

**White Cliffs Proposed Water Treatment Plant  
Due Diligence Assessment**

**Date:** 20 June 2017

**Author:** Dr Julie Dibden

**Proponent:** NSW Public Works Advisory on behalf of Central Darling Shire

**Local Government Area:** Central Darling Shire



## TABLE OF CONTENTS

INTRODUCTION .....	1
1. IMPACT ASSESSMENT.....	3
1.1 PROPOSED IMPACTS .....	3
1.2 IMPACT ASSESSMENT .....	3
2. AHIMS DATABASE SEARCH AND LANDSCAPE ASSESSMENT .....	4
2.1 AHIMS SITE SEARCH RESULTS.....	4
2.2 ASSESSMENT OF THE ARCHAEOLOGICAL SENSITIVITY OF LANDSCAPE FEATURES IN THE PROPOSED IMPACT AREA.....	6
2.3 CONCLUSION .....	7
3. DESKTOP ASSESSMENT AND VISUAL INSPECTION .....	8
3.1 DESKTOP ASSESSMENT .....	8
3.2 VISUAL INSPECTION .....	12
4. LEGISLATION.....	13
5. RECOMMENDATIONS .....	14
6. REFERENCES.....	15
APPENDIX 1 – AHIMS DATABASE SEARCH.....	16

## TABLE OF FIGURES

Figure 1 The activity area. ....	2
Figure 2 The location of the AHIMS site.....	5

## INTRODUCTION

NSW Archaeology Pty Ltd has been engaged by the NSW Public Works Advisory to prepare a Due Diligence Assessment in respect of the White Cliffs proposed water treatment plant project (the activity). A Review of Environmental Factors (REF) is currently being prepared for the project. This report will form a component of that document.

This report has been prepared in accordance with the NSW Office of Environment and Heritage – OEH (formally NSW DECCW) *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*<sup>1</sup> (NSW DECCW 2010).

For the purposes of this project, due diligence means ‘taking reasonable and practical steps to determine whether a person’s actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm’ (NSW DECCW 2010: 18).

The *Due Diligence Code* outlines a number of steps to be adhered to in order to exercise due diligence when activities are undertaken that have the potential to cause harm to Aboriginal objects. The code stipulates that these steps should be followed in order to:

- identify whether or not Aboriginal objects are or are likely to be present in an area;
- ascertain whether or not the proposed activities are likely to harm Aboriginal objects (if present); and
- determine whether an Aboriginal Heritage Impact Permit (AHIP) application is required.

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

As a result of this assessment, the following conclusions are made:

- There are no known *previously* recorded Aboriginal objects located in the activity area.
- The activity would occur in a highly disturbed context.
- No Aboriginal objects were recorded in the proposed activity area during the field assessment.
- It is concluded that the impact area is of low archaeological sensitivity and potential. An AHIP is not required.

---

<sup>1</sup> Hereafter referred to as the *Due Diligence Code*.



Figure 1 The activity area.

## 1. IMPACT ASSESSMENT

The proposed White Cliffs water treatment plant is located on Beth Street within the township of White Cliffs, immediately adjacent to the existing water treatment plant on its western side. Currently raw water is transferred from a reservoir to the existing White Cliffs WTP for treatment. The requirement to construct a new water treatment plant is proposed because the current facility, constructed in the 1980s, is faulty, aging and inadequate and, accordingly, in need of upgrading. The location of the proposed White Cliffs water treatment plant is shown in Figure 1.

The first question to be addressed in a process of due diligence is, *Will the activity disturb the ground surface or any culturally modified trees?* (NSW DECCW 2010: 11). When machinery is used to dig, grade, bulldoze, scrape, plough or drill the ground, the accompanying disturbance to the ground surface is often significant, and consequently, there is a high likelihood for any Aboriginal objects which may be present to be harmed.

### 1.1 Proposed Impacts

At this early stage of the planning process the nature and design of the proposed White Cliffs water treatment plant is unspecified, however, its construction will unavoidably cause disturbance to the ground.

### 1.2 Impact Assessment

The proposal would necessarily involve machinery and disturbance to the ground surface would occur. However, the activity area has already experienced high levels of prior ground disturbance, most notably mechanical grading over large areas.

## 2. AHIMS DATABASE SEARCH AND LANDSCAPE ASSESSMENT

### 2.1 AHIMS Site Search Results

A search of the NSW OEH Aboriginal Heritage Information Management System (AHIMS) has been undertaken in respect of this study (Search date: 11 April 2017). The search covered an area of 272 square kilometres, encompassed by Eastings: 691000 - 707000, Northings: 6579000 - 6596000 with a buffer of 50 meters (see Appendix 1).

One Aboriginal site #15-5-0017, is listed on AHIMS as being recorded within the broader search area. This site is located at some distance from the proposed activity area (Figure 2).

While only one Aboriginal site is listed as being present in the 272 square kilometre search area, it is worth noting that the AHIMS register only includes sites which have been reported to the NSW OEH. Generally, sites are only recorded during targeted surveys undertaken in either development or research contexts. Accordingly, this search cannot be considered to be an actual or exhaustive inventory of Aboriginal objects situated within the local area or indeed within the activity area itself.

Searches have been conducted of the NSW State Heritage Inventory and the Australian Heritage Database. No Aboriginal heritage sites are listed on these as being in the subject area.

***It is noted that for the purposes of Due Diligence, the AHIMS search results may be relied on for 12 months.***

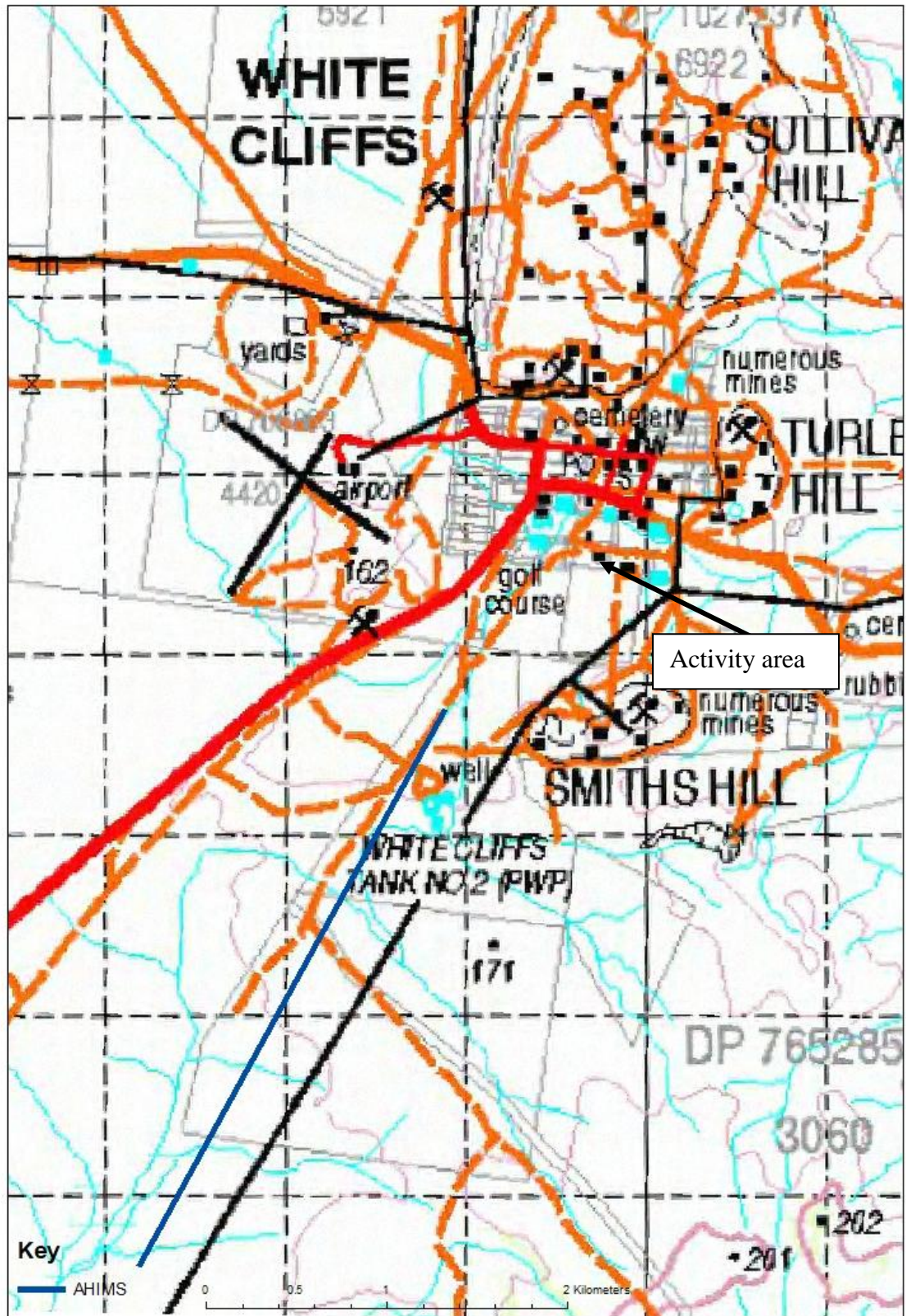


Figure 2 The location of the AHIMS site.

## 2.2 Assessment of the Archaeological Sensitivity of Landscape Features in the Proposed Impact Area

Regardless of the AHIMS search results and whether or not they indicate the presence of Aboriginal objects, it is a requirement to consider if Aboriginal objects are likely to be in the proposed activity area. *The Due Diligence Code of Practice - Step 2b (NSW DECCW 2010)* lists the following landscape features that indicate the likely existence of Aboriginal objects. Areas located:

- within 200 metres of waters (including the sea), or
- within a sand dune system, or
- on a ridge top, ridge line or headland, or
- within 200 metres below or above a cliff face, or
- within 20 metres of or in a cave, rock shelter, or a cave mouth; and
- on land that is not disturbed land (as defined on page 18 of the Due Diligence Code).

The Due Diligence Code of Practice does not, however, take into consideration other factors which could influence whether or not an area may contain Aboriginal objects, such as, for example, gradient (i.e. moderate gradient or steep land is unlikely to contain Aboriginal objects), rockiness (i.e. very rocky land, irrespective of its location, may not be archaeologically sensitive) or stream order (i.e. land within 200m of a 1<sup>st</sup> order stream will have a different level of archaeological sensitivity compared to a 3<sup>rd</sup> or 4<sup>th</sup> order stream).

### *Landscape*

The local area has been utilised by Europeans for grazing, mining and habitation, commencing in the 1860s. The effects of these activities across the area have included the removal of original vegetation and the subsequent erosion of topsoil due to water and wind erosion.

The study area is situated within the semi-arid Mulga Lands Bioregion and the Paroo catchment. Surface exposures of rocks at White Cliffs are confined predominantly to the hills and occur as sparsely outcropping Cretaceous sedimentary rocks, with a local capping of hard, bouldery Tertiary silcrete. The low areas are covered by gibber plains and sand plains, with local areas of alluvium along major watercourses. The gibber is comprised of highly weathered silcrete and ironstone pebbles, patinated with a smooth desert varnish (Brown, R. and Brown N)

[http://brovey.yolasite.com/resources/White\\_Cliffs\\_geology.pdf](http://brovey.yolasite.com/resources/White_Cliffs_geology.pdf).

The topography of the subject area consists of a simple slope of low gradient with northerly aspect.

The wider local area is likely to have provided Aboriginal land users with a limited variety of resource zones related to the surrounding plains and the intermittent flow of the riverine systems. Immediately to the northeast of the proposed activity area, at a



distance of some 150 metres, is situated an ephemeral drainage line. However, this feature would only have held water briefly after heavy rains, and remained dry most times. It is predicted the focal locale of occupation within the broader landscape would have been at some considerable distance from the proposed activity area, nearer to more permanent water sources, and it would have been in those regions where artefact discard of relatively high densities would have occurred. The subject activity area is predicted to have been very sparsely used for Aboriginal occupation, and accordingly associated artefact distribution is expected to be low.

### 2.3 Conclusion

The proposed activity area is on land which is assessed to be of generally very low archaeological sensitivity as a result of:

- the nature of the landform, being a simple slope away from reliable sources of water; and
- the high levels of previous disturbance.

### 3. DESKTOP ASSESSMENT AND VISUAL INSPECTION

#### 3.1 Desktop Assessment

Although no academic investigations have been conducted that specifically examine the White Cliffs district, some academic studies have been undertaken within the broader region. Consideration of a predictive model of site type and site location can be made through recourse to these previous studies and similar studies conducted within comparable geographical and environmental contexts relevant to the activity area. From this a contextual and relevant assessment of the archaeological potential of the study area can be formed, as the results of these may be applied to the current study as corollaries for inferred patterns of Aboriginal land usage prior to European occupation.

Pearson (1981) conducted a comprehensive study of the upper Macquarie region in relation to his PhD dissertation. In addition to carrying out extensive research of historical sources and reviewing ethnographic data, Pearson (1981) excavated three rock shelters and compiled information about other known archaeological sites in his study area.

Pearson (1981) developed a pattern of Aboriginal occupation through the analysis of site location attributes in relation to just over 40 recorded open campsites within four sample areas in the region. He found that archaeological sites could be grouped into two main types, occupation sites, and non-occupation sites which included scarred or carved trees, ceremonial sites, grinding grooves and burial sites. Through analysis of the location of these sites he proposed the following model for the prediction of site location (Pearson 1981):

- The distance of sites from water ranged from 10 to 500 m. However, larger sites were generally located nearer to water (Pearson's average distance from water being 90 m);
- Both good soil drainage and views over watercourses were important site location factors;
- Level ground, shelter from prevailing winds, and elevation above cold air (Pearson's average elevation being 9.1 m) also influenced site location;
- The majority of sites were situated in places that would originally have been comprised of open woodlands in order to source adequate fuel;
- Burial sites and grinding grooves were located as close to habitation as possible. However grinding grooves occur only where there is suitable outcropping sandstone, and burial sites are generally found in areas where soils are of sufficient depth and penetrability for the purposes of interment;
- Ceremonial sites such as earth rings were situated away from campsites;
- Similarly, stone arrangements were also located away from campsites, in isolated places, and were more likely to be located on small hills or knolls, although they can also occur on flat land;

- Scarred or carved trees were distributed with no obvious patterning other than their proximity to watercourses, and in areas more frequently used for camps;
- Quarry sites were located where known outcrops of serviceable stone were reasonably accessible; and
- Pearson suggests that Aboriginal campsites were rarely used for longer than three nights and that sites with evidence of extensive archaeological deposit probably represent accumulations of material over a series of short visits.

Koettig (1985) undertook a comprehensive study relating to Aboriginal occupation of the Dubbo area. Following a desktop review, Koettig (1985) commenced a systematic survey of a variety of landform units and stream orders so as to ascertain the relationship of site type and site location to specific environmental settings within three principal physiographic zones. As a result of this study Koettig (1985) proposed that:

- Aboriginal sites will be distributed throughout all landscape units;
- Open artefact scatters, scarred or carved trees and grinding grooves are the most common site types; and
- The location and comparative size of sites is principally determined by environmental and social influences. While site location dictated by social determinants cannot be predicted, some modelling of site type and site location in relation to environmental factors may be made. Those factors include:
  - *Proximity to water:* although sites were found in all landscape settings including hills and ridges distant from water, the largest campsites were located close to permanent water.
  - *Availability of food resources:* While the widest range of foods was found along major watercourses in association with the available permanent water, some foods were seasonal and located away from permanent watercourses.
  - *Geological formation:* Certain site types occur in particular settings. Grinding grooves are located where there are suitable sandstone outcrops, while quarries are found where there is a useable and accessible stone resource. Burials are most likely to be found in sandy deposits such as those that exist on alluvial flats.

Holdaway et al. (2002) prepared a preliminary statement of the archaeological significance of Peery Lake, c. 30 km east of White Cliffs. The study area included Peery (Pine) Creek, Round Hill and parts of the Peery Lake foreshore. Survey results at the latter location show that artefacts are distributed throughout the foreshore area in varying densities. The study investigated how geomorphic factors influence the surface exposure where archaeological material is found. Geomorphic factors were investigated at the micro level to understand the variety of landform processes that expose and bury artefacts in a semi arid landscape, in particular, the affects of the pastoral industry on the landscape.

A desktop study Aboriginal site distribution in the Lachlan CMA (NSW DECC 2007) may be cautiously extrapolated to the Central Darling. This review indicates that the single most determining factor influencing the distribution of sites across the landscape is water. Sites and higher artefact density is strongly tethered to water sources with average of sites distance from water being 294 metres (NSW DECC 2007). On the Lachlan Plains the average distance of sites from water was found to be 117 metres.

Vanessa Edmonds conducted a field survey in 1991 in relation to a proposed electricity transmission line extending from Wilcannia to White Cliffs. On the gibber plain to the south of the White Cliffs township, commencing at a distance of some 1.5 kilometres from the town and extending southwest, she identified a sparse but continuous artefact scatter, AHIMS site #15-5-0017, extending over a distance of some 4 kilometres. The artefacts were predominantly of silcrete, struck from the silcrete gibber pebbles found across the plain.

Phil Purcell (2004) conducted an investigation at Peery Lake on the northwestern edge of the Lake. The Lake is located 30kms east of White Cliffs. Peery Lake is a major physiographic feature of the Paroo channel country and is the terminal drainage basin of the Paroo. The development proposal investigated by Purcell was located across five landforms: Gibber mantled plain, Stony mantled slope, Alluvial channel, Lake, and Artesian spring. Artefacts were distributed among each landform type, and among various surface exposures ranging from lag deposits, scalds and areas of bare earth. Stony mantled slopes had the least number of artefacts which were scattered in very low numbers often long distances apart. There was no evidence found to suggest that geomorphic processes are obscuring greater numbers of artefacts along the slopes. The crest margins had higher concentrations but the larger assemblages were along the foreshore areas of the lake.

#### *Predictive Model of Aboriginal Site Distribution*

Based on the above review and a consideration of the elevation, geology, hydrology and topography of the study area, the type of Aboriginal objects known to occur in the region and the potential for their presence within the subject area are listed as follows.

The type of sites known to occur in the region and the potential for their presence within the study area are listed as follows:

##### *Stone Artefacts*

Stone artefacts can be found either on the ground surface and/or in subsurface contexts. Stone artefacts will be widely distributed across the landscape in a virtual continuum, with significant variations in density in relation to different environmental factors. In the local vicinity stone artefacts may be found on the gibber plain, given the abundant availability of silcrete represented by the gibber pebbles from which artefacts may be produced. Artefact density and site complexity is also expected to be greater near reliable water and the confluence of a number of different resource zones. The detection of

artefacts during a surface survey depends on whether or not the potential archaeological bearing soil profile is visible.

Given the environment of the proposal area, stone artefacts are predicted to be present in the very low density only, and if present, to be in a highly disturbed context.

#### *Hearths*

Hearths are the remains of cooking fires. In western NSW they are often made from stone or termite mound material. There is low potential for this site type to be present in the proposal area.

#### *Grinding Grooves*

Grinding grooves are found in rock surfaces and result from the manufacture and maintenance of ground edge tools. Grinding grooves are only found on sedimentary rocks such as sandstone. Given the absence of suitable rock exposures in the study area grinding groove sites are unlikely to be present.

#### *Burials sites*

The potential for burials to be present in the proposal area is considered to be low given the high levels of previous disturbance within the site.

#### *Rock Shelter Sites*

Rock shelter sites are unlikely to be present in the study area given the absence of large vertical stone outcrops.

#### *Scarred and Carved Trees*

Scarred and Carved trees result from either domestic or ceremonial bark removal. Carved trees associated with burial grounds and other ceremonial places have been recorded in the wider region. In an Aboriginal land use context this site type would most likely have been situated on flat or low gradient landform units in areas suitable for either habitation and/or ceremonial purposes.

Bark removal by European people through the entire historic period and by natural processes such as fire blistering and branch fall make the identification of scarring from a causal point of view very difficult. Accordingly, given the propensity for trees to bear scarring from natural causes their positive identification is impossible unless culturally specific variables such as stone hatchet cut marks or incised designs are evident and rigorous criteria in regard to tree species/age/size and its specific characteristics in regard to regrowth is adopted.

Nevertheless, the likelihood of trees bearing cultural scarring remaining extant and in situ is low given events such as land clearance and bushfires. Generally scarred trees will only survive if they have been carefully protected (such as the trees associated with Yuranigh's grave at Molong where successive generations of European landholders have actively cared for them).

There is, accordingly, very low potential for this site type to be present given the absence of trees within the activity area.

#### *Stone Quarry and Procurement Sites*

A lithic quarry is the location of an exploited stone source (Hiscock & Mitchell 1993: 32). Sites will only be located where exposures of a stone type suitable for use in artefact manufacture occur. Quarries are rare site types in the region. A stone quarry is could be recorded during the current study given the presence of gibber pebbles.

#### *Ceremonial Grounds*

In south-eastern Australia, ceremonial grounds were used in maturity rites associated with the initiation of youths. Bora grounds generally consisted of one or more circular rings defined by mounded earth, sand and/or rocks. This is a rare site type given the nature of the materials used in there construction. Agricultural practices and land clearing is likely to remove surface evidence of these places. The identification of ceremonial grounds is often dependent on Aboriginal oral tradition and historical records. This site type is unlikely to be present in the proposal area.

### 3.2 Visual Inspection

A comprehensive visual inspection of the proposed activity area was conducted in May 2017. Tony Latham (White Cliffs WTP engineer) assisted through giving access to the fenced proposed activity site and explaining aspects in relation to the water treatment plant.

The area was found to be comprehensively disturbed as the result of previous land surface modifying works, including comprehensive disturbance to large areas as the result of mechanical grading.

No Aboriginal objects were recorded and activity area was assessed to be of very low archaeological sensitivity.

#### 4. LEGISLATION

The National Parks and Wildlife Act 1974 (NPW Act) is the primary legislation for the protection of some aspects of Aboriginal cultural heritage in NSW. One of the objectives of the NPW Act is:

*... the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including but not limited to: (i) places, objects and features of significance to Aboriginal people ... (s.2A(1)(b))*

Part 6 of the NPW Act is administered by the NSW Office of Environment and Heritage (NSW OEH) and provides specific protection for Aboriginal objects and declared Aboriginal places by establishing offences of harm. Harm is defined to mean destroying, defacing or damaging an Aboriginal object or declared Aboriginal place, or moving an object from the land.

Section 86 of the NPW Act, *Harming or desecrating Aboriginal objects and Aboriginal places*, sets out the penalties for harming an Aboriginal object. For an individual, the penalty for harming an object the person knows is an Aboriginal object, is imprisonment for up to 2 years and a significant fine (>\$200,000).

Anyone proposing to carry out an activity that may harm an Aboriginal object or declared Aboriginal place must investigate, assess and report on harm that may be caused by the activity they propose. An Aboriginal Heritage Impact Permit (AHIP) may be required if harm to Aboriginal objects and declared Aboriginal places is proposed. When this is the case, an Aboriginal Cultural Heritage Assessment Report (ACHAR) is required to support the AHIP application. No Aboriginal objects are known to be present in the activity area and site is assessed to be of very low archaeological sensitivity. Based on the current assessment it is concluded that an AHIP is not required.

Further archaeological investigations such as test excavations can undertaken to provide a more informed assessment. Such work can be done within the provisions of the NSW DECCW (2010b) Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (the Code of Practice). Test Excavation undertaken in accordance with the Code of Practice, allows harm to Aboriginal objects to occur (during excavation) without the need for an AHIP. Such work would normally only take place if the Due Diligence assessment concluded that further archaeological works were necessary. In this case, that conclusion has not yet been reached.

## 5. RECOMMENDATIONS

*The Due Diligence Code of Practice (NSW DECCW 2010) - Step 4* of the Due Diligence Code of Practice (NSW DECCW 2010) indicates that where the assessment or visual inspection does not indicate that there are (or are likely to be) Aboriginal objects, the proponent can proceed with caution without an AHIP application. Section 4 provides further summary information of the legislative context relating to Aboriginal heritage in development contexts.

The assessment has concluded that based on the extent of previous impacts, the activity area is not archaeologically sensitive. No Aboriginal objects are known to be present.

Accordingly, further archaeological assessment and an AHIP are not required.

If Aboriginal objects are found while undertaking the activity the proponent must stop work and notify the NSW OEH; an AHIP may need to be sought.

If human skeletal remains are found the proponent must stop work immediately, secure the area to prevent unauthorized access and contact the NSW Police and OEH.



## 6. REFERENCES

- Holdaway, S. and Fanning, P. and Shiner, J. 2002. Geoarchaeological investigation of the Aboriginal landscape occupation in Peery National Park, western NSW. Final report to NSW NPWS.
- Hiscock, P. & Mitchell, S. 1993 *Stone Artefact Quarries and Reduction Sites in Australia: Towards a Type Profile*. AGPS: Canberra.
- Koettig, M. 1985 Assessment of Aboriginal Sites in the Dubbo City area. Report to Dubbo City Council.
- NSW DECCW 2010a Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.
- NSW DECCW 2010b Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010.
- NSW Department of Environment, Climate Change and Water 2007 Data Audit and overview of the Aboriginal Cultural Heritage in the Lachlan Catchment. Report to the Lachlan CMA Regional Aboriginal Reference Group.
- Pearson, M. 1981 *Seen Through Different Eyes: Changing Land Use and Settlement Patterns in the Upper Macquarie River Region of NSW from Prehistoric Times to 1860*. Ph.D. Thesis, Department of Prehistory and Anthropology, Australian National University, Canberra.
- Purcell, P. 2004 Cultural Heritage Technical Report Peery Lake, Paroo Darling National Park.
- Purcell, P. 2010 Aboriginal Cultural Heritage Assessment Rapid Response Desktop Assessment.

APPENDIX 1 – AHIMS DATABASE SEARCH



**Office of  
Environment  
& Heritage**

**AHIMS Web Services (AWS)**  
Extensive search - Site list report

Your Ref/PO Number : White Cliffs  
Client Service ID : 276325

---

<b>SiteID</b>	15-5-0017	<b>SiteName</b>	Samples 1-4,Karara;	<b>Datum</b>	AGD	<b>Zone</b>	54	<b>Eastng</b>	698200	<b>Northing</b>	6583500	<b>Context</b>	Open site	<b>Site Status</b>	Valid	<b>SiteFeatures</b>	Artefact :-	<b>SiteTypes</b>	Isolated Find	<b>Reports</b>	2020,2021	
		<b>Contact</b>		<b>Recorders</b>														<b>Permits</b>				

---

**Report generated by AHIMS Web Service on 11/04/2017 for Julie Dibden for the following area at Datum:GDA, Zone: 54, Eastings: 691000 - 707000, Northings: 6579000 - 6596000 with a Buffer of 50 meters. Additional Info : Archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 1**  
This information is not guaranteed to be free from error omissions. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.