D.1.3 Information Sources

The primary source of background information on indigenous heritage was the National Parks and Wildlife Service Head Office Sites Register which contains reports on systematic surveys in the Tea Gardens area as well as site forms containing information on each site found and recorded.

Preliminary background information on the non-indigenous heritage in the area was obtained by reference to the heritage/planning officer of the Great Lakes Council, the Council's Local Environmental Plan, including the Hunter Regional Environmental Plan and the NSW Heritage Council register.

Information on the Australian Agricultural Company which has long been active in the Tea Gardens area was derived from research carried out by Dr P. Pemberton in records contained in the Noel Butlin Archives Centre, ANU, Canberra.

D.2 Non-Indigenous Heritage

D.2.1 European History

The first Europeans to enter the Great Lakes District were assigned convicts engaged in cedar cutting in 1816. In 1824, the Australian Agricultural Company selected an area of 500,000 acres which extended north of Port Stephens as far as the Manning River and west to Stroud.

The Company engaged in a variety of agricultural and pastoral ventures, but few of these were commercially successful. Eventually, in 1832, the coastal strip was surrendered to the crown in exchange for land on the Peel River at Tamworth.

A number of small settlements arose in this area, associated with various industries such as timber getting, boat building, farming, fishing and mining. The Tea Gardens area remained part of the Company territory until 1856, when the Company began to dispose of its holdings. Around Tea Gardens, land was often let in the form of extended leases, for cattle runs. However, soon after 1906, when legislation was introduced to make rates payable on unimproved land, most of the remaining Company land in the Tea Gardens area was also sold.

The village of 'Myallton' (that is Tea Gardens) was laid out as a Company settlement in 1866, while the settlement of Hawks Nest was set out by the NSW Government about the same period. The first land grants in the Tea Gardens/Hawks Nest area were made in 1865. The urban area for Tea Gardens/Hawks Nest was officially gazetted in 1921.

The allotments for the settlement of 'Limestone' on the margins of Wobbegong Bay at the southern edge of the study area, were set out in the 1890s. A Company map from 1854 shows a 'shell bank' at the location of the later settlement. At that time the Company was leasing the area to

limeburners who would have been burning shell (either natural remains or Aboriginal shell middens) to produce lime for cement.

By the late 1880s, the timber industry had declined and the population was also diminishing.

Sand mining began in the 1960s. A punt service to connect Tea Gardens and Hawks Nest began in 1928, to be replaced by the existing 'Singing Bridge' in 1974.

The study area was once part of a larger block of 3,248 acres which extended from the Limekilns Road north to the parish boundary at Viney Creek. In 1908, this land was sold as Lot 35, parish of Combewah to Patrick Hough, a member of the Hough family who had purchased considerable amounts of property in the Tea Gardens area.

D.2.2 European Heritage

Despite the long history of European activity in and around the study area, the survey found no European structures or items of historical significance.

D.3 Indigenous Heritage

D.3.1 Indigenous Consultation

The study area is located in the district of the Karuah Local Aboriginal Land Council. The Land Council was contacted and advised of the proposed archaeological investigation. Arrangements were made for a representative of the Land Council, Mr Carl Simms, to participate in the fieldwork.

A copy of this draft report has been sent to the Land Council for their review and discussion of the results and proposed management strategies arising from the investigation. The Land Council have been requested to prepare a written statement outlining their response to the report and addressing any specific cultural concerns relevant to the study area. This statement will be forwarded when it becomes available.

D.3.2 Context and Background

A search of the National Parks and Wildlife Service Site Register showed that a total of 49 sites had been listed in an area extending west–east between Carrington and the coastline, and south–north between Port Stephens and the Bombah Broadwater. Many of these sites had been recorded during systematic surveys for various commercial or government developments, but many were also the result of accidental discovery by local residents. Detailed information on the contents and context for many of these sites is minimal. It is likely that many sites have been destroyed or obscured through natural processes or pastoral usage and the development of the urban landscapes of Tea Gardens and Hawks Nest.

Research in the Port Stephens-Myall River region, and in the Newcastle Bight to the south, has been sufficient to allow a moderate level of prediction of the likely nature and distribution of the archaeological resource in the current study area. Shell middens were the most common site type, accounting for 35 (70 percent) of the total number of sites. They included a midden associated with a burial and a midden associated with axe grinding grooves. A range of other sites were represented in the area, consisting of five open camp sites, four burial sites, a scarred tree, a bora/ ceremonial ground with a carved tree, a natural mythological site, a stone arrangement and a fish trap.

On the basis of these relative site frequencies, it could be predicted that the sites most likely to be found during surveys in the region would be middens, concentrated mainly on the shoreline of Port Stephens and along the coastline, the margins of wetlands, estuarine creeks and the Myall River Valley. A range of other site types may also occur. Open campsites, consisting of surface scatters of artefacts, might be found on elevated, well-drainage landforms where suitable conditions of exposure and visibility existing.

D.3.3 Existing Archaeological Knowledge and Previous Investigations

In the Tea Gardens area, a number of estuarine middens have been recorded around the margins of the lakes and swamps along the Lower Myall River and bays and creek mouths along the northern shoreline of Port Stephens (for example National Parks and Wildlife Service Site Numbers 38-5-18, 38-5-56, 38-5-44, 38-5-41). Most of these shell deposits are relatively shallow, ranging from a few centimetres to a depth of 30 centimetres, and occur in disturbed contexts. There appears to be only limited amounts of stone material or other archaeological evidence present.

Several middens have also been recorded on the beach and dunes north of Hawks Nest (for example 38-5-19 and 38-5-24) and at North Head (Yacaaba). These coastal middens contain open ocean beach and rock platform shellfish, as well as some estuarine shell. Many of the middens were extensive, although poorly preserved. A midden complex at Dark Point (Dyall 1975) contained evidence of fishing and, although focussed primarily on marine resources, also contained bones attesting to the exploitation of various terrestrial mammal and bird species. The range of habitats (coastal, estuarine, wetlands, forest) represented in this area would have been a rich source of food and probably supported a large Aboriginal population.

A number of systematic archaeological surveys have been carried out in the Tea Gardens area. Many of these investigations have been hindered by poor visibility due to vegetation cover and it is likely that more sites exist than have been formally recorded. Several recent studies of most relevance to the present investigation are outlined in *Table D.1*.

Table D.1: Previous Archaeological Investigations

Source and Year	Location	Findings

Source and Year	Location	Findings
Dallas 1982	Proposed Waterview Estate, immediately north of Tea Gardens (opposite study area)	Estuarine midden, a range of shell species and two flaked artefacts. The site was assessed as being of low archaeological significance.
Rich and Brayshaw 1994	Monkey Jacket	No archaeological evidence was found.
Byrne 1985	Mouth of Myall River at Hawks Nest	Four minor occurrences of oyster shell at a density of between 400 fragments and 1,200 fragments per square metre. One artefact was found. The site was assessed as being of low archaeological significance, due to its single shell species, disturbed condition and shallow depth.
Brayshaw 1988	Western bank of the Myall River, adjacent to Dredge Island	Four occurrences of shell deposit. Shell deposit could be regard as 'dinner time' camps. Due to the depth of deposit (about 30 centimetres), the range of species present and the undisturbed nature of the sites, their potential significance was greater than previous middens recorded.
Dean-Jones 1989	South Tea Gardens	No archaeological evidence was found.
Silcox 1998	First stage of Myall River Downs subdivision, east of the study area	A small open camp site of two artefacts, a 'blocky' quartzite flake and an indurated mudstone flake, plus an isolated artefact, a silcrete flake with heavy retouch/use wear. The site was assessed as being of low archaeological significance.

D.3.4 Survey Findings

Figure 3.13 of the local environmental study shows the location of archaeological sites derived from the survey.

The survey recorded a total of ten (M1-M10) formally designated midden sites, consisting of diffuse variably dense scatters of whole and shell fragments with occasional flaked stone artefacts. All sites were found at the edges of the cleared component of the study area, mostly on the margins of the SEPP 14 wetlands on Kore Kore Creek or adjacent to the marshy lowlands which extend beyond the SEPP 14 wetlands along the southern edge of the study area. No sites were found on the sand plain away from the wetlands margins, and no evidence of shell had been revealed during the excavation of the sand mine in the north-east of the study area (G Cox pers comm).

Sites M1, M2, M3, M4 and M5 were widely spaced along a low rise which extends along the edge of the swampy terrain on the northern side of the SEPP 14 wetlands. The rise is highest at its eastern end, sloping gradually to the west over a distance of roughly 300 metres to form a low, diffuse undulating surface which continues along the margins of the wetlands to the west for a distance of about two kilometres.

Whole shells and shell fragments were scattered in a variable density along most of the rise, mostly as a sparse scatter or occasional fragment but with higher densities of shell fragments exposed at a number of locations. Due to the clearing activities and consequent disturbance of much of the sandy

surface, these scatters occurred in heavily disturbed contexts where the disturbance from the clearing had often resulted in widespread displacement and dispersal of the original shell concentration. The extent of the main site could only be approximately defined due to the disturbance that had occurred. It was possible that the disturbance had impacted only on upper shell layers and there was potential for some depth of intact shell deposit to have survived below the present ground surface.

However, the distribution of the main shell concentrations was interpreted as representative of a variable but widespread occupation of the wetlands margin.

To the east of the central creek, the understorey vegetation had been widely cleared from the rise and the adjoining sand plain, resulting in widespread disturbance of the ridge surface to a depth of at least 10 centimetres. The ground surface was currently covered by an understorey layer dominated by bracken, with a sparse ground layer of various grasses and low herb species. The recent construction of a haul road which runs along the northern side of the rise to the east of the central creek has disturbed and obscured part of the original topography and drainage pattern along the wetlands margins. Several shallow, open drains have been excavated across the sandy flats and through the ridge, to allow water from the flats to drain southwards into the wetlands.

To the west of the central creek, the clearing process appeared to be much more recent and the degree of regrowth of bracken was much less, resulting in much greater exposure of the sandy surface and higher visibility.

Sites M6, M7, M8 M9 and M10 were located along the western edge of the study area, on the edges of terraces and on creek flats bordering Kore Kore Creek and the western creek. These locations had also been heavily disturbed by the clearing of vegetation and shell fragments were scattered intermittently across the ground surfaces between the site concentrations.

At each site, all of the complete shells and shell fragments belonged to three species of shellfish commonly found in middens formed near estuarine mudflat environments. These species were:

- Mud whelks (*Pyrazius ebeninus);*
- Sydney cockle (*Anadara traezia);* and
- Rock oyster (*Crassostrea commercialis).*

Due to the widely dispersed nature of the shell scatters, it was not possible to determine accurately the relative proportions of these species in the shell assemblage. Mud whelks and Sydney cockles, due to their stronger structure, often occur in a relatively intact condition, although somewhat weathered. Rock oysters, because of their laminar structure, tend to decay and disintegrate more readily into small fragments, and may have been under-represented.

A summary of archaeological findings is contained in *Table D.2* and the location of the findings is shown in *Figure 3.13* of the local environmental study.

Table D.2: Surveyed Indigenous Sites

Site	Site Type	Topographic Location	Site Environment	Site Area	Site Condition	Visibility
M1	Shell midden (dispersed)	Sandy rise beside wetlands	Open eucalypt woodland; bracken understorey; variable grass and herb ground layer	200 metres x 50 metres along top of rise	Disturbed by clearing of native vegetation and shallow ploughing	Variable (20 to 70 percent) for 200 metres to west from eastern end of rise, reducing to very low (<5 percent)
M2	Shell midden (dispersed), flaked stone artefacts	Sandy rise beside wetlands	Open eucalypt woodland; bracken understorey; variable sparse grass and herb ground layer; intermittent vegetation litter	North of haul road, sparse shells in 30 metres x 15 metres on both sides of drain; south of haul road most shells in 10 metres x 3 metres on west side of drain; sparse shells over 50 metres x 10 metres along east side of drain	Site area and surrounding surface disturbed by clearing of native vegetation, shallow ploughing, drain excavation and construction of haul road	High (50 to 80 percent) for 80 metres north from haul road and 15 metres on both sides of drain; visibility on adjoining littered surface much lower (10 to 20 percent); south of road visibility high (70 to 90 percent) on both sides of drain
M3	Shell midden (dispersed), flaked stone artefacts	Sandy rise at junction of central creek and wetlands	Open eucalypt woodland; sparse bracken understorey; intermittent vegetative litter	North of haul road, most shells and artefacts in 20 metres x 20 metres blow-out; occasional shells on adjoining rise up to 10 metres west from blow-out; south of haul road, most shells in 10 metres x 3 metres on rise	Site area and surrounding surface disturbed by clearing of native vegetation, shallow ploughing, wind erosion and construction of haul road	Highest (<95 percent) across blow-out, reducing to 40 to 70 percent on surrounding surface due to disturbance and litter
M4	Shell midden (dispersed)	Gently undulating sandy terrain beside wetlands	Open eucalypt woodland; sparse bracken understorey; intermittent vegetative litter	Shells scatters in low to moderate density over 40 metres x 30 metres	Site area and surrounding surface disturbed by clearing of native vegetation and shallow ploughing	Low to moderate (20 to 40 percent) across site location due to disturbed sandy surface and litter
M5	Shell midden (dispersed)	Gently undulating sandy terrain beside wetlands	Open eucalypt woodland; sparse bracken understorey; intermittent vegetative litter	Shells scattered in variable density for over 150 metres east-west along fenceline at edge of wetlands and up to 50 metres inland from the fence; slightly higher density of shells in area of 80 metres x 30 metres	Site area and surrounding surface disturbed by clearing of native vegetation and shallow ploughing	Low to moderate (20 to 40 percent) across site location
M6	Shell midden (dispersed), flaked stone artefacts	Both banks of western creek, 300 metres from Kore Kore Creek	On north bank, west of track cleared and covered by short grass; east of track is forest with dense understorey of lantana/long grass; on south bank, track runs through forest with dense understorey	On north bank, shells and artefacts in 4 metres x 3 metres in track cutting; occasional shells spread for 30 metres north along track; on south bank, sparse scatter of shells on 5 metres x 5 metres sand spoil heap	Disturbed by track cutting through creek banks, traffic on track, clearing of vegetation and bulldozing activity	On both sides of creek, visibility along track moderate to hight (30 to 70 percent) for over 100 metres; visibility low (<20 percent) west of track, very low (<5 percent) east of track
M7	Shell midden (dispersed)	Gently undulating sandy terrace bordering western creek	Cleared pine plantation; open eucalypt woodland with dense bracken understorey; variable carpet of vegetative litter	Sparse shell scatter over 120 metres x 50 metres	Site area and surrounding terrace disturbed by clearing of pine plantation and understorey vegetation, plus shallow ploughing	Low to moderate (10 to 40 percent) across site area and on adjoining terrace; visibility nil in adjoining forest

Site	Site Type	Topographic Location	Site Environment	Site Area	Site Condition	Visibility
M8	Shell midden (dispersed), flaked stone artefacts	Edge of sandy terrace overlooking Kore Kore Creek	Cleared pine plantation; open regrowth eucalypt/pine woodland; bracken understorey with various regenerating plants (*Acacia, Kennedia* spp)	Sparse shells and occasional artefacts scattered over 50 metres x 30 metres along fenceline at edge of terrace	Site area and surroundings terrace disturbed by clearing of pine plantation and understorey vegetation, and shallow ploughing	Moderate to high (30 to 70 percent) across site area and on surrounding terrace
M9	Shell midden (intact)	Edge of sandy terrace overlooking Kore Kore Creek	Cleared pine plantation; open regrowth eucalypt/pine woodland; bracken and grass understorey; dense carpet of pine needles and slashed lantana and bracken stems	Low rise of 10 metres x 10 metres; shells visible in roots and small fallen trees	Site appeared undisturbed; adjacent terrace disturbed by clearing of pine plantation and shallow ploughing	Very low (<5 percent) on site location and on adjacent terrace
M10	Shell midden (dispersed)	On low gradient slope to Kore Kore Creek	Cleared pine plantation; open regrowth eucalypt/pine woodland; bracken and grass understorey; carpet of pine needles	Sparse shell scatter over 20 metres x 10 metres	Site area and surrounding slope disturbed by clearing of pine plantation and understorey vegetation, and shallow ploughing	Low to moderate across site (20 to 40 percent), reducing to 10 percent on adjacent slope

D.4 Archaeological Site Significance

D.4.1 Significance Assessment Criteria

Introduction

The assessment of the significance of an archaeological site allows an overall value to be placed on the site so that decisions on the future management of the site can be made. The determination of significance will greatly influence whether sites are protected or are allowed to be destroyed. Significance can be determined at a local, regional or national level.

Significance can be assessed by consideration of a number of criteria, of which the most relevant are archaeological significance and cultural significance. Educational, historic and aesthetic significance may also have to be considered.

Archaeological Significance

Bowdler (1982:39f) established three main criteria for assessing the archaeological significance of a site. It is necessary to determine the site's research potential that is its capacity to provide information for relevant research questions concerned with the interpretation of local or regional prehistory. This process requires consideration of the existing data gained from previous investigations, in order to formulate the problems that the site may be able to elucidate.

The assessment of a site's research potential can be based on the evaluation of several factors:

- integrity of the site, that is its state of preservation;
- location;
- internal structure;
- site contents;
- association (that is its relationship with other sites); and
- age.

The concept of representativeness must also be considered. It must be established to what extent a site is a good example of its type, and to what extent similar sites occur elsewhere in the region, so that decisions can be made on the preservation of a representative sample of site types within a particular region for the purpose of research. Bowdler (1983:40) emphasised that "the better represented a site is, the lower the significance of any given individual site", but representativeness cannot be adequately assessed without detailed research into a number of similar sites. Due to several factors, such as the difficulty in obtaining sufficient and accurate information, especially from surface surveys, and the diversity of methodological approaches to detailed investigations, the meaningful comparison of ostensibly similar sites is often difficult.

The concept of rarity may also be considered. Rare sites, that is the only example, or one of few examples, of a particular type of site in a particular context, are likely to have high research value.

There are problems in determining how sites may differ in their degree of significance, and in determining how ranking of significance can be incorporated in management decisions. It should also be emphasised that open sites consisting of widely spread, low density concentrations of archaeological material are not necessarily unimportant or have low research potential. If such sites are characteristic of Aboriginal occupational behaviour in an area, then they may have high research value for questions relating to the prehistory of that area. Moreover, the visible expression of the site contents may be only the surface evidence of a greater amount of buried deposit. The problem lies in carrying out sufficient detailed research at a range of locations to determine what constitutes a representative body of evidence.

Aboriginal (Cultural) Significance

This concept represents the importance with which a site is regarded by the contemporary Aboriginal community. This form of significance can only be determined by the community, and is unlikely to be based on the same criteria as used to establish archaeological significance although these may influence the final decision. All Aboriginal sites have some degree of cultural significance, although some sites have more specific significance because of particular cultural, spiritual or historic connections. Aboriginal people are concerned about the preservation of their cultural identity, and the connection to their past lifestyles and the natural environment that sites embody.

Educational, Historic and Aesthetic Significance

These forms of significance are usually regarded as subsidiary to the two major areas of significance outlined above. The assessment of educational significance involves the potential of a site to provide information for various sectors of the general public. A number of factors for example accessibility, ease of interpretation, manageability, state of preservation, how good an example the site is, must be considered. Historic significance depends on the association of a site with a particular historic event, time period, person or activity. The concept of aesthetic significance involves a more subjective approach, concerning aesthetic values, and is usually confined to art sales.

Assessment of Sites M1 to M10

The ten midden sites found during the survey consisted of sparse scatters of whole shells and shell fragments occurring on sandy surfaces with moderate to high surface visibility but low archaeological visibility due to the highly disturbed condition of the site locations. The amount of information available for an assessment of the site's significance (for example the integrity of the site location, the nature and extent of the site's contents, the potential for subsurface deposits) was generally limited, due to the amount of disturbance and displacement of the site material.

It is likely that occupation was almost continuous along the wetlands margins, resulting in a series of 'base' camps at specific locations, where settlement and discard of shells was concentrated, separated by stretches of landscape with a lower occupation intensity and a lower shell discard rate. Intensive occupation would probably have taken place around the junctions of the creeks and the wetlands, where several resource zones were readily available.

All sites occurred in a variably disturbed contexts resulting from recent clearing of vegetation. M6 occurred at a creek crossing, on an unsurfaced road cutting through both banks. At several sites (M5, M6, M7, M8 and M9), there was some potential for the visible shell scatter to extend beyond the existing site area into adjacent, more heavily vegetated ground where visibility was much less.

The range of shells at each site was limited to three species, all commonly found on estuarine mudflats and typical of estuarine middens. The limitations of the surface examination, combined with the amount of disturbance, prevented a complete assessment of the range of subsistence activities that may have taken place. Although the survey found no other forms of evidence (for example of other subsistence activities such as fishing) or evidence of the exploitation of any of the range of other prey species available, the highly disturbed and dispersed nature of the site locations may have destroyed or obscured small amounts of more delicate evidence for example fish bones. It is possible that only the more resistant shells have survived, or that other evidence is still present but remains buried in older deposit.

If the original shell deposit was shallow, that is less than 30 centimetres, the visible shell scatter may represent the entire site deposit now completely dispersed on the surface. However, if the original shell deposit was deeper than the zone of disturbance, then the visible shell scatter may represent only the upper layers of the deposit and there may be intact deposit with research potential surviving below the disturbed zone.

A small number of artefacts were recorded from several of the sites, although it is possible that more artefacts were present at those sites then were seen during the survey. All artefacts were made of similar material, fine grained volcanic tuff. The majority of the artefacts were unmodified flakes, broken flakes and flaked pieces, all smaller than three centimetres maximum dimension, several retouched artefacts were also found in terms of artefact types and raw materials, the artefacts were all consistent with the assemblages found at other sites in similar environmental contexts in the vicinity of Tea Gardens, all dated to a mid-late Holocene age.

The sites as recorded were therefore of limited scientific significance, due to the limited range of evidence and their highly disturbed context. However, the shell scatters may be the surface indicators of subsurface shell deposit which has survived in an undisturbed context. A more detailed investigation of the sites would require some degree of excavation which would also enable comparison of these sites with other excavated midden sites in the area, for example the sites north of Tea Gardens. It may also be possible to examine the geomorphological processes involved in the formation of the site locations, as well as investigate the relationship of these processes to the cultural processes involved in the formation of the site.

Although surface visibility was limited over most of the study area, due to the disturbed state of the surface and/or the leaf/bark litter, the level of disturbance and visibility was similar across most of the landscape. The differential discovery of evidence, that is almost all evidence was restricted to the wetlands margin, demonstrated a widespread Aboriginal presence in this landscape. The concentration of archaeological evidence was not a function of the degree of visibility but a real reflection of the prehistoric settlement pattern. The available evidence suggests that the sites were

probably smaller 'base' camps associated with the exploitation of a limited range of estuarine wetlands resources.

The almost complete absence of evidence on the terrain away form the wetlands suggests that the plain was not occupied to any significant extent. While Aboriginals probably traversed the area during hunting trips to the hilly hinterland, no part of the study area is more than 2.5 kilometres probably half to three-quarters of an hour walk) from the 'base' camps adjoining the wetlands. Most of the travel between the study area and the rugged country to the north was probably via the ridge in the north-west corner and along Kore Kore Creek. There was probably little incentive for long term camping on the sandy plain, although some short term camping may have taken place along the central creek as suggested by the isolated artefact IF1 found next to this creek.

D.5 Heritage Constraints and Management Issues

D.5.1 Zones of Indigenous Archaeological Sensitivity

The study area can be divided into three zones of varying levels of archaeological significance and research potential, with specific management strategies. The zones were designated as follows:

- Highest archaeological sensitivity;
- Medium archaeological sensitivity; and
- Lowest archaeological sensitivity.

The demarcation of these zones was somewhat arbitrary and the zones tend to grade into each other. Identification of the zones was based on the highest density of surface archaeological material and the greatest potential for the survival of intact deposit with potential for further research.

The extent of the three zones is indicated in *Figure 3.13* of the local environmental study.

D.5.2 Highly Sensitive Areas

The survey demonstrated that Aboriginal occupation was focussed on the southern and western margins of the study area, on the slightly elevated rise along the southern edge of the study area and the edge of the terrace along the western side of the study area. These locations were closest to the estuarine environments of Kore Kore Creek and Pindimar Bay and would have been most suitable for prolonged and/or repeated Aboriginal occupation, resulting in the accumulation of varying amounts of occupation evidence. They were therefore considered to have the greatest potential for the accumulation of *in situ* archaeological deposit with research potential.

This zone should therefore incorporate all of the slightly raised terrain along the margins of the estuarine wetlands of Pindimar Bay and Kore Kore Creek, as indicated on *Figure 3.13* of the local environmental study. The strip of terrain should have a nominal width of at least 30 metres from the edge of the existing wetlands, to ensure that the most likely occupation locations are included. At several locations, where a greater area of archaeological potential was considered to be present, the zone has been widened to take in these locations, for example at the eastern end of the

rise (M1) and at the junction of the central creek and the wetlands. Although some shells may occur beyond this zone, they are likely to have been displaced from their original context by the clearing activity and are of low significance.

On the basis of its research potential, therefore, this zone should be excluded from any development planned for the area and preserved for possible future research.

D.5.3 Medium Sensitive Areas

The elevated ground formed by the series of rises along the western side of the central creek was also considered to have some potential for occupation, possibly in the form of open camp sites composed primarily of scatters of stone artefacts rather than shell midden deposits. Although no evidence of occupation was seen at these locations during the survey, the disturbed nature of the ground surface and/or the carpet of vegetative litter would tend to obscure any archaeological material that was not shell, especially smaller stone artefacts.

This area was also selected to provide a representative sample of the inland landscape of the study area, containing landforms which were suitable for occupation but were possibly not directly related to shellfish exploitation.

The main area covered by this zone would consist of the terrain extending for a distance of up to 200 metres west from the central creek channel, as indicated on *Figure 3.13* of the local environmental study.

This zone should also include the ridge at the north-west corner of the study area. The ridge would have provided an elevated, well drained landform next to the creek, as well as an access route between the elevated country to the north and the sand plain of the study area. Although the potential for the formation of archaeological deposit with research potential on the ridge crest of most of the side slopes was limited, there was some potential for the formation of archaeological deposit on the lower slopes skirting the base of the ridge.

This zone should therefore, as much as possible, also be excluded from any development planned for the area. However, if any development is planned that would affect the zone, especially the series of rises along the central creek, it would be necessary to carry out a suitable program of subsurface investigations to determine whether any archaeological deposit was present and to assess its natures, extent and possible significance, before any development could proceed.

D.5.4 Low Sensitive Areas

This zone would consist of the remainder of the study area outside the high and medium zones mostly low-lying and poorly drained ground unsuitable for prolonged occupation. No evidence of shell or other archaeological material was seen during the survey of this area, apart from the few isolated stone artefacts. Despite the disturbed ground surface and intermittent carpet of vegetative litter, overall visibility was roughly equivalent to the level of visibility adjacent to the wetlands where archaeological evidence was much more common.

It was considered that if any substantial amounts of archaeological material were present on the remainder of the sand plain, some

indications of this presence would have been apparent. The potential for the occurrence of undiscovered archaeological material in the study area on the sand plain away from the wetlands margins was therefore considered to be low.

It is therefore proposed that there would be no archaeological constraints on development in this zone provided that if any archaeological material such as midden deposit or skeletal material is uncovered during any future development, then work should case at that location and the discovery should be reported to the National Parks and Wildlife Service so that a basic assessment of its nature, extent and potential significance can be made before work can continue.

It is emphasised that the surviving material evidence of Aboriginal occupation along the east coast of NSW is increasingly under threat from a range of developments and it is necessary that appropriate measures should be undertaken to ensure that archaeological relics are not disturbed or destroyed by construction activities before they can be adequately assessed. Under the terms of the *National Parks and Wildlife Act (NSW) 1974 (Section 90[1])*, it is illegal to knowingly destroy, deface of damage any Aboriginal relic or place without the written consent of the National Parks and Wildlife Service Director.

APPENDIX B ERM Report

5. to manage adverse environmental impacts of the development, including activities related to site maintenance for hazard reduction, tree removal, landscaping, building, stormwater and drainage works and impacts associated with occupation; and

6. to provide a co-ordinated and manageable monitoring, auditing, reporting and review process.

The ESMP will provide landholders with detailed guidance on how to implement all key recommendations. Section 3.0 of the ESMP outlines key components of an Environmental Site Management Strategy. This framework was then utilised to develop a 10 year Environmental Management Works Program which is contained within Section 4.0 of the ESMP. Five key environmental management categories have been developed to allow for concentrated management actions to be formulated. These are:

- Threatened Species Management (inclusive of Squirrel Glider and Koala Management);
- Vegetation Management;
- Bushfire Protection Management;
- Long Term Management Strategies; and
- Ongoing Monitoring.

It is considered that the full implementation of the ESMP will ensure that any ecological impacts potentially arising from the proposal are successfully mitigated against. A project ecologist will be appointed by the Community Association to ensure that all measures are successfully implemented and reported.

4.2 CULTURAL HERITAGE

All Aboriginal sites have some degree of cultural significance although some sites have more significance than others. There are a number of known Aboriginal sites in the Tea Gardens area including a number of estuarine middens. Two middens (M1 and M2) were identified on the site as shown on Figure 3.12 of the *Myall River Downs Local Environmental Study* (LES) prepared by Parsons Brinckerhoff in 2003.

A recent site inspection has confirmed that M2 is not located on the site and the size and extent of M1 was over estimated in the LES. The boundary of M1 has been accurately surveyed and is conservatively portrayed on the proposed development plan (see "Constraints Plan" at *Annex A*).

Due to the potential sensitivity of the midden (M1), the proposed subdivision layout avoids disturbance in its vicinity. Like the controls proposed for the management of vegetation on site, the community association will also be responsible for ensuring that the midden is not detrimentally impacted. The strict controls imposed for the long term protection of the site will be facilitated through the community title scheme.

4.3 GEOLOGY AND SOILS

A geotechnical investigation was undertaken by Coffey Geosciences Pty Ltd (Coffey) to determine the site classification in accordance with *AS2870-1996 – Residential Slabs and Footings* and the acid sulfate soil conditions. The geotechnical assessment is provided as Annex H.

Topographically, the site is situated on a relatively flat aeolian plain, with ground slopes generally in the order of 0° to 3°. The site is well drained primarily by way of infiltration into the natural sand profile.

Based on the 1:250 000 Newcastle Geological Sheet, the site is underlain by alluvial deposits of Quaternary age comprising gravel, sand, silt and clay, overlain by varying thicknesses of aeolian (dune) sand deposits.

Acid Sulfate Soils Assessment

The Acid Sulfate Soils Risk Map for Port Stephens produced by the Soil Conservation Service of the NSW Department of Natural Resources, indicates that the site has a low probability of occurrence of acid sulfate soils, which if present would be expected to occur between depths of one metre and three metres below the ground surface.

Samples obtained by Coffey during field investigations were screened for the presence of actual and potential acid sulfate soils in accordance with the Acid Sulfate Soils Management Advisory Committee's guidelines (ASSMAC). The results indicate that the soils encountered during excavation of the test pits to the maximum depth of investigation of 2.2 metres, are neither actual nor potential acid sulfate soils. Therefore, an Acid Sulfate Soil (ASS) Management Plan is not necessary for excavations on the site to depths of less than 2.2 metres. The report recommends that if bulk excavation is to be carried out below the water table, some monitoring of these soils be undertaken to confirm that soil pH values less than 4 are not occurring.

Annex A

Subdivision and Development Plans

MYALL RIVER DOWNS

EIGHT LOT RURAL-RESIDENTIAL

COMMUNITY TITLE DEVELOPMENT PROPOSAL

SCHEDULE OF DRAWINGS

Sheet	File Number	Description	Revision
1	20600370	COVER SHEET & SCHEDULE OF DRAWINGS	A
2	20600377	PROP. LOT LAYOUT PLAN	A
3	20600371	CONSTRAINTS PLAN	A
4	20600372	DEVELOPMENT OPPORTUNITIES	A
5	20600373	PROP. DEVELOPMENT PLAN	A
6	20600374	DRAINAGE STRATEGY PLAN	A
7	20600375	SOIL & WATER MAN. PLAN	A
8	20600376	SOIL & WATER MAN. NOTES	A

client
MYALL RIVER DOWNS PTY. LTD.

drawing
EIGHT LOT RURAL–RESIDENTIAL
COMMUNITY TITLE DEVELOPMENT PROPOSAL

council
GREAT LAKES

parish
COWEAMBAH

SHEET SIZE: A1

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	G.H.	G.H.			

FINAL PLANS

Designed By

PTY. LIMITED
TATTERSALL SURVEYORS
DEVELOPMENT CONSULTANTS IN ENGINEERING, SURVEYING & PLANNING
DX 21403 RAYMOND TERRACE Phone (02) 4987 1500

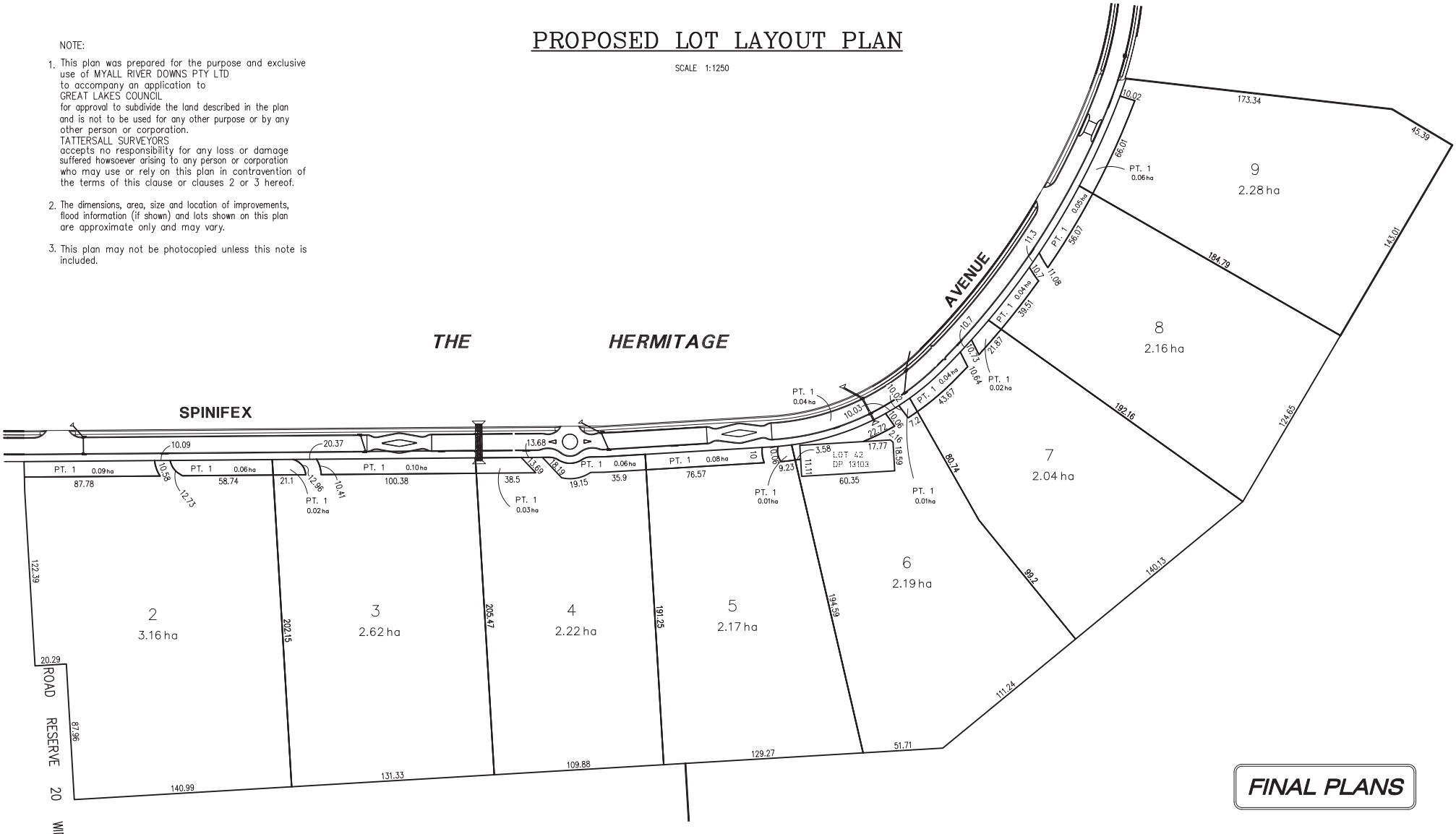
FILE : 20600370
JOB No. : 203399
SHEET No. :1 of 8
S:\projects\Hermitage Lifestyle Resort\DWG\RURAL SUBDIV\200300-8 lot dev proposal.dwg Plotted 11:41 07/12/06

PROPOSED LOT LAYOUT PLAN

SCALE 1:1250

NOTE:

1. This plan was prepared for the purpose and exclusive use of MYALL RIVER DOWNS PTY LTD to accompany an application to GREAT LAKES COUNCIL for approval to subdivide the land described in the plan and is not to be used for any other purpose or by any other person or corporation. TATTERSALL SURVEYORS accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this plan in contravention of the terms of this clause or clauses 2 or 3 hereof.
2. The dimensions, area, size and location of improvements, flood information (if shown) and lots shown on this plan are approximate only and may vary.
3. This plan may not be photocopied unless this note is included.



FINAL PLANS

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A	Original Issue	G.H.	G.H.			
*	Denote the original signature and date when revision was issued.					

TATTERSALL SURVEYORS DEVELOPMENT CONSULTANTS

SCALE : 0 12.5 25m (1:1250 for A1 Size Plot)

SHEET No. :2 of 8

JOB No. : 203399

FILE : 20600377

DATE :Plotted 11:42 07/12/06

SHEET SIZE A1

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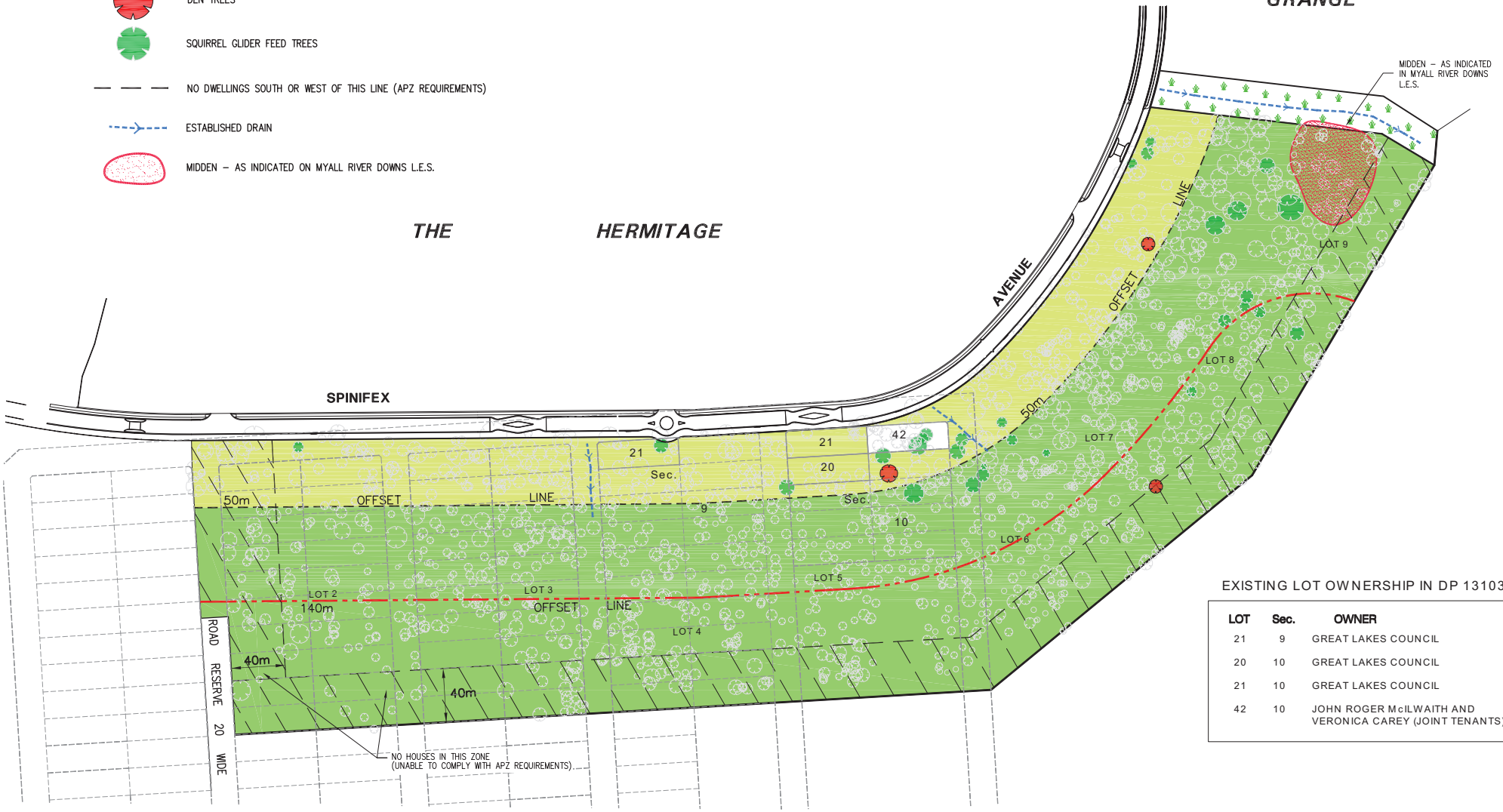
FINAL PLANS

CONSTRAINTS PLAN

SCALE 1:1500

LEGEND

- APZ MANAGEMENT – REQUIRED UNDER COURT APPROVED SQUIRREL GLIDER MANAGEMENT PLAN TO BE REGULARLY SLASHED TO PROTECT HERMITAGE.
- BUSHFIRE HAZARD REDUCTION – REQUIRED UNDER COURT APPROVED S.G.M.P. TO BE SLASHED TWICE ANNUALLY AND TO UNDERGO A REGENERATION PROGRAM OUTSIDE THE AREA BEING SLASHED.
- DELINEATION OF NORTHERN MOST EXTENT OF 'FOREST' DESIGNATION PERMISSIBLE TO PROTECT HERMITAGE – MUST REMAIN AS OPEN WOODLAND TO NORTH.
- DEN TREES
- SQUIRREL GLIDER FEED TREES
- NO DWELLINGS SOUTH OR WEST OF THIS LINE (APZ REQUIREMENTS)
- ESTABLISHED DRAIN
- MIDDEN – AS INDICATED ON MYALL RIVER DOWNS L.E.S.



EXISTING LOT OWNERSHIP IN DP 13103

LOT	Sec.	OWNER
21	9	GREAT LAKES COUNCIL
20	10	GREAT LAKES COUNCIL
21	10	GREAT LAKES COUNCIL
42	10	JOHN ROGER McILWAITH AND VERONICA CAREY (JOINT TENANTS)

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	G.H.	G.H.			
*	Denote the original signature and date when revision was issued.					

TATTERSALL SURVEYORS DEVELOPMENT CONSULTANTS

SCALE : (1:1500 for A1 Size Plot) | SHEET No. :3 of 8 | FILE : 20600371 | SHEET SIZE: A1

JOB No. : 203399 | DATE :Plotted 11:42 07/12/06

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DEVELOPMENT OPPORTUNITIES

BASED ON TREE RETENTION (SQUIRREL GLIDER HABITAT)

SCALE 1:1500

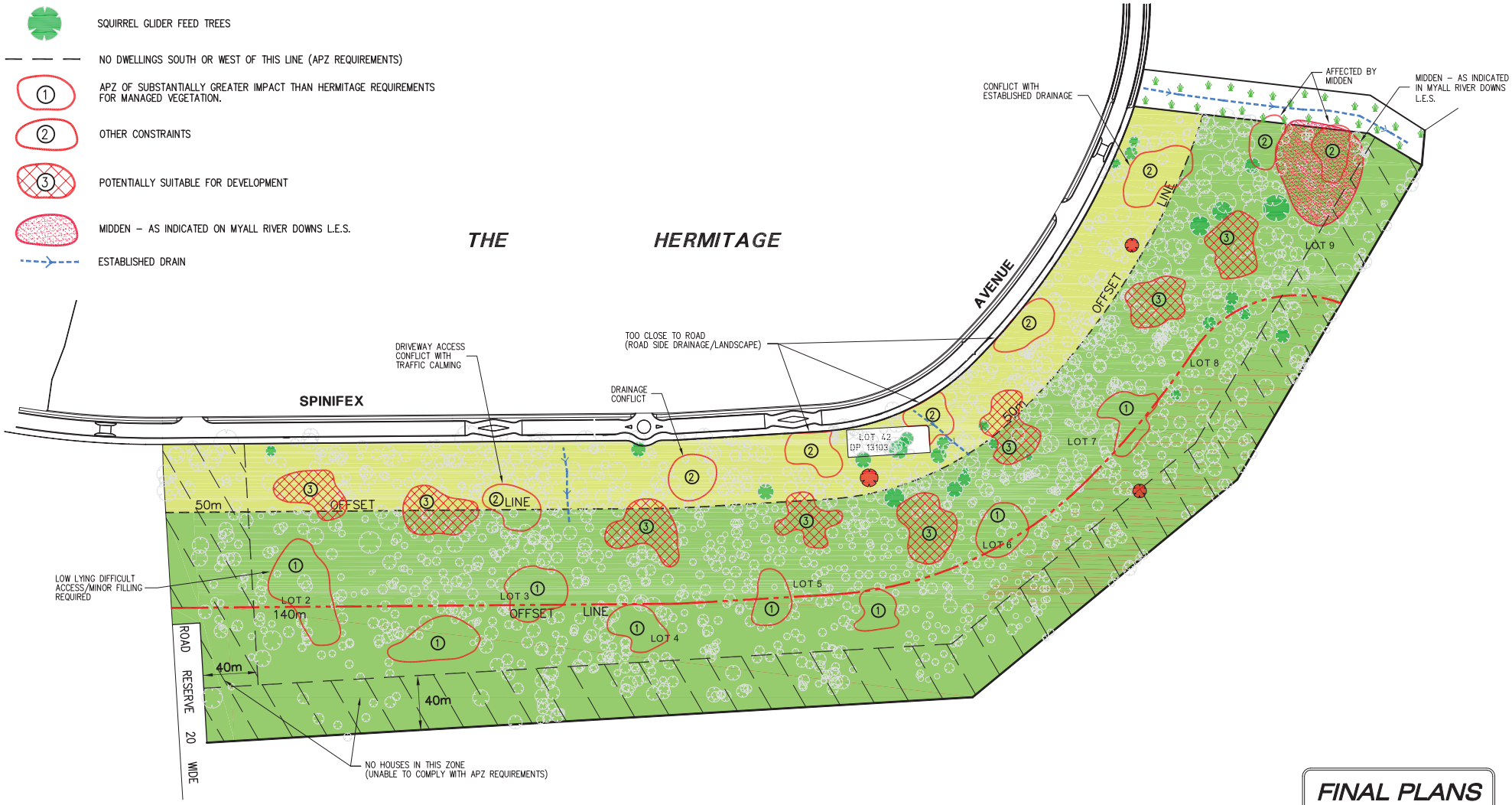
LEGEND

- APZ MANAGEMENT – REQUIRED UNDER COURT APPROVED SQUIRREL GLIDER MANAGEMENT PLAN TO BE REGULARLY SLASHED TO PROTECT HERMITAGE.
- BUSHFIRE HAZARD REDUCTION – REQUIRED UNDER COURT APPROVED S.G.M.P. TO BE SLASHED TWICE ANNUALLY AND TO UNDERGO A REGENERATION PROGRAM. REGENERATION ON INDIVIDUAL TREE BASIS.
- DELINEATION OF NORTHERN MOST EXTENT OF 'FOREST' DESIGNATION PERMISSIBLE TO PROTECT HERMITAGE – OPEN WOODLAND TO NORTH.
- DEN TREES
- SQUIRREL GLIDER FEED TREES
- NO DWELLINGS SOUTH OR WEST OF THIS LINE (APZ REQUIREMENTS)
- ① APZ OF SUBSTANTIALLY GREATER IMPACT THAN HERMITAGE REQUIREMENTS FOR MANAGED VEGETATION.
- ② OTHER CONSTRAINTS
- ③ POTENTIALLY SUITABLE FOR DEVELOPMENT
- MIDDEN – AS INDICATED ON MYALL RIVER DOWNS L.E.S.
- ESTABLISHED DRAIN

TEA GARDENS

GRANGE

THE HERMITAGE



FINAL PLANS

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	G.H.	G.H.			
*	Denote the original signature and date when revision was issued.					

TATTERSALL SURVEYORS DEVELOPMENT CONSULTANTS

SCALE : (1:1500 for A1 Size Plot) | SHEET No. :4 of 8 | JOB No. : 203399 | FILE : 20600372 | DATE :Plotted 14:20 13/02/07 | SHEET SIZE A1

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PROPOSED DEVELOPMENT PLAN

SCALE 1:1250

LEGEND

- LANDSCAPING STRIP – 10m WIDE (ZONE7) (AREA = 0.728ha or 3.74% OF SITE)
- APZ MANAGEMENT (AREA A) – REQUIRED UNDER COURT APPROVED SQUIRREL GLIDER MANAGEMENT PLAN TO BE REGULARLY SLASHED TO PROTECT HERMITAGE. (ZONE 3) (AREA = 2.369ha or 12.17% OF SITE)
- APZ MANAGEMENT (AREA B) – REQUIRED TO BE REGULARLY SLASHED, IN ADDITION TO AREA A ABOVE, TO PROTECT DWELLING. (ZONE 4) (AREA = 5.234ha or 26.89% OF SITE)
- BUSHFIRE HAZARD REDUCTION – REQUIRED UNDER COURT APPROVED S.G.M.P. TO BE SLASHED TWICE ANNUALLY AND TO UNDERGO A REGENERATION PROGRAM. (ZONE 2) REGENERATION ON INDIVIDUAL TREE BASIS. (AREA = 6.693ha or 34.39% OF SITE)
- REGENERATION (BUSHLAND POCKETS) – AREA TO BE REGENERATED & RESTRICTED FROM MANAGEMENT ACTIVITIES (I.E. NO SLASHING) TO BE SUITABLY FENCED/MARKED OFF. (ZONE 1) (AREA = 3.057ha or 15.72% OF SITE)
- – OUTER PROTECTION AREA (OPA) 5m. WIDE (AREA = 0.583ha or 3% OF SITE)
- DEN TREES
- TREES TO BE REMOVED FROM BUILDING FOOTPRINT AREA (AS REQUIRED)
- SQUIRREL GLIDER FEED TREES
- HOLLOW TREES
- PROPOSED BUILDING FOOTPRINT (ZONE 5) (AREA = 0.796ha or 4.09% OF SITE)
- APZ MANAGEMENT AREA B – 20–35m WIDE (ZONE 4)
- PROPOSED DRIVEWAY ZONE – 10m WIDE (ZONE 6) (AREA = 0.514ha or 2.64% OF SITE) NOTE: THIS AREA HAS NOT BEEN DEDUCTED FROM ZONES 2, 3 OR 6
- MAX. EXTENT OF 'FOREST' TYPE REGENERATION PERMISSIBLE
- BOLLARD ONLY AT 5m CENTRES
- BOLLARD ONLY AT 10m CENTRES
- BOLLARD AND CHAIN AT 5m CENTRES
- EXISTING POST & WIRE FENCE
- MIDDEN – AS INDICATED ON MYALL RIVER DOWNS L.E.S.
- ESTABLISHED DRAIN

PROP. FL. RL.3.0 — DENOTES PROPOSED DWELLING FLOOR LEVEL ASSUMING 300mm CONCRETE SLAB AND A MAX. FILL DEPTH OF 300mm

FINAL PLANS

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	G.H.	G.H.			
*	Denote the original signature and date when revision was issued.					

TATTERSALL SURVEYORS DEVELOPMENT CONSULTANTS

SCALE : 0 12.5 25m (1:1250 for A1 Size Plot) | SHEET No. :5 of 8 | JOB No. : 203399 | FILE : 20600373 | DATE :Plotted 12:09 08/08/07 | SHEET SIZE A1

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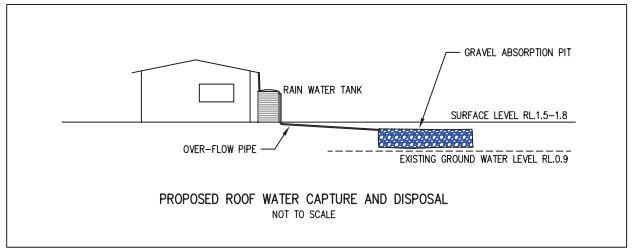
DRAINAGE STRATEGY PLAN

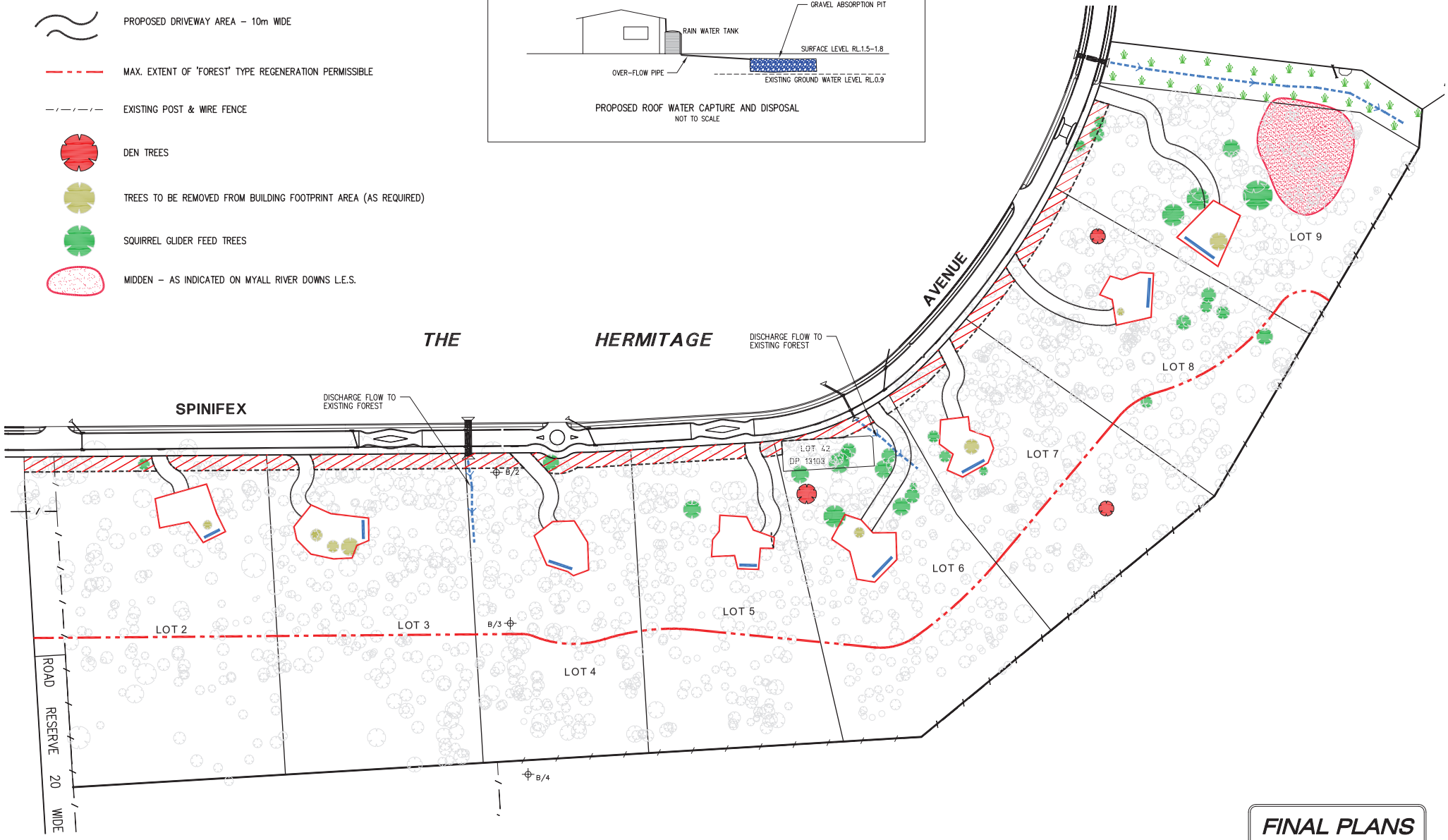
SCALE 1:1250

LEGEND

- LANDSCAPING STRIP – 10m WIDE
- PROP. GRAVEL ABSORPTION PIT / PROPOSED BUILDING FOOTPRINT
- PROPOSED DRIVEWAY AREA – 10m WIDE
- MAX. EXTENT OF 'FOREST' TYPE REGENERATION PERMISSIBLE
- EXISTING POST & WIRE FENCE
- DEN TREES
- TREES TO BE REMOVED FROM BUILDING FOOTPRINT AREA (AS REQUIRED)
- SQUIRREL GLIDER FEED TREES
- MIDDEN – AS INDICATED ON MYALL RIVER DOWNS L.E.S.



PROPOSED ROOF WATER CAPTURE AND DISPOSAL
NOT TO SCALE



FINAL PLANS

B/4 DENOTES WATER TABLE TEST BORE

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	G.H.	G.H.			
*	Denote the original signature and date when revision was issued.					

TATTERSALL SURVEYORS DEVELOPMENT CONSULTANTS

SCALE : 0 12.5 25m (1:1250 for A1 Size Plot)
SHEET No. :6 of 8
JOB No. : 203399
FILE : 20600374
DATE :Plotted 08:57 09/08/07
SHEET SIZE A1
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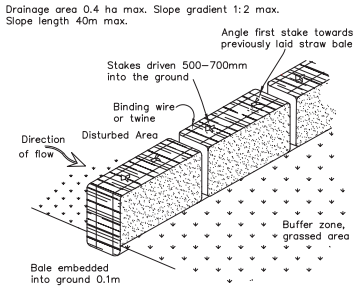
FINAL PLANS

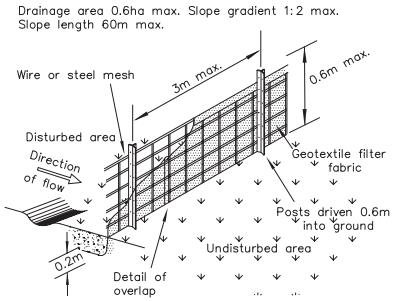
LEGEND

- LANDSCAPING STRIP – 10m WIDE (ZONE 6)
- PROP. GRAVEL ABSORPTION PIT
- PROPOSED BUILDING FOOTPRINT (ZONE 4)
- PROPOSED DRIVEWAY ZONE – 10m WIDE (ZONE 5)
- EXISTING POST & WIRE FENCE
- DEN TREES
- TREES TO BE REMOVED FROM BUILDING FOOTPRINT AREA (AS REQUIRED)
- SQUIRREL GLIDER FEED TREES
- MIDDEN – AS INDICATED ON MYALL RIVER DOWNS L.E.S.



STRAW BALE SEDIMENT FILTER

NOT TO SCALE



GEOFABRIC SEDIMENT FENCE

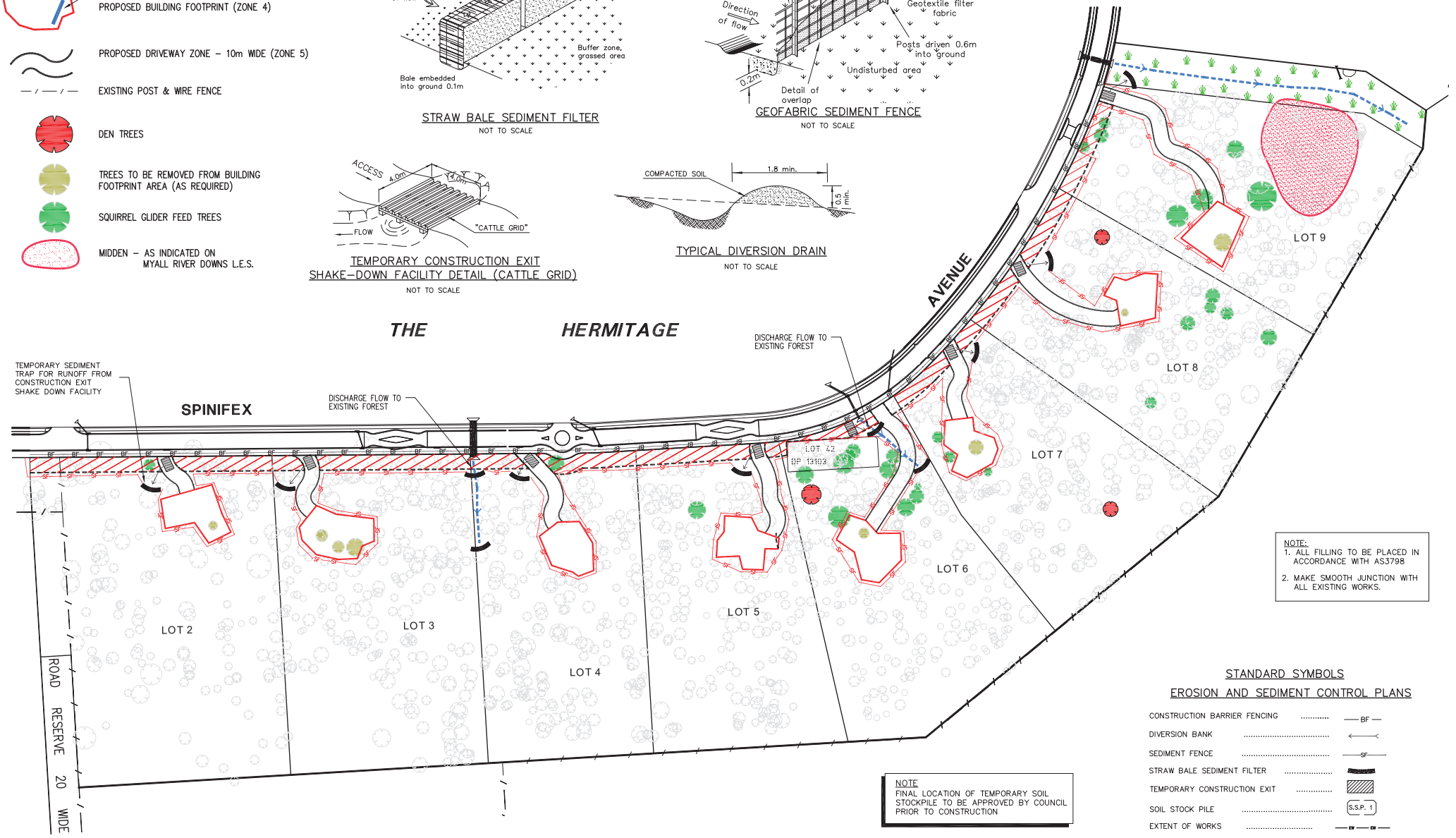
NOT TO SCALE

TEMPORARY CONSTRUCTION EXIT
SHAKE–DOWN FACILITY DETAIL (CATTLE GRID)

NOT TO SCALE

TYPICAL DIVERSION DRAIN

NOT TO SCALE



NOTE:
1. ALL FILLING TO BE PLACED IN ACCORDANCE WITH AS3798
2. MAKE SMOOTH JUNCTION WITH ALL EXISTING WORKS.

NOTE
FINAL LOCATION OF TEMPORARY SOIL STOCKPILE TO BE APPROVED BY COUNCIL PRIOR TO CONSTRUCTION

STANDARD SYMBOLS
EROSION AND SEDIMENT CONTROL PLANS

- CONSTRUCTION BARRIER FENCING ..... BF
- DIVERSION BANK .....
- SEDIMENT FENCE ..... SF
- STRAW BALE SEDIMENT FILTER .....
- TEMPORARY CONSTRUCTION EXIT .....
- SOIL STOCK PILE ..... S.S.P. 1
- EXTENT OF WORKS ..... EW

SOIL & WATER MANAGEMENT PLAN

SCALE 1:1250

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	G.H.	G.H.			
*	Denote the original signature and date when revision was issued.					

TATTERSALL SURVEYORS DEVELOPMENT CONSULTANTS

SCALE : 0 12.5 25m (1:1250 for A1 Size Plot)

SHEET No. :7 of 8 | FILE : 20600375 | SHEET SIZE A1

JOB No. : 203399 | DATE :Plotted 11:45 07/12/06

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GENERAL NOTES

1. This plan is to be read in conjunction with other engineering plans and any written instructions that may be issued.

2. The contractor shall implement all soil erosion and sediment control measures prior to disturbance of the related catchment area and to the satisfaction of the Superintendent.

3. The location of "silt" fences, barrier fences, sediment traps, basins and other devices are indicative only and final locations are to be decided on site. Variations will be permitted to best suit the circumstances.

4. Cleared vegetation must be disposed of by :–
   i) chipping or mulching for future landscaping and usage, or
   ii) transport to an approved landfill facility.

5. Temporary crossbanks (bunds constructed with earth, straw bales or sandbags), shall be constructed during roadworks to limit slope length, where possible, to 80 metres. These shall be constructed immediately prior to forecast rain and during temporary closure of the site, including weekends.

6. Temporary rehabilitation should be undertaken on disturbed areas where works have stopped and soils are expected to remain exposed for two months.

7. Sediment barriers (e.g. sandbags or straw bales) should be located upstream of stormwater inlet pits prior to the road surface being paved and lands upslope being rehabilitated.

8. At the conclusion of each day sand bags are to be placed at the end of completed sections of road pavement to prevent scouring.

9. The contractor will inspect all erosion and pollution control works at least weekly and following every rainfall event greater than 5mm, providing particular attention to the following matters :
   (a) Ensure drains operate effectively and initiate repair as required.
   (b) Remove spilled sand (or other materials) from hazard areas, including lands closer than 5 metres from likely areas of concentrated or high velocity flows such as waterways and paved areas.
   (c) Ensure rehabilitated lands have effectively reduced the erosion hazard and initiate upgrading or repair as appropriate.
   (d) Construct additional erosion and/or sediment control works as might become necessary to ensure the desired protection is given to downslope lands and waterways, i.e.,make ongoing changes to the plan.
   (e) Maintain erosion and sediment control measures in a functioning condition until all earthwork activities are completed and the site is rehabilitated.
   (f) Remove temporary soil conservation structures as a last activity in the rehabilitation program.

10. Utilise a single access only to the stock pile sites.

11. Do not taint clean catchment water with silt from the works.

12. Drop inlets which do not outlet to silt traps shall be blocked until all works are completed.

13. Rehabilitate the site as soon as possible after the completion of construction activities and within 10 working days.
    Lands where works are not to continue for more than 20 working days must be rehabilitated Such rehabilitation shall involve the spraying of a straw–bitumen mulch to the disturbed lands or equivalent.

14. Access areas limited to a maximum width of 10 (preferably 5) metres.

15. All positions shown are approximate and are best determined on site in conjunction with the superintendent.

16. Conformity with this plan shall in no way reduce the responsibility of the Contractor to protect against water damage during the course of the contract.

17. Topsoil and spoil shall be stockpiled in non–hazard areas and protected from surface run–off by diversion drains or similar. Stockpiles shall be surrounded on downstream sides by silt fencing. Stockpiles shall be suitably compacted to inhibit erosion. Where the stockpiling period exceeds four (4) weeks, the stockpile shall be seeded to encourage vegetation growth.

18. Topsoil shall be respread and stabilised as soon as possible. Disturbed areas shall be left with a scarified surface to encourage water infiltration and assist keying in topsoil.

19. The contractor shall provide a turf strip behind all kerb and gutter at completion of footpath formation.

20. The contractor shall maintain grass cover until all works have been completed including the maintainence period, by frequent watering and mowing where required.

21. All drainage works shall be constructed and stabilised as quickly as possible to minimise risk of erosion.

22. Vehicular traffic shall be controlled during construction confining access where possible to proposed or existing road alignments plus 3 metres. Areas to be left undisturbed shall be marked off.

23. Site access shall be restricted to a nominated point. The construction of a shake–down area will be required at the entry to the site.

24. Facilities and/or equipment must be provided for the application of water to disturbed areas to minimise the generation of airbourne dust from any area disturbed by construction activities.

25. Material removed from sediment control structures must be disposed of in a way that does not pollute waters or bushland.

26. Waste disposal containers must be provided on site for the collection and disposal of all industrial and domestic type wastes generated on site.

27. Concrete wastes or washings from any concrete mixture or deliveries must not be deposited in any location where they can flow or be washed into waters.

28. Runoff from vehicle, construction plant or mobile plant maintenance and cleaning areas must be contained, collected and disposed of in a manner to prevent entry into any waters, including sediment retention ponds.

29. Fuelling of vehicles and construction plant must be carried out with an operator or driver present, and in a way that prevents any spillage occuring.

SOIL & WATER MANAGEMENT NOTES

FINAL PLANS

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue	G.H.	G.H.			

* Denote the original signature and date when revision was issued.

TATTERSALL SURVEYORS DEVELOPMENT CONSULTANTS

SCALE : 0 12.5 25m (1:1250 for A1 Size Plot)

SHEET No. :8 of 8 | FILE : 20600376 | SHEET SIZE: A1

JOB No. : 203399 | DATE :Plotted 11:46 07/12/06

COMPUTER FILE :S:\projects\Hermitage Lifestyle Resort\DWG\RURAL SUBDIV\200300-8 lot dev proposal.dwg

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APPENDIX C Legislative Requirements

LEGISLATIVE CONTEXT

The following overview of the legal framework is provided solely for information purposes for the client, it should not be interpreted as legal advice. RPS Harper Somers O'Sullivan will not be liable for any of actions taken by any person, body or group as a result of this general overview, and recommend that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken as a result of the summary below.

Legislative Context - Indigenous

It is incumbent on any land manager to adhere to legislative requirements that protect indigenous cultural heritage in NSW. The relevant legislation is:

NSW National Parks and Wildlife Act 1974, Amendment 2001 (NPW Act).
Section 90. *A person must not destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place.* The NPW Act provides statutory protection for all Aboriginal relics (not being a handicraft made for sale) with penalties levied for breaches of the Act.

Aboriginal Places (that may or may not contain archaeological material) are given protection under Section 84 of the NPW Act. This is a place that, *in the opinion of the Minister, is or was of special significance with respect to Aboriginal culture, to be an Aboriginal place for the purposes of this Act*.

Environmental Planning and Assessment Act 1979 (EP&A Act)
The Act regulates a system of environmental planning and assessment for New South Wales. Land use planning requires that environmental impacts are considered including the impact on cultural heritage and specifically Aboriginal heritage. Within the EP&A Act Parts III; IV; V relate to Aboriginal heritage.

Part III: regulates the preparation of planning policies and plans; Part IV: governs the manner in which consent authorities determine development applications and outlines those that require an environmental impact statement; Part V: Under this State government agencies that act as determining authorities for activities conducted by that agency or by authority from the agency are regulated. The National Parks and Wildlife Service is a Part V authority under the EP&A Act.

In brief, the NPW Act provides protection for Aboriginal objects or places while the EP&A Act ensures that Aboriginal cultural heritage is properly assessed in land use planning and development.

Other legislation of relevance to Aboriginal cultural heritage in NSW include: NSW Heritage Act (1977*)* and NSW Local Government Act and at the Federal level: Aboriginal and Torres Strait Islander Heritage Protection Act (1984) and Australian Heritage Commission Act (1975).

Legislative Context – Non-Indigenous

At the national level the National Heritage List and the Commonwealth Heritage List (for those items under the control of the Commonwealth Government) records and protects those items that are accorded National Significance. The extensive Register of the National Estate lists those items considered of value for future generations.

Heritage Act 1977 (NSW)
The Heritage Act 1977 (amended in 1999) provides protection for listed items of heritage significance and can be defined as a place, building, work, relic, moveable object or precinct. The Act includes subsurface relics and protection is afforded items of state significance listed on the State Heritage Register. Items of Local Significance are afforded protection under the Environmental Planning and Assessment Act 1979. Of note is the following provision under Section 139:

- A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.

Environmental Planning and Assessment Act 1979 (EP&A Act)

The Act regulates a system of environmental planning and assessment for New South Wales. Land use planning requires that environmental impacts are considered including the impact on historic relics and Aboriginal heritage.

a) the extent to which the carrying out of the development in accordance with the consent would affect the historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance of the item and its site,

b) whether the setting of the item and, in particular, whether any stylistic, horticultural or archaeological features of the setting should be retained, and

c) whether the item constitutes a danger to the users or occupiers of that item or to the public.

APPENDIX D Aboriginal Site Type Glossary

The following is a brief description of most Aboriginal site types.

Artefact Scatters

Artefact scatters are defined by the presence of two or more stone artefacts in close association (i.e. within fifty metres of each other). An artefact scatter may consist solely of surface material exposed by erosion, or may contain sub-surface deposit of varying depth. Associated features may include hearths or stone-lined fireplaces, and heat treatment pits.

Artefact scatters may represent:

- Camp sites: involving short or long-term habitation, manufacture and maintenance of stone or wooden tools, raw material management, tool storage and food preparation and consumption;
- Hunting or gathering activities;
- Activities spatially separated from camp sites (e.g. tool manufacture or maintenance); or
- Transient movement through the landscape.

The detection of artefact scatters depends upon conditions of surface visibility, including vegetation cover, ground disturbance and recent sediment deposition. Unfavourable conditions obscure artefact scatters and prevent their detection during surface surveys.

Bora Grounds

Bora grounds are a ceremonial site associated with initiations. They are usually comprise two circular depressions in the earth, and may be edged with stone. Bora grounds generally occur on soft sediments in river valleys, although they may also be located on high, rocky ground in association with stone arrangements.

Burials

Human remains were often placed in hollow trees, caves or sand deposits and may have been marked by carved or scarred trees. Burials have been identified eroding out of sand deposits or creek banks, or when disturbed by development. The probability of detecting burials during archaeological fieldwork is extremely low.

Culturally Modified Trees

Culturally modified trees include scarred and carved trees. Scarred trees are caused by the removal of bark for use in manufacturing canoes, containers, shields or shelters. Notches were also carved in trees to permit easier climbing. Scarred trees are only likely to be present on mature trees remaining from original vegetation. Carved trees, the easiest to identify, are caused by the removal of bark to create a working surface on which engravings are incised. Carved trees were used as markers for ceremonial and symbolic purposes, including burials. Although, carved trees were relatively common in NSW in the early 20th century, vegetation removal has rendered this site type extremely rare. Modified trees, where bark was removed for often domestic use are less easily identified. Criteria for identifying modified trees

include: the age of the tree; type of tree (the bark of many trees is not suitable, also introduced species would be unlikely subjects); axe marks (with the need to determine the type of axe - stone or steel – though Aborigines after settlement did use steel); shape of the scar (natural or humanly scarred); height of the scar above the ground (reasonable working height with consideration given to subsequent growth).

Fish Traps

Fish traps comprised arrangements of stone, branches and/or wickerwork placed in watercourses, estuaries and along coasts to trap or permit the easier capture of sea-life.

Grinding Grooves

Grinding grooves are elongated narrow depressions in soft rocks (particularly sedimentary), generally associated with watercourses, that are created by the shaping and sharpening of ground-edge implements. To produce a sharp edge the axe blank (or re-worked axe) was honed on a natural stone surface near a source of water. The water was required for lubricating the grinding process. Axe grinding grooves can be identified by features such as a narrow short groove, with greatest depth near the groove centre. The grooves also display a patina developed through friction between stone surfaces. Generally a series of grooves are found as a result of the repetitive process. Grinding grooves have been identified in the study area.

Isolated Finds

Isolated finds occur where only one artefact is visible in a survey area. These finds are not found in apparent association with other evidence for prehistoric activity or occupation. Isolated finds occur anywhere and may represent loss, deliberate discard or abandonment of an artefact, or may be the remains of a dispersed artefact scatter. Numerous isolated finds have been recorded within the study area. An isolated find may flag the occurrence of other less visible artefacts in the vicinity or may indicate disturbance or relocation after the original discard.

Middens

Shell middens comprise deposits of shell remaining from consumption and are common in coastal regions and along watercourses. Middens vary in size, preservation and content, although they often contain artefacts made from stone, bone or shell, charcoal, and the remains of terrestrial or aquatic fauna that formed an additional component of Aboriginal diet. Middens can provide significant information on land-use patterns, diet, chronology of occupation and environmental conditions.

Mythological / Traditional Sites

Mythological and traditional sites of significance to Aboriginal people, may occur in any location, although they are often associated with natural landscape features. They include sites associated with dreaming stories, massacre sites, traditional camp sites and contact sites. Consultation with the local Aboriginal community is essential for identifying these sites.

Rock Shelters with Art and/or Occupation Deposit

Rock shelters occur where geological formations suitable for habitation or use are present, such as rock overhangs, shelters or caves. Rock shelter sites generally contain artefacts, food remains and/or rock art and may include sites with areas of potential archaeological deposit, where evidence of rock-art or human occupation is expected but not visible. The geological composition of the study area greatly increases the likelihood for rock shelters to occur.

Stone Arrangements

Stone arrangements include lines, circles, mounds, or other patterns of stone arranged by Aboriginal people. These may be associated with bora grounds, ceremonial sites, mythological or sacred sites. Stone arrangements are more likely to occur on hill tops and ridge crests that contain stone outcrops or surface stone, where impact from recent land use practices has been minimal.

Stone Quarries

A stone quarry is a place at which stone resource exploitation has occurred. Quarry sites are only located where the exposed stone material is suitable for use either for ceremonial purposes (e.g. ochre) or for artefact manufacture.

APPENDIX E Site Cards

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

New Recording ☒ Additional information ☐

SITE IDENTIFICATION					
Site name	MRD 1			NPWS Site Number	
Owner/manager	Mr Peter Childs Planning Manager Creighton Building Co.				
Owner Address	PO Box 38 Tea Gardens NSW 2324 (02) 4997 9999				
LOCATION					
Location	Myall River Downs, off Settlers Way, Tea Gardens NSW 2324				
How to get to the site	Heading east along Myall Way (main road into Tea Gardens off the Pacific Hwy). Right into Settlers Way continue through the Hermitage Residential Development - the Community Facilities will be on right. On the left (east) approximately 250 metres from the road is MRD 1, a shell midden. Access is restricted by a fence line and locked gates.				
1: 250,000 map name	1:25000			NPWS map code	9332-4S
Datum/Zone	MGA 56	Easting (GDA)	419876E	Northing (GDA)	6385890N
Method for grid reference	DGPS	Map scale (if method = map)	9332-4S(1;25000)	Map name	Port Stephens
NPWS District				NPWS Zone	Northern
Portion no.				Parish	Port Stephens
SITE DESCRIPTION					
Site type(s)	Shell Midden			Site type code (NPWS use only)	
Description of site and contents CHECKLIST: eg. Length, width, depth, height of site, shelter, deposit, structure, element eg. Tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet,/dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. Likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	The midden was first noted in exposures adjacent a drainage line (running north-east/ south-west). The midden boundaries while established are not definitive as it was determined by presence/absence of shell in exposures. The midden appears to be located on a low lying north-east/south-west mound that follows the above mentioned drainage line. Visibility was limited to exposures with dense ground cover across the majority of the site. It was noted that on the opposite bank of the drainage line no shell was visible however this may have been a result of dense ground cover hampering visibility rather than absence of shell. The midden is located in open eucalypt woodland, with a bracken fern understory, with moderate to dense ground cover. The midden site has been previously disturbed by the clearing of native vegetation, cattle grazing activities, and possible shallow ploughing. Visibility was variable, 75% along the drainage line and on exposure on top of the rise, and >5% in the central sections. (Plate 1) The midden is a sparse scatter (4 fragments visible in a 1M x 1M) of medium sized mainly broken pieces of Sydney cockle *(Anadara traezia)* and Mud whelks (*Pyrazius ebeninus*), 90% and 10% representation respectively. Few whole shells were located. The midden site extends approximately 200m x 50 metres. One artefact recorded, an andesite core, located in sand adjacent to the drainage line. Location: 419889.72 E 6385840.57 N. (Plate 2) <u>Artefact</u> Length: 63mm Width: 81mm Thickness: 25mm Cortex: 35%-40% Platform: Length 45mm Platform: Width 17mm Material: andesite Artefact is similar to artefacts recorded for the northern side of Port Stephens (Dyall, L. 1971-1980. Port Stephens – North Side Aboriginal Sites. Unpublished manuscript).				

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

SITE ENVIRONMENT						
Land form	Low rise		**Aspect**	North East	**Slope**	<3%
Mark position of the site						
Local rock type	Sand		**Land use/effect**	Cattle Grazing / pasture improvment		
Distance from drinking water	Water found in drainage line. Wetland to east. Kore Kore Creek 1.5kms southeast.		**Source**	Wetlands / Creek		
Resource zone (eg. estuarine, river, forest)	Forest woodland / wetland		**Vegetation**	Banksia woodlands on dunes / Salt marsh / Eucalyptus sp.		
Edible plants	Bracken fern, Banksia		**Faunal resources** (include shellfish)	*Kangaroos, koalas, reptiles, small mammals, shellfish.*		
Other exploitable resources (eg. ochre)						
Are there other sites in the locality	yes	**Are they in the Sites Register**	yes	**Other site types include**	Middens	

SITE MANAGEMENT			
Site condition	Modified landscape - vegetation clearing, cattle grazing, shallow ploughing, man-made drainage lines.	The site is presently fenced and gated. The anticipated midden boundaries have been marked. Development is not proposed. Vegetation ground cover is dense and remaining remnant vegetation is in good condition. There are no cattle currently being grazed on the site.	
Management recommendations	The area be precluded from development.		
Have artefacts been removed from site	No	**When**	n/a
By whom	n/a	**Deposited at**	n/a
Consent applied for	n/a	**Consent issued**	☐n/a
Date of issue	n/a	**Consent number**	n/a

SITE INSPECTION AND RECORDING					
Reason for investigation	Follow up archaeological investigation to determine the origin of the shell material.				
Were local Aborigines contacted or present for the recording	☒Not contacted ☐Contacted and present ☐Contacted but not present	**Names and addresses**	Karuah Local Aboriginal Land Council		
Is the site important to local Aboriginal people	Unknown				
Verbal/written reference sources	Parsons Brinckerhoff 2003 Appendix D, R.Silcox 1999 Archaeological Survey Report. ERM Resolution of Deferred Matter – Great Lakes Local Environment Plan 1996 (Amendment No.44) and Statement of Environmental Effects. RPS Harper Somers O'Sullivan (2008) Archaeological Assessment of Myall River Downs for Great Lakes Council (in prep.)			**ASR report number(s)**	C- C-
Photographs taken	Yes			**No of Photos attached**	2
Site recorded by	RPS Harper Somers O'Sullivan			**Date of recording**	July 2008
Address/institution	RPS Harper Somers O'Sullivan PO Box 428 Hamilton NSW 2303				

APPENDIX F Plates

Plate 1: Midden 1 (M1) – Exposed sand bank adjacent to drainage line facing south. Eastern edge of M1.

Plate 2: Vegetation present over sections of M1.

Plate 3: M1 extent facing south.

Plate 4: Exposed shell visible at M1, mainly broken fragments of Sydney cockle species.

Plate 5: Dense vegetation present on the western edge of M1.

Plate 6: Andesite core, located in sand adjacent to the drainage line, M1.

Plate 7: Andesite core, located in sand adjacent to the drainage line, M1.

Plate 8: Andesite core, located in sand adjacent to the drainage line, M1.

Plate 9: Midden 2 (M2) facing north-west from eastern edge of M2, looking towards Haul Road and the associated drainage cutlet.

Plate 10 M2 drainage culvert from north east extent of M2.

Plate 11 Western side of Haul Road, no evidence of M2 visible.

Plate 12 Haul Road that runs through M2.

Plate 13: Broken Sydney Cockle shell fragments visible in M2.

Plate 14: Shell visible in M2, Sydney Cockle fragments dominate.

Plate 15: M2, mainly Sydney Cockle species.

Plate 16: Sydney Cockle species present M2.

Plate 17: Whole Mud Whelk found in M2.

Plate 18:Recording of greatest shell density located in M2, along the southern edge of the midden.

Plate 19: Location of Midden 3 (M3), access road leading to pine plantation, facing south. Midden material scattered across access trail and visible to the west.

Plate 20: M3 western extent, visible shell present to the west of the access trail along fence line.

Plate 21: Broken fragments of shell visible in the lower left hand side of the plate.

Plate 22: Broken sparse fragments of Sydney Cockle species present at M3.

Plate 23: M3 looking north west from the southern edge of M3 along the vehicle access trail.

Plate 24: Gated area leading to access trail where the M3 is located, facing south from Haul Road.

Plate 25: View of dense vegetation associated with middens 4, 5 and 6, only one small fragments of shell visible.

Plate 26: Dense grounds cover associated with middens 4, 5, and 6.

Plate 27: Ground cover associated with middens 4, 5 and 6.

Plate 28: View of interface between the clear managed land and the habitat conservation corridor where middens 4, 5, and 6 are possibly located. Facing south east.

Plate 29: Extremely dense vegetation at the location of midden 5.

Plate 30: View of operational sand mining located to the west of the subject area