal Cultural Heritage Assessments	Gordon Morton	90 Hermitage Road, Kurrajong Hills 2758. Tel. 4567 7421. Mob. 0422 865 831
Darug Land Observations	Gordon Workman	PO Box 571, Plumpton 2761. Mob. 0415 663 763. Fax. 9831 8868
Darug Aboriginal Land Care Inc.	Des Dyer	18a Perigee Close, Doonside 2767. Mob. 0408 360 814
Gunjeewong Cultural Heritage Aboriginal Corp.	#Cherie Carroll Turrise	1 Bellevue Place, Portland 2847. Tel. 6355 5673
Peter Falk Consultancy	Peter Falk	PO Box 1018 Mittagong 2575. Mob. 0401 938 060
Scott Franks		PO Box 76, Caringbah 1495. Mob. 0404 171 544
Gandangara LALC	Mark Johnson	PO Box 1038, Liverpool 2170. Tel. 9602 5280

(Note that Cherie Carroll Turrise has no direct association with 'country' but has other associations).

Table 1 – List of registered Aboriginal stakeholders.

Relevant extracts from this report were sent to each of the registered stakeholders by **Registered Post** to give them the opportunity to provide any cultural information directly associated with the Project Site that might present a constraint to the proposed development. Only one report was "return to sender" because the address had changed, and that was the report to Tharawal LALC. Subsequently it was possible to find the land council's new address and a copy of the extract was sent to the new address.

3. THE ENVIRONMENTAL CONTEXT

Any discussion of the likely presence of Aboriginal cultural remains or of the basis why such remains might be discovered must be within the context of the environment and the resources that would have been available to any Aboriginal occupants of the area.

3.1 The general geology and topography

The Project Site occurs in the southern section of the Sydney-Bowen Basin. The Sydney-Bowen Basin is a major structural basin, which extends from Batemans Bay, southern New South Wales, to south of Collinsville, Queensland in the north. The New South Wales portion of the basin is divided into northern and southern sections by a transverse structural high to the north of Narrabri. The southern section is further divided into two lower structural basins, the Sydney Basin and the Gunnedah Basin. The surficial geology of the Sydney Basin is dominated by Triassic sandstones, which occupy the central area around which the Permian sediments crop out (Menzies 1974).

The bedrock of the Project Site comprises of continental-type sedimentation in structural and erosional depressions, of the Hawkesbury Sandstone formation, comprising sandstone, shale and claystone (Dept. Mineral Resources 1980).

The Project Site generally is of a gently undulating plain much of which is contained within a large meander of the Bargo River. The Project Site drains southwards flowing via four drainage depressions, two of which are short steeply-dipping gullies, which terminate at the edge of the sheer drop into the 80 m deep vertically sided gorge on the southern boundary, the other two flowing into the gorge via adjacent properties.

Soils in the area are predominantly of shallow pasture topsoil overlying weathered sandstone, but in some places above the 250 m AHD contour there are exposures of shale. There is little stone in the cleared pasture areas but the steep scarp that dominates the eastern section comprises outcropping bedrock, boulders and floaters of indurated sandstone.

Elevations in the Project Site vary from a high of 280 m AHD on the rise near Greenacre Drive, down to just below 250 m AHD in the bottom of the largest of the gullies where it crosses the southern

boundary, but for the most part the rises and swales of the central undulating area are in the 245-260m AHD range.

3.2 Vegetation

As the aerial photograph shows large tracts of the Project Site that were cleared for an open-range turkey farm and fowl-sheds (now defunct, but many of the roads, tracks, fencelines and concrete shed-floors are still visible in the aerial photograph in **Figure 2**), but today the cleared areas are grazed by a small herd of cattle, all unused structures have been removed, and ducks are raised in the two groups of sheds that dominate the high ground. As a consequence of the cattle-grazing large areas of open woodland remain free of understorey and appear as "manicured" parkland, with tall trees and grass groundcover.

3.3 Water resources

As referred to above the Project Site is drained by four drainage depressions of which two are steeply dipping gullies and so it is unlikely that there ever was a reliable water source in the area as the run-off would be quick and brief after heavy rain. However, while the water in the Bargo River was inaccessible – the gorge walls being too steep to descend merely for water – Myrtle Creek would have been a reliable and readily accessible water source less than three hundred metres to the north of the Project Site. And so the absence of a reliable water source within the Project Site would never have been constraint to its use by Aboriginal people.

3.4 Stone resources

No stone suitable for the manufacture of tools, weapons, or implements was observed to occur naturally on any surface within the Project Site. There are outcrops of sandstone bedrock in numerous places along the rim of the gorge and in the larger of the two gullies but no evidence of conglomerates or any material suitable for knapping into stone tools or implements. It is therefore probable that if any artefactual material is present within the Project Site that it is of an exotic material (introduced), and brought in from elsewhere. If they are present artefacts will be found either in very

low-density scatters or as isolated artefacts, and most will probably be small (less than 20 cm long) as a consequence of material curation and/or re-use.

3.5 Potential food resources

From the species of surviving vegetation found throughout the Project Site it can be surmised that the Project Site contained resources typically found elsewhere in the region, that is, that it does not appear to have been a source of any food or material that could not have been obtained elsewhere.

3.6 Previous impacts

As referred to previously much of the more level areas of the Project Site have been cleared, firstly for chicken and turkey farms, and for pasture. In addition there are numerous roads and tracks that ran between the various sheds and structures, all of which have been removed save for the concrete floors, aprons, steps and pathways. There are also seven small dams and one large dam, but numerous other breached dams (or manure settling ponds?) not visible in the aerial photograph, that fringe the south-eastern rim of the low-lying area, where many concrete fowl shed-floors were aligned down the slope so that the manure could be flushed directly into the ponds.

4. THE ARCHAEOLOGICAL RECORD

4.1 The AHIMS Site Register (2006)

In **2006** Appleton made a search of the Aboriginal Heritage Information Management System (AHIMS: Site Register) for all sites within an area described by the AMG references Easting 277000-285000: Northing 6207000-6214000 (an area of 8 km west to east, by 7 km long north to south), centred on the Project Site. A cover letter to the results is included as **Appendix vi.**

The listing showed that 26 sites had been recorded in the 56 square-kilometre search area, of which only three occurred within the map coverage of **Figure 1**. Neither of two sites in Myrtle Creek, and at

Mermaids Pool upriver on the Bargo less than a kilometre to the south of the Project Site (known to Glenda Chalker) listed on the Sites Register.

Of the three sites in **Figure 1** two were shelters, one with art and the other with occupation deposits, recorded by Sefton. Both map references plot to open gently rolling country, one in an open paddock within the Project Site (see Figure 1: #52-2-2079), and the other to a residential area of Tahmoor (#52-2-2078). Clearly these are not the locations of shelters and the two site locations probably refer to sites in Myrtle Creek, where Glenda Chalker said she knew of such sites. The sites were probably recorded using a 1: 250,000 scale map as 1: 25,000 scale maps were not available until about 1983, and one millimetre on a 1: 250,000 scale map was equal to 250 m. This is not an unusual result as many of the map references on the AHIMS Sites Register for sites recorded before the mid-1980s are inaccurate (pers. experience).

Of the 26 sites within the search area, thirteen were shelters with occupation deposits and/or art, nine were isolated artefacts or open scatters, and there was one altered tree, one PAD (Potential Archaeological Deposit), one axe-grinding groove site, and an art site ("Migadan Spirit Site").

As referred to previously the Project Site was investigated by Denis Byrne of Mary Dallas Consulting Archaeologists, in 1993. Byrne reported that he had identified six PADs in the "easternmost of the two gullies". Each of the PADs was a rockshelter with "dry sandy loam deposits" over part or the entire rockshelter floor. Byrne suggested that

> "sub-division and associated infrastructural development may be excluded from the gully area (defined as that below the gently inclined terrain to either side, much of which is presently under pasture). This of itself should provide adequate protection for the PADs" (1993, 7-8).

As Byrne did not register the PADs on AHIMS they have not been recorded as sites requiring further investigation.

4.2 The AHIMS Site Register (2012)

On 3rd August **2012** ASR made a further search of the AHIMS Site Register to ensure that the records had not been increased by sites relevant to the Project Site that might have been registered since

2006. The search area was for all sites within the a rectangular centred on the Project Site, defined by E. 277000-285000, and N. 6207000-6214000, an area of 56 sq.km. The results showed that 57 sites had been recorded in the area. A check of the locations of each of the listed sites found that no new sites had been recorded in the Project Site. A copy of the AHIMS cover letter is included as **Appendix vii.** No details of the sites have been included in this report at the request of the AHIMS unit on the grounds that to do so is to threaten the security and safety of those sites.

4.3 Wollondilly Council Growth Management Strategy.

As required by the 2012 brief for this project a search was made of the "Wollondilly Growth Management Strategy 2011" (WGMS) to determine whether there were any issues of an archaeological or Aboriginal cultural aspect that might present a constraint to the proposed subdivision. The WGMS is, "a policy document with associated mapping which contains key directions and principles to guide proposals and Council decisions on growth" (Wollondilly Shire Council n.d.).

The only reference, either direct or indirect to heritage issues occurs in "7.5.8 Environmental Studies", of the WGMS which it states:

> "Heritage: Proposals must demonstrate no detrimental impacts to any item or place of Aboriginal or archaeological significance or on any heritage item or heritage conservation area".

No sites of Aboriginal cultural significance or of archaeological significance were recorded in the Project Site in 2006, and the AHIMS search in 2012 showed that no new sites had been recorded in the period since, and so there are no sites occur within the Project Site.

During the 2006 investigation Appleton (ASR) paid particular attention to the location of the potentially sensitive area identified by Byrne in 2006 but was of the opinion that no further investigation was necessary at that time, as the 2006 Preliminary layout showed that the gully was to remain undisturbed it was concluded that no further work in that area was necessary.

The current Preliminary Lot Layout shows that the section of the gully in which Byrne recorded the potentially sensitive area will not be developed and will be left as undeveloped woodland. If however

the gully is to be mechanically reshaped in any way to provide stormwater discharge from the subdivision into the gorge then the shelters in the gully should be further investigated; if on the other hand there is to be no alteration to the gully then no further investigation is necessary.

5. MODELS FOR SITE LOCATION

5.1 Site types and their location

In order to design an investigative strategy it is firstly necessary to develop a predictive model for site location. This is not to determine where the investigation should be conducted, but to establish a theoretical model for the distribution of archaeological material against which the effectiveness and subsequent analysis of the survey results can be tested, compared and reasoned. The basis upon which the predictive model is derived must however be one of consideration of which archaeological material might realistically be expected to not only be present, but also detectable.

The first objective of any archaeological investigation must be to observe and record sufficient of the archaeological record that is present to be able to propose that it is representative of the record as a whole. The investigative strategy is therefore directed and designed to detect that which is representative of the record in the particular study area, and naturally, as different study areas will comprise variations in environment, vegetation, topography, etc., so the investigative strategy must be designed to best suit the circumstances. The objective must be to detect material evidence, and so it is necessary to consider the extent to which artefactual material may be present, and the degree to which it is visible or might be discovered.

There are several factors, which are likely to affect, firstly, where Aboriginal people are most likely to have been, secondly, where they have left evidence of their activities, and thirdly, the degree to which that evidence is observable in the present record.

People visited places mainly to obtain resources, and in general places that were richest in resources were more likely to have been visited by people than those places with fewer resources. Important resources were permanent water, ephemeral water, food resources, stone raw material sources, shelter (from sun, wind, and rain), and perhaps suitable surfaces for rock art, and proximity to mythological natural features. Those resources may have been a factor in the suitability of a location

for particular ceremonial activities but cultural boundaries also influenced the choice of ceremonial grounds. Alternatively, sites frequently occurred along preferred access routes and particularly where that route coincided with a watercourse.

However, the attractions of such an environment frequently resulted in the archaeological record becoming discontinuous or significantly disturbed, as stock and vehicles impacted upon it in the post-European contact phase.

Frequency of visits and use of particular locations was also determined by the 'accessibility' or freedom from environmental constraints in the area. For example, whether there were alternative, preferred or easier ways to travel around or over natural barriers, be they geological, geographical, cultural, or imposed by fauna or flora, or whether they were only seasonally accessible, such as mounds on flood terraces, or the availability of water during periods of drought, or whether or not floods, fire or snow hindered access.

Few past Aboriginal activities are represented by surviving material evidence. This in part is because many activities did not leave material evidence (eg. tools were reused), but it is also because very little cultural material survived. An exception to this was shellfish, which was very durable.

The survival of material that is durable was also affected by recent European land use. Cultivation has destroyed many archaeological sites. However, cultivation can also help expose sites that might otherwise be covered. This brings us to the other important point about site distribution, which is that to a great extent site distribution recorded by archaeologists reflects the distribution of places where the ground surface is sufficiently eroded to expose artefactual material.

By far the majority of recorded sites have been stone artefact scatters or isolated stone artefacts, and in the vast majority of sites they were found in one or more of the following contexts:

i) On or adjacent to deposits containing quartz, quartzite, jasper, silcrete, chert, chalcedony, metamorphosed greywacke, and other indurated or siliceous sedimentary rocks, or redeposited fine-grained volcanics, or

ii) On river banks or adjacent to river banks where the watercourse contains river pebbles of quartz, quartzite, jasper, silcrete, chert, fine-grained volcanics, basalts, etc., and particularly at the junctions of watercourses, or

iii) On ridges and spurs overlooking watercourses or on high vantage points affording uninterrupted views of swamps, water holes, saddles, passes, and any other likely access path into the observer's area, or

iv) In the vicinity of outcrops of suitable raw material such as basalt, silcrete, chert, or other highly silicified sedimentary rock.

Other site types do occur and perhaps because of their lower and less predictable profile, are present in far greater numbers than we are aware of. People died but there are few recorded burials. One reason may be that in many instances the soils are too acid for the preservation of bone, but a far more likely reason is simply that burial frequently entailed subsurface internment, and a surface survey will only discover a burial where there has been erosion of significant disturbance to the surface deposits. As a consequence many burials have only been discovered when exposed by erosion of a sand body or river terrace.

Other site types such as carved trees, scarred trees, stone arrangements, Bora rings, etc., may once have been present, but are unlikely to have survived in easily accessible country from the attention of non-indigenous people. Thus, much of what might have existed is now lost or destroyed, and the archaeological record has become biased by the post-contact utilisation of resources, and by the selective exploitation and preservation of particular environments.

Other factors which affect the degree to which sites are recorded during an investigation include the time of year at which the fieldwork is performed (the seasonality of some vegetation growth) and the conditions under which the survey is performed – (wet, dry, cold, windy, poor light, etc.).

A brief description of site types such as isolated artefacts, open scatters, camp sites, knapping floors, quarries, middens, mounds, hearths, carved trees, scarred trees, stone arrangements, Bora rings, burials, engravings, paintings, grinding grooves, occupation deposits (and PADs), and ceremonial and mythological sites is included as **Appendix viii.**

5.2 A Predictive Model for site location in the Project Site.

Based on the information provided by the Topographic map (**Figure 1**) and the Google image (**Figure 2**) the following model for site distribution was proposed for the survey area which while potentially might contain useful silicified pebble material; does not contain any reliable source of water.

- Isolated artefacts may be present.
- Low-density artefact scatters are unlikely to be present,
- There will not be any shell midden remains.
- It is highly unlikely there will be any scarred trees.
- It is highly unlikely there will be any carved trees.
- There will be no art sites, engravings or occupation deposits.
- There will be no grinding grooves.
- There are no recorded Mythological sites in or near the survey area
- There will be no quarries.
- There will be no burials
- There will be no surviving Bora rings
- There will be no stone arrangements.

In summary, the only sites likely to be present if at all are isolated artefacts or low density artefact scatters. The following table is constructed on 'before' and 'after' information. The "site type likely to be present' column was based on the Predictive Model for site location before the field investigation and the 'found' column represents the results of the field investigation.

Clearly some site types do not depend on the nearby presence of a natural resource, as for example stone artefacts, burials, Bora rings, burials and middens; while other site types do, such as for example shelters, engravings, PADs, scarred and carved trees. Predictive Models for site location are based on the information taken from Topographic maps, geology maps, aerial photographs and the knowledge of the site type that might be present within such environments, but what those information sources cannot show are features less than 10m high or 10m across, and many site types are far less than 10m high or 10m across.

SITE TYPE	PRESENCE OF POTENTIAL CONTEXT	SITE TYPE LIKELY TO BE PRESENT	SURVEYED FOR	FOUND
ISOLATED ARTEFACT	YES	POSSIBLE	YES	NO
ARTEFACT SCATTER	YES	POSSIBLE	YES	NO
SCARRED TREE	NO	NO	YES	NO
CARVED TREE	NO	NO	YES	NO
MIDDEN	NO	NO	YES	NO
BURIAL	NO	NO	YES	NO
MOUND	NO	NO	YES	NO
SHELTER	NO	NO	NO	NO
NATURAL WELL	NO	NO	NO	NO
QUARRY	NO	UNLIKELY	YES	NO
GRINDING GROOVES	NO	NO	NO	NO
ENGRAVINGS	NO	NO	NO	NO
STONE ARRANGEMENT	NO	NO	NO	NO
HEARTH/FIREPLACE	NO	NO	NO	NO
BORA RING	NO	NO	NO	NO
PAD	YES	POSSIBLE	YES	NO

Table 2 - Showing the predicted likely presence of site types and the results of the field investigation.

6. THE SURVEY

6.1 The survey strategy (2006)

Prior to the investigation Appleton discussed the results of the 1993 investigation with Mr Michael Parkinson, Corporate Property Manager, Inghams, and the management options available to Inghams

for dealing with the potentially sensitive area identified by Byrne. Mr Parkinson agreed that as the gully could not be developed (the gully is a natural watercourse) that the most sensible solution was to exclude it from the proposed subdivision. As a consequence Appleton proposed to confirm the furthest point up the gully, of the potentially sensitive area as a basis on which to recommend how much of the gully should be excluded from the subdivision as a 'reserve'.

From the brief it was clear that there would be easy access to the area to be surveyed and it would be possible to survey the entire Project Site. Unfortunately, the ground visibility at the time of the investigation was poor. In effect it soon became obvious that most ground surfaces were covered in grass cover and that there was limited archaeological visibility. However there were many exposures along stock tracks, stock pads, dam walls, and in drip-line exposures beneath many of the trees and as these frequently occurred in environments and on land-forms in which it had been predicted sites were most likely to occur sufficient ground surface was visible to establish a representative result.

The three investigators began the survey west of the entrance on Tahmoor Road, working their way in an anti-clockwise direction around the Project Site. Every land-form and environment within the Project Site was investigated, with the exception of the hatchery and duck-shed quarantine areas. As referred to above the major gully was investigated downstream only as far as the potentially sensitive area, however all other drainage lines were fully investigated to the boundary fence. No attempt was made to survey the gorge walls but the survey did cover the sloping rim of the gorge outside the boundary fence wherever it was safe and practical to do so.

6.2 Details of the survey (2006)

Donna Whillock, Tharawal LALC Sites Officer, and Glenda Chalker, Cubbitch Barta Sites Officer, assisted in the field survey, which was undertaken on foot in light ideal for observing artefactual material. All of the areas shown shaded in red in **Figure 4** were surveyed on foot.

6.3 Site recording

All relevant observations as to the topography, vegetation cover, and conditions, were recorded in a field-log, and photographs taken with an Olympus Camedia C-3030 Zoom Digital Camera, to record

the character of the Project Site, and to witness survey conditions. The potentially sensitive location was recorded using a hand-held Garmin "GPS72" GPS (Global Positioning System).

6.4 Constraints to survey effectiveness.

While grass cover was a constraint to archaeological visibility in many areas there was easy access to all parts of the Project Site.

Figure 4 shows the effective survey coverage based on the assumption that most artefactual material if exposed and visible can be observed for up to 5 metres to either side of the path of the observer. Clearly this would vary significantly between a path walked through dense vegetation, and a path across a clay-pan, and is given as a guide only.

The effectiveness of the site visit should be assessed in terms of the site types that might be present, and **Table 2** addresses the issue of whether the context in which the site type would occur was present, and to what extent the site type was likely to occur.

There were no significant constraints to the investigation of the ridge in the north east corner which as described above were stripped of A Horizon soils and were therefore bare surfaces. Recent rain had also washed the surfaces of all loose dust and so archaeological visibility was excellent.

7 THE EFFECTIVE SURVEY COVERAGE

7.1 The Effective Survey Coverage.

The effectiveness of the site visit should be assessed in terms of the site types that might be present, and **Table 2** addresses the issue of whether the context in which the site type would occur was present, and to what extent the site type was likely to occur. It is important to remember that much of the area would have been populated by semi-closed open woodland or forest and that it was not an environment in which there was likely to be hearths. If hearths had been present they would be on level ground and probably within a short distance (<30m) from creeks. Similarly, it is unlikely there would be any campsites on any slope greater than 5°.

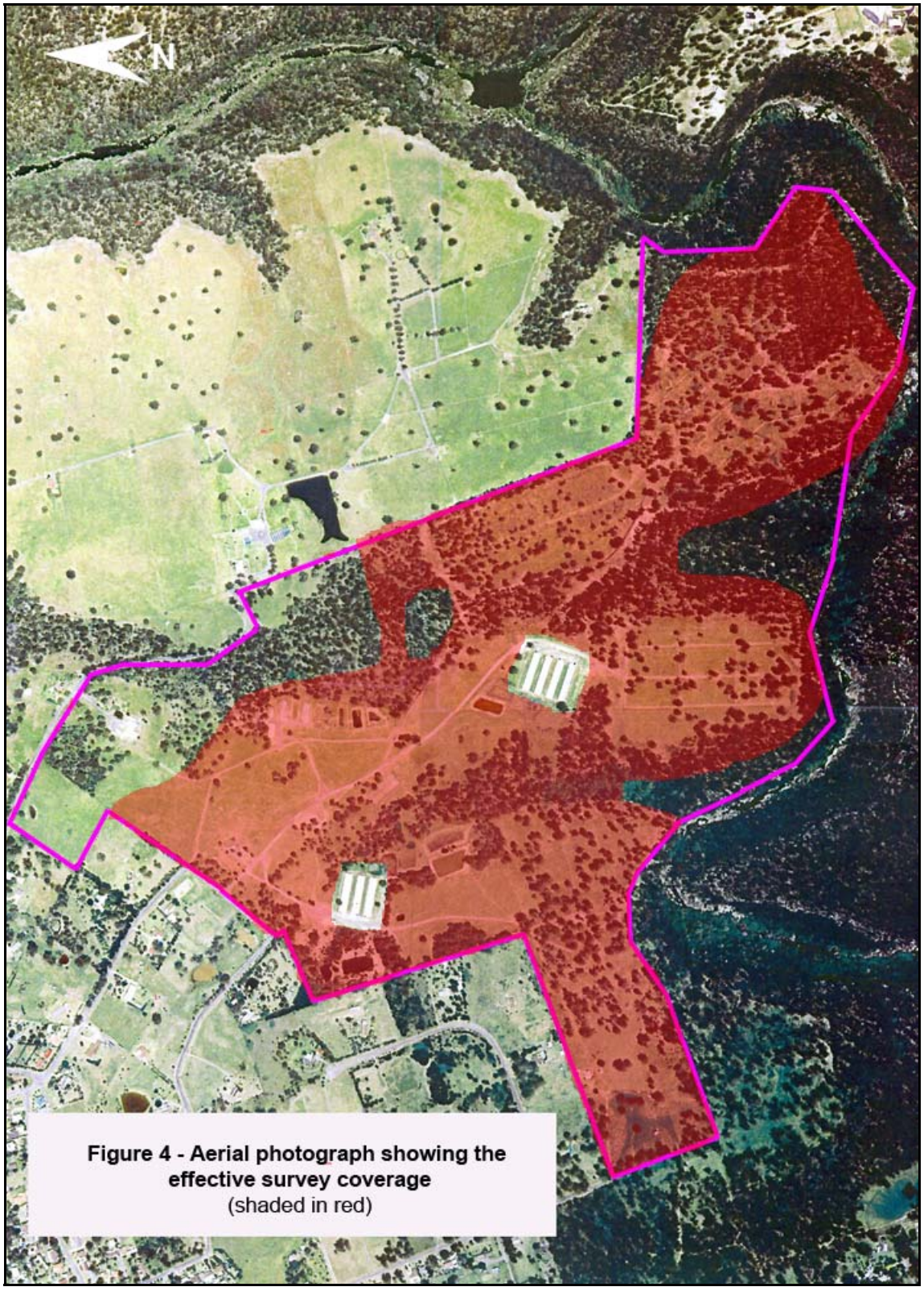


Figure 4 - Aerial photograph showing the effective survey coverage
(shaded in red)

The first of the following two tables (**Tables 3 and 4**) shows the calculated approximations of the survey coverage; and the second shows the calculated approximations of the survey effectiveness in terms of the landform, as prescribed in *"National Parks and Wildlife Amendment (Archaeological Investigations) Regulation 2010".*

It should be noted that neither of these tables take into consideration the extent to which there may be considerable differences in land use and past impacts within a single landform unit; or in the variable height or density of the ground cover across any single landform; or the extent to which soils are aggrading or degrading; or the differences in visibility between a scarred tree, a shell midden, a müller, and a single microlith (to take only four examples); or the differences in abilities and perceptions of individual archaeologists (varying between those of a recent graduate who has specialised in one particular aspect of archaeology such as shell middens, compared to a "twenty-year consultant"; or an academic using fist-year students in the survey; or an inexperienced field-worker with no formal training in artefact recognition). There are many factors that determine the effectiveness of a field survey, and the tables merely represent a statistical exercise to comply with the new regulations, but which in reality have little to do with how effective the field investigation has been.

7.2 Effectiveness of the survey technique

There was a dense grass cover in most of the Project Site but there were sufficient ground surface exposures in the environments in which artefactual material was most likely to be present if at all, for an effective sampling of the Project Site. In addition to the more obvious ground surface exposures some areas contained minor erosion features, which provided samples of those environments least likely to contain artefactual material. In addition to the duck sheds that are in use today there is a duck hatchery in the north-eastern corner of the Project Site. All three areas are 'quarantine areas' and were therefore not surveyed.

The survey technique was the most appropriate one to use in the circumstances, and the results are believed to be generally representative of the archaeological record in the Project Site, in which it was predicted there would be very little artefactual material. Although the entire area was sample surveyed, the groundcover was a constraint to the effectiveness of the survey.

A	B	C	D	E	F	G	H	I	
Survey unit (120ha or 1,200,000sqm)	**Landform**	**Survey unit 'horizontal' area sqm (1,200,000 sqm)**	**Horizontal exposure % (average)**	**Area of exposure (C x D) [approx.]**	**Visibility % (average)**	**Area available for site detection (E x F) - [approx.]**	**Area available for site detection % (G/C x 100) - [approx.]**	**Vertical exposure % (average)**	**Effective coverage sqm - [approx.]**
Cleared undeveloped pasture	Plateau (gentle slopes and swales)	650,000	5%	32,500	60%	19,500	3.00%	n/a	19,500
Developed (roads, concrete pads, dams, turkey farm etc)	Plateau (gentle slopes and swales)	300,000	5%	15,000	100%	15,000	5.00%	n/a	15,000
Wooded slopes	Slopes (on plateau and rim)	180,000	10%	18,000	30%	5,400	3.00%	n/a	5,400
Shallow drainage lines (L x 20m wide)	Drainage depressions (on plateau)	40,000	5%	2,000	25%	500	1.25%	n/a	500
Steep-sided gullies at perimeter (L x 50m)	Gullies (on rim of plateau)	30,000	30%	9,000	75%	6,750	22.50%	n/a	6,750

TABLE 3 - Survey coverage

A	B	C	D	E	F	G	H	
Landform	Landform area (1,200,000 sqm approx.)	Area surveyed (approx.)	Area effectively surveyed (= effective coverage)	% of landform surveyed (= area surveyed/ landform area x 100) [approx.]	% of landform effectively surveyed (= area effectively surveyed/landform area x 100) [approx.]	Number of sites (previously recorded)	Number of new sites	Number of artefacts or features
Plateau (gentle slopes and swales) - cleared	650,000	487,500	19,500	75%	3.00%	0	0	0
Plateau (gentle slopes and swales) developed	300,000	240,000	15,000	80%	5.00%	0	0	0
Slopes (on plateau and rim) wooded	180,000	135,000	5,400	75%	3.00%	0	0	0
Drainage depressions (on plateau)	40,000	32,000	500	80%	1.25%	0	0	0
Gullies (on rim of plateau)	30,000	24,000	6,750	80%	22.50%	0	0	0

TABLE 4 - Landform summary

In summary, the only sites likely to be present if at all are isolated artefacts. The table (**Table 2**) is constructed on 'before' and 'after' information. The "site type likely to be present' column was based on the Predictive Model for site location before the field investigation and was based on the likely resources. The 'found' column represents the results of the field investigation.

Clearly some site types do not depend on the nearby presence of a natural resource, as for example stone artefacts, burials, Bora rings, burials and middens; while other site types do, such as for example shelters, engravings, PADs, scarred and carved trees. Predictive Models for site location are based on the information taken from Topographic maps, geology maps, aerial photographs and the knowledge of the site type that might be present within such environments, but what those information sources cannot show are features less than 10m high or 10m across, and many site types are far less than 10m high or 10m across.

The digital images following show various aspects of the Project Site.

Plate 1 – Looking south-westwards from the entrance on Tahmoor Road.

Plate 2 – Looking southwards from the head of the main drainage line.

Plate 3 – Exposure on the banking to the north of the northern sheds.

Plate 4 – Looking southwards down the western track towards the gorge.

Plate 5 – The open woodland in the western section.

Plate 6 – Looking north-westwards along the rim of the gorge towards the western section.

Plate 7 – Looking south-westwards down the westernmost drainage line to the gorge boundary.

Plate 8 – Looking down into the 80 m-deep. gorge from outside the southern boundary

Plate 9 – Looking southwards down the main drainage line into the wooded area.

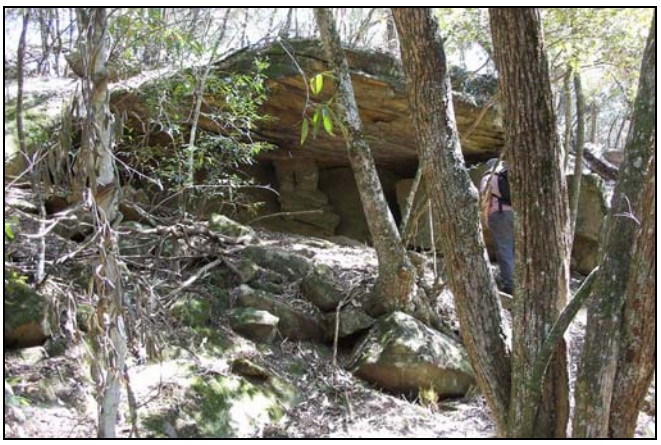


Plate 10 – The PAD in the southern. drainage line

Plate 11 – The PAD showing the headroom and the deposits.

Plate 12 – Casuarina woodland along the eastern upper-bank of the main drainage line.

Plate 13 – Looking south-westerly from the base of the scarp in the south-eastern corner.

Plate 14 – The concrete floors of defunct fowl-sheds above a breached dam in the south-eastern corner.

Plate 15 – Casuarina woodland in the extreme south-eastern corner of the Project Site

Plate 16 – Looking north-westwards along a defunct road in the south-eastern corner.

Plate 17 – More defunct shed bases above another breached dam in the south-eastern corner.

Plate 18 – Looking along the wooded scarp along the eastern boundary of the Project Site.

Plate 19 – Defunct shed floors in the north-eastern corner of the Project Site.

Plate 20 – Looking south-westwards along the central elevated area, from the north-. eastern corner

8. THE RESULTS OF THE INVESTIGATION IN 2006

No sites of cultural or archaeological significance were recorded.

9. DISCUSSION

9.1 The results of the investigation in 2006

When it was observed how little surface water there was and the inaccessibility of the gorge it was not surprising that no sites were found, however given that there are known sites in Myrtle Creek less than a few hundred metres from the Project Site we had expected to find at least one or two isolated artefacts, despite the absence of a source of stone suitable for knapping into tools or implements within the Project Site.

While it is difficult to be confident that there are no Aboriginal sites in the Project Site, primarily as a consequence of the extent of the clearing of vegetation and the use of the property as a 'turkey and chicken farm', it is reasonable to assume that if there is any artefactual material present that it is likely to consist of isolated artefacts and/or low density artefact scatters, neither of which would be in their depositional contexts, and unlikely to be visible.

In summary, although the Project Sites occur in a region in which there are known to be places of Aboriginal association, there is very little potential for the area to contain recoverable archaeological material. Primarily as a consequence of the extent to which the Project Site has been altered, there are few undisturbed contexts in which archaeological material might be observed. If however archaeological material is present, it is likely to consist of small isolated artefacts or low density open scatters only, none of which will be observed other than by chance.

The following section has been included to inform the proponents of the implications of the new guidelines and codes in the event that they should decide that the potentially sensitive area (recorded by Byrne), should be further investigated because they propose to alter the gully in which it occurs.

9.2 Codes of Practice: NSW OE&H Requirements for Archaeological Assessments and Investigations

Recent legislated amendments to the National Parks and Wildlife Act 2010, and the introduction of Codes of Practice, and Due Diligence, have established new procedures for how archaeological

investigations should be undertaken and reported; and re-defined the procedure to be followed in consulting with Aboriginal stakeholders. These are briefly summarised below.

9.2.1 "Code of Practice for Archaeological Investigation in NSW 2010".

The purpose of *National Parks and Wildlife Act 1974, Part 6* – "Code of Practice for Archaeological Investigation in NSW" is twofold:

- To establish the requirements for undertaking test excavation as part of archaeological investigation without an AHIP – also adopted by clause 3A of the *National Parks and Wildlife Amendment (Archaeological Investigations) Regulation 2010.*
- To establish the requirements that must be followed when carrying out archaeological investigation in NSW where an application for an **AHIP** is likely to be made.
- The Code is applied **when further investigation** (such as subsurface investigation) is necessary, and when the proposed activity will be undertaken to support a **development application** under the *Environmental Planning and Assessment Act 1979*.

9.2.2 "Due Diligence Code of practice for the Protection of Aboriginal Objects in NSW 2010".

The purpose of this code of practice is to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (**AHIP**).

If Aboriginal objects are present or likely to be present and an activity will harm those objects, then an **AHIP** will be required.

> "*If you have followed this code and at any point have reasonably decided that an AHIP application is not necessary either because Aboriginal objects are not present or, if they are present, harm to those objects can be avoided, you can proceed with caution.*

If, however, while undertaking your activity you find an Aboriginal object you must stop work and notify OE& and you may need to apply for an AHIP. Some works may not be able to resume until you have been granted an AHIP and you follow the conditions of the AHIP. Further investigation may be required depending on the type of Aboriginal object found.

If human skeletal remains are found during the activity, you must stop work immediately, secure the area to prevent unauthorised access and contact NSW police and OE&H" (DECCW 2010).

9.2.3 "National Parks and Wildlife Amendment (Archaeological Investigations) Regulation 2010".

The amendments provide detailed procedural instructions for how sites should be recorded and how investigations should be reported in order to provide consistency and transparency in archaeological investigations. The Aboriginal consultation undertaken for this project is in accordance with the new standards, and the report has been structured as per the new directive, only minor changes having been made to the recommended sequence of "chapters" to provide a more logical sequence.

9.2.4 "Guide to investigating, assessing and reporting on Aboriginal Cultural heritage in NSW (Office of Environment & Heritage, 2011).

A guide to the procedure for investigating, assessing and reporting on Aboriginal Cultural heritage. This procedure was released in April 2011.

10. SIGNIFICANCE ASSESSMENT

The NSW OE&H policy to safeguard all sites, Aboriginal places, and archaeological material of significance wherever possible requires that some means of assessing the significance of the sites is necessary. This is not only for the purpose of determining whether the proposed development can

proceed as proposed, but also to provide Cultural Resource Managers with the information for future management of the area.

10.1 Cultural significance

The Aboriginal or cultural significance of Aboriginal relics and sites can only be assessed by the Aboriginal community, and in particular, the Elders. It is the responsibility of the archaeologist to ensure that the Elders or elected representatives of the Aboriginal community are advised of the survey results, and are consulted as to their knowledge and opinion of the significance of the area, and to transcribe and present those expressions in report form.

In this instance, Donna Whillock, representing Tharawal LALC, and Glenda Chalker, representing Cubbitch Barta, were unaware of any Aboriginal association with the Project Site. Copies of their recommendations are included as **Appendix I** and **Appendix ii.**

No responses were received from any of the registered stakeholders, who were consulted in 2012 by way of draft extracts from this report, and so it can be assumed that they either do not have any additional cultural information; or that they do not want any information they might have, to be made public.

10.2 Research potential

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there is nothing to assess.

10.3 Educational potential

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there is nothing to assess.

10.4 Aesthetic value

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there is nothing to assess.

10.5 Uniqueness and/or rarity

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there is nothing to assess.

11. IMPACT ASSESSMENT

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there is nothing to assess.

12. MANAGEMENT AND MITIGATION MEASURES.

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there is nothing to manage or avoid.

13. RECOMMENDATIONS

In the absence of artefactual material or identification of the Project Site as being a place of Aboriginal cultural significance there are no constraints on archaeological or Aboriginal cultural grounds to the proposed subdivision of Part DP 19669, Tahmoor. However the proponents are advised of the following provision which applies to all development projects in NSW:

NSW OE&H has made the following recommendations in relation to any earthworks operations as additional Statements of Commitment or as conditions of approval as appropriate:

1. If Aboriginal cultural objects are uncovered due to the development activities, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and Aboriginal community representatives must be contacted to determine the significance of the object(s). The site is to be registered in the AHIMS (managed by NSW OE&H) and the management outcome for the site included in the information provided to the AHIMS. It is recommended that the Aboriginal community representatives are consulted in developing and implementing management strategies for all sites, with all information required for informed consent being given to the representatives for this purpose.

2. If human remains are located during the project, all works must halt in the immediate area to prevent any further impacts to the remains. The NSW Police, the Aboriginal community and NSW OE&H are to be notified. If the remains are found to be of Aboriginal origin and the police consider the site not an investigation site for criminal activities, OE&H should be contacted and notified of the situation and works are not to resume in the designated area until approval in writing is provided by NSW OE&H. In the event that a criminal investigation ensues, works are not to resume in the designated area until approval in writing (*has been received*) from NSW Police and NSW OE&H.

3. All reasonable efforts must be made to avoid impact to Aboriginal cultural heritage values at all stages of the development works. If impacts are unavoidable, mitigation measures are to be negotiated with the Aboriginal community and NSW OE&H.

4. All reasonable efforts must be made to avoid impact to Aboriginal cultural heritage values at all stages of the development works. If impacts are unavoidable, mitigation measures are to be negotiated with the Aboriginal community and NSW OE&H.

GENERAL GLOSSARY:

The definitions that follow are for terms used in this and other reports written by the author, and do not necessarily apply to their use in different contexts.

ADZE : A modified flake with at least one steeply-retouched working edge. While all adzes are generally considered to be wood-working tools it is probable that some also served as cores and others as scrapers. Adzes with a uniform butt were frequently hafted to make a chisel-like tool, but the intended use of the adze determined the size of the adze and whether it was hafted (Flenniken and White, 1985).

ARCHAEOLOGICAL DEPOSIT :
Sediments which contain evidence of past Aboriginal use of the place, such as artefacts, hearths, burials etc.

ARTEFACT : Any object that has attributes as a consequence of human activity (Dunnell, 1971). In this report 'artefacts' has been used generally to describe pieces of stone that have been modified to produce flakes, flaked pieces, cores, hammerstones, or axes.

BACKED BLADE :
A stone tool manufactured from a flake on which one margin has been modified by the removal of small flakes to blunt the edge or margin opposite the cutting edge.

BORA GROUND :
A ceremonial site comprising of one or two connected circles composed of compacted or mounded earth, or defined by an arrangement of stones, of 2 to 30m diameter, generally used in male initiation rites.

CAMPSITE : A place at which the density of artefacts and the variety of material indicates that people 'frequently' used the place as a stopping or resting place. Such places are also likely to contain or be close to water resources, food resources, or stone material resources. In this report a campsite is used to describe artefact scatters that are associated with hearths or fireplaces, as distinct from scatters that are not associated with hearths or fireplaces, which are described as Open Scatters.

CORE : A piece of stone from which flakes have been removed, that cannot otherwise be described as a retouched or modified artefact.

CORTEX : The naturally altered surface of stone – eg. the water-worn surface of river pebbles.

DEBITAGE : The small waste material observed in knapping floors. Generally, waste material is described as all those fragments having a maximum dimension of less than 10mm.

FLAKE : A fragment of stone exhibiting features indicating that it has been deliberately removed from a core piece. These features are evident as:

i) Platform: Plane or point at which a blow was delivered to remove the flake.
ii) Bulb of Percussion: Convex surface that occurs on the face or ventral surface of a flake, radiating from the point of impact, produced as a consequence of the force pattern.
iii) Eraillure: see below.

Other terms:

i) Dorsal: The back or outer face of a flake as it would have been prior to removal from a core. Frequently either ridged or exhibiting negative flake scars when removed in secondary flaking, with a natural weathered cortex when removed in primary flaking.
ii) Ventral: The 'chest' or inner face of a flake as it would have been prior to removal from the core. The surface upon which the Bulb of Percussion occurs.
iii) Platform Preparation: The removal of flakes from a surface to produce a level platform. May be evidenced by retouch scars to the platform.

iv) Retouch: The removal of small flakes from an edge or margin of an artefact to modify its shape or resharpen its edge.
v) Proximal: The end of a flake closest to the striking platform.
vi) Distal: The end of a flake furthest from the striking platform.
vii) Margin: The edge of an artefact.
viii) Eraillure: A small circular to elliptical negative flake scar occurring on the surface of the bulb of percussion on flakes of very fine-grained or highly silicified material. It occurs 'naturally' as a consequence of internal forces generated at the time of flake removal.
ix) Split Cone: Occurs when the flake splits down its axis frequently removing part of the striking platform. Generally believed to be produced by faulty knapping technique, but is also probably a consequence of flawed material.
x) Transverse Snap: Occurs when a flake snaps across its axis. Generally believed to be caused by post-depositional impacts such as human or stock treadage, or vehicular traffic.

FLAKED PIECE :

A fragment of stone exhibiting flake scars indicating that it is an artefact, but not displaying diagnostic features, such as a Bulb of Percussion, Striking Platform, or an Eraillure.

HOLOCENE PERIOD :

The period from 10,000 years ago to the present.

In situ : In its original place – as deposited.

ISOLATED ARTEFACT :

A solitary stone artefact, at least 50m from its nearest neighbour. This is based on NPWS policy that two artefacts within 50m of each other constitute a site.

KNAPPING FLOOR:

A discrete scatter of artefacts in which at least two artefacts are recognisably of the same material, and derive from the same piece of stone. Also described as a stone tool manufacturing site or floor.

LOCATION : The place at which an artefact is found, or a place identified as having either archaeological or Aboriginal significance.

MEASUREMENT :

I) Flake:
  i) Length: Measured along the percussion axis at right angles to the platform.
  ii) Width: The greatest width measured at right angles to the percussion axis.
  iii) Thickness: The greatest thickness measured at right angles to the percussion axis.
II) Flaked piece:
  i) Length: The longest dimension
  ii) Width: The greatest width measured perpendicular to the length.
  iii) Thickness: The greatest thickness measured perpendicular to the length.
III) Core:
  i) Length: The longest dimension.
  ii) Width: The greatest width measured perpendicular to the length.
  iii) Thickness: The greatest thickness measured perpendicular to the length.

MIDDEN : A refuse heap or stratum of food remains, such as mollusc shells, and other occupational debris (Dortch, 1984 – see also Meehan, 1982).

Identification is often aided by colour variations in layering. A source for stone material tool manufacturing material found as river pebbles in creek beds, and artefacts often display a water-worn cortex.

NEGATIVE FLAKE SCAR :
A concave surface resulting from the removal of a flake, occurring on the surface of the rock from which a flake has been removed.

PLEISTOCENE PERIOD :
The period from about 10,000 years ago to 2 million years ago.

POTENTIAL ARCHAEOLOGICAL DEPOSIT (PAD) :
Synonymous with Potentially Archaeologically Sensitive : Having the potential to contain archaeological material although none is visible.

ROTATION :
The removal of flakes from a core by blows directed at different angles, to different platforms. May be evident on the dorsal surface of a flake as negative flake scars, which do not follow the same direction as the percussion axis of the flake. This may be confused with scars produced during core preparation.

SCAT : The solid waste material produced by an animal – dung, droppings, manure (Triggs, 1985).

SCATTER : Two or more artefacts occurring within 50 metres. Scatter may also be used in the context of 'background scatter', meaning the general distribution of artefacts across the landscape that cannot be recognised as discrete concentrations.

SITE : A discrete area or concentration of artefactual material, place of past Aboriginal activity, or place of significance to Aboriginal people.

ROCK TYPES (the most common types)

BASALT: Fine-grained igneous rock. Principally occurs in lava flows and constitutes over 90% of volcanic rocks (White 1993).

CHALCEDONY :
A form of silica (partially translucent), which occurs as linings in cavities in rocks. When banded it is known as AGATE (Department of Mines, 1973). Chalcedony is uniformly coloured and agate has curved bands or zones of varying colour (Cook & Kirk, 1991).

CHERT : Another name for sedimentary chalcedony. It occurs most frequently in limestones, or in marine sedimentary rock, or as pebbles in sedimentary rock. In its depositional context it is often concentrated in bedding planes. Chert found in deep-water limestones is formed from radiolaria and diatoms (siliceous planktonic micro-organisms) (Cook & Kirk, 1991).
Chert is a form of amorphous or extremely fine-grained silica, partially hydrous, found in concretions and beds. It is classified as a chemical sedimentary rock although it may be precipitated both organically and inorganically (Department of Mineral Resources, n.d.).

CONGLOMERATE :
Naturally cemented gravel. Conglomerate is a coarse-grained clastic sedimentary rock composed of generally rounded fragments of other rock types larger than 2 mm in diameter, set in a fine-grained matrix of sand, silt, or any of the common natural cementing materials (Department of Mineral Resources, n.d.).
A coarse grained sedimentary rock formed largely of rounded, water-worn pebbles (White 1993)

GREYWACKE :
A type of sandstone, grey or greenish-grey in colour, tough and well indurated and typically poorly sorted (Clark & Cook, 1986).

A generally poorly sorted, dark sandstone containing feldspar and sand-sized rock fragments of metamorphic or volcanic rocks (Department of Mineral Resources, n.d.).
Usually a dark and coarse-grained rock compared to mudstones and siltstones that are much finer-grained and better sorted.

IGNEOUS ROCK :
Rock formed by the cooling and solidification of magma on or below the earth's surface (Geography Dictionary, 1985).

JASPER: A red, opaque, compact form of silica or chalcedony (Cook & Kirk 1991).

LIMESTONE: Sedimentary rock, principally of calcium carbonate (White 1993).

METAMORPHIC ROCK: Rocks altered in texture or crystal content by heat and/or pressure (White 1993).

MUDSTONE : A fine-grained detrital rock, usually quite massive and well consolidated. May be black through grey to off-white, browns, reds and dark blues/greens. Frequently found in association with sandstones (Cook & Kirk, 1991).
An unlaminated sedimentary rock consisting of clay minerals and other very fine-grained sediments (White 1993).

QUARTZ: A widely distributed form of silica. May occur in many different colours caused by impurities. Commonest mineral on the Earth's surface, in many acid, igneous and metamorphic rock and in most clastic sediments, frequently found in veins and cavity fillings (Cook & Kirk 1991).

QUARTZITE :
Quartzites are formed by the regional or contact metamorphism of quartz arenites, siltstones, and flints (cherts). They are composed essentially of quartz, and usually have a fine-grained granoblastic (grains are roughly the same size) texture. Generally massive, but may sometimes show sedimentary structures (Cook & Kirk, 1991).

SANDSTONE: Sedimentary rock composed mainly of grains of silica (White 1993).

SHALE: A laminated fine-grained sedimentary rock (composed mainly of clay minerals) which splits easily on bedding planes (White 1993).

SILCRETE : A near surface or surface siliceous induration (Desen & Peterson, 1992).
A conglomerate consisting of surficial sand and gravel cemented into a hard mass by silica.
A siliceous duricrust (Bates & Jackson, 1980).
Crusts may form as a result of low, infrequent rainfall, on reasonably flat surfaces. These are known as duricrusts – those cemented by silica are known as silcretes (Clark & Cook, 1986), sometimes referred to locally as 'billy' (Gentilli, 1968), or 'grey billy'.
Silcrete on the northern tablelands of NSW forms at the surface contact between sediments of the Sandon Beds and the Armidale Beds with overlying basalt, where groundwater (more rich in silica than surficial water) interacts with surficial water and precipitates new quartz as the matrix to the sediments (N.D.J. Cook, Dept. of Geophysics, UNE, pers. Comm.).
In softer formations of quartz sands, groundwater has apparently been responsible for the formation of concretionary layers of silcrete. Under altered climatic conditions, the less competent beds erode away leaving concretions. Since they are often the size of old-fashioned woolsacks and are greyish and white, they are popularly known as gray billy (slang for billy goat) (Fairbridge, 1968).

SCIENCE TERMS (taken from Banks 1995, and others as referenced).

BEDROCK : Outcrop of *in situ* rock material below the soil profile.

BENCH : A strip of relatively level earth or rock breaking the continuity of a slope.

BLOWOUT : A closed depression formed in the land surface by wind eroding sands and depositing them on adjacent land.

CLAYPAN : A depression caused by the aeolian deflation of sediments, or by the presence of a prior lake.

DUNE : A ridge built up by wind action composed of sands, silts, or sand-sized aggregates of clay.

DYKE: A vertical intrusion of igneous rock which comes up along a fault or line of weakness and cuts through the pre-existing rock (White 1993).FLOODPLAIN : A large flat area, adjacent to a watercourse, characterised by frequent active erosion and aggradation by channelled and overbank stream flow.

GIBBER : A level surface covered by a thick deposit of gravel or broken siliceous pebbles, occurring in the more arid parts of the continent, thought to have been formed from the break-up of a siliceous (silcrete) surface crust, and termed gibber plains (Whittow, 1984) – see also silcrete.

GILGAI : Surface microrelief associated with soils containing shrink-swell clays. Gilgai consists of mounds and depressions, or irregularly distributed small mounds and subcircular depressions varying in size and spacing. Vertical interval usually <0.3m; horizontal interval usually 3-10m, and surface almost level.
Sometimes called 'crab-hole' soils.

GULLY : An open incised channel in the landscape generally greater than 30cm deep and characterised by moderately to very gently inclined floors and steep walls.

HUMMOCK : A small raised feature above the general ground surface.

IGNEOUS ROCKS: Rocks formed by the crystallisation of molten magma (White v1993).

LANDFORM ELEMENTS :
Crest : Landform element standing above all points in the adjacent terrain.
Flat : Neither a crest or a depression <3% slope.
Upper slope : Adjacent to and below a crest or flat but not a depression.
Midslope : Not adjacent to a crest, a flat or a depression.
Lower slope :Adjacent to and above a flat or a depression but not a crest.

LITHOSOLS : Shallow soils showing minimal profile development and dominated by the presence of weathering rock and rock fragments.

RILL : A small channel cut by concentrated runoff through which water flows during and immediately after rain.

RUNOFF : That portion of precipitation not immediately absorbed into or detained upon the soil and which thus becomes surface flow.

SCARP/CLIFF : A steep slope terminating a plateau or any level upland surface.

SCRUB : vegetation structure consisting of shrubs 2-8m tall.

SHEET EROSION : The removal of the upper layers of soil by raindrop splash and/or runoff.

SOIL PROFILE :

"A HORIZON" : The top layer of mineral soil. This may consist of two parts:

A_1 HORIZON: Surface soil and generally referred to as the topsoil.

A_2 HORIZON: similar in texture, but paler in colour, poorer in structure, and less fertile.

" B HORIZON" : The layer below the A Horizon. This consists of 2 parts:

B_1 HORIZON: A transitional horizon dominated by properties characteristic of the underlying B_2 horizon.

B_2 HORIZON: typically contains concentrations of silicate clay and/or iron, and/or aluminium and/or translocated organic material.

"C HORIZON" : The parent rock. Recognised by its lack of pedological development, and by the presence of remnants of geologic organization.

"R HORIZON" : Hard rock that is continuous (Charman & Murphy, 1993; 350-1).

SPUR : A ridge which projects downwards from the crest of a mountain as a water-parting (Whittow, 1984).

SUBSOIL : Sub-surface material comprising the B and C Horizons of soil with distinct profiles; often having brighter colours and higher clay contrasts.

SURFACE CONDITION :

Gravelly : Over 60% of the surface consists of gravel (2-69mm).
Hardsetting : Soil is compact and hard.
Loose : Soil that is not cohesive.
Friable : Easily crumbled or cultivated.
Self-mulching : A loose surface mulch of very small peds forms when the soil dries out.

SWALE : A linear level-floored open depression excavated by wind or formed by the build-up of two adjacent ridges.

SWAMP : Watertable at or above the ground surface for most of the year.

TERRACE : A flat or gently inclined surface bounded by a steeper ascending slope on its inner margin and a steeper descending slope on its outer margin (Whittow, 1984).

TOPSOIL : A part of the soil profile, typically the A_1 horizon, containing material that is usually darker, more fertile and better structured than the underlying layers.

UNDERSTOREY : A layer of vegetation below the main canopy layer.

VEGETATION: Forest types.

Closed forest: Canopy provides complete cover – these areas are often called rainforests.
Tall open (wet eucalypt) forest: Canopy cover is reduced – understorey of trees and shrubs.
Open forest (dry eucalypt) Canopy is lower and more open – understorey of hard-leaved shrubs and grasses.
Woodland: Trees are more widely spaced – understorey is grass rather than shrubs

Hardwood: A group of trees called angiosperms, or flowering plants, also called broadleaved plants. Most common is eucalypt.
Softwood: A group of trees called gymnosperms or conifers. Includes pine trees, spruces and firs, cypress pine. Used as timber.

Forests can be described as: open or closed; tall or short; wet or dry; softwood or hardwood.
Varieties: rainforest; wet eucalypt forest; mixed eucalypt forests; dry eucalypts forests; cypress pine forests.

Old growth forests are forests that have not been disturbed for 200 years (Underwood S & G, 1995)

ZEOLITE: Family of alumina-silicate minerals. Used in industry as catalysts and drying agents.
Occurs as low-grade metamorphic minerals, and also in vesicules in lavas, or in shallow igneous intrusions (Cook & Kirk 1991).
Various natural zeolites have applications in agriculture, aquaculture, water treatment, and pollution control, in soil conditioning and as an odour control agent in stock feeds, pet litters, fertilizers, sewerage treatment and other uses (Mineral Resources 2001).

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APPENDICES

Appendix i: Correspondence from Tharawal LALC (2006)

Appendix ii: Correspondence from Cubbitch Barta NTCAC (2006)

Appendix iii: Sample letter to government departments & agencies

Appendix iv: Aboriginal Land Claim

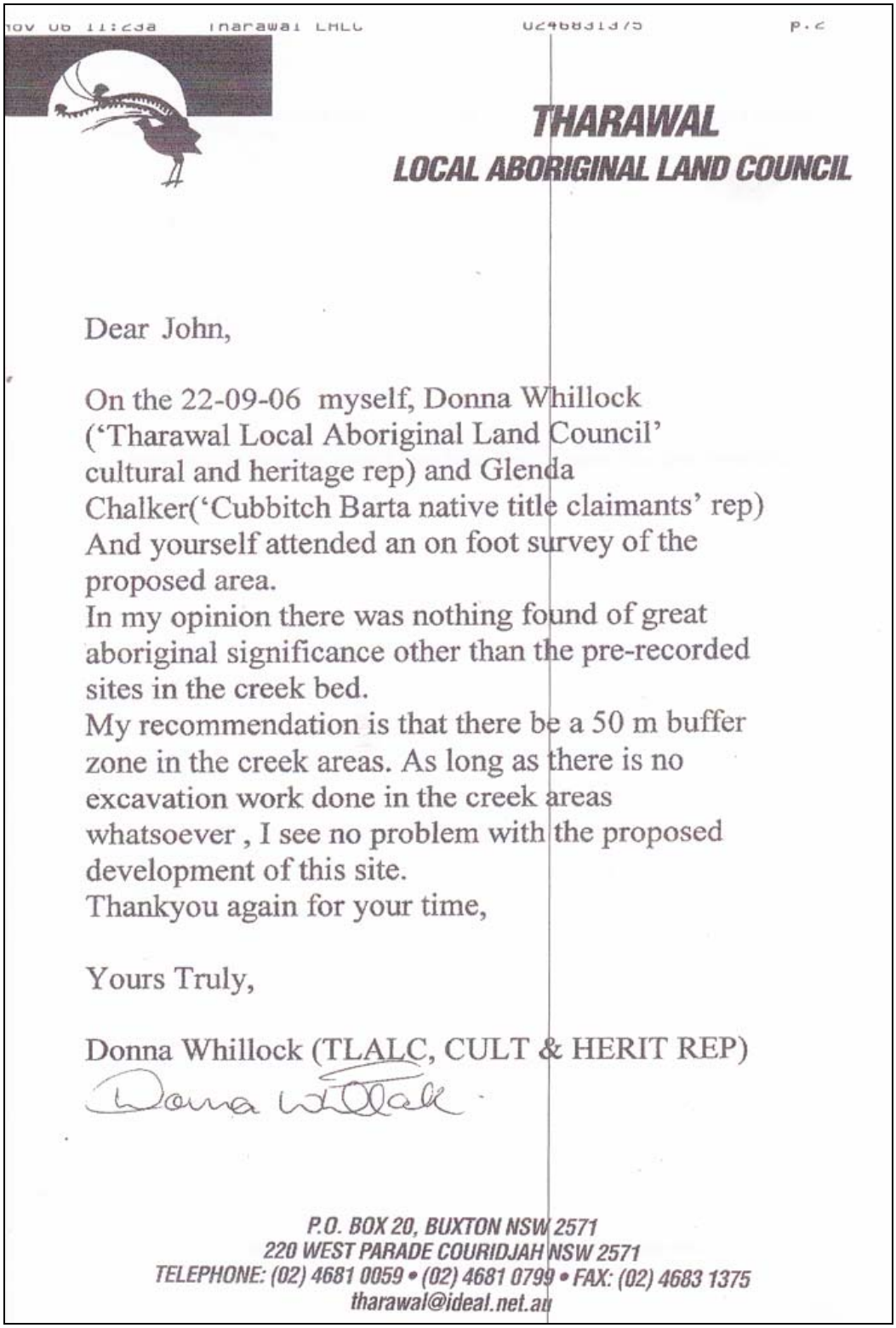
Appendix v: Advertisement in the "*Macarthur Chronicle*"

Appendix vi: AHIMS Search 2006

Appendix vii: AHIMS Search 2012

Appendix viii: Site types

Appendix i: Report form Tharawal Local Aboriginal Land Council



Nov 06 11:23a Tharawal LALC 0246831375 p.2

THARAWAL
LOCAL ABORIGINAL LAND COUNCIL

Dear John,

On the 22-09-06 myself, Donna Whillock ('Tharawal Local Aboriginal Land Council' cultural and heritage rep) and Glenda Chalker('Cubbitch Barta native title claimants' rep) And yourself attended an on foot survey of the proposed area.
In my opinion there was nothing found of great aboriginal significance other than the pre-recorded sites in the creek bed.
My recommendation is that there be a 50 m buffer zone in the creek areas. As long as there is no excavation work done in the creek areas whatsoever , I see no problem with the proposed development of this site.
Thankyou again for your time,

Yours Truly,

Donna Whillock (TLALC, CULT & HERIT REP)

Donna Whillock

P.O. BOX 20, BUXTON NSW 2571
220 WEST PARADE COURIDJAH NSW 2571
TELEPHONE: (02) 4681 0059 • (02) 4681 0799 • FAX: (02) 4683 1375
tharawal@ideal.net.au

Appendix ii: Report from Cubbitch Barta Native Title Claimants Aboriginal Corporation

Cubbitch Barta Native Title Claimants
Aboriginal Corporation,
55 Nightingale Road,
PHEASANTS NEST. N.S.W. 2574.
6th November, 2006

Archaeological Surveys & Reports Pty Ltd.
16 Curtis Street,
APPLETON. N.S.W. 2350.

Dear John,

RE; INGHAMS TAHMOOR.

On Friday 22nd September, I took part in an Aboriginal survey on the Inghams property at Tahmoor with yourself and Donna Whillock from the Tharawal Local Aboriginal Land Council.

The survey area was surveyed by foot, with the whole of the area covered, apart from the creek line where PAD,s were previously. Only one of the PAD,s previously recorded by Dennis Byrne back in the early 90,s was revisited during the survey.

There were no new Aboriginal sites recorded during the survey.

Any development in the area should have no impact upon the creek lines or the shelters within them. To avoid any impact a 50 metre exclusion zone above the creek lines should be included in the development, and absolutley no impact including water retention basins or the like in the creek lines anywhere near the shelters.

There are no other restrictions to any other development within the project area. Most of the land has been grossly disturbed in the past by the chicken farm that previously existed on the property. There has been huge amounts of the natural soil levels moved around, leaving little or no potential to contain undisturbed deposit. Although I do believe that in the past some of the landscape within the proposed development would have had Aboriginal sites, they have been long destroyed by the previous land use.

Consultation with Cubbitch Barta Native Title Claimants Aboriginal Corporation and the Tharawal Local Aboriginal Land Council should continue in regards to the manangement of the shelters, along with a Plan of Management in regards to the shelters and surrounding areas.

Yours faithfully,

G. Chalker

Glenda Chalker
02 46 841129.

Appendix iii: Sample letter to government departments & agencies

Archaeological
Surveys
&
Reports
Pty Ltd

John Appleton
A.C.I.S., A.C.I.M., B.A. (Hons)

16 Curtis Street, Armidale, NSW 2350
Tel. 02 6772 6512 Fax 02 6772 4567 Mob. 0428 651 789
Email japples@northnet.com.au

ABN 67 075 625 722

The General Manager
Wollondilly Shire Council
PO Box 21
Picton 2571

7th June 2012

Re: Archaeological Assessment: Proposed subdivision of Part Lot 19669, Tahmoor

Dear Sir/Madam

This is to advise that in July 2006 Archaeological Surveys & Reports Pty Ltd (ASR) undertook an archaeological investigation of Part Lot 19669, Tahmoor for Inghams Enterprises Pty Limited (Inghams). Since then there have been changes to guidelines and codes with regards to consultation with registered Aboriginal stakeholders. The proponents now wish to prepare a Planning Proposal (rezoning) to Wollondilly Council for rural residential subdivision. In order to address the changes to the codes and guidelines Inghams has engaged ASR to carry out the work necessary for compliance with the new requirements.

In accordance with "*Aboriginal Cultural Heritage Consultation requirements for proponents 2010*" (OE&H); "*Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW 2011*" (OE&H); "*Draft Code of Practice for Archaeological Investigation in NSW*" (OE&H 2010); and "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales" (OE&H 2010), we are now seeking information on any Aboriginal groups, stakeholders or traditional knowledge holders with an interest in the management of Indigenous heritage matters in the Tahmoor area. Would you please provide contact details for any known Aboriginal groups with a cultural interest in this area. The nominated groups can then be included in the consultation process with regard to Indigenous heritage issues.

Regards

1

Appendix iv: Registered Native Title Claim

Appendix v: Advertisement in the "*Macarthur Chronicle*"

Appendix vi: AHIMS Search 2006

Department of
Environment and Conservation (NSW)

Your reference : Sydney # 45
Our reference : AHIMS #16889

Archaeological Surveys & Reports Pty Ltd
16 Curtis StreetJohn Appleton
Armidale NSW 2350

Thursday, 14 September 2006

Attention: John Appleton

Dear Sir or Madam:

Re: AHIMS Search for the following area at Tahmoor;Zone: 56;E: 277000 - 285000;N: 6207000 - 6214000

I am writing in response to your recent inquiry in respect to Aboriginal objects and Aboriginal places registered with the NSW Department of Environment and Conservation (DEC) at the above location.

A search of the DEC Aboriginal Heritage Information Management System (AHIMS) has shown that *26* Aboriginal objects and Aboriginal places are recorded in or near the above location. Please refer to the attached report for details.

The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.

The following qualifications apply to an AHIMS search:

- AHIMS only includes information on Aboriginal objects and Aboriginal places that have been provided to DEC;
- Large areas of New South Wales have not been the subject of systematic survey or recording of Aboriginal history. These areas may contain Aboriginal objects and other heritage values which are not recorded on AHIMS;
- Recordings are provided from a variety of sources and may be variable in their accuracy. When an AHIMS search identifies Aboriginal objects in or near the area it is recommended that the exact location of the Aboriginal object be determined by re-location on the ground; and
- The criteria used to search AHIMS are derived from the information provided by the client and DEC assumes that this information is accurate.

All Aboriginal places and Aboriginal objects are protected under the *National Parks and Wildlife Act 1974* (NPW Act) and it is an offence to destroy, damage or deface them without the prior consent of the DEC Director-General. An Aboriginal object is considered to be known if:

PO Box 1967 Hurstville NSW 2220
43 Bridge Street Hurstville NSW 2220

Telephone (02) 9585 6345
Facsimile (02) 9585 6094

ABN 30 841 387 271
ahims@environment.nsw.gov.au
www.environment.nsw.gov.au

- It is registered on AHIMS;
- It is known to the Aboriginal community; or
- It is located during an investigation of the area conducted for a development application.

If you considering undertaking a development activity in the area subject to the AHIMS search, DEC would recommend that an Aboriginal Heritage Assessment be undertaken. You should consult with the relevant consent authority to determine the necessary assessment to accompany your development application.

Yours Sincerely

Freeburn, Sharlene
Administrator
Information Systems Section
Cultural Heritage Division
Phone: (02) 9585 6471
Fax: (02) 9585 6094

Appendix vii: AHIMS Search 2012

Office of Environment & Heritage
NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Your Ref Number : inghams
Client Service ID : 76420

John Appleton
16 Curtis Street
Armidale New South Wales 2350

Date: 03 August 2012

Attention: John Appleton

Email: japples@northnet.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 277000 - 285000, Northings : 6207000 - 6214000 with a Buffer of 1000 meters.Additional Info : Update of 2006 report for Inghams Enterprises Pty Limited for proposed subdivision conducted by John Appleton on 03 August 2012

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

57	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

PO BOX 1967 Hurstville NSW 2220
43 BridgeStreet HURSTVILLE NSW 2220
Tel: (02)9585 6345 (02)9585 6741 Fax: (02)9585 6094

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

Appendix viii: Site Types

Site types associated with Indigenous activities and culture

The definitions that follow are for terms used in this report, and do not necessarily apply to their use in different contexts.

Art sites are defined as places where any medium has been applied to a rock surface either as symbols, characters, drawings, paintings, or any other rendition, recognisable as not being a natural discolouration or feature. They also include markings to a rock surface, either by engraving, abrading, or pecking, and which cannot be identified as being a natural feature.

Bora rings are circles of 2-30 metres diameter of compressed earth (from repeated treading or dancing), or stone arrangements, at which men performed initiation ceremonies, and are the most frequently recorded ceremonial sites. Sometimes they occur as two rings joined by a central track in a barbel configuration. They usually occur on level or low-lying country, which is usually the first topographical unit to be cultivated, or utilised for highways and roads, but they may also occur as circular stone arrangements on elevated rock platforms and hilltops. If they are or were present then they are usually either already known and have been recorded, or they have long since been destroyed.

Carved trees are readily recognised by even the untrained observer. The carving is incised either into the outer bark, or more commonly, into the living wood after removal of a section of the bark. The designs frequently consist of 'diamond cross-cuts', but may also consist of stylised animal motifs. Previously unrecorded carved trees are still discovered in relatively remote or inaccessible areas. Carved trees frequently occur near burial sites and/or Bora rings, but in some regions they may have been tribal boundary markers.

Fish traps may occur either in rivers or on seashores. They are recognisable as unnaturally formed stone arrangements that were constructed to trap fish (or eels or turtles) carried into the enclosure in deep water, and which are left stranded within the enclosure as the water level drops. The fish were then caught by nets, hand, or by spear.

Grinding grooves are usually observed on the surfaces of large sedimentary boulders or exposed shelves and outcrops of sedimentary rock along creek banks and beds, or near water. They have been produced by Aborigines using the rock surface to shape and sharpen the edges of stone to produce ground-edged axes, or to sharpen wooden spears (the latter tend to be narrow and deep). Water was used to lubricate the surface of the rock. The grooves frequently occur as linear abraded depressions in the rock, and may each be between 10 and 50 centimetres long, up to 15 centimetres wide, and 2 to 5 centimetres deep. Some sedimentary rock surfaces may exhibit shallow ground depressions of roughly round or elliptical shape, and these are more likely to be associated with seed grinding, root crushing, or other food preparation.

Middens may be identified variously as beach, lagoon, lacustrine, or estuarine, and are most likely to be observed at or above the water line where erosion, topsoil removal, or mining has exposed the shell. The size of the midden can vary enormously, with the smallest comprising a 'one off', "dinner-time camp" (Meehan. 1982), with as few as two or three shells, or a shallow lens of only a few centimetres. The largest middens may extend for many kilometres and may comprise of a number of lenses and layers of shell and ash up to several metres deep. These large middens may be evidence of continuous exploitation of the resource over

many thousands of years. Middens of fresh water mussel shell may be found in eroding creek banks or in eroding terraces, particularly near both existing and defunct water holes.

Isolated shell or fragments may occur on any surface and in any situation. A single shell may have been discarded by a bird, but the presence of use-wear would indicate Aboriginal use of the shell as a tool, which was discarded after use. Such occurrence is likely to be where there is no immediate source of stone material suitable for tool manufacture.

Natural Mythological sites are places of significance to Aborigines, either because they are described in mythological stories or songlines, or because they were used in religious ceremonies. They may occur anywhere and while some are more predictable than others – as for example, permanent water holes, waterfalls, rock promontories, etc., others may have no particularly remarkable features. Seldom is there any recognisable artefactual evidence or anything to distinguish it from similar features in the vicinity. These sites must of necessity be identified by Aboriginal people with an association with the place.

Open sites, campsites, knapping floors, scatters, and isolated artefacts, are most likely to occur on eroded and exposed creek banks, particularly where slope wash or stock trails has removed the humic layer, or on eroded ridges and spurs, particularly near the junctions in watercourses.

Open sites are most likely to be present in greatest numbers near a source of either raw stone material, or potential food resources, or in a natural corridor between two differentially preferred environmental zones, or at the contact between two environmental zones containing different resources.

Artefacts in open scatters are likely to be manufactured from the dominant raw material available; i.e. Greywacke on greywacke-sourced soils, quartz on granite-sourced soils, silcrete and chert on relict sedimentary soils.

Artefact assemblages in open scatters are likely to consist predominantly of discard material, i.e., cores, flakes, flaked pieces, and debitage.

Artefacts exhibiting retouch scars and backing are most likely to occur in sites where secondary activity took place peripheral to the central camp site, although this is a generality and can only be observed where there is sufficient surface visibility to identify peripheral sites. Fragments of flakes with retouch or backing may occur on knapping floors indicating breakage occurring during manufacture, or maintenance areas in which damaged tools have been replaced and discarded.

Isolated artefacts are likely to be most frequently observed where the groundcover obscures all but the larger artefacts, such as cores, and large flakes, or where there is little contrast between the texture of artefactual material and the surface upon which it lies. Artefacts of materials contrasting with the matrix may be visible regardless of size; eg. quartz artefacts may be far more visible than much larger basalt artefacts against a background of dark humic terrace soils.

PADs or Potential Archaeological Deposits are deposits, usually in shelters (but they may also be identified where there are intact deposits in open areas), which although not containing any visible archaeological material, are considered likely to contain archaeological material below the surface. These 'sites' are not recorded as sites on the Aboriginal Site Register, but are identified as places that require subsurface testing to establish whether a site exists or not.

Rock shelters with art or occupation deposits, are most likely to occur where the character of the parent rock is sufficiently massive or consolidated for it to retain a structure that weathers differentially to form shelters and overhangs.

Scarred trees are perhaps the most difficult site type to determine as having been caused by deliberate removal of the bark by humans and not as a consequence of natural events; such as abrasion from falling trees or branches, natural branch attrition, fire damage, or contact from vehicles or stock. They may occur in places wherever there are tree species that produce bark suitable for tool and implement manufacture. While some scars are clearly the consequence of deliberate bark removal by Aborigines (either evidenced by stone axe marks, or identified by Knowledge Holders), some scars were made by settlers, and stockmen, and surveyors who frequently blazed trails and property boundaries by scarring the trees, and by timber men who removed a strip of bark to test the suitability of a tree for logging.

Other site types such as hearths, burials, etc., are less easily predicted, although burials are frequently associated with carved trees, and Bora rings, and hearths with campsites, shelters, and shell middens.