MT FYANS
WIND FARM

APPENDIX T

PRELIMINARY CULTURAL HERITAGE REPORT

BIOSIS

MARCH 2017

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Mount Fyans Wind Farm, Mortlake, Victoria: Preliminary Cultural Heritage Assessment

Prepared for Hydro Tasmania
31 March 2017

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Quality Assurance	Amy Wood

Mapping	In accordance with the approved form, the following projected spatial data has been forwarded to AV for this CHMP: Study area boundary.

Summary

Activity

This is a Preliminary Cultural Heritage Assessment for the whole of a large and diverse study area for the Mount Fyans Wind Farm, a project proposed by Hydro Tasmania. The proposed activity is a high impact activity under regulation 43(1)(xxvi) of the *Aboriginal Heritage Regulations 2007* as 'land used to generate electricity, including a wind energy facility'. The study area is in an area of cultural heritage sensitivity under regulation 23(1) of the *Aboriginal Heritage Regulations* 2007 as it contains the named waterways, Salt Creek and Blind Creek.

Based on the current extent of the study area (which includes areas of cultural heritage sensitivity) there is a mandatory trigger for a CHMP under Section 46(a) of the *Aboriginal Heritage Act 2006.* Should areas of cultural heritage sensitivity be avoided it may be possible to avoid a mandatory CHMP, however the risk to Aboriginal cultural heritage will not be entirely removed.

This report will use a project specific predictive model and subsequent ground-truthing to assess the potential for Aboriginal cultural heritage over the study area and to enable creation of an efficient methodology for further archaeological investigation.

Eastern Maar Aboriginal Corporation has an existing Native Title Application over the majority of the project area (referred to as the Mount Fyans Wind Farm herein). AV have informed the Heritage Advisor (HA) of the intention of the Kuuyang Maar Aboriginal Corporation to reapply for Registered Aboriginal Party status, and have advised Biosis to consult with both groups for the subsequent CHMP (refer s. 1.8). The Martang are the Registered Aboriginal Party for the area referred to herein as the Western Extension Area.

The project will be divided into two study area according to the boundaries of the respective Traditional Owner groups (Figure 2). The Mount Fyans Wind Farm CHMP will be assessed by AV as there is no appointed RAP. The Martang will evaluate the CHMP for the Western Extension Area.

Activity Location

The study area is located near the township of Mortlake, approximately 200 km west of Melbourne (Figure 1). It is approximately 578 ha in area and is bordered to the south by the Hamilton Highway, to the north by Woorndoo-Dundonnell Road, to the east by Six Mile Lane and Darlington-Nerrin Road and to the west by the Hamilton Highway and Salt Creek (Figure 1).

The majority of the study area is within Farming Zone (FZ, Moyne Shire), with some areas of roadside zoned Road Zone (RDZ1).

The study area is contained within the Victorian Volcanic Plain Bioregion, and the surface geology is the result of quaternary basalt flows, with small areas of more recent alluvial sediments (derived from basalt) around lakes and waterways. The most recent basalt flows, which are confined to the northern section of the study area, have formed a complex of stony rises, interspersed with low-lying areas and wetlands. Older basalt flows in the southern section of the study area have weathered to a more undulating or flat landscape.

Most of the study area has been cleared of native vegetation and is currently managed for grazing and cropping. However areas of remnant native vegetation persist within the stony rises, and in low-lying areas associated with depressions and drainage lines. Several roadsides within the wider area are known to support high-value native grasslands. Very few remnant native trees are present within the main wind farm area.

The study area includes upper reaches of Blind Creek, the east bank of Salt Creek, a number of unnamed tributaries of Stony Creek and Mount Emu Creek and a number of wetlands and farm dams (Figure 2)

The study area also includes a proposed transmission line corridor, which extends from the south-western edge of the wind farm, through an area supporting open River Red Gum woodland and a commercial Blue Gum plantation before terminating at the Mortlake Power Station (Figure 4).

The study area is within the:

- Victorian Volcanic Plain Bioregion
- Hopkins River Basin
- Management area of the Glenelg Hopkins CMA
- Moyne Shire Local Government Area.

The extent of the study area covered by this study is shown in Figure 2.

Cultural Heritage Desktop Assessment

A Desktop Assessment was undertaken to provide background information on the activity and its impacts, other archaeological studies, previously recorded Aboriginal places, the environment and to develop a prediction model for the study area.

At this stage, no consultation with any Aboriginal Traditional Owners has been undertaken.

Cultural Heritage Desktop Assessment Results

The study area lies within the volcanic undulating plains and stony rises of Victoria's western district. A number of intermittent and perennial crater lakes and swamps are present within the vicinity; two of which are within the study area. It is also surrounded by creek systems, including Blind Creek and Salt Creek, which were an important resource to the *Girai wurrung.* The geographic region contained an array of flora and fauna species as well as watercourses which the Aboriginal people were known to have harvested and depended upon. Salt Creek is a known location of sandstone extraction by Aboriginal people and shells, red clay, obsidian and greenstone were brought to the area for trade. Mature red gums have been identified within the vicinity of the study area.

Spatial predictive modelling was employed to make broad predictions about the study area based on generalisations across a wider area in order to inform more detailed and targeted investigations. The modelling was undertaken at small scale using environmental and topographic datasets which were processed individually and then combined through weighted overlay modelling. This was used as a guide for potential cultural heritage sensitivity. Figure 5e shows an overview of the results, which show that Blind Creek, Salt Creek, and the stony rises in the north of the study area are the most likely areas for the presence of Aboriginal archaeological places.

The ground truthing of this spatial predictive modelling took place over two separate visits to the study area. The model was mostly supported, with additional areas of sensitivity identified which were not identified through the specific criteria of the predictive model, or where the sensitivity value varied.

Previous regional studies and CHMPs in the general area have detected evidence for past Aboriginal land use, through the identification of artefact scatters, scarred trees, burial/human remains and mounds that occur adjacent to lakes and swamps or stony rises in the geographic region and throughout the study area.

Based on the review of the geographic region, including its environment, recorded Aboriginal archaeological places, previous archaeological assessments, an analysis of spatial data and the reconnaissance assessment, a site prediction model was developed for the study area. This model not only identifies what site types are likely to occur, but where they are most likely to occur. Within the current study area, the areas of highest sensitivity for the presence of Aboriginal archaeological places are along major waterways and on high ground, particularly around Blind Creek and Salt Creek. As Figure 5e illustrates, most of the study area is considered to be of lower likelihood for the presence of cultural material (on the given spectrum), particularly in the southern section of the study area, south of the Warndoo – Darlington Road. The landscape diverges from Volcanic Plains to open, flat topography with reduced degree of slope, vegetation and favourable landforms (Figures 5b, 5c and 5d). The field reconnaissance

assessment confirms the findings of the predictive modelling conclusions, achieved by confirming the location of significant and sensitive landform features and broad areas of previous disturbance throughout the study area.

Overall, the model provides the basis for the development of a targeted survey methodology for the next stage assessment. No Aboriginal Places were located during this phase of the assessment.

Acknowledgements

Biosis Pty Ltd acknowledges the contribution of the following people and organisations in preparing this CHMP:

- Michael Hogan (Hydro Tasmania)
- Henham Rous (local resident)
- Mark Venosta, Delta Freedman, Jenny Fiddian, Stephanie Vick and James Shepard (Biosis Pty Ltd)

Abbreviations

AV	Aboriginal Victoria
BP	Before Present
CHMP	Cultural Heritage Management Plan
DGPS	Differential Global Positioning System
DPC	Department of Premier and Cabinet
EMAC	Eastern Maar Aboriginal Corporation
EVC	Ecological Vegetation Class
GDA94	Geodetic Datum Australia 1994
GSV	Ground Surface Visibility
HA	Heritage Advisor
HV	Heritage Victoria
KMAC	Kuuyang Maar Aboriginal Corporation
MGA	Map Grid of Australia
RAP	Registered Aboriginal Party
TO	Traditional Owners
VAHR	Victorian Aboriginal Heritage Register

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Part 1 – Cultural Heritage Assessment

1 Introduction

This is a Preliminary Cultural Heritage Assessment for the whole of a large and diverse study area for the Mount Fyans Wind Farm, a project proposed by Hydro Tasmania. The proposed activity is a high impact activity under regulation 43(1)(xxvi) of the *Aboriginal Heritage Regulations 2007* as 'land used to generate electricity, including a wind energy facility'. The study area is in an area of cultural heritage sensitivity under regulation 23(1) of the *Aboriginal Heritage Regulations* 2007 as it contains named waterways (Blind and Salt Creeks).

Based on the current extent of the study area (which includes areas of cultural heritage sensitivity) there is a mandatory trigger for a CHMP under Section 46(a) of the *Aboriginal Heritage Act 2006.* Should areas of cultural heritage sensitivity be avoided it may be possible to avoid a mandatory CHMP, however the risk to Aboriginal cultural heritage will not be entirely removed.

Eastern Maar Aboriginal Corporation have an existing Native Title Application over the majority of the project area (referred to as the Mount Fyans Wind Farm, CHMP 12657 herein). Aboriginal Victoria (AV) have informed the Heritage Advisor (HA) of the intention of the Kuuyang Maar Aboriginal Corporation to reapply for Registered Aboriginal Party (RAP) status, and have advised Biosis to consult with both groups for any future CHMP. The Martang are the RAP for the area referred to herein as the Western Extension Area (CHMP 12658).

The project will be divided into two study areas according to the boundaries of the respective Traditional Owner groups (Figure 2). The Mount Fyans Wind Farm CHMP will be assessed by AV as there is no appointed RAP. The Martang will evaluate the CHMP for the Western Extension Area.

1.1 Study area Location

The location of the study area is indicated on Figure 1. It is located on farmland south of Dundonnell, 5km north-east of Mortlake, and approximately 200 km west of Melbourne. The study area is approximately 578 hectares of land owned by 13 separate property owners. The study area is situated within the Parishes of Mortlake, Darlington West, Jellalabad, Tootak and Ligar and the local government area of Shire of Moyne and can be found on RACV VicRoads Map 74 (see Figure 1). The wider geographic region of the study area includes the undulating plains and stony rises of Victoria's western district. These undulating plains are scattered with lakes, floodplains and swamps. The north-east of the region includes stony rises and the south-west includes volcanic eruption points with associated scoria cones, lava shields and scoria deposits. This geographic region reflects similar access to resources as the study area.

1.1 Sponsor

The sponsor for the future CHMPs is:

Hydro Tasmania

Mr. Michael Hogan

Level 11, 4 Elizabeth Street, Hobart TASMANIA 7000

Contact: (03) 6230 5544

1.2 Heritage Advisors

The Heritage Advisors (HA) for this CHA are Dr Ilya Berelov and Amy Wood, Biosis Pty Ltd.

Dr Ilya Berelov BA(Hons), GradDipEd, PhD, MAACAI

Dr Ilya Berelov is Team Leader of Cultural Heritage with Biosis Pty Ltd, and specialises in cultural heritage assessment, expert advice, management of complex and large-scale cultural heritage management projects, Indigenous community consultation, and gaining approvals from regulatory authorities. Ilya has been actively involved in the research, teaching and management of archaeological projects across Australia, Israel, Jordan, Turkey, and the United States of America for over 17 years.

Ilya holds a PhD in Archaeology (La Trobe University) specialising in the subsistence strategies of mobile societies. Since 1993 he has participated in numerous research and salvage projects in a variety of geographic settings and on a range of temporal scales. His involvements have focused primarily on multidisciplinary collaborations into prehistoric cultures of the ancient Near East and Australia. Recently, Ilya has concentrated on heritage education, and cultural resource management in Australia and the American Southwest. He has specialised in artefact analysis, particularly in discard behaviors and alternate methods of artefact quantification at both one-period and multi-component sites. Ilya is a fully qualified HA as specified in the requirements of the Victorian *Aboriginal Heritage Act 2006*.

Amy Wood BA Archaeology (Hons)

Amy has nine years experience working as consultant archaeologist in New South Wales and Victoria. Amy received a B.A. (Honours) in Archaeology from the University of Queensland. Her honours thesis focussed on the role of Archaeology in Native Title determinations. Amy has work experience in the USA and Portugal, and consulting experience in Sydney and southern New South Wales on several major infrastructure projects. Whilst in Victoria with Biosis, Amy has completed several CHMPs and Heritage Assessments. As a field archaeologist Amy has extensive experience in salvage excavations, sub-surface testing, surveying, recording and artefact analysis. Amy is a member of the Australian Archaeological Association Inc and the Australasian Society for Historical Archaeology. Amy is a fully qualified HA as specified in the requirements of the *Aboriginal Heritage Act 2006*.

1.3 Owners/Occupiers of the study area

The owners of the study area, when the initial site inspections were undertaken in 2012 and 2013 were as follows:

Table 1 Owners and Occupiers within the study area

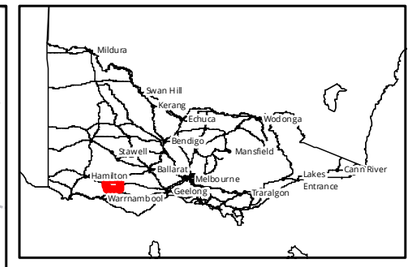
Property	Contact Name
Stradbroke	Henham Rous
	Keith Stradbroke
	Rosie Stradbroke
Goldsworthy/Roycroft/Blackmore	Colin Goldsworthy
Donaldson/Manooka	Bruce Donaldson
Walmsley	Ric & Pamela Walmsley
Erwin	Wesley Erwin
McSween	Ian McSween
Lehman	Jason Lehman

Property	Contact Name
Anders	Derek Anders
Down Ampney Corp Pty. Ltd.	Nathan Hahn
Australian Blue Gum Plantations Pty Ltd	Martin Clarke
Draffen Properties Pty Ltd	Stirling Draffen
Jennifer Mary Armstrong	Stirling Draffen
MIRVAC Funds Management Ltd	Sean Sanson

1.4 Registered Aboriginal Party

As this is a Preliminary Cultural Heritage Assessment, no Traditional Owners were consulted as part of this assessment. For the Mount Fyans Wind Farm CHMP 12657, there is currently no Registered Aboriginal Party (RAP) appointed for the region that includes the study area., however Eastern Maar Aboriginal Corporation have lodged an application for RAP status. As of 31 March 2017, no decision on this application has been made. Under Section 65 (b)(i) of the *Aboriginal Heritage Act 2006*, a Sponsor may apply to the Secretary, Department of Premier and Cabinet (DPC) for approval of a CHMP if there is no relevant RAP.

For the Western Extension Area CHMP 12658, Martang Pty Ltd are the RAP for the region that includes the respective study area.



Legend

Study area

Figure 1: Location of the Study area - Mount Fyans windfarm, Victoria.

0 1 2 3 4 5

Kilometers

Scale: 1:100,000 @ A3

Coordinate System: GDA 1994 MGA Zone 54

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1.5 Activity Description

Biosis Pty Ltd. was commissioned to investigate the archaeological and cultural heritage values of the study area. The majority of the study area is within Farming Zone (FZ, Moyne Shire), with some areas of roadside zoned Road Zone (RDZ1. The total size of the study area is 578 hectares.

1.5.1 Nature of the Activity

The Sponsor proposes to develop the study area as a wind farm for the purposes of creating electricity. The intended use of the study area is shown in Appendix 1.

A general description of the works associated with the proposed activity follows:

- Access track establishment works to each turbine location, followed by the construction of turbine foundations at each chosen location;
- Underground electricity utilities will be extended throughout the study area to connect each turbine and to connect with the substations.

1.5.1.1 Likely Impacts on the Ground Surface

The final location of impacts has not yet been determined, as this report and future findings will inform the location of the wind farm development. However, construction associated with the activity will include the following impacts on the ground surface and former buried surfaces within the study area:

- Stripping of topsoil across all turbine footprints, substations and site offices.
- The construction wind turbines, substations, access tracks and site offices. Depth of excavation is unknown at this stage.
- Underground electricity between turbines and the substations will be excavated to standard depths not exceeding one metre.

All of these activities have some potential to impact Aboriginal cultural heritage if it is present within the study area.

1.6 Extent of the study area

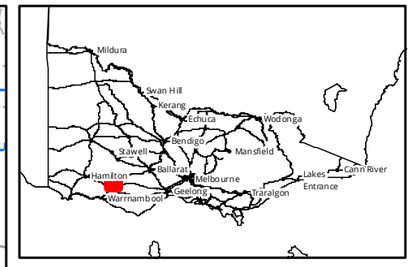
The study area is located within the Hopkins River basin, and is located in between the Mt Emu Creek and Fiery/Salt Creek catchments. It is also within the Victorian Volcanic Plain (VVP) bioregion (DSE Biodiversity Interactive Map; www.dse.vic.gov.au). The broader study area occupies 578 hectares and is bounded to the south by the Hamilton Highway; to the north by Warndoo –Dundonnell Road, to the east by Six Mile Lane and Darlington-Nerrin Road and to the west by the Hamilton Highway and Salt Creek (Figure 1). The transmission line extends south and southwest from Hamilton Highway, across private and commercial plantation properties, to Connewarren Lane.

The study area comprises undisturbed stony rises to the north of Woorndoo-Dundonnell Road created by lava floes from nearby Mount Fyans. Most of the study area to the south of this consists of open, cleared pastured paddocks that have been used for grazing or have been ploughed for crops. The study area is dissected in the west by Blind Creek, and a number of other small drainage features and creeks occur in the very south and across the north through the stony rises.

The extent of the study area is indicated in Figure 2. All geographic coordinates in this CHMP are referenced to the Victorian Government Standard GDA94 MGA.

At this stage, the number and locations of turbines and access tracks is unknown.

All properties are within the Shire of Moyne, in Hampton County. They are located within the Parishes of Mortlake, Darlington West, Jellalabad, Tootak and Ligar.



ADVERTISED PLAN

Legend

- Study area
- ★ VAHR Places
- Kuuyang Maar Aboriginal Corporation RAP Application area, and Eastern Maar Aboriginal Corporation Native Title Application area
- Martang RAP area

Figure 2: Extent of the Activity Area

0 0.85 1.7 2.55 3.4 4.25

Kilometers

Scale: 1:80,000 @ A3

Coordinate System: GDA 1994 MGA Zone 54

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Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

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1.7 Documentation of Consultation

No consultation with Aboriginal Traditional Owners was undertaken during the preparation of this Preliminary Cultural Heritage Assessment.

Martang, Eastern Maar and Kuuyang Maar will be consulted as part of any future CHMPs for this project.

1.7.1 Native Title

Eastern Maar Aboriginal Corporation have lodged a Native Title claim, registered under 'Eastern Maar People'. This claim covers the entirety of the study area, and was approved as a registered claim on 20 March 2013 by the National Native Title Tribunal (NNTT). The Eastern Maar People are the native title party for the project under Section 6(1)(a) of the *Aboriginal Heritage Act 2006*.

However, Martang have been appointed by the Victorian Aboriginal Heritage Council (VAHC) as the Registered Aboriginal Party, and as such have recognised Martang as the Traditional Owners for their region. They will be the sole Aboriginal party consulted for the Western Extension Area.

2 Desktop Cultural Heritage Assessment

The following section contains the results of the Desktop Assessment. The background research and searches associated with the Desktop Assessment were undertaken by Delta Freedman, Biosis Pty Ltd. on 23rd of April 2012, and updated on 18 March 2014 and 9 December 2016. There were no obstacles in completing the Desktop Assessment.

2.1 Geographic Region

The geographic region has been selected to represent a range of landforms and resources that would be accessible from the study area. The geographic region is a representational portion of the undulating plains and stony rises of Victoria's western district. These undulating plains are scattered with lakes, floodplains and swamps. The north-east of the region includes stony rises and the south-west includes volcanic eruption points with associated scoria cones, lava shields and scoria deposits. This geographic region reflects similar access to resources as the study area.

The geographic region is shown in Figure 3.

2.1.1 Geomorphology and Geology of the Geographic Region

The geographic region is situated within the Victorian Volcanic Plain geomorphological unit. This unit is characterised by low-lying undulating plains formed on volcanic and sedimentary lithologies (State of Victoria Department of Primary Industries, 2011). Evidence of volcanic activity in the geographic region occurs in the form of stony rises, eruption points and scoria deposits located in the south-west and north-east of the region. The extinct volcanic cones within the geographic region include Mount Shadwell, 1.5 km south of the study area; and Mount Fyans; Mount Violet; and an unnamed volcanic cone in the northeast of the geographic region.

The undulating plains and stony rises of the geographic region have been shaped by streams of fluid basalt. 'As well as comprising the rock surface and sub-surface of the site, the lava flows have controlled the orientation of streams and the development of lakes and swamps at the margins of flows and on flow surfaces' (Rosengren, 2013). This basalt rock belongs to the newer volcanic group, which is the most recent volcanic activity in Victoria (State of Victoria Department of Primary Industries, 2011). The topography is broadly flat to undulating, with higher volcanic eruption points of Mount Shadwell in the west and Mount Fyans in the north. Mount Shadwell is a source of olivine, which is currently quarried (Moyne Shire Council, 2012).

The geographic region is bound to the west by Salt Creek, a channel 'deeply incised into the lava surface' (Rosengren, 2013), and the east by Mount Emu Creek and its alluvial floodplain. Salt Creek is a well defined incised watercourse, flowing southward from Lake Bolac to the Hopkins River. A number of minor tributaries and smaller creeks dissect the region, including Blind Creek which traverses the study area, and 'follows a boundary between lava flows' (Rosengren, 2013). Frequent perennial and intermittent lakes also appear throughout the geographic region, the predominant being Lake Barnie Buloke, Lake Eyang, Lake Sheepwash, Lake Gellie and Salt Lake. In addition, there are a number of swamps, the largest being Mctavish Swamp in the north-west and Gum Swamp (centrally located).

The soils of the geographic region are shallow stony earths and dark clays (State of Victoria Department of Sustainability and Environment, 2011).

The geomorphology and geology of the geographic region is shown in Figure 3.

2.1.2 Geomorphology and Geology of the study area

The study area is characterised by Pliocene/Pleistocene newer volcanic lava flows (State of Victoria Department of Primary Industries, 2011) (Figure 4). The main landforms are undulating plains and stony rises (Figure 3). Areas of poorly defined drainage that a likely to be frequently inundated during winter months are located throughout the study area. Blind Creek dissects the central portion of the study area and there are isolated swamps and small lakes located in the north of the study area.

Stony rises are a feature of the landscape and are associated with volcanic eruptions of Mt. Fyans (LCC 1976: 239). Soils associated with the stony rises are likely to be shallow friable gradational soils and cracking clay soils over basalt. The southern plains are likely to have deeper deposits of sodic and non-sodic texture contrast soils with some gradational soils also present (State of Victoria Department of Primary Industries 2011).

The study area is marked by two discrete periods of volcanism. These two periods have manifested in sharply contrasting landscapes. The older and weathered lava flows from 1-3 million years ago now appear as flat to gently undulating surfaces with little to know surface rock. North of Woorndoo – Darlington Road, the most recent Mount Fyans eruption formed a landscape of complex stony rises (mounds, ridges and depressions), sharp contours and a high frequency of loose stone and boulders. This area is a significant example of long basalt lava flows which has remained mostly undisturbed (Rosengren, 2013).

The wetlands in this northern section feature high cliffed shorelines and lunette deposits, and are 'unusual in a Victorian context' (Rosengren, 2013).

2.1.3 Climate of the Geographic Region

The climate of the geographic region has been relatively stable for the last 5,000 years with warm dry summers and mild wet winters. Prior to about 10,000 years ago, particularly at the end of the Last Glacial Maximum, conditions were cooler and drier than today, but may have still resulted in relatively abundant resources on which Aboriginal people depended.

Victoria is within a Temperate Zone signified by a warm summer and cool winter, autumn and spring being the mildest seasons with short occasional rainfall. In Dundonnell, the mean maximum temperature in January is 29° C, falling to 11° C in July and annual rainfall is 602 millimetres a year (Australian Government Bureau of Meterology, 2011).

These climatic conditions, as well as historical climatic extremes such as seasonal drought, the strength of prevailing winds and variation in water abundance would have influenced Aboriginal occupation and settlement patterns due to the particular species of flora and fauna supported by these conditions and hence the practicality of harvesting food and material resources.

2.1.4 Flora of the Geographic Region

The study area is within the Victorian Volcanic Plain bioregion. This bioregion is dominated by Cainozoic volcanic deposits which formed a flat to undulating basaltic plain containing stony rises, old lava flows, volcanic cones, eruption points, and salt/freshwater shallow lakes (Department of Primary Industries, 1996-2011).

Classification of native vegetation in Victoria follows a typology in which ecological vegetation classes (EVC) are the primary level of classification. An EVC contains one or more plant (floristic) communities, and represents a grouping of broadly similar environments. Classification of EVCs follows Department of Environment and Primary Industries benchmarks.

The Victorian Volcanic Plain pre-1750 mapping of the area encompassing the study area would have previously supported Plains Grassy Wetland (EVC 125), Plains Grassland (EVC 132), and Plains Sedgy Wetland (EVC 647) (State

of Victoria Department of Sustainability and Environment, 2011). The EVC mapping does identify remnant native vegetation within the study area.

Plains Grassy Wetland is treeless (or can rarely contain river red gums or swamp gums) and has a ground cover of grasses, small sedges, herbs and sparse shrubs. Plains Grassland is also treeless, dominated by graminoid and herb vegetation occurring on fertile cracking basalt soils prone to seasonal waterlogging or freely draining red loamy basalt derived soils. Plains Sedgy Wetland is a sedgy-herbaceous/aquatic herb vegetation cover with occasional eucalypt and tea-tree. It occurs in seasonally wet depressions on volcanic plains with fertile, silty, peaty or heavy clay soils (State of Victoria Department of Sustainability and Environment, 2011).

Many plant resources available to Aboriginal people in the region were harvested for food and material resources. Examples of these are Kangaroo Grass *Themedia triandra*, Poong'ort *Carex tereticaulis*, and Watter Ribbons *Triglochin procerum s.l.* (Gott & Conran, 1991). Roots, such as the Yam Daisy *Microserus scapigera*, seeds and fruits were important staples in the Aboriginal diet, as well as for medicine (Coutts, 1979). Tubers of Yam Daisy tubers Water Ribbons were roasted in hot coal-fired earth ovens, or ground and mixed with water to form dough which was baked in ovens (Zola and Gott, 1992). Plant resources were also utilised for domestic activities and played an essential role in providing raw material for manufacturing. F or example the leaves and stems of grasses provided fibre suitable for making coarse string for bags and fishing nets while the outer bark of trees was used to construct canoes or shelters. Wood was also used for the making of various weapons, such as spears, and implements such as axe handles and digging sticks.

2.1.5 Fauna of the Geographic Region

The environment of the geographic region supported a wide range of fauna species. Large mammals known to occur across the volcanic plain include the Eastern Grey Kangaroo *Macropus giganteus* and Black Wallaby *Wallabia bicolor*. Strict fire regimes were utilised to clear land and encourage fresh grass growth to attract these larger species (Aboriginal Affairs Victoria, 1996).

Although trees were sparse in this landscape, the area still supported populations of arboreal mammals, including the Koala *Phascolarctos cinereus*, Common Brushtail Possum *Trichosurus vulpecular* and Common Ringtail Possum *Pseudocheirus peregrinus* (Museum Victoria, 2002). A range of smaller terrestrial mammals were also present, including Eastern Barred Bandicoots *Perameles gunnii*, Short-beaked Echidna *Tachyglossus aculeatus* and several small carnivorous marsuials including the Fat-tailed Dunnart *Sminthopsis crassicaudata*, which is still known to occur in some rocky areas across the volcanic plain. Waterways supported populations of Water Rat *Hydromys chrysogaster* and Platypus *Ornithorhynchus anatinus*. The area also supported a range of microbat, frog, reptile and bird species.

The perennial and intermittent lakes and swampy areas in the geographic region would have contained aquatic animals such as fish, molluscs, crustaceans, eels and an array of wetland dependent birds, most notably the Brolga *Grus rubicunda*. Within Victoria's western district, Aboriginal people were observed taking eels and fishing in autumn, spring and summer. People also hunted by bird-snaring between autumn and spring, and snake and rat catching in spring (Coutts, Witter, McIlwraith, & Frank, 1976, p. 10).

The fauna available in the geographic region would have provided an abundant and varied diet for Aboriginal people, as well as a resource for making clothing and costume, food storing and consuming containers, medicine, shields and tools, instruments and other recreation activities (Gott & Conran, 1991).

RURAL CITY OF ARARAT

SHIRE OF CORANGAMITE

SHIRE OF MOYNE

SHIRE OF MOYNE

Nerrin Nerrin

Pura Pura

Chatsworth

Woorndoo

Hexham

Darlington

Mortlake

Ellerslie

Kolora

Glenormiston South

Noorat

Terang

Ballangeich North

Framlingham East

The Sisters

Ballangeich

MORTLAKE-ARARAT ROAD

HAMILTON HIGHWAY

HOPKINS HIGHWAY

TERANG-MORTLAKE ROAD

MCKINNONS BRIDGE-N

7422-0164
7422-0104
7422-0119
7422-0161
7422-0161160
7422-0160
7422-0158
7422-0157
7422-0118
7422-0159
7422-0162
7422-015758
7422-0574-2
7422-0560
7422-0574-3
7422-0560
7422-0210
7422-0165
7422-0165
7422-0223
7422-0561
7422-0561
7422-0211
7421-0228
7421-0232-2
7421-0232-3
7421-0232-5
7421-0232-4
7421-0115-1
7421-0115-2
7421-0115
7421-0114
7421-0113
7421-0114
7421-0113
7421-0228
7421-0231
7421-0230
7421-0185
7421-0185
7421-0227-1-6
7421-0225-4
7421-0225-1
7421-0225-2-3
7421-0227-7-9
7421-0183
7421-0184
7421-0100
7421-0097
7421-0096
7421-0099
7421-0195
7421-0160
7421-0162
7421-0198
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7422-0549
7422-0549
7422-0548
7422-0546
7422-0314
7422-0547
7422-0546
7422-0547
7422-0566
7422-0566
7422-0166
7422-0166
7522-0072
7522-0072
7522-0019
7522-0019

Legend

- Activity Area
- Geographic
- VAHR

Geomorphological Units (1:250, 000)

- Low relief, low drainage density
- Eruption points; maars, scoria cones and lava shields, including associated ash and scoria deposits
- Plains with poorly developed drainage and shallow regolith
- Plains with well developed drainage and deep regolith
- Plains and plains with low
- Stony
- Terraces, floodplains and lakes, swamps and lunettes and their deposits

Figure 3: Geographic Region and Geomorphology of the Geographic Region

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

Acknowledgements: Vicmap (c) State of Victoria

Matter: 23981
Date: 14 December 2016,
Checked by: LH, Drawn by: lmilne
Location: \\bio-data-01\matters$\23900s\23981\Mapping\23981_F3_GR_Geomorph.mxd

0 1,500 3,000 4,500 6,000 7,500

Metres
Scale 1:150,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54

N

Figure 4: Geology of the Geographic Region

Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

Acknowledgements: Vicmap (c) State of Victoria

Matter: 23981
Date: 20 April 2017,
Checked by: LH, Drawn by: lmilne
Location: \\bio-data-01\matters$\23900s\23981\Mapping\23981_F4_Geology.mxd

0 1,500 3,000 4,500 6,000 7,500
Metres
Scale 1:150,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54
N

Legend

- Activity Area
- Geographic Region
- VAHR Places

Geological Units (1:250,000)

- Grampians Group
- Hanson Plain Sand
- Newer Volcanic Group
- Unnamed alluvium
- Unnamed duricrust
- Unnamed lunette deposits
- Unnamed scoria deposits
- Unnamed sheetflow basalt
- Unnamed stony rises
- Unnamed swamp and lake deposits
- Unnamed valley-filling basalt

2.2 Search of the Victorian Aboriginal Heritage Register

A search of the Victorian Aboriginal Heritage Register (VAHR) was undertaken on 23rd April 2012, and updated 18 March 2014 and 9 December 2016 for Aboriginal archaeological places and Aboriginal archaeological assessments within the geographic region. Historic maps held at the Public Records Office of Victoria and the Land and Survey Information Centre were consulted and other heritage registers including the Victorian Planning Scheme Heritage Overlay and the Australian Register of the National Trust were also searched to provide background information for the geographic region.

2.2.1 VAHR Places in the Geographic Region

A search of the VAHR has identified 46 previously recorded Aboriginal archaeological places located within the geographic region (1). The predominant Aboriginal archaeological place types in the geographic region are earth features (53%). There are also artefact scatters (34%), burial/human remains and scarred trees (6% equally).

There is one previously recorded Aboriginal archaeological place in the study area:

Myrngrong (VAHR 7422-0166), on which there is limited information. The site was reported to the Archaeological and Aboriginal Relics Office in 1974. The site is located near a lake within the study area, and consists of axe heads and a grinding stone.

There are two Aboriginal archaeological places within 200 metres of the study area (Figure 4). They are located within close proximity to each other and within very similar contexts. These include:

Mortlake Isolated Artefact 1 (VAHR 7421-0183) contains quartz unretouched waste flakes, located on the Hamilton Highway road reserve adjacent to an unnamed farm dam which was probably a swamp prior to draining and dam construction. The land is currently agricultural and the area has been planted with introduced pine trees.

Mortlake Isolated Artefact 2 (VAHR 7421-0184) contains one quartz unretouched waste flake located on the Hamilton Highway road reserve adjacent to a dam which was considered to likely have been a swamp prior to draining and dam construction. The land is currently agricultural and contained planted pines.

Table 2 VAHR places in the Geographic Region

Shaded rows indicate sites within 200 metres of the study area.

VAHR No.	Name	Type
7421-0096	L. CONNEWARREN 1	Earth Feature
7421-0097	L. CONNEWARREN 3	Earth Feature
7421-0098	L. CONNEWARREN 4	Earth Feature
7421-0099	L. CONNEWARREN 5	Earth Feature
7421-0100	L. CONNEWARREN 6	Earth Feature
7421-0113	CONNEWARREN PARK 1	Earth Feature
7421-0114	CONNEWARREN PARK 2	Earth Feature
7421-0115	CONNEWARREN PARK 3	Artefact Scatter and Earth Feature
7422-0566	Dundonnell Wind Farm 1	Low Density Artefact Distribution
7421-0183	MORTLAKE 1	Artefact Scatter
7421-0184	MORTLAKE 2	Artefact Scatter

VAHR No.	Name	Type
7421-0185	MC 1	Artefact Scatter
7422-0104	Salt Creek Paddock	Earth Feature
7421-0195	REICHMANS LANE 1	Artefact Scatter
7421-0198	STONY CREEK 11	Object Collection
7422-0104	Salt Creek Paddock	Earth Feature
7422-0118	Karronbrae 2	Earth Feature
7422-0119	Boorana	Earth Feature
7522-0019	South Terrinallum 1	Aboriginal Human Remains (Burial)
7522-0072	Terinallum Cranium	Aboriginal Human Remains (Burial)
7422-0154	Mogila 1	Earth Feature
7422-0155	Mogila 2	Earth Feature
7422-0156	Mogila 3	Earth Feature
7422-0157	Barfold 2	Earth Feature
7422-0158	Barfold 3	Earth Feature
7422-0159	Barfold 4	Earth Feature
7422-0160	Barfold 5	Earth Feature
7422-0161	Barfold 6	Earth Feature
7422-0162	Barfold 1	Earth Feature
7422-0163	Lamont	Earth Feature
7422-0164	Brooks	Earth Feature
7422-0165	Cabarita	Earth Feature
7422-0166	Myrngrong	Artefact Scatter
7422-0210	Salt Creek 6	Scarred Tree
7422-0211	Gum Swamp 1	Scarred Tree
7422-0223	Salt Creek 1	Earth Feature
7422-0314	Mount Violet 1	Earth Feature
7422-0546	Tiverton 1	Artefact Scatter
7422-0547	Tiverton 2	Artefact Scatter
7422-0548	Tiverton 3	Artefact Scatter
7422-0549	Tiverton 4	Artefact Scatter
7422-0550	Mount Fyans 1	Artefact Scatter
7422-0560	Salt Creek Bridge 1	Artefact Scatter

VAHR No.	Name	Type
7422-0561	Mortlake-Ararat Rd, Woorndoo	Artefact Scatter

2.2.2 Archaeological Assessments within the Geographic Region

Previous Aboriginal archaeological assessments and published studies within five kilometres of the study area are listed in this section. Whilst no archaeological investigations or assessments have been undertaken within the study area, a number of broader investigations have been undertaken in the vicinity. A detailed summary of these reports is included below.

Archaeological Surveys

Regional archaeological studies of Victoria's western district have focused on mound sites (Coutts P. , Witter, McIlwraith, & Frank, 1976) and (Coutts, Witter, & Parsons, 1977). In these studies, mound sites tended to be found clustered along major drainage systems and contained animal remains and lithic material, implying the exploitation of a wide range of resources. Lithic material comprised of quartz and diorite, with rare occurrences of formal tool types but large amounts of quartz debitage. Mounds varied from large pits up to a metre deep, small oven pits, burial mounds and stone hearths, with an average surface area of 150m² (Coutts P. , Witter, McIlwraith, & Frank, 1976, p. 19). They contained an occupational accumulation of debris such as ash and charcoal and despite the tendency to be located along drainage systems, could not be specifically defined to any particular geomorphological setting in western Victoria. Given these factors and the labour investment required for constructing mounds, Coutts, Witter and Parsons (1977, p. 22) concluded that the mounds in Victoria's western district were an outcome of relative social and economic stability. In addition to these archaeological places, a large rock arrangement and fishtrap complex was located at Lake Bolac, 17 kilometres north-west of the study area (Coutts, Witter, & Parsons, 1977, p. 23).

There are 17 earth features (mounds) and two burial/human remain places within the geographic region. Mounds occur to the north and west of the study area. Two are located along Salt Creek while the remaining 15 are all within 300m of unnamed lakes and swamps or on the edge of stony rises. The Salt Creek mounds are situated on the creek bank and contain a slight hump of black soil. The largest was recorded as 13mx16mx25cm deep on a slight rise. The remaining mounds were variably 7-19m in diameter and 20-50cm deep, contained black soil and are located on flat land within 300m of shallow (now drained) swamps and lakes. Occasional occurrences of charcoal, chert and quartz flakes, buckshot, basalt cobbles and sandstone were also found in association with the mounds. Of the 17 places, variable amounts of disturbance had occurred from ploughing or rabbit burrowing, and mature red gums were frequently present in the vicinity of the mounds.

The burials are located to the north-east of the study area; one is on the south extent of Salt Lake (Terrinallum Cranium- 12km north-east of the study area) and the other is adjacent to an unnamed lake at the base of a stony rise (South Terrinallum 1- 10km east of the study area). Terrinallum Cranium consists of a single cranium with two teeth and South Terrinallum 1 contained fragmentary skeletal remains found in an eroded deposit.

Wood (1994) undertook an archaeological survey of a proposed optical fibre cable between Mortlake and Lismore, following the Hamilton Highway directly south of the current study area. The landform between these two towns comprises of undulating plains, creeklines and swampy areas. The desktop assessment predicted that small to moderate sized lithic scatters would occur near watercourses, lakes and swamps. The entire area had been ploughed, with ground visibility ranging from 25-75%. As a result of the survey, the places VAHR 7421-0173 and VAHR 7421-0184 were recorded.

Luebbers (1997) undertook an archaeological survey of a 114 hectare farm property in Mortlake, five kilometres south-west of the current study area. The property has undulating terrain containing two unnamed freshwater lakes and a number of drainage lines. A backhoe test pit revealed a soil profile of root matter extending to 30mm below the surface overlaying firm black silty clay to depths ranging between 0.4-1.3m, to a base of very stiff grey,

yellow, brown and orange silty clay extending to a depth of at least three metres. The majority of the property was too heavily grassed or planted with crops to achieve visibility; hence no Aboriginal archaeological material was identified.

Cultural Heritage Management Plans

No CHMP assessments have been undertaken within the study area. Two have been prepared to the south of the study area in Mortlake, which shares similar environmental and topographic conditions as the study area.

Kirkwood, Neuweger and Clarke (2008) prepared a CHMP (10152) for a wind farm in two areas near Mortlake. The first is three kilometres south-west of the current study area, bordered by the Hamilton Highway, Mount Emu Creek and Castle Carey Road. The second is seven kilometres south of the current study area, bordered by Hinkleys Lane, Mortlake-Framlingham Road and Londrigans Lane. These total areas cover 4,745 hectares of agricultural land. A pedestrian and vehicular survey was undertaken for the CHMP. Areas of Aboriginal cultural heritage sensitivity were noted within the study area, including land within 200 metres of waterways and swamps and areas of raised ground. Ground Visibility ranged from 0-70%, with crops and long grass obscuring visibility in some areas. The land had been intensively ploughed and included irrigation channels and dams. No Aboriginal archaeological material was identified as a result of the survey and after investigation of waterways/swamps and areas of raised ground, sensitivity for archaeological material were considered to be low.

Ford (2009) prepared a second CHMP (11020) for the Mortlake Wind Farm, encompassing the CHMP 10152 study area which had been increased to 6,003 hectares. A pedestrian and vehicular survey was undertaken for the CHMP. Ground visibility ranged from 5-100% as dense cropping, the presence of livestock and boggy ground obscured visibility in some areas. The landscape comprised of three landforms; stony rises, flat silt floodplains and creeklines. Of these landforms, Mount Emu Creek was considered to have the highest likelihood for Aboriginal archaeological material due to its function as a main access point for water and as a travelling route through the landscape. One Aboriginal archaeological place was identified as a result of the survey- Darlington AS 1 (VAHR 7421-0201), located on a low silty rise overlooking a non-perennial swamp which also contained mature gum trees. The place contains seven flaked quartz and silcrete artefacts in fair condition with some impacts from stock trampling and rabbit damage. It was concluded that the absence of quartz and silcrete sources in the study area indicated that the stone was sourced from other locations and brought to the area to be worked. The place was rated as having moderate significance. As the place would not be impacted by the activity, no specific recommendations were made and no sub-surface testing was carried out.

These regional investigations and CHMPs undertaken south of the study area indicate that Aboriginal archaeological material in the form of quartz and silcrete lithic material, scarred trees, mounds and burials do occur within landforms also pertinent to the study area. As sub-surface testing was not a feature of the more recent investigations, the sub-surface extent of artefactual material is not clearly defined. Poor ground surface visibility and agricultural activity often inhibited effective survey coverage and it was often concluded that if it were not for these factors, more Aboriginal archaeological material would have potentially been identified. Areas of archaeological sensitivity identified in these investigations such as within 200m of watercourses and raised landforms also occur within the study area. Archaeological assessments and CHMPs completed within the Geographic Region are summarised in Table 3 below.

Archaeological assessments have also been recently conducted for two wind farm developments located outside the current Geographic Region, however the context of each is highly relevant to the Mount Fyans project. Each wind farm has been located on a series of stony rises, at Mt Gellibrand and Macarthur. Aboriginal places have been recorded at each of these locations within the stony rises present.

Murphy and Owen (2010) completed a CHMP to Complex Assessment level (10554) for the Macarthur Wind Farm. No sites were recorded through the Standard Assessment, however four isolated artefacts and one site with two artefacts were located during sub-surface test excavations, all of which were in rural properties and on stony rises.

The artefacts were recorded between 10-36 centimetres from the ground surface and were mostly quartz, with one silcrete flake. However, Murphy and Owen concluded that although there was some activity around stony rises, the focus of Aboriginal peoples' activities in the past was around resource rich areas, such as dry land adjacent to major waterways .

Conversely, a CHMP completed by **Canning et al (2011)** for the proposed wind farm at Mt Gellibrand (southeast of the Mount Fyans Wind Farm and outside the Geographic Region), resulted in numerous Aboriginal sites being recorded in stony rises. A great deal of sub-surface testing was undertaken throughout the study area, and subsequently almost every stony rise was found to contain sub-surface artefacts. This supported their site prediction models that stony rises are a sensitive landform for Aboriginal sites. Canning et al concluded that the extent of human occupation was restricted to the stony rises, as it was higher ground above the level of seasonal inundation.

Murphy and Rymer (2016) conducted a CHMP (12393) for the current Activity, under the project name Dundonnell Wind Farm. The report states the Activity Area is surrounded by farmland and local roads and measures approximately 4 200 hectares in size. The standard assessment involved a pedestrian survey, which was conducted in three phases, due to the subsequent expansion of the Activity Area. In each case, careful attention was given to surveying land within 200 metres of previously recorded places VAHR 7422-0154, -0156 and -0314. Ground surface visibility varied but was extremely poor due to extensive grass cover in the areas of stony rises and the sloping plan of Mount Fyans. The small area of weathered volcanic plain held up to 40% visibility due to continuous land use activities such as ploughing. No places were recorded during the ground surface survey in any of the survey areas.212 Test Pits of various sizes (primarily 1 x 1 metre and 50 x 50 cm Test Pits) were excavated during the Complex Assessment. Excavation resulted in the recording of 141 stone artefacts, which were registered as four separate places in the VAHR, as 7422-0567, -0568, -0566 and -0572 respectively. Aboriginal cultural heritage was present within both the stony rises and the volcanic plains landforms. The places registered during CHMP 12393 indicate both the differential and repetitive occupation of locations within the Activity Area. These places were used primarily for hunting and gathering activities, as well as providing vantage points from the stony rises to view the surrounding landscape.

Murphy and Rymer (2016) conducted a CHMP (12394) for the construction of an overhead transmission powerline to connect the Dundonnell Wind Farm with the Heywood-Moorabool network. The Activity Area exists as large stretches of linear sections crossing road reserves and farmland across the region and measures approximately 38km in length. The Standard Assessment involved the pedestrian survey across the entire Activity Area, which largely comprised the volcanic plains to the west and north of Mortlake. Ground surface visibility was changeable at about 20% and consisted of dense vegetation as well as more highly visible areas subject to ploughing and across the existing powerline easement. No new Aboriginal cultural heritage places were recorded during the Standard Assessment. The potential for further cultural heritage material in the form of stone artefact scatters was concluded to be low within the areas of road reserves and also outside of areas located within 50 metres of the former wetlands north of North Road. Based on the results of the Desktop and Standard Assessments and because the Activity avoided areas identified as having moderate potential for Aboriginal cultural material, no Complex Assessment was required.

Table 3 Aboriginal archaeological assessments within the geographic region

Report No.	Author & Year	Title	VAHR No.
11020	(Ford, 2009)	Mortlake Wind Farm, Mortlake, Victoria	7421-0201
10152	(Kirkwood, Neuweger, & Clarke, 2008)	Mortlake Wind Farm, Mortlake, Victoria	None identified
697	(Wood, 1994)	Archaeological survey of proposed	7421-0183

Report No.	Author & Year	Title	VAHR No.
		telecom ofc: Mortlake - Caramut - Lismore - Ellerslie - Terang	7421-0184 7422-0541 7422-0542 7422-0543 7422-0544 7422-0545 7522-0023
10377	(Schell & Wines, 2008)	Mortlake power station project	7520-0176 7421-0199 7421-0197 7421-0196 7421-0198
4170	(Turnbull, 2008)	Mortlake water pipeline water variations	None identified
33	(Presland G. , 1984)	An archaeological survey of the route of the Sydenham to Portland transmission line	7621-0005 7321-0271 7622-0005 7822-0084 7521-0027 7721-0027
1069	(Luebbers, 1997)	Archaeological site survey of a waste water treatment plant, section lane, Mortlake, victoria	None identified
12393	(Murphy & Rymer, 2016)	Dundonnell Wind Farm	7422-0566 7422-0567 7422-0568 7422-0572
12394	(Murphy & Rymer, 2016)	Dundonnell Wind Farm Transmission Line	None identified

2.3 Historical and Ethno-historical Accounts in the Geographic Region

By at least 40,000 years ago the entire continent of Australia had been colonised by Aboriginal people (Bowler, et al., 2003). This is evidenced in Victoria at Keilor along the Maribyrnong River Valley, where artefacts in clay deposits have yielded dates of 36,000 BP (Bowler J. , 1976). Following this, further evidence in the form of skeletal material from Dry Creek near the Keilor site was dated to 6,500 years old, and soil deposits associated with artefacts were dated to 17,000 BP (Mulvaney, 1975). More recent excavations of a small hunting camp at Box Gully on Lake Tyrell have been dated from 26,600 to 32,000 cal BP (Richards, Pavilides, Webber, Johnston, & Walshe, 2007).

After about 10,000 years ago evidence from western Victoria suggests an increase in water availability and climatic improvement. One theory suggests that after this time, and particularly in the last 4,000 years, a higher density of population, semi-permanent settlement, increased ceremonial exchange and the development of complex social networks developed (Lourandos, 1977; Lourandos, 1983), which caused a corresponding increase and change in the amount and types of sites found in the state. Lourandos (1983) suggests that this change was predominantly influenced by social forces.

In classical Aboriginal Australian society, culture and history were recorded through oral accounts and visual communication (contemporarily conferred as art). With little understood of their way of life prior to their displacement from their land after European contact, what became recorded by observers of Aboriginal Victorian society was mostly conditioned by biases of the writers and misconceptions stemming from their own ethnocentric points of view (Presland, 1994, pp. 115-117). For the purposes of this desktop assessment, information about Aboriginal Victorian pre and post contact history has been sourced from nineteenth and twentieth century primary and secondary ethnographic/historical records.

2.3.1 Ethno-history

Linguistic boundaries and social organisation

Prior to European colonisation, the Victorian landscape was delineated by socio-dialectical groups who shared a common language and who as a group identified as owning particular areas of land, with individually owned tracts of country. This was a system of spatial organisation based on land tenure (Clark, 1990, pp. 11-14).

The anthropologist William Stanner (1965) determined that Aboriginal Australian land ownership was differentiated through economy and estate; estate refers to the homeground of a descent group which is determined through the group's religious affiliation to creation ancestors, and economy refers to a group's biographical, historical and residential association with tracts of land. In addition, a group may also have a range, being a tract of country of which they have rights to procure food and resources. Prior to European colonisation, the Victorian landscape was delineated by socio-dialectical groups who shared a common language and who as a group identified as owning particular areas of land, with individually owned tracts of country. Group territories thus were the totally of these domains (Presland G. , 1994, pp. 38-39). The socio-dialectical group *Girai wurrung* occupied the geographic region.

Aboriginal groups mapped natural features as boundaries for their ranges, estates and economic territories. The *Girai wurrung* held land from the Hopkins River/Salt Creek/Fiery Creek in the west, to Mount Emu Creek in the east, extending southward to the coastline (Clark, 1990, p. 208).

Land ownership and access rights or responsibilities centred on the smaller named groups that formed the broader language grouping. These groups are often called 'clans' or 'local descent groups', however as (Wesson, 2000, p. 8) reasons, they are better described as 'named groups', as the membership structure of these groups and their degree of division from other groups could vary. In most instances, primary allegiance was owed to this named group, although this could vary according to context and location. Commonly, named groups were led by senior elders who exercised internal political and religious authority, as well as being recognised as their spokesperson when dealing with other groups (Barwick, 1984). Particularly influential group leaders could also assume authority over the leaders of other culturally affiliated groups (Wesson, 2000, p. 8). The named group who occupied land closest to the study area were the *Burug gundidj* who held land to the south surrounding Mortlake and Mount Shadwell, and in the north near Mount Fyans the *Purteet chowel dundidj* held land south-east of Lake Bolac, including Mount Hamilton (Clark, 1990, p. 208).

Membership to a named group is defined by a localised matrilineal or patrilineal descent group, with female member of the group partnering with men outside of their group (exogamous) and across moiety lines; however they maintained an identity of belonging to their fathers group. Men then had to adhere to certain duties such as providing food to their father-in-law. Social engagement could be influenced by appropriate conduct between family members, for example men had avoidance behaviours they had to adhere to in the presence of their mother-in-law, and there were other speech or special duties which were expected in family relationships (Atkinson & Berryman, 1983, pp. 29-31). A further level of social organisation was moiety affiliation. In northern and southern Victoria, people were divided into *waa* (crow) and *bunjil* (eaglehawk) or *Mak-quarra* and *Kil-parra* (Howitt, 1904) and (Smyth, 1878). The moieties of *Burug gundidj* and *Purteet chowel dundidj* are unknown.

Social activity involving neighbouring named or socio-dialectical groups was usually held in warmer periods, held at the intersection of group boundary's and arranged by a person assigned of the responsibility of travelling between

groups to organise the time, place, and events of the meeting. This person could speak a number of different dialects and acted as intermediaries in negotiations between the groups. Activities would include sports and dancing, with up to 500 men, women and children attending. (Atkinson & Berryman, 1983).

The last known spokesperson for the *Girai wurrung* was a man named Kaawirn Kuunawarn. Kaawirn Kuunawarn summoned a meeting with three neighbouring groups in 1838, immediately prior to the occupation of the landscape by non-Indigenous people. The number of individuals who attended the meeting was recorded by notching a spear thrower, which the Aboriginal Protector James Dawson counted to be approximately 1000 individuals (Dawson, 1881). Dawson recorded that the *Girai wurrung* met with the *Djab wurrung*, *Dhauwurd wurrung* and *Wada wurrung* groups to harvest eels at Lake Bolac and hunt emus at Mirraewuae Swamp near Hexam (Dawson, 1881).

Dawson also described a large meeting in Terang, south of the study area, outlining the articles traded and their local sources:

> At the periodical great meetings trading is carried on by the exchange of articles peculiar to distant parts of the country. A favourite place of meeting for the purpose of barter is a hill called Noorat, near Terang. In that locality the forest kangaroos are plentiful, and the skins of the young ones found there are considered superior to all others for making rugs. The aborigines from the Geelong district bring the best stones for making axes, and a kind of wattle gum celebrated for its adhesiveness. This Geelong gum is so useful in fixing the handles of stone axes and the splinters of flint in spears, and for cementing the joints of bark buckets, that it is carried in large lumps all over the Western District. Greenstone for axes is obtained also from a quarry on Spring Creek, near Goodwood; and sandstone for grinding them is got from the salt creek near Lake Boloke. Obsidian or volcanic glass, for scraping and polishing weapons, is found near Dunkeld. The Wimmera country supplies the maleen saplings, found in the malee scrub, for making spears. The Cape Otway forest supplies the wood for bundit spears, and the grass-tree stalk for forming the butt piece of the light spear, and for producing fire; also a red clay, found on the sea coast, which is used as a paint, being first burned and then mixed with water, and laid on a brush formed of the cone of the banksia while in flower by cutting off its long stamens and pistils. Marine shells from the mouth of the Hopkins River, and its freshwater shells, are also articles of trade (Dawson, 1881, p. 78).

The succession or inheritance of lands and named-group estates could occur in a number of ways. Individuals and groups could inherit lands from their father, their mother, through their birthplace, conception place, the burial place of their ancestors, and through totemic connections (Wesson, 2000). Access rights also crossed generations and marriage partners. Howitt wrote that:

> The right to hunt and to procure food in any particular tract of country belonged to the group of people born there, and could not be infringed by others without permission. But there were places which such a group of people claimed for some special reason, and in which the whole of the tribe had interest (Howitt, 1904, p. 311).

People would often travel or reside in the territory of another named-group so that they could fulfil religious or family obligations, or exercise the privilege, granted to them by family or moiety associations, of exploiting the resources of another estate (Barwick, 1984). Hence most Aboriginal people could speak a number of different dialects and when living in the territory of another named-group, would use the speech of its owners (Tindale, 1974). For daily activities and the exploitation of local estates, people are thought to have travelled in small residential units or extended family groups - often termed 'bands' (Wesson, 2000).

Certain individuals within the Aboriginal groups had responsibilities assigned to them for the management of natural resources. Anthropogenic manipulation of the environment was observed by the non-Indigenous settlers within Port Phillip, for example fire regimes which cleared tracks through vegetation, aided in hunting and also

dissuaded settlers for entering Aboriginal territory (Atkinson & Berryman, 1983, p. 12). Canoes were cut from the bark of river red-gums and box trees in spring to early summer, hafted with stone axe heads, shaped over a fire, seasoned in the sun, then the end blocked with clay (Edwards, 1975). Hooped nets made from fibre were used to catch crayfish, yabbies and fish, while cross-line nets were strung low above the water for catching ducks or below the water to catch schools of fish. Fish weirs were built across watercourse anabranches, which filtered the fish following receding floodwaters. Weirs consisted of closely placed stakes driven vertically into the mouths of receding floodwater channels for a 5-6 week harvest. Line nets were also used to catch emus and kangaroos. A strategically placed group of people drove the animals towards the nets. Reed spears with hafted bone, carved barbs, stone pieces or hardened wooden points set into the head were used for catching larger marsupials. (Atkinson & Berryman, 1983, pp. 19-25).

2.3.2 Post Contact History

The rapid spread of European colonisation of the Melbourne region altered Victorian Aboriginal society. The increased presence of settlers on Aboriginal land resulted in dispossession from land and diminished access to resources. These factors combined with population decline from introduced diseases and conflict, transformed Aboriginal pre-contact society to be orientated around colonial activity; such as movement onto camps to the outskirts of towns or relying on European industry for livelihood.

According to non-Indigenous observations recorded in 1859, when the *Girai wurrung* first sighted a European ship they considered it to be associated with a mythical creature of the sea named *kooring* (Clark, 1990, p. 193). They were however familiar with outsider activity as sealers frequented the area prior to pastoralists in south-western Victoria. The first squatters on *Girai wurrung* land were William Hamilton and Watson who occupied 40,000 acres south-west of Terang in 1838. In 1839 three more squatting stations were established; Mount Shadwell adjoining Mortlake run by Robert Anderson who superintended for the Derwent Company, Allandale on the Hopkins River, and Tooram, also on the Hopkins River. In 1840, the Keilambete squatting run was established by John Thomson, which saw the first conflict occur between *Girai wurrung* and squatters. A shepherd working at Keilambete was murdered, after which the commissioner of crown lands for the Portland Bay pastoral district, Foster Fyans, lead what was perceived by the protector of Aborigines Charles Sievwright as an indiscriminate attack on Aboriginal people within the district (Bridges, 1972, p. 24).

In 1839 the Port Phillip Aboriginal Protectorate Scheme was established, with appointed Protectorates to provide religious instruction, rations, homes and medical care to Aboriginal people whilst recording population information; a pretext of encouraging Aboriginal Victorians to adopt a European lifestyle (Atkinson & Berryman, 1983). Managed by the Chief Protector George Augustus Robinson, the western district came under the jurisdiction of Sievwright. He was stationed at Keilambete, with the *Girai wurrung* positioned to camp beside Lake Keilabete as the lake was a recognised meeting place for *Girai wurrung* named groups to settle disputes and conduct other business (Clark, 1990, p. 195). Thomson did not support this arrangement and Sievwright moved everyone to Lake Terang, south of Mortlake (Clark, 1990, p. 194) until the government gazetted a reserve at the base of Mount Rouse in 1842, north-west of Mortlake near the township of Penshurst. Sievwright was not accepted by the squatters neighbouring the reserve as he actively investigated the squatter G.S Bolden who killed two *Gunawurd gundidj* people travelling to Mount Rouse reserve. For such an intrusion into squatter affairs, they successfully petitioned the government to dismiss Sievwright, who was replaced by the medical practitioner Dr. John Watton (Clark, 1990, p. 195).

The NSW Legislative Council appointed a Select Committee to inquire into the success or failure of the Port Phillip Aboriginal Protectorate, beginning in 1849. James Webster from Mount Shadwell responded to the committee, stating that from his visits to the station at Lake Terang and Mount Rouse reserve he perceived the Protectorate to be 'useless and a waste of expenditure... the condition of the Aborigines would only improve of the children were removed, at an early age, from their parents and their tribe' (Clark, 1990, p. 195). The Legislative Council recommended abolishing the Protectorate.

The Select Committee held a further inquiry in 1859 into the welfare of Aboriginal people. Reports from pastoralists in the western district indicated a rapid fall in the Aboriginal people due to conflict, influenza and alcohol (Clark, 1990, pp. 196-197). With no government assistance, the Aboriginal people supported themselves by working as stockriders or farmhands for settlers in exchange for clothing, medical assistance and occasionally received cash payment. *Girai wurrung* continued to camp on the flats around Mortlake and Terang (Murdoch, 1921). In response to the Committee, the farmer J.M Allan summarised that:

> the mode of living of the Aborigines had been modified by their residence among the whites: the men generally lived amongst the farmers, whereas the women and children were left to fend for themselves in the forest, and were actually worst off than before the advent of the whites... he considered it unjust to prevent the Aborigines from coming within a certain radius of towns (Clark, 1990, p. 197).

Although informants at the inquiries remarked on the rapid fall in the Aboriginal population, it was a number of years before any action was taken. In 1860 a Central Board was appointed with Local Guardians to function as correspondents to the Board and distribute supplies. Robert Bourke of Mount Shadwell was appointed as a guardian. He reported to the Board in 1861 that:

> Their moral and social condition was very depressed and there was a great deal of drunkenness amongst them. They are frequently employed by farmers in the neighbourhood, but only during the harvest season; at other times they subsist by hunting... the only means I would suggest for the advancement of the Natives would be to grant a portion of land to two of the Natives who are steady with a view of ascertaining whether they could be induced to cultivate it. Twenty acres would be sufficient, and instead of fee simple, they should receive a lease for life, without power to sublet. Bourke in (Clark, 1990, p. 197)

Dr. John Singleton of the Church of England in Warrnambool applied to the Board for land for a reserve. In 1861 his request was granted in the form of 3,500 acres beside the Hopkins River, which became the Framlingham Aboriginal Station. A census in 1877 of Victoria's Aboriginal Population showed there were no *Girai wurrung* people within their defined territory, aside from those at Framlingham (Clark, 1990, p. 203).

2.3.3 Regional History

In 1834 John Batman, a grazier and businessmen, arrived in Port Phillip from Van Diemen's Land. With John Fawkner, Batman formed the Port Philip Association to legitimise land claims in the district (Calder, 2002). The Port Phillip district was proclaimed open to settlement in 1836, allowing the sale of unoccupied land by auction. The Derwent Company commissioned an expedition lead by Major William Drummon Mercer, accompanied by George D. Mercer and overseer Thomas Anderson. Their purpose was to establish pastoral claims in the district. In 1839 they established a 78,000 acre run surrounding Mount Shadwell with Anderson as the manager (Luebbers, 1997). Due to past volcanic activity and abundant permanent water sources, the region was ideal for pastoral interests and many others were attracted to the area. The study area falls within the former pastoral runs of Mt. Shadwell North, Stony Point and Mount Fyans (Spreadborough & Anderson, 1983).

The establishment of the Mortlake township in the mid nineteenth century facilitated the development of a local economy based on primary production and agricultural services. After 1850 the discovery of gold to the north and east of Mount Shadwell saw a dramatic increase in diggers and settlers to the region (Luebbers, 1997). Mortlake remains the western districts centre of agricultural and pastoral activity (Moyne Shire Council, 2012).

2.3.4 Land Use History of the study area

The study area traverses the localities of Mortlake, Woorndoo and Dundonnell. Previous archaeological investigations within these locations have identified a number of past land uses, mainly blue gum timber plantation, stock grazing and cropping. Early landscape paintings and drawings show the pastoral landscape of the geographic

region as a largely flat treeless expanse (Plate 1), with notable exceptions around creek lines (Plate 2), which have also attracted exotic plantings (Plate 3). The study area has also been subject to some infrastructure development in the form of roads, fencing, and housing/sheds. Recent aerial imagery shows the entire area as cleared agricultural land (Nearmap, 1 January 2004). Pastoral runs and stock grazing from the nineteenth century, as well as clearing trees and other native vegetation may have impacted on the integrity of Aboriginal archaeological material.

Plate 1 Mount Shadwell – William Jefferys 1840-1855 (State Library of Victoria Image H8853)

Plate 2 Mount Fyans Woolshed by Louis Buvelot 1869 (National Gallery of Australia 68.6)

Plate 3 Mount Fyans Homestead by Louis Buvelot 1869 (National Gallery of Australia 1993.550)

2.3.5 Spatial Predictive Modelling

The purpose of this predictive model, designed specifically for this project, was to broadly assess the likelihood of archaeological values within the study area, based on a variety of datasets (discussed below), and to inform further investigation.

The study area contains stony rises that are the result of basalt flows from volcanic eruptions at Mount Fyans. The study area is also dissected by a number of creeks and waterways. Previous studies within the geographic region indicate that stony rises and waterways are landforms that are likely to contain Aboriginal sites. Stony rises generally have undergone little disturbance through farming activities so the chances of finding undisturbed sites increases. With this in mind, spatial predictive modelling was undertaken in ArcGIS using Spatial Analyst tools to compare, analyse and overlay numerous environmental and topographic datasets which have been individually processed and then combined using weighted overlay modelling to provide a single surface showing a scale of predictability based on these datasets. It is important to note that predictive modelling is undertaken at small scale using the datasets available and should be used as a guide for potential cultural heritage sensitivity across the geographic region and not an absolute statement of potential in any specific area. Five main datasets were considered during the modelling process. These datasets and the processes used to prepare and rate them for use in the model are outline below individually.

It is important to note that the purpose of this model is to make some broad predictions about the study area based on generalisations across a wider area in order to inform more detailed and targeted investigations. It cannot account for more specific phenomenon which might actively contribute or detract from the areas suitability for Aboriginal places such as areas which had ceremonial significance. The model is based on the ability of the model to detect variations in landform. Subtle variations may not be detected and can only be picked up in survey.

The predictive model:

All of the layers outlined below were processed, and then combined and weighted using the Weighted Overlay Tool in ArcGIS Spatial Analyst. This allowed each layer to be weighted and ranked according to an equivalent but arbitrary scale of 1-9, with a score of 9 being areas most likely to support Aboriginal places and a score of 1 being very unlikely to support Aboriginal places. A score of 5 was used as a 'neutral' score with values higher meaning that the value of the input layer was actively contributing to an increased likelihood of existence, whereas a score of less than 5 was actively detracting from the potential of the area. A final surface model with numbers ranked from 1-9 was produced although only 4 classes resulted due to the combination of layer evening out the scores. For example, if the water layer has a high value due to proximity to a major water source but the area is devoid of native vegetation, this lowers the score in that area.

Digital Terrain Model:

A digital terrain model (DTM) was created from 1m contour data provided by Hydro Tasmania and 1:25,000 scale hydro lines from VicMap using the Topo to Raster tool in ArcGIS Spatial Analyst. A slope surface was then derived from the DTM and classified into slope classes as defined by Speight (1990). The lower scores are assigned to flats and moderate scores to high slopes. The rationale is that flat areas, unless adjacent to or existing in conjunction with other higher weight landforms, are not generally a focus for past Aboriginal activity and so the likelihood of finding material culture is lower. More severe slopes are less likely to be traversed by past peoples and are also more likely to have been subject to erosion and so are less likely to support archaeological deposits.

Water resources:

The DTM was used to create a stream accumulation model which shows the amount of land that comprises the watershed of any given point within the DTM. This was filtered to restrict values which best approximated areas mapped as drainage lines. These data were then ranked into 9 classes using a quantile classification method. Streams with the highest flow throughout the area were assigned the highest score and areas with the lowest flow, the lowest score. A 200m buffer was also applied to the classes to capture the area adjacent to creeks which are more likely to contain Aboriginal places due to their proximity to the creek line.

As using a flow accumulation method does not capture water body areas, such as lakes, these water body areas were manually added to the water resources layer using the VicMap 1:25,000 hydro polygon datasets. As natural water bodies were often a focus of activity for past peoples, these areas and a 200m buffer around them were assigned the highest probability level. It should be noted that the hydro area dataset used does not differentiate between naturally occurring lakes and ponds, and artificial dams. This means that some areas around larger farm dams may be erroneously shown as high potential.

Landform/High points:

Some local landform elements also have a higher potential for Aboriginal Places where they offer views over the local area such as hillocks and ridgelines. These elements were also calculated using the stream accumulation model as areas with 0 flow generally represent a local high point, though this produces a lot of background noise created by errors in the DTM or minor changes in the landscape which do not represent significant local high points. To account for this, the raster model is converted to polygon representation of areas of 0 flow and major features are digitised or modified manually based on the 0 flow model in conjunction with a shaded relief of the DTM which visually represents landform elements by modelling shadows created by the sun across the DTM at a given time of day. The modified polygons are then converted back into a raster surface representing the key elements.

Vegetation:

EVC data sourced from DSE (2005) was used to represent areas of lower disturbance across the geographic region. The vegetation polygons were converted to raster and reclassified according to the broad vegetation classes depending on the likelihood Aboriginal places could exist in the area. The highest ratings were given to wetlands

and swamps as these areas were often the focus for Aboriginal hunting and foraging activities. Open woodlands were given the next highest ranking as they are easier to traverse, more likely to have exposed areas and have the potential to contain modified trees. Vegetation classes associated with drainage lines were also given a higher rating because of their association with water resources. Shrublands and grasslands were given a lower rating because, although they would still have been used by past peoples, they have a lower likelihood of containing Aboriginal places. The lowest ranking was given to 'no data' areas as this shown in conjunction with aerial imagery showed that most of these areas contained farmland or non-native vegetation and so were more likely to have been disturbed.

2.3.5.1 Conclusion of predictive scoring for the study area

Within the current study area, the most likely areas for the presence of Aboriginal archaeological places have been identified along major waterways and on high ground, in close to water sources, particularly Blind Creek (Figure 5e). However these areas are limited and are most prevalent in the north of the study area. As Figure 5e illustrates, most of the study area is considered to be of low likelihood for the presence of cultural material, particularly in the southern parts of the study area. This can be attributed to the open, flat topography and the lack of water features, such as swamps and creeks.

Overall, the model provides the basis for the development of a targeted survey methodology for the next stage assessment.

RURAL CITY OF ARARAT

RURAL CITY OF ARARAT

SHIRE OF MOYNE

Lake Eyang

Woorndoo

Lime Creek

Boswell Swamp

Salt Creek

MORTLAKE-ARARAT ROAD

Gum Swamp

Hopkins River

Hexham

Blind Creek

Black Swamp

Lake Connewarren

Mortlake

JAMIESON RD

HAMILTON HIGHWAY

HOPKINS HIGHWAY

TERANG-MORTLAKE ROAD

Stony Creek

Hopkins River

Ellerslie

Legend

- Activity Area
- Geographic

Potential Based on Water

- Highest Potential
- Lowest Potential

Figure 5a: Spatial Predictive Modelling for the Activity Area - Water Resources

biosis
Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

Acknowledgements: Vicmap (c) State of Victoria

Matter: 23981
Date: 20 April 2017,
Checked by: LH, Drawn by: lmilne
Location: \\bio-data-01\matters$\23900s\23981\Mapping\23981_F5a_Water.mxd

0 1,000 2,000 3,000 4,000 5,000
Metres
Scale 1:100,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54

N

RURAL CITY OF ARARAT

RURAL CITY OF ARARAT

SHIRE OF MOYNE

Lake Eyang

Woorndoo

Lime Creek

Boswell Swamp

Hopkins River

Salt Creek

MORTLAKE-ARARAT ROAD

Gum Swamp

Hexham

Blind Creek

Black Swamp

Lake Connewarren

Mortlake

JAMIESON RD

HAMILTON HIGHWAY

HOPKINS HIGHWAY

TERANG-MORTLAKE ROAD

Stony Creek

Hopkins River

Ellerslie

Kolora

Legend

- Activity Area
- Geographic Region

Potential Score Based on Slope

- 6 - Highest Potential
- 4 - Lowest Potential

Figure 5b: Spatial Predictive Modelling for the Activity Area - Degree of Slope

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Acknowledgements: Vicmap (c) State of Victoria

Matter: 23981
Date: 20 April 2017,
Checked by: LH, Drawn by: lmilne
Location: \\bio-data-01\matters$\23900s\23981\Mapping\23981_F5b_Slope.mxd

0 1,000 2,000 3,000 4,000 5,000
Metres
Scale 1:100,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54

N

RURAL CITY OF ARARAT

RURAL CITY OF ARARAT

SHIRE OF MOYNE

Chatsworth

Woorndoo

Hexham

Mortlake

Ellerslie

Lake Eyang

Lime Creek

Boswell Swamp

Salt Creek

Hopkins River

MORTLAKE-ARARAT ROAD

Gum Swamp

Mustons Creek

Blind Creek

Black Swamp

Lake Connewarren

HAMILTON HIGHWAY

JAMIESON RD

TERANG-MORTLAKE ROAD

HOPKINS HIGHWAY

Stony Creek

Legend

- Activity Area

Potential Score Based on Vegetation

- 9 - Highest Potential
- 8
- 7
- 6
- 4 - Lowest Potential

Figure 5c: Spatial Predictive Modelling for the Activity Area - Vegetation

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Acknowledgements: Vicmap (c) State of Victoria

Matter: 14385
Date: 20 April 2017,
Checked by: MT, Drawn by: lmilne
Location: P:\23900s\23981\Mapping\23981_F5c_Vegetation.mxd

0 1,000 2,000 3,000 4,000 5,000
Metres
Scale 1:100,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54

N

Lake Eyang
Woorndoo
Dundonnell
Hopkins River
Boswell Swamp
Lake Sheepwash
Salt Creek
MORTLAKE-ARARAT ROAD
Gum Swamp
Hexham
SHIRE OF MOYNE
Blind Creek
Black Swamp
HAMILTON HIGHWAY
Lake Connewarren
Mortlake
JAMIESON RD
HOPKINS HIGHWAY
Stony Creek
TERANG-MORTLAKE ROAD
Ellerslie

Legend

Acitivity area

Potential Score Based on Favourable Landform

- 9 - Highest Potential
- 8
- 7
- 5 - Lowest Potential

Figure 5d: Spatial Predictive Modelling for the Activity Area - Favourable Landforms

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Acknowledgements: Vicmap (c) State of Victoria

ADVERTISED PLAN

Matter: 23981
Date: 20 April 2017,
Checked by: SSK, Drawn by: lmilne
Location: \\bio-data-01\matters$\23900s\23981\Mapping\23981_Figure5d_HighPoints.mxd

0 1,000 2,000 3,000 4,000 5,000
Metres
Scale 1:100,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54

N

Lake Eyang
Woorndoo
Lime Creek
Boswell Swamp
Lake Sheepwash
Gum Swamp
MORTLAKE-ARARAT ROAD
Hopkins River
Salt Creek
Hexham
SHIRE OF MOYNE
Mustons Creek
Blind Creek
Black Swamp
Lake Connewarren
Mortlake
JAMIESON RD
HAMILTON HIGHWAY
HOPKINS HIGHWAY
Stony Creek
TERANG-MORTLAKE ROAD
Kolora
Ellerslie

Legend

- Activity Area
- Areas of sensitvity (Biosis)
- Areas of sensitivity (OAAV)

Predictive model

Overall Potential Score

- 8 - Highest Potential
- 7
- 6
- 5 - Lowest Potential

Figure 5e: Aboriginal sensitivity overview

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Acknowledgements: Vicmap (c) State of Victoria

Matter: 23981
Date: 12 December 2016,
Checked by: LH, Drawn by: lmilne
Location: \\bio-data-01\matters$\23900s\23981\Mapping\23981_F8_Sensitivity_overview.mxd

0 1,000 2,000 3,000 4,000 5,000
Metres
Scale 1:100,000 @ A3
Coordinate System: GDA 1994 MGA Zone 54

N

2.4 Conclusions from the Desktop Assessment

Based on the above review of the geographic region, including its environment, recorded Aboriginal archaeological places, previous archaeological assessments and information on the activities of the *Girai wurrung*, a site prediction model has been developed. The site prediction model utilises the existing regional information in order to target landforms which might have archaeological potential during the Standard Assessment. The site prediction model acts as a guideline for designing the ground survey strategy and identifies key points for consideration.

The study area lies within the volcanic undulating plains and stony rises of Victoria's western district. A number of intermittent and perennial crater lakes and swamps are present within the vicinity; two of which are within the study area. It is also surrounded by creek systems which were an important resource to the *Girai wurrung.*

Previous regional studies and CHMPs in the general area have detected evidence for past Aboriginal land use, mainly in the form of mounds, scarred trees and artefact scatters. The identification of Aboriginal archaeological places within the study area is dependent on a number of factors determined in the Desktop Assessment. The presence of resources within the study area and information obtained from prior surveys of the general area provides some direction in developing a model to predict the density and location of Aboriginal places in the study area.

Key points for consideration are:

- Pastoral runs and stock grazing from the nineteenth century, as well as clearing trees and other native vegetation may have impacted on the integrity of Aboriginal archaeological material.
- The geographic region contained an array of flora and fauna species as well as watercourses which the Aboriginal people were known to have harvested and depended upon. Salt Creek is a known location of sandstone extraction by Aboriginal people and shells, red clay, obsidian and greenstone were brought to the area for trade. Mature River Red Gum trees have been identified within the vicinity of the study area.
- Artefact scatters, scarred trees, burial/human remains and mounds occur adjacent to lakes and swamps or stony rises in the geographic region. Two such waterbodies occur within the study area.

The northern part of the study area is considered sensitive for Aboriginal sites as the landform in this section contains numerous stony rises that overlook waterways and the plains to the south. As the northern section is located on the edge of the volcanic flow from Mount Fyans, the land has undergone fewer disturbances through farming activities than land to the south due to the surface as well as subsurface basalt deposits.

Stony rises in the southern section of the study area are less frequent and less pronounced, however they still occur and are still considered sensitive for Aboriginal sites. Creeks and waterways throughout the study area are considered sensitive for Aboriginal sites.

2.4.1 Predictive Modelling

A model has been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist(ed) throughout the study area and where they are more likely to be located.

This model is based on:

- Site distribution in relation to landscape descriptions within the study area
- Consideration of site type, raw material types and site densities likely to be present within the study area
- Findings of the ethnohistorical research on the potential for material traces to present within the study area
- Potential Aboriginal use of natural resources present or once present within the study area
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding geographic region.

Therefore the following Aboriginal archaeological place types likely to be found are summarised in Table 4 below:

Table 4: Aboriginal Site Types most likely to occur within the study area

Site Type	Site Description	Potential
Flaked Stone Artefact Scatters and Isolated Artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	**High:** A total of 11 stone artefact sites have been previously recorded in the geographic region in association with water courses. Two artefact scatters occur within 200 metres of the study area, located near the Hamilton Highway road reserve and an unnamed (now drained) lake. They have the high potential to be present in undisturbed areas within close proximity to water courses, swamps and high points, including stony rises, throughout the study area.
Earth features/mounds	Mounds are places were Aboriginal people lived over extended periods of time, creating a visible raised 'mound'. Mounds typically contain charcoal, burnt clay or stone heat retainers from cooking ovens, animal bones, shells, tone tools, and occasionally Aboriginal remains.	**High:** Within the geographic region, 17 earth mounds have been identified in close proximity to creeks, lakes and swamps and at the base of stony rises.
Scarred Trees	Trees with cultural modifications.	**Medium:** A small number of scarred trees have been identified on Salt Creek and an unnamed lake/swamp area within the geographic region. Despite widespread removal of mature native forest within the geographic region, mature red gums are present within the study area.
Burials	Aboriginal burial sites.	**Medium:** Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil types associated with the study area are not commonly associated with burials, however, soft sediments can occur in associated with deep alluvial deposits along creeks and lake beds within the wider region.

Site Type	Site Description	Potential
Potential Archaeological Deposits	Potential sub surface deposits of cultural material.	**High:** Potential archaeological deposits have been previously recorded in the region across a wide range of landforms including both low lying plains and raised ground, including stony rises. They have high potential to be present in undisturbed areas within close proximity to water courses, swamps and high points, including stony rises, throughout the study area.
Shell Middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	**Moderate:** Shell midden sites have not been recorded within the study area or the geographic region. However, based on the ethnohistory of the region, there is some potential for shell middens to be located in vicinity of permanent water sources, particularly swamps where freshwater mussels would have been available.
Quarries	Raw stone material procurement sites.	**Low:** There is no record of any quarries being within or surrounding the study area.
Aboriginal Ceremony and Dreaming Sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	**Low-Moderate:** There are currently no recorded mythological stories for the study area. However, it should be noted that many stories about the existence of the Bunyip have been recounted in numerous ethnographic documents.
Post-Contact Sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	**Low:** There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal Places	Aboriginal places may not contain any "archaeological" indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events	**Low-Moderate:** There are currently no recorded Aboriginal historical associations for the study area.

Site Type	Site Description	Potential
	commenced or particular buildings.	

In conclusion, the results of the Desktop Assessment have indicated there is a potential for unidentified Aboriginal archaeological material and cultural values within the study area. A site inspection will refine the modelling and predictive statements, and allow further assessment of potential Aboriginal cultural heritage, and the sensitivity of landforms within the study area to contain such material.

3 Site Inspection

A reconnaissance field assessment of the wider study area was undertaken by Amy Wood and Jenny Fiddian (Biosis Pty Ltd) on the 20 August 2012 (in the area designated as the Mount Fyans Wind Farm CHMP). As additional properties were added to the study area, further field assessment was carried out by Amy Wood and Tiffany James Lee between 29-30 January 2013, within the Western Extension Area CHMP (refer Figure 2). The assessment was aimed to assess the results of the Desktop Assessment, and test the predictive model and assumptions developed therein. The following section summarises the findings of the reconnaissance assessment.

Views of the study area were recorded using digital photography. Field notes were taken recording ground conditions, slope and details of areas of potential for Aboriginal cultural heritage.

3.1 Results

The wider study area was the subject of a windscreen survey, which involved an overall landscape assessment from the road. This was not designed to replace or include a field survey; rather it was to identify/confirm landforms considered to be culturally sensitive, to gauge the level of previous ground disturbance and to identify previous land use. As discussed above, a site prediction model had been developed on the basis of landform type, and the windscreen survey was carried out to assess the results of this against the landscape.

The roads which border and transect the study area were driven to enable clear observation of each property. The HAs were able to observe the study area from Woorndoo – Dundonnell Road, Woorndoo – Darlington Road, Mount Fyans Lane for some extent, Six Mile Lane, Castle Carey Road, North Station North Road, North Station South Road, Mortlake – Ararat Road, Five Mile Lane and the Hamilton Highway.

Notes were taken on the various landforms, levels of disturbance and current land use, and photographs were taken of the throughout the study area.

A transmission line corridor (refer Survey Unit 10, Figure 9), was added to the study area after the second ground-truthing assessment carried out in January 2013. In consultation with the Sponsor, the HAs decided that this area would be subject to a Standard Assessment as part of any future CHMPs or heritage assessments (rather than commencing with a preliminary cultural heritage assessment), as it is a small and linear section, and could be traversed and assessed more easily.

Areas of Potential Archaeological Sensitivity

Figures have been developed to show three levels of sensitivity: results of the predictive model (Figures 5a-5e), ground-truthing results (Figure 6), and statutory areas of sensitivity (Figure 7). The predictive model shows quantified sensitivity – scores were given to each component (vegetation, degree of slope, water sources and favourable landforms). The results were tallied to create Figure 5e. The statutory areas of sensitivity (ie those which have been listed as per r. 23 of the Aboriginal Heritage Regulations 2007), are limited to named waterways. Throughout the ground-truthing assessment, the results of the predictive model were scrutinised with particular attention to the areas of highest potential, and the statutory areas of sensitivity were also inspected. In addition, the landscape was considered independently of the mapping, and some additional areas of sensitivity were recorded and mapped. Finally, each of the three approaches to classifying sensitivity are shown in a comparison figure (Figure 8), which shows each layer superimposed upon the other (ie Figures 5e, 6 and 7 combined).

Mount Fyans Wind Farm Area

The site inspection identified areas in the north of the study area as being of high archaeological and cultural sensitivity – these observations tended to confirm the site prediction model as developed during the desktop assessment. Areas of greatest archaeological potential were largely undisturbed stony rises, which are considered sensitive for Aboriginal sites as they provided a higher, drier location on the landscape from which the surrounding plains could be observed and various activities carried out.

Waterways, in particular Blind Creek, Salt Creek and wetlands in the north of the study area, were also considered to be areas of sensitivity. Land within 200m of a waterway is considered to have high potential for the presence of Aboriginal sites, particularly rises overlooking waterways.

In the south eastern part of the study area, rises close to Six Mile Lane and Five Mile Lane were identified as sensitive (Figure 6.13). In the south west (Figure 6.8), there is a swamp and some creek lines. Rises overlooking these are considered to be sensitive for Aboriginal sites. Where Blind Creek crosses North Station South Road and Castle Carey Road rises overlook the creek, these are considered to be sensitive for Aboriginal sites (Figure 6.7). Land east of the rise and east of the vehicle track is not considered sensitive for Aboriginal sites (see Plate 1 below).

Plate 4: Study area east of Blind Creek and rise, east of Mortlake – Ararat road, facing east.

In the central west of the study area (Figures 6.6 and 6.7), there are extensive stony rises overlooking Blind Creek. These are considered to be highly sensitive. A water body located on the south side of Woorndoo – Darlington Road has a rise on its northeast side (Figure 6.12). This area is considered to be sensitive for Aboriginal sites (see Plate 2 below).

Plate 5: Stony rise overlooking water body, Woorndoo - Darlington Road, facing southwest.

The northern section of the study area, between Woorndoo – Dundonnell Road and Woorndoo – Darlington Road is considered to be highly sensitive for Aboriginal sites. This section of the study area is the termination of the lava flow from Mount Fyans. It has undergone little disturbance and stony rises are evident throughout. A range of Aboriginal site types may be present here, including ceremonial sites.

The areas of sensitivity marked on Figures 6.10 and 6.11 were recorded as part of the secondary ground-truthing assessment, as this section of the property was added to the project in late 2012. Those in Figure 6.10 are low wetlands with significant stony rise surrounds, and therefore an area considered to be rich in resources, shelter, and having significantly better perspective on the landscape than the majority of the project area (topographically flat with few landscape features).

Figure 6.11 details three areas of sensitivity which are not noticeably significant through assessment of the aerial photography or the predictive model. However, through observation on the ground, these three areas appear as a series of low lying swamps or minor wetlands, bordered by stony rises which appear to connect to each other around these low-lying points, and with a minor creek closely aligning with these to the west.

The southern section of the study area has undergone substantially more disturbance, and although areas of sensitivity were identified, these are not as widespread as in the northern section. The southern section has been subjected to farm activities, construction of houses and assorted farm buildings and services. The southern section is generally lower lying than the northern, with fewer rises evident.

Western Extension Area CHMP 12658

The primary areas of sensitivity recorded during the ground-truthing largely coincide with both the regulated (statutory), and predictive model results – Blind Creek and Salt Creek (Plate 3), and Flat Top Hill (Figure 6.3). However it is our understanding that this prominent hill will not be impacted by this project.

Additional areas recorded and mapped include swampy areas, stony rises, wetlands and minor drainage lines.

Figure 6.1 depicts an extended area of sensitivity for Salt Creek, on the east bank, at the northern most extent of the study area. This area was added given its proximity to a major waterway, its size (a more significant wetland or swamp than others seen within the project area), and the rises surrounding the area. In the southern extent of the study area, on a rise east of Salt Creek, is another swampy wetland (Figure 6.2) that was identified as having potential for archaeological sites. This area is considered less sensitive than that shown in Figure 6.1, however should be further assessed if it is likely to be impacted.

West of the Mortlake – Ararat Road, on Figure 6.3, a small drainage line is highlighted. This is east of Flat Top Hill, and warrants further survey in consideration of its potential to hold resources, and proximity (or possible relationship to), landscape features which surround it.

Figure 6.4 shows 3 small depressions, or gilgais, which were partially filled with water at the time of assessment. These are of low sensitivity.

Plate 6: West bank of Salt Creek

Plate 7: Flat Top Hill

Plate 8: Swampy area east bank of Salt Creek

Plate 9: Swampy area east bank of Salt Creek

3.2 Summary of Results

No sites were located during the course of the Preliminary Cultural Heritage Assessment. The most common site types likely to occur within the study area are artefact scatters and isolated artefacts, particularly on rises overlooking waterways. Scarred trees may occur where mature indigenous trees remain. Oven mounds may be present on the plains and in association with waterways. Freshwater middens may occur along creek banks and ceremonial sites including stone arrangements may be present where basalt outcrops in the northern section of the study area.

There is also potential for historical sites to be present in the study area. The Mount Fyans Homestead is a significant historical place, with intact homestead, outbuildings, water channels and dry stone walls. It is likely other properties in the study area also retain historical features, and these should be assessed if they will be impacted by the project.

3.3 Conclusions

Numerous areas of sensitivity for Aboriginal sites were identified during the windscreen assessment, including the entire northern section of the study area north of Woorndoo – Darlington Road. However, much of the southern part of the study area is considered to have low likelihood of Aboriginal sites. From prior experience, it is possible that low stony rises not detected in the terrain model, and not accessible through the ground-truthing assessment, exist within the landscape. The latter can only be identified during a full archaeological survey (ie a controlled survey with higher coverage of the area). Therefore it is possible that some archaeologically sensitive stony rises exist in the southern extent of the study area.

Broadly, the statutory areas of sensitivity match with those located in the predictive model (ie Blind and Salt Creeks, and wetlands in the very northern section of the study area). However, the predictive model identified areas of

additional and varying sensitivity (such as high degree of slope, ephemeral and unnamed waterways, and favourable landforms). The level of sensitivity will be further discussed with the Traditional Owners should the project move forward. This will allow greater consideration of the impact on areas of varying significance, and may therefore inform future methodology and design. The ground truthing confirmed that the majority of the areas identified hold archaeological potential, and also identified additional areas that were not picked up in the specific criteria of the predictive model.

The site prediction model – based on landscape and described above – was generally supported by observations made during the windscreen survey. However, this alone is insufficient to determine the degree to which the landscape is sensitive for Aboriginal sites, and whether any sites are present. The scope of the activity and study area are extremely large, and this Preliminary Cultural Heritage Assessment and model was focussed on a broad scale assessment of the landscape features to give direction to future investigation. For an accurate understanding of the cultural heritage values in this area, a detailed, thorough assessment would be required. The model and ground truthing has allowed comprehensive understanding of the site as a whole, and any further inspection can now be tailored based on the information gathered thus far. Any subsequent field survey should be undertaken by suitably qualified archaeologists and representatives from Kuuyang Maar Aboriginal Corporation, Eastern Maar Aboriginal Corporation, and Martang Pty Ltd, as per the RAP and relevant TO boundaries.

RURAL CITY OF ARARAT

SHIRE OF MOYNE

Lake Eyang

Woorndoo

Lime Creek

Boswell Swamp

Lake Sheepwash

Gum Swamp

MORTLAKE-ARARAT ROAD

Salt Creek

Hopkins River

Hexham

Mustons Creek

Blind Creek

Black Swamp

HAMILTON HIGHWAY

Lake Connewarren

Mortlake

JAMIESON RD

HOPKINS HIGHWAY

TERANG-MORTLAKE ROAD

Stony Creek

Hopkins River

Ellerslie

Kolora

Legend

- Acitivity area
- Areas of sensitvity (Biosis)

Figure 6: Ground truthing results

Biosis Pty Ltd

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Acknowledgements: Vicmap (c) State of Victoria

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Lake Eyang
Woorndoo
Lime Creek
Boswell Swamp
Lake Sheepwash
Gum Swamp
MORTLAKE-ARARAT ROAD
Hopkins River
Salt Creek
Hexham
SHIRE OF MOYNE
Mustons Creek
Blind Creek
Black Swamp
Lake Connewarren
Mortlake
HAMILTON HIGHWAY
JAMIESON RD
HOPKINS HIGHWAY
Stony Creek
TERANG-MORTLAKE ROAD
Kolora
Glenormiston
Ellerslie

Legend

- Activity Area
- Areas of sensitivity (OAAV)

Figure 7: Statutory areas of sensitivity

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Acknowledgements: Vicmap (c) State of Victoria

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Woorndoo
Lime Creek
Boswell Swamp
Lake Sheepwash
Gum Swamp
MORTLAKE-ARARAT ROAD
Hopkins River
Salt Creek
Hexham
SHIRE OF MOYNE
Mustons Creek
Blind Creek
Black Swamp
Lake Connewarren
Mortlake
HAMILTON HIGHWAY
JAMIESON RD
HOPKINS HIGHWAY
TERANG-MORTLAKE ROAD
Stony Creek
Hopkins River
Kolora
Ellerslie

Legend

- Activity Area
- Areas of sensitvity (Biosis)
- Areas of sensitivity (OAAV)

Predictive model

Overall Potential Score

- 8 - Highest Potential
- 7
- 6
- 5 - Lowest Potential

Figure 8: Aboriginal sensitivity overview

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Acknowledgements: Vicmap (c) State of Victoria

Matter: 23981
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Figure 9: Survey units

Acknowledgements: Vicmap (c) State of Victoria

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Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

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4 Summary of Outcomes

This report has assessed the cultural heritage values and potential of the study area on three different levels: desk-based research, predictive modelling, and field inspection. The areas which would trigger an Aboriginal CHMP are shown on Figure 7. These areas, and those plotted through the predictive model were tested through visual landform assessment. The ground truthing identified further areas of sensitivity that need to be investigated through archaeological survey and/or subsurface testing of any respective, future CHMPs if undertaken.

4.1 Statutory Triggers for a CHMP

Figure 7 outlines the areas of sensitivity, as per the *Aboriginal Heritage Regulations 2007.* Salt Creek, Blind Creek, and wetlands in the very northern section of the study area (ie just south of the Warndoo-Dundonnell Road), are all areas of cultural heritage sensitivity which, in conjunction with the impact of the wind farm (a high impact activity), will trigger the requirement for a CHMP.

4.2 Additional Areas of Sensitivity

Outlined in section 3.1 and Figure 6, these areas will not trigger a CHMP, however are considered to hold potential for Aboriginal Places. As they have been identified, further archaeological investigation should be considered, including assessment with the Traditional Owners. It is possible that these areas will require significant future assessment, such as excavation, and this should be considered through the design process. Locating these areas early may assist with the overall design, and thereby reduce the total archaeological investigation required.

4.3 Further Investigation

With due consideration to the size and potential sensitivity of the study area, we advise that a Standard Assessment should be considered for sample areas within the overall project. The objective of further targeted survey would be to provide further detailed information on the sensitivity of individual landforms and landscape units to allow the client to make informed decisions on the cultural heritage aspects of the design.

Based on the results of the desktop study modelling, the overall study area will be divided into survey units; each representing different landforms. These include watercourse corridors and broad landscape character units. It is proposed that a 10ha sample of each survey unit should be investigated, representing an overall sample survey of 90ha, or approximately 1% of the overall study area. This will constitute Stage 1 of the Standard Assessment for any CHMP that may be required for the scheme.

4.4 Recommendations

Recommendations will be developed on the basis of final design and in consultation with the Traditional Owners, AV, and the Sponsor as the project progresses through the CHMP stages.

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Glossary

The glossary provides definitions of various terms used in this CHMP. There is often a degree of confusion about the use of terms such as *heritage place*, *historical place*, *archaeological place*. The definitions of these terms, as used in this report, have been included in the glossary and their relationship outlined in Figure 9. The term used most consistently is *heritage place.* For the purpose of discussion in this plan 'heritage place' can be subdivided into Aboriginal place and Historic place.

Heritage place: A place that has aesthetic, historic, scientific or social values for past, present or future generations – ' ... this definition encompasses all cultural places with any potential present or future value as defined above' (Pearson and Sullivan 1995:7).

Aboriginal place: Aboriginal place is defined under Section 5 of the *Aboriginal Heritage Act* 2006 as follows:

5 What is an Aboriginal place?

(1) For the purposes of this Act, an Aboriginal place is an area in Victoria or the coastal waters of Victoria that is of cultural heritage significance to the Aboriginal people of Victoria.

(2) For the purposes of subsection (1), *area* includes any one or more of the following—

(a) an area of land;

(b) an expanse of water;

(c) a natural feature, formation or landscape;

(d) an archaeological place, feature or deposit;

(e) the area immediately surrounding any thing referred to in paragraphs (c) and (d), to the extent that it cannot be separated from the thing without diminishing or destroying the cultural heritage significance attached to the thing by Aboriginal people;

(f) land set aside for the purpose of enabling Aboriginal human remains to be re-interred or otherwise deposited on a permanent basis;

(g) a building or structure.

The archaeological place types encountered in Australia can be divided into three main groups:

Historical archaeological place: an archaeological place formed since non-Aboriginal settlement that contains physical evidence of past human activity (for example a structure, landscape or artefact scatter).

Aboriginal historical archaeological place (or contact place): a place with a historical context such as an Aboriginal mission station or provisioning point; or a place that shows evidence of Aboriginal use of non-Aboriginal materials and ideas (for example: artefact scatter places that have artefacts made from glass, metal or ceramics).

Aboriginal prehistoric archaeological place: a place that contains physical evidence of past Aboriginal activity, formed or used by Aboriginal people either before, or not long after, European settlement

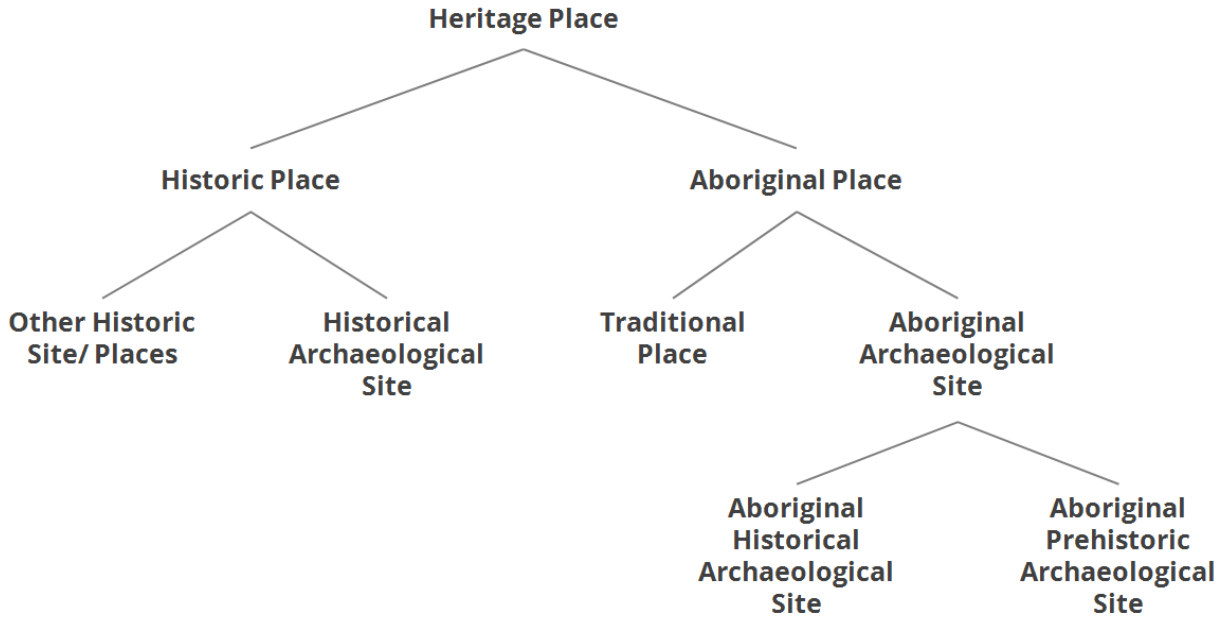

Figure 9. Terminology used for categories of heritage places

Alluvial terrace: a platform created from deposits of alluvial material along river banks.

Angular fragment: a piece of stone that is blocky or angular, not flake-like.

Archaeology: the study of the remains of past human activity.

Artefact scatter: a surface scatter of cultural material. Aboriginal artefact scatters are defined as being the occurrence of five or more items of cultural material within an area of about 100 square metres. Artefact scatters are often the only physical remains of places where people have lived camped, prepared and eaten meals and worked.

Backed piece: a flake or blade that has been abruptly retouched along one or more margins opposite an acute (sharp) edge. Backed pieces include backed blades and geometric microliths. They are thought to have been hafted onto wooden handles to produce composite cutting tools. Backed pieces are a feature of the 'Australian small tool tradition', dating from between 5,000 and 1,000 BP in southern Australia (Holdaway & Stern, 2004).

Blade: a flake at least twice as long as it is wide.

Burial place: usually a sub-surface pit containing human remains and sometimes associated artefacts.

Contact place: see 'Aboriginal historical archaeological place'.

Core: an artefact from which flakes have been detached using a hammerstone. Core types include single platform, multi-platform and bipolar forms.

Cortex: original or natural (unflaked) surface of a stone.

Cortical: refers to the cortex.

Flake: a stone piece removed from a core by percussion (striking it) or pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.

Flaked piece: a piece of stone with definite flake surfaces, which cannot be classified as a flake or core.

Formal tool: an artefact that has been shaped by flaking, including retouch, or grinding to a predetermined form for use as a tool. Formal tools include scrapers, backed pieces and axes.

GDA94 or Geocentric Datum of Australia 1994: a system of latitudes and longitudes, or east and north coordinates, centred at the centre of the earth's mass. GDA94 is compatible with modern positioning techniques such as the Global Positioning System (GPS). It supersedes older coordinate systems (AGD66, AGD84). GDA94 is based on a global framework, the IERS Terrestrial Reference Frame (ITRF), but is fixed to a number of reference points in Australia. GDA94 is the Victorian Government Standard and spatial coordinates for excavations, transects and places in CHMP documents.

Geometric microlith: a small tool that has been fashioned from breaking apart a microblade. The piece is then retouched or backed and a small tool formed.

Grindstones: upper (handstone) and lower (basal) stones used to grind plants for food and medicine and/or ochre for painting. A handstone sometimes doubles as a hammerstone and/or anvil.

Ground Surface Visibility: the degree to which the surface of the ground can be seen. This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land-use practices, such as ploughing or grading. Visibility is generally expressed in terms of the percentage of the ground surface visible for an observer on foot.

Hearth: usually a sub-surface feature found eroding from a river or creek bank or a sand dune - it indicates a place where Aboriginal people cooked food. The remains of a hearth are usually identifiable by the presence of charcoal

and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved within a hearth.

Isolated artefact: the occurrence of less than five items of cultural material within an area of about 100 squaremetres. It/they can be evidence of a short-lived (or one-off) activity location, the result of an artefact being lost or discarded during travel, or evidence of an artefact scatter that is otherwise obscured by poor ground visibility.

Manuport: foreign fragment**,** chunk or lump of stone that shows no clear signs of flaking but is out of geological context and must have been transported to the place by people.

Map Grid of Australia (MGA): The official coordinate projection for use with the Geocentric Datum of Australia 1994 (GDA94).

Mound: these places, often appearing as raised areas of darker soil, are found most commonly in the volcanic plains of western Victoria or on higher ground near bodies of water. The majority were probably formed by a slow build-up of debris resulting from earth-oven cooking; although some may have been formed by the collapse of sod or turf structures.

Percussion: the act of hitting a core with a hammerstone to strike off flakes.

Platform preparation: removal of small flake scars on the dorsal edge of a flake, opposite the bulb of percussion. These overhang removal scars are produced to prevent a platform from shattering.

Pre-contact: before contact with non-Aboriginal people.

Post-contact: after contact with non-Aboriginal people.

Quarry (stone/ochre source): a place where stone or ochre is exposed and has been extracted by Aboriginal people. The rock types most commonly quarried for artefact manufacture in Victoria include silcrete, quartz, quartzite, chert and fine-grained volcanics such as greenstone.

Rejuvenation flake: a flake that has been knapped from a core solely for the purpose of preparing a new platform and making it easier to get flakes off a core, as it reduces the angle between platform and core surface.

Retouch: a flake, flaked piece or core with intentional secondary flaking along one or more edges.

Rock art: 'paintings, engravings and shallow relief work on natural rock surfaces' (Rosenfeld 1988: 1). Paintings were often produced by mineral pigments, such as ochre, combined with clay and usually mixed with water to form a paste or liquid that was applied to an unprepared rock surface. Rock engravings were made by incising, pounding, pecking or chiselling a design into a rock surface. Rare examples of carved trees occasionally survive.

Rock shelter: may contain the physical remains of camping places where people prepared meals, flaked stone, etc. They are often classed as a different type of place due to their fixed boundaries and greater likelihood of containing sub-surface deposits. Rockshelters may also contain rock art.

Scarred tree: scars on trees may be the result of removal of strips of bark by Aborigines e.g. for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide hand and toe holds for hunting possums and koalas. Some scars may be the result of non-Aboriginal activity, such as surveyors' marks.

Scraper: a flake, flaked piece or core with systematic retouch on one or more margins.

Shell midden: a surface scatter and/or deposit comprised mainly of shell, sometimes containing stone artefacts, charcoal, bone and manuports. These place types are normally found in association with coastlines, rivers, creeks and swamps – wherever coastal, riverine or estuarine shellfish resources were accessed and exploited.

Significance: the importance of a heritage place or place for aesthetic, historic, scientific or social values for past, present or future generations.

Striking platform: the surface of a core, which is struck by a hammerstone to remove flakes.

Structures (Aboriginal): can refer to a number of different place types, grouped here only because of their relative rarity and their status as built structures. Most structures tend to be made of locally available rock, such as rock arrangements (ceremonial and domestic), fishtraps, dams and cairns, or of earth, such as mounds or some fishtraps.

Stratified deposit: material that has been laid down, over time, in distinguishable layers.

Transect: A fixed path along which one records archaeological remains.

Utilised artefact: a flake, flaked piece or core that has irregular small flake scarring along one or more margins that does not represent platform preparation.