Report

North Shearwater Estate (Stages One to Three)

Aboriginal Due Diligence Assessment

Wolin Pty Ltd

12 December, 2018
Rev 0 (Final)

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Report Details

North Shearwater Estate (Stages One to Three) - Aboriginal Due Diligence Assessment

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Function	Signature	Name and Title	Date
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1. INTRODUCTION

Advitech Pty Limited (trading as Advitech Environmental) was engaged by Tattersall Lander to undertake further archaeological investigation to assist in gaining development approval for Stage One to Stage Three of the North Shearwater Estate at Tea Gardens. Stages Four and Five will be considered at a later stage. The field inspection was conducted on the 3 December 2018. The survey located a few artefacts. Due to the Potential Archaeological Deposit (PAD) in Stage One of the development and the location of a possible artefact nearby, it was recommended that consultation with the Karuah Local Aboriginal Land Council (LALC) be undertaken as part of the due diligence assessment.

It should be noted that this report was prepared by Advitech Pty Limited for Wolin Pty Ltd ('the customer') in accordance with the scope of work and specific requirements agreed between Advitech and the customer. This report was prepared with background information, terms of reference and assumptions agreed with the customer. The report is not intended for use by any other individual or organisation and as such, Advitech will not accept liability for use of the information contained in this report, other than that which was intended at the time of writing.

2. QUALIFICATIONS OF THE INVESTIGATOR

Jake Brown, Archaeologist, has 2 years of experience in Aboriginal archaeological assessments, research, reporting, analysis and consultation. This experience has included cataloguing stone artefacts from the Hunter region, conducting field surveys, monitoring of potential find sites during surface/subsurface disturbance across central and northern Queensland.

Jake's educational qualifications include a Bachelor of Social Science (Hons) in Sociology and Anthropology, University of Newcastle 2015, and a Graduate Certificate of Archaeology from Flinders University 2017. Jake is a member of the Australian Archaeological Association.

3. BACKGROUND AND OBJECTIVES

The objective of this report is to determine the extent of any heritage values that may be associated with the site and to assist in answering a development application query from the Mid Coast Council by utilising a due diligence assessment.

4. THE STUDY AREA

The North Shearwater precinct is a development area that has five planned stages. At present, Stages One to Three are in a development phase, and Stages Four and Five are planned future works. The location is approximately 48 km North-East of Newcastle (see **Figure 1**) and approximately 4 kms north of Tea Gardens (see **Figure 2**). The approximate area of the site is 116 hectares. The land zoning indicates R2 low density, E2 Enviromental conservation, SP3 tourist, R3 Medium density residential and RU2 Rural landscape. The Durness homestead (in Stage Five of the development) is listed in the Great Lakes Local Environmental Plan 2014 in Schedule 5 Part 1 Heritage Items as Locally significanct.

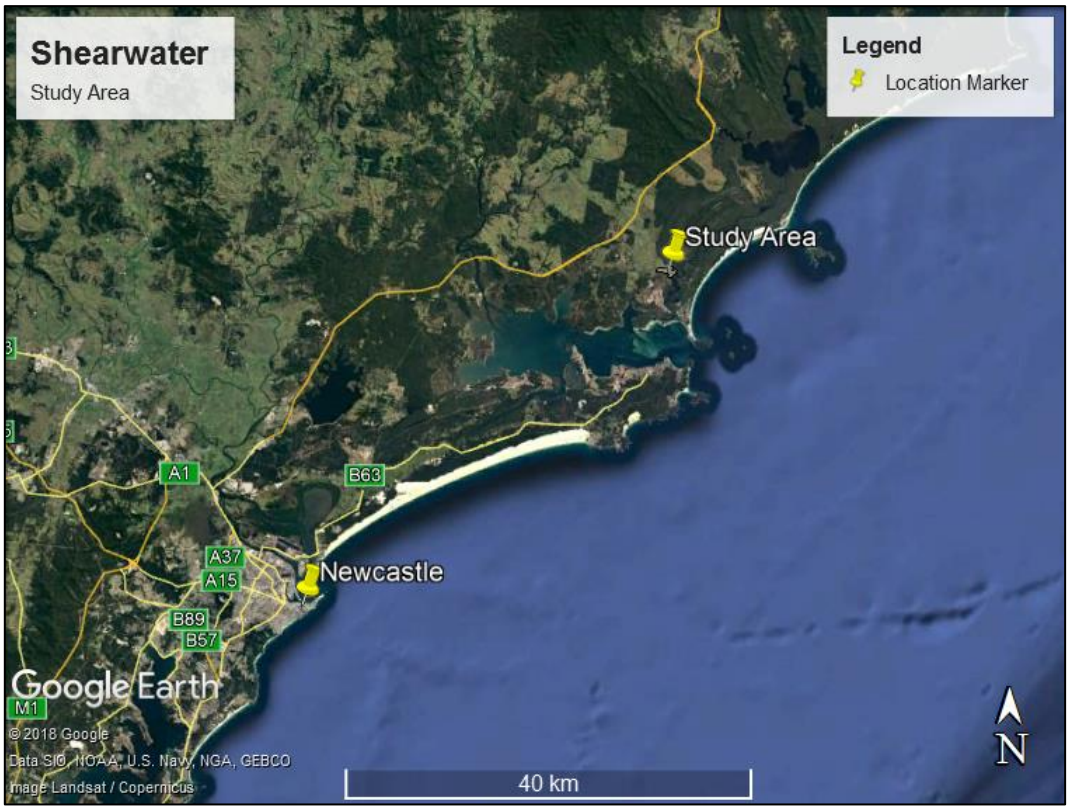

Figure 1 Study area location to Newcastle map (Google Earth)

Figure 2 Study area location to Tea Garden map (Google Earth)

4.1 Topography

The topography of the area is steeper towards the western side of the study area. The area varies from 60 m in the west to 10 m in the east. The 10m side is the edge of the lot/plan that borders the Myall River (see **Figure 3**). The bioregion description from NPWS (2003 171) defines the topography as typically coastal sand barrier through low foothills and ranges and gorges of the escarpment, with increasing rainfall inland along this transect.

4.2 Hydrology

The development site is situated at the southern end of the North Coast Bioregion within the Karuah Manning sub region. The Myall River borders the eastern and south eastern border of the lot/plan DP 1154170. Monkey Jacket Creek is within the eastern side of the lot/plan area; however, the development area stops approximately 150 m west of the creek. As can be seen in **Figure 3,** there are smaller creeks and human made water bodies throughout the rest of the development area. The area is a part of the Karuah catchment area. The area covers 4,480 km² (Department of Industry) (see **Figure 2**).

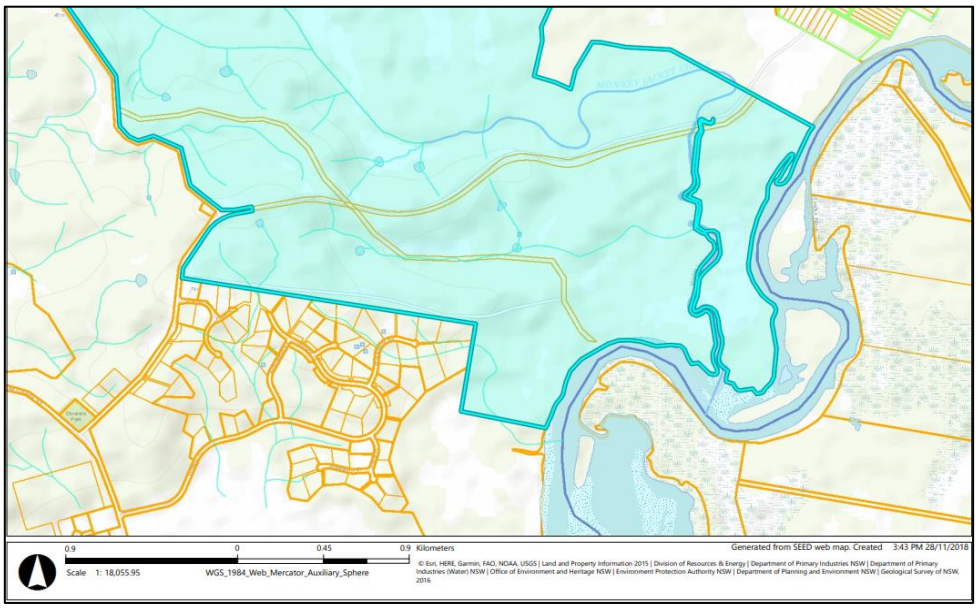

Figure 3: Map of Topography and Hydrology of Lot 2, 3 & 4 DP 1154170

4.3 Geology/Soils

The geomorphology of the area was investigated thoroughly in a 2009 report by AMBS. The area is quaternary period and Wooten bed formation under the Carboniferous period. Based on the Newcastle geological map sheet 1562 (1966), the two geological areas represent approximately half of the site each. The registered PADs are represented in both geological areas. The geomorphology as discussed in the AMBS report (2009) is more detailed than the Department of Land and Water soil conservation landscape maps (Murphy 1995). The North Coast Bioregion contains loams (red friable and clay), yellow earths and yellow and brown earths are found on hillcrests and slopes and organic loams and deep siliceous sands and well developed podzols on alluvial plains and coastal dunes (NPWS 2003 172). The Great Soil Group map of NSW (OEH 2017) indicates podzols and a type of yellow podzolic soils (less fertile granites and metasediments) that are present at the site.

4.4 Geomorphology/Landforms

The lower area of the North Coast bioregion adjoining the Myall Lakes system has high foredunes, low inner barrier ridges, wide lake basins and high parabolic dunes meeting bedrock hills (NPWS 2003 172). The site has a variance in the contours running west to east starting at 60 m to 10 m (see **Figure 4**).

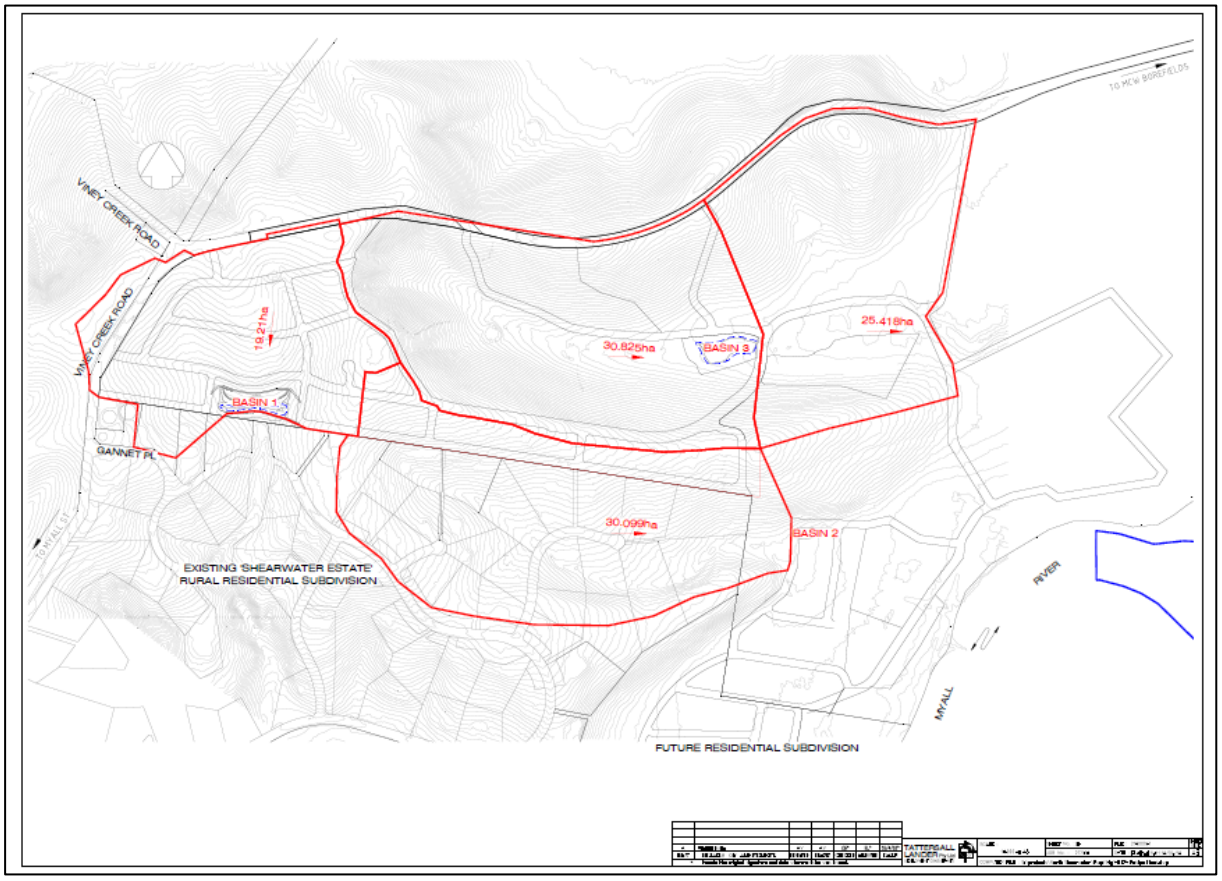

Figure 4: Tattersall Lander development map 21800061 with contours

4.4.1 Flora and Fauna

The majority of the landscape in the study has been cleared for agricultural purposes. There are sections of the landscape that features open woodlands. During the survey, grey kangaroos, Australian Magpies, Australian Raven and Brown Quail were spotted. The Manning Macleay sub-region in the North Coast Bioregion is classified as having:

> *Wet sclerophyll forest with white mahogany, small-fruited grey gum, Sydney blue gum, blackbutt, tallowwood and brush box. White gum, blackbutt, forest red gum and grey box on dry open flats. Dense Antarctic beech on Barrington tops and patches of mixed cool temperate and warm temperate rainforest on Comboyne Plateau on basalt. Coastal complex of banksia, paperbark, smooth-barked apple, and blackbutt with numerous shrubs and areas of heath and swamp on dunes. Mangroves in estuaries. (NSW NPWS 2003).*

The vegetation that previously existed in the study area would have most likely provided habitat for many small mammals, birds and reptiles. Food, water and other resources required for Aboriginal occupation would have most likely been more plentiful on the surrounding coastline as evidenced by the presence of Aboriginal shell middens throughout Port Stephens and the region.

Sokoloff (1976) wrote that the Worimi people managed their resources with skill and initiative. Animals hunted on the coastline strip included possums, native bees, kangaroo, flying foxes, birds and kangaroo rats. The Worimi were swift and agile in climbing trees and killing with stones, spears or the throwing stick. Fishing was undertaken with fish hooks (made from shell), spears and lines. Worimi women created implements and utensils from bark, plant, shell and bone. No scarring or modification of trees attributable to Aboriginal people was found during the survey.

4.5 Landscape history, uses and disturbances

The Insite (2009) report details the history of the area and land in question. It is cited using Engel, Winn and Wark (2000, pp.11) that the area has been used for agricultural purposes since European colonisation from the mid-1820s originally by the Australian Agricultural company with the intention to farm sheep. In the 1830s, the study area became part of Bundabah Run as the area was unsuitable for sheep and was turned over to Cattle; however, Engel, Winn and Wark (2000, pp. 68-69) states that the project failed and the area was again divided in 1867. After that time, in 1868, a lease including the current study area was granted and used for logging, agistment of cattle and horses as well as an orchard (Engel, Winn and Wark, pp. 2000, pp. 218-220). In 1902, 27,000 acres were purchased forming Durness which included the current study area, which ran cattle, a dairy and blacksmithing (Engel, Winn and Wark 2000, pp. 255-256). This history details the clear agricultural use of the land along with the associated disturbance that is a by-product of the industry such as residential buildings, local population amenities (roads, piers/docks), and manufacturing.

5. METHODOLOGY

The methodology employed for this assessment incorporates the following:

- An extensive search of the OEH Aboriginal Heritage Management System (AHIMS) and other relevant statutory registers (see **Sections 5.3**);
- A summary of the archaeological context (see **Section 6.1**);
- Preliminary research into the environmental contexts of the project area (see **Section 4**);
- A summary of the regional character of Aboriginal occupation and heritage (which takes into consideration the overall cultural sensitivity of the study area landscape) (see **Section 6.5**);
- A predictive model which predicts the likely patterning of Aboriginal objects within the study area (see **Section 6.6**);
- A summary of the site survey including the archaeological investigation methodology and results of the field investigations (see **Section 6.7**);
- Aboriginal Community consultation (see **Section 7**);
- Heritage significance assessment incorporating the potential impacts of the proposed development on any Aboriginal cultural heritage values, identified Aboriginal sites or potential archaeological deposits (PADs) identified within or adjacent to the project area (see **Section 7**);
- Conclusion (see **Section 9**); and
- Recommendations for the conservation of cultural heritage values (see **Section 8**).

5.1 Statutory obligations

All work in this due diligence assessment has been carried out in accordance with:

- *National Parks and Wildlife Act, 1974* (NPW Act);
- National Parks and Wildlife Amendment Regulation, 2009 (NPW Regulation);
- *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DDCoP, 2010);
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) insofar as this relates to due diligence assessment;
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) insofar as this relates to a due diligence assessment; and
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (OEH 2010).

Under the NPW Act, it is an offence to harm an Aboriginal object whether or not a person knows it is an Aboriginal object. Property owners, developers and land managers are required to consider their proposed activities, and whether any harm may occur to Aboriginal objects and places under several pieces of legislation. The NPW Act is administered by the Office of Environment and Heritage (OEH) and is the primary legislation for the protection of Aboriginal cultural heritage in New South Wales. Under Part 6 of the Act, it is an offence to knowingly harm or desecrate an Aboriginal object or Aboriginal place. If harm to an object or place is anticipated, an Aboriginal Heritage Impact Permit (AHIP) must be applied for and OEH may issue an AHIP under s90 of the Act.

Linked to the NPW Act is the *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (DDCoP, 2001). A person or organisation who exercises due diligence in determining that their actions would not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later unknowingly harm an object without an AHIP. The due diligence defence is not available for activities which harm Aboriginal places.

The following legislation also relates to the protection of Aboriginal Heritage:

Environmental Planning and Assessment Act 1979 (EPA Act)
The potential impacts of a development on Aboriginal heritage are a key component of the environmental impact assessment process under the EPA Act. In NSW, the EPA Act is the principal law overseeing the assessment and determination of development proposals which are considered under the Act.

Heritage Act 1977 (NSW) (the Heritage Act)
The Heritage Act protects the natural and cultural history of NSW with emphasis on non-indigenous cultural heritage through protection provisions and the establishment of a Heritage Council. While Aboriginal heritage sites and objects are protected primarily by the NPW Act 1974, if an Aboriginal site, object or place is of great significance it can be protected by a heritage order issued by the Minister on the advice of the Heritage Council.

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (as amended 1987) (Commonwealth)
The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 protects areas and/or objects which are of significance to Aboriginal people and which are under threat of destruction. A significant area or object is defined as one that is of particular importance to Aboriginal people according to Aboriginal tradition.

The Aboriginal Land Rights Act 1983 (NSW)
The NSW Aboriginal Land Rights Act 1983 is administered by the Department of Human Services: Aboriginal Affairs NSW and establishes the NSW Aboriginal Land Council and local Aboriginal land councils. The Act requires these bodies to take action to protect the culture and heritage of Aboriginal persons in the council's area and promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

The Native Title Act 1993 (Commonwealth)
The Native Title Act 1993 provides the legislative framework to recognise and protect native title, establishes ways in which future dealings affecting native title may proceed and to set standards for those dealings, including providing certain procedural rights for registered native title claimants and native title holders in relation to acts which affect native title.

The Australian Heritage Commission Act 1975 (Commonwealth)
The Australian Heritage Commission Act 1975 established the Australian Heritage Commission, which assesses places to be included in the National Estate and maintains a register of these places, which are significant in terms of their association with particular community or social groups for social, cultural or spiritual reasons. The Act does not include specific protective clauses.

5.2 Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW

The DDCoP arises from the NPW Act, as noted in **Section 5.1**. The DDCoP sets out a procedure which, when followed, will satisfy the due diligence requirements. If an entity can demonstrate that they exercised due diligence and determined that it was unlikely that Aboriginal objects would be harmed, then they have a defence to prosecution under the strict liability offence under Section 86(2) of the NPW Act. The DDCoP sets out the reasonable and practicable steps to be undertaken when considering development to:

- Identify whether or not Aboriginal objects are present or likely to be present in an area;
- Consider whether or not their activities are likely to harm Aboriginal objects (if present); and
- Determine whether an AHIP is required.

Following successful due diligence, an activity may be undertaken, though always with caution. Work should be stopped and OEH notified if any Aboriginal objects are found. The due diligence defence does not authorise continuing harm.

5.3 AHIMS searches

An AHIMS extensive search of the project area was conducted on 14 September, 2018 with a buffer of 200 metres. Two Aboriginal sites were found to be within 200 metres the planned project area.

A copy of the Advitech Environmental extensive AHIMS search is attached at **Appendix 1**. The results of the search are noted in **Table 1** below. The locations of all registered sites noted in this search have been mapped in **Figure 5**. **Figure 5 is not for public disclosure and should be removed prior to any further publication of this assessment.** The two potential archaeological deposits were recorded from the Insite (2009) survey. The site IDs are 38-5-0301 for PAD 1 and 38-5-0302 for PAD 2.

Table 1: AHIMS Sites within 1000m of study area

NPW Site No.	Site Name	Site Description
38-5-0301	Shearwater PAD 1	Potential Archaeological Deposit
38-5-0302	Shearwater PAD 2	Potential Archaeological Deposit

Figure 5: AHIMS search results in relation to study area

6. ABORIGINAL DUE DILIGENCE ASSESSMENT

The following assessment has been undertaken in accordance with *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DDCoP, 2010). A review of the archaeological literature of the region and the results of an OEH AHIMS search provides contextual information for the current assessment. Thus, it is possible to obtain a broader picture of the wider cultural landscape highlighting the range of site types throughout the region, frequency and distribution patterns and the likely presence of any sites within the study area. It is then possible to use the archaeological context in combination with the review of environmental conditions to establish an archaeological predictive model for the study area.

6.1 Local and Regional Archaeological Context

The study area has had three reports written for the current development from 2009. The following is a review of reports produced during previous archaeological assessments within the region of the study area.

Insite Heritage (2009) *Aboriginal and European Heritage Assessment North Shearwater Precinct: Local Environment Study*. Report to GeoLink Pty. Ltd.

The survey discovered two potential archaeological deposits (see **Figure 6**) that covered large portions of Stages One and Five. It was recommended that due to the potential for Pleistocene sands and the likelihood of subsurface material test excavations should occur with a geomorphologist to determine subsurface material.

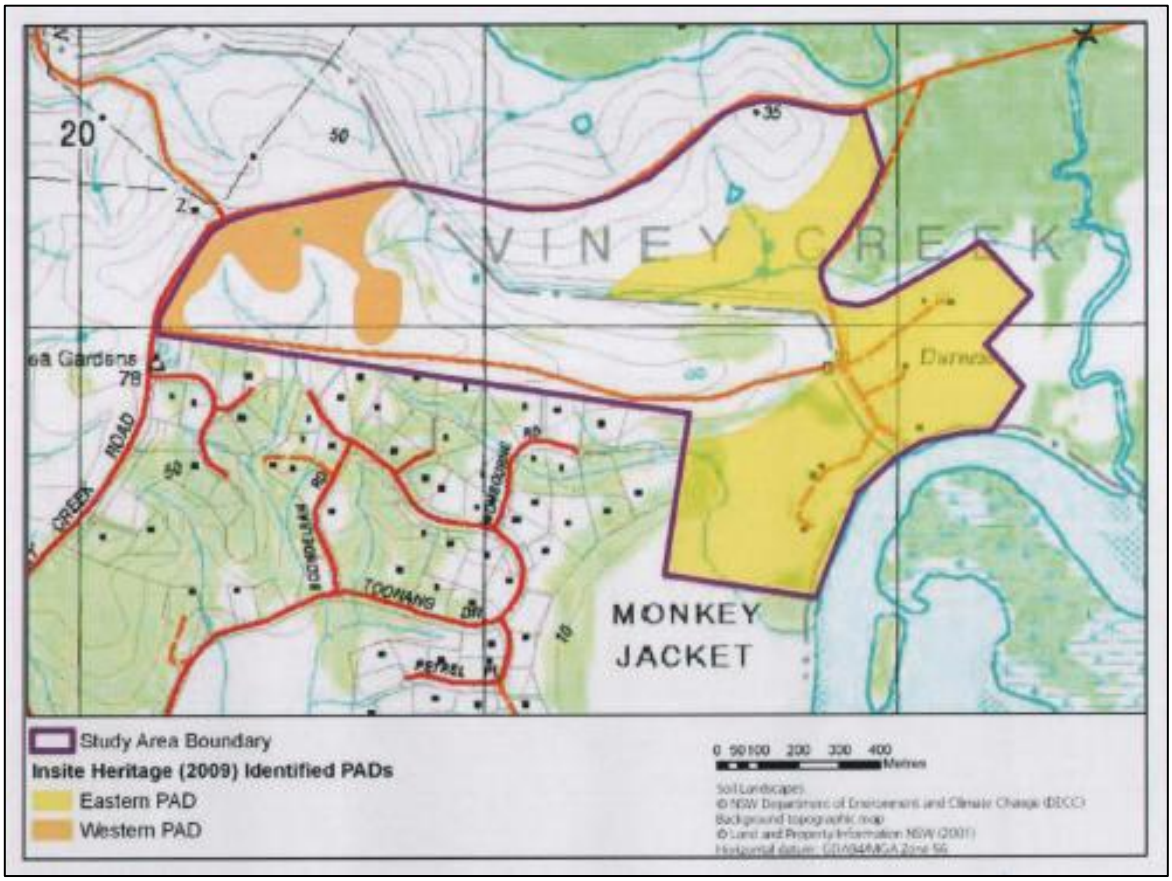

Figure 6: PADs mapped by Insite Heritage (2009). ABMS (2009) map

AMBS (2009). *Archaeological and Geomorphological Review for North Shearwater Precinct – Local Environmental Study*. Report to RPS Harper Somers O'Sullivan.

Upon further investigation, the geomorphology concluded that the sands below the surface were from the Holocene and this reduced the potential for PADs. The sizes of each PAD determined by Insite Heritage were greatly reduced from this investigation (See **Figure 7**).

AMBS (2010). *Archaeological Test Excavation Research Methodology: North Shearwater Precinct*. Report to Great Lakes Council.

A test excavation methodology was developed to be undertaken to assist with the potential development of the site. Three transects locations with 15 test pits of 1 m² were recommended (see **Figure 8**). It was also recommended that the Karuah Aboriginal Land Council be involved in the excavations.

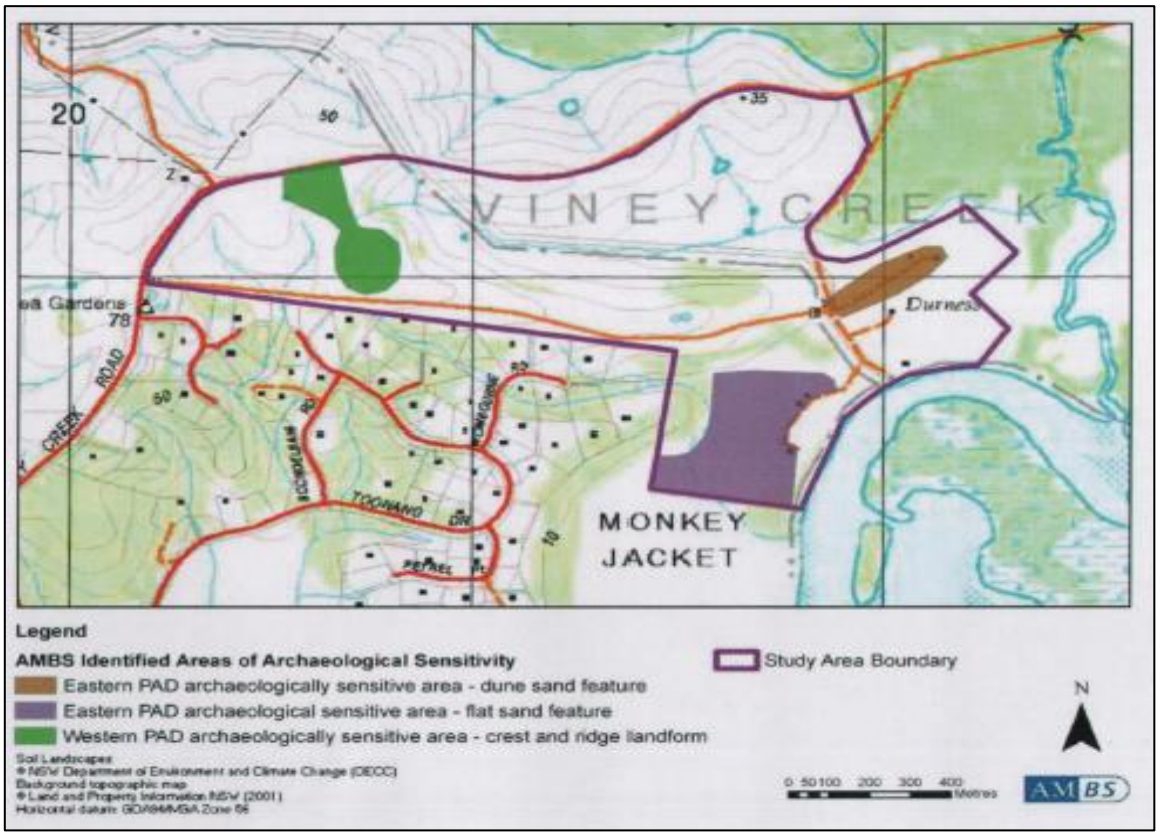

Figure 7: ABMS (2009) redefined PADs

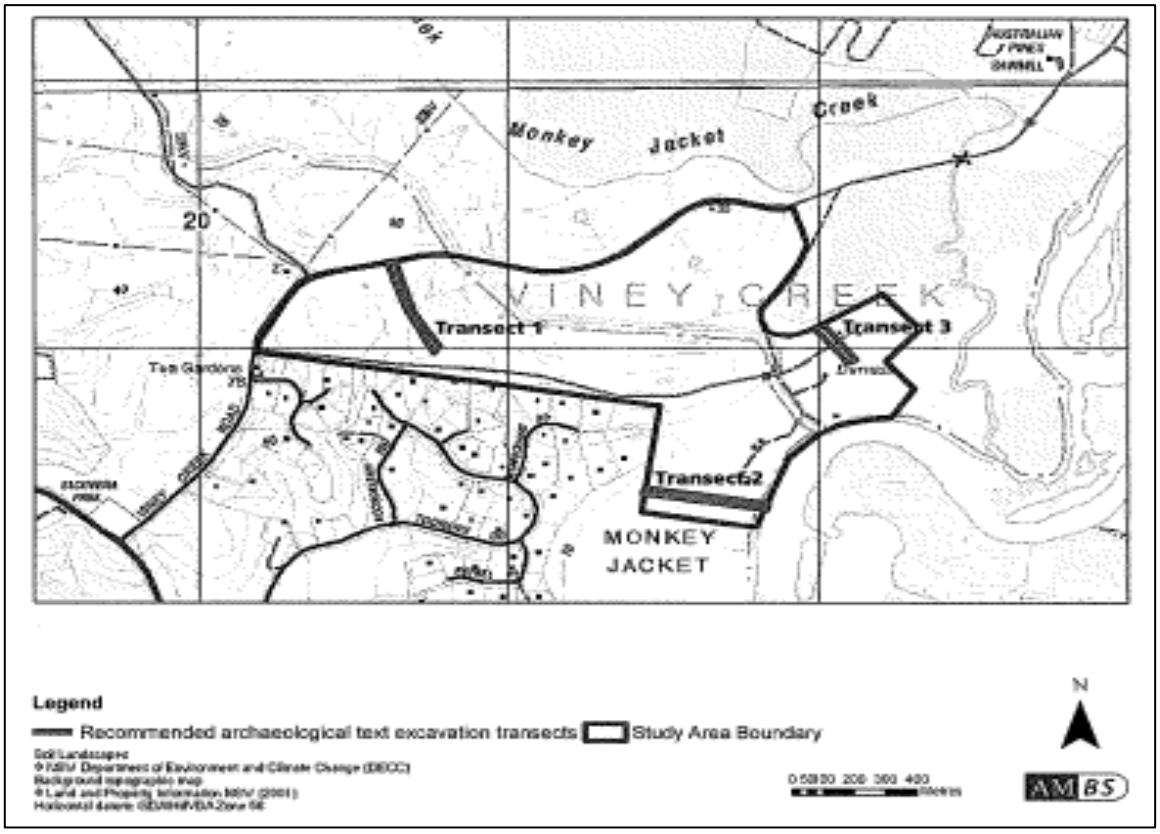

Figure 8: Proposed transects of test excavation ABMS (2010)

6.2 OEH Aboriginal Heritage Information Management System (AHIMS)

A search of the OEH AHIMS register has shown that there are two known Aboriginal sites currently recorded within the study area with a 200 metre buffer of the search area. The AHIMs results are provided in **Appendix 1**.

There are many variables that must be considered when using the Aboriginal Heritage Information System (AHIMS). More particularly, site coordinates, and descriptions are not always correct due to the following factors:

- Errors resulting from the evolution of subsequent computer systems used by OEH that have failed to account for or correctly translate old coordinate systems, such as topographic map references, to new systems;
- Errors resulting from human error or incorrect descriptions of locality on the site cards submitted to AHIMS;
- Errors resulting from data input. Most commonly the naming of the correct mapping system used; and
- Few sites have been updated on the AHIMS register to record if they have been subject to a s87 or s90 permit and, as such, what sites remain in the local area and what sites have been destroyed is unknown.

6.3 Existing Predictive Models of Past Aboriginal Land Use

The main aim of this assessment is to attempt to define both the potential nature and extent of Aboriginal occupation across the study area. As a result, the nature of the analysis focused on both the landform units and known sites. The purpose of this strategy is to highlight any variations between sites and associated assemblages, landforms and resources across the area. In doing this, it is possible to identify variation across the landscape, landforms and assemblages that correspond with variation in the general patterns of landscape use and occupation. The nature of activities and occupation can often be identified through the analysis of stone artefact distributions across a landscape. No Aboriginal objects have been registered on or within 1000 m of the study area.

A general model of forager settlement patterning in the archaeological record has been established by Foley (1981). This model distinguishes the residential 'home base' site with peripheral 'activity locations'. Home base sites generally occur in areas with good access to a wide range of resources (reliable water, raw materials, and so on). The degree of environmental reliability, such as reliable water and subsistence resources, may influence the rate of return and length of occupation of sites and hence the complexity of evidence. Home base sites generally show a greater diversity of artefacts and raw material types (which represent a greater array of activities performed at both the site and immediate area).

Activity locations occur within the foraging radius (approximately 10km) of a home base camp (Renfrew and Bahn 1991). Based on the premise that these sites served as a focus of a specific activity, they will show a low diversity in artefacts and are not likely to contain features reflecting a base camp (such as hearths). However, it is also possible that the location of certain activities cannot be predicted or identified, adding to the increased dispersal of cultural material across the landscape. If people were opting to carry stone tools during hunting and gathering journeys throughout the area rather than manufacturing tools at task locations, an increased number of used tools should be recovered from low density and dispersed assemblages.

6.4 The Landscape and Cultural Heritage

The following is extracted from '*What is an Aboriginal Cultural Landscape*?' (DECCW 2010):

> *All landscapes contain evidence of human use. The way that perceptions, beliefs, stories, experiences and practices give shape, form and meaning to a landscape is termed a cultural landscape (ACH 1998). An Aboriginal cultural landscape is 'a place or area valued by an Aboriginal group (or groups) because of their long and complex relationship with that land. It expresses their unity with the natural and spiritual environment and embodies their traditional knowledge of spirits, places, land uses, and ecology. Material remains of the association may be prominent, but will often be minimal or absent.*
>
> *The landscape scale of cultural heritage is similar to the concept of 'whole-of-landscape' in ecosystem conservation – just as there is connectivity between all parts of natural ecosystems (e.g. plants, animals, soils and water) there is connectivity between cultural objects and places through past human behaviour patterns. The cultural landscape concept emphasises the landscape-scale of history and the connectivity between people, places and heritage items. It recognises that the present landscape is the product of long-term and complex relationships between people and the environment.*
>
> *Aboriginal cultural landscapes are comprised of:*
>
> *Significant biodiversity and a diverse range of ecological systems and associations, all of which contributed to the continuing existence of Aboriginal peoples in the region over many thousands of years, and which are valued in different ways by Aboriginal communities today;*
>
> - *Material remains of this continuing occupation in the form of a diverse array of Aboriginal sites and places known to the Aboriginal communities, some of which will be recorded on the Department of Environment, Climate Change and Water's Aboriginal Heritage Information Management System.*
> - *Extensive historical records from 1788 through to today which record observations of Aboriginal people and lifestyles, wars, massacres, social and cultural events, population census, social interactions, language etc, and which influence Aboriginal community values today.*
> - *An Aboriginal population made up of people who have traditional association and knowledge of the region, as well as others who live, work and play within the region, all of whom may attribute various values with the area, derived from the distant and recent past, through to the present day.*
>
> *For Aboriginal people, the significance of individual landscape features is derived from their inter-relatedness within the cultural landscape. This means features cannot be assessed in isolation and any assessment must consider the feature and its associations in a holistic manner. This may require a range of assessment methods and will always require the close involvement and participation of Aboriginal people. By consulting with Aboriginal people and using the concept of cultural landscapes, the story behind the features can be told which demonstrates the associations that may exist between Aboriginal objects and other features within the landscape* (DECCW 2010).

6.5 Local and Regional Character of Aboriginal Land Use and its Material Traces

6.5.1 Aboriginal History

The heritage of the Myall Lakes area is connected with the Worimi People. The study area in a local context can be associated with research in the broader area to define the history of the area. The broader area has provided finds of middens (Silcox 1999; Brayshaw 1988; Dallas 1982; Villiers 1981), scatters (Baker 1994).

Other sites in the area include:

- Dark Point Aboriginal Place. This Aboriginal Place consists of 7km of coastline within the Myall Lakes National Park. It was a gathering and ceremonial place for clans of the Worimi and contains Aboriginal sites, objects and burials;
- Gooreenggai (North Arm Cove) Ceremonial Site. A men's ceremonial site consisting of stone arrangements and located on Baromee Hill;
- Buladelah Mountain. An Aboriginal Place consisting of a variety of cultural sites and considered a spiritual place for Aboriginal ancestors;
- Birubi Point Aboriginal Place. This Aboriginal Place is located at Anna Bay; and
- Soldiers Point Aboriginal Place. This Aboriginal Place is located at Soldiers Point (3km south east of the study area). Soldiers Point has a continuous history of Aboriginal settlement and cultural activity, particularly fishing. It includes burials and a men's ceremonial area.

Enright (1932) details a paddle carved from stone tools found at Bombo Point (Bombah Point) in the Myall Lakes. The Cultural connections of the Worimi is described by Constable and Love (2015, pp. 11) as largely relates to customary history and usage, ecological value relating to fish and animal species, or economic value relating to food.

Constable and Love (2015, pp. 12-13) also identified areas that are of interest including Karuah River as a meeting place, Seal Rocks as a tribal boundary, food sources including fish, shellfish species and turtles, as well as mangroves as a resource. Other types of research document include Dyall (1982) who conducted a Birubi excavation and mentions consumption of terrestrial birds, mammals, reptiles, shellfish species and fish. The ABMS (2009) report details previous surveys is the area of the study area. The Condux Development which is the area of the current residential estate neighbouring the study area which revealed a shell midden. Another survey to the south west (2 km) identified a shell midden and two Chert flaked artefacts (Dallas 1982 cited by AMBS 2009).

6.5.2 Contemporary Cultural Accounts

Constable and Love (2015, pp. 11) categorise the cultural water assets as:

- Customary – ceremony, meeting place, gender specific business, totems;
- Spiritual (dreaming, stories and songlines);
- Flora and fauna;
- Economic – trade, food, employment/income, tourism; and
- Recreational – gatherings and swimming.

6.5.3 Cultural significance

The Burra Charter (2013) defines 'cultural significance' very broadly to include 'aesthetic, historical, scientific, social or spiritual value for past, present or future generations'. This definition captures places of cultural significance to Indigenous cultures. It also includes places that provide a physical location that is integral to the existence, observation and practice of intangible heritage. The Burra Charter definition of cultural significance encompasses all forms of spirituality, regardless of the culture from which it emanates. Similarly, aesthetic value is not limited to a 'western' perception of aesthetics (taken from ICOMOS Practice Note: The Burra Charter and Indigenous Cultural Heritage Management).

Community consultation with the Karuah LALC by Insite Heritage (2009) and ABMS (2009), ABMS (2010), with a Karuah LALC report (appendix in ABMS 2009) suggest that sites exist in the nearby area and, whilst no new sites were discovered during their participation, that watercourses hold significance and could yield sites when further work is conducted.

During this assessment, the registered Aboriginal stakeholders did not indicate whether the area was culturally significant.

6.6 Predictive Model for the Study Area

A predictive model of site types and site patterning for the study area is generally achieved through a review of previous archaeological studies undertaken throughout the locality and the region, the OEH AHIMS register and the environmental context of the study area. The aim of a predictive model is to understand the nature of previous Aboriginal occupation and determine the nature of land use. This theme often aims to identify and explain archaeological patterning in site type, content and distribution. General archaeological theories have been developed outlining the relationship between land use patterns and the resulting archaeological evidence.

Comparable data from archaeological research within the locality to support a predictive model for this study area is disparate. However, and based on the landscape of an alluvial river plain, it is considered that in its natural condition, the study area would have historically provided Aboriginal people with a variety of flora and faunal resources. The Myall River and Monkey Jacket Creek is the nearest and relatively reliable source of water. The Myall River borders the site in the east and the Monkey Jacket Creek is approximately 150 m east of the development boundary of the eastern most point. In accordance with Foley's model (1981), it is envisaged that the area was most likely only used for opportunistic hunting or gathering of resources whilst accessing the watercourses.

Notwithstanding the predictive model above, the highly disturbed state of the majority study area removes virtually all likelihood for the presence of Aboriginal objects except in those areas which from previous assessment have been deemed sensitive.

Figure 9: Photo of study area landscape 3 December 2018

6.6.1 Limitations

Predicative modelling can provide a good indication of site types and site patterning in the area. However, it can also be influenced by a variety of factors including the following:

- Aboriginal people involved in previous studies or surveys may not have disclosed the existence of places with cultural heritage values as they may not have been under immediate threat when the earlier study was undertaken;
- The distribution of surface archaeological material does not necessarily reflect that of sub-surface deposits;
- The number of studies recorded or published in the local area. Fewer studies suggest that sites were possibly developed prior to introduction of the current regulations and guidelines or that little development has been undertaken in the area;
- The number of sites may reflect the number of surveys done. For example, a large percentage of sites found along creek lines may be, at least partially, representative of how many cultural heritage surveys focused on these landforms;
- A report from AHIMS does not represent a comprehensive list of all Aboriginal objects or places in the local or region of the study area as it lists recorded sites only and is mostly a record of survey effort (OEH 2011).
- Ground surface visibility and vegetation hinders the finding of site locations;
- The distribution of surface archaeological material does not necessarily reflect that of sub-surface deposits;
- The geomorphologies of the majority of NSW soils and high levels of erosion affect sites and site contents, and the extent of those disturbances is unknown. For example, a site identified at the base of an eroded slope may have originally derived from the upper crest;

- Biases due to differential sampling of landforms based on decisions made by archaeologists;
- As a result of restrictions due to the locations of proposed development areas,
- Levels of exposure on different landforms;
- Artefact counts can be skewed due to factors such as differing levels of fragmentation of material and levels of ground surface visibility. A very large number of sites/ artefacts can be located on exposures with either no or very few artefacts visible away from the exposures;
- In relation to stone artefact raw materials, it is important to note that there is a potential for discrepancies in the way in which archaeologists classify lithic materials. This will consequently affect the proportional representation of raw materials within the recorded assemblages; and
- Variation in the classificatory definitions employed by archaeologists will significantly influence the range of artefact types identified within a study area. For example, the distinction between a waste flake, a debitage flake and a flaked piece may be heavily subject to the perspective of the recorder. Thus, it is not productive to attempt to quantify the proportionate representation of artefact types identified in previous studies.

6.6.2 Model of Occupation for Shearwater

A general set of predictions, consistent with other studies in the region (for example, Worth et al 2002; Brayshaw 1984; Roberts 2000; NPWS 1993) and forager settlement patterning (Foley 1981; and Renfrew and Bahn, 1991) is summarised as follows:

- The area may have previously been used by Aboriginal people for short term occupation or intermittent foraging and resource gathering activities incidental collection of resources;
- There is no indication that features requiring a considerable labour investment such as stone lined ovens or heat treatment pits are present in the study area. The presence of these features would indicate occupation for extended periods of time; and
- It is considered that group mobility in the study area was high. Campsites frequently shifted throughout the landscape and artefact assemblages are not expected to contain elements such as grindstones, heat-treatment pits, ovens and the diversity of implements frequently discarded at places of extended residential occupation.

Worth et al (2002) predicted the following model of occupation for South Pindimar (approximately 10km south west) as:

- Coastal and estuarine shorelines are areas of high archaeological potential;
- Coastal and estuarine shorelines provide a variety of exploitable resources such as fish, shellfish and waterbirds;
- Expected site types are shell middens, open camp sites and ceremonial/social sites;
- Stone artefact scatters are likely to be found on level, well drained locations, on low ridges, above creek lines and water courses;
- Ceremonial areas, represented by stone arrangements and or scarred trees, may be present;
- There is a low potential for scarred trees to be present in uncleared areas with mature growth trees;

- Rock shelters and caves are likely in areas with the suitable geological formations and type;
- Quarry sites, and associated stone tool workshops, may be present;
- Burials may be found in sandy deposits; and
- Axe grinding grooves may be present in areas with suitable outcropping such as sandstone near water holes and creek beds.

6.6.3 Archaeological Potential in the Study Area

Taking into account previous archaeological studies in the region (see **Section 5.1**), the vast majority of artefactual material in the region was observed on exposures with good to excellent ground surface visibility. The likelihood of finding artefacts surrounding these exposures was reduced due to poor visibility. Isolated artefacts are usually identified in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing) and access ways can also expose surface artefacts (Brooks *et al* 2009). However, no Aboriginal objects were noted at surface level within cleared areas. Artefact scatters, which are also described as open campsites, include archaeological remains such as stone artefacts, shell, and sometimes hearths. Based on information gained from regional studies, it can be expected that:

- The likelihood of locating sites increases with proximity to water;
- The likelihood of finding large sites increases markedly with proximity to water;
- In swamp areas, sites are more likely to be found on the elevated margins of the swamp;
- A variety of raw materials will be represented though the majority of sites but will be predominated by sedimentary rock;
- A variety of artefact types will be located though the majority will be flakes, flaked pieces and debitage;
- The likelihood of finding scarred trees is moderate to high dependent on the level of previous clearing in an area; and
- The majority of sites will be subject to disturbances including human and natural.

There is a low to medium chance that Aboriginal object(s) may be present within the study area. This conclusion is based on:

- The lack of Aboriginal objects found during the survey;
- The lack of Aboriginal sites or places registered within the locality;
- The results of past archaeological studies; and
- The highly disturbed nature of the study area due to intensive clearing and agricultural practices.

6.7 Archaeological report, survey and data collection

6.7.1 Methodology

The purpose of an archaeological survey is to record all material traces and evidence of Aboriginal and use that are visible on the ground surface or exposed otherwise. It is also to physically identify where areas may be inferred as being likely to contain Aboriginal objects beneath the ground surface. Areas that were relatively undisturbed with the greatest exposure of ground surface and with landforms suitable for occupation were targeted in the field survey. Those areas are highlighted in

Figures 6 and **7**. The majority of the study area has been intensively modified by agriculture and development for farming infrastructure. Transects were undertaken on foot. Start and end points were all defined by the development plans and previous surveys.

Survey units have not been defined for this survey due to the similarity of the landscape forms across the entire study area. The study area is a valley and ridge system moving to a flood plain and either consists of cleared or vegetated areas of wooded sections or grass/low shrubs which have previously been cleared (see **Figures 9, 10** and **11**).

6.7.2 Survey coverage

In order to determine the conditions present and effectiveness of the survey, the following survey coverage data is provided (see **Table 2**). Effective coverage is an estimate of the amount of ground observed taking into account local constraints on site discovery such as vegetation and soil cover. There are two components used to determine the effective coverage: visibility and exposure.

Visibility is the amount of bare ground on the exposures which may reveal artefacts or other cultural materials, or visibility refers to 'what conceals'. Visibility is hampered by vegetation, plant or leaf litter, loose sand, stony ground or introduced materials (such as rubbish). On its own, visibility is not a reliable factor in determining the detectability of subsurface cultural materials (DECCW 2010/783, pp. 39). Exposure refers to 'what reveals'. It estimates the area with a likelihood of revealing subsurface cultural materials rather than just an observation of the amount of bare ground. Exposure is the percentage of land for which erosion and exposure is sufficient to reveal cultural materials on the surface (DECCW 2010/783, pp. 37).

The effective coverage for the study area was determined for both visibility and exposure ratings and **Table 2** details the visibility rating system used. As indicated in **Table 2**, the effective coverage for the study area illustrates the overall effectiveness of the survey. As indicated in **Table 2**, the effective coverage for the study area is 86.5% with clearance and ploughing being the limiting factor.

Table 2. Survey effective coverage

SU	Landform	Area (ha)	Vis. %	Exp. %	Exposure type	Previous disturbances	Present disturbances	Limiting visibility factors	Effective coverage (ha)
1	Valley and ridge system to flood plain	46	70%	90%	clearance, agriculture	Agriculture, residential infrastructure, quarrying/debris	Agriculture, residential infrastructure	Vegetation associated with grazing,	30
Totals		**46**							**30**
Effective coverage %									**66%**

As indicated in **Table 3**, the only landform present within the study area was a valley and ridge system to flood plain.

Table 3: type table title here

Landform	Landform area (ha)	Area effectively surveyed	% of landform
Valley and ridge system to flood plain	46	30	66

7. RESULTS

Previous archaeological assessments have been carried out in 2008 by Insite Heritage, and in 2009 by AMBS. The original study undertaken by Insite Heritage determined two Potential Archaeological Deposits. This was due to the assumption of the area potentially containing Pleistocene Sands. The Pleistocene Sands are considered likely to carry a high heritage concentration for sub-surface artefacts. This was supported by the community consultation with the Karuah Local Aboriginal Land Council. A scatter of whelk shells were also located in this survey, however disturbance to the area disrupted the original context of what was described as a potential midden (Insite 2009). The 2009 assessment by ABMS reviewed the geomorphology and archaeological findings from the Insite (2009) report. The age of the sand deposits were found to be of the Holocene era, however it was determined that three archaeological sensitive areas within the AHIMS registered areas (ABMS, 2009, pp. 29-37). This greatly reduced the PAD areas as recorded by Insite Heritage.

Two site visits were conducted. The first was held on the 3 December 2018, and entailed an overview of all five stages of the development. The second site visit on the 7 December 2018 was with Local Aboriginal Community members and surveyed Stage One only. Four artefacts were found during the survey on 3 December 2018, with one artefact in Stage One and three artefacts in Stage Four. In Stage One, the potential artefact was located with the Western PAD, and appears to be within the minimised PAD as determined by ABMS (2009). Three stone artefacts were found in a deforested area of Stage Four of the development, as detailed in the overall site plan provided by Tattersall Lander (reference 21800038) (see **Figure 10**). The artefacts in Stage Four when examined with **Figure 6** are within the top north eastern portion of the Eastern PAD at the outer most boundary of the development area.

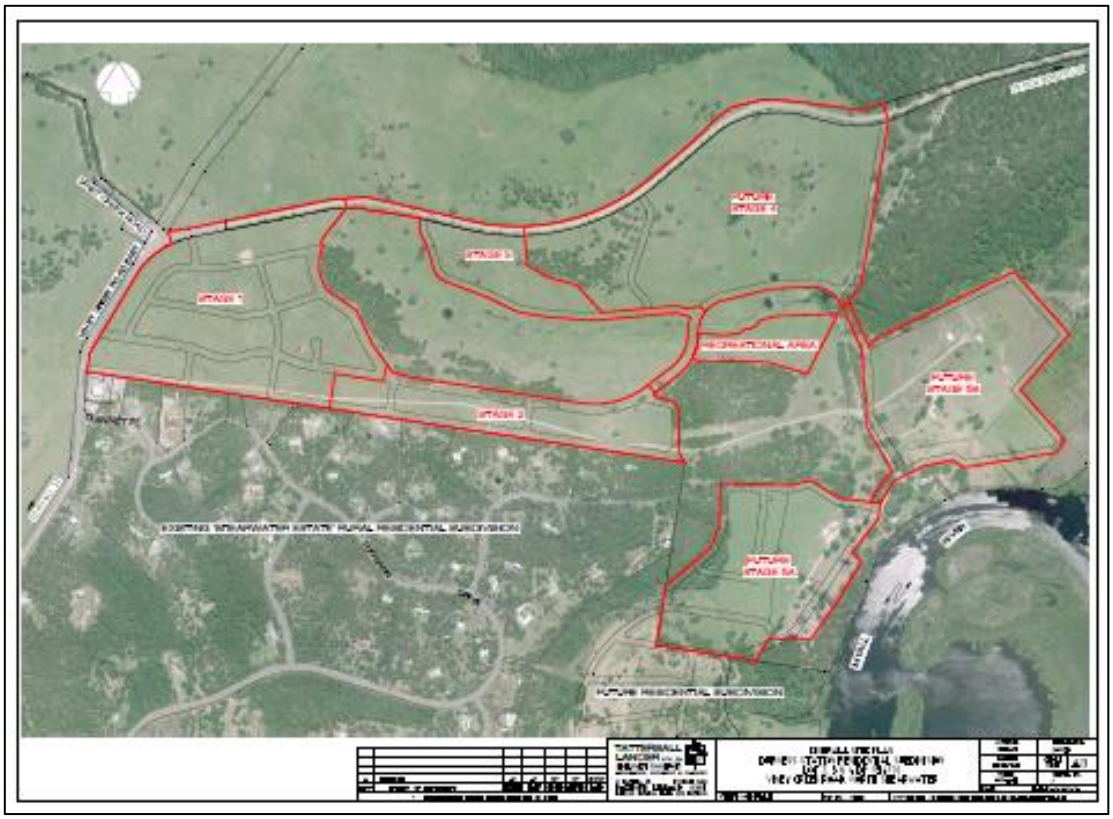

Figure 10: Tattersall Lander development map 21800038 with stage details

Due to the reassessment in 2009 by ABMS, the PADs that were deemed sensitive have been redefined in terms of size. This was factored into the site survey. The survey was carried out using a handheld GPS. This is to assist with ground covered, recording finds located and with determining existing sensitive areas estimated from the ABMS report (2009), the AHIMS location details for Pad 1 (site ID 38-5-0301) and Pad 2 (site ID 38-5-0302) and shell scatter (Insite 2008) included in the GPS file. The survey was undertaken using transects spaced to visually cover 10-20 m per person depending on ground visibility in different areas.

Figure 11: Study area landscape 3 December 2018

Figure 12: Artefact located in Stage Four of the development 3 December 2018

Figure 13: Artefact located in Stage Four of the development 3 December 2018

Figure 14: Artefact located in Stage Four of the development 3 December 2018

The artefact visible in **Figure 12** was located approximately 12 metres south of the marked location of the artefact in **Figure 13**. **Figure 14** was located further north of the artefacts, all were within the boundaries of the Eastern PAD as defined by Insite Heritage (2009) (see **Figure 6**). All these artefacts were located in Stage Four of the planned development. Stages Four and Stage Five are to occur at a later date and this report does not directly relate to this assessment.

Community Consultation for Due Diligence with the Karuah LALC – 7 December 2018

A meeting and site walk over was held with Karuah Local Aboriginal Land Council and Karuah Indigenous Corporation representatives on 7 December 2018, and included Karuah LALC Acting CEO Mr Dave Feeney, and Mr Dave Kirk. The site visit occurred from 8:30 am to 9:15 am within Stage One. The PAD that was discovered on 3 December 2018 confirmed existence of an artefact (see **Figure 15**). The representatives also discovered a grinding groove (see **Figure 16**) within Stage One.

Figure 15: Artefact found in Western PAD reduced area 3 December 2018

Figure 16: Grinding Groove in Stage One 7/12/2018

This led to the representatives wishing to review previous Archaeological reports attached to the AHIMS site cards and deliver their recommendations about the site. Other comments about the site made by the Karuah Representatives were the potential for a campsite at the location due to landscape features, a Men's site or a corrobboree ground. The site was also mentioned as a good location for the connection of a trail from the Karuah River. Following further correspondence on the 11 December 2018, Mr Feeney recommended that 10 tests to determine greater knowledge about the site history.

8. RECOMMENDATIONS AND CONCLUSIONS

Recommendations for the North Shearwater project include following previous reports from Insite Heritage (2009) and ABMS (2009 & 2010) with findings such as test pitting with included methodology. This should be undertaken in consultation with the local Aboriginal representatives such as Karuah Local Aboriginal Land Council or their appointed representatives. Given the continued discovery of potential cultural heritage items across the entire development site, applying for an AHIP and undertaking a full Aboriginal Cultural Heritage Assessment at this point in time, may expedite future development for Stages Four and Five, particularly given these stages contain the other registered PAD (eastern PAD) and substantive artefacts found in the 3 December 2018 survey.

Following further consultation with Karuah LALC and their representatives and the December 2018 field survey, it is recommended following the previous findings of the cultural heritage reports for further investigation through test pitting and the required AHIP permit. An Aboriginal Cultural Heritage Assessment Report (ACHAR) requiring consultation with the local Aboriginal community is advised for determining the extent of heritage values along with an Aboriginal Heritage Impact Permit application.

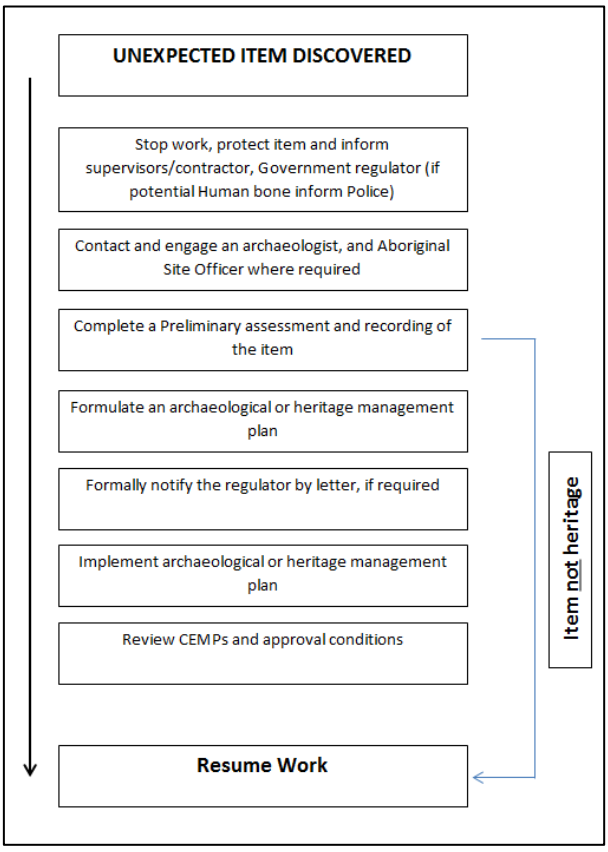

Figure 17 Unexpected finds procedure

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Appendix I

AHIMS Search

Not for public disclosure and should be removed prior to any further publication of this assessment