



**Berwick Waterways Precinct Structure
Plan, Berwick.**

**Cultural Heritage Management Plan
#11350**

Sponsor: Metropolitan Planning Authority

Cultural Heritage Advisor: Jim Wheeler

**Authors: Erica Walther, Paul Freestone and Jim
Wheeler**

Large Sized Activity

Complex Assessment

28th May 2014

AHMS
ARCHAEOLOGICAL & HERITAGE
MANAGEMENT SOLUTIONS



Berwick Waterways Precinct Structure Plan, Berwick
Cultural Heritage Management Plan (OAAV#11350)
28th May 2014

Sponsor: Metropolitan Planning Authority

Cultural Heritage Advisor: Jim Wheeler

Authors: Erica Walther, Paul Freestone and Jim Wheeler

LARGE SIZED ACTIVITY

DESKTOP STANDARD & COMPLEX ASSESSMENT

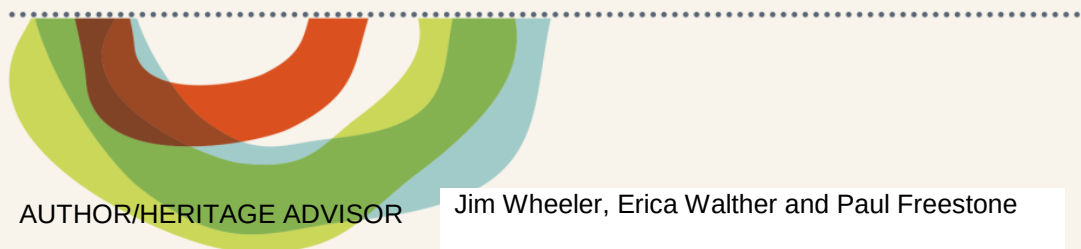
**Prepared by Archaeological & Heritage Management Solutions (AHMS)
Pty Ltd on behalf of Metropolitan Planning Authority**

PLEASE NOTE

THIS REPORT CONTAINS PICTURES OF AND INFORMATION ABOUT PEOPLE WHO MAY HAVE
PASSED AWAY

ARCHAEOLOGICAL & HERITAGE
MANAGEMENT SOLUTIONS

SYDNEY | MELBOURNE | PERTH

**AUTHOR/HERITAGE ADVISOR**

Jim Wheeler, Erica Walther and Paul Freestone

PROPONENT

Metropolitan Planning Authority

PROJECT NAMEBerwick Waterways Precinct Structure Plan,
Cultural Heritage Management Plan 11350**REAL PROPERTY
DESCRIPTION**Precinct Structure Plan 9 – Berwick Waterways
(see Section 2 for cadastral details)**DATE**28th May 2014

AHMS INTERNAL REVIEW/SIGN OFF				
WRITTEN BY	DATE	VERSION	REVIEWED	APPROVED
Erica Walther and Paul Freestone	12/8/2010	Draft for client review	Jim Wheeler	Jim Wheeler
John Tunn and Jim Wheeler	28/5/2014	Final	Jim Wheeler	Jim Wheeler

Copyright and Moral Rights

Historical sources and reference materials used in the preparation of this report are acknowledged and referenced in figure captions or in text citations. Reasonable effort has been made to identify, contact a, acknowledge and obtain permission to use material from the relevant copyright owners.

Unless otherwise specified in the contract terms for this project AHMS:

- Vests copyright of all material produced by AHMS (but excluding pre-existing material and material in which copyright is held by a third party) in the client for this project (and the client's successors in title);
- Retains the use of all material produced by AHMS for this project for AHMS ongoing business and for professional presentations, academic papers or publications

ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS

ABN 45 088 058 388
ACN 088 058 388

www.ahms.com.au
info@ahms.com.au

SYDNEY
2/729 Elizabeth St
Waterloo NSW 2017
P 02 9555 4000
F 02 9555 7005

MELBOURNE
2/35 Hope St
Brunswick VIC 3056
P 03 9388 0622

PERTH
13/336 Churchill Ave
Subiaco WA 6008
P 08 9381 5206

EXECUTIVE SUMMARY

Metropolitan Planning Authority (The Sponsor) engaged Jim Wheeler of Archaeological and Heritage Management Solutions (AHMS) Pty Ltd (Cultural Heritage Advisor) to prepare a Cultural Heritage Management Plan (CHMP) for the proposed residential and mixed uses precinct structure plan (PSP) and subdivision at 'Berwick Waterways', south of the Princes Freeway and north of Greaves Rd, south west of Berwick town centre

The study area is approximately 75 ha in total and currently comprises 25 individual allotments. All allotments are located within the City of Casey Municipality.

A notice of intent to prepare the CHMP was lodged with Office of Aboriginal Affairs Victoria (OAAV) on the 07/07/2010 (a copy of the notice is included in Appendix 1). A response from OAAV was received on the 16/07/2010. OAAV issued a project number 11350. OAAV advised that as there was no Registered Aboriginal Party for the activity area, OAAV are the statutory authority responsible for evaluating the CHMP.

The CHMP was prepared in accordance with the requirements of the *Aboriginal Heritage Act* 2006 and associated regulations and guidelines issued by OAAV regarding preparation of CHMPs. The overriding purpose of the CHMP was to document and assess the Aboriginal heritage (archaeological and cultural) values of the subject land, the impact of proposed development on those values and to provide management procedures to minimise and mitigate impact before, during and after development.

A search for known Aboriginal sites on the OAAV Victorian Aboriginal Heritage Register (VAHR) within the southeast study area was undertaken to identify previously recorded sites within and surrounding the study area.

A total of 45 Aboriginal sites have been recorded within this search area, comprising over 95% artefact scatters, but no scarred trees or burials. Within a 10km radius of the activity area a total of 710 Aboriginal sites have been recorded,

with artefact scatters being most common (84%), followed by scarred trees (12%) and multi-component sites (4%).

Based upon our analysis of the VAHR Aboriginal sites database, and background archaeological data reviewed in this chapter, the topography and distribution of natural resources near the activity area generally indicated a potential for:

- Surface scatters of stone artefacts, particularly in areas of soil exposure caused by erosion;
- Low density stone artefact scatters within remnant topsoils in areas located at distance from reliable water and/or stone sources;
- Low density stone artefact scatters within former swamps and waterlogged areas;
- Higher density stone artefact scatters within remnant topsoils in areas located on flat and slightly elevated landforms in close proximity to reliable water and/or stone sources;
- Higher density of artefacts and frequency of sites in or near resource intersection zones;
- Isolated finds anywhere across the landscape; and
- Burials in soft sands that have a neutral or alkaline pH and are more than 300 mm deep.

A survey of the activity area was undertaken in order to identify exposed cultural material (i.e. surface sites). The survey also aimed to examine landforms, vegetation patterns, geomorphic units, and areas of disturbance. Not all properties within the activity area were surveyed due to restricted access from the property owners. Generally surface visibility was low due to dense grass cover except in areas of high wear from vehicular traffic and treading by cows and horses near fence lines, gates and around trees. Residential buildings, sheds and stables, mounds of soil, and drainage channels also affected surveying. Surface water was often heavy due to

recent rains and poor soil drainage due to the underlying clay and flat environment of the activity area.

No Aboriginal Archaeological sites were located during the survey.

Levels of disturbance across the activity area were clearly visible at the time of the survey; namely those associated with development and construction of the previous residence, driveways, fences, land clearance and agricultural practices including stock grazing, ploughing, drainage and the planting of non-indigenous vegetation. It is likely that the disturbance of ploughing, levelling and construction, and stock grazing across the activity area has affected the integrity of any Aboriginal cultural deposits present within the activity area. The survey and standard assessment concluded that the activity area was a former swamp and had a low level potential to contain Aboriginal sites or objects.

Following consultation with the Wurundjeri Tribe Land Compensation & Cultural Heritage Council (WTLC&CHC), the Bunurong Land Council and the Boonwurrung Foundation, it was decided to undertake test excavation to confirm the levels of prior soil disturbance and confirm that the area is unlikely to contain Aboriginal cultural deposits. The test excavation (the Complex Assessment) also aimed to determine the extent, nature and significance of any Aboriginal archaeological sites and sub-surface deposits found within the activity area.

The strategy comprised controlled manual and machine excavation of fourteen 1 metre x 1 metre test trenches along two linear transects. Test excavation was, in part, constrained by permission to access land. Excavated material was 100% sieved through 5mm screens.

No Aboriginal artefacts were located during the excavations.

The test excavations confirmed that the activity area contains a soil profile developed under waterlogged conditions, supporting our conclusion that the activity area comprised a swamp. The former swamp was drained and cleared during soldier settlement development after the world war two. Evidence of soil disturbance revealed during the test excavations also indicated that the vertical integrity of soil

profiles within the activity area have been affected by clearing, grazing, cut and fill, cultivation and bioturbation.

In summary, the assessment concluded that the likelihood of Aboriginal cultural deposits within the activity area is low.

No recommendations have been made to minimise or avoid harm because no Aboriginal sites or objects are present within the activity area and the assessment concluded that the likelihood of Aboriginal cultural heritage within the activity area is low. This CHMP does, however, recommend that neither the Sponsor nor the Aboriginal community representatives speak to the media about Aboriginal heritage issues relating to the project unless agreed by the other party. The CHMP also includes a range of standard contingencies in the unexpected event that Aboriginal sites or human remains are discovered during the activity.

CONTENTS

Executive summary.....	4
contents	8
list of figures (including maps)	11
list of tables.....	12
abbreviations	13
definitions.....	13
part 1 - assessment.....	14
1 INTRODUCTION	15
1.1 Preamble.....	15
1.2 Reason for the current study	17
1.3 Authorship.....	18
1.4 Acknowledgements	19
2 Activity Description	20
3 Extent of Activity Area.....	21
4 Documentation of Consultation	24
4.1 Development of Consultation	24
4.2 Outcomes of Consultation	25
5 Desktop Assessment	27
5.1 Preamble.....	27
5.2 Background to Assessment	28
5.3 Geographic Region	30
5.4 Review of Aboriginal Places in the Region	32
5.5 Review of Regional Archaeological Context (including reports and published works) 36	
5.5.1 Regional Studies	36
5.5.2 The Use of Terrain Patterns and Proxy Data in Selecting Reports for Review 37	
5.5.3 Local Studies	42
5.5.4 Previous Studies within the Activity Area	51
5.6 General Ethno-Historical Background	52
5.7 Review of Thomas Journal to Identify Aboriginal Use and Occupation in the Local Area	62
5.7.1 Introduction	62
5.7.2 Settlement Patterns	64

5.7.3	Hunting and Gathering	65
5.7.4	Burial Practice	66
5.7.5	Frontier Violence and Early Settler Relations	67
5.7.6	Summary	69
5.8	Environmental Context (Landforms & Geomorphology).	70
5.8.1	Landscapes	70
5.8.2	Drainage and Water Resources	71
5.8.3	Published Geological Information	74
5.8.4	Geomorphology & Soils.....	76
5.8.5	Vegetation	76
5.8.6	Terrain Units within the Activity Area	78
5.8.7	Landforms within the activity area.....	80
5.9	Landuse History	81
5.9.1	Land History Use History in the South East Region	81
5.9.2	Landuse disturbance within the activity area	82
5.10	Andrew Long & Associates Terrain Profile Modelling	85
5.11	Desktop Assessment Conclusions and Predictive Modelling.....	89
6	Standard Assessment (Survey).....	94
6.1	Survey Details.....	94
6.2	Survey Methodology	94
6.3	Survey Coverage	97
6.4	Survey Results	98
6.5	Disturbance within the Activity Area	99
6.6	Survey Conclusions	103
6.7	Cultural Values Mapping	104
6.7.1	Methodology and Approach	104
6.7.2	Previous Work	106
6.7.3	Wider Values	108
6.7.4	Berwick Waterways PSP.....	116
7	Complex Assessment (Test Excavations)	123
7.1	Preamble.....	123
7.2	Objectives & Rationale.....	123
7.3	Excavation Methodology	124
7.3.1	Preamble.....	124
7.3.2	Scope of Work	124

7.3.3	Excavation and recording methods	125
7.3.4	Post Excavation Analysis	127
7.4	Excavation Results	128
7.4.1	General.....	128
7.4.2	Necessary Variations	128
DETAILS OF ABORIGINAL CULTURAL HERITAGE IN THE ACTIVITY AREA		15
8	Test Excavation Analysis.....	16
8.1	Soil Profiles.....	16
8.2	Soil Chemistry.	17
8.3	Prior Land Use and Disturbance Analysis	17
8.4	Discussion.....	18
9	Assessment Conclusions	20
9.1	Extent of Sites	20
9.2	Nature of Sites.....	20
9.3	Significance Assessment	20
9.3.1	Principles & Evaluation Criteria	20
9.3.2	Evaluation of Aboriginal Cultural Significance	21
9.3.3	Evaluation of Public Significance.....	22
9.3.4	Evaluation of Scientific Significance.....	22
10	Impact Assessment (s.61 Matters)	24
10.1	Development Design.....	24
10.2	Evaluation	24
part 2 - cultural heritage management recommendations		26
11	Cultural Heritage Management Recommendations	27
11.1	Basis for Recommendations	27
11.2	Definitions	27
11.3	Recommendations	28
Recommendation 1 - Impact Avoidance & Minimisation.....		28
Recommendation 2 - Sensitive Information.....		28
11.4	Contingencies.....	28
Contingency 1 - Contingency for discovery of human skeletal remains.....		29
Contingency 2 - Contingency planning for discovery of Aboriginal cultural heritage.		31
Contingency 3 - Custody and Management of Aboriginal Cultural Heritage during the course of the activity.		36
Contingency 4 - Resolution of Disputes.....		37

Contingency 5 - Compliance and Mechanisms for non-compliance.....	37
References	41
Appendix 1 - Notice of Intent	59
Appendix 2 - Schedule to PLANNING SCHEME (ugz)	62
Appendix 3 - Glossary of Technical Terms	70

LIST OF FIGURES (INCLUDING MAPS)

Figure 1 - Location of the Activity Area (outlined in red) Source: Andrew Long and Associates.....	16
Figure 2 - Plan of the Activity Area (Activity Area shaded in green).....	22
Figure 3 - Proposed PSP structure plan. Drawing provided by Metropolitan Planning Authority.....	23
Figure 4 - Location of the activity area (red), within the Geographic Region. Source: Andrew Long and Associates 2010. Volume 5.	31
Figure 5 - Registered Aboriginal cultural heritage places in the South-east Study Area Source: Andrew Long and Associates 2010. Volume 5 (Draft p.20). Activity Area shaded green.	34
Figure 6 – Areas of Aboriginal cultural heritage sensitivity in the South-east Study Area Source: Andrew Long and Associates 2010. Volume 5 (Draft p.21). Activity Area shaded green	35
Figure 7 - Undated plan (William Thomas) showing the road from Ruffy's Mayune Station to O'Connors Station and thence to Dandenong.. Thi	63
Figure 8 - Thomas sketch of Bun wurrung travelling by dray.	64
Figure 9 – Extent of former swamp in the activity area.	73
Figure 10 – Plan showing geological formations within the Activity Area (outlined red). The codes Sm (purple) and Nxx (pale yellow) as outlined above. Source: “GeoVic”, Department of Primary Industries.....	75
Figure 11 – DEPI, Victorian Resources Online. 1750 Ecological Vegetation Communities (EVC's) identified within the study area (left) and current modeled extent of remnant EVC's (right) Study area outlined red.	77
Figure 12 – Terrain units in the South-east Study Area Source: Andrew Long and Associates 2010. Volume 5 (Draft p31).....	79
Figure 13 – Landforms in the activity area.	80
Figure 14 – Activity Area outlined red on Historic Aerial Photography Melbourne Metropolitan Project 1960.	83

Figure 15 - Plan of the study area showing areas of high disturbance in green, caused by cut and fill, building platforms and dams. The orange rectangles show the location and arrangement of former market garden beds. A series of tracks/path are located crossing the study area between the field. Basemap Source: Google Earth Pro 2010.....	84
Figure 16 – Preliminary character map of South-east Study Area indicating disturbed areas and predicted ‘Zones of Likelihood’ – 1 being the highest.the current Activity Area is shown in inset at the top of the map.....	86
Figure 17 – GIS preliminary sensitivity plan and predictive model revised as a result of AHMS additional desktop research.	93
Figure 18 – Properties that granted access during survey work.	96
Figure 19 – Survey coverage on accessed properties.....	97
Figure 20 – Disturbance map (deskstop assessment analysis and survey).	101
Figure 21 – Fill platform and recently deposited spoil.....	102
Figure 22 – Deep drainage ditch running parallel to Centre Road near property No. 9.	102
Figure 23 – Alignment of excavated test trenches indicating excavation method used at each location - manual excavation (blue) and machine excavation (red). Trench scale is exaggerated for display purposes.	129
Figure 24 - North section of Trench-3-1 with terracotta pipe in west section (left).....	18

LIST OF TABLES

Table 3.1 - Allotments within the Activity Area	21
Table 4.1 - Aboriginal Community Correspondence Log.	25
Table 5.1 - Terrain Units	78

ABBREVIATIONS

OAAV	Office of Aboriginal Affairs Victoria
AHC	Australian Heritage Council
BP	Before Present
CHMP	Cultural Heritage Management Plan
EVC	Ecological Vegetation Communities
MPA	Metropolitan Planning Authority
GSV	Ground surface visibility
LGA	Local Government Area
PSP	Precinct Structure Plan
RAP	Registered Aboriginal Party
SGD	Significant Ground Disturbance
VAHR	Victorian Aboriginal Heritage Register
VRO	Victorian Resources Online.

DEFINITIONS

ACTIVITY AREA	The area or areas to be used or developed for the activity
REGIONAL STUDY AREA	The South East Region analytical unit as defined by Andrew Long and Associates¹

¹ 2010 Volume 5 (draft)

PART 1 - ASSESSMENT

1 INTRODUCTION

1.1 Preamble

Metropolitan Planning Authority (The Sponsor) engaged Jim Wheeler of Archaeological and Heritage Management Solutions (AHMS) Pty Ltd (Cultural Heritage Advisor) to prepare a Cultural Heritage Management Plan (CHMP) for the proposed precinct structure plan (PSP) and subdivision at 'Berwick Waterways', south of the Princes Freeway and north of Greaves Rd, south west of Berwick town centre (**Figure 1**). The study area is approximately 75 ha in total and currently comprises 25 individual allotments which are listed in **Table 3.1** on page 21. All allotments are located within the City of Casey municipality.

A notice of intent to prepare the CHMP was lodged with Office of Aboriginal Affairs Victoria (OAAV) on the 07/07/2010 (a copy of the notice is included in **Appendix 1**). OAAV responded on the 16/07/2010 and issued a project number 11350. OAAV advised that as there was no Registered Aboriginal Party, OAAV are the evaluating authority.

The CHMP was prepared in accordance with the requirements of the *Aboriginal Heritage Act 2006* and associated regulations and guidelines issued by OAAV regarding preparation of CHMPs. The overriding purpose of the CHMP was to document and assess the Aboriginal heritage (archaeological and cultural) values of the subject land, the impact of proposed development on those values and to provide management procedures to minimise and mitigate impact before, during and after development.

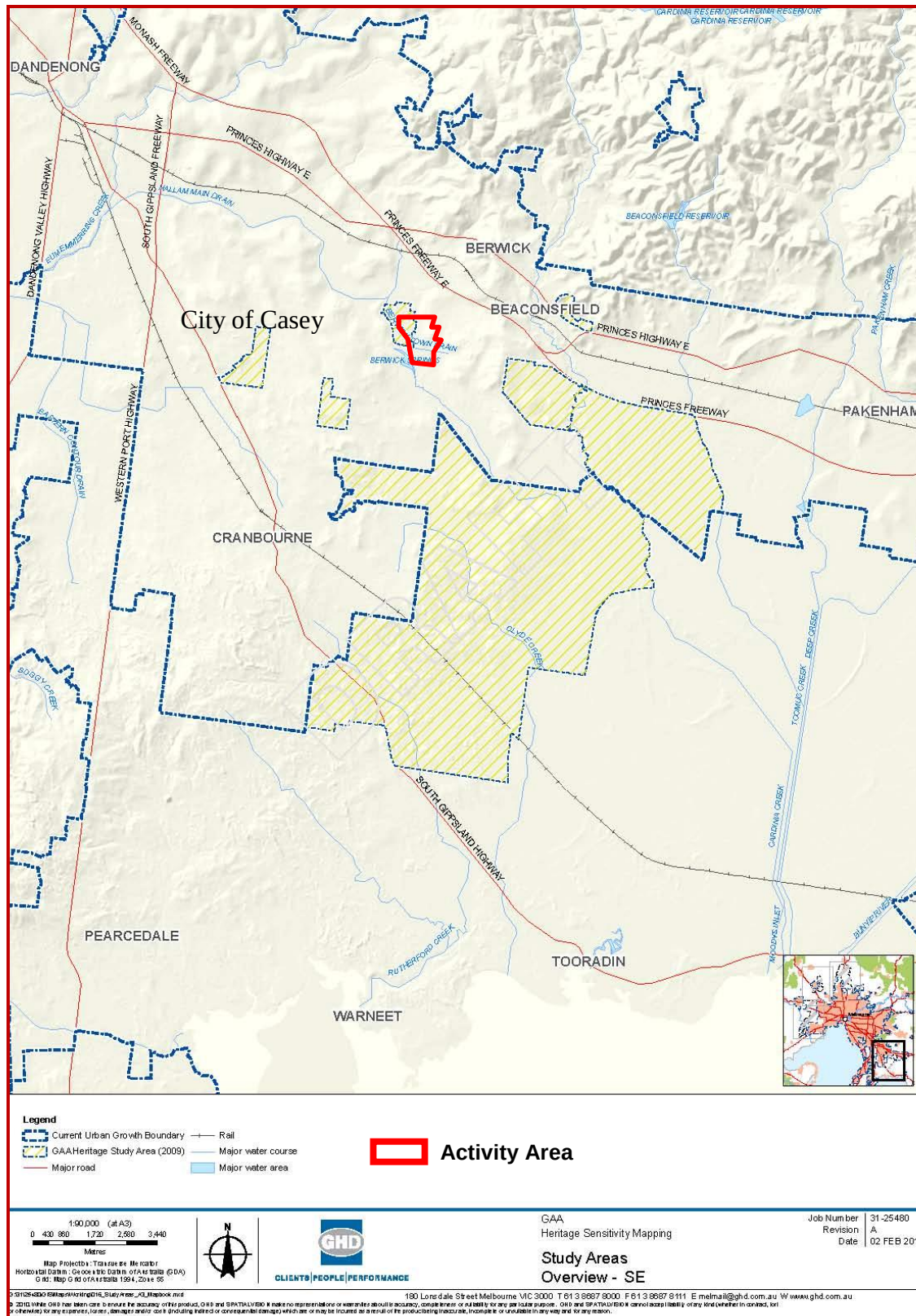


Figure 1 - Location of the Activity Area (outlined in red) Source: Andrew Long and Associates².

² 2010 Volume 5 (Draft p.6)

1.2 Reason for the current study

The objective of the CHMP was to identify and assess the nature, extent and significance of Aboriginal sites, objects and cultural heritage values within the subject land and to provide mitigation, protection and contingency procedures to manage those values before, during and after development of the land within the Precinct Structure Plan.

- A CHMP is required as the activity is a high impact activity and is within an area of sensitivity (*Aboriginal Heritage Regulations r.6*).
- Specifically, the activity area is situated within an area of cultural heritage sensitivity ('Koo Wee Rup Plain' - *Aboriginal Heritage Regulations r.31*).
- The activity (a subdivision) is a defined high impact activity (*Aboriginal Heritage Regulations r.46*).

This CHMP has been prepared in accordance with the Aboriginal Heritage Act 2006.

In accordance with Section 61 of the Aboriginal Heritage Act 2006, the following mandatory matters are considered by this CHMP:

- whether the activity will be conducted in a way that avoids harm to Aboriginal cultural heritage;
- if it does not appear to be possible to conduct the activity in a way that avoids harm to Aboriginal cultural heritage, whether the activity will be conducted in a way that minimises harm to Aboriginal cultural heritage;
- any specific measures required for the management of Aboriginal cultural heritage likely to be affected by the activity, both during and after the activity;
- any contingency plans required in relation to disputes, delays and other obstacles that may affect the conduct of the activity; and
- requirements relating to the custody and management of Aboriginal cultural heritage during the course of the activity.

In addition the Management Plan also includes matters set out in Schedule 2 of the Regulations.

Specific aims of the CHMP were as follows:

- Identify any known Aboriginal sites, relics and any places of cultural significance to the Aboriginal community within the subject land;
- Assess the potential for Aboriginal sites and/or relics buried below ground surfaces;
- Assess the Aboriginal heritage significance of Aboriginal sites, relics, places and areas of archaeological potential in partnership with the local Aboriginal community;
- Assess the impact of the activity on Aboriginal sites, relics, places and significance values;
- Make appropriate recommendations for protection of cultural heritage and/or mitigation of development impact, including contingency procedures, in consultation with the local Aboriginal community.

1.3 Authorship

The principal authors of this report were Paul Freestone (B. Arch), Jim Wheeler (B.A Hons) and Erica Walther (B. Arch Hons). Graham Wilson (B.A. B.Geology), Jared Brindley, and Shannon Sutton (B.A. Hons) also made important contributions to content used in this report. The Cultural Values Mapping assessment and reporting was written by Chris Johnston, Shannon Nicolson, Ian Travers and Leo Martin of Context Pty Ltd.

The desktop component of the report also draws on and cites information included in a regional desktop assessment prepared for the Metropolitan Planning Authority (MPA) by Andrew Long & Associates Pty Ltd. Principal contributors to the Andrew Long & Associates report included: Andrew Long, Jim Allen, Anna Light, Kristal Buckley, Neville Rosengren, Melinda Albrecht and Katherine Sheedy.

1.4 Acknowledgements

The authors acknowledge the assistance and valuable input provided by the Metropolitan Planning Authority, in particular Cathy Brady and Alexandra Malishev. We would also like to acknowledge the valuable assistance provided by Darren Griffin, Alan Wandin and Ashley Firebrace of the Wurundjeri Tribe Land Compensation & Cultural Heritage Council (WTLC&CHC), Sam Pender of the Boonwurrung Foundation Ltd, and Sonia Murray and Steve Pepper of the Bunurong Land Council.

2 ACTIVITY DESCRIPTION

The land is currently zoned UGZ – Urban Growth Zone. This zone attempts to streamline planning controls within the Precinct Structure Plan (PSP) area by effectively removing the rezoning process. Therefore the current zoning of the land as UGZ will remain while the PSP ‘master plan’ is completed.

The Sponsor does not intend to develop each individual allotment – they would be sold for residential development after the sub-division works are complete. The residential allotments will remain zoned ‘UGZ – Urban Growth Zone’ under the Casey City Planning Scheme. The schedule to this zone is included in Appendix 3. In keeping with the PSP, works within this area do not require rezoning to be completed.

The Activity Area is shown on **Figure 2**. The finalised Precinct Structure Plan is included as **Figure 3**.

3 EXTENT OF ACTIVITY AREA

The Activity Area comprises a 75 hectare parcel of land divided into 25 individual allotments that constitute PSP 9 'Berwick Waterways' (shown on Figure 2 and detailed in Table 3.1 below). All allotments are located within the City of Casey Municipality.

The activity area incorporates land within the study area that is proposed to be subject to sub-division and infrastructure works.

Table 3.1 - Allotments within the Activity Area

Lot 1 TP748354D	Lot 1 TP085701C	Lot 4 PS052810	Lot Res1 PS323945M
Lot 6 PS052810	Lot 3 PS 052810	Lot 5 PS052810	Lot 7 PS 052810
Lot 9 PS052810	Lot A PS437692E	Lot 11 PS052810	Lot 1 PS338577G
Lot 1 PS314788C	Lot 1 TP213106J	Lot 1 TP748354D	Lot Res1 PS336088J
Lot 1 PS336088J	Lot A PS430080B	Lot 16 PS052810	Lot 14 PS052810
Lot 1 PS323945M	Lot 12 PS052810	Lot 10 PS052810	Lot 2 PS323945M
Lot 3 PS323945M			

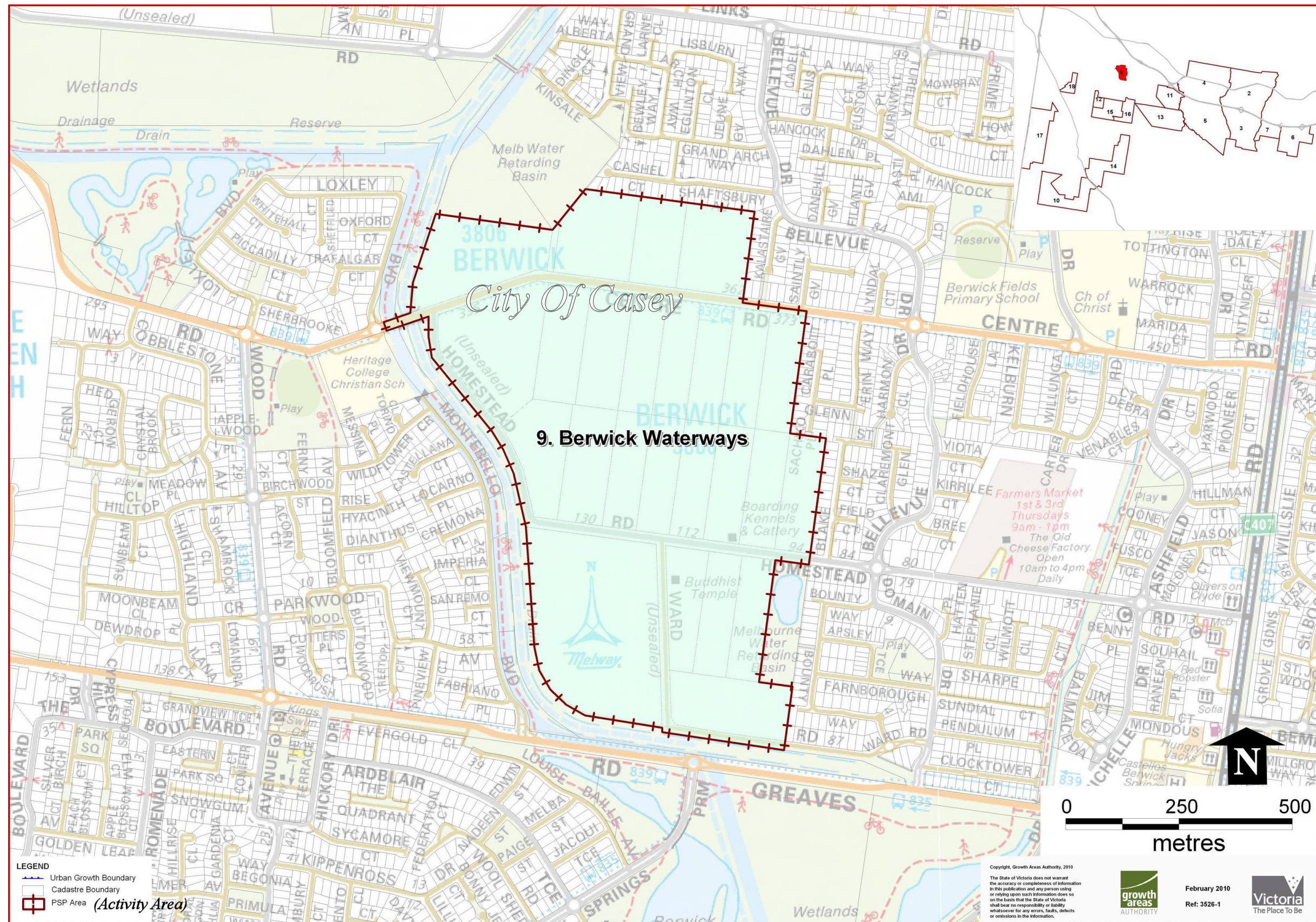


Figure 2 - Plan of the Activity Area (Activity Area shaded in green)

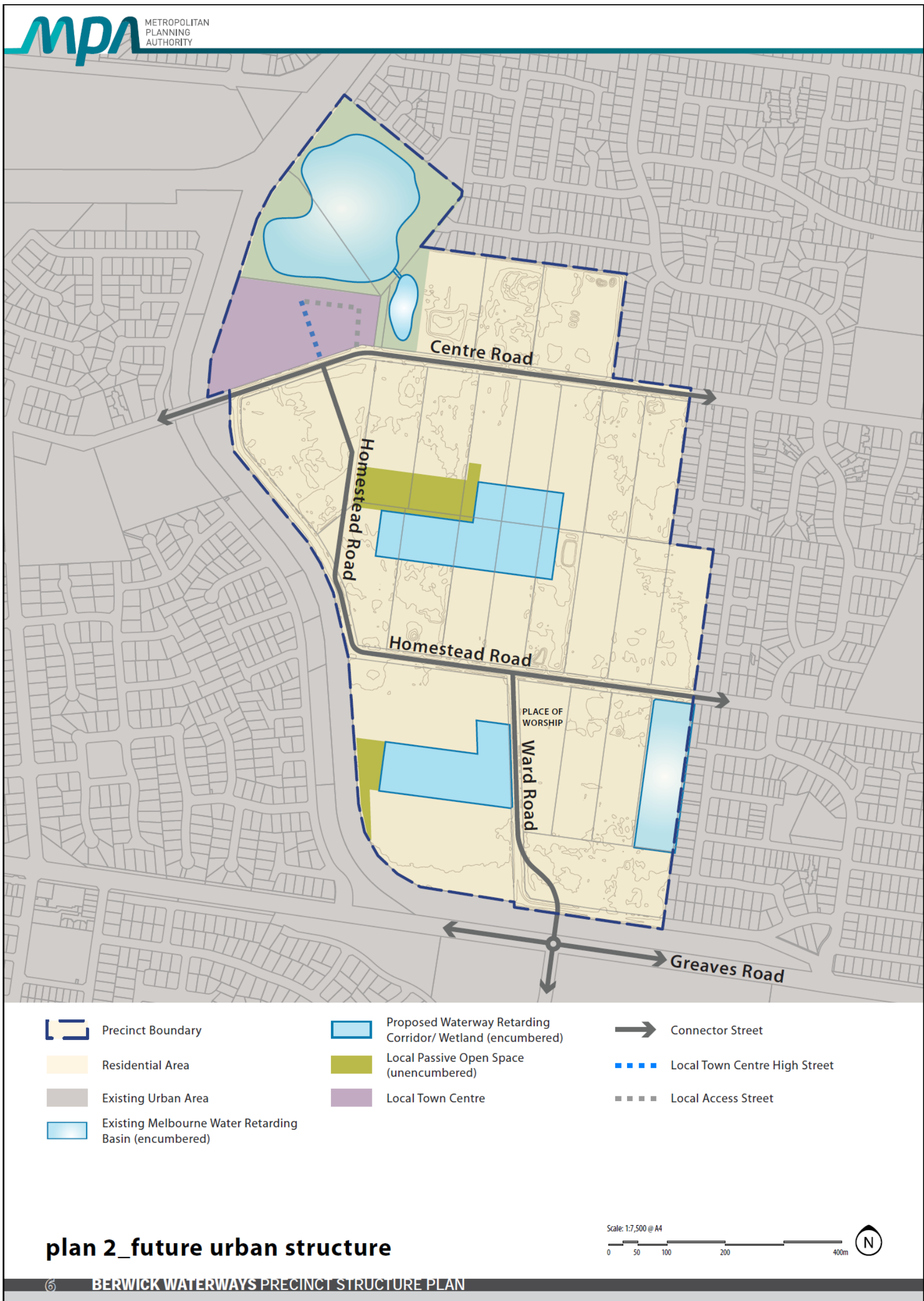


Figure 3 - Proposed PSP structure plan. Drawing provided by Metropolitan Planning Authority.

4 DOCUMENTATION OF CONSULTATION

4.1 Development of Consultation

There were no Registered Aboriginal Parties (RAPs) at the time notice of intent to prepare this CHMP was provided to OAAV. On the advice of OAAV we undertook a process of consultation with the RAP applicants (the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc.) and two relevant traditional owner groups: The Bunurong Land Council and the Boonwurrung Foundation.

Our approach to the Aboriginal community consultation was to undertake all components of the study in partnership with the Wurundjeri, Bunurong and Boonwurrung. In practice, we invited representatives of the groups to participate in survey and excavation. In addition, we undertook cultural values mapping with elders and knowledge holders from the Aboriginal community. The Bunurong Land Council and Wurundjeri both participated in the cultural values mapping, however, despite repeated attempts to contact and arrange involvement of the Boonwurrung foundation, they did not respond to our request for input.

We also invited the groups to comment on the outcomes of the survey and excavation.

The representatives that participated in the CHMP, including consultation and on-site attendance were as follows:

- Darren Griffin (WTLC&CHC)
- Alan Wandin (WTLC&CHC)
- Ashley Firebrace (WTLC&CHC)
- Steve Pepper (Bunurong Land Council)
- Sam Pender (Boonwurrung Foundation).

The development of consultation with the Wurundjeri Tribe Land and Compensation Cultural Heritage Council, Bunurong Land Council and Boonwurrung Foundation is set out in **Table 4.1**.

Table 4.1 - Aboriginal Community Correspondence Log.

Date	Action	Method
02/05/2010	Invited members of all three groups to participate in survey.	email
02/06/2010	Undertook survey.	Fieldwork
20-22/07/2010	Excavation	Fieldwork
19/7/2010 - 30/7/2010	Initial meetings and discussions with Bunurong Land Council and Wurundjeri for cultural values mapping	Meetings convened by Context
9/8/2010	Cultural values mapping field trip	Field trip convened by Context

4.2 Outcomes of Consultation

The Aboriginal representative groups were consulted closely throughout the development of the CHMP, including during the survey, excavation and cultural values mapping. The issues discussed and raised by the groups were considered during preparation of and reflected in the final CHMP. The results of the cultural values mapping assessment work carried out by Context Pty Ltd are detailed at length in Section 6.7 of the report.

RESULTS OF ABORIGINAL CULTURAL HERITAGE ASSESSMENT

5 DESKTOP ASSESSMENT

5.1 Preamble

This section comprises the 'desktop assessment' required by the *Aboriginal Heritage Regulations (2007)*. In accordance with the regulations this section of the report comprises the following:

- a search of the Victorian Aboriginal Heritage Register for information relating to the activity area, including the date(s) the Victorian Aboriginal Heritage Register was accessed;
- an identification and determination of the geographic region of which the activity area forms a part that is relevant to the Aboriginal cultural heritage that may be present in the activity area;
- a concise map or maps showing the geographic region referred to in point 2 and the location of the activity area in that geographic region;
- a review of the registered Aboriginal places in the geographic region referred to in point 2;
- a review of reports and published works about Aboriginal cultural heritage in the geographic region referred to in point 2, relevant to the activity area;
- a review of historical and ethno-historical accounts of Aboriginal occupation of the geographic region referred to in point 2, relevant to the activity area;
- a review of the landforms or geomorphology of the activity area;
- a review of the history of the use of the activity area, including discussion of prior disturbance to ground surfaces and soil deposits if available; and
- a conclusion surmising from the desktop assessment where it is possible Aboriginal cultural heritage may be located in the activity area.

The information obtained during desktop assessment assists in determining the archaeological potential of the activity area in a number of ways. For example: Considering the types of natural resources that may have been available within the study area, or in the local region, provides an indication of why people may have been present in the area and of the potential physical traces of such a presence (e.g. the types of stone used for artefact making, whether trees having bark suitable for the manufacture of certain items existed/exist in the area, or whether there exists a known resource - plant animal or otherwise - that may have drawn people to the area).

Information about previously recorded archaeological sites in the region can provide an indication of the types and distribution of archaeological deposits and material that may be present, or may once have been present, in the study area. It also provides comparative information that is essential for the assessment of the archaeological significance of any previously unrecorded archaeological material or deposits.

Environmental and historical information (particularly regarding past and present land use) may indicate the potential for post-depositional processes to have altered or disturbed any archaeological deposits or materials that may have once, or may still, exist within the current study area.

In short, knowledge of the environmental, cultural and historical contexts of the study area is crucial for understanding the archaeological potential and significance of that area.

5.2 Background to Assessment

In April 2010 Andrew Long and Associates produced a draft report³ on behalf of the Metropolitan Planning Authority. The purpose of this report was to assist with strategic planning of Aboriginal heritage management within Melbourne's South-East Growth Corridor. As such, we have drawn on and cited relevant information from that report. Additional research specific to the current Activity Area was undertaken by AHMS.

³ Andrew Long and Associates (April 2010)

Andrew Long and Associates⁴ employed a complex methodology which involved the collation and analysis of a range of desktop data sources, including VAHR data (registered cultural heritage places), geomorphology (terrain mapping), land use history (disturbance mapping), ethnohistory (observations of Aboriginal lifestyles and activities) and a review of archaeological reports and Aboriginal consultation⁵.

The primary output of the Andrew Long and Associates report is a predictive model and GIS Map (Stage 1, Desktop Assessment) which was designed to assist with strategic planning and to form the basis for further testing, refinement and mapping of cultural heritage sensitivity during each precinct specific CHMP.

⁴ *2010 Volume 1 and Volume 5* (Draft)

⁵ *Andrew Long and Associates 2010, Volume Five, Section 2 'Method Of Assessment'* (Draft)

5.3 Geographic Region

The Activity Area is located within the South East Growth Areas region as defined by Andrew Long and Associates⁶:

The South-East Growth Corridor Study Area is an area of low elevation and relief at the interface between the southern slopes of the Dividing Range and the broad sweep of drained wetland around the north of Western Port, approximately 40-55 km SE of the Melbourne CBD. The landscape is characterised by sandy rises and alluvial floodplains, fringed to the north by foothills and to the south east by Koo Wee Rup Swamp.

... The South East Study Area comprises a series of discontinuous land holdings approximately defined by the suburb of Hampton Park (North West), the satellite settlements of Pakenham (north east) and Cranbourne (south west). The Study Area encompasses approximately 56 square kilometres of floodplain, sandy rises and reclaimed wetlands south east of Melbourne, fringed to the north by foothills of the Great Dividing Range⁷.

A map showing the activity area within the region is shown overleaf in **Figure 4**.

⁶ 2010, Volume 5(Draft)

⁶ 2010 Volume 1 and Volume 5 (Draft)

⁶ Andrew Long and Associates 2010, Volume Five, Section 2 'Method Of Assessment' (Draft)

⁶ 2010 Volume 5 (Draft p.23)

⁷ Andrew Long and Associates 2010 Volume 5

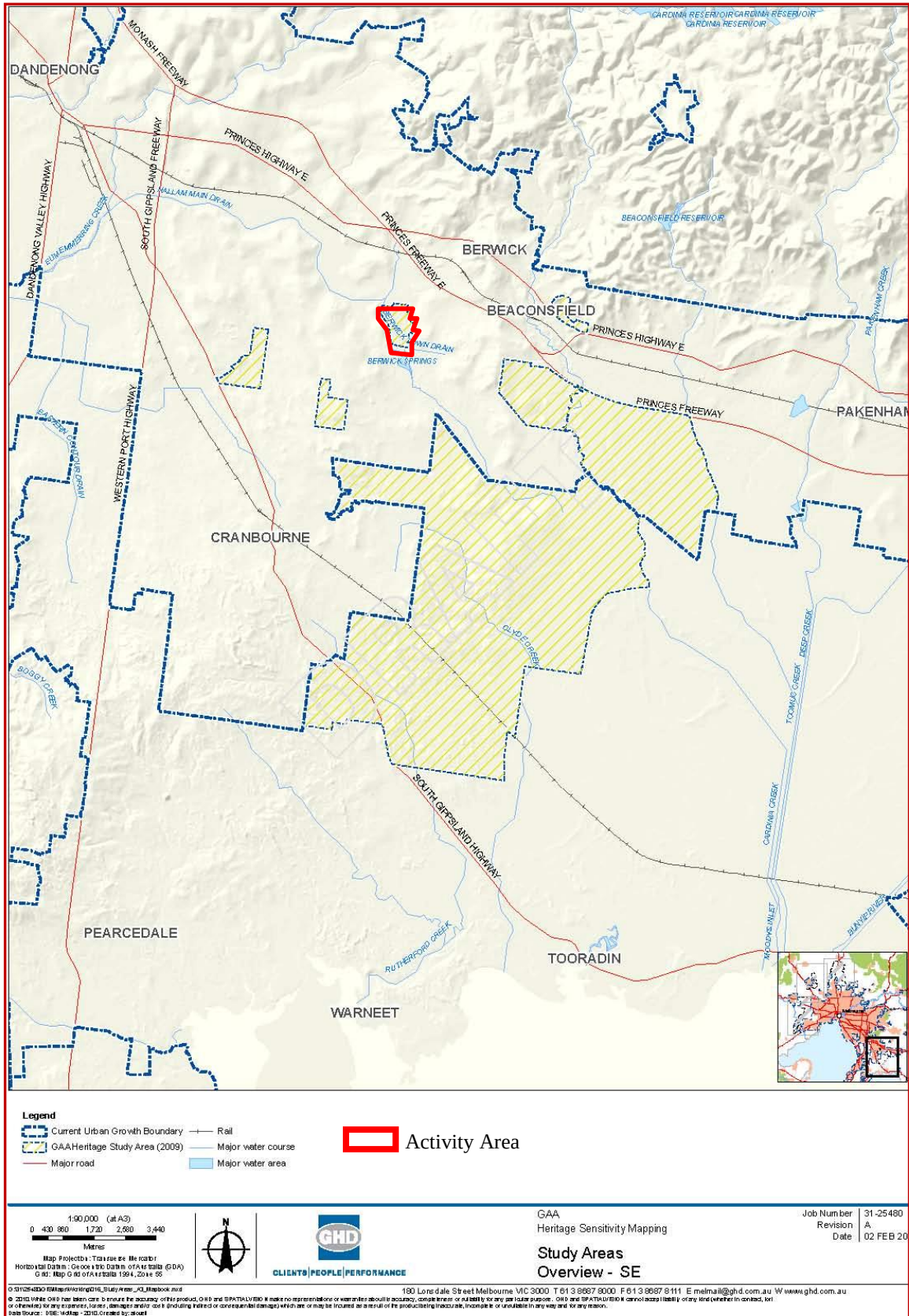


Figure 4 - Location of the activity area (red), within the Geographic Region. Source: Andrew Long and Associates 2010. Volume 5.

5.4 Review of Aboriginal Places in the Region

A search of the Victorian Aboriginal Heritage Register (VAHR) was undertaken on the 8th of June 2010 and a subsequent search was conducted on the 13th July 2010. A total of 45 sites have been recorded within the south-east region search area. Andrew Long and Associates also undertook detailed review of VAHR data as part of their regional assessment study in early 2010. The following review incorporates some of the analysis provided by Andrew Long and Associates in their regional study.

Previously recorded sites and areas of previously defined cultural heritage sensitivity are shown on **Figure 5** and

Figure 6.

The distribution of previously recorded sites within the region is likely to be due to a combination of factors, namely areas of previous archaeological investigation and ground surface visibility. Patterning may also reflect, to some degree, past settlement patterning.

The results of the Andrew Long and Associates VAHR search is as follows⁸:

There are only 45 Aboriginal places in the South-east Study Area registered on the Victorian Aboriginal Heritage Register (VAHR), representing the smallest site population between the Study Areas⁹. The majority of these places are stone artefact scatters (n=43, 95.5%) with a single earth feature and a single multi-component place present. There are no scarred trees or burials recorded within the Study Area, though by analogy these may be expected to occur.

Given the limited number of Aboriginal Cultural Heritage Places identified within the South-east Study Area, a broader zone of investigation was established, comprising a 10 km 'buffer' zone around the boundary of the South-east Study Area. This provided a sufficient sample of Aboriginal places to identify any patterning and to provide comparable data for those places located within the South-east Study Area.

The broader investigation area, comprising a 10 km buffer surrounding the South-east Study Area (not including the South-east Study Area itself) contained a total of 710 Aboriginal places of which, again, the majority are stone artefact scatters (84%), followed by scarred trees (12%) then multi-component places (4%).

⁸ Andrew Long and Associates 2010, Volume 5, Section 6 (Draft pp.19-22)

⁹ North, Northwest, West, and South-East, as defined in Andrew Long & Associates, 2010, Volume 1

Andrew Long and Associates conclude the following:

Given the influence of post-depositional changes, stone artefacts are now the common element between all of these places, given their durability in the archaeological records, however it is important to recognise that other material types such as wood, bone, shell, skin, charcoal and bark would once have been important physical components of these places, in varying proportion depending on the nature of the activity. Although some of these materials may survive under exceptional preservation conditions, the importance of stone artefacts as a key indicator of a wide range of place types should not be under-estimated.

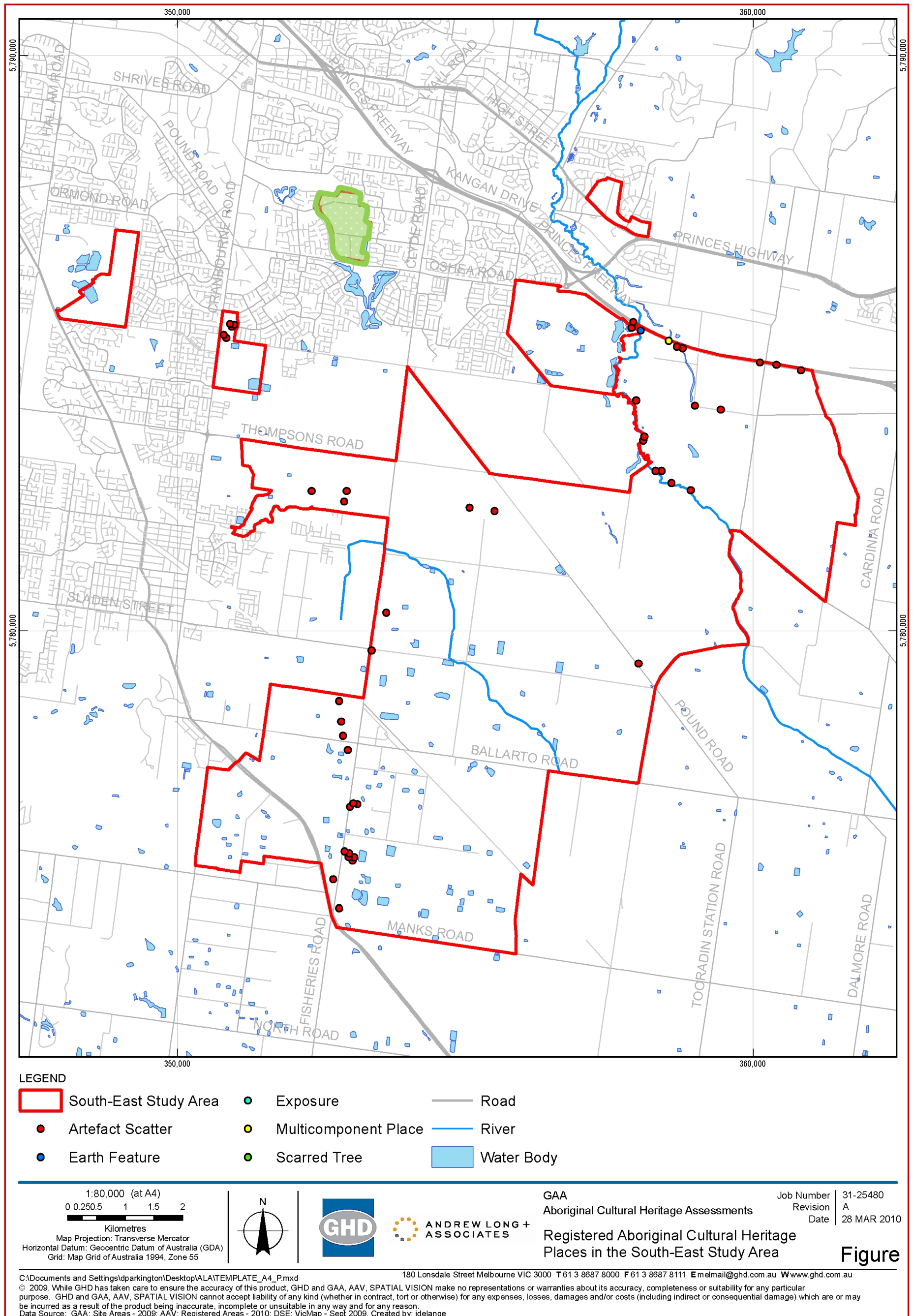


Figure 5 - Registered Aboriginal cultural heritage places in the South-east Study Area Source: Andrew Long and Associates 2010. Volume 5 (Draft p.20). Activity Area shaded green.

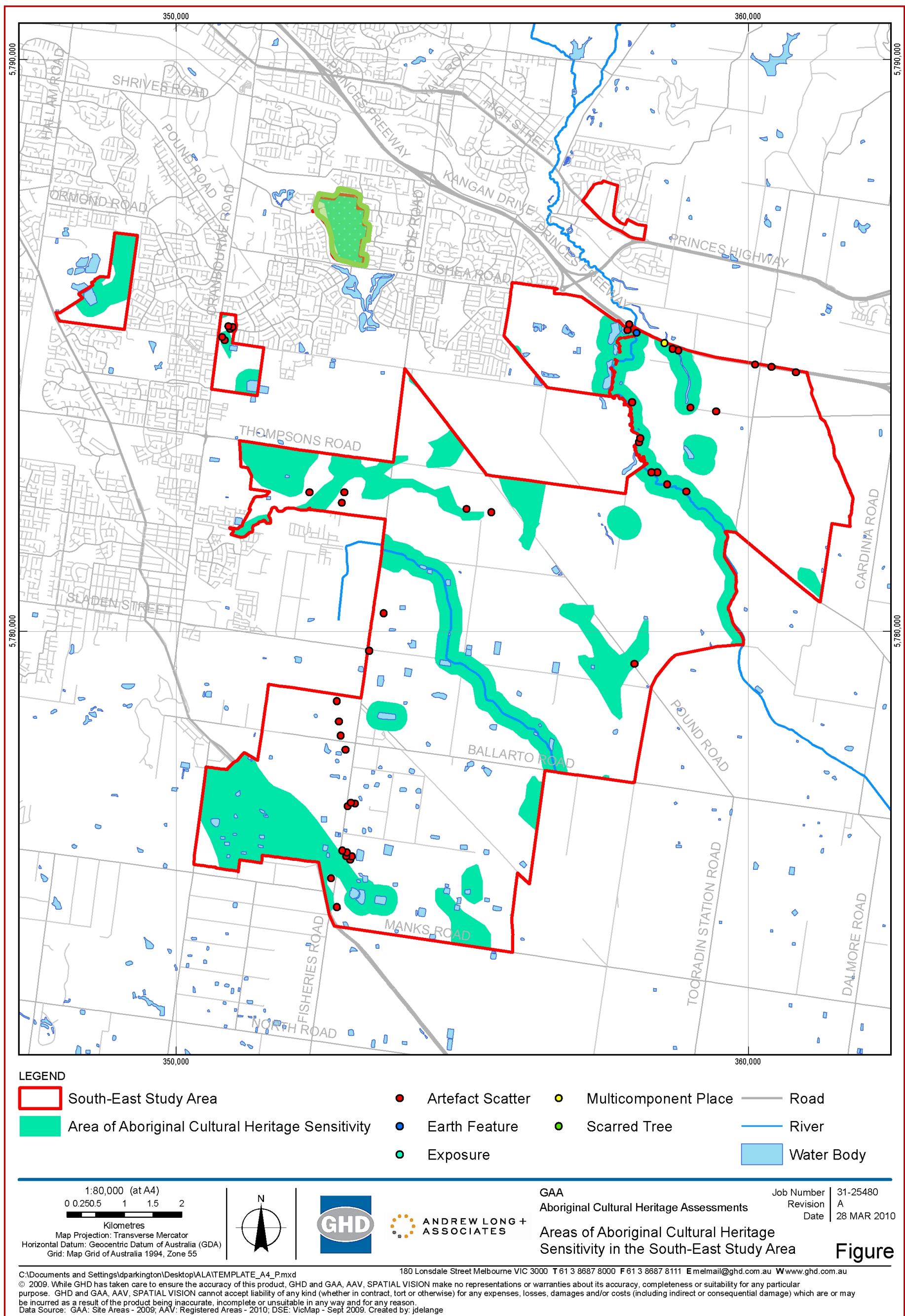


Figure 6 – Areas of Aboriginal cultural heritage sensitivity in the South-east Study Area Source: Andrew Long and Associates 2010. Volume 5 (Draft p.21). Activity Area shaded green

5.5 Review of Regional Archaeological Context (including reports and published works)

For the purposes of determining settlement and site location patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. This provides evidence about economic and social systems in the past and also assists archaeologists in predicting likely site types, site locations and the nature of the archaeological resource in any given area.

Andrew Long and Associates undertook a review of the scope and extent of previous archaeological and cultural heritage assessments of relevance to the South East Region Study Area¹⁰. The study aimed to review reports that have provided a significant contribution to the understanding of the nature and character of the archaeological record within the Study Area¹¹.

These assessments (n=17) are dominated by basic background studies and pedestrian surveys with only a small number including subsurface testing (n=4) and of these few, mechanical subsurface testing is the most commonly utilised method (n=3) with no controlled manual excavation conducted¹².

5.5.1 Regional Studies

Andrew Long & Associates determined that¹³:

Only two regional archaeological studies have been undertaken on areas that partially overlap with the south east Study Area (Gaughwin 1981, 1983; Smith 1991), as discussed below. Note that the Study Area for Presland's (1983) Melbourne Metropolitan Area extended into the region, however no fieldwork was conducted of relevance to this Project (see Volume 1).

Particular attention has been paid to predictive statements which can be used to inform the development of the predictive model and map for the current Project¹⁴.

¹⁰ *2010 Volume 5, Section 11*

¹¹ *The South East Growth Corridor*

¹² *2010 Volume 5, Section 11*. P62 in DRAFT report

¹³ *Andrew Long and Associates 2010*

¹⁴ *Andrew Long and Associates 2010 Volume 5 Section 11* (p62 on draft report)

5.5.2 The Use of Terrain Patterns and Proxy Data in Selecting Reports for Review

Due to the “absence of a single regional report which could provide data useful to the purposes of the Project” Andrew Long and Associates identified localised studies which were “incorporated into the analysis leading to the generation of a predictive model and map”. These reports were used to “provide qualitative information about the nature and character of Aboriginal Cultural Heritage Places”.

Andrew Long and Associates encountered difficulties in interpreting the results of the various studies due to extremely limited ground surface visibility during field surveys.

Ideally, in such a scenario where ground surface visibility is lacking, greater reliance is placed on the results of controlled subsurface testing and excavation programs. However, few have been undertaken in the South-east Study Area – and in most cases where they have been undertaken the results are not presented in a useful way (i.e. lack of lithic information and discussion of landforms). In terms of a spatial area, very limited detailed archaeological data has been gathered in the northern section of the Study Area, essentially the land most distant from Melbourne.

Given the standards, format and rigor applied to their evaluation, CHMPs are now considered the benchmark for systematic archaeological evaluation in Victoria, however to date only six approved CHMPs have been completed within the South-east Study Area (Fiddian¹⁵; Murphy & Rymer¹⁶; Jenkins & Patterson¹⁷; Feldman *et al.*¹⁸; Debney *et al.*¹⁹; Ford *et al.*²⁰).

As a result, reports on similar landforms (which may have been located some distance from the current activity area) were included in the investigation used as ‘proxy’ data sets to strengthen the predictive model.

The following report summaries include extracts from Andrew Long and Associates²¹:

Western Port Catchment (Gauthwin 1981; 1983)

The archaeological survey of the Western Port Catchment undertaken by Denise Gauthwin²² provides useful information on the regional distribution of Aboriginal

¹⁵ Fiddian (2007)

¹⁶ Murphy & Rymer (2008)

¹⁷ Jenkins & Patterson (2009)

¹⁸ Feldman *et al.* (2009)

¹⁹ Debney *et al.* (2009)

²⁰ Ford *et al.* (2009)

²¹ Andrew Long & Associates 2010 Volume 5 Section 11 (Draft pp 59-77)

places. Gaughwin used data on place location, place contents, landforms, and subsistence resources in conjunction with historical records to develop a subsistence model for the Western Port Catchment. The Western Port Catchment Study Area includes the South-east Study Area.

Gaughwin sample surveyed the three landscape units which made up the catchment: coastal margins, upland hills and coastal plains²³. The South-east Study Area falls within the coastal plains landform defined by Gaughwin²⁴. The survey method was based on an opportunistic approach due to issues of visibility and, as such, any area with *some* ground surface visibility were included creating a bias towards certain landforms (e.g. via market gardens and eroding dunes) and an under-representation of other landforms (e.g. swamps, areas under pasture)²⁵.

The results for all three landscape units are summarised here but as the South-east Study Area occurs within Gaughwin's 'coastal plains' land unit, the results for this landform are discussed in more detail. Note, however, that Gaughwin's investigation of the coastal plains land unit was restricted to Phillip Island, French Island and the Top of the Bay region, only up to 10 km from the top of Western Port Bay.

Gaughwin surveyed an area of 439 ha within the coastal margins landscape unit. A total of 247 Aboriginal places were identified within this area, consisting of shell middens and stone artefact occurrences. The majority of places were located on high-energy coastlines with 37 places recorded on medium-energy coastlines and 7 on low-energy coastlines²⁶.

A total of 122 ha within the upland hills landscape unit was surveyed with ploughed paddocks at Gembrook providing some surface visibility²⁷. A total of four places were identified within the upland hills consisting of stone artefact scatters including cores and grinding stones²⁸. The places were situated in a range of localized contexts from ridgelines to sloping ground and valleys. Gaughwin did not propose any model of land-use for this landform citing the lack of ground coverage achieved and absence of clear place variation²⁹.

Within the coastal plains, Gaughwin further subdivided this unit into A) well drained land and B) wetlands and swamps³⁰. Gaughwin surveyed an area of 266 ha in total within the coastal plains unit, 256 ha within subunit A and 10 ha within subunit B, only 1% of the total unit area. Most of the surveyed area consisted of inland areas of Phillip Island, French Island and the northern sections of Western Port Bay. A total of 14³¹

²² Gaughwin (1981; 1983)

²³ Gaughwin(1983: 33)

²⁴ Gaughwin (1983: 32)

²⁵ Gaughwin (1983: 96)

²⁶ Gaughwin (1983: 109-110)

²⁷ Gaughwin (1983: 98, 110)

²⁸ Gaughwin (1983: 153)

²⁹ Gaughwin (1983: 153)

³⁰ Gaughwin (1983: 38-40)

³¹ Gaughwin (1983, 110) states that fifteen Aboriginal places were identified within the coastal plains landform however refers to only fourteen after this point.

Aboriginal places were identified within the coastal plains landform unit all comprising stone artefact occurrences³². All of these places were located within subunit A³³, all were identified on higher ground (predominantly on Cranbourne Sands³⁴) and all were identified as a result of European impacts such as ploughing³⁵. The majority of places were located on the interface between higher ground (subunit A) in proximity to wetlands and swamps (subunit B)³⁶, suggesting the importance of the proximity of these subunits in relation to place location.

Gaughwin³⁷ only examined six of the 14 stone artefact occurrences identified within the coastal plains landform. Within these six assemblages, quartz and fine-grained silcrete were the dominant raw materials represented (with quartz the most common) with marine chert, medium and coarse-grained silcrete, volcanic, granite, ochre, sandstone and siltstone also present in low numbers. Artefact densities across these places varied between 0.07 – 2.4 artefacts per m². The six places are considered here as a single assemblage comprising 970³⁸ stone artefacts.

Of the 970 stone artefacts, quartz is the dominant raw material representing 45.5 of the assemblage followed by fine-grained silcrete (40.8%). Medium-grained silcrete represents 5.9% of the assemblage and all of the other raw materials listed above are present in negligible quantities (less than 1% per raw material type).

Across the combined assemblage, tools, flakes and blades, manuports, bipolar fragments and three core categories were identified (nondescript cores, microblade cores and bipolar cores). Flakes and blades comprised the highest proportion of the assemblage (81.8%), cores made up 8.9% of the assemblage with the core sub-categories combined, tools at 5% and the remainder comprised fragments and manuports. Fine-grained silcrete dominated the tool category, followed by medium-grained silcrete/quartzite with quartz, marine chert, volcanic and sandstone raw materials present in lower frequencies³⁹.

Scrapers (with sub-categories of nosed, steep-edged, thumbnail, concave and small flake), microliths (with sub-categories of bondi point, crescent and segment), non-specific, utilised pieces, grind-stones and anomalous flakes with retouch were defined as the tool type categories⁴⁰. Scrapers comprised 45.5% of the tools present within the coastal plains Aboriginal places identified followed by microliths (32.7%) with the other categories present in low frequencies.⁴¹ Gaughwin⁴² suggests that the 'Top of the

³² Gaughwin (1983: 110)

³³ Gaughwin (1983: 110)

³⁴ Gaughwin (1983: 113)

³⁵ Gaughwin (1983: 112)

³⁶ Gaughwin (1983: 113)

³⁷ Gaughwin (1983: 127)

³⁸ Gaughwin (1983, 127) states that 136 stone artefacts are present in 7921-0126 however the breakdown suggests only 134 stone artefacts are present and this lower number has been used in the calculations presented in this summary.

³⁹ Gaughwin (1983: 132)

⁴⁰ Gaughwin (1983: 132)

⁴¹ These calculations are based on 55 tools being present in the assemblage (Gaughwin 1983, 132) not tools.

Bay' places (where five of the six analysed coastal plains places were identified) were all characteristic of the Australian Small Tool Tradition (ASTT), therefore were determined to be less than 5,000 years old. However, Gaughwin⁴³ notes that as the Cranbourne Sands, on which the places were all identified, had stabilised in the late Pleistocene, she suggests that 'mixing' of artefactual material had occurred over time, limiting the ability to make interpretations regarding age or length of occupation of the places.

Using both site location and site contents information, Gaughwin⁴⁴ proposes models of land-use for each land-unit and for the Western Port Catchment Study Area.

For the coastal plains unit in particular, Gaughwin⁴⁵ highlights two obstacles in the creation of a land-use model: limited survey coverage and absence of cultural material other than lithics. Gaughwin⁴⁶ suggests that the *site location* information highlights a correlation between site location and well-drained rises adjacent or in proximity to wetlands, swamps and lagoons. Gaughwin⁴⁷ suggests that *site contents* information indicates multi-purpose use places, with stone artefacts types associated with tool manufacture and plant processing present (note that Gaughwin proposes this model for subunit A only and no model is presented for subunit B).

Using the results of her studies, including ethnographic information, Gaughwin proposed that Aboriginal subsistence in the Western Port Catchment Study Area was based primarily on the coastal plains, particularly plains adjacent to wetlands with the coastal margin relatively unimportant in terms of subsistence resources and utilisation⁴⁸.

Berwick-Pakenham Corridor (Smith 1991)

Smith⁴⁹ undertook an archaeological assessment of the Berwick-Pakenham residential growth corridor, which extends on either side of the Princess Highway between Dandenong and Bunyip (49 km in length and between 3-16 km wide)⁵⁰. The Study Area consisted of four landscape units: undulating hills, lowland plains, floodplains and Cranbourne Sands, of which all are present within the South-east Study Area, predominantly undulating hills and lowland plain, according to Smith⁵¹. The survey used a sampling methodology to achieve survey coverage of each landscape unit, however, due to the large size of the Study Area and the lack of surface visibility only

⁵⁴ Gaughwin (1983:130).

⁴² Gaughwin (1983: 134)

⁴³ Gaughwin (1983: 1354-135)

⁴⁴ Gaughwin (1983: 140 – 177)

⁴⁵ Gaughwin (1983: 151-152)

⁴⁶ Gaughwin (1983: 131)

⁴⁷ Gaughwin (1983: 151)

⁴⁸ Gaughwin (1983: 158)

⁴⁹ Smith (1991)

⁵⁰ Smith (1991,: 2)

⁵¹ Smith (1991: 7)

0.26% of the corridor was effectively surveyed (<1% effective coverage within each landscape unit⁵²). Smith emphasised that conclusions drawn from the nature and distribution of sites should be viewed as tentative due to the very low effective coverage⁵³.

A total of 62 Aboriginal places were identified during the survey, consisting of 32 stone artefact scatters, 15 isolated stone artefacts and 15 scarred trees with the majority of places identified within the lowland plains unit (52%), followed by undulating hills (21%), floodplains (17%) then Cranbourne Sands (10%).

Smith⁵⁴ calculated Aboriginal place densities for Cardinia Creek which occurs within the northern section of the South-east Study Area (23 places were identified - four within the undulating hills landscape unit and 19 within the lowland plains landscape unit), as 100 scarred trees per 1 km² and 250 stone artefact scatters per 1 km² calculated. These calculations are higher than the densities for the remainder of the landscape units. Of the places identified in association with Cardinia Creek, 91% were located within 50 m of the creek with only two places located at a greater distance⁵⁵.

In general, undulating hills and lowland plains contained relatively high proportions of stone artefact occurrences (scatters and isolated finds) with limited numbers of scarred trees. Stone artefact occurrences were located in the range of landforms present, except in floodplains located in the lowland plains and floodplain landscape units. Scarred trees were located on creek banks and floodplains⁵⁶.

The floodplains landscape contained a high proportion of scarred trees and limited stone artefact occurrences, while the Cranbourne Sands did not contain any scarred trees (due to the absence of suitable trees, likely a result of European clearance practices), and small amounts of stone artefact occurrences⁵⁷. An analysis of Aboriginal place density determined that for stone artefact occurrences the Cranbourne Sands had the highest density with 833 occurrences calculated to occur per 1 km², with significantly lower densities (25-143 places per 1 km²) calculated for the remaining landscape units. Scarred tree densities varied between zero for the Cranbourne Sands to 50 scarred trees per 1 km² for the floodplains landscape unit⁵⁸.

Of the 296 stone artefacts identified during the study, the majority (c. 70% each) were recorded in the lowland plains landscape unit, followed by the undulating hills and Cranbourne Sands landscape units (c. 14% each), the floodplain landscape unit (c. 1.4%). The stone artefact density calculations were highest for the Cranbourne Sands unit with 6,250 per 1 km² calculated, followed by 1,099 per 1 km² within the lowland plains unit and < 100 per 1 km² for the remaining landscape units⁵⁹.

⁵² Smith (1983: 34)

⁵³ Smith (1991: 28)

⁵⁴ Smith (1991: 36)

⁵⁵ Smith (1991: 38)

⁵⁶ Smith (1991: 36)

⁵⁷ Smith (1991: 59)

⁵⁸ Smith (1991, Table 3)

⁵⁹ Smith (1991: 45)

Quartz⁶⁰ dominated the assemblages of all landscape units, excepting for the undulating hills unit where it came a close second to chert (40% chert to 33% quartz). Quartz was also the only raw material present across all four of the landscape units⁶¹. Silcrete, quartzite, mudstone, basalt, glass and other raw materials were also present in lesser numbers. The dominance of quartz is associated with the western section of the Study Area (the Port Phillip catchment) and declines toward the Toomuc and Cardinia Creeks area where chert becomes more common⁶².

Smith (1991, 46) utilised four categories of artefact type: tools⁶³ (2%), cores (6%), flakes (46%) and flaked pieces (45%). The tools comprised ground axes (n=2), scrapers (n=2), a backed blade and a geometric microlith.

In general, Smith⁶⁴ determined that the results of the survey reflected the distribution and abundance of water and food resources (with proximity to water being a significant determiner for Aboriginal place location). Cardinia Creek was a focus of activity within the corridor and may have been used as a path between the coast and the corridor through Koo-wee-rup Swamp. Possible trade links between Mt William and the study region were also proposed⁶⁵. It also appeared that Aboriginal places reflected spatially restricted activities. For instance, differences in the stone artefact assemblage indicated that sites in the south west section of the corridor appeared to have been the focus of wooden implement manufacture while sites in the eastern part of the corridor involved the manufacture of blades. There was also evidence of the trade of stone raw materials between the coast and the corridor⁶⁶.

5.5.3 Local Studies

Andrew Long and Associates also undertook a review of smaller studies within the region and local area. The summary prepared by Andrew Long and Associates is selectively quoted and cited in the following sections.

Review of Localised Reports and CHMPs⁶⁷

Fifteen localised Aboriginal archaeological studies were undertaken prior to 2007 in areas that either entirely occur within the South-east Study Area, or partially extend into the area. None of these reports provide sufficient information considered to enhance our understanding of the archaeological record in the South-east Study Area or do not provide information in addition to what is available on the VAHR cards for

⁶⁰ *Interesting when compared to Presland's (1983) absence of any mention of quartz.*

⁶¹ *Smith (1991: 50)*

⁶² *Smith (1991: 49)*

⁶³ *This tool category is based on morphology as Smith mentions that 31 flaked pieces showed signs of usewear without placing them in the tool category.*

⁶⁴ *Smith (1991)*

⁶⁵ *Smith (1991: 58)*

⁶⁶ *Smith (1991: 57-8)*

⁶⁷ *Andrew Long and Associates 2010 Volume 5 Section 11 (Draft p. 66)*

Aboriginal places within the South-east Study Area, so have not been summarised here.

Only six have been undertaken in areas that either entirely occur within the South-east Study Area, or partially extend into the area. Only four of these (Murphy & Rymer 68; Feldman et al.69; Debney et al.70; Ford et al.71) contains archaeological information that is considered to enhance our understanding of the archaeological record within the South east Study Area. This is due to the level of controlled archaeological excavation undertaken as part of these assessments and, in the case of Murphy and Rymer⁷², a suitable number of stone artefacts recorded to provide comparative data. The remaining CHMPs were limited to field surveys that did not result in the identification of any Aboriginal cultural heritage (Jenkins & Patterson 73) or excluded the South-east Study Area section from assessment (Fiddian 74).

The following summaries by Andrew Long & Associates refer to 'Terrain Units'⁷⁵, which are defined and explained in subsequent sections of this desktop assessment report. Terrain Profile 11 is referred to frequently, and this is the relevant terrain type within the Berwick Waterways activity area and surrounding landscape, comprising broad flood plain and open depression landforms. Summaries of relevant local studies within these terrain units are included below.

Officer South, Edenbrook and Lakeside (Murphy and Rymer 2007a&b, 2008a&b; Rhodes 2003; Rhodes and Bell 2007)⁷⁶

Numerous archaeological investigations have been undertaken within the Terrain Pattern 11 unit, mostly associated with infrastructure upgrades along the Princes Freeway and the development of Melbourne's outer suburbs at Berwick, Beaconsfield, Officer and Pakenham.

Prior to the initiation of the Aboriginal Heritage Act (2006), Murphy and Rymer⁷⁷ conducted an archaeological investigation of the sewer rising main in Officer South, immediately adjacent to the north of the South-east Study Area. Survey did not identify any Aboriginal Cultural Heritage Places and a sub-surface testing program was recommended and subsequently undertaken (Murphy and Rymer⁷⁸). The CHMP

⁶⁸ Murphy & Rymer (2008)

⁶⁹ Feldman et al. (2009)

⁷⁰ Debney et al.(2009)

⁷¹ Ford et al. (2009)

⁷² Murphy and Rymer (2008)

⁷³ Jenkins & Patterson (2009)

⁷⁴ Fiddian (2007)

⁷⁵ Andrew Long and Associates 2010 Volume 5 Section 2.3 and Section 8

⁷⁶ Andrew Long and Associates 2010 Volume 5 Section 11 (Draft p. 69-71)

⁷⁷ Murphy and Rymer (2007a)

⁷⁸ Murphy and Rymer (2007)b

prepared by Murphy and Rymer⁷⁹ presents the results of these two previous reports and also the results of additional excavation conducted during the CHMP process.

The activity area comprises c. 6 km (east-west alignment) of proposed pipeline route (c. 4 m width) traversing the Cardinia Creek terrace and alluvial floodplain situated on lowland plain between the Dandenong Ranges to the north and Koo-wee-Rup Swamp to the south. The area has been subject to vegetation clearing, ploughing, grazing, drainage works, erosion dam construction and evidence of disturbance resulting from the construction of the Pakenham Bypass (Murphy and Rymer⁸⁰). A large mound to the immediate north is comprised of excavated soil associated with the Pakenham Bypass construction and also from the previous subsurface salvage program associated with two Aboriginal Cultural Heritage Places (7921-0737 and 791-0801), also to the north (Murphy and Rymer⁸¹).

The field survey section presented in the CHMP is derived from the initial cultural heritage assessment (Murphy and Rymer⁸²). Survey focussed on areas of surface visibility that were not impacted by the Pakenham Bypass construction works (Murphy and Rymer⁸³). To the east of Cardinia Creek the overall surface visibility was low (<5%) due to pasture grasses (0-10% visibility per m²) with only isolated patches of exposure (70-90% visibility per m²). Overall surface visibility to the west of Cardinia Creek was calculated at c. 40%⁸⁴, due to exposures associated with the Pakenham Bypass construction. No Aboriginal Cultural Heritage Places were identified during survey. Three areas of archaeological sensitivity were identified⁸⁵,

- within 200m to the west of Cardinia Creek (disturbed contexts)
- within 200m to the east of Cardinia Creek (potential for in situ sub-surface deposits)
- between 200 m to the east bank of Cardinia Creek and along its tributaries (superficially disturbed contexts).

Three phases of sub-surface testing were undertaken along the pipeline route: Phase 1 (Murphy and Rymer⁸⁶) involved the mechanical excavation of transects, Phase 2 involved the monitoring of geotechnical boreholes, and Phase 3 involved the manual excavation of five 1x1m test pits and three .5x.5m test pits. A total of 83.95 m² was excavated (excluding the geotechnical bores for which only depth is provided). Sub-surface testing identified two new Aboriginal Places (7921-0866 and 7921-0867) and identified additional stone artefacts associated with a previously recorded Aboriginal Cultural Heritage Place (7921-0739). All of these comprised subsurface stone artefact occurrences at a distance of between 15-20 m from Cardinia Creek or a tributary of

⁷⁹ Murphy and Rymer (2008a)

⁸⁰ Murphy and Rymer (2008a:7)

⁸¹ Murphy and Rymer (2008a: 34)

⁸² Murphy and Rymer (2007a)

⁸³ Murphy and Rymer (2008a: 25)

⁸⁴ Murphy and Rymer (2008a: 25)

⁸⁵ Murphy and Rymer (2008a: 32-33)

⁸⁶ Murphy and Rymer (2007b)

the creek. Murphy and Rymer⁸⁷ identified a decrease in artefact density with increasing distance from Cardinia Creek.

Murphy and Rymer⁸⁸ concluded that the eastern levee bank of Cardinia Creek comprises the highest Aboriginal archaeological potential with tributaries of the creek comprising lower potential and the plain between these two areas being of very low potential. This distribution pattern was interpreted as reflecting a long-term, repeated and intensive utilisation of the banks of Cardinia Creek by Aboriginal people who exploited the resources here while moving between more permanent campsites.

Terrain Pattern 11 was also explored to the north of the Pakenham Bypass, at the site of a proposed residential development known as Edenbrook, which was located at Lot A and Lot 1 Henry Road, Pakenham and situated on an alluvial plain formed by Toomuc Creek (Murphy and Rymer⁸⁹). Survey and sub-surface testing identified twelve Aboriginal Cultural Heritage Places within the Study Area (ten new sites, two previously recorded), all of which are stone artefacts scatter sites, only one of which is considered to be of high scientific significance (7921-0200).

Rhodes⁹⁰ conducted archaeological monitoring and subsurface testing at Delfin Lakeside Development, Pakenham. This area once fringed the Koo Wee Rup Swamp. Eighteen subsurface stone artefact scatters were recorded on the floodplain and hill slope. Two sites (7921-0471 and 7921-0473) contained large numbers of artefacts in relatively intact deposits. The remaining sites were considered short term or satellite sites. Stone artefact analysis indicated a variety of economic activities were performed within the Study Area. Buried sites on the floodplain were considered to be older than those identified on the hill-slope. Subsequent excavation at 7921-0510/0511 recovered 285 stone artefacts, the majority of which were identified in the deepest of three deposits (65-93cm). A radiocarbon date from a hearth at the bottom of the lower layer was dated to 24,000 BP (uncalibrated), while a date from the top of the lower unit came in at 5,200 BP (uncalibrated) (Rhodes⁹¹).

Previous regional studies and localised surveys have located a range of Aboriginal archaeological sites within the Terrain Pattern 11 including: scarred trees, isolated stone artefact occurrences and surface and sub-surface scatters of stone artefacts. There is evidence for subsurface stone artefact sites to exist within alluvial deposits of creek margins and on the northern edge of the former Koo Wee Rup Swamp (Rhodes⁹²; Rhodes and Bell⁹³), though the majority of previously recorded sites are surface artefact scatters. The land use history of the region indicates that most surface lithic sites would not be intact due to the impact of European occupation. One site has been formally dated, which is located on the floodplain south of Princes Highway, Pakenham, and directly north of the present activity area. A hearth feature associated with this scatter site has been provisionally dated at 24,168±268 years BP

⁸⁷ Murphy and Rymer (2008a: 41, 48)

⁸⁸ Murphy and Rymer (2008a: 47-49)

⁸⁹ Murphy and Rymer (2008b)

⁹⁰ Rhodes (2003)

⁹¹ Rhodes (2004a)

⁹² Rhodes (2003)

⁹³ Rhodes and Bell (2004)

(Rhodes⁹⁴). This site provided the first potential evidence for Pleistocene Aboriginal occupation of the eastern region of Melbourne. It is also the second earliest occupation site in the Melbourne area. Based on the confirmation of the date, this site should be considered one of the most scientifically significant in the Melbourne region.

Casey Central (Feldman et al. 2009)⁹⁵

Feldman *et al.*⁹⁶ prepared a CHMP for c. 10.6 ha of land west of Narre Warren Road and south of Glasscocks Road proposed for a retail development. The area was characterised by generally flat land with a sandy rise located in the south. At the time of the assessment a shopping centre and associated carpark was located in the north east corner of the subject land. The area had previously been subject to vegetation clearing, infrastructure installation and activities associated with the construction of the extant shopping centre and associated carpark⁹⁷.

The field survey involved pedestrian survey and was undertaken by five people, walking 5 m apart, over one day. The entire area (excepting the already developed north east corner) was subject to survey. Due to a consistent grass cover, surface visibility across the area was low, <1% in the southern half of the property and <5 – 10% in the north⁹⁸. Patches of exposure were present in the north west. No Aboriginal cultural material was identified as a result of the survey....

... As a result of the survey, two areas of varying Aboriginal archaeological potential were identified⁹⁹: the rise was determined to be of moderate potential; the area between the extant shopping precinct and the rise was determined to be of low-moderate potential. The remainder of the area, due to its previous modifications and topography, was determined to be of low potential.

The subsurface testing program employed two approaches: shovel test pits (0.16 m² pits) were utilised to establish the presence/absence of cultural material (50 shovel test pits) and to define the boundary of any Aboriginal place identified (24 shovel test pits); 1 m² pits were manually excavated to establish stratigraphy prior to the initiation of the complex assessment (two pits) and to establish the nature and significance of Aboriginal places (one pit). All excavated material was fully sieved.

The subsurface testing established that subsurface soils on the rise comprised grey-brown loamy sand to c. 40 cm overlying grey-brown firm sand to c. 85 cm which overlay orange sandy clay with coffee rock inclusions to c. 130 cm where orange-brown compact clay with coffee rock inclusions appeared. On the flat land north of the rise, beneath the humic topsoils, a medium-brown clayey silt extended to c. 40 cm where a medium-brown cemented clayey silt occurred overlying a mottled clay base with coffee rock inclusions at c. 50 cm.

⁹⁴ Rhodes (2004a)

⁹⁵ Andrew Long and Associates 2010 Volume 5 Section 11 (Draft pp. 71-73)

⁹⁶ Feldman et al. (2009)

⁹⁷ Feldman et al. (2009: 34, 37)

⁹⁸ Feldman et al. (2009: 41-44)

⁹⁹ Feldman et al. (2009: 45)

The testing identified a total of 30 stone artefacts 30-75 cm below the ground surface with:

- 18 stone artefacts identified in shovel test pits; and
- 12 stone artefacts identified in two 1 m² manual excavation pits.

The subsurface testing identified five new Aboriginal places (7921-1082, 7921-1114 - 1117), all subsurface stone artefact occurrences.

Aboriginal place 7921-1082 is located on the rise in the south of the property and is a low density subsurface stone artefact occurrence. The 24 stone artefacts in this place were identified between 5-75 cm below the surface with 11 of the artefacts identified between 5-40 cm in dark grey sandy silt and the remaining 13 artefacts between 70-80 cm in mid-grey firm silty sand.

Aboriginal place 7921-1114 is located on the rise in the south of the property and is a low density subsurface stone artefact occurrence. The place comprises two stone artefacts identified between 20-30 cm at the interface between dark brown humic sandy silt and a lighter sand deposit.

Aboriginal place 7921-1115 comprised a single stone artefact identified between 35-40 cm below the surface on the flat land. Evidence of ground disturbance was present in this area.

Aboriginal place 7921-1116 comprised a single stone artefact identified at 24 cm below the surface in a light grey-brown compact sandy silt deposit on the flat land. Evidence of ground disturbance was present in this area.

Aboriginal place 7921-1117 comprises two stone artefacts identified between 25-35 cm below the surface in a light grey friable sandy silt deposit on the flat land. Evidence of ground disturbance was present in this area.

No discussion of stone artefact density is provided, however calculations based on all excavated pits (regardless of the presence/absence of cultural material) and the total number of stone artefacts identified (considered as 30¹⁰⁰), suggested an artefact density across the area of c. 2 artefacts pm².

Given the limited number of stone artefacts present, a breakdown of raw material is presented rather than any analysis, although artefact type for Aboriginal places 7921-1114 – 1117 are provided and include one silcrete microlith, two silcrete flake fragments and three quartzite flake fragments (2009, 51, 60-64).¹⁰¹ Raw material was dominated by quartz (50%). with silcrete (33.3%), quartzite (10%), fine-grain siliceous (3.3%) and volcanic (3.3%) also represented. In shovel test pit A4 marked depth division between raw material can be seen with silcrete occurring between 30-45 cm below the surface and quartz occurring at depths greater than 70 cm. Given the low frequency of artefacts, however, this pattern cannot be confirmed elsewhere.

¹⁰⁰ *The number of artefacts in total and per Aboriginal place is inconsistent throughout the CHMP.*

¹⁰¹ *No artefact catalogue or listing of artefact type is provided other than in the Aboriginal place descriptions. However, the description of Aboriginal place 7921-1082, comprising c. 80% of the total assemblage, does not provide any reference artefact type so cannot be discussed here.*

Princes Highway, Officer (Parmington 2008)¹⁰²

Parmington¹⁰³ completed a CHMP for two adjoining properties on the Princes Highway, Officer/Pakenham, which were traversed by a linear ridgeline (Terrain Pattern 1) oriented in an east-west direction. The region is characterised by undulating topography that ranges between 40 metres to 75 metres above sea level in elevation. To the north of the ridgeline the land slopes away to a valley and floodplain below then up again on to a second minor ridgeline located further to the north. Prior to survey, five Aboriginal Cultural Heritage Places were located within 2.5km of the activity area. While no surface artefacts were identified during the survey, assessment of landform and the fact that heritage sites had been previously identified led to the recommendation for sub-surface investigations to proceed. The sub-surface testing program targeted areas of high archaeological potential, such as ridgelines and elevated ground in close proximity to permanent and ephemeral watercourses. The objective of the sub-surface testing program was to determine the nature, extent and significance of any Aboriginal Cultural Heritage Places sites located within the activity area. Two sites were identified during excavation, both of which were associated with the ridgeline running through the property (Parmington¹⁰⁴).

The results of the sub surface testing program undertaken at 625 Princes Highway and 707 Princes Highway Officer determined that the highest concentration of Aboriginal stone artefacts occurred on the minor ridgeline in the vicinity water. These results are consistent with the environmental context and patterning of previously recorded sites in the surrounding region, where the largest artefact scatter sites are generally found closest to creek lines and catchments and on the high rises close to water and former swamp margins.

Clyde North: Brookfield (Clarke et al. 2009)¹⁰⁵

A CHMP was prepared, including a desktop study, field survey, and sub-surface testing program, for a 120 ha property in Clyde North (Clarke et al.¹⁰⁶), located to the west of the central section of the South-east Study Area. While the majority of the property at the corner of Berwick Road and Cranbourne Road is situated within the undulating plateau of Terrain Pattern 5, a small portion is located within Terrain Pattern 10. While survey identified no new Aboriginal Cultural Heritage Places, subsequent sub-surface testing added two new sites to the previously recorded three sites within the property. All five sites were investigated through the sub-surface testing program, which confirmed that the rises and hills in the region were an attractive place for camping, eating and maintaining tools in the past for Aboriginal people.

¹⁰² *Andrew Long and Associates 2010 Volume 5 Section 11 (Draft p.75)*

¹⁰³ *Parmington (2008)*

¹⁰⁴ *Parmington (2008: 97-99)*

¹⁰⁵ *Andrew Long and Associates 2010 Volume 5 Section 11 (Draft p. 76)*

¹⁰⁶ *Clarke et al. (2009)*

Cranbourne: Desalination Pipeline (Debney et al. 2009)¹⁰⁷

A small area of Terrain Pattern 10 was also dissected by the Desalination Project Pipeline, which extends from Wonthaggi to Cranbourne across a number of Terrain Patterns (Debney et al. 2009). While the survey and sub-surface testing within the 400m wide investigation corridor identified 69 new Aboriginal Cultural Heritage Places, none were located within the Terrain Pattern 10 landform within the South East Study Area. The pipeline easement also crossed a large area of Terrain Unit 10 to the east of the South East, and identified low concentrations of stone surface artefact scatters.

Cranbourne East (Light 2009a&b)¹⁰⁸

A 47 ha residential subdivision in Cranbourne East (1555 Sth Gippsland Highway) was investigated for Aboriginal Cultural Heritage Places by Light¹⁰⁹. The entire testing area is located within Terrain Pattern 3, but to the immediate west of the South East Study Area. The evaluation comprised a desktop assessment, field survey and two phases of subsurface testing, including: Phase 1 - shovel test pits and Phase 2 - 1 x 1 m test pits. These testing components were designed to respond to the following aims:

- to fully define the actual archaeological sensitivity of the activity area;
- to determine the presence / absence of archaeological subsurface deposits, and;
- to collect data on the nature and significance of any deposits identified.

The investigation identified eight Aboriginal Cultural Heritage Places (7922-1041 and 7921-1048). In total, these ACHPs comprise 162 stone artefacts. All of the ACHPs recorded as a result of this assessment comprise stone artefacts in a subsurface context within the sandy rises, limited to the mid-upper slopes and the tops of the rises and dune and two comprise additional surface artefacts (7921-1044 and 7921-1045). The results of the evaluation have demonstrated that the upper slopes and tops of the sandy rises and dune are sensitive for Aboriginal archaeological deposits and the remainder of the activity area is considered to be of negligible sensitivity. The results of the evaluation conform to previous predictive models presented for the region.

Light¹¹¹ also undertook a CHMP of a 61 ha property at 50 Berwick-Cranbourne Road, Cranbourne East, which is located within Terrain Pattern 3 and immediately adjacent to (northwards) 1555 Sth Gippsland Highway. A desktop assessment, field survey, and sub-surface testing (shovel test pits, mechanical transects and 1 x 1 m test pit) identified ten Aboriginal Cultural Heritage Places within the survey area. Eight of the ACHPs recorded as a result of this assessment all comprise stone artefacts in a subsurface context within the sandy rises, limited to the mid-upper slopes and the tops of the rises and two comprise surface artefacts only. Aboriginal activity appears to

¹⁰⁷ Andrew Long and Associates 2010 Volume 5 Section 11 (Draft p. 76)

¹⁰⁸ Debney et al. (2009)

¹⁰⁹ Andrew Long and Associates 2010 Volume 5 Section 11 (Draft p. 76-77)

¹¹⁰ Light (2009a)

¹¹¹ Light (2009b)

have focussed on the higher hills and sand rises which provided dry vantage points adjacent to the swamps/wetlands which occurred on the low-lying land surrounding them.

Clyde and C21 PSP Desktop Assessment (Murphy & Kennedy 2009)

Murphy and Kennedy¹¹² completed a Desktop assessment the C21 Business Park and Clyde North PSPs. The report consisted of a desktop assessment and survey for both Historic and Aboriginal archaeology. Ground surface visibility during the survey severely hampered the effectiveness of the survey. As a result, no new Aboriginal archaeological sites were located¹¹³.

Land within 200m of Cardinia Creek and associated with the Koo Wee Rup Plains were considered to be of high archaeological potential compared with areas greater than 200m from Cardinia Creek¹¹⁴.

1435 Thompsons Rd Cranbourne (Vines 2008)

Vines¹¹⁵ completed subsurface testing for a residential subdivision immediately south of the current activity area. The landforms within the proposed subdivision included sandy rise, slope, and low-lying former swampland. Four sites were located as a result of subsurface testing. These sites were located on the sandy rise landform. The majority of artefacts were located between 30 and 50cm (at the base of the 'bioturbation zone').

Casey Central Shopping Centre CHMP (2009)

Feldman, Mathews and Chandler¹¹⁶ completed a CHMP for the far northern portion of the Casey Central Town Centre PSP (directly to the north of the current activity area extent). The approved activity includes expansion of the existing Casey shopping centre to the south. A survey was undertaken as part of the standard assessment. No artefacts were located on the surface, likely due to poor ground surface visibility. Auger probing was implemented during the standard assessment. This confirmed isolated sandy dune deposits overlying a Baxter Sandstone profile¹¹⁷.

The Complex testing phase consisted of a series of test pits (1m x 1m) and shovel test pits (40x40cm) across the activity area. Five previously unrecorded sites were located as a result of the subsurface testing. Four sites were considered to be of low significance, one site was assessed as being of moderate significance¹¹⁸. Two of the

¹¹² 2009

¹¹³ Murphy & Kennedy 2009:40

¹¹⁴ Murphy & Kennedy 2009:40-1

¹¹⁵ Vines 2008

¹¹⁶ 2009

¹¹⁷ Feldman et.al. 2009:45

¹¹⁸ Feldman et.al. 2009:68

sites were located on a rise landform and three sites were located on a plain landform. Salvage of the larger site (7921-1082, Casey Central 1) was recommended¹¹⁹.

5.5.4 Previous Studies within the Activity Area

No previous studies have been conducted within the Activity Area.

¹¹⁹ *Feldman et.al. 2009:69*

5.6 General Ethno-Historical Background

This section presents a history of Aboriginal occupation and use of the study area based on documentary evidence and early ethnographic records. This information is important in providing a context to the archaeological investigations, to assist in interpreting the results of the archaeological test excavations and to aid in assessing the cultural heritage values of the area.

The following general ethnohistory was prepared by Andrew Long and Associates¹²⁰ for the Metropolitan Planning Authority for the South East Growth Area which includes the current activity area.

Introduction¹²¹

Note: Most of the South-east Study Area is currently contested through the RAP Application processes of the Aboriginal Heritage Act. The Project team is aware that the presentation of ethnohistory – even with the significant caveats included in this draft – is sensitive and possibly contentious. This section should therefore be considered to be a preliminary account while feedback is sought.

This section briefly reviews the available ethnohistorical and historical information relating to Aboriginal people in the South-east Region at the time of European contact.

Ethno historical records of Aboriginal people in Greater Melbourne in the period following colonisation were few, and those that were written were done so by Europeans after settlement had already significantly disrupted the lives of Aboriginal people. As such, ethnographic sources should not be considered as a window into the past but rather an imperfect interpretation of observations and communications. This especially needs to be considered where particular Aboriginal groups or individuals are noted in specific locations as these observations were made when Aboriginal people had already lost their traditional lands and much of their resources, possibly requiring movement outside of traditional boundaries.

The journals of Assistant Aboriginal Protector William Thomas are one of the chief sources of information about the Aboriginal people who lived in the South-east Region¹²². Thomas made his observations from protectorate stations he established at Arthurs Seat (1839-1840) and at Narre Warren (1840-1843). Other sources of information include written records of early European settlers, government administrators, missionaries and government station managers such as John Green from Coranderrk Aboriginal Station. Much of this information has been summarised in

¹²⁰ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹²¹ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹²² Thomas Journals (1838-1867)

secondary sources such as the previous archaeological research undertaken by du Cros¹²³.

Useful secondary sources include the studies of Barwick¹²⁴, Goulding¹²⁵, Clark¹²⁶ and Presland¹²⁷. These sources provide accounts of Aboriginal life during the early contact period including information about the spatial and social organisation of Aboriginal groups within this region. Below is a summary of the relevant information.

The main information sources used in this review are:

- Thomas, W. 1838-67. William Thomas Papers, 1838-67. Uncatalogued MSS, Set 214, Items 1-24. Mitchell Library, Sydney.
- Howitt, A.W. 1904. The Native Tribes of South-east Australia
- Much of the information regarding the *Kurung jang balug* and other *Woi wurrung* clans was provided to him by Aboriginal informants from the Kulin Nation:
- Robinson, G.A. *Diaries and Papers* contains information regarding the *Woi wurrung* clans
- Howitt n.d. *Kulin notes* in Howitt Papers , SLV, 1.

The secondary information sources used in this review are:

- Clark, I. 1990. *Aboriginal Languages and Clans* utilises primary source material such as the Howitt Papers.
- The papers and diaries of G. A. Robinson, W. Thomas, F. Tuckfield, E.S. Parker, the 1835 Todd journal, Wedge (1836 in Bonwick 1883) and Stewart (1836 in Croll et al 1937) providing useful information regarding language information and the spatial and social organisation of the *Bun wurrung* language group.
- Goulding, M. 1988. *Aboriginal occupation of the Melbourne Area, District 2*. Report to the Land Conservation Council.
- Barwick 1984; Clark 1990 (specific information regarding Bun wurrung clans)

¹²³ du Cros (1989, 1991)

¹²⁴ Barwick (1984)

¹²⁵ Goulding (1988)

¹²⁶ Clark (1990)

¹²⁷ Presland (1994)

- du Cros 1989, 1991 (more general information)
- Presland, G. 1985 (1994). *Aboriginal Melbourne: The Lost Land of the Kulin People*. McPhee Gribble, Ringwood.

Aboriginal Clans¹²⁸

The basic unit of Aboriginal social organisation in Victoria was the clan: a group based on kinship through the male line with a shared historical, religious and genealogical identity. The clan was a land-owning unit whose territory was defined by ritual and economic responsibilities. Groups of neighbouring clans speaking the same dialect and sharing political and economic interests identified themselves by a language name. In many cases this name used the suffix *(w)urrung*, meaning 'mouth or way of speaking'.¹²⁹

At the time of European colonisation, central and north eastern Victoria was occupied by a collection of peoples known as the *Kulin*, who shared certain cultural, social and language characteristics. The *Kulin* were in turn divided by distinctive language variations and organisational attributes, resulting in the definition of individual groups by contemporary observers as 'tribes'. Today they are more consistently defined by ethno historians as clans linked by commonalities of language, or 'language groups'. In contemporary Aboriginal society in the Melbourne region, the terms 'tribe', 'people' or 'nation' are more commonly used by Aboriginal people to demonstrate a traditional identity or allegiance, beyond the strictly academic term 'language group'.

Each tribe consisted of independent groups of closely related kin, or 'clans', who were spiritually linked to designated areas of land through their association with topographic features connected to mythic beings or deities. Clan lands were inalienable, and clan members had religious responsibilities, such as conducting rituals for 'the perpetuation of species associated with the particular mythic beings associated with that territory'.¹³⁰

At the time of European contact, *Kulin* people from two language groups, the *Woi wurrung* and the *Bun wurrung* (spelling according to Clark¹³¹), however numerous variants exist) occupied land in the Koo Wee Rup Swamp region. The *Woi wurrung*, were referred to in contemporary observations as the Yarra Tribe, occupying land to the north and east of Carrum Swamp, and the *Bun wurrung*, were variously known as the Coast Tribe, the Westernport Tribe or the Port Phillip Tribe, who occupied the area to the south. Today these groups, the *Woi wurrung* and *Bun wurrung*, are more commonly referred to as the Wurundjeri and Bunurung or Boon wurrung.

¹²⁸ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹²⁹ Barwick (1984: 105-6)

¹³⁰ Berndt (1982:4)

¹³¹ Clark (1990:364)

Clark¹³² suggests that two clans of these language groups occupied land bordering on the South-east Study Area, in which Koo Wee Rup Swamp appears to have formed a shared border region between them.

The individual clan groups are interpreted as follows:

- The *Bulug willam* – meaning ‘swamp dwellers’. This *Woi wurrung* clan primarily identified with the ranges and swamps south of ‘Yering’ on the Upper Yarra, but their range extending south east to Koo Wee Rup Swamp and the head waters of the La Trobe River, and south to adjoining *Bun wurrung* clans at Cranbourne and Carrum Swamp¹³³. They were a patrilineal sub-group of the *Wurundjeri Balug*, or ‘white gum tree people’, who occupied the largely upland country of the broader Yarra and Maribyrnong catchments to the north, west and east of Melbourne.
- The *Mayune balug* clan – meaning ‘Mayune people’ (i.e. people associated with the locality of Mayune, or the watershed between Carrum and Koo Wee Rup swamps). This *Bun wurrung* clan was associated with the Cranbourne area, the upper Mornington Peninsula and the head of Western Port Bay to the south and east of Carrum Swamp¹³⁴.

The precise extent of the estates or territories occupied by these clans has not been conclusively defined, and remains a subject of debate to the present day. Most references to Aboriginal people in the vicinity of Melbourne during the early contact period refer generally to the *Woi wurrung* or *Bun wurrung*, without specific reference to individual clans¹³⁵.

Intertribal relationships varied throughout the region. The *Bun wurrung* intermarried with other Kulin tribes, although these relationships did not prevent inter-tribal warfare. William Kyle noted that when the *Bun wurrung* visited Melbourne in the early 1840s, they camped away from the other Aboriginal groups, locating themselves near the residence of the Governor-General, with the *Wada wurrung* camping on either side of the general cemetery, or west of Sydney Road near Royal Park and the *Woi wurrung* people camped on the Melbourne Cricket Ground or at Newtown Hill (Fitzroy), and the *Daung wurrung* at Ryrie’s Hill (Clifton Hill)¹³⁶. Smyth¹³⁷ suggests that the positioning of these Aboriginal groups corresponds to their real tribal boundaries, with the groups arranged as if they had been ‘set by compass’. While the *Bun wurrung* were closely affiliated with *Woi wurrung* groups to the north, they had a long-standing dispute with the *Kurnai* in Gippsland, with many references to periodic raids carried out by both groups. In 1840 a *Bun wurrung* group arrived at Yallock station (8 km North-West of Lang Lang) on their way to carry out a reprisal raid in Gippsland. The women, children

¹³² Clark (1990)

¹³³ Clark (1990:385-6)

¹³⁴ Clark (1990:366-7)

¹³⁵ Clark and Heydon (1998)

¹³⁶ Clark (1990: 276)

¹³⁷ Smyth (1976, 124)

and old men of the group remained at the station 'hunting and fishing' until the raiding party returned five weeks later¹³⁸.

Barwick¹³⁹ also notes that there was intermarriage between the *Kurung-jang-balluk* clan of the *Woi wurrung* language group and several clans of the *Bun wurrung* language group¹⁴⁰.

Seasonal Movement¹⁴¹

Aboriginal people in the Study Area followed a semi-sedentary hunter gatherer lifestyle. Watercourses and swamps, such as Cardinia Creek and local swamps and wetlands, contained a diversity of eels, fish, shellfish, birds and other plant or animal foods and these resource-rich locations would have formed a particular focus for regular occupation. Wallabies, wombats and other animals would have been hunted in the hills during summer. Plant foods utilised included tuberous roots, fern tree hearts and liquid amber from the black wattle tree.

William Thomas, the Assistant Protector of Aborigines for Westernport, recorded most of the limited documented information regarding the lifestyle of the *Woi wurrung* and *Bun wurrung* peoples occupying the littoral zone between Port Phillip Bay and Westernport Bay, however other settlers and travellers such as Daniel Bunce¹⁴² and George Haydon¹⁴³ have contributed to a broader picture of Aboriginal life across the region in the decade following European settlement.

In general, they observed clans living a hunter-gatherer lifestyle, moving within their lands to make use of seasonal plant and animal resources (e.g. Thomas noted that coastal clans used to travel by canoe to French Island in the centre of Westernport Bay to obtain eggs), trading opportunities and to meet ritual and kinship obligations.

A typical mobile Aboriginal encampment in the region was described by William Thomas¹⁴⁴, while travelling between Port Phillip Bay and Westernport in 1854:

*...all are employed; the children in getting gum, knocking down birds etc; the women in digging up roots, killing bandicoots, getting grubs etc; the men in hunting kangaroos, etc, scaling trees for opossums etc. They mostly are at the encampment about an hour before sundown – the women first, who get fire and water, etc. by the time their spouses arrive...In warm weather, while on tramp, they seldom make a miam – they use merely a few boughs to keep off the wind, in wet weather a few sheets of bark make a comfortable house. In one half hour I have seen a neat village begun and finished.*¹⁴⁵

¹³⁸ Gunson (1968: 6)

¹³⁹ Barwick (1984: 121)

¹⁴⁰ Barwick (1984: 121)

¹⁴¹ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹⁴² Bunce (1856)

¹⁴³ Haydon (1846)

¹⁴⁴ Thomas

¹⁴⁵ Thomas in Gaughwin & Sullivan (1984: 93-94)

The effective exploitation of resource diversity within a group's territory was integral to their success as hunter-gatherer communities. For example, Hibbins¹⁴⁶ has noted that the coastal *Ngaruk willam*, a *Bun wurrung* group based on the coastal margin of Carrum Swamp moved between three distinct environmental domains throughout the year, thus reducing their vulnerability to severe ecological fluctuations (e.g. droughts).

A review of early explorer's recordings of Aboriginal people in the Western Port area¹⁴⁷ found that camping locations with bark huts were noted throughout Western Port and were always located on the banks of rivers and creeks. Aboriginal people were observed to spend between 3-10 days at these types of camps, exploiting resources within a 10 km radius¹⁴⁸.

During the winter months, the Aboriginal people moved between Port Phillip and Western Port Bays and during the summer they generally moved into and beyond the Dandenongs on hunting expeditions. A favourite camp on the way to the Dandenong hills was Barnibyrnong on Cardinia Creek¹⁴⁹. Hovell reported in February 1827 on a meeting he had with a large group of more than 100 Aboriginal men, women and children near the Carrum Swamp. He noted of the women he observed:

*They are most of them young and healthy, & each had a child, both Men & women had good coverings made from the skins of the Kangaroo, they had several fine Kangaroo dogs by which they get their principal support.*¹⁵⁰

Hovell had also met some of the men from this Aboriginal group in January 1827, at a camp south of the Dandenongs. He noted that the oldest man was around 70 and appeared to be the chief of the group¹⁵¹. This man had a very long white beard, and had small arms and legs. Some of the men and boys had a front tooth knocked out, and some did not. Gunson has suggested that in the Western Port area tooth evulsion does not appear to have continued after European contact¹⁵². The group had one or two tin pots and pieces of iron made into tomahawks, and some woollen cloth prior to Hovell's meeting. Shell middens and camping places were also observed around Tooradin during the 1880s:

*Behind the Bridge Hotel lie numbers of what are known as 'Blackfellows' ovens, much after the same style as you find them outside Swan Hill. The blacks were very numerous around Tooradin at one time. The game proving a happy hunting ground for them...The 'ovens' have not been disturbed here, though occasionally axeheads and flints are picked up*¹⁵³.

¹⁴⁶ Hibbins (1984:11)

¹⁴⁷ Sullivan (1981)

¹⁴⁸ Sullivan (1981: 33-7)

¹⁴⁹ Gunson (1968: 10)

¹⁵⁰ Hovell (1826-1827: 71) in Gunson (1968: 4)

¹⁵¹ Gunson (1968: 4)

¹⁵² Gunson (1968: 4)

¹⁵³ Hawkeye (1889: 15) in Gunson (1968: 9)

Along the southern edge of the Study Area near Western Port, eels were caught by Aboriginal people at Tooradin, by wading in the creek mud whilst the tide was out, feeling for the eels with their hands and biting them on the back of the head before throwing the eels onto the creek bank, a practice observed by Ben Brett during the 1860s¹⁵⁴.

Thomas noted that there was a campsite at Red Bluff, Western Port Bay, near six 'native wells' at the foot of the bluff called *mallum mallum*. Fresh spring water could be procured from these wells by scooping holes in the sand¹⁵⁵.

Trade and Exchange¹⁵⁶

The uneven distribution of particular resources (e.g., greenstone for ground edge axes) resulted in a trade and exchange network between different clan groups across the study region. For example, the Bun wurrung traded with the Woi wurrung, particularly for Mount William greenstone which occurred in Woi wurrung country and from which stone axe-heads were made.

Customs, Rituals and Beliefs¹⁵⁷

George Gordon McCrae made several observations about Aboriginal people in the Mornington peninsula region during early European settlement:

*Their covering was the opossum rug, the squares of skin on the inner surface being scored in various patterns, afterwards rubbed in with a red earth or ochre to give a better effect. They wore, also, forehead bands, or fillets, of netted fibre, often coloured with red ochre. In the front of this, over the forehead, they struck ornamental feathers and sometimes over one ear a short tobacco pipe*¹⁵⁸.

Thomas related the following account of tracking 5 other Aboriginal people, and an exchange with a koala:

I was out with a celebrated Western Port black tracking five other blacks. The tracks had been lost some days at a part of the country where we expected they must pass. We ran down a creek; after going some miles a bear made a noise as we passed. The black stopped, and a parley commenced. I stood gazing alternately at the black and the bear. At length my black came to me and said, 'Me big one stupid; bear tell me no you go that way'. We immediately crossed the creek, and took a different track. Strange as it may appear, we had not altered our course above one and a half miles

¹⁵⁴ Gunson (1968: 9)

¹⁵⁵ Thomas papers Box 2, Box 3, p. 34 in Gunson (1968: 10)

¹⁵⁶ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹⁵⁷ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹⁵⁸ George Gordon McCrae in Gunson (1968: 4)

before we came upon the tracks of the five blacks, and never lost them after¹⁵⁹.

Smyth gave an account of the Bunyip, *Toor-roo-dun*, who lived on the Western Port Plains:

The Western Port blacks call the Bun-yip Toor-roo-dun, and a picture of the animal, made by Kurruk many years ago, under the direction of a learned doctor, is that of a creature resembling the emu...On the Western Port plains there is a basin of water – never dry, even in the hottest summers – which is called Toor-roo-dun, because the Bun-yip lives in that water. Toor-roo-dun inhabits the deep waters, and the thick mud beneath the deep waters, and in this habit resembles the eel. The natives never bathe in the waters of this basin. A long time ago some of the people bathed in the lake, and they were all drowned, and eaten by Toor-roo-dun¹⁶⁰.

Smyth also related a belief regarding a mountain range called 'Narn' located to the north east of Western Port:

There is a range with a well-marked culminating point lying to the north-east of Western Port, which, the Aborigines say, is inhabited by an animal resembling in form a human being, but his body is hard like stone. The mountain is called Narn, and the strange animal is named Wi-won-der-rer. Formerly this animal used to kill many blacks. So many indeed were killed by Wi-won-der-rer that at last it became necessary to consider in what way those remaining might be preserved. A council of aged and wise men was held, and much debate ensued, and many suggestions were made. Finally it was agreed that the most cunning doctor, with other learned doctors and priests, should visit Narn and ascertain the conditions of Wi-won-der-rer, and, if possible, kill him and his people (of whom there were a good many). The wise men explored the mountain ranges very carefully. Armed with spears, stone hatchets, and waddies, they sought to find and lay the strange creatures with bodies like stones. And they found them at length; but their weapons, when they assaulted them, made no impression on them. It was reported, however, that these creatures were vulnerable in the eyes and the nostrils. One doctor said he had thrust his spear into the eye of a Wi-won-der-rer, and had killed him, and another said that he had killed one by thrusting his spear into his nostril.

The blacks will not visit this range. A settler was lost many years ago in the neighbourhood of Narn, and though every inducement was offered to the blacks to explore the range, and, if possible, track him, they would on no account go near it. They said the settler had been caught and killed by Wi-won-der-rer¹⁶¹.

¹⁵⁹ Thomas in *Bride* 1898, 90-91 in Gunson (1968: 14)

¹⁶⁰ Smyth (1876: 436)

¹⁶¹ Smyth (1876, Vol 1: 455-456)

Smyth relates how the wife of Ning-er-ra-noul of the Western Port tribe, sickened and died when her husband was taken away from her, and that King Benbow's wife died on his grave¹⁶².

Post European Contact¹⁶³

The development of the nearby township of Melbourne resulted in the loss of traditional lands and resources, the spread of disease, social breakdown and removal of both groups and individuals to reserves and mission stations. Aboriginal people from other clans and language groups were attracted to Melbourne for a variety of reasons, making it difficult to identify and document the ethnohistory and post-contact history of specific Aboriginal clan groups after the period of initial settlement.

In 1835 land began being settled by European colonists with Aboriginal resources depleted by the introduced cattle. The Aboriginal people living in the region sought refuge in various stations set up by William Thomas between 1839-1843 around Western Port¹⁶⁴. Thomas hoped that the stations would encourage Aboriginal people to take up an agricultural lifestyle but spent most of his time unsuccessfully trying to keep Aboriginal people out of Melbourne.

Native Police Corps¹⁶⁵

In 1837, the site of the headquarters of the newly established Native Police Corps was selected by men from the Woi wurrung, Bun wurrung and Daung wurrung Aboriginal groups in an area known as 'Narre Narre Warren'¹⁶⁶. The 1837 Native Police Corps was largely unsuccessful. An administrative feud ultimately led to the Commandant's resignation, with the Corps lasting only 10 weeks from 28 October to 7 January 1839¹⁶⁷. A second attempt was made to set up the Corps from 18 September to 15 January 1839, located at what is now Jolimont, Melbourne¹⁶⁸. The corps was revived in 1842 with the appointment of a new Commandant, Henry Pulteney Dana¹⁶⁹. To recruit the force, Dana and Thomas sought the aid of Billibellary from the Woi wurrung. On 24 February 1842, Billibellary brought 21 men from the Bun wurrung and Woi wurrung groups¹⁷⁰.

¹⁶² Smyth (1876 Vol. 1: 139)

¹⁶³ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹⁶⁴ Barwick (1998: 31)

¹⁶⁵ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹⁶⁶ Fels (1990: 1-2)

¹⁶⁷ Fels (1990: 3, 5)

¹⁶⁸ Fels (1990: 5)

¹⁶⁹ Fels (1988: 25-31)

¹⁷⁰ Bridges (1971: 121)

Camps, Missions, Government stations¹⁷¹

Some Aboriginal people in the region were able to live outside of Aboriginal Missions in the latter half of the 1800s. Thomas managed to secure 832 acres of land at Mordialloc in 1852 at a location where Aboriginal people had camped since 1835. In 1860, the Aboriginal Protectorate system was replaced by the Central Board for the Protection (CBPA) of Aborigines. The CBPA established Coranderrk Station at Healesville for the Kulin Aboriginal people. Despite the best efforts of Thomas, once Coranderrk Station was established, the Mordialloc Reserve was revoked and sold in 1863, with some of the Aboriginal residents moving to Coranderrk Aboriginal Station, and the remainder staying in camps at Mordialloc and Cranbourne. Many Bun wurrung Aboriginal people remained at the Mordialloc Station reserve and did not move to Coranderrk until the late 1870s¹⁷². Ben Brett, a European settler who arrived in Western Port in 1863, reported another Aboriginal camp in the region from around this time period. Brett recalled that three or four Aboriginal people ‘...had a mia-mia at Tooradin, and used to come as far as Red Bluff’ and observed that the group shot ducks and caught eels in the Tooradin Creek which they would then sell¹⁷³. By 1866 most of the remaining Aboriginal people in the Port Phillip region, were removed to Coranderrk Aboriginal Station in Healesville¹⁷⁴.

Implications¹⁷⁵

As previously discussed, the strength of ethnohistorical recordings is debatable, perhaps providing a better picture of colonial perceptions rather than acting as a window to the past. However, some broad implications can be drawn from the information available:

- Post-colonisation, people from both Woi wurrung and Bun wurrung were recorded as having associations in proximity to the SE Study Area.
- Marriage, trade and exchange were recorded as occurring between these two groups, as well as with other Kulin tribes.
- Local resources (e.g. roots, eels, opossum skins) formed the basis of seasonal movement across the landscape and played a role in local customs.
- Recorded materials utilised by Aboriginal people include animal skins, feathers, bark and stone. Of these, lithics are likely to be the only material to have survived and remain in the landscape.
- European introduced items such as tin pots, iron and other materials were utilised by Aboriginal people.

¹⁷¹ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

¹⁷² Barwick (1998: 35, 52, 66)

¹⁷³ Brett in South Gippsland Development League (1966: 380)

¹⁷⁴ Clark & Heydon (1998)

¹⁷⁵ 2010, Volume 6 Section 9 "Ethnohistory" (Draft pp 41 – 48)

5.7 Review of Thomas Journal to Identify Aboriginal Use and Occupation in the Local Area

5.7.1 Introduction

The previous section summarised a generalised ethnographic history of the south east Growth Area prepared by Andrew Long & Associates. The purpose of the current section is to review selected sections of the William Thomas Journals held in the Mitchell collection at the State library of NSW that throw light on specific aspects of Aboriginal occupation and use in the local area. The primary research focused on a journey Thomas took with the *Bun wurrung people* in his role as Protector of Aborigines between January – May 1840. This particular journey passed near the Berwick Waterways activity area.

Thomas' journey commenced at Tuerong on 4 February 1840 and ended at Dandenong on 17 March of that year.¹⁷⁶ The final stages of the journey took Thomas from Ruffy's Station "Mayune" (located immediately east of Cranbourne) northeast towards Cardinia Creek past 'Mr Bates' Station (James Bathe) to O'Connor's Station (Terence O'Connor) - a distance of approximately 9km (refer to **Figure 7**). O'Connor's Station was located 5 kilometres south-east of Berwick Waterways, which is indicated on an undated plan prepared by William Thomas as being located within a large swamp system (see red arrow on **Figure 7**).

¹⁷⁶ *Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840*

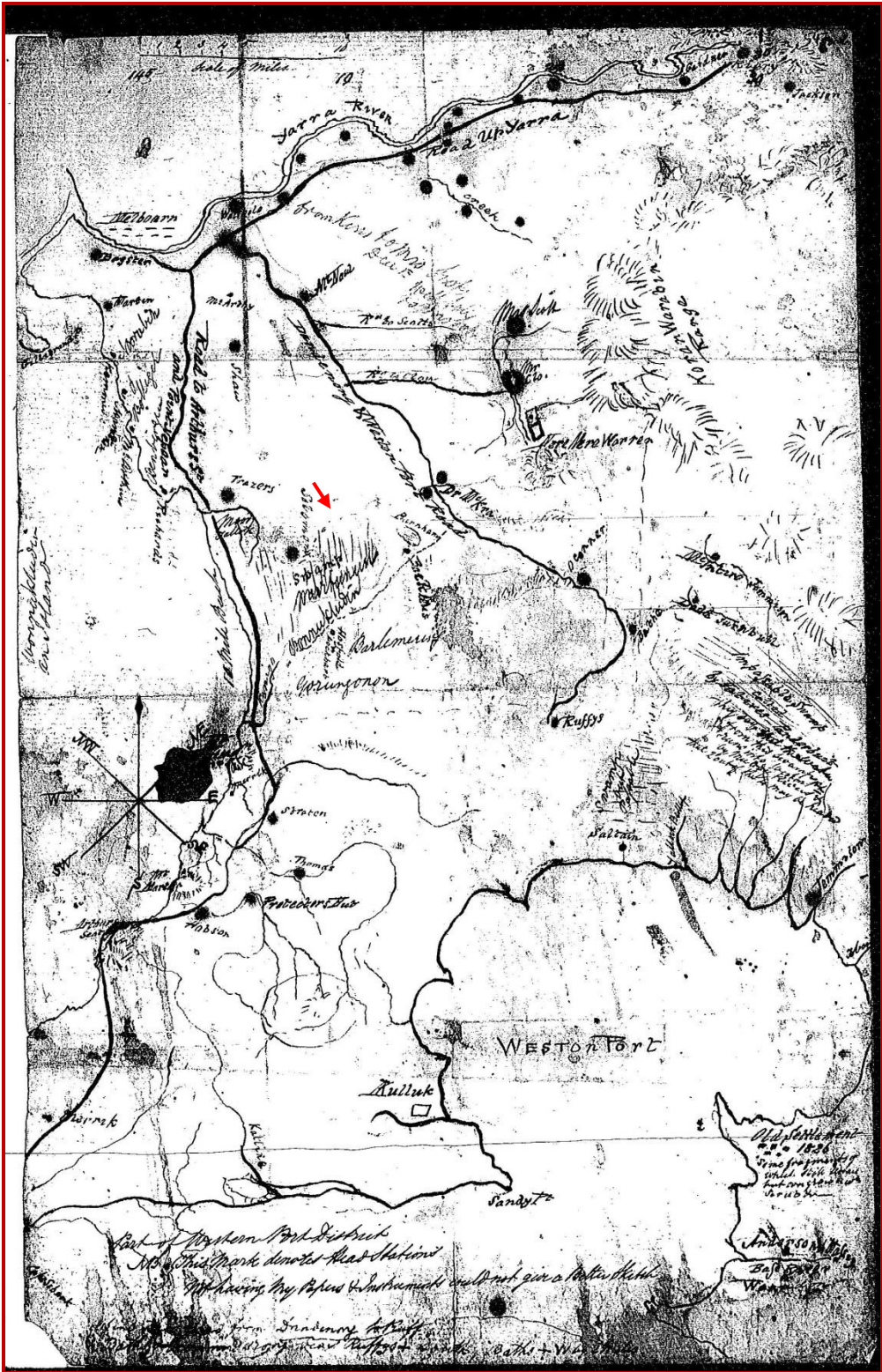


Figure 7 - Undated plan (William Thomas) showing the road from Ruffy's Mayune Station to O'Connors Station and thence to Dandenong.¹⁷⁷ This shows a large swamp in the vicinity of the activity area.

¹⁷⁷ William Thomas, *Protector of Aborigines, Victoria. Papers 1832-1902 Mitchell Library ZML MSS214/22 (28) fol 547*

5.7.2 Settlement Patterns

Permanent European settlement in the region altered many aspects of *Bun wurrung* traditional lifestyle within a remarkably short period of time. Thomas' journey of 1840 was in part a continuance of a traditional seasonal movement through the eastern portion of *Bun wurrung* territory modified by new points of interest that were to be either avoided or visited.¹⁷⁸ The appearance of pastoral stations had greatly altered where *Bun wurrung* people could hunt and camp either through exclusion or attraction. Areas survived within the region that remained largely intact as traditional food gathering areas. This was particularly the case with streams that entered and flowed out of the Koo-wee-rup where vegetation clearance had not been undertaken and where roads had not been formed. Melbourne had also become a particular attraction and it is noteworthy that on finding that a dray was leaving Ruffy's Mayune Station for 'town' a number of Thomas' party chose to leave the group and take advantage of this conveyance. On the following day at O'Connor's Station a further five members of the party took another dray to Melbourne leaving the remainder of the party to travel by foot to Dandenong.¹⁷⁹

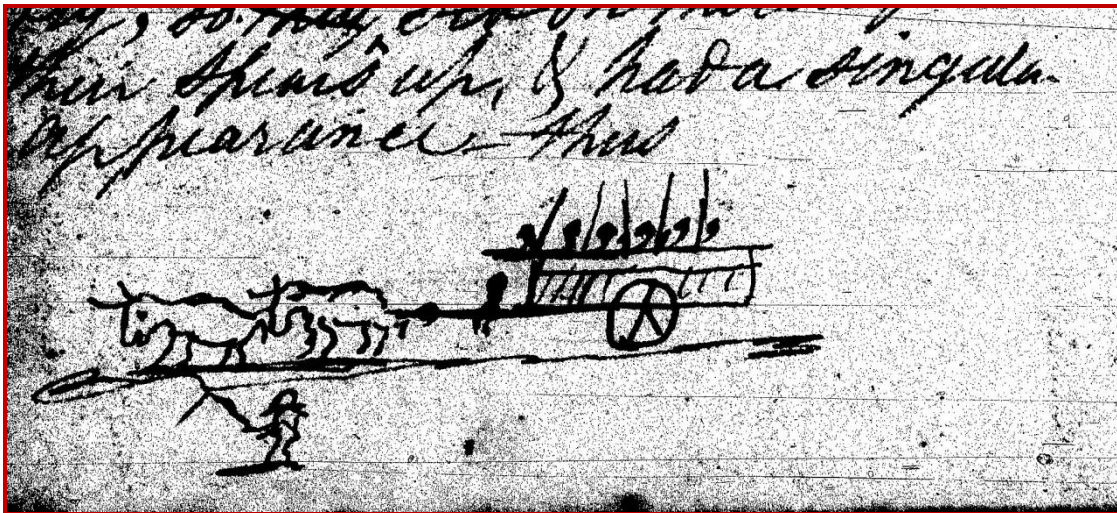


Figure 8 - Thomas sketch of *Bun wurrung* travelling by dray.¹⁸⁰

¹⁷⁸ Sullivan (1981)

¹⁷⁹ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840: entry 14 March 1840

¹⁸⁰ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840: entry 11 February 1840.

Other aspects of life documented by Thomas on his journey included the relationship between the *Bun wurrung* and their neighbours, and particularly the depopulation of the eastern part of the *Bun wurrung* range where it adjoined Gippsland. The journey itself was from water source to water source. On two occasions poor water was encountered and another two instances of absence of water that had been anticipated were recorded. The time spent at any one encampment varied considerably over the 42 nights spent on the journey. Where there was an absence of good water the stay was usually overnight. In one location the party remained for fifteen days and eight at another. Where a lengthy stay was made at any one location small groups would sometimes go hunting for several days before returning to the main encampment.

5.7.3 Hunting and Gathering

Thomas' Journal described the *Bun wurrung* catching a variety of animals, fish and gathering roots. In February 1840, the Tobinerk Camp was in good spirits. The *Bun wurrung* had caught two kangaroos, four large *wandals* ("like hares") and plenty of eels and gum. 'Opposums', bears and *beart* (like hares) were also regularly hunted.

In addition, roots were gathered.¹⁸¹ Thomas describes large amounts of eels caught and distributed by elder men to the families.

While encamped at *Lannen Badgen*, the *Bun wurrung* failed to catch eels but caught some duck and native bears in abundance. The "natives caught a very large Guanna" and did not eat it and "said no good one for fat". At the Tobinerk camp, women go eel spearing after sunrise. The women would return with plenty of eels, four bears, two opossums, a quart or two of "currants" and a quart of "rasberries". The *Bun wurrung* also hunted lyre birds.¹⁸²

Thomas's account of the *Bun wurrung* hunting and gathering practices described mostly women's activities. The men were most likely away during the time Thomas kept his journal, as he mentions that the women were bewailing the loss of their husbands. Thomas also writes that two hours after sunset some of the women whose husbands were absent moved about 50 yards from his tent and gave a shout in one

¹⁸¹ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840

¹⁸² Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840

voice five times in the direction of their husbands. Thomas describes the Aboriginal women as “All quiet – Lubras industrious”. In February 1840, Thomas reported that “women kill kangaroos without assistance” at Tobinerek. Apart from kangaroos, the women returned with eels and gum. It is unknown whether women were hunting kangaroos due to the absence of men or if this was a regular female hunting practice.

Thomas describes the daily practices of the Bun wurrung that he witnesses, “The Lubras all stop at home this day plenty food – they have enough to supply them, are reconciled all together and the Lubras who have kept their miam at a little distance come up with the rest and made miam”. “The Lubras all but 3 leave early for kangaroos and opossums, the youth and old men only present when I read in the forenoon - the Lubras return early by 3 o’clock - 3 kangaroos and 9 opossums”. To celebrate the return of the men, the women present them with necklaces made of reeds.

5.7.4 Burial Practice

Thomas documented many aspects of traditional culture during the journey such as a particular burial practice observed on the northern shore of Western Port, during which the body was covered by approximately fifty lengths of timber laid horizontally to a height of 3 feet with the ground all around burnt.¹⁸³ Thomas was also privy to a number of aspects of *Bun wurrung* ritual and ceremony. These were recorded in some detail when he was permitted to witness the ceremony.

At the Kunnong campsite, Thomas was placed in charge of two old men, women and children. A child born on the 12th dies and Thomas persuaded them to let him bury it in a box. Thomas was permitted to witness “A most singular ceremony”. Thomas describes the ceremony in detail which included the cutting of hair, burial of the hair, sticks, birds’ wings, the women lying down covered by blankets and so on. At sun rise the woman whose infant had died went to the grave and lit a fire¹⁸⁴.

¹⁸³ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840: entry 19 February 1840

¹⁸⁴ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840

5.7.5 Frontier Violence and Early Settler Relations

Conflict.

Thomas went to the beach and mudflats accompanied by one of the Aborigines from the encampment at Jamieson's hut – this person was armed with a double-barrelled shot gun. Thomas asked if the Aborigines ever travelled to French Island. His informant told him that before white men came, he and a number of named individuals (known to Thomas) cut a lot of bark and made boats and travelled to French Island. A lot of birds but no kangaroos or possums – “he said they were plenty frightened”. He then pointed to the mountains and said that “all the Blacks from Willsons Promontory & Perrong (?) to Kirkbillessce all this country where we now were were dead – not one left – Two Fold Black fellows [Gunnai/Kurnai] long time ago killed many many (?) all dead”.

In February 1840, Thomas' group decided that they would go Bullen Bullen (lyre-bird hunting) for five days. One of the women later told Thomas that “they were going to kill wild Black fellows & that *Moloco simaluk murrambinna cogella* putting her hand to the thick part of the leg & the (?) part of arm – I immediately shew'd anger. An Old Man being present I turn'd to him told him One Great Father made us all, Black fellows 2 Fold Bay, Black fellows Westen Port, Black fellows Barrubal, Black fellows Goldborn, White Man this country, White Man that country”.¹⁸⁵ Thomas indicated that he would go with them and that they would have to spear him before they speared the Two Fold Blacks. The *Bun wurrung* insisted that they did not intend to kill Black fellows. Ross volunteered to go with them so that Thomas could be informed of their movements and to be convinced that no slaughter took place.

Frontier Violence and Relations with Europeans

Thomas recorded evidence of earlier European aggression against the *Bun wurrung*. When questioning a young woman regarding some old scars that Thomas had assumed were spear wounds, he was informed that: *Long time ago me Pckaninny -*

¹⁸⁵ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840

*White Man plenty shoot my all Blackfellows.*¹⁸⁶ The wounds she carried Thomas surmised were the result of buck shot.

Thomas also describes the mixed relations on the frontier, which often included cycles of violence and reconciliation. For instance, the dogs owned by the *Bun wurrung* killed five or six young chickens just hatched at Jamieson's hut. In retaliation Jamieson shot dead the wrong dog and wounded another. A burial ceremony was conducted by the Aboriginal dog owner. Jamieson apologised and paid the owner compensation.

Thomas also wrote about the *Bun wurrung* swimming techniques which he found curious and bizarre. Thomas described the Aboriginal swimming technique as "they do not swim like a white man or so fast, like swans or ducks they work their hand open under their bellies & not spreading out like we swim, you cannot see their legs". Thomas also observed that they never dived but walked into the water.

It was also clear that many early European settlers were openly hostile to a continued Aboriginal presence in the area. Thomas noted with disdain, after being refused permission to camp on a property close to Dandenong, that "this is the 12th Station where we have been ill received".¹⁸⁷ Within four years of European settlement the *Bun wurrung* had already established etiquette regarding camping on pastoral leases: "The Blacks are very careful where they Encamp to avoid giving offence - they encamps at a nook of the Creek quite out of the way of Cattle &c, & at least half or 3/4 of a mile from the huts".¹⁸⁸

Thomas noted that firing of the landscape was a source of conflict between the *Bun wurrung* and the squatters. Of most concern to the squatters was the firing of areas that were used to graze stock. During traditional hunting, a firestick was usually carried in order to drive game. According to Thomas' journal, Aborigines argue that firing the bush is something they have always done for hunting possums, wombats

¹⁸⁶ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840: entry 9 February 1840

¹⁸⁷ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840: entry 17 March 1840

¹⁸⁸ Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840: entry 17 March 1840

and other animals. The *Bun wurrung* promised not to set any more fires and the party went out without firesticks and returned with plenty of roots¹⁸⁹.

5.7.6 Summary

Some important key points can be drawn from our review of Thomas' journals:

- The locality near Berwick Waterways was part of a large swamp system;
- Over the course of the journey, camping sites were always located near a creek or water source. Duration of stay varied considerably and appeared to be related to how abundant water and other food sources were;
- Women were actively involved in hunting, including bringing back Kangaroos that appear to have been killed through use of digging sticks as a weapon;
- Firing of the landscape was a frequent occurrence and was primarily used to corral game;
- The Bun wurrung had a rich spiritual life and burial ritual; and
- Frontier relations were complex, with good relations between some early European settlers (such as O'Connor) and the Bun wurrung, but clear evidence of hostility and violence directed at the Bun wurrung from many other settlers.

¹⁸⁹ *Thomas Journal 1840 ZML MSS 214 Item 2 (28) Journal January to May 1840*

5.8 Environmental Context (Landforms & Geomorphology).

Archaeological assessment reports include information about the environmental context of study areas because of the important role environmental characteristics played in influencing the types of archaeological sites in any given area. Physical environments influence both the type and availability of natural resources and the types of cultural activities that were carried out in the past. Correspondingly, this also influences the types of archaeological sites that may be found.

A determination of the former environmental context is essential to develop accurate models of cultural activity, site distribution patterns and the archaeological potential of any given area. The environmental setting of the activity area is discussed below.

5.8.1 Landscapes

The activity area is located within the Victorian Uplands and Sunlands system, formed through past volcanic activity as well as through changes in the sea level. Geological evidence suggests that the Port Philip and Western Port areas were ‘probably not inundated before 10,000 years before present (BP)’¹⁹⁰. Further evidence suggests that Port Philip did not begin to fill until 9,000 years BP and Western Port not until 8,000 years BP¹⁹¹. The nearby French and Philip Islands are unlikely to have been formed until 5,000 – 6,000 years BP when the highest sea levels approached current levels¹⁹². During the mid-Holocene high stand, the sea level increased by approximately 1.70 metres above the current sea level.

Sea level fluctuations have created Pleistocene sands (in the form of dunes) which have blocked drainage. Impediments to local drainage have resulted in the formation of large swamp deposits, in particular the Carrum and Koo Wee Rup Swamps¹⁹³. In general as a result, current drainage patterns across the region are broad and informal (with the exception of Cardinia Creek).

¹⁹⁰ Coutts et al. 1976:68 as cited by Sullivan 1981:3

¹⁹¹ Sullivan 1981:3

¹⁹² Coutts et al. 1976:68 as cited in Sullivan 1981:3

¹⁹³ Andrew Long and Associates 2010 Volume 5 Section 8 (DRAFT p29)

In general, the landforms of the South East region consist of three main types, relating directly to the geomorphology. These are hard Palaeozoic sediments, weathered Pliocene sandstones, and younger (Quaternary) sediments formed by either alluvial or aeolian action¹⁹⁴.

5.8.2 Drainage and Water Resources

Andrew Long and Associates have described the drainage and water resources of the South-East region as follows:

There are no major streams crossing the Study Area. Cardinia Creek and Toomuc Creek have small catchments and low gradient and the largest stream, the Bunyip, was also blocked by the dunes. Unlike the streams flowing into Port Phillip Bay, the northern Westernport streams did not develop incised channels during the glacial low sea level times. They also lack the hard rock basement that allows the development and preservation of narrow incised channels¹⁹⁵.

Due to artificial drainage, channeling, and dam construction, the current pattern of hydrology substantially altered from original drainage regimes. Dams in particular have captured water flows preventing the natural flow of water to continue along natural water courses including Cardinia Creek and Koo Wee Rup Swamp.

Koo Wee Rup swamp was the dominant landscape feature in the region prior to the artificial channeling works conducted during the 19th century. The success of post-contact settlement in the district was reliant on attempts to clear and reclaim the swamp, in effect, altering the natural environment until original water resources have become near unrecognizable

Koo Wee Rup swamp has been discussed in depth as part of the report prepared by Andrew Long and Associates:

According to early account the region was originally a thick tangle of ti-tree, mud, water, red gum, blackwood wattles and prickly acacias¹⁹⁶. The Koo Wee Rup Swamp dominated the region's natural landscape, extending over 100,000 acres¹⁹⁷. For European squatters and settlers, the Koo Wee Rup Swamp was seen as a barrier. The townships of Officer South, Clyde and Cranbourne were on the fringes of the

¹⁹⁴ *Andrew Long and Associates 2010 Volume 5 Section 8 (DRAFT p29)*

¹⁹⁵ *Andrew Long and Associates 2010 Volume 5 Section 8 (DRAFT p29)*

¹⁹⁶ *Williams (1984: 8)*

¹⁹⁷ *Williams (1984: 8)*

swamp. Land in and around the township of Cranbourne was considered excellent for agricultural purposes.

The rivers and creeks in the region all fed into the Koo Wee Rup Swamp and served as natural boundaries for townships and properties, while the Koo Wee Rup Swamp itself acted as a natural barrier¹⁹⁸. The swamp originally had two natural outlets into Westernport Bay. Cardinia Creek, Dandenong Creek, Deep Creek, Toomuc Creek and Bunyip River all led to the Koo Wee Rup Swamp from the north. The Bunyip River and Ararat Creek and their tributaries were the major water sources feeding into the swamp from the north, the King Parrot, Musk and Heifer Creeks the most significant from the east¹⁹⁹.

The rivers and creeks in the region all fed into the Koo Wee Rup Swamp and served as natural boundaries for townships and properties, while the Koo Wee Rup Swamp itself acted as a natural barrier²⁰⁰. The swamp originally had two natural outlets into Westernport Bay. Cardinia Creek, Dandenong Creek, Deep Creek, Toomuc Creek and Bunyip River all led to the Koo Wee Rup Swamp from the north. The Bunyip River and Ararat Creek and their tributaries were the major water sources feeding into the swamp from the north, the King Parrot, Musk and Heifer Creeks the most significant from the east²⁰¹.

Historic 19th century maps and plans show the Berwick Waterways activity area was located within a large swamp system **(Figure 7 and Figure 9)**.

¹⁹⁸ Williams (1984: 9)

¹⁹⁹ Shire of Pakenham (1981: 3)

²⁰⁰ Williams (1984: 9)

²⁰¹ Shire of Pakenham (1981: 3)

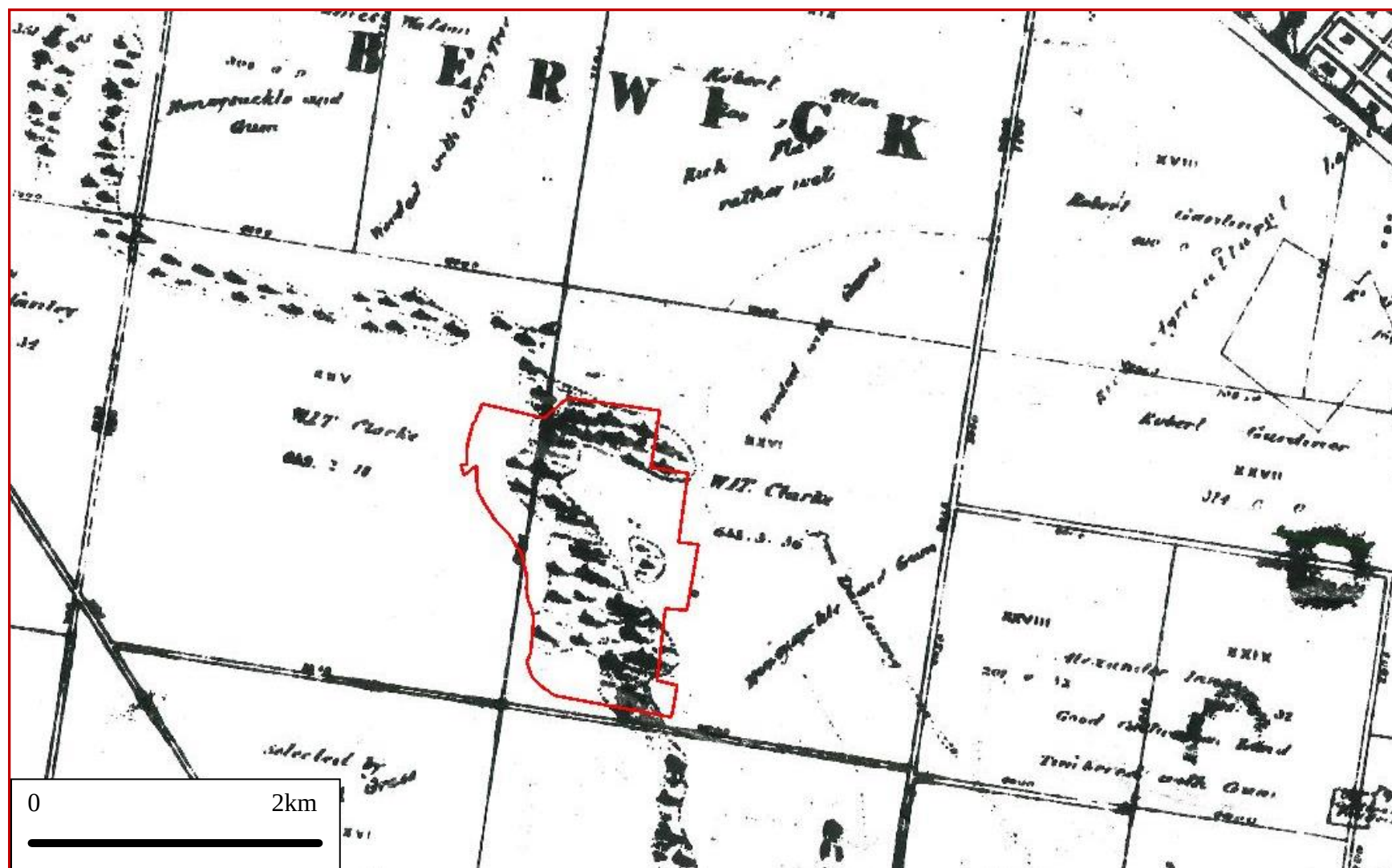


Figure 9 – Extent of former swamp in the activity area. Source : 'DANDENONG CRANBOURNE ETC ROLL 25 HISTORIC MAPS AND PLANS VPRS 15899@PRO

5.8.3 Published Geological Information

Published geological information relating to the activity area indicates four different geological formations in the vicinity of the current activity area. These types are outlined below and shown on **Figure 10**.

The current Activity Area is dominated by:

- *Qm1 Unnamed Swamp and Lake Deposit*: lagoon and swamp deposits: silt, clay.

Immediately occurring to the east and west of the activity area is:

- Sm Murrindindi Supergroup, Palaeozoic (Devonian and Silurian) marine mudstone and sandstone.
- Further to the southwest of the activity area lays Nxx Baxter Sandstone fluvial deposits.

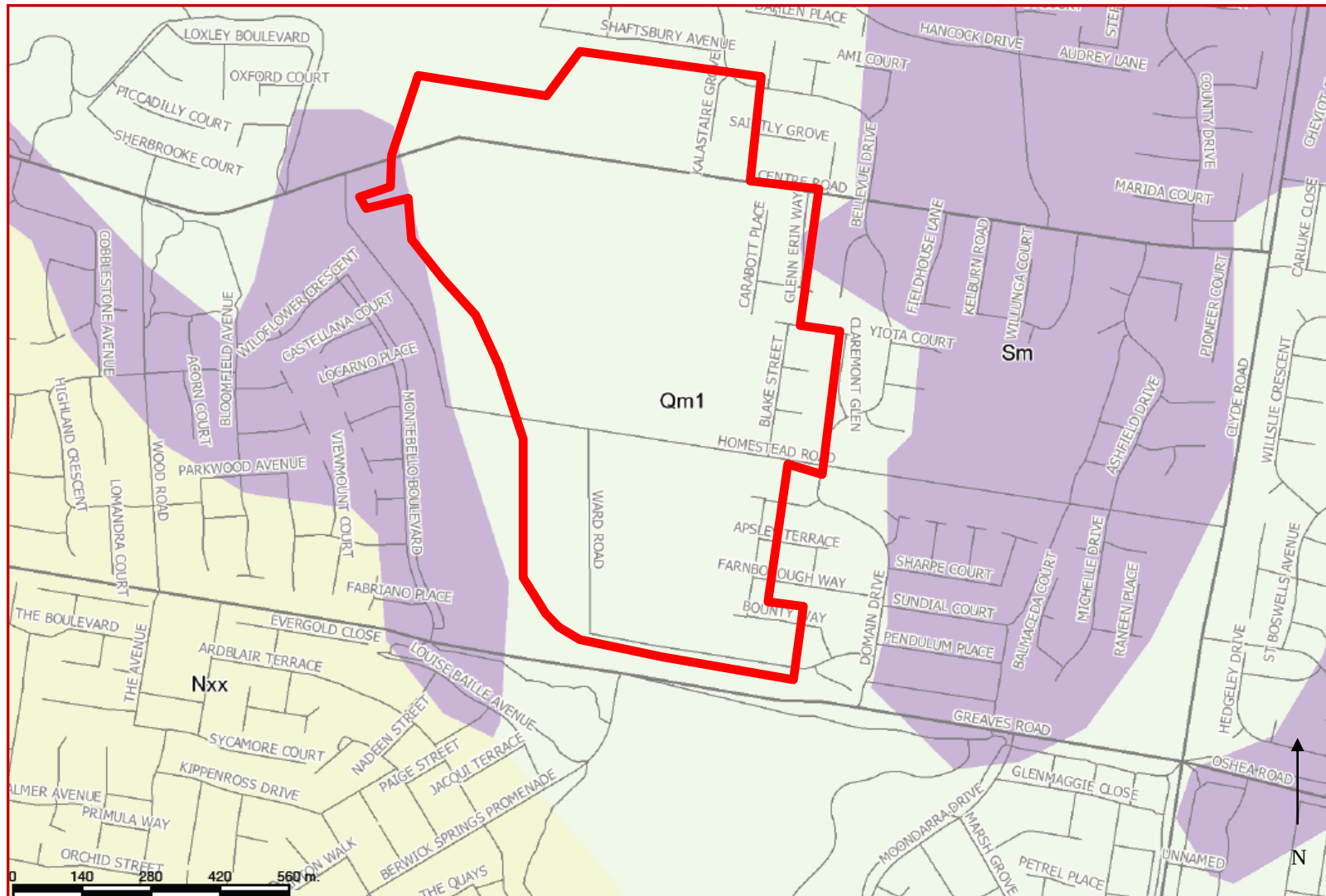


Figure 10 – Plan showing geological formations within the Activity Area (outlined red). The codes Sm (purple) and Nxx (pale yellow) as outlined above. Source: “GeoVic”, Department of Primary Industries.

5.8.4 Geomorphology & Soils

Soil types within the current activity have not been subject to detailed investigation such as those completed for the Mornington Peninsula and Western Port²⁰². Despite this, similarities between geological types within the current activity area and previous studies undertaken by Sargent are likely to provide an indication of soil types that may be present within the current activity area.

The majority of the activity area forms a low lying waterway and floodplain environment consisting of the clay and clay loam soils relating to Quaternary (Holocene) swamp and lake deposits. These geologically recent deposits consist of lacustrine clays derived from permanently waterlogged conditions within the former swamp (similar to Dalmore Clays)²⁰³.

5.8.5 Vegetation

Published information on vegetation and biodiversity is included on the Victorian Resources Online website (VRO). It provides a good indication of the prevailing vegetation patterns prior to European settlement and clearance of the land. For the purposes of showing the general patterns of vegetation across the study area, we have re-produced a copy of the VRO 1750 Vegetation Communities (EVC) Map relevant to the study area (refer to **Figure 11**).

The EVC within the current activity is:

- 688 Swampy Riparian Woodland/Swamp Scrub Mosaic.

Comparison of the 1770 (modeled) and 2005 (current) EVC extent indicates that original vegetation community has been almost entirely removed during the historical period.

²⁰² Sargeant 1975 Sargeant 2002/3

²⁰³ http://www.dpi.vic.gov.au/dpi/vro/map_documents.nsf/pages/pp_cranbourne_east

Berwick Waterways Precinct Structure Plan 9, Berwick
 Cultural Heritage Management Plan #11350 • May 2014
 77

5.8.6 Terrain Units within the Activity Area

During the study undertaken by Andrew Long and Associates²⁰⁴, the South East study area was divided into terrain units for analytical purposes. The defined terrain units were developed by the CSIRO and use geological, topographical, and soil as a means of dividing the activity area into separate units²⁰⁵.

The terrain map produced by Andrew Long and Associates is reproduced (**Figure 12**). A close up of the activity area is shown (inset). The terrain unit within the current activity area is Terrain Pattern 11 Pleistocene and Holocene swamp and alluvial sediments (See **Table 5.1** - Terrain Units).

Table 5.1 - Terrain Units²⁰⁶

Terrain Pattern 11 Pleistocene and Holocene swamp and alluvial sediments			
Geology	Relief	Topography, Drainage, Distribution	Soils
<i>Pleistocene and Holocene</i> Swamp and fluvial sediments.	≤5m	Flat terrain slightly higher than Terrain Pattern10 – drained swampland and alluvial plains at the northern margins of the Cardinia and Koo Wee Rup swamps. Remnant stream course segments. <i>Broad zone north of Terrain Pattern10 and south of Pakenham. Extends into valleys in Terrain Pattern1 (hills).</i>	Uniform deep red-brown or grey silty clay.

²⁰⁴ 2010 Volume 5

²⁰⁵ Andrew Long and Associates 2010 section 8 (DRAFT P29)

²⁰⁶ Andrew Long and Associates 2010 Volume 5 Section 8.3 (DRAFT pp32-39)

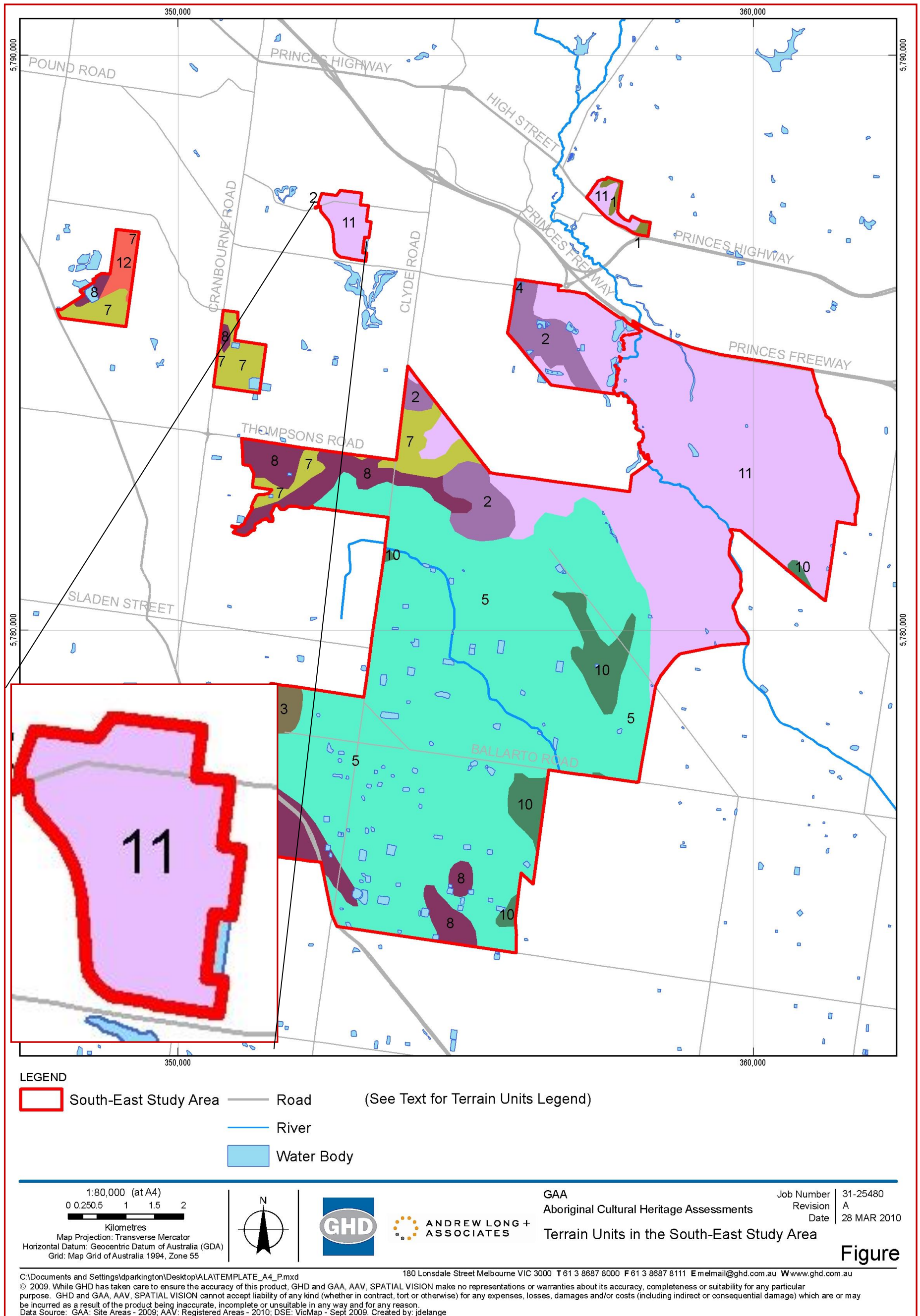


Figure 12 – Terrain units in the South-east Study Area Source: Andrew Long and Associates 2010. Volume 5 (Draft p31). Activity Area shown on inse.

5.8.7 Landforms within the activity area

The activity area comprises an open depression / floodplain landform. The land is flat, with minimal slope gradient. The hydrology of the activity area has been radically altered during the historic period. A large drain can be seen on the western and southern margins of the activity area. The drain was excavated in the mid 20th century to drain the land and divert water away.

The activity area originally comprised part of a broad poorly defined drainage line. Historical map overlays indicate that the central portion of the activity comprised a drainage line, and the remainder of the activity area comprised floodplain that was probably permanently waterlogged (refer to **Figure 13**).

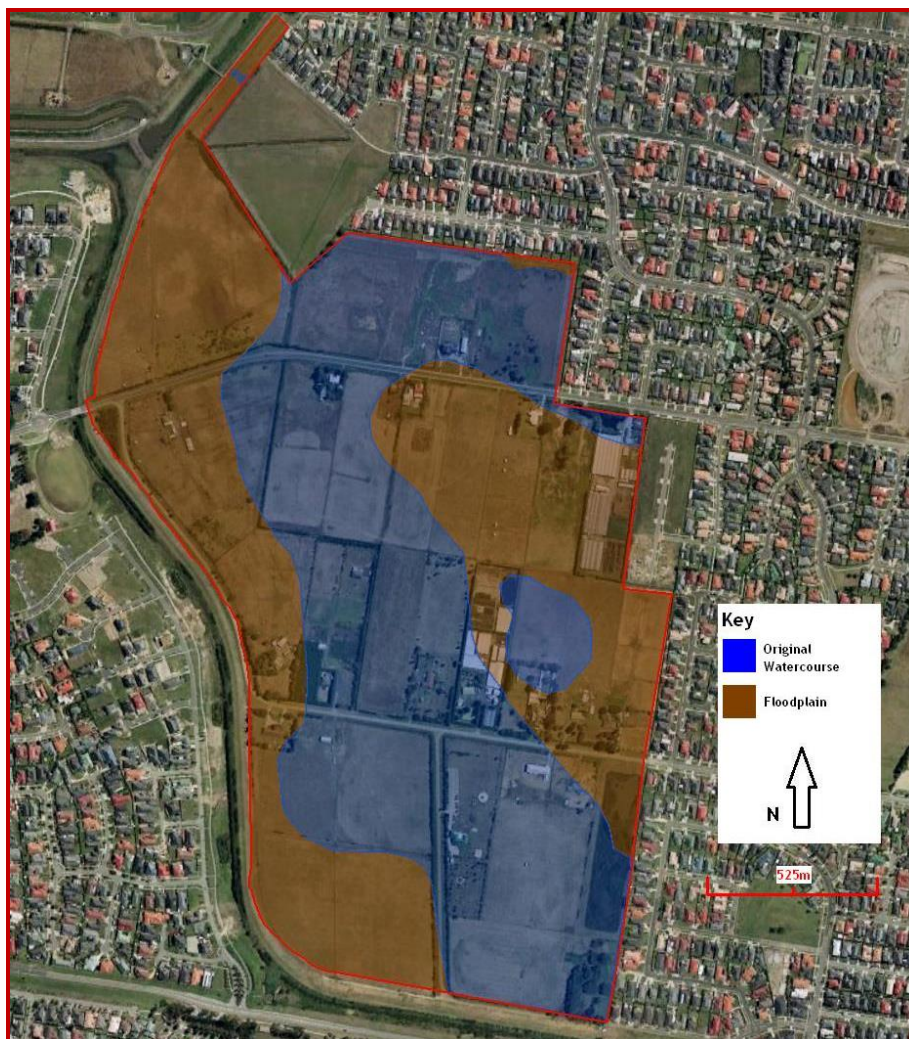


Figure 13 – Landforms in the activity area.

5.9 Landuse History

5.9.1 Land History Use History in the South East Region

Andrew Long and Associates²⁰⁷ completed a detailed land use history for the South East Region. The following is a brief summary of the findings for the region:

The majority of the South East study area currently consists of undeveloped rural landholdings. Early pioneers to the region (pre 1860) settled along the fringes of Koo Wee Rup Swamp (which was largely impenetrable due to thick scrub). The Lands Acts of the mid - late 19th century resulted in the establishment of smaller landholdings and compulsory improvements such as construction of dwellings, fencing, and drainage. During the latter part of the 19th century the construction of roads, vegetation clearance and drainage works further opened up agricultural land and potential, providing wealth for the settlers of the South East region.

Government funded swamp reclamation commenced in the 1870s, and the 'main drain' was established from the Bunyip River across the Koo Wee Rup swamp to exit at Western Port. Several smaller drains were constructed to feed into the main drain. Enlargements and other alterations to the drainage scheme occurred regularly throughout the 20th century, until the 1960s.

Establishment of the railway in the South East region resulted in an increase in population growth as well as growth in primary and secondary industry. Major industries in the SE included market gardening, dairy farming and dairying, clay and sand extraction (for brickmaking), orcharding, small scale industrialization (goods manufacture), timber extraction and sawmilling and horse studs.

The South East region was largely agricultural, and intensity increased with the Soldier Settlement Schemes, which were active in the region. Immigration after WW2 resulted in further subdivision and growth within the region. Agricultural focus was to small residential properties and resulted in a rise in the market garden industry.

²⁰⁷ *Andrew Long and Associates 2010 Volume 5 Section 10 (Draft PP49-58)*

The South East region has been a subject to significant expansion surrounding towns and suburbs. Infrastructure improvements have resulted in population growth.

5.9.2 Landuse disturbance within the activity area

The current activity area comprises 25 individual allotments which were originally part of the former Garem Gam Run. The lots were created as part of the soldier settlement scheme post-World War 2, which also included excavation of channels to drain water off the former swamp. A 1960 aerial photograph of the activity area shows the land subdivided and entirely cleared (refer to **Figure 14**).

The small allotments are currently used for a variety of agricultural, commercial and rural-residential purposes. Activities currently being conducted within the activity area include cultivation, market gardening, grazing, residential uses, light commercial uses and agistment.

Our analysis of current and historical aerial photographs of the activity area was used to identify various levels of disturbance. The levels of assessed prior disturbance are listed below and shown on **Figure 15** as:

- Clearing of native vegetation across the majority of the activity area;
- Repeated ploughing in areas of crop production;
- Construction of fences; roads, driveways and tracks providing access to and within the various properties;
- Major Modification of drainage (excavation of Berwick Town Drain) and Minor channeling works for drainage control (within each individual property); and
- Construction of house and farm building complexes throughout the activity area.



Figure 14 – Activity Area outlined red on Historic Aerial Photography Melbourne Metropolitan Project 1960.



Figure 15 - Plan of the study area showing areas of high disturbance in green, caused by cut and fill, building platforms and dams. The orange rectangles show the location and arrangement of former market garden beds. A series of tracks/path are located crossing the study area between the field. Basemap Source: Google Earth Pro 2010.

5.10 Andrew Long & Associates Terrain Profile Modelling

Andrew Long and Associates created a predictive model for the South East region (**Figure 16**). The model is based on six criteria which were given various weightings according to statistical analysis of previously recorded sites within the region, combined with “specialist opinion” weightings for each category. The six attributes include: terrain pattern, geology, EVC 1750, Elevation and proximity to water. The categories selected were considered to have a bearing on the pattern Aboriginal occupation and use in the study area in the past. Each attribute weighting is discussed in detail as part of the report prepared by Andrew Long and Associates²⁰⁸.

In general the map (**Figure 16**) displays:

“... a pattern broadly suggesting the cultural heritage place densities along creeks, water bodies and around points of elevation, particularly the extensive sandy rises in the Clyde-Cranbourne area, with comparative lower densities across broader, flatter plains remote from water bodies...”²⁰⁹

Andrew Long and Associates point out some “inherent weaknesses” in their model due mainly to small sample biases²¹⁰. They also caution that the model is a “draft preliminary character map based on a statistical modelling exercise which does not necessarily conform precisely to reality, until it has been fully checked and tested”²¹¹.

The model does not take into account varying levels of site specific disturbance, beyond that which is considered significantly high to have removed all traces of Aboriginal cultural heritage. Further, the model does not include sufficient information to attribute disturbance as a variable limiting factor affecting the preservation or significance of archaeological deposits.

²⁰⁸ *2010 Volume 5, Section 12* (Draft PP. 78-102)

²⁰⁹ *Andrew Long and Associates 2010 Volume 5* (Draft p. 98)

²¹⁰ *Andrew Long and Associates 2010 Volume 5* (Draft p. 97)

²¹¹ *Andrew Long and Associates 2010 Volume 5* (Draft p. 98)

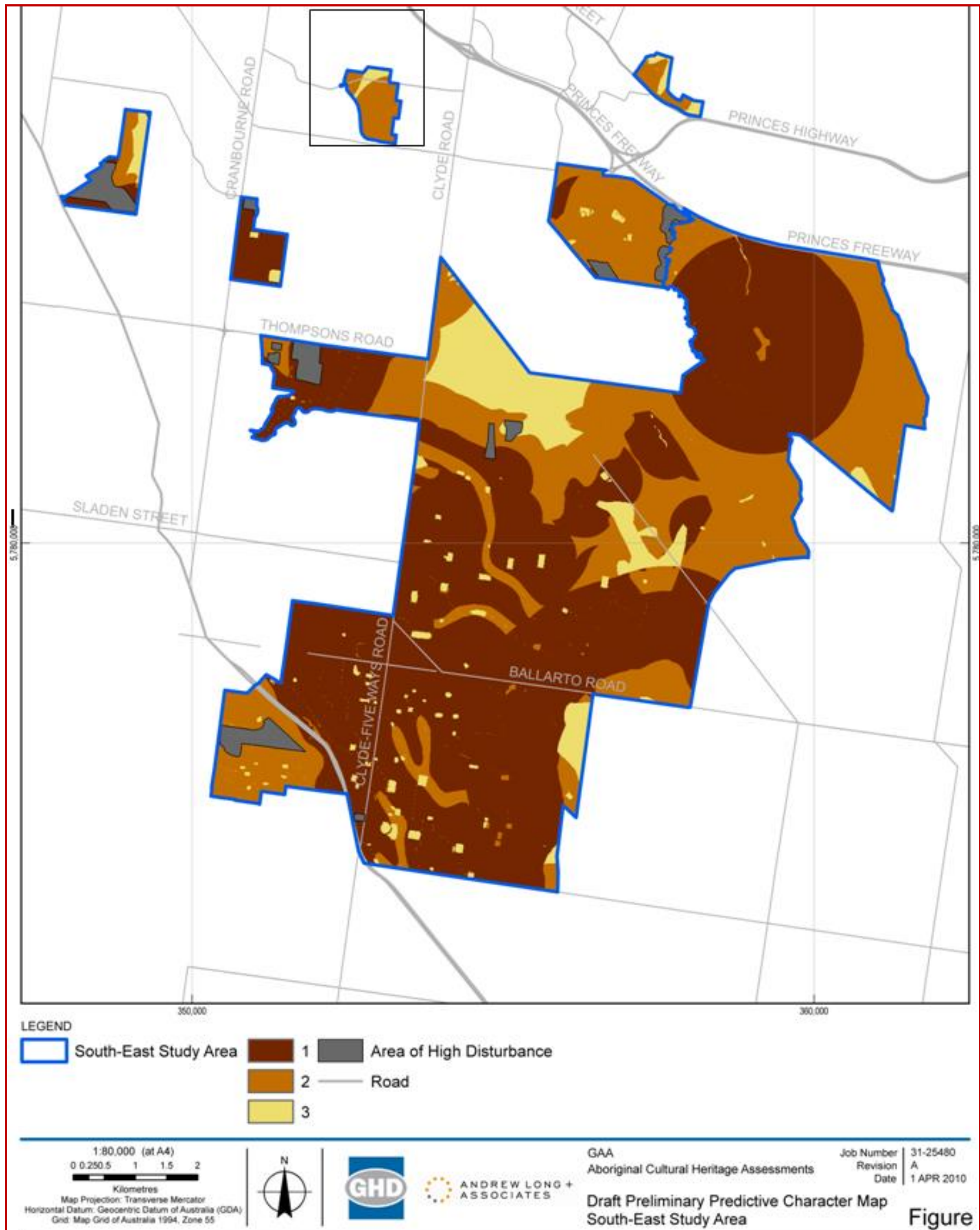


Figure 16 – Preliminary character map of South-east Study Area indicating disturbed areas and predicted 'Zones of Likelihood' – 1 being the highest. the current Activity Area is shown in inset at the top of the map.

The predictive model comprises three zones of differing 'likelihood'. The following are descriptions of these three 'character zones':

Zone 1 – High Likelihood of Cultural Places.²¹²

These areas correlate with the highest densities of registered Aboriginal cultural places, including places of high scientific and cultural significance.

The cultural heritage character consists of dense scatters of stone artefacts (including potential intact sub-surface deposits) and scarred trees (pending suitable woodland or paddock isolates), and other potential sites that are not yet represented within the Study Area, such as burials and shell middens.

In theory it was predicted that these areas contain the core Aboriginal cultural values within the Study Area, and as such careful planning and management is critical.

Areas of particular importance include the Cranbourne Sands and major waterways. Please note that several of these appear not to be well represented in this run of the model, including Cardinia Creek.

CHMPs would be required for activities proposed for this zone and as such would be subject to the greatest emphasis for site protection in accordance with Section 61a of the *Aboriginal Heritage Act* 2006. Similarly an emphasis must be placed on controlled excavation during any field investigations, with any coarser evaluation techniques (e.g. shovel test probes) and mechanical excavation kept to a minimum, as and when they are permitted in compliance with the Act.

Zone 2 - Moderate Likelihood of Cultural Places.²¹³

These areas correlate with the secondary densities of registered Aboriginal cultural places. Generally these areas would not be characterised by places of high scientific significance, however exceptions may exist.

The cultural heritage character consists of scatters of stone artefacts (generally surface deposits) and scarred trees (pending suitable woodland or paddock isolates). Although it is possible that other potential sites as yet unrepresented within the Study

²¹² *Andrew Long and Associates 2010 Volume 5* (Draft p.101)

²¹³ *Andrew Long and Associates 2010 Volume 5* (Draft p.101)

Area, such as burials and shell middens would be present, subject to special circumstances (e.g. alluvial terraces).

It was predicted that these areas would contain the supplementary Aboriginal cultural values within the Study Area, that require careful planning and management, however there is a reduced requirement for protection if adequate investigation and documentation is undertaken.

Areas of particular importance include the minor creek and wetland margins and minor elevations.

CHMPs would be required for activities proposed for this zone, however there would be a reduced emphasis on site protection in accordance with Section 61a of the *Aboriginal Heritage Act* 2006, provided systematic controlled excavation is undertaken for significant nodes. Similarly an emphasis must be placed on controlled excavation during field investigations, however the use of coarser evaluation techniques (e.g. shovel test probes) and mechanical excavation may be applied under more general circumstances, as and when they are permitted in compliance with the Act.

Zone 3 - Low likelihood of Cultural Places.²¹⁴

These areas correlate with the areas where Aboriginal cultural places are generally absent, with the exception of diffuse artefact scatters and occasional scarred trees. It is not considered that places of high scientific significance would exist in this zone, however the cultural significance of even minor finds cannot be overlooked.

Other potential sites as yet unrepresented within the Study Area, such as burials and shell middens may also be present, subject to special circumstances (e.g. localised rock outcrops and alluvial terraces), however these would be very rare.

In theory, it is predicted that these areas would contain the lesser Aboriginal cultural values within the Study Area, that require consideration through an auditing process, but with a reduced requirement to protect or document through detailed investigation.

²¹⁴ *Andrew Long and Associates 2010 Volume 5 (Draft p.102)*

The landscapes within this are relatively uniform plains and slopes at distances from major water sources, with comparatively limited landform differentiation. This can make it difficult to predict specific locations of cultural places within this landscape.

CHMPs may be undertaken for activities proposed for this zone, however it is likely that these would be limited to desktop and survey audits with limited requirement for controlled excavation, other than coarse evaluation techniques (e.g. shovel test probes) and mechanical excavation, as and when they are permitted in compliance with the Act.

5.11 Desktop Assessment Conclusions and Predictive Modelling

The desktop assessment described in the preceding chapters of this CHMP has been used to identify prevailing Aboriginal site settlement patterns within the region and in the local area surrounding Berwick Waterways. Analysis of historical aerial photographs, 19th century maps and plans and early accounts of Aboriginal settlement allowed us to identify original environmental characteristics of the area. This was useful in identifying areas of past ground disturbance that may have affected the integrity and significance of archaeological deposits. It also assisted in identifying the likely archaeological potential of the activity area.

Drawing on the desktop research and archaeological survey work, we make the following predictions:

- Higher density artefact scatters and sub-surface deposits are likely to be located on crest landforms.
- Higher density artefact scatters and sub-surface deposits are likely to be found on elevated areas adjacent to creeks or wetlands.
- The density and frequency of artefact scatters and sub-surface deposits is likely to be lower in areas that were originally wetland or inundated because these areas were unsuitable for occupation.

- The density and complexity of artefact scatters and sub-surface deposits is likely to decrease with distance from water sources.
- Scarred trees may be present within areas containing mature remnant native trees of sufficient age; and
- Isolated finds may be found anywhere across the landscape.

We used MapInfo GIS (Geographical Information System) to develop and map the predictions made regarding archaeological potential. The purpose of the predictive model is to:

- Provide the Metropolitan Planning Authority, individual landowners within the PSP and Aboriginal community stakeholders with information about areas of Aboriginal archaeological sensitivity to feed into constraints and opportunities analysis,
- Help inform early PSP planning and design work, and
- To assist in developing a methodology for undertaking archaeological test excavation.

The following is a list of variables that contribute to archaeological potential within the Berwick Waterways PSP area. The variables of crest landform, remnant vegetation and inundated areas are not included because they are not present within the Berwick Waterways PSP area. The variables are ranked in order of importance.

1. Proximity to former water sources.

Proximity to water is one of the key determinants of archaeological potential. In general, sites are larger, more complex and more frequently found in close proximity to water sources. Drainage and hydrology patterns have been significantly altered since European settlement in order to retain water in storage dams for agricultural purposes and drain waterlogged areas to open them up for grazing and cultivation. GIS-modelling combined with analysis of

topographic maps, historic aerial photos and observations during the survey have been used to determine the likely extent of wetlands and waterlogged areas that existed before European settlement. Prior watercourses are shaded blue on **Figure 13**.

2. Former Wetlands

Although there is a higher frequency and density of Aboriginal sites located adjacent to former wetlands, the density and frequency of sites within former wetlands is usually low because waterlogged areas were not suitable for sustained occupation. As discussed above, drainage and hydrology patterns have been significantly altered since European settlement in order to retain water in storage dams and drain waterlogged areas. GIS-modelling combined with analysis of topographic maps, historic aerial photos and observations during the survey indicate the entirety of the activity originally comprised wetland.

3. Areas of cut and fill disturbance

Are considered unlikely to contain Aboriginal archaeological deposits because topsoil units (ie. artefact bearing soil units) have been removed. These areas include dams and the construction of building platforms for houses and sheds. They are considered to have nil archaeological sensitivity. Disturbance relating to cut and fill is shaded red on **Figure 15**.

4. Areas of market gardening

Are considered to have a very low level of archaeological sensitivity because topsoil units have been heavily disturbed by deep ploughing, establishment of garden beds, re-grading and establishment of sub-ground watering systems. These areas may contain Aboriginal cultural deposits but they are likely to have a very low level of integrity and a very low level of scientific significance. Areas of market gardening / orcharding are marked light blue on **Figure 15**.

5. Areas of ploughing

Are considered to have a lower level of archaeological sensitivity because the top 20–30cm of topsoil has been disturbed by ploughing. These areas may contain Aboriginal cultural deposits but they are likely to have a lower level of integrity and a lower level of scientific significance. It is noted, however, that in deeper soils there is potential for more intact archaeological deposits to survive beneath the plough zone. Areas of ploughing are marked grey on **Figure 15**.

MapInfo GIS software was used to model and map the predictions about archaeological potential. This allowed us to produce maps that show areas of varying archaeological sensitivity graded from high to nil. The modelling and mapping is based on a probabilistic approach, where the two main traits (proximity to water and crest landform) were used to determine the combined level of potential. Areas of prior disturbance have reduced sensitivity based on the degree and type of prior disturbance. The model traits are as follows:

- Areas within 200m of former water = Moderate Sensitivity;
- Areas within former water = Low Sensitivity;
- Areas more than 200m from former water = Low Sensitivity;
- Cut and Fill Disturbance = Nil Sensitivity;
- Market Gardening / Orchardring Disturbance = Very Low – Nil Sensitivity; and
- Ploughing Disturbance = Reduced Sensitivity by One Level.

Figure 17 shows the results of the GIS predictive model. The figure shows areas of moderate potential (light red) grading to very low to nil potential (grey).

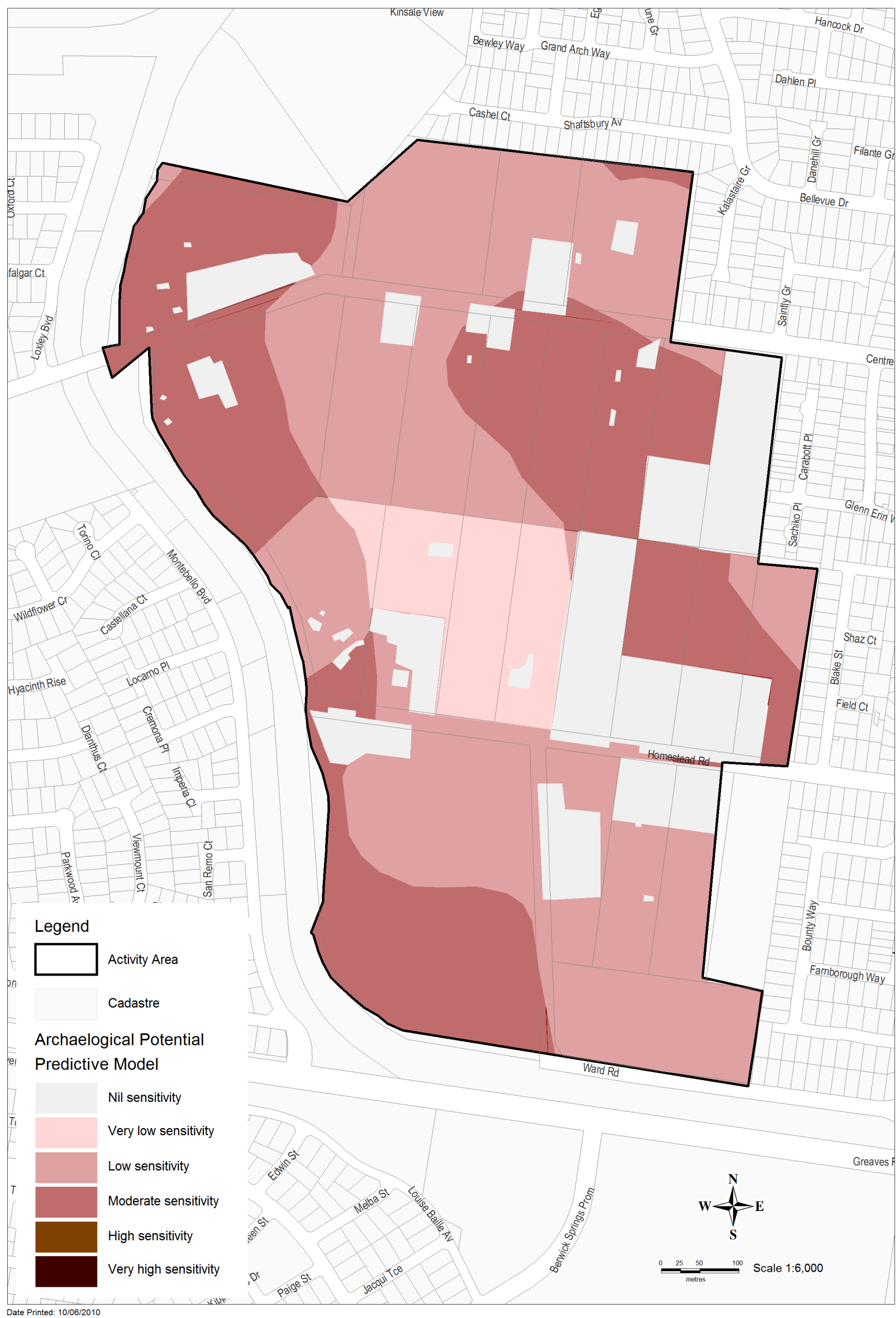


Figure 17 – GIS preliminary sensitivity plan and predictive model revised as a result of AHMS additional desktop research.

6 STANDARD ASSESSMENT (SURVEY)

6.1 Survey Details

An initial survey site inspection was carried out by Jim Wheeler and Jared Brindley on 2nd June 2010 to assess whether or not the activity area had been subject to significant ground disturbance and whether or not a CHMP was required.

Representatives of the Wurundjeri Tribe Land and Compensation Cultural Heritage Council (WTLC&CHC), Bunurong Land Council and Boonwurrung Foundation were invited to participate in the survey. Mick Farnham and Mark Gardiner of the Bunurong Aboriginal Land Council and Wurundjeri Tribe Land & Compensation Cultural Heritage Council attended the site inspection.

The principal aim of the survey was to identify exposed cultural material (i.e. surface sites) and areas of disturbance. These results and observations were used to identify any potential archaeological deposits (i.e. areas that are 'likely' to contain Aboriginal sites or objects). They were also used to assess the extent to which past land-uses may have affected natural soil profiles.

Finally, the survey results and observations were used to assist in development of an excavation methodology for complex assessment.

The following sections detail the results of the survey.

6.2 Survey Methodology

The archaeological site inspection and survey was designed to sample the range of landforms and soil landscape types within the activity area.

The standard assessment involved a three stage approach:

Stage 1 - An analysis of topographic maps and aerial photographs of the study area was undertaken prior to the survey to identify landforms across the activity area and

to identify areas of ground surface exposure in the form of tracks, unsealed roads, dams, cuttings and areas of ground exposure (i.e. erosion scours). These areas were targeted during the survey because they provided an opportunity to identify surface artefact scatters and to investigate exposed soil profiles.

Stage 2 - The first step we took during the inspection was to drive around the property to familiarise ourselves with the landscape and identify mature/old growth native trees and areas of ground surface visibility. This assisted in scoping out our approach to survey.

Stage 3 - Following the initial scoping work surveying was conducted on foot within the properties that had agreed to allow access for our team (the accessible properties are shown on **Figure 18**). The team walked in transects with a spacing of 5 metres between each team member.

The survey used the information obtained from analysis of aerial photographs and topographic maps (Stage 1), as well as the initial scoping work (Stage 2), to survey areas of ground surface visibility (to identify surface artefact scatters) and mature/old growth trees (to identify scarred trees). Areas of erosion and ground exposure were examined for archaeological evidence such as stone artefacts, charcoal and shell. Ground surfaces and cuttings were also examined to determine the degree of soil disturbance, erosion and potential for archaeological deposits below current ground. Mature trees were examined for evidence of scarring, axe marks and/or old footholds.



Figure 18 – Properties that granted access during survey work.

6.3 Survey Coverage

The survey team aimed to cover the entire activity area excluding areas with standing structures, concrete pavement, piles of debris or spoil, and drainage channels. Not all properties were surveyed as permission to access was not granted by some owners. Survey coverage is shown on **Figure 18**. Coverage is shown on **Figure 19**.



Figure 19 – Survey coverage on accessed properties.

6.4 Survey Results

No Aboriginal archaeological sites were located during the survey. The effectiveness of the survey was hampered by very low ground surface visibility (estimated at < 5 % effective visibility) and due to dense paddock grass cover, residential structures (driveways, garage, sheds and stables), scattered building debris and rubbish. Minimal areas of soil exposure were located within paddocks on trodden ground or close to trees, gates and fences frequented by animals or vehicles.

The survey confirmed the activity area comprises cleared land located on an open depression landform. The land is flat with virtually no slope gradient (DGPS data indicates trench levels across the activity area vary from 17.8-18.3m AHD). This lack of variation in levels combined with clear evidence in the desktop assessment that a broad drainage line originally crossed the activity area indicates that the entire activity area likely comprised swampy waterlogged ground prior to drainage modifications during the mid 20th century that drained off and diverted water away from the land.

Small weather board and brick residences occupy most of the surveyed properties. Other observed buildings include garages, sheds and stables for horses. Concrete, gravel and vehicle-worn driveways and tracks provide access to the properties and in to the grassy paddocks at the rear of the properties.

It was concluded the activity area had very low archaeological potential and is unlikely to contain Aboriginal cultural heritage primarily because the land was located within a former swamp but also due to the levels of prior ground disturbance that have disturbed soils across portions of the activity area. Therefore, we concluded that the activity area was unlikely to contain Aboriginal cultural heritage.

6.5 Disturbance within the Activity Area

A range of prior land use disturbances were identified during the survey. Properties 5, 3, 14 and 27 contained large platforms of fill and/or spoil deposits (**Figure 21**). It appears these large platforms of fill are associated with land fill activities and also probably in part to elevate land above flood / waterlogging levels.

Deep drainage ditches have been cut beside the main roads (**Figure 22**) and very shallow ditches also provide drainage with the paddocks. A large embankment runs parallel to the Berwick drain to the west and south of the activity area. This drain provides a boundary between housing estates on the higher ground overlooking the low laying floodplain of the activity area.

The following specific disturbances to the soil profile were observed during the survey (these are shown on **Figure 20**):

- Construction of residential houses, sheds, garages and stables;
- Concrete and gravel driveway access to properties and worn tracks within paddock enclosures;
- Installation of fences and gates;
- Spoil heaps of soil (possibly introduced) and discarded rubbish or building debris;
- Cutting of deep drainage ditches running parallel to Centre Road and Homestead Road, and within individual paddocks;
- An embankment (levy) along the Berwick drainage channel running to the west and south;
- Plantings of European (introduced) vegetation (e.g. Cyprus pine) and growth of introduced paddock weeds (e.g. Scottish thistle, blackberry);

- Cultivation of paddock grasses for stock grazing;
- Ploughing and raising of the landscape for market garden; and
- Native vegetation removal across the activity area since European occupation.

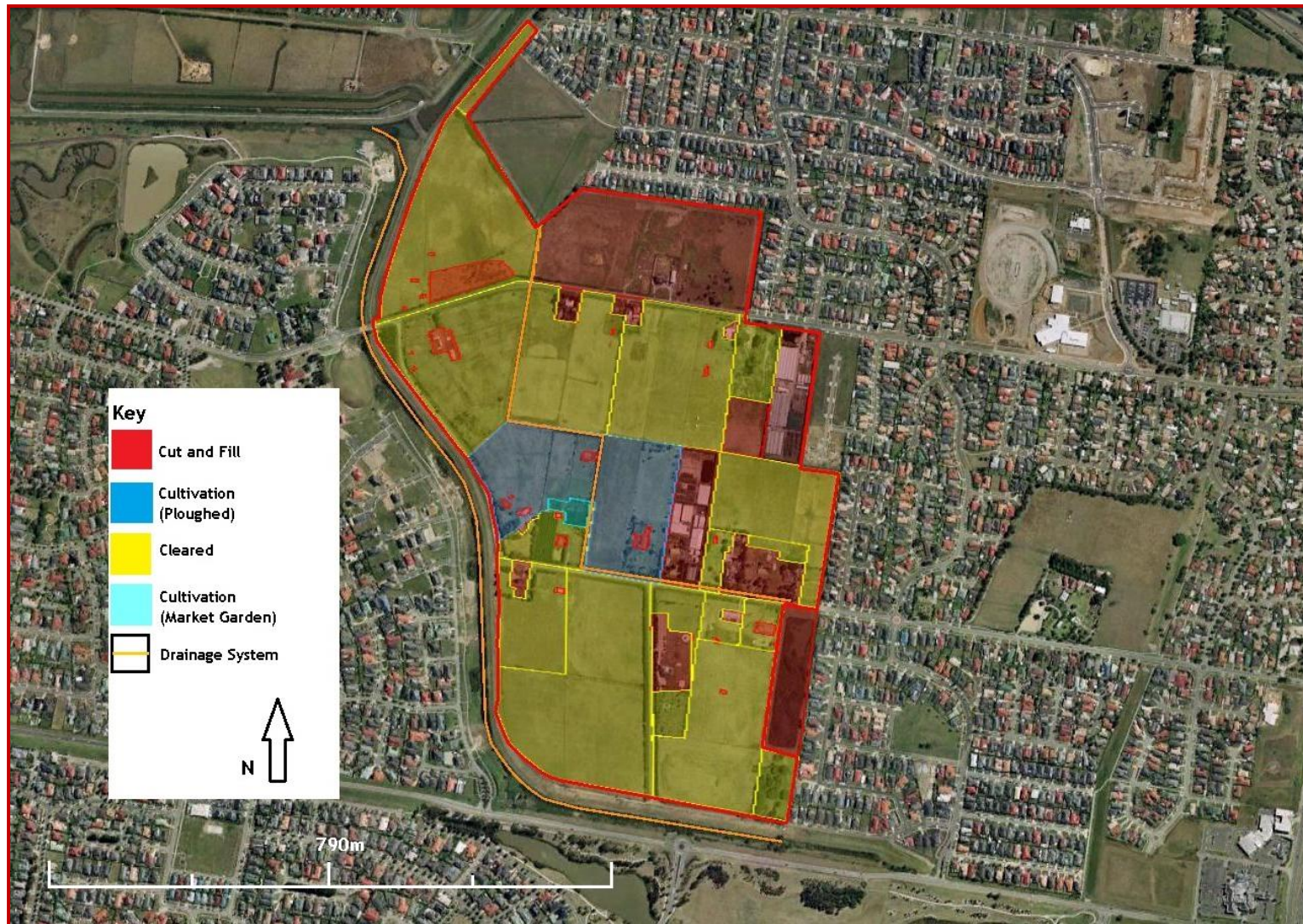


Figure 20 – Disturbance mapping drawing on desktop assessment analysis and the results of site survey work.



Figure 21 – Fill platform and recently deposited spoil.



Figure 22 – Deep drainage ditch running parallel to Centre Road near property No. 9.

6.6 Survey Conclusions

The entire activity area comprises open depression landform that originally formed part of a significant swamp system. After the land was drained, cleared and subdivided as part of soldier settlement post-world war two the activity area has been used for a variety of agricultural, rural-residential and light commercial activities. These activities have resulted in the varying levels of disturbance across the activity area.

No artefacts were found during the survey. As discussed in the desktop assessment, local and regional settlement modeling indicates that former swamps and permanently waterlogged land has a low level of archaeological potential because it was unsuitable for occupation. Previous archaeological investigations in the region bear out this pattern – artefacts and cultural deposits are seldom found in former swamps. Whilst Aboriginal cultural deposits are frequently discovered on floodplains and on the fringes of former swamps, they are very seldom found on open depression landforms. For these reasons, we conclude that the activity area is unlikely to contain Aboriginal cultural heritage.

In consultation with the Wurundjeri Tribe Land and Compensation Cultural Heritage Council (WTLC&CHC), Bunurong Land Council and Boonwurrung Foundation we decided that a small programme of test excavation should be undertaken to confirm the presence of former swamp and gauge the depth and integrity of soil profiles to confirm that the activity area is indeed ‘unlikely’ to contain Aboriginal Cultural Heritage.

The results of the test excavation are included in the Complex Assessment (**Section 7**).

6.7 Cultural Values Mapping

6.7.1 Methodology and Approach

This section of the management plan provides a summary of the cultural values mapping report prepared by Context Pty Ltd for the south-east growth area precincts in 2010²¹⁵. The work was undertaken by Chris Johnston and Shannon Nicolson, with assistance from Ian Travers and Leo Martin. Elders and representatives consulted included Dianne Kerr, Bill Nicholson, Ringo Terrick, Eddie Ockwell, Darren Griffin (Manager – Cultural Heritage), Megan Goulding (CEO), Alex Parmington (Cultural Heritage Advisor) and Kristal Buckley (Country Plan project officer) of the Wurundjeri Tribe Land Compensation & Cultural Heritage Council and Steve Compton and Darren Symmington of the Bunurong Land Council Aboriginal Corporation.

The approach used for the cultural values mapping focused on engagement with traditional owner groups with an interest in the South East Growth Corridor to:

- 1 - Agree on an approach to identifying cultural values
- 2 - Discuss the nature of cultural values
- 3 - Visit each of the three precincts
- 4 - Review and refine the outcomes of the field visits
- 5 - Consider these results in relation to looking after defined Aboriginal cultural values.

The three traditional owner groups with acknowledged connections to the South East Growth Corridor were invited to participate:

- Wurundjeri Tribe Land Compensation & Cultural Heritage Council – representing Woiwurrung people (referred to as Wurundjeri representatives in the text)

²¹⁵ Context 2010

- Boon Wurrung Foundation – representing Boon wurrung people (no text references)
- Bunurong Land Council Aboriginal Corporation - representing Boon wurrung people (referred to as Bunurong representatives in the text).

Two of the three groups were able to participate, but Boon Wurrung Foundation was not able to do so as Elder Carolyn Briggs was interstate and overseas during the study period, and was not able to be contacted. Appendix 1 of the Context Pty Ltd report contains details of these consultations.

The approach adopted was to recognise two broad ways in which the cultural values of the landscape might be recognised:

By seeing and interpreting the landscape:

- recognising the opportunities inherent in the landscape – potential living areas, travel routes, resource gathering places (etc)
- recognising parts of the landscape as associated with past uses and activities
- recognising the cultural values of natural resources, including totemic values.

Through knowledge of the landscape

- from traditional knowledge and stories (where traditional knowledge means knowledge passed down from forebears/predecessors)
- from contemporary experience including recent opportunities to be on country for reasons including cultural heritage surveys.

In practice, the project entailed meetings and field visits with elders, key knowledge holders and representatives. There was an initial meeting with Bunurong on the 16/7/2010, followed by a field visit on 6/9/2010 and finally a review meeting on 20/9/2010. There was an initial meeting with Wurundjeri on 27/7/2010, followed by a field visit on 9/8/2010 and a review meeting on 21/9/2010

6.7.2 Previous Work

Andrew Long & Associates (ALA) undertook a strategic regional desktop assessment of the South East Growth Corridor for the Growth Areas Authority in 2010.²¹⁶ This work was intended to set the scene for more detailed precinct assessments. The ALA project did not specifically define the term ‘cultural values’, nor did it include an assessment of these cultural values. This work was identified as still remaining to be undertaken.

This gap in the regional assessment has been recognised by traditional owner groups and by GAA and was incorporated into the scope of work for the south-east growth areas CHMP projects.

Nevertheless, the ALA project did highlight that the landscape of the South East Study area could be significant to Aboriginal people for all of the following reasons and should therefore be the subject of continuing consultation with the Aboriginal community organisations involved in the South-east Study Area.

Aboriginal people emphasise that the entire landscape within their country is of cultural value – the ancient and recent landforms, flora and fauna, watercourses.

The Aboriginal organisations in the South-east Study Area have worked in the field on cultural heritage projects and know specific areas very well. Other areas are less well known – especially where few surveys have been done - but are still part of their country and highly valued.

Beyond this all-encompassing view of ‘country’, the following landscape characteristics have substantial cultural value:

Waterways & wetlands – in addition to the high potential for the occurrence of archaeological sites, these elements are themselves culturally significant. Fords and fish traps in the creeks can make the watercourses significant, as well as the associated stories and archaeological sites near to water. In the South-east Study

²¹⁶ *Andrew Long & Associates, 2010 Growth Areas Authority Report for Strategic Approach to Aboriginal heritage management for Melbourne's Growth Areas (5 volumes).*

Area, significant waterways include Cardinia and Toomuc Creeks. The close proximity of the Study Area to the massive Koo-Wee-Rup Swamp (and Carrum Swamp further to the south) also lends interest and potential cultural values.

Areas of natural habitat, including wildlife corridors are likely to have high archaeological potential, but are also expected to be of high cultural value generally. Flora and fauna have cultural value as traditional and contemporary sources of food, charcoal, sap/eucalyptus gum, medicines, clothing, baskets/tools, artistic expression, stories, spiritual beliefs and totems. Continuing health of habitat, and access to nature and its resources are important management issues.

Areas of habitat of specific plant and animal species, such as totem species, eels, witchetty grubs, swans, various birds and marsupials, old man weed, yam daisy, basket making reeds, bracken and tree ferns, some types of wattles, various endangered species (growling grass frog, striped legless lizard, Golden Sun moth).

Known archaeological/cultural sites are very important, and in some cases, the surroundings and corridors of access and use associated with such sites need to be considered (such as ceremonial sites or burials).

Old trees – some with scars or toe holes – are highly valued, especially now that development and drought have reduced their numbers. Birthing trees are known in some areas and culturally important.

Burial places – ancient and contemporary – are of immense importance to all Aboriginal people.

Ceremonial sites and gathering places known from traditional, historical and contemporary times. For example, the Bunurong Land Council highly value the locations of meteor craters within and near to the Study Area, and there are recorded instances of Bunurong ceremonies at some of these locations during the period of early contact with Europeans. There is concern that the AAV Register of Aboriginal Places, including literature references is often overlooked when considering the documentation of known cultural places.

Tracks and routes are important elements and are often reflected in modern day roads and routes (some of these recorded in the historical literature are noted in section 10 of this report)

Stone sources for the manufacture of stone artefacts of different kinds; ochre is another culturally important natural resource.

Hills and high points within the volcanic landscape – while these areas may or may not have high potential for archaeological sites, many of them are important story places, landmarks, lookouts, boundary markers (and so on).

Places of post-contact and contemporary importance/history – including features or places given Indigenous names in contemporary or historical times, favoured camping and recreation sites, and places where the Aboriginal people have held important gatherings or made significant achievements. For example, the Dandenong Police Paddocks is a very important historical and cultural place for the Wurundjeri people, located to the north west of the Study Area. The presence of Aboriginal people within commonly described historical themes is also a gap which could be addressed through further cooperative research projects. Unfortunately, map-based recognition of places of historical and contemporary Aboriginal social value would require cultural mapping processes which are not possible within the current project.²¹⁷

6.7.3 Wider Values

Background

The South East Growth Corridor includes the traditional country of Woiwurrung and Boon wurrung people. The Cultural Values Mapping was not concerned with establishing traditional boundaries and noted all three groups consulted have sought to be a Registered Aboriginal Party under the *Aboriginal Heritage Act* 2006 for the precincts considered in this project. The project therefore sought to understand the

²¹⁷ *Ibid*, pp. 54-55.

cultural values attributed to the wider landscape and the specific precincts by Aboriginal representatives of these two peoples.

There is considerable knowledge about the culture and lives of both Woiwurrung and Boon wurrung peoples both prior to and following colonisation of their lands by Europeans. Some of that knowledge is ancient, having been passed down orally from generation to generation. An often cited example is the knowledge of the flooding of Port Phillip Bay and the position of the former river alignment that was documented through the oral testimony of Boon wurrung Arweet (head man) 'Old Benbow' to a select Committee of the Legislative Council in 1858. Other knowledge is recent, having come through research, through archaeological survey and monitoring. All knowledge is of value in trying to bring Aboriginal cultural values into the precinct planning process.

Both Woiwurrung and Boon wurrung people have traditional and continuing, contemporary connections with this landscape and the Berwick Waterways PSP. And they have a wealth of knowledge, some of which has been able to be shared and recorded within the scope of the present project. Information held by Woiwurrung and Boon wurrung people and shared during this project remains in their ownership.

The Aboriginal ethnohistory for the three precincts has been prepared from historical sources by AHMS and provided a valuable overview and background.

The landscape

Wurundjeri perspectives

For Wurundjeri representatives, their traditional country is a place to which they feel both connection and responsibility.

The loss of knowledge and connection resulting from colonial occupation and settlement is felt deeply. The increasing recognition of the prior ownership and non-relinquishment of their traditional country is a very tangible demonstration that Aboriginal people have come through very hard times, have returned to country and

are now able to stand up and speak for their land. This is an important responsibility that comes with being a traditional owner.

For those Wurundjeri representatives who have been able to spend time on country in recent years doing site survey and other work (such as revegetation), this process is helping reconnect to the land. It is also enabling them to piece together this evidence to build a picture of how people lived in and used this landscape; creating this larger picture is regarded as very important.

The interruption of 200 years of colonisation sadly has displaced us from our land. We are just starting to find our way home again. The site surveys are starting to get us back onto and in touch with our lands. Its like being reintroduced again to a long lost family member.

There is a deeply felt connection to places where the land still retains evidence of past Indigenous people's lives: for example, those parts of the landscape where the land form, vegetation and animals remain relatively unchanged.

This countryside was traversed by Boon wurrung and Wurundjeri people for thousands of years and used by Wurundjeri for thousands of years in a continual fashion, we know this by all the artefacts we find everywhere...we are of the same blood, still walk the land, still value, still custodians to the earth....

Sites and artefacts are important evidence that Aboriginal people were there and were 'everywhere'.

The cultural values appreciated by Wurundjeri people are embodied in the land itself: in the materials available to make artefacts, in the waterways that sustain people, animals as totems, spiritually and in many other ways.

Values exist in everything we used in the landscape and in those things that remain .

There is some scepticism about what has been written down in the past about Aboriginal people, while on the other hand recognising that some documents contain

important information including information that can help rebuilt and secure cultural understandings for present and future generations.

Responding to the idea of reading the landscape, it was seen that this is a useful way to understand the larger picture. As well, it respects the knowledge that Aboriginal people have – whether this knowledge has been passed down or is knowledge they are gaining from recent experiences while working in the landscape. Aboriginal people are highly focused on understanding how people lived in the landscape, and their readings of the landscape may offer the best opportunities to gain an ‘insider’s view’.

Bunurong perspectives

Bunurong Land Council has assembled a substantial body of material into a report that accompanied a Bunurong boundary map, and this report was been made available to Context. This material is understood to have accompanied their RAP application. The report draws on a wide range of sources, focusing on material that presents the direct testimony of Boon wurrung and Woiewurrung speakers, much of it as recorded by Robinson or Thomas.

Bunurong representatives advise that the Mayune Bulluk clan’s country included the areas around Pakenham and the surrounds of the Koo Wee Rup Swamp. Their travel routes from the coast (Westernport Bay) inland to the foothills included Cardinia Creek, and these are well documented in early European accounts, and a number of routes were mapped by Thomas. Many of these tracks became the routes used by Europeans and have become formalised as road easements through the process of land survey. There are at least 3 traditional routes that cross this area: the track along Cardinia Creek (PSP 11) which concludes at the Koo Wee Rup swamp, the generally east-west track to Gippsland at the north end of PSP 11 (generally on the alignment the former Gippsland Road, now Princes Highway/Freeway), and a track

down along Pound Road and down to Tooradin (this being in part along the course of the Eumemmering Creek).²¹⁸

The landscape across this region contains important places associated with resources, ceremony, movement patterns, creation (etc).

There is no one special spot ... there are many ... Tooradin, Cardinia Creek, meteorite sites, stone sources in the nearby foothills, down to the Cranbourne sands ... Aboriginal people knew the significance of the land and the changes within the landscape.

Opportunities to see, understand and reconnect the elements of the landscape – and therefore how people lived here - are important to Bunurong representatives.

Bunurong people want to see the site that their people left over thousands of years and want to still be able to see the links from the site to the creek....

There is an important creation story that extends across this landscape, from the Cranbourne sand country (korri warrick) up to the foothills near the present Cardinia Reservoir, down along Cardinia Creek and out to Western Port Bay. In summary the story is:

Karkarkrook (Bunjil's wife) was out digging for yams in the sandy country (ie Cranbourne sands). Her digging stick struck a hard rock and fire shot out into the sky (this is linked to the meteorite shower that fell across a wide sweep of country from Pearcedale to Clyde North, with the meteorites said to have originated in the Pleiades star cluster). The fire escaped and burnt across a wide sweep of country, and the land went dark. The crow Waa, stole the fire and took it to a large lake (near the present location of Cardinia Reservoir) and made a fire and was cooking meat. Everyone complained to Bunjil because Waa had the fire while everyone else was in the dark and hungry. Bunjil offered two helpers – the black shouldered kite and the crimson rosella – and they went up to get the fire from Waa. One tackled Waa (the

²¹⁸ Hilary Sullivan *An archaeological survey of the Mornington Peninsula, Victoria. VAS Occasional Report Series No. 6, August 1981. This report shows the routes to the south as routes 1 and 4.*

black shouldered kite – hence its markings) *while the other stole the fire back* (hence the crimson colour gained from the fire) *and gave it to the people. During the fight to regain the fire from Waa, Too-roo-dun who was camped at the big lake with her children, decided to get away from the noise. She headed southwards, creating Cardinia Creek* (Tooradin is named after her and is the place where she is said to dwell). *Her children went up and over the range and formed a series of creeks including Toomuc Creek, Ararat Creek, Gum Scrub Creek* (which all drain into Westernport Bay).²¹⁹

Elements of this story have been recorded by Aldo Massola in *Bunjil's Cave: Myths, Legends and Superstitions of the Aborigines of South-East Australia* (Lansdowne Press, 1968).²²⁰

Some of the elements across the wider landscape that are known to and understood by Boon wurrung people were highlighted by Bunurong representatives and include: Tooradin, Koo Wee Rup Swamp, Mt Corranwarrabul/Mt Dandenong, the extensive springs throughout the area, the Cranbourne sands as a rich and productive landscape, the clan boundaries between Mayune balluk and Yallock balluck. The creation stories of these places are known and a number of ceremonial locations as well (for example a site associated with the meteorite shower, another in the Clematis area).

The seasonal movements of people to the coast and to the hills was an important part of traditional life and reflected a deep knowledge of the country and its seasonal abundance and climate. Winter camps were in the protection of the foothills where certain resources were abundant, and summer camps were close to the coast, again taking advantage of the seasonal abundance of resources.

Land dictates resources available – wattle falling, crays are crawling...

²¹⁹ Story as recounted by Steve Compton to Chris Johnston, 18/11/2010.

²²⁰ Massola, Aldo *Bunjil's Cave: Myths, Legends and Superstitions of the Aborigines of South-East Australia*, Lansdowne Press, 1968. Bunurong representatives advise that Massola records some elements of this story but does not bring all the elements together.

Uncle Merv told me once ... before you'd skin a possum, uncle would throw a rope up the tallest tree and attach the possum, pull it right up where no flies would get to it. When you want your food you go and find where you left it. Put it into the water and eat it.

Movement between these areas would have been via a variety of footways. Thomas recorded a number of tracks, and it is important to realise that the specific route would have depended on a number of cultural and environmental factors. Likewise camping locations on such a journey would have varied, with people coming back to places time and time again. The location of Eden Rise shopping centre, to the west of Berwick Waterways PSP, contained a lot of artefacts, a hearth and 'blackfellow's bread', a type of edible underground fungi probably *Polyporus mylittae*.

Cardinia Creek is a very significant feature in the landscape, and has been important to Aboriginal people for a long time. The alignment of the creek will have varied over the millennia and it is important not to just focus on the alignment of the creek today, but to appreciate the landscape through which it has and is flowing. Cardinia Creek is also important as a boundary between two Boon Wurrung clans.

There were a number of crossing points on the creek: the Princes Highway is located on one such point. Bunurong representatives described there being specific wet weather crossings dry weather crossing points. The Bunurong representatives indicated the creek would have had a number of different names, with each reach of the creek having a distinctive character and name. Two bottlenecks on the creek and associated large waterhole were noted at the initial meeting and can be seen on the c1850s land subdivision plan.²²¹

The scale of the stone tool site identified on Cardinia Creek to the immediate north of the nearby Minta Farm PSP indicated to the Bunurong representatives that Aboriginal people would have spent extended period of time in this locality, and the finding of a miniature stone axe head indicates the presence of children and families to the Bunurong representatives. The area along the creek is resource-rich and people

²²¹ *Op. cit. PROV Unit 5404 Roll 25 Dandenong Cranbourne etc.*

could have stayed for extended periods, undertaking ceremony, visiting sacred sites in the nearby hills, making stone tools and using them to make hunting weapons and other objects from blackwood and other timbers.

There is a number of creation or dreaming stories that relate to the area including the creation of Cardinia Creek and Tooradin swamp for example. To the north in the foothills there is a story of a 'bat-like creature' with bat wings and clawed feet. Bunurong representatives advise that frightening creatures are often evoked to stop women and children going into country that contains sacred sites that are forbidden or dangerous for them. They believe that there are sacred sites within the foothills immediately to the north of the Princes Highway. They also understand that there are significant sacred sites associated with the creation story of the creek from here down to Westernport Bay and Tooradin Swamp.

Bunurong representatives appreciate that elements within the landscape are links to creation events: the basalts are linked to Bunjil, the granites to Lowhan, sandstones with Karkarkrook. They feel connections to important and powerful birds such as the wedge-tailed eagles, powerful owls, mopokes.

Bunurong representatives also see the landscape as peopled. They speak of relationships between adjoining clans and tribes and the protocols required for access. For example, they spoke of Seven Acre Rock as the place where Taungurung people wanting to come over to Bunurong country would go with Wurundjeri people, and there they would light a fire and wait for Bunurong people to come and take them down the right way. Seven Acre Rock is large granitic rocky outcrop, 600 m altitude and located south of Powelltown (in the catchment of the Little Yarra River), which provides extensive views over the Yarra State Forest, the Bunyip River Valley, and the Bunyip State Park.

6.7.4 Berwick Waterways PSP

Background

Several historical plans were of interest to Aboriginal representatives:

- The undated (c1841) Thomas plan²²² showing pastoral leases, travel routes and place names
- A parish plan showing a large swamp extending to the south and the north west and a small area to the east and the annotation to the west of 'from Dandenong' indicating a track
- A redrawing of a Thomas plan by Sullivan (1981) indicating Aboriginal travel routes.
- A Berwick parish plan²²³ showing hand-annotations of a proposed 'canal' through CA 25 and 26, presumably evidence of the drainage scheme that was latter implemented.
- A County Plan (L.5959) showed a creek line crossing through the larger swamp area and a notation of 'canal' similar to the current drainage line.

In discussion, the Wurundjeri representatives noted the annotation 'from Dandenong' indicating a track to the east crossing the original Crown Allotment (CA 26) on a SE-NW alignment and wondered about the possible origin of this track as an Aboriginal travel route, given that a similar route is indicated by Sullivan and is also shown to extend through PSP 11 to the east of Berwick Waterways. This track alignment appears to be outside the present PSP boundary.

²²² Copy provided by AHMS sourced from Historical Records of Victoria Vol 2b, with the original source being PROV VPRS 10 Inward registered Correspondence to the Superintendent of Port Phillip District, relating to Aboriginal Affairs map accompanying letter of 29 January 1841.

²²³ *Berwick, County of Mornington* [cartographic material] / photo-lithographed at the Department of Lands and Survey Melbourne by T.F. McGauran by Victoria. Dept. of Crown Lands and Survey Melbourne : Dept. of Lands and Survey, 1892. Held in the National Library of Australia.

The extent of the swamp was also of interest, and Bunurong representatives noted that it formed part of Eumemmering Creek.

Two additional historical plans were located after field work had been completed. These showed the development of the study area as a Closer Settlement Scheme, the Hallam Valley Estate, occupying CA 25 and 26.²²⁴ This estate was gazetted in 1927 and the 'irrigable allotments' were made available for application.²²⁵ It is assumed that the drainage scheme was implemented immediately prior to the acquisition of the land by the Crown and its subsequent subdivision under the Closer Settlement Act.

The precinct

Wurundjeri perspectives

The precinct was first viewed from the west side, looking down from Montebello Boulevard, and then from Ward Road. We drove out via Homestead Road. We did not go onto any private properties as Wurundjeri representatives were not interested in doing this.

Bunurong perspectives

Bunurong representatives viewed the area from the west side, looking down from Montebello Boulevard. Both had been on-site previously and were familiar with it. They decided there was no need to drive around the roads within the precinct.

²²⁴ *Plan of portion of land in the Parish of Berwick, County of Mornington*, SLV 820 BJE 1873- ; *Berwick, County of Mornington*, Dept. of Crown Lands and Survey Melbourne : Dept. of Lands and Survey, with annotations up to 1975.

²²⁵ *Victorian Government Gazette* , No. 166, 30 November 1927, page 3812.

Reading the landscape

Wurundjeri perspectives

The change to the landscape by the draining of the swamp through a constructed channel was noted. Its alignment did not follow the original swamp/creek and it did not have a natural form.

...when it was a swamp it was significant to people, but since it was drained it was no longer as good of a resource for our people...wild life all gone...during the winter time all this (koo wee rup swamp) would have been all one, but in summer time it would have dried up into separate swampy sections... (E)

The higher ground to the west – Montebello Boulevard – is now completely covered with houses. Wurundjeri representatives indicated that if there were any evidence of Aboriginal people, it would have been on the higher ground above the swamps ‘up there where those houses are already developed’ (E). To see the extent of change and the loss of the landscape brought some sadness: ‘all gone now’ (E).

Bunurong perspectives

Bunurong representatives described the form of the Eumemmering Creek as a wide, slow moving body of water, confirming what can be seen from the historical plans. Much of the precinct would have been swampy, and offered important food and cultural resources. The edges of the swamps and the higher ground (for example the residential area along Montebello Boulevard) would have contained evidence of Aboriginal people.

The Eumemmering Creek marks a change in the landscape and vegetation, with the sands on one side (peppermint, messmate, yams) and the silts and clays on the other (yellow box, manna gums, wattles). The Eumemmering Creek runs through the heart of Mayune Ballock country and was a significant waterway for that clan.

Traditional knowledge

Wurundjeri perspectives

There was discussion of the nature of this area generally as a locality where there are natural springs found throughout the landscape. The Berwick Springs Estate immediately to the south for example takes its name from the local springs, and the waterways in the estate are thought to be a way of managing the extent of the spring water coming from the ground in that area.

Springs were used as a water source for Aboriginal people... purest water ... water from mother earth all year round...(R)

Where springs exist across this landscape, they are seen to represent important cultural values and are a connection to Aboriginal forebears. It was noted that there could be springs anywhere in this landscape. Springs may also have links to creation stories, and to people's travel and camping patterns.

A possible spring site was noted from a review of an aerial photograph. This site on Homestead Road has been mapped; it may warrant further investigation.

Bunurong perspectives

The importance of the Eumemmering Creek is as a major source of water running through the Mayune Balluck's clan lands. This water supported plant and animals: blackwood, swamp gum, wattle, tyabb, paperbarks and all these plants had their uses for Aboriginal people.

The swampy areas of Eumemmering Creek are also spring fed. These swamps created important food resources:

Uncle Merv said that the springs on Clyde Road used to form a lake, and thousands of swans would breed there – the swan eggs were a huge resource (D)

Ask if Boon wurrung also hunted swans, one representative said that they took the eggs only.

Another important activity here would have been catching eels, noting that Robinson had recorded the Boon wurrung methods of catching and killing eels.

Contemporary knowledge

Wurundjeri perspectives

Wurundjeri representatives did not offer any information from their own experiences on this particular area of land. Both knew this area generally, and the Berwick Springs area to the south well.

Bunurong perspectives

The cutting of the drain to channel the water away from the natural creek alignment has occurred on the western edge of the swampy land. Depending on the construction process, some of the land on the eastern and western edge of the drain may contain Aboriginal artefacts buried below a layer of spoil removed to create the drain. Representatives noted that the development of the road and housing estate had probably also impacted sites.

Cultural values in the landscape

This precinct broadly has the following identified cultural values:

- The landscape retains in its form and in the plant species present, some evidence of the former swamp / Eumemmerring Creek. The landscape has been substantially modified.
- Eumemmerring Creek was a vital source of water and food for Mayune Balluck people.
- The memory of Eumemmerring Creek is retained in this landscape, and its story could be told here.

- Springs may have cultural importance; any springs on this land, including a possible spring on Homestead Road may warrant further investigation.
- These cultural values have been mapped on PSP 9 based on the information provided by Aboriginal representatives.

Impacts and opportunities

The cutting of the drainage channel and the development of housing to the east and west on the edges of the former creek/swamp has changed the landscape, and probably obliterated significant evidence.

There is an opportunity to tell the story of the creek and to re-link its parts across the landscape.

Recommendations

These recommendations relate to PSP 9 and the recognition and protection of Aboriginal cultural values. Further recommendations are made in Section 4 about the approach to the recognising and interpreting cultural values across the broader landscape.

Of the recommendations below, some may form part of the mitigation measures recommended in the CHMP, while others may be best considered as part of the development planning and design, and interpretation planning.

The recommendations below may be best considered as part of the development planning and design, and interpretation planning.

1. Re-establish the importance of Eumemmering Creek for Aboriginal people. Enable its importance to be reasserted or 're-imagined' through activities such as:
 - re-naming or dual naming.
 - interpretation.

- document the former course of the creek (through use of historical maps for example).
2. In development design, the aim should be to enable the natural forms of the land to be appreciated: this includes the former swamp/waterway, changes of slope, high and low points etc.

7 COMPLEX ASSESSMENT (TEST EXCAVATIONS)

7.1 Preamble

The test excavation formed the Complex Assessment component of the CHMP. A total of 14 test trenches were excavated on accessible properties within the activity area.

The methodology and research design for the archaeological test excavation was developed taking into consideration the results of predictive modeling, desktop research and archaeological survey/site inspections as described in previous sections of this report.

7.2 Objectives & Rationale

The test excavation had three primary objectives:

1. To confirm the finding of the standard assessment that the activity area is unlikely to contain Aboriginal cultural heritage;
2. To assess the nature, extent and significance of any Aboriginal sites and archaeological deposits identified during the course of the test excavation work; and
3. To inform management of Aboriginal heritage through the development process.

The aims of the complex assessment were as follows:

- Sample a range of the terrain within the activity area in order to examine soil profiles and confirm the low level of archaeological potential within the activity area;
- Record the vertical extent, sub-surface nature and significance of any archaeological deposits located;

- Record the nature and extent of any ground disturbance;
- Undertake excavation work in partnership with the Aboriginal representative groups;
- Undertake appropriate post-excavation analysis;
- Prepare an excavation report presenting the results of excavations and any post-excavation analysis; and
- Draw on the results of excavation in developing recommendations for management of Aboriginal heritage during development in partnership with the Aboriginal representative groups.

Our excavation approach used the range of terrain within the activity area as the basis for sampling. Sampling was also constrained by the properties that allowed access for the excavation work. The properties that permitted access are shown on **Figure 19**.

7.3 Excavation Methodology

7.3.1 Preamble

The test excavation was completed between 20th - 22nd July 2010. The excavation was directed by Alison O'Connor (B. Arch Hons), who was supported by a team of three archaeologists and one representative each from the Bunurong Land Council Wurundjeri Tribe Land Compensation and Cultural Heritage Council and the Boonwurrung Foundation.

7.3.2 Scope of Work

The programme of work comprised controlled manual and machine excavated 1 metre x 1 metre test trenches set out on two transects designed to cover the range of terrain in the activity area. Each trench was spaced 100 meters apart. This was considered optimal to allow conclusions to be drawn about the extent of soil

disturbance, landscape use, and the nature and extent of the archaeological resource. A total of 14 trenches (comprising a total of 14 square meters) were excavated (see **Figure 23**).

An initial stage of work comprised manual excavation of a trench on each landform (open depression and floodplain) to establish sub-surface conditions and stratigraphy as required by the *Aboriginal Heritage Regulations 2007*. The remaining trenches were excavated by either controlled manual or controlled mechanical excavation. Controlled mechanical trenches were excavated in areas with high clay content and/or were waterlogged. Controlled manual trenches were excavated in areas that were not accessible to the machine and/or had soils with a lower clay content that could be excavated by hand in a controlled manner.

All excavations were undertaken to the level of B or C horizon sub-soil. Sub-soil units comprised heavy plastic clays and swamp gleys.

All A-horizon soil deposits were passed through 5 mm hand sieves or a 5 mm mechanical/wet-sieve in order to recover any artefacts present (i.e. 100% recovery of archaeological material >5mm). Wet sieving was primarily adopted for excavation units with a high clay content, to overcome clogging of the sieve mesh and ensure accurate recognition and recovery of cultural material. Overlying imported fills and underlying B horizon subsoils were not sieved because they are culturally sterile units and/or are unlikely to contain Aboriginal objects or sites.

7.3.3 Excavation and recording methods

Excavation and recording techniques are described below.

Trench Placement and Survey.

The test trench locations were surveyed in and pegged out by professional *RapidMap* surveyors engaged by AHMS. For each trench location an x,y,z datum was established and marked in ground with a surveyors peg.

Excavation Methodology

- All excavation was undertaken in 10cm arbitrary spits within 1m x 1m spatial units;
- Manual excavation entailed primarily the use of shovel and trowel;
- All trenches were oriented north-south;
- Representative soil samples were retained for pH testing and soil description;
- Mechanical excavation was undertaken using a 3 tonne rubber tracked mechanical excavator equipped with a 100cm mud bucket;
- Wet-sieving was undertaken using a high pressure Gurnee (water-blaster), which had been restricted to a safe operating water pressure of approximately 100psi; and
- All excavation trenches were backfilled with the sieve spoil following the recording phase of the work.

Sieving

- All soil excavated as part of manual testing was dry-sieved using 5mm hand sieves or wet sieved through a large 5mm static screen;
- Fill deposits were not sieved because they are imported units and culturally sterile; and
- C horizon deposits excavated as part of stratigraphy exploration were not sieved because they are culturally sterile, being derived from decomposing parent rock that pre-dates human occupation of Australia.

Recording

- A dumpy level was used to measure relative levels at the beginning and end of each excavated trench. The datum peg (at each trench location) was used to record the levels of deposits and features (if encountered);
- A standard site recording form was used for each spit in each trench. Details included site name, date, site recorder, spit number, soil unit and depth, test trench number, description of finds, description of soil, sketch plan of excavation (if relevant to show structure) and end of spit levels;
- A photographic record was kept of trench excavations, including scaled trench section photos;
- Scaled section drawings of each excavated test trench were made;
- An overall site plan was produced using x,y,z coordinates recorded by the DGPS; and
- Artefacts recovered from sieving were retained in plastic clip-lock bags and labeled with the provenance details including: date, site name, excavation trench, soil unit, and spit.

7.3.4 Post Excavation Analysis

Stone Artefact Analysis

No stone artefacts were found.

Other Analyses

No other remains (faunal, shell, charcoal from hearth etc) were found.

7.4 Excavation Results

7.4.1 General

Archaeologists who participated in the excavation included Alison O'Connor (B.Arch. Hons. - Director), Paul Freestone (B.Arch - Supervisor), Jared Brindley and Amanda Zivcic. Alan Wandin and Ashley Firebrace represented the Wurundjeri Tribe Land and Compensation Cultural Heritage Council (WTLC&CHC), Steve Pepper represented the Bunurong Land Council, and Sam Pender represented the Boonwurrung Foundation.

A total of 14 trenches were excavated and 100% sieved through 5mm screens. This comprised 14m².

No Aboriginal artefacts were located during the excavations.

7.4.2 Necessary Variations

Weather during the excavation was generally fine except for the final day (22nd July 2010) with drizzle and light rain. Soils were saturated by recent rains and poor drainage which caused the sieves to block frequently with wet clay. Only Trench 7, located close to a paperbark tree, did not fill with water during excavation. The location of Trench 1 was particularly affected by surface water and was relocated further north by approximately 11.70 metres. Trench 3 was originally located on a vehicle access track and was therefore re-located northeast 6 metres.

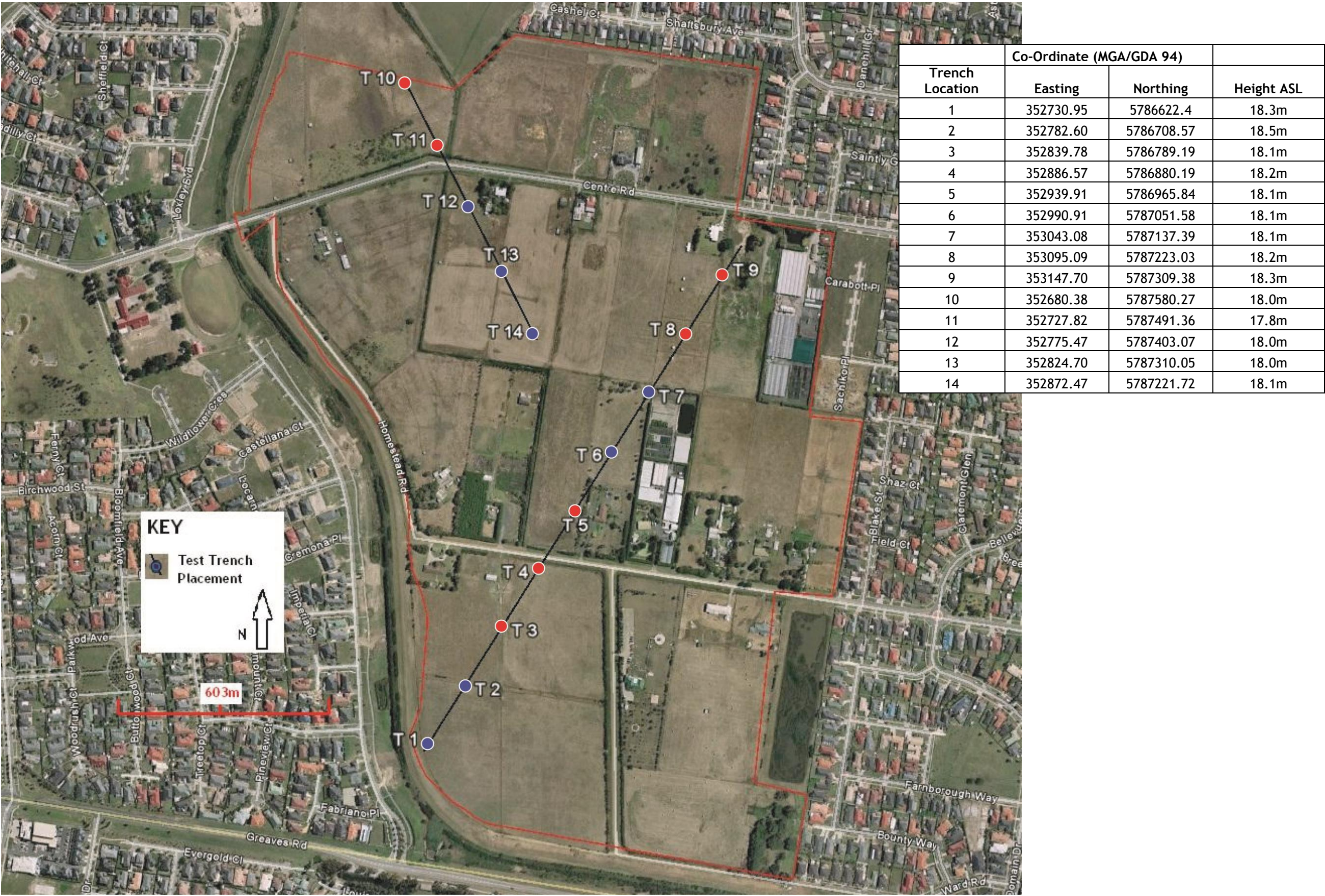
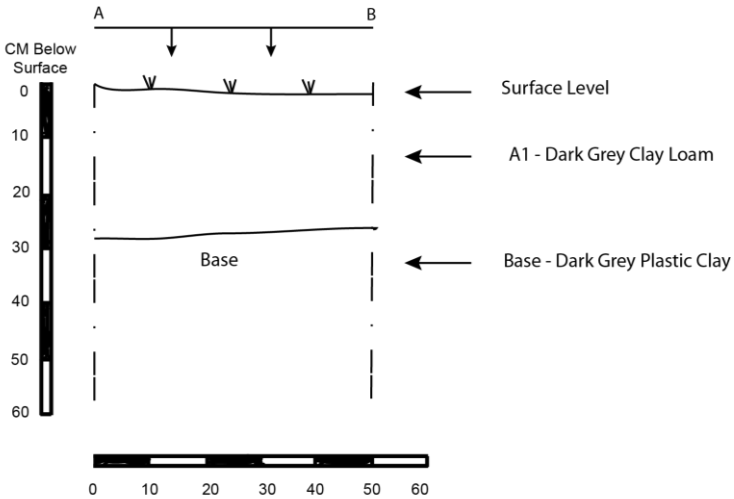


Figure 23 – Alignment of excavated test trenches indicating excavation method used at each location - manual excavation (blue) and machine excavation (red). Trench scale is exaggerated for display purposes.

Trench	01
Location: Point	352730.95 5786622.4
AHD	18.3m
Slope category	Nil
Depth of excavation	20cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.3m	GAA Berwick Waterways CHMP Trench: 01 Section: Northern 1:10 PF 20.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	02
Location: Point	352782.60 5786708.57
AHD	18.5m
Slope category	Nil
Depth of excavation	28cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6
Description and evidence of disturbance	Dark grey Clay Loam, friable but saturated due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height:18.5m	GAA Berwick Waterways CHMP Trench: 02 Section: Northern 1:10 PF 20.07.10 
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	03-1
Location: Point	352839.78 5786798.19
AHD	18.1m
Slope category	Nil
Depth of excavation	13cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots, terracotta drainage pipe runs north-south along the western boundary at c. 55cm (not pictured).
Section drawing: Datum height:18.1m	GAA Berwick Waterways CHMP Trench: 03-1 Section: Northern 1:10 JB 20.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	04
Location: Point	352886.57 5786880.19
AHD	18.2m
Slope category	Nil
Depth of excavation	20cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots, A1 unit contains very compact, dry clay blocks.
Section drawing: Datum height: 18m2m	GAA Berwick Waterways CHMP Trench: 04 Section: Northern 1:10 JB 20.07.10 CM Below Surface 0 10 20 30 40 50 60 A B Surface Level A1 - Grey Silty Clay Loam A2 - Grey Loamy Clay Base Base - Dark Grey Clay 0 10 20 30 40 50 60
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	05
Location: Point	352939.91 5786965.84
AHD	18.1m
Slope category	Nil
Depth of excavation	20cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.1m	GAA Berwick Waterways CHMP Trench: 05 Section: Northern 1:10 AO 21.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	06
Location: Point	352990.91 5787051.58
AHD	18.1m
Slope category	Nil
Depth of excavation	15cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.1m	GAA Berwick Waterways CHMP Trench: 06 Section: Northern 1:10 PF 21.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	07
Location: Point	353043.08 5787137.39
AHD	18.1m
Slope category	Nil
Depth of excavation	20cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable, less saturated with water due to recent rains than other pits due to a Paperbark tree in the vicinity, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.1m	GAA Berwick Waterways CHMP Trench: 07 Section: Northern 1:10 PF 21.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	08
Location: Point	353095.09 5787223.03
AHD	18.2m
Slope category	Nil
Depth of excavation	15cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.2m	GAA Berwick Waterways CHMP Trench: 08 Section: Northern 1:10 JB 22.07.10 0 10 20 30 40 50 60
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	10
Location: Point	352680.38 5787580.27
Location: Point	355147.70 5787309.38
AHD	18.0m
Slope category	18.3m
Slope category	Nil
Depth of excavation	16cm
Excavation	20cm
Soil type	Clay Loam
Soil type	Clay Loam
Landform type	Floodplain
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots. Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit disturbed, much of the rest of the paddock is covered in fill and the trench shows a gravel and quartz sand fill inclusion.
Section drawing: Datum Height: 18.0m Datum height: 18.3m	GAA Berwick Waterways CHMP GAA Berwick Waterways CHMP Trench: 10 Section: Northern 1:10 AO 22.07.09 Section: Northern 1:10 AO 21.07.10 CM Below Surface 0 10 20 30 40 50 60 Surface Level A1 - Dark Grey Clay Loam Fill - Sandy Fill Inclusion with Modern Rubbish A2 - Dark Grey Clay Loam Base - Dark Grey Clay Loam 0 10 20 30 40 50 60
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	11
Location: Point	352727.82 5787491.36
AHD	17.8m
Slope category	Nil
Depth of excavation	15cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 17.8m	GAA Berwick Waterways CHMP Trench: 11 Section: Northern 1:10 AO 22.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	12
Location: Point	352775.47 5787403.07
AHD	18.0m
Slope category	Nil
Depth of excavation	15cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.0m	GAA Berwick Waterways CHMP Trench: 12 Section: Northern 1:10 PF 22.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	13
Location: Point	352824.70 5787310.05
AHD	18.0m
Slope category	Nil
Depth of excavation	15cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam with some orange mottling, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.0m	GAA Berwick Waterways CHMP Trench: 13 Section: Northern 1:10 PF 22.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

Trench	14
Location: Point	352872.47 5787221.72
AHD	18.1m
Slope category	Nil
Depth of excavation	18cm
Soil type	Clay Loam
Landform type	Floodplain
pH	6.5
Description and evidence of disturbance	Dark Grey Clay Loam, friable but saturated with water due to recent rains, A1 unit heavily disturbed by grass roots.
Section drawing: Datum height: 18.1m	GAA Berwick Waterways CHMP Trench: 14 Section: Northern 1:10 PF 22.07.10
Photo:	
Vertical distribution of artefacts	None
Artefact types/materials	N/A

DETAILS OF ABORIGINAL CULTURAL HERITAGE IN THE ACTIVITY AREA

8 TEST EXCAVATION ANALYSIS

No Aboriginal archaeological evidence was located as a result of the complex assessment. The following sub-sections provide an analysis of the results of the complex assessment.

8.1 Soil Profiles

Test excavation revealed the activity area contains one main soil profile, as discussed in the desktop assessment, comprising Holocene swamp and lake clay deposits to a shallow depth. Two horizons were encountered in all excavations:

- A-horizon of anaerobic, humic dark-grey clay-loam, friable with heavy root content to a depth of approximately 15-20cms; and
- B-horizon podosol of dark-grey and dull-orange mottled plastic clay. The B-horizon mottling likely relates to the presence of organic compounds mixed with aluminum or iron oxides.

This is a classic hydrosol profile developed under waterlogged conditions, confirming the activity area former part of a swamp system.

Almost all trenches were saturated with surface and subsurface water due to recent rain and poor drainage over the heavy B-horizon clays.

Land clearance, ripping and cultivation of the landscape for agricultural purposes, as well as treading by livestock and cultivation of grasses for feed have undoubtedly impacted on the A horizon. However, no evidence of cultivation in the form of furrowing was observed. Bio-turbation in the rich humic clay topsoil was evidenced by heavy grass roots, seed pods, insects (beetles) and worms. These activities have contributed to homogenization and mixing of the topsoil profile.

8.2 Soil Chemistry.

An analysis of soil pH is relevant in considering whether the soil has potential for survival of organic or bone remains. Aboriginal groups often used soft soils, particularly dunes and alluvial soils near creeks, for inhumation. Skeletal remains are often found in soft soils with a neutral to alkaline pH. Likewise, organic materials like wood also have potential to survive in waterlogged anaerobic soils with neutral to alkaline pH. The potential for survival of skeletal and organic remains in low pH acidic soils is much lower because the acidity aggressively decomposes bone and organic material.

Soil pH was measured from samples taken during excavation for the purposes of gauging soil acidity and assessing the likelihood of artefact preservation across various parts of the site. This analysis showed Soil pH across the activity area is consistently 6.0 - 6.5 - being slightly acidic.

Given the likelihood that traditional Aboriginal burials within the study area would have ceased more than 150 years ago and the presence of thin acidic soils within the activity area, there is virtually no potential that skeletal remains survive in the activity area.

Prior to European modifications of the original drainage regime, the activity area probably had anaerobic waterlogged conditions that may have allowed for preservation of organic artefacts. However, the land was drained and cleared during the early post war period and this would have introduced a seasonal cyclic regime of drying and waterlogging. This process of alternating dry and wet would have resulted in the decomposition of any organics that may have been preserved in the old swamp.

8.3 Prior Land Use and Disturbance Analysis

The degree of disturbance indicated during the Desktop and Standard Assessments was confirmed during the test excavations. All trenches within the activity area showed some degree of disturbance resulting from land clearance, cultivation of

pasture grasses (grass root disturbance and seed pod germination), treading by grazing cows and horses, and natural bioturbation by burrowing worms and beetles. As a result, topsoil profiles were homogenized.

Excavation of trench 3 revealed a terracotta drainage pipe running on a north-south alignment at 55cms deep. Grass roots, worms and beetles do not appear to penetrate beyond 20cms deep due to the impermeable plastic B-horizon clay unit.



Figure 24 - North section of Trench-3-1 with terracotta pipe in west section (left).

8.4 Discussion

No Aboriginal archaeological deposits were located during the standard and complex assessments conducted as part of this CHMP.

It is concluded that the presence of Aboriginal cultural deposits within the activity area is unlikely. The assessment confirmed the activity area formed part of a swamp system, with soil profiles developed under waterlogged conditions. Local and regional

archaeological settlement patterning indicates that Aboriginal objects and cultural deposits are seldom found on open depression landforms within swamps / perennially waterlogged land. It is likely that these areas were unsuitable for occupation or any sustained use – therefore physical remains are generally absent or very sparse in swamps. Regional and local archaeological patterning indicate that the elevated crest landforms to the west of the activity area may have been a focus of occupation and use and undisturbed portions of the crest landform are likely to have a higher level of archaeological potential.

Disturbance across the activity area has also affected the integrity of soil profiles within the activity area, lowering the scientific significance of any archaeological deposits (if they were present).

9 ASSESSMENT CONCLUSIONS

9.1 Extent of Sites

No Aboriginal sites or objects were found during the assessment. The assessment concluded that the activity area is unlikely to contain Aboriginal cultural heritage.

9.2 Nature of Sites

No Aboriginal sites or objects were found during the assessment. The assessment concluded that the activity area is unlikely to contain Aboriginal cultural heritage.

9.3 Significance Assessment

Aboriginal sites are assessed in terms of three significance criteria: Archaeological (scientific), Cultural (Aboriginal) and Public Significance. These criteria recognise that Aboriginal sites are valuable in a number of ways. Namely:

- to the Aboriginal community as an aspect of their cultural heritage and as part of continuing traditions;
- to the broader community, for educational, historical and cultural enrichment values; and
- to the scientific community for potential research value.

9.3.1 Principles & Evaluation Criteria

“Heritage significance” and “cultural significance” are terms used to describe an item’s value or importance to our society. The Australian ICOMOS Burra Charter (1988) defines cultural significance as:

“Aesthetic, historic, scientific or social value for past, present or future generations”

This value may be contained in the fabric of the item, its setting and relationship to other items, the response that the item stimulates in those who value it now, or the meaning of that item to contemporary society.

The cultural significance of Aboriginal archaeological sites can only be assessed in consultation with the relevant Aboriginal community of communities.

The archaeological significance of a site is generally seen as being directly linked to its scientific or research value. In general this refers to the ability of the contents of a location to enable investigation of research questions, present and future. As future research questions and capabilities cannot always be predicted, archaeological significance is most often assessed in terms of the condition or integrity of deposits present at the location, and their representativeness and/or rarity²²⁶.

In Australia the concept of archaeological significance is commonly defined as a set of questions, originally proposed by Bickford and Sullivan in 1984²²⁷ that are used as a means of assessing the significance of an archaeological site. These questions ask whether a site:

- can provide information not available from other sources;
- can provide information not available from other sites; and
- can answer pertinent research questions.

9.3.2 Evaluation of Aboriginal Cultural Significance

This area of assessment concerns the relationship and importance of sites to the Aboriginal community. Aspects of cultural significance include both people's traditional and contemporary links with a given site or landscape as well as an overall concern by Aboriginal people for sites and their continued protection.

²²⁶ *Burke and Smith 2004: 249*

²²⁷ *Bickford and Sullivan 1984:23-24, see also Burke and Smith 2004: 250*

Unmodified natural features in the landscape can signify sacred sites/places of significance. As such they are archaeologically invisible and can only be identified with the aid of Aboriginal interpretation. If such sites are known they may hold particular cultural significance to contemporary Aboriginal communities. Furthermore, sites of significance are not restricted to the period prior to contact with Europeans. Often events related to the Contact-period may be so important to local Aboriginal communities that they have become significant. If these events relate to a specific place in the landscape, then that place may become sacred or highly significant to the local Aboriginal communities.

The cultural values of the activity area have been documented and assessed by Context Pty Ltd as part of this project and are summarised in Section 6.7 of this report.

9.3.3 Evaluation of Public Significance

This category concerns a site's potential to educate people about the past. It also relates to the heritage value of particular sites as being representative examples of past lifestyles, why they are important, and why they should be preserved.

An assessment of public significance in part considers the ability of an archaeological deposit found during excavation to demonstrate aspects of past Aboriginal life. Therefore a whole range of issues need to be considered including rarity (i.e. are there other resources that can demonstrate these aspects of Aboriginal life?), aesthetics, potential for conservation and potential for interpretation.

No Aboriginal sites or cultural deposits were found during the assessment, therefore the activity area currently has no public significance.

9.3.4 Evaluation of Scientific Significance

The objective of undertaking scientific significance assessment for a site is to determine its research potential in terms of contribution to knowledge about the past. Criteria used to evaluate scientific potential include condition/integrity, representativeness and rarity.

No Aboriginal sites or cultural deposits were found during the assessment, therefore the activity area currently has no archaeological scientific significance.

10 IMPACT ASSESSMENT (S.61 MATTERS)

10.1 Development Design

The Metropolitan Planning Authority (the Sponsor) are developing a Precinct Structure Plan (PSP) for the activity area. This PSP will essentially comprise a large subdivision that will include a range of uses incorporate residential development, town centre, water detention, open spaces, roads, services and infrastructure designed to support the proposed subdivision.

The proposed activity would be 'high-impact' development and would be considered a 'sub-division' under Regulation 48 of the Aboriginal Heritage Regulations 2007. The Sponsor does not intend to develop each individual allotment – they would be sold for development after the sub-division works are complete.

Substantial cut, fill and re-grading will be required to establish the subdivision allotments, in addition to building roads, excavating trenches for services and making the land suitable for residential sub-division. This will remove all topsoils within the footprint of the proposed development allotments and in discrete areas where footings and services are required. The open space areas will be substantially largely undisturbed.

10.2 Evaluation

No artefacts were located within the activity area. The assessment found the activity area is located in an environmental context and landform that seldom contains Aboriginal sites and cultural deposits, probably because it was unsuitable for occupation and sustained use. The activity area has also been subject to various impacts that have affected soil stratigraphy and vertical integrity across the activity area.

The results of assessment clearly demonstrate that the potential for proposed development to impact on Aboriginal sites or relics is very low or 'unlikely'. No further archaeological investigations or salvage measures are warranted.

The results of test excavation clearly demonstrate that the potential for proposed development to impact on Aboriginal sites or objects is very low. No further archaeological investigations or salvage measures are warranted.

However, there always remains the possibility that undetected artefacts may exist in any given area. For this reason contingency plans for dealing with the event of Aboriginal archaeological material or deposits being unearthed during development are provided in the management recommendations section below.

PART 2 – CULTURAL HERITAGE MANAGEMENT RECOMMENDATIONS

THESE RECOMMENDATIONS BECOME COMPLIANCE REQUIREMENTS ONCE
THE CULTURAL HERITAGE MANAGEMENT PLAN IS APPROVED.

11 CULTURAL HERITAGE MANAGEMENT RECOMMENDATIONS

11.1 Basis for Recommendations

The recommendations of this CHMP are made in accordance with:

- the Aboriginal Heritage Regulations 2007;
- Section 61 of the Aboriginal Heritage Act 2006
- the results of desktop, standard and complex assessment documented in this report;
- the impact of proposed development within the activity area; and
- the views of the Aboriginal community representatives.

11.2 Definitions

In the Recommendations and Contingencies included in the following two chapters, the following words have the meanings described below:

- RAP means the Registered Aboriginal Party.
- 'Aboriginal Stakeholders' means the RAP, or if no RAP has been appointed, the Wurundjeri Tribe Land Compensation & Cultural Heritage Council, the Boonwurrung Foundation and the Bunurong Land Council Aboriginal Corporation.
- 'Office of Aboriginal Affairs Victoria' or 'OAAV' means Office of Aboriginal Affairs Victoria, Department of Premier and Cabinet, or such other government department which has responsibility for the Aboriginal Heritage Act 2006 from time to time.
- Activity means the activity to which this CHMP relates.

- Cultural Heritage Advisor (or 'CHA') has the same meaning as "Cultural Heritage Advisor" in the Aboriginal Heritage Act 2006.
- Development Proponent means a person or corporation who has responsibility for implementing the activity.

11.3 Recommendations

These recommendations become compliance requirements once the Cultural Heritage Management Plan is approved.

Recommendation 1 – Impact Avoidance & Minimisation

No Aboriginal cultural heritage was located during the investigations undertaken for this CHMP. The likelihood of Aboriginal cultural deposits within the activity area is low and the activity is unlikely to harm or disturb Aboriginal cultural heritage. A search of the VAHR revealed that no registered Aboriginal cultural heritage is located in the activity area. No Aboriginal cultural heritage was located during the standard and complex assessments of this Cultural Heritage Management Plan. Therefore impact avoidance and minimisation measures are not required.

Recommendation 2 – Sensitive Information.

It is recommended that neither the Sponsor nor the Aboriginal community representatives speak to the media about any issues related to Aboriginal heritage without the consent of the other.

11.4 Contingencies

The Aboriginal Heritage Act 2006 requires Cultural Heritage Management Plans (CHMP) to include Contingency Plans for the following:

- Disputes, delays and other obstacles that may affect the conduct of the activity (Aboriginal Heritage Act 2006:Section 61(d));

- Custody and management procedures for Aboriginal cultural heritage which will be affected by an activity, for the duration of the activity (Aboriginal Heritage Act 2006: Section 61(e));
- The Aboriginal Heritage Act 2006 also requires Cultural Heritage Management Plans to include Contingency Plans for the following:
- The matters referred to in Section 61 of the Act (Aboriginal Heritage Act 2006 13(1)(a));
- The resolution of any disputes between the Sponsor and relevant Registered Aboriginal Party(s) (RAP) in relation to the implementation of the plan or the conduct of the activity (Aboriginal Heritage Act 2006 13(1)(b));
- Reviewing compliance with the CHMP and mechanisms for remedying non-compliance (Aboriginal Heritage Act 2006 13(1)(c));
- The management of Aboriginal cultural heritage found during the activity (Aboriginal Heritage Act 2006 13(1)(d)) and;
- The notification, in accordance with the Act, of the discovery of Aboriginal cultural heritage during the carrying out of the activity (Aboriginal Heritage Act 2006 13(1)(e)).

Contingency 1 – Contingency for discovery of human skeletal remains.

If at any time during the activity suspected human skeletal remains are discovered within the activity area, works must cease and the Victoria Police (03 9247 6666) and the State Coroner's office (1300 309 519) be notified immediately. If there are reasonable grounds to believe that the remains are Aboriginal, the Department of Sustainability and Environment's Emergency Coordination Centre must be contacted immediately on 1300 888 544. Below is a 5 step contingency plan developed by the Department of Planning and Community Development (DPCD) that must be followed in the event of any such discovery.

Discovery

- a. If suspected human skeletal remains are discovered at any time during the activity, works in that area must stop to ensure minimal damage is caused to the remains. It is an offence to interfere with a potential crime scene under the *Coroners Act 2008* and *Crimes Act 1958*, unless under the direction of the Coroner and;
- b. The remains must be left in place and protected from harm or damage.

Notification

- a. Upon site personnel discovering suspected human skeletal remains, the Coroner's Office (1300 309 519) and the Victoria Police (03 9247 6666) must be notified immediately;
- b. If there is reasonable grounds to believe that the remains could be Aboriginal, the Department of Sustainability and Environment's Emergency Co-ordination Centre must also be contacted on (1300 888 544);
- c. All details of the location and nature of the human remains must be provided to the relevant authorities; and
- d. If it is confirmed by these authorities that the discovered remains are Aboriginal skeletal remains, the person responsible for the activity must report the existence of the skeletal remains to the Secretary (DPCD) in accordance with Section 17 of the *Aboriginal Heritage Act 2006*.

Impact Mitigation or Salvage

- a. The Secretary (DPCD), after taking reasonable steps to consult with any Aboriginal person or body with an interest in the Aboriginal human remains, will determine the appropriate course of action as required by Section 18(2)(b) of the *Aboriginal Heritage Act 2006*;

- b. An appropriate impact mitigation or salvage strategy as determined by the Secretary (DPCD) must be implemented by the sponsor (this will depend on the circumstances in which the remains were found, the number of burials found, the type of burials and the outcome of consultation with any Aboriginal body or person);

*Note: In consultation with the Aboriginal community(s), the Sponsor may consider incorporating a contingency plan to reserve an appropriate area for reburial of any recovered human skeletal remains that may be discovered during the activity. This may assist the Secretary in determining an appropriate course of action

Contingency 2 – Contingency planning for discovery of Aboriginal cultural heritage.

This CHMP has determined that the activity area has a very low potential to contain further unknown Aboriginal cultural heritage. In the event of Aboriginal cultural heritage being discovered the following contingencies provide a list of measures that must be followed:

Contingency 2.1 - Discovery

- a. A person who discovers previously unknown Aboriginal cultural heritage will immediately notify the person in charge of the Activity and the Sponsor;
- b. The person in charge of the Activity must then immediately cease work in the location of the discovery and within a buffer zone of 5 meters from the suspected Aboriginal cultural heritage (work outside of this zone may continue);
- c. Within a period of two working days the person in charge of the Activity and the Sponsor must contact and engage an appropriately qualified Cultural Heritage Advisor to record the Aboriginal cultural heritage. The Sponsor must also invite the Aboriginal Stakeholders to investigate the discovery in conjunction with the Cultural Heritage Advisor;

- d. The Cultural Heritage Advisor (in consultation with the Aboriginal Stakeholders and the Sponsor) must determine whether the discovered Aboriginal Cultural Heritage falls into category i. or ii. below:
 - i. isolated or dispersed scatters of less than 10 stone artefacts over a 10 square meter area – Contingency 2.2 applies; or
 - ii. other Aboriginal Cultural Heritage – Contingency 2.3 applies.

Contingency 2.2 - Isolated or dispersed scatters of less than 10 stone artefacts over 10 square meters

If the cultural heritage adviser determines that the discovered Aboriginal Cultural Heritage consists of isolated or dispersed scatters of less than ten stone artefacts over a 10 square meter area, the following applies:

- a. The Sponsor must consider if the activity can be conducted in a way that avoids or minimises harm to the Aboriginal cultural heritage. If the activity cannot be conducted in a way that avoids harm to Aboriginal cultural heritage no further specific measures for the management of Aboriginal cultural heritage are required other than the completion of all necessary documentation (see (b) below);
- b. The Cultural Heritage Advisor must update and/or complete site records, provide management advice and liaise with OAAV if deemed necessary. The Aboriginal site must be recorded and documented in accordance with all relevant OAAV standards and guidelines and any artefacts must be managed in accordance with the curation procedures described in Contingency 3.

Contingency 2.3 - Other Aboriginal cultural heritage

If before, during or after the activity any unexpected Aboriginal cultural heritage is discovered that does not constitute isolated or dispersed scatters of 10 stone

artefacts or less, the following contingencies provide a list of measures that must be followed:

- a. The Sponsor must first consider if the activity can be conducted in a way that avoids or minimises harm to the Aboriginal cultural heritage. If harm can be avoided no further action is required except for completion of all necessary documentation (see (d) below).
- b. If the Cultural Heritage Advisor, in consultation with the Aboriginal Stakeholders, assesses the Aboriginal cultural heritage as having low or very low scientific significance then, after recording procedures are completed, works may continue within the activity area without any further specific action except for completion of all necessary documentation (see (d) below).
- c. If the Cultural Heritage Advisor, in consultation with the Aboriginal stakeholders, assesses the Aboriginal cultural heritage as having moderate or high scientific significance and if harm cannot be avoided or minimised then salvage excavation of the Aboriginal cultural heritage should be considered. Any salvage excavation must be carried out in accordance with proper archaeological practice (r.61 - *Aboriginal Heritage Regulations 2007*) and undertaken by an appropriately qualified archaeologist. Salvage excavation must also comply with the criteria outlined below in Contingency 2.4. If salvage excavation is undertaken, a report on the results of the salvage excavation must also be prepared and lodged with OAAV. After the Aboriginal cultural heritage has been recorded, works may proceed.
- d. The Cultural Heritage Advisor must update and/or complete site records, provide management advice and liaise with OAAV if deemed necessary. The Aboriginal site must be recorded and documented in accordance with all relevant OAAV standards and guidelines and any artefacts must be managed in accordance with the curation procedures described in Contingency 3.

Contingency 2.4 – Salvage Methodology

If salvage excavation is deemed necessary in accordance with contingency.2.3(c) outlined above, the following salvage methodology must be followed:

- a. A programme of controlled manual excavation will be conducted within the vicinity of the discovery at a location determined by the Cultural Heritage Advisor in consultation with the Aboriginal Stakeholders and the Sponsor. The excavation should be no larger than 9 square meters in area.
- b. Prior to commencement of the salvage excavation, a suitably qualified archaeologist or archaeological consultancy must be engaged to prepare a research design and methodology and then undertake the excavation, post excavation analysis and reporting. Representatives of the Aboriginal stakeholders must be invited to participate in the field work and be given an opportunity to review and comment on the excavation report.
- c. The salvage will employ controlled manual excavation in 1m² spatial units and 100mm vertical units (spits). A-horizon topsoil units will be excavated and sieved through a 5mm screen. Any artefacts shall be collected off the screen, will be stored in plastic clip lock bags with the unit provenance details clearly marked on the bag.
- d. Flexibility will be allowed to vary the shape of the open-area in order to follow the extent of high-density deposits or discrete cultural features, such as hearths or knapping floors, however the initial set-out should be 3m by 3m.
- e. The artefacts recovered from the controlled manual salvage shall be analysed and catalogued by a stone artefact specialist and a post-excavation analysis report shall be prepared that specifically addresses the local and regional research questions. The analysis and report should be completed within 12 months of the completion of the salvage excavation. The analysis will aim to determine the following:

- i. Suspected origin of the stone (whether from quarries where the rock is in place, or dispersed along riverbeds);
 - ii. Quantity of stone, by counts and weight;
 - iii. Identification of the artefacts;
 - iv. Interpretation of finished implements among the artefacts, including function of the implements and what they indicate about how the makers lived;
 - v. Patterns in spatial and chronological distributions of the artefacts;
 - vi. Age of the artefacts; and
 - vii. Archaeological research potential and significance of the site.
- viii The aims of the stone artefact analysis will be achieved through analysis of raw material type, core-flake ratio, utilisation, secondary flaking characteristics, reduction sequence, cortex percentage and formal tool/technological identification by a qualified archaeologist(s) who is/are specialized in analysis of Aboriginal stone artefacts.
- f. If use wear evidence is found, use wear analysis of a sample of the recovered assemblage will be undertaken using a x10 stereo microscope with an oblique light. This analysis would examine features on artefacts that may provide evidence of taphonomy or use wear. Such features may include edge wear, edge damage, abrasive striations and silica polish.
 - g. If faunal remains are found during the excavations, a faunal (or archaeo-zoology) specialist will be engaged to identify and analyse any shell, fish bone and animal bone recovered during excavation. The analysis will aim to determine:
 - h. Suitably qualified specialists will be engaged to undertake analysis of environmental samples, residues and C14 dating if suitable evidence is recovered and considered likely to inform any of the research questions.

- i. The post-excavation analysis should specifically review the evidence found during the salvage excavation and test excavations and consider any evidence of change through time and how it may relate to the geomorphic and environmental history of the subject land.
- j. The results of the salvage excavations will be documented in a detailed excavation report following completion of post-excavation analysis. Reporting will be consistent with best practices and in accordance with all relevant OAAV guidelines. The report will specifically address the relevant research questions established in the research design. The excavation and analysis report must be submitted to Office of Aboriginal Affairs Victoria.
- k. The cultural heritage advisor engaged by the Sponsor or the development proponent shall prepare a Place Inspection form documenting the work and lodge the form with Office of Aboriginal Affairs Victoria.

Contingency 3 – Custody and Management of Aboriginal Cultural Heritage during the course of the activity.

The custody of Aboriginal cultural heritage during the course of the Activity will comply with the requirements established by the *Aboriginal Heritage Act 2006*. Aboriginal cultural heritage will be assigned according to the following order of priority as appropriate and advised by OAAV:

- a. Any relevant RAP that is registered for the land from which the Aboriginal heritage is retrieved;
- b. Any relevant Native Title Holder over the land from which the Aboriginal heritage is retrieved;
- c. Any relevant Native Title Party (as defined by the *Aboriginal Heritage Act 2006*) for the land from which the Aboriginal heritage is retrieved;
- d. Any relevant Aboriginal person or persons with traditional or familial links with the land from which the Aboriginal heritage is retrieved, as advised by OAAV;

- e. Any relevant Aboriginal body or organisation which has historical or contemporary interests in Aboriginal heritage relating to the land from which the Aboriginal heritage is retrieved, as advised by OAAV;
- f. The owner of the land from which the Aboriginal heritage is retrieved; and
- g. The Museum of Victoria.

Contingency 4 - Resolution of Disputes

Where the Secretary (DPC) is evaluating the CHMP, this requirement has no application.

Contingency 5 – Compliance and Mechanisms for non-compliance

Review of this CHMP must be undertaken by the Sponsor or Sponsor's delegate to ensure compliance with the Recommendations and Contingencies detailed above. This shall ensure the Activity is undertaken in accordance with this CHMP. For convenience, a concise checklist of CHMP requirements is included in the table below. The checklist should be progressively signed off by the Sponsor or Sponsor's delegate.

COMPLIANCE CHECKLIST TABLE		
REQUIREMENT	COMPLETED YES / NO?	SIGNATURE
BEFORE COMMENCEMENT OF ACTIVITY		
Has the proponent and/or relevant contractors been made aware of the contingency requirements of the management plan and provided with a copy of the approved CHMP ?		
AFTER COMMENCEMENT OF ACTIVITY – On identification of unknown Aboriginal cultural heritage (isolated and dispersed stone artefacts, less than		

10 artefacts over 10 m2 area) were the following steps undertaken ?		
Person in charge of the activity and sponsor notified		
Works ceased within 5m buffer zone		
Within two working days, a CHA engaged to investigate and assess the discovery		
Within two working days, Aboriginal stakeholders notified and invited to investigate discovery in conjunction with CHA		
CHA completed and updated VAHR place recording forms		
Artefacts managed in accordance with Contingency 3		
On identification of unknown Aboriginal cultural heritage (Other Aboriginal cultural heritage, greater than 10 artefacts in a 10m2 area) were the following steps undertaken?		
Person in charge and sponsor notified		
Works ceased within 50m buffer zone		
Within two working days, a CHA engaged to investigate and assess discovery		
Within two working days, Aboriginal stakeholders notified and invited to investigate discovery in conjunction with CHA		
CHA completed and updated place cards. CHA, in conjunction with Aboriginal stakeholders assess significance of Aboriginal cultural heritage and		

consider whether harm avoidance/minimisation is feasible		
If CHA assesses the cultural heritage as having moderate or high significance, salvage excavation considered and implemented in accordance with Contingency 2.4		
Artefacts managed in accordance with curation procedures described in Contingency 3		
On identification of unknown Aboriginal cultural heritage (human skeletal remains) were the following steps undertaken?		
Person in charge and sponsor notified		
Works ceased within 50m buffer zone		
State Coroner's office, Victoria Police notified and Department of Sustainability and Environment's Emergency Coordination Centre notified		
Contingency 1 followed		

Please Note:

Causing harm to Aboriginal cultural heritage is an offence under the *Aboriginal Heritage Act 2006*.

The Minister for Aboriginal Affairs or an inspector under the *Aboriginal Heritage Act 2006* may issue a stop order if there is reasonable grounds for believing that the carrying out of an activity is harming or likely to harm Aboriginal cultural heritage.

The Minister, on the advice of the Secretary, the Aboriginal Heritage Council or an inspector may also order a cultural heritage audit if the Minister reasonably believes that –

- The sponsor of an approved cultural heritage management plan has contravened, or is likely to contravene, the recommendations in the plan; or
- The impact on Aboriginal cultural heritage of an activity to which an approved cultural heritage management plan applies will be greater than that determined at the time the plan was approved or the permit was granted;

If the Minister orders a cultural heritage audit, a stop order must also be issued to the sponsor requiring the sponsor to stop the activity immediately.

A cultural heritage audit must be conducted by or under the supervision of an inspector appointed under the *Aboriginal Heritage Act 2006*. The Secretary may, however, direct the sponsor of a cultural heritage management plan to which an audit relates to engage a cultural heritage advisor to conduct the audit. If the Secretary directs the Sponsor to engage a cultural heritage advisor to conduct an audit the sponsor must comply with the direction (penalties do apply).

An inspector who conducts or supervises the conduct of a cultural heritage must provide a written report of the findings of the cultural heritage audit to the Minister. The report may identify any apparent contravention of the approved cultural heritage management plan and recommend amendments to the approved cultural heritage management plan.

The Minister may then approve the report of the cultural heritage audit if they are satisfied with all matters. If the audit applied to an approved cultural heritage management plan and the audit report recommended changes to the recommendations of the plan; the Minister may amend the plan in accordance with the recommendations and the plan as amended becomes the approved cultural heritage management plan in accordance with the *Aboriginal Heritage Act 2006*

REFERENCES

Office of Aboriginal Affairs Victoria (2007) 'Guide to Preparing Cultural Heritage Management Plans'.

Allen, J., G. Hewitt and J. de Lange, (2008) 'Report on Bend Road Archaeological Investigations: Bend Road 1 Phases 1 to 3'.

Anderson, J.R. (1972) The Quaternary geology and sedimentology of the Gallus Sites at Keilor Victoria. Unpublished B. Sc. (Hons) report, School of Geology, University of Melbourne

Andrefsky, W. (1998) 'Lithics: macroscopic approaches to analysis' Cambridge University Press, Cambridge.

Andrew Long and Associates, (April 2010) 'Strategic Approach to Aboriginal Heritage Management for Melbourne's Growth Areas' (Volume 1 of 5): Project Overview. Draft Report prepared for the Metropolitan Planning Authority.

Andrew Long and Associates (April 2010) 'Strategic Approach to Aboriginal Heritage Management for Melbourne's Growth Areas Desktop Assessment Report - South-East Growth Area' (Volume 5 of 5). Draft report prepared for the Metropolitan Planning Authority.

Armour-Chelu, M. and P. Andrews (1994) 'Some effects of bioturbation by earthworms (Oligochaeta) on archaeological sites' *Journal of Archaeological Science* 21:433-443.

Baales, M. (2001) 'From lithics to spatial and social organization: interpreting the lithic distribution and raw material composition at the final Palaeolithic site of Kettig' (Central Rhineland, Germany) *Journal of Archaeological Science* 28:127-141.

Barker, M. (2009) Watsons Creek Rehabilitation Scheme, Grant Road, Baxter. Cultural Heritage Management Plan #10616. Unpublished report by Heritage Insight for Melbourne Water.

Barrows, T.T., J.O. Stone, L.K. Fifield, and R.G. Cresswell (2002) 'The Timing of the Last Glacial Maximum in Australia' *Quaternary Science Reviews* 21:159–73.

Barton, H. (2001) 'Mobilising Lithic Studies: an application of evolutionary ecology to understand prehistoric patterns of human behaviour in the Simpson Desert, far Western Queensland', unpublished PhD thesis, Department of Archaeology, University of Sydney.

Barwick, D. (1998) 'Rebellion at Coranderrk.' Aboriginal History Monograph 5, Office of Aboriginal Affairs Victoria, Melbourne.

Beaumont, N.E., Curran, J.F. and R.H. Hughes. 2005. *Early days of Berwick and its surrounding districts: Beaconsfield, Upper Beaconsfield, Harkaway, Narre Warren and Narre Warren North*,

Bell, J. (2001) 'An Archaeological Survey of Proposed Realignment of Clyde-Five Ways Road, Survey Report, VicRoads.

Berndt, R. (1982) 'Traditional Concepts of Aboriginal Land', in Berndt, R. (ed.) *Aboriginal Sites, Rights and Resource Development*. Academy of Social Sciences in Australia, Fifth Academy Symposium, 11th November 1981, Proceedings. University of Western Australia Press, Perth, 1–11.

Berwick-Pakenham Historical Society (1982) 'In the wake of the pack tracks: a history of the Shire of Berwick, now the City of Berwick and the Shire of Pakenham', Berwick-Pakenham Historical Society, Berwick.

Berwick-Pakenham Historical Society (2002) 'Oak Trees and hedges: a pictorial history of Narre Warren, Narre Warren North and Harkway', Berwick-Pakenham Historical Society, Pakenham.

Bird, C. F. M. and D. Frankel (1991) 'Problems in Constructing a Prehistoric Regional Sequence: Holocene South-east Australia' *World Archaeology* 23(2): 179-192.

Bocek, B. (1986) 'Rodent ecology and burrowing behaviour: predicted effects on archaeological site formation' *American Antiquity* 51(3): 589-603.

Bonwick, J. (1883) 'Port Phillip Settlement'. Sampson, Low, Marston, Searle & Riverington, London.

Bowen, A. (2000) 'Lots 17-22 Farm Road, Werribee. Cultural Heritage Study' John Nicol Pty Ltd.

Bowler, J.M. (1969) 'The Keilor Terraces: an assessment of geological problems' *The Artefact* 14: 1-16.

Bowler, J. (1970) 'Alluvial terraces in the Maribyrnong Valley, Keilor, Victoria' *Mem. Nat.Nus.Vic.* 30:15-58.

Bowler, J.M. (1976) 'Aridity in Australia: Age, origins and expression in aeolian landforms and sediments' *Earth Science Reviews* 12: 279-310.

Bowler, J.M., D.J. Mulvaney, L.A. Casey and T.A.Darragh (1967) 'Green Gully burial' *Nature* 213: 152-54.

Bride, T. (ed) (1969) 'Letters From Victorian Pioneers'. Second edition. Heinemann, Melbourne.

Broome, R. (2002) 'Aboriginal Australians: Black Responses to White Dominance' 1788- 2001 Allen & Unwin New South Wales.

Bunce, D. 1859 (1979) 'Travels with Dr. Leichhardt' Oxford University Press, Melbourne.

Butler, G & Associates (1999) 'Cardinia Shire Heritage Study: a heritage study of parts of the shire previously in the Cranbourne and Sherbrooke shires' (vols one & two), Cardinia Shire Council, Cardinia.

Byrnes, A. (1989) 'The stratigraphy of Quaternary sediments of the Werribee Delta, Victoria' B.Sc. Honours thesis (Unpublished) School of Geology, University of Melbourne.

Caldere, D. and D.Goff (1991) 'Aboriginal Reserves & Missions in Victoria' Department of Conservation and Environment, Melbourne.

Campbell, J. (1978) 'A Clyde History: Public Hall and Mechanics' Institute jubilee', Clyde Public Hall Committee.

Canning, S. (2004) 'Site Unseen: Archaeology, Cultural Resource management, Planning and Predictive Modelling in the Melbourne Metropolitan Region' Ph.D. Thesis (unpublished). School of European and Historical Studies LaTrobe University.

Casey-Cardinia Library Corporation (2001) 'Cranbourne: a town with history', City of Casey, Narre Warren.

Cekalovic, H. (2002) 'Cultural Heritage Assessment of Proposed Subdivision, South Gippsland Highway, Cranbourne, Victoria'.

Clarke, D., A. Edwards, L. Kirkwood, O. Nicolson, T. MacManus and J. Ward (2009). 'Proposed Housing Subdivision, 305 Berwick-Cranbourne Road, Clyde North, Victoria'.

Clark, I. (1990) 'Aboriginal Languages and Clans: An Historical Atlas of Western and Central Victoria, 1800-1900'. Monash Publications in Geography, no. 37.

Clark, I. (2004) 'Bend in the Yarra: a History of the Merri Creek Protectorate Station and Merri Creek Aboriginal School 1841-1851', Aboriginal Studies Press, Canberra.

Clark, I and T. Heydon (1998) 'The Confluence of the Merri Creek and Yarra River: A History of the Western Port Aboriginal Protectorate and the Merri Creek Aboriginal School' Unpublished Report to Office of Aboriginal Affairs Victoria.

Clark, I. D. and T. Heydon (2002) 'Dictionary of Aboriginal place names of Melbourne and Central Victoria' Victorian Aboriginal Corporation for Language, Northcote, Victoria.

Condon, M.A. (1951) 'The Geology of the Lower Werribee River, Victoria' *Proc. R. Soc. Vict.* 63:1-24.

Context Pty Ltd. (2004) 'City of Casey thematic environmental history (post contact)' City of Casey, Brunswick.

Cook, D. and J. Yugovic (2003) 'Clyde-Tooradin grassland rediscovered' *The Victorian Naturalist* 120: 140–146.

Cotter, R. (2001) 'Boon wurrung: People of the Port Phillip District' Lavender Hill Multimedia, Red Hill South, Victoria.

Cotter, R. (2005) 'A Cloud of Hapless Foreboding: Assistant Protector William Thomas and the Port Philip Aborigines 1839-1840' Nepean Historical Society Inc., Sorrento Victoria.

Cupper, M.L. (2005) 'Last glacial to Holocene evolution of semi-arid rangelands in southeastern Australia' *The Holocene* 15:541-553.

Dahlhaus, P. G. (1986) 'Engineering geology of Melton' Geological Survey of Victoria Unpublished. Report, 1986/06.

Debney, T., J. Fiddian, H. Cekalovic, A. Orr, M. Lawler, T. Meara, R. Regal, and K. Houghton (2009) 'Desalination Project Transfer Pipeline and Power Utilities Corridor, Wonthaggi to Cranbourne, Victoria: Cultural Heritage Management Plan'.

Du Cros, H. (1989) 'Deer Park Archaeological Survey Stage 2 and Stages 3-7, Survey Report, Melton Shire Council.

Du Cros, H. (1991) 'Craigieburn Land Holdings Development. An archaeological survey for Aboriginal and Post-contact sites on the property of Craigieburn Land Holdings, Victoria.

Du Cros & Associates (1992) 'Cardinia Creek Terrace, Officer OAAV 485'.

Edney, P.A., Kershaw, A.P. and De Deckker, P. (1990) 'A late Pleistocene and Holocene vegetation and environmental record from Lake Wangoom, Western Plains of Victoria, Australia'. *Palaeogeography, Palaeoclimatology, Palaeoecology* 80:325-43.

Ellender, I. and Wesson, L. (2002) 'Aboriginal versus European perspectives on country' *Philosophy Activism and Nature Journal* 2:1-15.

Ellender, I. (1991) 'A report on Aboriginal Archaeological Sites in the Royal Botanic Gardens Cranbourne'.

Ellender, I. (1991) 'The Royal Botanic Gardens Cranbourne' An Archaeological Survey for Aboriginal Sites in the Australian Garden.

Ellender, I., R. Luebbers, J. and Bowler (2009) 'The Royal Botanic Gardens, Cranbourne, Victoria'. Completion of Landscape Development in the Australian Garden Stage Two. The Aboriginal Cultural Heritage Management Plan.

Feldman *et al.* (2009) 'Casey Central Shopping Centre, City of Casey, Cultural Heritage Management Plan'.

Fels, M. (1988) 'Good Men and True: the Aboriginal Police of the Port Phillip District 1837-1853' Melbourne University Press, Melbourne.

Fels, M. (1990) 'The Dandenong Police Paddocks, vol. 1: early use as Native Police Headquarters and Aboriginal Protectorate Station, 1837-1853' Occasional Report No. 25, Department of Conservation and environment, Melbourne.

Felton, P. (1981) 'Victoria: Land Reserved for the Benefit of Aboriginies', in Peterson, M. (ed). *Aboriginal Land Rights Handbook*. AIAS, Canberra

Fenner, C. (1918) 'Physiography of the Werribee River Area'. *Proceedings of the Royal Society of Victoria*, 31:176–313.

Fiddian (2007) 'Proposed development at 560 Narre Warren - Cranbourne Road, Cranbourne, Victoria: Cultural Heritage Management Plan, OAAV 10084,' Stockland Development Pty Ltd.

Flemming, J. (1984) 'Journal of the Exploration of Charles Grimes / James Flemming' Queensberry Hill Press. Melbourne.

Ford *et al.* (2009) 'Victorian Desalination Project - Cranbourne Extension of the Power Supply Alignment, Cranbourne, Victoria: *Aboriginal Cultural Heritage Management Plan OAAV 10881*'

Frankel, D., D. Gaughwin, C. Bird and R. Hall (1989) 'Coastal Archaeology in South Gippsland' *Australian Archaeology* 28.

Gallus, A. (1976) 'The Middle and Early Upper Pleistocene Stone Industries at the Dry Creek archaeological sites near Keilor, Australia' *The Artefact* (n.s.) 1(2).

Gallus, A. (1974) 'A summary of the results of excavations by Archaeological Society of Victoria at Keilor (near Melbourne) as per April 1974' *The Artefact* 33:1-9.

Gaughwin, D. and H. Sullivan, (1983) 'Aboriginal Boundaries and Movements in Western Port, Victoria' *Aboriginal History* 8(1):80-98.

Gaughwin, D. (1981) 'Sites of Archaeological Significance in Western Port Catchment, vol. 1' Report prepared by the Division of Prehistory La Trobe University, Victoria for the Environmental Studies Division, Ministry for Conservation, Victoria.

Gaughwin, D. (1981) 'Sites of archaeological significance in the western port catchment: Vol 2, Recommendations, Unlock the Land: A History of the Cohuna District, 1875-1975' (2nd edition), Acacia Publications Pty Ltd., Blackburn.

Gill, E.D. (1968) 'Quaternary sediments of the Maribyrnong River, Keilor' In: McAndrew, J., Marsden, M.A.H. (Eds). *Regional Guide to Victorian Geology*, School of Geology, University of Melbourne, Pp.31-32.

Gill, E. D. (1971) 'Applications of radiocarbon dating in Victor Australia'. *Proc.Roy.Soc.Vict.* 84:71-85.

Gill, E.D. (1962) 'Victoria' in: A.N.Z.A.A.S. Committc for the Investigation of the Quaternary Strandline Changes (Sections C and P) *Aust.J.Sci.* 35:203-4.

Grant, K. (1968) 'A terrain evaluation system for engineering' Commonwealth Scientific and Industrial Research Organization, Melbourne, Division of Soil Mechanics technical paper; no.2.

Grant, K. (1972) 'Terrain classification for engineering purposes of the Melbourne area, Victoria': Commonwealth Scientific and Industrial Research Organization Division of Applied Geomechanics technical paper ; no. 11.

Grant, K. (1973) 'Terrain classification for engineering purposes of the Queenscliff area' Commonwealth Scientific and Industrial Research Organization Victoria Division of Applied Geomechanics technical paper; no. 12

Grant, K. (1974) 'The PUCE programme for terrain evaluation for engineering purposes. 2. Procedures for terrain classification' Commonwealth Scientific and Industrial Research Organization Division of Applied Geomechanics technical paper; no. 19.

Grant, K. and T.G. Ferguson (1978) 'Terrain analysis and classification for engineering purposes of the Warragul area, Victoria' Commonwealth Scientific and Industrial Research Organization, Division of Applied Geomechanics technical paper; no. 21.

Gunson, N. (1968) 'The Good Country' Cranbourne Shire, Melbourne.

Harcourt, R. 2000 'Southern invasion, Northern conquest: story of the founding of Melbourne' Golden Point Press, Blackburn South

Hare, A. G. and R.A.F. Cas (2005) 'Volcanology and evolution of the Werribee Plains intraplate, basaltic lava flow-field, Newer Volcanics Province, southeast Australia' . [*Australian Journal of Earth Sciences*](#), Volume [52](#), (1)59-78.

Hare, A.G., R.A. Cas, R. Musgrave, and D. Phillips (2005) 'Magnetic and chemical stratigraphy for the Werribee Plains basaltic lava flow-field, Newer Volcanics Province, southeast Australia: implications for eruption frequency' [*Australian Journal of Earth Sciences*](#) [52](#)(1)41–57.

Hawkeye (1889) 'Around Tooradin, Western Port. The Sportsman's Paradise'. Brotherton & Cooper, Prahran and St Kilda.

Hewitt, G. and J. de Lange (2007) 'Report on Bend Road Archaeological Investigations, Bend Road 2 Phases 1-4'.

Hicks, D. (1988). Berwick-Pakenham Corridor Historical Survey, Ministry for Planning and Environment, Melbourne.

Hills, E. S. (1940) 'Physiography of Victoria. An Introduction to Geomorphology' Whitcombe and Tombs Pty. Ltd., Australia.

Hills, E. S. (1975) 'Physiography of Victoria. An Introduction to Geomorphology' Whitcombe and Tombs Pty. Ltd., Australia.

Hiscock, P. (2001) 'Sizing up Prehistory: Sample Size and Composition of Archaeological Assemblages' *Australian Aboriginal Studies* 2001(1).

Hiscock, P. and V. Attenbrow (1998) 'Early Holocene Backed Artefacts from Australia' *Archaeology in Oceania* 33(2).

Hiscock, P. and V. Attenbrow, V. (2002) 'Morphological and Reduction Continuums in Eastern Australia: Measurement and Implications at Capertee 3' Tempus 7, Anthropology Museum, University of Queensland.

Holdaway, S. and N. Stern (2004) 'A Record in Stone: the study of Australia's flaked stone artefacts' Museum of Victoria and Aboriginal Studies Press.

Holdaway, S. D., Witter, P. Fanning, R. Musgrave, G. Cochrane, T. Doelman, S. Greenwood, D. Pigdon and J. Reeves (1998) 'New approaches to open site spatial archaeology in Sturt National Park, New South Wales, Australia' *Archaeology in Oceania* 33: 1-19.

Holdgate, G. R., B. Geurin, M.W.Wallace and S.J. Gallagher (2001) 'Marine geology of Port Phillip, Victoria' *Australian Journal of Earth Sciences* 48:439–455.

Hovell, W. H. (1826-7) 'Journal on the voyage to and at Western Port, New South Wales' Original manuscript. Mitchell Library, Sydney.

Howell-Meurs, J. and Long (2006) 'Pakenham Bypass Section 1 and 3. Archaeological Sub-surface Testing Programme', OAAV 3466, VicRoads.

Howell-Meurs, J. (2008) 'Roundabout construction and associated works - Corner Boundary, Palmers & Robinsons Roads, Truganina' CHMP 10354, Vicroads

Howitt, A. W. (1996 (1904) 'The native tribes of South-East Australia' Aboriginal Studies Press, Canberra.

Howitt (n.d.) 'Kulin notes' in Howitt Papers, SLV, 1

Hyett, J. (2002) 'An Archaeological Survey: Cranbourne-Frankston Road Duplication, McClelland Drive to Warrandyte Road' report by TerraCulture for VicRoads.

Hynes, R.A. and A.K Chase (1982) 'Plants, Sites and Domiculture: Aboriginal Influence upon Plant Communities in Cape York Peninsula' *Archaeology in Oceania*: 17(1)

ITP-Nolan (2001) 'Deutgam Groundwater Technical Report' unpublished report prepared for SRW, September 1002, 26 pages + appendices.

Jeffrey, P. J. (1981) 'A Study of the Land in the Catchments to the North Melbourne' Soils Conservation Authority, Report.

Jenkin, J. J. (1988) 'Quaternary & Geomorphology' In: Douglas, J. G. & Ferguson, J. A., (Eds) *Geology Of Victoria*. Victorian Division, Geological Society of Australia, Melbourne. Pp. 351-426.

Jenkin, J.J. (1991) 'Geomorphology' in *Introducing Victorian Geology*. Eds. Cochrane, G.W., Quick, G.W., and Spencer-Jones, D., Geological Society of Australia (Victorian Division).

Jenkins & Patterson (2009) 'Pakenham – Narre Warren Sewerage Transfer Scheme, South-east Melbourne, Victoria'. OAAV 10636, South-east Water Ltd

Joyce, E.B., J.A. Webb, P.G. Dahlhaus, K.G. Grimes, S.M. Hill, A. Kotsonis, J. Martin, M.M. Mitchell, J.L. Neilson, M.L. Orr, J.A. Peterson, N.J. Rosengren, J.N. Rowan, R.K. Rowe, I. Sargeant, T. Stone, B.K. Smith, and S. White, (with material by the late J. J. Jenkin) (2003) 'Geomorphology, the evolution of Victorian landscapes' Chapter 18 in: Birch W. D. (Ed). *Geology of Victoria*, 533-561. Geological Society of Australia Special Publication No. 23. Geological Society of Australia (Victoria Division).

Joyce, E.B. and J.R. Anderson 'Late Quaternary Geology and Environment at the Dry Creek Archaeological Sites near Keilor Australia'. *The Artefact*. 1(2): 47-74.

Keble, R.A. (1950) 'Geology of the Mornington Peninsula' *Memoir of the Geological Survey of Victoria* No 17. Published in 1950, fieldwork conducted in the 1920s.

Kebble, R.A, and J. Macpherson (1946) 'The contemporaneity of river terraces of the Maribyrnong River Victoria, with the Upper Pleistocene in Europe' *Mem. Nat. Mus. Vic* 14(2):52-68.

Kinhill Engineers P/L (1997) 'Cranbourne East-West Road link Environmental Effects Statement'.

Lakic, M and R. Wrench (eds.) (1994) 'Through Their Eyes: An Historical Record of Aboriginal People of Victoria as Documented by the Officials of the Port Phillip Protectorate 1839-1841' Museum of Victoria, Melbourne.

Lambeck, K. and J. Chappell (2001). 'Sea level change through the last glacial cycle' *Science* 292:679–86.

Land Conservation Council of Victoria (LCC) (1991) 'Melbourne Area, District 2 Review: Descriptive Report'.

'The Land of the Lyre Bird. A story of early settlement in the great forest of South Gippsland' Melbourne (1920).

Lane, S. (2008) 'Descriptive report of artefacts excavated during Test excavation programme carried out for the Western Port Land Use Optimisation Study, 2008' appended to *Westernport Industrial Sub-Division. Hastings, Victoria. Cultural Heritage Management Plan (OAAV#10200)* Unpublished report by AHMS for Lefta Corporation.

Light, A. (2009)a '1555 Sth Gippsland Hwy, 5 Adrian St, 6 Adrian St & 7 Nelson St (Residential Subdivision) Cranbourne East'.

Light, A. (2009)b '50 Berwick-Cranbourne Road, Cranbourne East (Residential Subdivision): Aboriginal Cultural Heritage Management Plan'.

Light, A. (2007) 'Indigenous cultural heritage assessment Toolern Creek Park'. Parks Victoria

Long, A. (2006) 'Werribee and Cottrell Streets Werribee, Planning Study: Stage 2 assessment of short listed options' Draft report to Hyder Consulting Pty Ltd.

Lourandos, H. (1980) 'Forces of change: Aboriginal technology and population in south western Victoria' Unpublished PhD thesis, Department of Anthropology, University of Sydney.

McCrae, G.G., 'The early settlement of the Eastern Shores of Port Phillip Bay. With a Note on the Aborigines of the Coast' *Victorian Historical Magazine*, 1(1):22.

McDonald, J. (1997) 'Interim Heritage Management Report: ADI Site St Marys. Volume 1: Text' Report to Lend Lease - ADI Joint Venture in Response to the Section 22 Committee Interim Report.

McKenzie, M. G. and P.A. Kershaw (2004) 'A Holocene pollen record from cool temperate rainforest, Aire crossing, the Otway region of Victoria, Australia' *Review of Palaeobotany and Palynology* 132(3-4):281-290

Massola, A. (1959) 'History of the Coast Tribe Morgan, J. (1852)' The Life and Adventures of William Buckley: Thirty-two years a Wanderer Amongst the Aborigines of the then Unexplored Country around Port Phillip, now the Province of Victoria. Heinemann, Melbourne.

Melbourne Water (2002) 'Devilbend Draft MasterPlan' Report prepared for Melbourne Water and the Victorian government.

Morgan, J. (1996(1852)) 'The Life and Adventures of William Buckley: Thirty Two Years a Wanderer amongst the Aborigines of the then Unexplored Country Round Port Phillip' Archibald MacDougall, Hobart.

Muir, S. (2003)b 'An Archaeological Survey and Sub-surface Testing of Lot 2, 160 Berwick Cranbourne Road, Cranbourne East' Unpublished report to the City of Casey.

Mulvaney, D.J. (1967) 'Thomas William (1793- 1867)' in *Australian Dictionary of Biography*, Volume 2, Melbourne University Press, New York, pp. 518- 519.

Murphy, A. (2006) 'Pearcedale Road Rising Main, Cranbourne: Cultural Heritage Assessment'.

Murphy, A. and D. Owen, D. (2008) 'Lot 2 (P.5464430D), Cnr Evans & Thompsons Roads, Lyndhurst'.

Murphy, A and T. Rymer (2007)a 'Officer South Rising Main, Officer: Cultural Heritage Assessment'.

Murphy, A. and T. Rymer (2007)b 'Officer South Rising main, Officer: Sub-surface Testing Investigations'.

Murphy, A. and T. Rymer (2008)a 'Sewer Rising Main, Officer South, Cultural Heritage Management Plan'.

Murphy, A. and T. Rymer (2008)b 'Edenbrook Residential Estate, Henry Road Pakenham, Cultural Heritage Management Plan'.

Murphy, A & Kennedy, S. (2009) Clyde North & C21 Precinct Structure Plan Desktop Cultural Heritage Assessment. Report to MPA and Tract Consultants on behalf of Australand Holdings Ltd by Tardis Enterprises Pty Ltd

Murray, J. (1801) 'Murray's log, H.M.A. Surveying vessel lady Nelson on discovery, Lieutenant Comander John Murray', chapter 5 in Lee, I. (Mrs. C.B Marriott). (1915). *The log books of the Lady Nelson with the journals of her first commander Lieutenant James Grant, R.N. London.*

Neilson, J.L. (1967) 'The Physiography of the Melbourne Area' *Geological Survey of Victoria Bulletin* 59:47–52.

Parmington, A. (2008) '625 Princes Highway, Officer and 707 Princes Highway Pakenham, Victoria: Cultural Heritage Management Plan'.

Paton, T.R. and M.A.J. Williams (1972) 'The concept of laterite' *Annals of the Assoc. of Amer. Geographers* 62:42-56.

Peron, M. F. (1809) 'A Voyage of discovery to the southern hemisphere performed by orders of the Emperor Napoleon during the years 1802, 1803 and 1804' Translated from French by Phillips, R. (1975) Macmillan Publishing, London.

Presland, G. (1983) 'An Archaeological Survey of Melbourne Metropolitan Park' Victoria Archaeological Reports 15.

Presland, G. (1985) 'Aboriginal Melbourne: The Lost Land of the Kulin People' McPhee Gribble, Ringwood.

Rees, D.B. (Ed). (2000) 'Land Systems Of Victoria' (Version 2) Dept. of Natural Resources and Environment, Centre for Land Protection Research Technical Report No. 56 3rd ed.

Rhodes, D. (2003) 'Results of the Archaeological Subsurface Testing and Monitoring and Development of a Management and Interpretation Plan for the Lakeside Estate at Pakenham'.

Rhodes, D. (2004)a 'Report on the Results of Subsurface Testing at Officer Farm, Pakenham'.

Rhodes, D. (2004)b 'Report on an Archaeological Excavation of a Precontact Bunurong Campsite, Lakeside Estate, Pakenham.'

Rhodes, D. and Bell, J. (2004) 'Shire of Cardinia Urban Growth Corridor Aboriginal Heritage Study' Report by Heritage Insight Pty Ltd to the Shire of Cardinia.

Richardson, N. (1992) 'Conjoin sets and stratigraphic integrity in a sandstone shelter: Kennif Cave (Queensland, Australia)' *Antiquity* 66:408-418.

Roberts, D. (1985) 'From Swampland to Farmland: a history of the Koo-Wee-Rup flood protection district' Rural Water Commission of Victoria, Armadale.

Rowan, J. N. (1982) 'Land Types' In *Atlas of Victoria*, ed. J. S. Duncan (Government Printer: Melbourne).

Rowan, J.M. (1990) 'Land Systems in Victoria' Department of Conservation and Environment and the Land Conservation Council, Victoria.

Rowe, R. K., D.F. Howe and N.F. Alley (1981) 'Guidelines for Land Capability Assessment in Victoria' Soil Conservation Authority, Report.

Sargeant, I. (1975) 'Soil survey of Westernport Bay Catchment' Soil Survey Rep. No 52. Vict. Dept of Agriculture. Victoria's Resources Online.

Sargeant, I. J. (1975) 'Soil Survey. In 'Westernport Bay Environmental Study 1973-74' Ministry for Conservation, Report.

<http://www.dpi.vic.gov.au/dpi/vro/portreg.nsf/696c4532f2cc03304a256718003e5c09/9e30498c41e91e58ca256b9900154a71?OpenDocument>

Schell, P., A. Light, A. Barker and C. Reid (2009) '415 Clyde-Five Ways Road, Clyde'.

Shire of Pakenham (1981) 'Flooding in Kooweerup Swamp: Pakenham Shire' Pakenham Shire, Pakenham.

Singleton, O. P. (1973)a 'Outline of the Geology and Physiography of Victoria' In: McAndrew, J., Marsden, M.A.H. (Eds). *Regional Guide To Victorian Geology*, School of Geology, University of Melbourne, 1-13.

Singleton, O. P. (1973)b 'Geology of the Bacchus Marsh district' In: McAndrew, J., Marsden, M.A.H. (Eds). *Regional Guide To Victorian Geology* School of Geology, University of Melbourne, 59-64.

Smith, L.J. (1991) 'Berwick-Pakenham Corridor. Aboriginal Archaeology'. Victoria Archaeological Reports 45.

Sarr, J. (n.d.) 'Melton - Plains of Promise' James Ferguson, Brisbane.

Stone, T.N., Cupper, M.L., (2003) 'Last Glacial Maximum ages for robust humans at Kow Swamp, southern Australia' *J. Hum. Evol.* 45:99-111.

Sullivan, A.P. (1992) 'Investigating the archaeological consequences of short-duration occupations' *American Antiquity* 57(1):99-115.

Sullivan, A.P. (1995) 'Artifact scatters and subsistence organization' *Journal of Field Archaeology* 22(1):49-64.

Sullivan, H. (1981) 'An Archaeological Survey of the Mornington Peninsula Victoria' Archaeological Survey Occasional Reports 6.

Thomas, W. LT. (n.d) Notebook: Original Manuscript. R. B. Papers, Box 1176/6a, La Trobe Library, Melbourne.

Thomas, W. Journal November (1841) Box 2 and 3.

Thomas, W. ML. (n.d) Private Papers, 16 volumes and 8 boxes of papers, journals, letterbooks, reports etc. Uncatalogued manuscripts, Set 214: items 1-28. Mitchell Library, Sydney.

Thomas, W. (c. 1854) 'Brief account of the Aborigines of Australia Felix'. In Bride, T. F. ed. (1969) *Letters from Victorian Pioneers*. Melbourne.

Tuckey, J. H. (1803) 'Memoir of a chart of Port Phillip, surveyed in October 1803 by Lieutenant James Tuckey of His Majesty's ship *Calcutta*' *Historical Records of Australia*. Series, 1. Australian Government Publishing Service, Canberra.

Tulloch, J. (2004) 'An Archaeological sub-surface testing program at Blacks Camp Rd, Somerville, Victoria' Report prepared by Biosis Research for Department of Education and Training.

Turner, H. G. (1904) 'A History of the Colony of Victoria; 2 volumes' Longmans, London.

Van de Graaff, R.H.M., and Howe, D.F. (1976) 'A Study of the Land in the Yarra Valley Catchment' Soil Conservation Authority, Unpublished Report.

VandenBerg, A.H.M. (1968) 'Geology of the Melbourne District' In McAndrew, J., Marsden, M.A.H. (Eds). *Regional Guide to Victorian Geology*, School of Geology, University of Melbourne, Pp.14-30.

Victorian Geomorphology Reference Group (2009) 'Victoria's Geomorphological Framework' http://www.land.vic.gov.au/DPI/Vro/vrosite.nsf/pages/landform_grg

Wandsnider, P. (1996) 'Describing and comparing archaeological spatial structures' *Journal of Archaeological Method and Theory* 3(4):319-384.

Wasson, R.J. and T.H. Donnelly (1991) 'Palaeoclimate Reconstructions for the Last 30000 Years in Australia-a contribution to prediction of future climate' (CSIRO Division of Water Resources. Technical Memorandum 91/3) CSIRO. Canberra.

Waterhouse, J.(2003) 'The Orchard School: the history of the Toomuc Valley State School, no. 3084, Beacons Hills College, Pakenham'.

Webb, J.A. and S.D. Golding (1998) 'Geochemical mass-balance and oxygen-isotope constraints on silcrete formation and its paleoclimatic implications in southern Australia' *Journal of Sedimentary Research* 68(5):981-993.

Wesson, S. (2000) 'An Historical Atlas of the Aborigines of Eastern Victoria and Far South-Eastern New South Wales' Monash Publications in Geography and Environmental Science Number 53 School of Geography and Environmental Science Monash University, Melbourne.

Wheeler, J., S. Lane, and L. Materese (2008) 'Westernport Industrial Sub-Division. Hastings, Victoria' Cultural Heritage Management Plan (OAAV#10200) Unpublished report by AHMS pty ltd for Lefta Corporation.

Williams, E. (1984) 'Look to the rising sun, back to Cardinia 1984: a history of Cardinia and district, including Rythdale and Pakenham South' Back to Cardinia Committee, Cardinia.

Xiberras, A *et.al.* (2009) 'CHMP Proposed Caravan Park 715 Baxter-Tooradin Road, Pearcedale #10615' Unpublished report by Urban Colours Arts and Cultural Heritage Consultants for Pearcedale Properties Pty Ltd.

Yugovic, J. (2006) 'The beautiful country: Extracts from remarks on the voyage to Western Port by William Hovell' *Indigenotes* 17(2):4–5.

Yugovic, J. (2008) 'Flora and fauna of The Inlets, Koo Wee Rup, Victoria' Report to Melbourne Water, Biosis Research Pty Ltd, Victoria.

Yugovic, J. and S. Mitchell (2004) 'Preliminary vegetation mapping of the Koo-Wee-Rup Swamp and adjacent grasslands' Report to Cardinia Shire Council, Biosis Research Pty Ltd, Victoria.

Yugovic, J. and S. Mitchell (2005) 'Vegetation mapping of the Koo-Wee-Rup Swamp and adjacent grasslands' Report to Cardinia Shire Council, Biosis Research Pty Ltd, Victoria.

Yugovic, J. and S. Mitchell (2006) 'Ecological review of the Koo-Wee-Rup Swamp and associated grasslands' *The Victorian Naturalist* 123: 323–334.

Zhou, L., A.J. Williams and J.A. Peterson (1994) 'Late Quaternary aeolianites, palaeosols and depositional environments on the Nepean Peninsula, Victoria, Australia' *Quaternary Science Reviews* 13:225–239.

Zola, N. and B. Gott (1992) 'Koorie Plants Koorie People: Traditional Aboriginal Food, Fibre, and Healing Plants of Victoria' The Koorie Heritage Trust, Melbourne.

Online sources

History of the Casey region: www.casey.vic.gov.au/history/article.asp?Item=919

Cranbourne, Encyclopedia of Melbourne:
www.emelbourne.net.au/biogs/EM00415b.htm

Narre Warren, Encyclopedia of Melbourne:
www.emelbourne.net.au/biogs/EM01041b.htm

Pakenham, Encyclopedia of Melbourne:
www.emelbourne.net.au/biogs/EM01106b.htm

APPENDIX 1 – NOTICE OF INTENT

Notice of Intent to prepare a Cultural Heritage Management Plan for the purposes of the *Aboriginal Heritage Act 2006*

This form can be used by the Sponsor of a Cultural Heritage Management Plan to complete the notification provisions pursuant to s.54 of the *Aboriginal Heritage Act 2006* (the "Act").

SECTION 1 – Sponsor Information

Name of Sponsor: Growth Areas Authority

Business Name: Growth Areas Authority

Postal Address: Level 29/ 35 Collins St, Melbourne, VIC, 3000

Telephone Number: (03) 9651 9600 Fax number: (03) 9651 9623

Mobile: _____

Email Address: cathy.bradley@gaa.com.au

SECTION 2 – Description of proposed activity and location

- Provide a project name: Berwick Waterways
- List the relevant municipal district/s (ie. Local Council or Shire): Casey
- Clearly identify the proposed activity for which the cultural heritage management plan is to be prepared (ie. mining, road construction, housing subdivision):
Precinct Structure Plan (Subdivision)
- Clearly identify the area (such as listing cadastral information, attaching a copy of a title search, or indicating the street address):
Lot 1 TP748354D, Lot 1 TP085701C, Lot 4 PS052810, Lot Res1 PS323945M, Lot 6 PS052810, Lot 3 PS323945M, Lot 2 PS323945M, Lot 10 PS052810, Lot 12 PS052810, Lot 1 PS323945M, Lot 14 PS052810, Lot 16 PS052810, Lot A PS430080B, Lot 1 PS336088J, Lot Res1 PS336088J, Lot 1 TP748354D, Lot 1 TP213106J, Lot 1 PS314788C, Lot 1 PS338577G, Lot 11 PS052810, Lot A PS437692E, Lot 9 PS052810, Lot 7 PS 052810, Lot 5 PS052810, Lot 3 PS 052810
- Attach a map (to scale, with a north arrow and indicating the municipal district - if any) that clearly identifies the area and boundaries in respect of which the cultural heritage management plan is to be prepared.
 - Please ensure the map refers to existing roads and features, rather than proposed roads and features.
 - Please ensure the map has the activity area outlined on it.
 - The map should have a legend, north arrow, scale, at least 3 readily identifiable geographical locations (such as road intersections, parcel boundaries, or road/river crossings), and should state the map's projection.

SECTION 3 – Cultural Heritage Advisor

If you would like a Cultural Heritage Advisor (a person who has the qualifications or experience [or both] required under section 189 of the Act) notified of the status of this Cultural Heritage Management Plan, please provide the following details for that person:

<u>James Wheeler</u>	<u>AHMS</u>	<u>JamesW@arksolutions.com.au</u>
<i>Name</i>	<i>Company (if any)</i>	<i>Email address</i>

SECTION 4 – Expected start and finish date for the cultural heritage management plan

Start date: 07 / 06 / 2010 Finish date: 01 / 08 / 2010

SECTION 5 – Why are you preparing this Cultural Heritage Management Plan?

- ☒ A Cultural Heritage Management Plan is required by the Aboriginal Heritage Regulations 2007
- What is the High Impact Activity listed in the regulations? Subdivision
- Is any part of the activity in an area of cultural heritage sensitivity, as listed in the regulations? **YES** / NO
Please Circle
- ☐ Other reasons (Voluntary)
- ☐ An Environmental Effects Statement is required
- ☐ A Cultural Heritage Management Plan is required by the Minister for Aboriginal Affairs

SECTION 6 – List the relevant registered Aboriginal parties (if any)

This section should only be completed where there is a registered Aboriginal party in relation to the Plan

N/A

SECTION 7 – Signature of Sponsor

I certify that to the best of my knowledge and belief that the information supplied is correct and complete.

Signed: _____ Date: ____ / ____ / ____
[Sponsor]

SECTION 8 – Notification Checklist

- ☐ Ensure appropriate attachment/s are completed and attached to this notification (see section 2 of this form).

Please ensure this notice and all attached items are sent to the:

Deputy Director
Aboriginal Affairs Victoria
Department of Planning and Community Development
GPO Box 2392
MELBOURNE VIC 3001

Email: vahr@dpcd.vic.gov.au

Notes:

- Ensure that any relevant registered Aboriginal party/s is also notified. A copy of this notice may be used for this purpose. (A registered Aboriginal party is allowed up to 14 days to provide a written response to a notification specifying whether or not it intends to evaluate the management plan)
- In addition to notifying the Deputy Director and any relevant registered Aboriginal party/s, a sponsor must also notify any owner and/or occupier of any land within the area to which the management plan relates. A copy of this notice may be used for this purpose.

APPENDIX 2 – SCHEDULE TO PLANNING SCHEME (UGZ)

37.07

21/09/2009
VC60

URBAN GROWTH ZONE

Shown on the planning scheme map as UGZ with a number.

Purpose

To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.

To manage the transition of non-urban land into urban land in accordance with a precinct structure plan.

To provide for a range of uses and the development of land in accordance with a precinct structure plan.

To contain urban use and development to areas identified for urban development in a precinct structure plan.

To provide for the continued non-urban use of the land until urban development in accordance with a precinct structure plan occurs.

To ensure that, before a precinct structure plan is applied, the use and development of land does not prejudice the future urban use and development of the land.

Application of provisions

Part A – No precinct structure plan applies

The provisions of clauses 37.07-1 to 37.07-8 apply if no precinct structure plan applies to the land.

Part B – Precinct structure plan applies

The provisions of clauses 37.07-9 to 37.07-16 apply if a precinct structure plan applies to the land.

Precinct structure plan provisions

A precinct structure plan applies to land when the precinct structure plan is incorporated in this scheme.

PART A - PROVISIONS FOR LAND WHERE NO PRECINCT STRUCTURE PLAN APPLIES

37.07-1

10/05/2008
VC48

Table of uses

Section 1 – Permit not required

USE	CONDITION
Agriculture (other than Animal keeping, Apiculture, Intensive animal husbandry, Rice growing and Timber production)	
Apiculture	Must meet the requirements of the Apiary Code of Practice, May 1997.
Bed and breakfast	No more than 6 persons may be accommodated away from their normal place of residence. At least 1 car parking space must be provided for each 2 persons able to be accommodated away from their normal place of residence.

Section 1 – Permit not required (continued)

USE	CONDITION
Carnival Circus	Must meet the requirements of A 'Good Neighbour' Code of Practice for a Circus or Carnival, October 1997.
Dependent person's unit	Must be the only dependent person's unit on the lot. Must meet the requirements of Clause 37.07-2.
Dwelling (other than Bed and breakfast)	Must be the only dwelling on the lot. The lot must be at least 40 hectares. Must meet the requirements of Clause 37.07-2.
Geothermal energy extraction	Must meet the requirements of Clause 52.08-4.
Home occupation Informal outdoor recreation Mineral exploration	
Mining	Must meet the requirements of Clause 52.08-2.
Minor utility installation Natural systems Railway Road	
Search for stone	Must not be costeaning or bulk sampling.
Telecommunications facility	Buildings and works must meet the requirements of Clause 52.19.
Tramway	

Section 2 – Permit required

USE	CONDITION
Animal boarding	
Animal keeping (other than Animal boarding)	Must be no more than 5 animals.
Car park	Must be used in conjunction with another use in Section 1 or 2.
Cemetery Community market Crematorium	
Dependent person's unit – if the Section 1 condition is not met	Must meet the requirements of Clause 37.07-2.
Display home	
Dwelling (other than Bed and breakfast) – if the Section 1 conditions are not met	Must be no more than two dwellings on the lot. Must meet the requirements of Clause 37.07-2.
Education centre Emergency services facility	

Section 2 – Permit required (continued)

USE	CONDITION
Freeway service centre	Must meet the requirements of Clause 52.30.
Freezing and cool storage	
Group accommodation	Must be used in conjunction with Agriculture, Outdoor recreation facility, Rural industry, or Winery. Must be no more than 6 dwellings.
Hospital	
Host farm	
Interpretation centre	
Leisure and recreation (other than Informal outdoor recreation and Motor racing track)	
Manufacturing sales	
Medical centre	
Mineral, stone, soil, or geothermal energy extraction (other than Mineral exploration, Geothermal energy extraction, Mining, and Search for stone)	
Nursing home	
Place of assembly (other than Carnival, Circus, and Place of worship)	Must not be used for more than 10 days in a calendar year.
Place of worship	
Primary produce sales	
Real estate agency	
Residential hotel	Must be used in conjunction with Agriculture, Outdoor recreation facility, Rural industry, or Winery.
Restaurant	
Rice growing	
Rural industry	
Rural store	
Store (other than Freezing and cool storage and Rural store)	Must be in a building, not a dwelling, and used to store equipment, goods, or motor vehicles used in conjunction with the occupation of a resident of a dwelling on the lot.
Timber production	Must meet the requirements of Clause 52.18.
Utility installation (other than Minor utility installation and Telecommunications facility)	
Veterinary centre	
Wind energy facility	
Winery	

Section 3 - Prohibited

USE

Accommodation (other than Dependent person's unit, Dwelling, Group accommodation, Host farm, Nursing home, and Residential hotel)
 Industry (other than Rural industry)
 Intensive animal husbandry
 Motor racing track
 Office (other than Medical centre and Real estate agency)
 Retail premises (other than Community market, Manufacturing sales, Primary produce sales and Restaurant)
 Saleyard
 Warehouse (other than Store)
 Any other use not in Section 1 or 2

37.07-2

10/06/2008
VC48

Use of land for a dwelling

A lot used for a dwelling must meet the following requirements:

- Access to the dwelling must be provided via an all-weather road with dimensions adequate to accommodate emergency vehicles.
- The dwelling must be connected to a reticulated sewerage system or if not available, the waste water must be treated and retained on-site in accordance with the State Environment Protection Policy (Waters of Victoria) under the Environment Protection Act 1970.
- The dwelling must be connected to a reticulated potable water supply or have an alternative potable water supply with adequate storage for domestic use as well as for fire fighting purposes.
- The dwelling must be connected to a reticulated electricity supply or have an alternative energy source.

These requirements also apply to a dependent person's unit.

37.07-3

10/06/2008
VC48

Subdivision of land

A permit is required to subdivide land.

Each lot must be at least 40 hectares.

A permit may be granted to create smaller lots if any of the following apply:

- The subdivision is to create a lot for an existing dwelling. The subdivision must be a two lot subdivision. An agreement under section 173 of the Act must be entered into with the owner of each lot created which ensures that the land may not be further subdivided so as to create a smaller lot for an existing dwelling. The agreement must be registered on title.
- The subdivision is the re-subdivision of existing lots and the number of lots is not increased. An agreement under section 173 of the Act must be entered into with the owner of each lot created which ensures that the land may not be further subdivided so as to increase the number of lots. The agreement must be registered on title.
- The subdivision is by a public authority or utility service provider to create a lot for a utility installation.

37.07-4

10/06/2008
VC48

Buildings and works

A permit is required to construct or carry out any of the following:

- A building or works associated with a use in Section 2 of Clause 37.07-1. This does not apply to:
 - An alteration or extension to an existing dwelling provided the floor area of the alteration or extension is no more than 50 square metres.

- An alteration or extension to an existing building used for agriculture provided the floor area of the alteration or extension is no more than 100 square metres. The building must not be used to keep, board, breed or train animals.
- Earthworks which change the rate of flow or the discharge point of water across a property boundary.
- Earthworks which increase the discharge of saline water.
- A building which is within any of the following setbacks:
 - 100 metres from a Road Zone Category 1 or land in a Public Acquisition Overlay to be acquired for a road, Category 1.
 - 40 metres from a Road Zone Category 2 or land in a Public Acquisition Overlay to be acquired for a road, Category 2.
 - 20 metres from any other road.
 - 5 metres from any other boundary.
 - 100 metres from a dwelling not in the same ownership.
 - 100 metres from a waterway, wetlands or designated flood plain.

37.07-5 Referral of applications

10/05/2008
VC48

An application of the kind listed below must be referred in accordance with section 55 of the Act to the referral authority specified in Clause 66.03.

- An application to use or develop land for any of the following:
 - Display home
 - Education centre
 - Hospital
 - Medical centre
 - Nursing home
 - Place of worship
 - Real estate agency.
- An application to subdivide land to create a lot smaller than 40 hectares in area.

37.07-6 Environmental audit

10/05/2008
VC48

Before a nursing home, pre-school centre or primary school commences on potentially contaminated land, or before the construction or carrying out of buildings and works in association with a nursing home, pre-school centre or primary school commences on potentially contaminated land, either:

- A certificate of environmental audit must be issued for the land in accordance with Part IXD of the Environment Protection Act 1970, or
- An environmental auditor appointed under the Environment Protection Act 1970 must make a statement in accordance with Part IXD of that Act that the environmental conditions of the land are suitable for the sensitive use.

In this clause, "potentially contaminated land" means land used or known to have been used for industry, mining, or the storage of chemicals, gas, wastes or liquid fuel (if not ancillary to another use of the land).

37.07-7 Decision guidelines

10/05/2008
VC48

Before deciding on an application to use or subdivide land, construct a building or construct or carry out works, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate:

- The State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.
- The effect on the future urban development and use of the land, and adjacent or nearby land, having regard to:
 - Any relevant Growth Area Framework Plan.
 - Any precinct structure plan being prepared for the area.

- Any comments or directions of the referral authority.
- Whether the proposal will prejudice the logical, efficient and orderly future urban development of the land, including the development of roads, public transport and other infrastructure.
- The capability of the land to accommodate the proposed use or development, including the disposal of effluent.
- How the use or development relates to sustainable land management.
- Whether the site is suitable for the use or development.
- The impact of the siting, design, height, bulk, colours and materials to be used on the natural environment, major roads, vistas and water features, future urban use of the land, and the measures to be undertaken to minimise any adverse impacts.
- The impact on the character and appearance of the area or features of architectural, historic or scientific significance or of natural scenic beauty or importance.
- The location and design of existing and proposed infrastructure including roads, public transport, walking and cycling networks, gas, water, drainage, telecommunications and sewerage facilities.
- Whether the use and development will require new or upgraded infrastructure, including traffic management measures.

37.07-8

21/09/2009
VC60

Advertising signs

Advertising sign requirements are at Clause 52.05. The zone is in Category 3.

Despite the provisions of Clause 52.05-9, a permit may be granted, for a period of not more than 5 years, to display an advertising sign that promotes the sale of land or dwellings.

PART B - PROVISIONS FOR LAND WHERE A PRECINCT STRUCTURE PLAN APPLIES

37.07-9

10/06/2008
VC48

Use of land

Any requirement in the Table of uses and any requirement specified in the schedule to this zone must be met.

Table of uses

Section 1 – Permit not required

USE	CONDITION
Any use in Section 1 of a zone applied by the schedule to this zone	Must comply with any condition opposite the use in Section 1 of the applied zone Must comply with any condition specified in the schedule to this zone
Any use specified in the schedule to this zone as a use for which a permit is not required	Must comply with any condition specified in the schedule to this zone

Section 2 – Permit required

USE	CONDITION
Any use in Section 2 of a zone applied by the schedule to this zone	Must comply with any condition opposite the use in Section 2 of the applied zone Must comply with any condition specified in the

USE	CONDITION
	schedule to this zone
Any use specified in the schedule to this zone as a use for which a permit is required	Must comply with any condition specified in the schedule to this zone
Any other use not in Section 1 or 3	

Section 3 - Prohibited

USE
Any use in Section 3 of a zone applied by the schedule to this zone
Any use specified in the schedule to this zone

37.07-10 Subdivision of land

10/05/2008
VC48

A permit is required to subdivide land. Any requirement in the schedule to this zone must be met.

A permit granted must:

- Be generally in accordance with the precinct structure plan applying to the land.
- Include any conditions or requirements specified in the schedule to this zone.

37.07-11 Buildings and works

10/05/2008
VC48

If the schedule to this zone specifies:

- That the provisions of a zone apply to the development of land, the provisions of the zone apply to land in the circumstances specified in the schedule.
- Provisions relating to the development of land, those provisions apply to land in the circumstances specified in the schedule.

If the schedule to this zone specifies that a permit is required to construct a building or construct or carry out works, a permit granted must:

- Be generally in accordance with the precinct structure plan applying to the land.
- Include any conditions or requirements specified in the schedule to this zone.

37.07-12 Application requirements

10/05/2008
VC48

An application to use or subdivide land, construct a building or construct or carry out works, must be accompanied by any information specified in the schedule to this zone.

37.07-13 Exemption from notice and review

10/05/2008
VC48

An application under clause 37.07-9 to 37.07-11 which is generally in accordance with the precinct structure plan applying to the land is exempt from the notice requirements of section 52(1)(a), (b) and (d), the decision requirements of section 64(1), (2) and (3) and the review rights of section 82(1) of the Act, unless the schedule to this zone specifies otherwise.

37.07-14 Decision guidelines

10/05/2008
VC48

Before deciding on an application to use or subdivide land, construct a building or construct or carry out works, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate:

- The State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.
- Any relevant Growth Area Framework Plan.
- The precinct structure plan applying to the land, including the vision and objectives of the precinct structure plan.
- Any guidelines in the schedule to this zone.

37.07-15
10/06/2008
VC48

Inconsistencies between specific and applied zone provisions

If there is an inconsistency between the specific provisions specified in the schedule to this zone and the provisions of a zone applied by the schedule to this zone, the specific provisions prevail to the extent of any inconsistency.

37.07-16
10/06/2008
VC48

Advertising signs

Advertising sign requirements are at Clause 52.05. This zone is in the category specified in the schedule to this zone or, if no category is specified, Category 3.

Notes:

Refer to the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement, for strategies and policies which may affect the use and development of land.

Check whether an overlay also applies to the land.

Other requirements may also apply. These can be found at Particular Provisions.

APPENDIX 3 – GLOSSARY OF TECHNICAL TERMS

Aeolian	Wind generated geological processes. In an archaeological context it usually refers to wind blown deposits and sands.
Backed Artefact / Backing	A retouched tool (maybe a complete, distal, medial or proximal flake) that displays evidence of backing along one lateral margin. This backing may be initiated from the ventral surfaces or alternately may be an example of bidirectional backing initiated from both surfaces (Holdaway and Stern 2004:259). There are four main types of commonly recognised backed artefacts, which include ‘Bondi Points; geometric microliths (or ‘Backed Blades’), Juan Knives and Eloueras’.
Bipolar	A method of removing flakes from a core, by striking a core against an anvil (Holdaway and Stern 2004:11). This is often evidenced by crushing at the platform and/or at the termination of the flake; Bipolar flaking is also evidenced as crushing at the base (end opposite the platform) of a core.
Blade	A flake that is twice as long as its width.
Bulbar	Refers to a bulb of percussion produced during a conchoidal fracture
Chert	‘a dense, extremely hard, microcrystalline or cryptocrystalline, siliceous sedimentary rock, consisting mainly of interlocking quartz crystals, sub-microscopic and sometimes containing opal (amorphous silica). It is typically white, black or grey, and has an even to flat fracture. Chert occurs mainly as nodular or concretionary aggregations in limestone and dolomite, and less frequently as layered deposits (banded chert). It may be an organic deposit (radiolarian chert), an inorganic precipitate (the primary deposit of colloidal silica), or a siliceous replacement of pre-existing rocks’ (Lapidus 1990:102).
Conchoidal	Where a force strikes the surface of a core forming a circular or ‘ring’ crack that bends back towards the surface of the core,

	forming a partial bulb of percussion. The fracture frequently moves towards the exterior surface of the core, detaching a flake (Holdaway and Stern 2004:34).
Core	Andrefsky (1998:80-81) states a core can be understood as ‘an objective piece that has had flakes removed from its surface’; Holdaway and Stern (2004:37; 5-8) provide further clarification ‘artefacts that retain the negative flake scars of previous flake removals’.
Cortex	The outer layer of patination of rock is known as cortex. It is found on weathered stone (Holdaway & Stern 2004: 26-27). Cortex types (mostly rough, water worn or pebble) can indicate the source that stone material was obtained from.
Debitage	Small spalls and flakes produced during percussion, bipolar and pressure flaking.
Fine Grained Basalt	Basalt is a volcanic rock. See Volcanic below.
Flake	Depending on the completeness of the flake, a flake may have a number of common characteristics which may include: a platform, bulb of percussion, errailure (or bulbar) scar, point of force impact (PFI or umbo), dorsal ridge and ventral surface, fissures (or indentations), ripple marks (which radiate away from the point of force impact/umbo) and a termination. Not all of these features are typically found on every flake, however they are attributes likely to be present from conchoidal fracture.
egative Flake Scar	The negative indentation or scar left behind on a flake, core or tool when a flake is removed. The presence and abundance of negative flake scars can reveal information about the process of flaking. For example negative flake scars on a) cores can provide information on how intensely the core has been used, b) on the dorsal surface of a flake can indicate how intensely the core was flaked before this flakes was removed and/or that the core platform was cleaned off to start flaking again (platform rejuvenation), c) along the edge of a flake can

	indicate retouch/backing (Holdaway and Stern 2004:184).
Point	A term applied to certain formal types such as Bondi Points.
Platform	A striking platform or a platform is the surface from which a flake is struck from a Core (Holdaway and Stern 2004:5); flakes retain part of the platform on their proximal end.
Quartz	‘crystalline silica, SiO ₂ . It crystallizes in the trigonal system, commonly forming hexagonal prisms. For cryptocrystalline varieties of silica see Chalcedony. Colourless and transparent quartz, is found in good crystals, is known as rock crystal. Varieties that are colours due to the presence of impurities may be used as gemstones, amethyst, purple to blue-violet, rose quartz, pink; citrine, orange- brown; smoky quartz, pale yellow to deep brown’ (Lapidus 1990:429).
Quartzite	‘a metamorphic rock consisting primarily of quartz grains, formed by the recrystallization of sandstone by thermal or regional metamorphism; a metaquartzite and a sandstone composed of quartz grains cemented by silica; an orthoquartzite’ (Lapidus 1990:430).
Retouch	Modification of a flake or core prior to use. Retouch is the ‘removal of a series of small, contiguous flakes’ from the edges of the artefact (Holdaway and Stern 2004:33). There are several different types of retouch which are identified as backing; stepped; scalar; invasive; notched and serrated retouch.
Reduction	By definition stone material is made smaller when it is struck to produce stone flakes and tools. This process is known as stone reduction. <i>‘Modern stone artefact analyses use the reductive nature of stone artefact manufacture as the basis for reconstructing the processes by which artefacts were made. By analysing the size and form of artefacts, archaeologists can obtain information about how stone was acquired from its source, the form in</i>

which the stone was transported to campsites, how it was worked, and the way stone artefacts were use until discarded' (Holdaway and Stern 2004:3).

Scarred Tree	A tree that has been marked as a result of bark being removed by Aboriginal people for cultural reasons or for use in making shields, containers, canoes etc. Some trees may also have marks caused by making toe holds for climbing up trees.
Scraper	'A minimal definition of a scraper is that it is a flake with one or more margins of continuous retouch'. It also indicates the stage of reduction the flake has reached (see Holdaway and Stern 2004:227).
Silcrete	'a hard surface deposit composed of sand and gravel cemented by opal, chert and quartz, formed by chemical weathering and water evaporation in semi-arid climate. Extensive deposits of silcrete are found in S. Africa and Australia. Silcrete is a siliceous duricrust' (Lapidus 1990:472).
Termination	There are a number of different flake terminations (or ends of a flake) which are possible through flaking stone material. The main types of flake terminations include step, hinge, feather and plunging. Flake terminations can provide information about how the flake was removed.
Tool	A tool is an artefact which shows evidence of modification (i.e. by retouch) or without modification (i.e. show signs of usewear) (Holdaway and Stern 2004:33; 39).
Tuff	'pyroclastic rock composed mainly of volcanic ash (fragments <2mm in diameter). Tuffs may be classified as crystal tuff if they contain a large proportion of crystal fragments, vitric tuff composed mainly of glass and pumice fragments and lithic tuff, containing mainly rock fragments. A consolidated mixture of lapilli and ash is a lapilli tuff' (Lapidus 1990:519-520).
Usewear	'Evidence of distinctive patterns of wear [which is] sometimes found on the edges of artefacts that were believed to have

been used for specific purposes’ (Holdaway and Stern 2004:41). Several types of usewear can be observed. Holdaway and Stern (2004:41; 167) identify ‘chattering’ and ‘edge damage’ as one form of usewear.

Volcanic

‘All extrusive rocks and associated high-level intrusive ones. The group is entirely magmatic and dominantly basic. Igneous lithic material generally dark in colour and may be glassy (like obsidian) or very fine-grained or glassy igneous rock produced by volcanic action at or near the Earth’s surface, either extruded as lava (e.g. basalt) or expelled explosively’ (Lapidus 1990:535).